Racial Health Inequality in Medicine and Economics

Marcella Alsan
Harvard Kennedy School and NBER

ASHEcon Annual Conference, 2021
Life Expectancy - Boustan and Margo
Life Expectancy - Boustan and Margo
Life Expectancy - Boustan and Margo
Vital Statistics Surveillance Report


2019-20 Change in Life Expectancy - NCHS

<table>
<thead>
<tr>
<th>Category</th>
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<td>Non-Hispanic white male</td>
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<td>Non-Hispanic white female</td>
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The Conceptualization of Race in Economics and Medicine

Historical Connections and Current Challenges

Diversity in the Professions

Potential Avenues for Research
Race in Economics and Medicine
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<th>Medicine</th>
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- Genetics
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<td>Models</td>
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“Peculiarities”

► “Before going into the peculiarities of their diseases, it’s necessary to glance at the anatomical and physiological differences between the negro and the white man.”

► “Debasement of the mind... unable to take care of themselves...no letters...no buildings, roads, or improvements, or monuments of any kind are any where found [in Africa] to indicate they have ever been awakened from their apathy and sleepy indolence.”
Drapetomania – A mental illness causing those who were enslaved to abscond.

Dysaesthesia aethiopica – An illness causing insensibility to pain and leading to wanton destruction of property.

Treatment

for Drapetomania – “experience...was decidedly in favor of whipping them out of it, as a preventive measure.”

for Dysaesthesia aethiopica – “have the patient well washed...slap the oil in with a broad leather strap”
Racial bias in algorithms

Hidden in Plain Sight — Reconsidering the Use of Race Correction in Clinical Algorithms

Darshali A. Vyas, M.D., Leo G. Eisenstein, M.D., and David S. Jones, M.D., Ph.D.

- Reviewed the use of race as incorporated into algorithms used to guide treatment in cardiology, nephrology, obstetrics, urology, oncology, endocrinology, and pulmonology.

- The explicit use of race in algorithms almost invariably makes patients with otherwise similar lab or clinical findings less likely to receive screening, close surveillance, and speedy referrals or interventions if they are Black or Hispanic.

- Recent work by Obermeyer, Powers, Vogeli, and Mullainathan found even without explicit reference to race, bias in algorithm used to estimate disease severity based on prior costs (which are higher for White patients) leading to more referrals.
The Conceptualization of Race

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<tr>
<td>Algorithms</td>
<td>Models</td>
</tr>
</tbody>
</table>
Eugenics and Economics in the Progressive Era

Thomas C. Leonard

"We must strain out of the blood of the race more of the taint inherited from a bad and vicious past, before we can eliminate poverty...from our social life. The scientific treatment which is applied to physical diseases must be extended to mental and moral disease, and a wholesome surgery and cautery must be enforced...for the good of all."

— Francis Walker, former president of MIT and the AEA’s founding president
William Z. Ripley

“Races of Europe”
"No amount of restitution for past injustice...could solve the basic problem of the Negro...that on average he lacks a desire to improve himself, and... a willingness to discipline himself to this end. The task of our time has been to make the Negro discontented with himself, not with the white man."

"The Negro...is excluded from many occupations by the varied barriers the prejudice can raise, and these must and will be struck down. But he is excluded from more occupations by his own inferiority as a worker, again on average. Lacking education...a tenacity of purpose...a willingness to work hard, he will not be an object of employers’ competition"
Discrimination models in economics
Tastes and averages

- Taste-based and statistical discrimination models aim to understand differences in treatment across groups, conditional on similar economically-relevant attributes.
- Both are from the vantage point of the majority group.
  - David Williams and colleagues on *Everyday Discrimination Scale and Major Experiences of Discrimination*.
- Latter approach assumes relevant attributes vary across groups.
  - As Phelps (1972) writes: “[T]he employer who seeks to maximize expected profit will discriminate against blacks or women if he believes them to be less qualified...on the average than whites and men, respectively.”
- Omit the importance of implicit or unconscious bias.
“Economists...are viewed as the objective scientists, with the tools to identify solutions; presumably absent ‘passion.’ But if you start with a model that has race as exogenous, racial differences cannot be objectively approached. The model begins with a fallacy that assumes racial differences as a natural order.” – William Spriggs, open letter to economists

The models omit the role institutions, culture, and their interactions may have in perpetuating the unequal distribution of the attributes themselves.

