WN21 Anti-Racism Faculty Hiring Initiative Proposal Submission Guidelines

Cover Sheet

Proposal Title: Racial Justice in Healthcare: Informatics and Data-Driven Approaches

Proposal Lead(s) Names:

- Manjunath (Amit) Pai, Chair and Professor, College of Pharmacy, Department of Clinical Pharmacy (CoP)
- Cheryl Moyer, PhD, MPH, Associate Chair for DEI and Associate Professor, University of Michigan Medical School, Department of Learning Health Sciences (UMMS-DLHS)
- Tiffany Veinot, PhD, Associate Dean for Faculty, School of Information (UMSI) and Professor, School of Information and School of Public Health, Department of Health Behavior and Health Education
- Lenette Jones, PhD, Assistant Professor, School of Nursing, Department of Health Behavior and Biological Sciences (UMSN)
- Denise Anthony, PhD, Director of Health Informatics Program and Professor, School of Public Health, Department of Health Management and Policy (SPH-HMP)

Proposal Lead(s) Contact Information:

Manjunath (Amit) Pai
Department of Clinical Pharmacy
College of Pharmacy
University of Michigan
3569 CCL
428 Church Street
Ann Arbor, MI 48109
Email: amitpai@med.umich.edu

Cheryl Moyer
Department of Learning Health Sciences
University of Michigan Medical School
209 Victor Vaughan Building, 2054
1111 E. Catherine St.
Ann Arbor, MI 48109-2054
Email: camoyer@umich.edu

Tiffany Veinot
School of Information
University of Michigan
4314 North Quad
105 S. State Street
Ann Arbor, MI 48109-1285

E-mail: tveinot@umich.edu

Lenette Jones
Department of Health Behavior and Biological Sciences
School of Nursing
University of Michigan
400 North Ingalls Building
Ann Arbor, MI 48109-
5482
Email: lenettew@umich.edu

Denise Anthony
Department of Health Management and Policy
School of Public Health
M3166, SPH II
1415 Washington Heights
Ann Arbor, Michigan 48109-2029
Email: deniseum@umich.edu

Names and Affiliations of Faculty Involved in the Proposal:

College of Pharmacy (CoP)

- Antoinette Coe, College of Pharmacy, Department of Clinical Pharmacy
- Hae Mi Choe, College of Pharmacy, Department of Clinical Pharmacy
- Michael Dorsch, College of Pharmacy, Department of Clinical Pharmacy
- Steve Erickson, College of Pharmacy, Department of Clinical Pharmacy
- Karen Farris, College of Pharmacy, Department of Clinical Pharmacy
- Kristin Klein , College of Pharmacy, Department of Clinical Pharmacy
- Corey Lester, College of Pharmacy, Department of Clinical Pharmacy
- Jasmine Luzum, College of Pharmacy, Department of Clinical Pharmacy
- Beatriz Mitrzyk, College of Pharmacy, Department of Clinical Pharmacy
- Manjunath (Amit) Pai, Chair, College of Pharmacy, Department of Clinical Pharmacy - Lead
- Paul Walker, College of Pharmacy, Department of Clinical PharmacyS
- Sarah Vordenberg, College of Pharmacy, Department of Clinical Pharmacy

Medical School, Dept of Learning Health Sciences (UMMS-DLHS)

- Charles Friedman, Medical School, Department of Learning Health Sciences and School of Information
- David Hanauer, Medical School, Department of Learning Health Sciences and School of Information
- Amy Kilbourne, Medical School, Department of Learning Health Sciences
- Zachary Landis-Lewis, Medical School, Department of Learning Health Sciences
- Cheryl Moyer, Medical School, Department of Learning Health Sciences - Lead
- Gretchen Piatt, Medical School, Department of Learning Health Sciences
- Jodyn Platt, Medical School, Department of Learning Health Sciences
- Rachel Richesson, Medical School, Department of Learning Health Sciences
- Anne Sales, Medical School, Department of Learning Health Sciences
- Karandeep Singh, Medical School, Department of Learning Health Sciences and School of Information

- Caren Stalburg, Medical Schoool, Department of Learning Health Sciences
- Vinod Vydiswaran, Medical School, Department of Learning Health Sciences and School of Information

School of Information (UMSI)