“A substantial body of evidence suggests that limiting the study of discrimination to the actions of potentially prejudiced individuals dramatically understates the extent to which people experience discrimination...the extent to which discrimination may account for social inequality; and...to which discrimination may play a role in markets for labor, credit, and housing, as well as in other contexts.” – Mario L. Small and Devah Pager (JEP, 2020)
Understanding race as endogenous
Slide adapted from Dr. Chandra Jackson (NIH) and Williams et al. (Annu. Rev. Public Health, 2019)

Race is not a risk factor
Race is primarily the social interpretation of one's phenotype, nationality or ethnicity

Racism is the risk factor
Racism is a system of structuring opportunity and assigning value based on race

Racism operates on many levels
- **Institutional**: processes that are embedded in laws, policies, and practices that support the differential advantage/disadvantage of groups
  - **Individual-level**: discrimination and micro-aggressions
  - **Internalized**: self-hatred due to your race (e.g., believing and behaving as if you are less than others)
Historical Connections and Current Challenges
Medical exploitation and motivated beliefs: Dr. Marion Sims

Dr. Marion Sims - “Father of Gynecology.” Statue removed from Central Park, 2018
(Not) treating pain

Interviewed laypeople and medical residents and students. Gave medical students clinical vignettes.

9% of all med students believed that Blacks’ nerve endings are less sensitive than Whites (20% among laypeople), translated into differential hypothetical treatment.

Meta-analysis of 14 studies in the *American Journal of Emergency Medicine* found that compared to White patients, Black patients were 40% less likely to receive medication to ease acute pain and Hispanic patients were 25% less likely.

Sources: Hoffman et al. *(PNAS, 2016)*; Lee et al. *(AJEM, 2019)*
The Tuskegee Study of Untreated Syphilis in the Negro Male

Alsan and Wanamaker (*QJE*, 2018)

- Used an interacted triple-difference framework to test hypothesis; comparing across race and sex, before versus after the study disclosure, interacted with a measure of geographic proximity to the study site.
- Find increases in mistrust, lowered utilization and higher mortality from chronic diseases in the years following the disclosure.
- Explains about 35% of the racial gap in adult male life expectancy in 1980.

Image source: CDC National Archives
Beyond Tuskegee — Vaccine Distrust and Everyday Racism

Simar Singh Bajaj, and Fatima Cody Stanford, M.D., M.P.H., M.P.A.

“Every day, Black Americans have their pain denied, their conditions misdiagnosed, and necessary treatment withheld by physicians. In these moments, those patients are probably not historicizing their frustration by recalling Tuskegee, but rather contemplating how an institution sworn to do no harm has failed them.”
Physician bias and racial disparities in veteran health

Eli, Logan and Miloucheva (NBER working paper, 2020)

Black-to-white ratio of receiving negative comments from assessing physicians
No physician is racist, so how can there be structural racism in health care? An explanation of the idea by doctors for doctors in this user-friendly podcast from the great @DrKatzNYCHH and @ehlJAMA!

Structural Racism for Doctors—What Is It?
Many physicians are skeptical of structural racism, the idea that economic, educational, and other social systems ...

🔗 edhub.ama-assn.org

8:00 AM · Feb 24, 2021 · Sprinklr
The Great Migration

Family arriving from rural South to Chicago, 1920

Source: Schomburg Center for Research in Black Culture, New York Public Library (1168439)
# Great Migration - Educational and Income Gains

Black et al. (AER, 2015)

## Table 2—Earnings (in 2010 dollars) and Education by Residence in 1970, African Americans Born in the Deep South, 1916–1932

<table>
<thead>
<tr>
<th>Born in Georgia or South Carolina</th>
<th>Men’s wage and earnings</th>
<th>Men’s total personal income</th>
<th>Men’s education</th>
<th>Women’s education</th>
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</thead>
<tbody>
<tr>
<td>Mean for individuals residing in the South</td>
<td>26,684</td>
<td>29,675</td>
<td>6.96</td>
<td>7.98</td>
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<tr>
<td>Coefficient on “residing in the North”</td>
<td>18.214***</td>
<td>20.150***</td>
<td>2.05***</td>
<td>1.41***</td>
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<tr>
<td>Observations</td>
<td>5,084</td>
<td>5,084</td>
<td>5,084</td>
<td>6,208</td>
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<tr>
<td>Born in Alabama or Mississippi</td>
<td>Mean for individuals residing in the South</td>
<td>25,806</td>
<td>29,123</td>
<td>7.22</td>
</tr>
<tr>
<td>Coefficient on “residing in the North”</td>
<td>20.988***</td>
<td>22,224***</td>
<td>1.80***</td>
<td>1.47***</td>
</tr>
<tr>
<td>Observations</td>
<td>5,023</td>
<td>5,023</td>
<td>5,023</td>
<td>6,142</td>
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<tr>
<td>Born in Louisiana</td>
<td>Mean for individuals residing in the South</td>
<td>28,359</td>
<td>31,502</td>
<td>7.24</td>
</tr>
<tr>
<td>Coefficient on “residing in the North”</td>
<td>17.931***</td>
<td>19,545***</td>
<td>2.19***</td>
<td>1.98***</td>
</tr>
<tr>
<td>Observations</td>
<td>2,143</td>
<td>2,143</td>
<td>2,143</td>
<td>2,513</td>
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</table>
# Great Migration - health losses