- Nazanin Andalibi, School of Information
- Tawanna Dillahunt, School of Information
- Oliver Haimson, School of Information
- Libby Hemphill, School of Information and Director, Resource Center for Minority Data at Inter-University Consortium for Politics and Social Research (ICPSR)
- Abigail Jacobs, School of Information
- David Jurgens, School of Information
- Predrag Klasnja, School of Information
- Gabriela Marcu, School of Information
- Qiaozhu Mei, School of Information and Director, Master of Applied Data Science (MADS) Program
- Mustafa Naseem, School of Information
- Casey Pierce, School of Information
- Tiffany Veinot, School of Information and School of Public Health, Department of Health Behavior and Health Education - Lead

School of Nursing (UMSN)

- Jade Burns, School of Nursing, Department of Health Behavior and Biological Sciences
- Ivo Dinov, School of Nursing, Department of Health Behavior and Biological Sciences
- Lenette Jones, School of Nursing, Department of Health Behavior and Biological Sciences - Lead
- Michelle Munro-Kramer, School of Nursing, Department of Systems, Populations and Leadership
- Massy Mutumba, School of Nursing, Department of Health Behavior and Biological Sciences
- Sheria Robinson-Lane, School of Nursing, Department of Systems, Populations and Leadership
- Rob Stephenson, Chair, Department of Systems, Population and Leadership
- Marie-Anne Sanon Rosemberg, School of Nursing, Department of Systems, Populations and Leadership

School of Public Health (SPH)

- Denise Anthony, School of Public Health, Department of Health Management and Policy and School of Information, and Director of Health Informatics Program - Lead
- Cathleen Connell, School of Public Health, Department of Health Management and Policy and Department of Health Behavior and Health Education
- Melissa Creary, School of Public Health, Department of Health Management and Policy
- Ebbin Dotson, School of Public Health, Department of Health Management and Policy
- Kyle Grazier, School of Public Health, Department of Health Management and Policy
- Scott Greer, School of Public Health, Department of Health Management and Policy
- Richard Hirth, School of Public Health, Department of Health Management and Policy
- David Hutton, School of Public Health, Department of Health Management and Policy
- Holly Jarmon, School of Public Health, Department of Health Management and Policy
- Rahul Ladhania, School of Public Health, Department of Health Management and Policy
- Jersey Liang, School of Public Health, Department of Health Management and Policy
- Lynda Lisabeth, School of Public Health, Department of Epidemiology

- Elisa Maffioli, School of Public Health, Department of Health Management and Policy
- Jeffrey McCullough, School of Public Health, Department of Health Management and Policy
- David Mendez, School of Public Health, Department of Health Management and Policy
- Thuy Nguyen, School of Public Health, Department of Health Management and Policy
- Edward Norton, School of Public Health, Department of Health Management and Policy
- Lisa Prosser, School of Public Health, Department of Health Management and Policy and Director, Susan B. Meister Child Health Evaluation and Research Center
- Simone Singh, School of Public Health, Department of Health Management and Policy
- Michael Rubyan, School of Public Health, Department of Health Management and Policy
- Andrew Ryan, School of Public Health, Department of Health Management and Policy
- Shawna Smith, School of Public Health, Department of Health Management and Policy

Institutes and Centers at the University of Michigan

- John Ayanian, Director of Institute of Health Policy and Innovation (IHPI)
- Phillipa Clarke, Professor, Institute for Social Research (ISR)
- Margaret Hicken, Research Associate Professor in the Social Environment and Health Program; Director of RacismLab at Institute for Social Research (ISR)
- H.V. Jagadish, Director of Michigan Institute on Data Science (MIDAS)
- Margaret Levenstein, Director of Inter-University Consortium for Politics and Social Research (ICPSR)

Rationale for the proposed cluster hire (1000 words):

Description. Building on the expertise of five schools and multiple Institutes/Centers, this cluster hire will focus on using informatics and data science methods to detect, understand, and reduce structural racism within healthcare, and racial healthcare disparities. Five themes, selected to address multiple levels of racism, unite the cluster hire:

(1) Racial bias and unintended racist consequences in data, algorithms, and technologies that enable healthcare;

(2) The intersection of racial residential segregation with healthcare access, quality, safety, and health outcomes;

(3) Data-driven, anti-racist, health policy analysis regarding racial disparities in health insurance, healthcare access, quality, and safety;

(4) Healthcare provider education and point-of-care informatics interventions to reduce providers' implicit racial biases and enhance their structural competence; and

(5) Community-driven, technology-enabled models of healthcare delivery that address racism as a social determinant of health and empower racialized communities in service/intervention design.