Black et al. *(AER, 2015)*

## Table 4—Impact of Living in the North on Survival to Age 70 and Age 75 Conditional on Survival to Age 65, Men and Women Born in the Deep South

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
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<tr>
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<td>OLS (1)</td>
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<td>Mean of the dependent variable</td>
<td>0.825</td>
<td>0.44</td>
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<tr>
<td>Live in North</td>
<td>0.0033** (0.0016)</td>
<td>-0.071** (0.030)</td>
</tr>
<tr>
<td>Born on railroad line</td>
<td>0.050*** (0.0019)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>364,988</td>
<td>364,988</td>
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</table>

*Panel A. Survival to age 70*

<table>
<thead>
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<th>Women</th>
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<tbody>
<tr>
<td>Mean of the dependent variable</td>
<td>0.631</td>
<td>0.44</td>
</tr>
<tr>
<td>Live in North</td>
<td>0.0050** (0.0020)</td>
<td>-0.070* (0.038)</td>
</tr>
<tr>
<td>Born on railroad line</td>
<td>0.057*** (0.0023)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>253,254</td>
<td>253,254</td>
</tr>
</tbody>
</table>
The Great Migration and segregation

Estimated number of migrants leaving the South each decade (Source: University of Washington America’s Great Migrations Project)

Dissimilarity over time (Source: Cutler et al. (JPE, 1999))
The Great Migration and present-day outcomes
Ellora Derenoncourt (working paper, 2021)

Figure 9: Great Migration CZs have higher segregation, crime, and policing

Notes: This figure plots the coefficient on the instrument for Black population increases during the Great Migration, in approximately one standard deviation units, in separate regressions. The dependent variables in Panel (a) are standardized 1920 private school enrollment rates; mean 1931-1943 urban murders per 100,000 of the urban population; mean 1920-1940 local jail rate per 100,000; and mean government expenditure shares and per capita or per pupil spending. The dependent variables in Panel (b) are standardized mean 1970-2000 white and Black private school enrollment rates; the Theil indices in residential racial and income segregation in 2000; the fraction of families in 2000 with commute times less than 15 minutes; mean 1977-2002 murders per 100,000 of the population; mean 1983-2000 incarcerated per 100,000 of the population; and mean 1972-2002 government expenditure shares by category. The unit of observation is a commuting zone. The instrument is the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 outflows of migrants as predicted by southern economic factors alone. A one standard deviation increase is approximately 30 percentiles. Baseline 1940 controls include share of urban population made up of 1935-1940 Black southern migrants, educational upward mobility, share of labor force in manufacturing, and census division fixed effects. Panel (b) includes controls for the average 1931-1943 murder rate.

Data sources: IPUMS complete counts 1940; U.S. Census; Boustani (2016); see Appendix F for full list of data sources for each mechanism.
The Great Migration and present-day outcomes
Ellora Derenoncourt (working paper, 2021)

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Data sources: I PUMS (2010-2015); Dey (2016); see Appendix F for the full list of data sources.
1930s redlining: federal Home Owners’ Loan Corporation (HOLC)


- RD study by Aaronson et al. (2021) found that redlining (maps) causally led to higher poverty rates and teenage pregnancies; ongoing work explores effects on child health

"Colored infiltration a definitely adverse influence on neighborhood desirability." - HOLC appraiser in Brooklyn

“Segregation continues to be a predictor of significant health disparities – as measured by divergent rates of infant mortality – in comparisons between African Americans and whites and between Hispanics and whites.”

“After controlling for concentrated poverty, health status advantages for whites were diminished...Thus, to reduce or eliminate racial and ethnic health disparities, policy makers should address the problems associated with concentrated poverty.”
Mass Incarceration: 13th amendment freed those enslaved and prohibited slavery, with the exception of slavery as punishment for a crime.

- Historical patterns whereby prison population responded to reduced supply from outmigration (Myers 1990) or from demand shocks (Archibong and Obikili 2020).

- Black men are 5.8 times more likely to be in prison than White men, and Black women are 1.8 times more likely to be in prison than White women (Bureau of Justice Statistics 2020).

- Currently, 10% of Black children have a parent in jail/prison (Morsy and Rothstein 2016).
Corrections and community health
Kamarulzaman et al. (The Lancet, 2016)

Misdemeanours; but in some settings this time can be extended for years. In these settings, both overcrowding and high detainee turnover of individuals with blood-borne infections and tuberculosis often restricts screening, prevention, and treatment services, and potentially places uninfected detainees at an increased risk of infection. Pre-trial detention centres and prisons are often under-funded and without mandate to provide comprehensive health services that are available in prisons because of their supposed short-term function. Consequently, detainees are often denied access to treatment for pre-existing HIV, HBV, HCV, or tuberculosis infections, which increases the potential for ongoing transmission and the development of drug-resistant strains. Drug injecting in prisoners might start soon after arrest in police lock-up and jails as a way to alleviate symptoms of opioid withdrawal, to cope with being detained, and being in an overcrowded and chaotic environment.

During incarceration, although drug use and drug injecting frequency might be low in prison because of reduced availability of drugs, associated risks are often amplified compared with the community because prisoners share scarce injecting equipment with many inmates. Studies done in the early 2000s in UK prisons documented up to 25% of people who untreated inmates return. Figure adapted from Awofeso and colleagues, by permission of Public Health Reports.
Spillover effects of police killings

Changes in poor mental health days by victim and respondent race, Bor, Venkataramani, Williams, and Tsai, (The Lancet, 2018)

Effect on emotional disturbance among LA high school students, Ang (QJE, 2021)
Growing evidence that (self-reported) discrimination is associated with:

- Inflammation (Lewis et al. 2010)
- Coronary artery calcification (Lewis et al. 2006)
- Dysregulation in cortisol (Zieders et al. 2014)
- Carotid intima-media thickness (Troxel et al. 2003)
- Nighttime blood pressure (Beatty and Matthews 2009)

"It’s as if you’re playing the game Jenga...They pull out one piece at a time, at a time, and another piece and another piece, until you sort of collapse” – Arline Geronimus
Diversity and concluding comments
Does diversity matter for health?
Alsan, Garrick, Graziani (AER, 2019)

▶ A study to examine a recommendation of leading medical institutes, to diversify the physician workforce, on health behaviors.

▶ Tests whether Black men increase their take-up of preventive care when randomly assigned to a Black vs. non-Black male doctor.

▶ Two stages, first to identify if photo alone would lead to preference for specific physician, second stage to test match.
Effect of Black MD for non-invasive and invasive tests

- Ex Post Selection: Black vs. Non-Black (%)

Non-invasive
- BP
- BMI
- Diabetes
- Flu No $
- Chol

Invasive
Increasing diversity in medicine

- Black share of medical school faculty rose from 3.1% in 2003 to 3.6% in 2018
- Black share of medical school graduates, however, was lower in 2018 (6.2%) than it was in 1995 (6.4%)
- Fewer Black men matriculated to medical school in 2014 (515) than in 1978 (542)

Increasing diversity in economics
AEA Committee on the Status of Minority Groups in the Economics Profession (2020)

Black representation in economics has actually decreased somewhat since 1995, going from 6.4% to 5.3% in 2019 (Figure 2) while the Black share of all subject degrees conferred has increased considerably from 7.2% to 10.3% over the same time span. That Black representation in economics and STEM fields has followed a markedly different trend from Black representation in other subjects suggests that there may be specific barriers to Black students in both STEM and economics degree attainment. (Although we note that there has been growth in recent years in Black STEM PhD attainment, but not Black economics PhD attainment.)

Also, in recent years the Black representation in the population, all subject degrees, STEM fields and economics have remained fairly flat with population share (12.5%) greater than all subject share (10.3%), greater than STEM greater than economics.

Figure 2: Changes in Representation of Blacks/African Americans. This figure shows the percentage of the Black/African American population within the total population along with the percentage of economics degrees, STEM degrees, and degrees in all subjects awarded to Black/African American students from 1995 to 2019.

Note: The downtick in population in 2000 is likely due to the fact that beginning in 2000 the Census has allowed respondents to identify with more than one race. Choosing two or more races is its own racial category.

The decrease in Black economics PhD recipients can be seen in Appendix Table 6. Black representation among economics PhD recipients is from untabled calculations using the IPEDS and Survey of Earned Doctorates.

In 2018-19, Black Americans comprised 2.8% (13), Hispanic Americans 5.8% (27) and Native Americans 0% (0) of Economics PhDs awarded to U.S. citizens/permanent residents.
Increasing the supply of research
Krieger, Boyd, De Maio, and Maybank (*Health Affairs* blog, 2021)

<table>
<thead>
<tr>
<th></th>
<th>BMJ</th>
<th>JAMA</th>
<th>NEJM</th>
<th>The Lancet</th>
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</thead>
<tbody>
<tr>
<td>Total # of articles, 1990-2020</td>
<td>78,545</td>
<td>40,411</td>
<td>43,378</td>
<td>63,971</td>
</tr>
<tr>
<td>Total # of articles that included the word &quot;racism&quot; anywhere in the text</td>
<td>644</td>
<td>145</td>
<td>109</td>
<td>315</td>
</tr>
<tr>
<td></td>
<td>0.8%</td>
<td>0.4%</td>
<td>0.3%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Total # of articles that included the word &quot;racism&quot; anywhere in the text and were available for analysis</td>
<td>475</td>
<td>141</td>
<td>109</td>
<td>288</td>
</tr>
<tr>
<td>Total # of empirical studies</td>
<td>20</td>
<td>11</td>
<td>4</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>4.2%</td>
<td>7.8%</td>
<td>3.7%</td>
<td>10.1%</td>
</tr>
</tbody>
</table>

Share of publications mentioning racism anywhere in the text, 1990-2020
Increasing the supply of research
Advani, Ash, Cai, and Rasul (2021)

Share of publications that are race-related, by year and discipline
Increasing the supply of research
Advani, Ash, Cai, and Rasul (2021)

Economists’ estimated shares of race-related research vs. actual shares
Some next steps

- Theorists: Incorporating the role of institutions, motivated beliefs and the perspectives of disadvantaged groups in economic models of discrimination

- Metrics: unit and item non-response of surveys, churn and censoring of claims/EMR data, potential bias of data elements filtered through providers; multiple levels of analysis, correct scale

- Applied:
  - Supply side, finance/incentivize equity
  - Health beyond medical care

- All: increase grant funding, professorships, and publications?
“When I started medical school and learned about the health outcomes that afflicted black people, I had assumed these differences were chiefly due to genetics. To be sure, there are diseases, such as sickle-cell anemia, lupus and sarcoid, which appear to preferentially target black patients at a biological level. But what had become abundantly clear during my years in medical school and as a doctor, however, were the many ways that social and economic factors influence health, and more than anything else, account for the sickness and suffering I have seen.”
Thank you

Additional resources: https://www.aeaweb.org/about-aea/committees/csmgep
Appendix Slides
Figure 3: Relationship between 1940-1970 Black population change and upward mobility in 2012

Notes: This binned scatter plot depicts the relationship between average upward mobility in the 2000s for men and women with low income parents and the percentile of actual Black population increase during the Great Migration (1940 to 1970) for northern commuting zones. The unit of observation is a CZ. The right hand side variable is grouped into 20 bins (5 percentiles each). Upward mobility is defined as expected mean household income rank for men and women with parents at the 25th percentile of the parent income distribution. Income is measured from IRS tax returns for cohorts and parents of cohorts born between 1980 and 1986.

Data sources: IPUMS complete count 1940; US Census; CCD B.

1940-70 Black population change and 2012 upward mobility
Effect of cash crop price shocks on colonial incarceration rates by type in Nigeria

Cash Crop Prices and Incarceration Rates in Colonial Nigeria
Follow-up work on race-concordance
Alsan and Eichmeyer (NBER working paper, 2021)

Panel (A): Sender Rating
Panel (B): Flu Vaccine Intent
Panel (C): COVID-19 Vaccine Intent
Panel (D): Flu Vaccine Take-up

Notes:
Figure shows the mean of each outcome by treatment condition among the sample of Black respondents (dark blue bars), as well as among the sample of White respondents (light blue bars). Outcomes are ratings of the sender (Panel (A)), flu vaccine intent (Panel (B)), COVID-19 vaccine intent (Panel (C)), and flu vaccine take-up (Panel (D)). Sender rating is an inverse-covariance-weighted index as described in Anderson (2008). For dark blue bars, $p$-values test the null hypotheses that the concordant expert, concordant non-expert (standard signal condition), and discordant expert (acknowledgement condition) means each differ from the discordant expert (standard signal condition) among Black respondents. For light blue bars, $p$-values test the null hypothesis that the concordant expert (standard signal condition) mean differs from the discordant expert (standard signal condition) among White respondents. 95% confidence intervals using robust standard errors are shown.

Figure 1: Treatment Effects on Sender Ratings, Vaccine Intent and Take-up

Willingness to Takeup COVID-19 Vaccine by Sender and Signal Arm