Structural Racism in Healthcare. The COVID-19 pandemic has renewed attention to health disparities long-experienced by African-American, Hispanic/Latinx, Native-American/Alaska Native, and Native-Hawaiian/Pacific-Islanders in the US.[1-4] These groups are more likely to be hospitalized or die of COVID-19 than White, non-Hispanics.[5-13] Underlying this are racial disparities in healthcare, "…differences between population groups in the way they access, experience, and receive healthcare."[1]

Structural racism drives healthcare disparities; racism is "…an organized social system in which the dominant racial group, based on an ideology of inferiority, categorizes and ranks people into social

groups called 'races' and uses its power to devalue, disempower, and differentially allocate valued societal resources and opportunities to groups defined as inferior."[14] Structural racism is a self-sustaining system. While some of its manifestations may be at the individual level, it stems from a society that devalues racialized groups and, in healthcare, operates at the institutional level.[15,16] Racialized groups experience devaluing and disempowerment: a third of African-Americans, 23% of Native-Americans, and 20% of Hispanics/Latinos report racial discrimination in clinical encounters.[17-19] Healthcare resources are unfairly distributed: racial residential segregation—especially for African-Americans—is linked to reduced access to primary care, hospitals, and pharmacies.[20-23] Regarding healthcare receipt, African-American, Native-American, Hispanic/Latino, and Native Hawaiian/Pacific-Islander Americans receive lower-quality healthcare than non-Hispanic Whites across 33%-40% of quality indicators monitored annually.[1]

Racism functions at individual (beliefs, unconscious bias), cultural (language, values, symbols), and institutional (laws, policies, practices) levels.[14] Institutional racism can persist in healthcare policies and practices without explicitly racist individuals. For example, racial "adjustment" that alters diagnostic algorithms or clinical practice guidelines based on patient race often directs more healthcare resources to Whites.[24] Thus, racial adjustment in kidney function measurement results in African-Americans being referred to nephrologists when sicker than Whites.[25] Devices used in healthcare may be racially biased; pulse oximeters are less accurate for African-American and Hispanic/Latino people—with potential failure to identify dangerous blood oxygen levels.[26-28] Racialized groups experience discrimination in healthcare, resulting in worse care and outcomes. For example, African-American newborns have lower mortality rates when their physician is African-American.[29]

Building on strengths. U-M has a growing number of faculty in the partnering units investigating health disparities and informatics, data analytics, or technology-enabled interventions. The cluster hire will help faculty coalesce around racial justice as a focal strength, thus becoming **the leading US institution**

in this area. Moreover, cluster-based mid-career/senior hires will increase momentum in, and support for, existing efforts that often involve junior faculty.

The first theme synergizes with research on informatics and healthcare disparities at UMMS-DLHS, UMSI, and SPH-HMP. Topics include: design and implementation of "upstream," technology-based interventions (Dillahunt, Haimson, Landis-Lewis, Marcu, Naseem, Veinot); patient portals, telehealth, and their implications for healthcare disparities (Anthony, Creary, Pierce, Veinot, Dorsch, Lester); privacy/security of health information (Anthony, McCullough, Ladhania); technological/algorithmic biases and how they address or exacerbate disparities (Anthony, Jacobs, Ladhania, Luzum, Pai, Smith); ethics in artificial intelligence for well-being (Andalibi); racial differences in treatment and their health effects (Jurgens); and hateful speech on social media (Hemphill, Resnick, Jurgens). Collaborator MIDAS will connect hires to a network of ~350 faculty, and facilitate access to datasets and computing resources.

The second theme augments geospatial research at the CoP, UMMS-DLHS, SPH-HMP and UMSI. Researchers have documented medication access "deserts" in communities (Farris, Erickson, Nguyen), investigated location tracking in mobile interventions for patients (Dorsch, Veinot, Smith), and examined geospatial data on healthcare access predict health outcomes (Veinot, Singh, Vydiswaran, Moyer). This theme benefits from Michigan Medicine's geocoded patient data, and georeferenced datasets (Clarke) from collaborator ICPSR.

The third theme enriches strengths in policy research regarding health inequity conducted by faculty from CoP, UMSH and SPH-HMP. A new hire will help extend research conducted at the Center for Evaluating Health Reform to a greater racial justice concentration. They will join researchers who have identified the role of payment policies in clinical access and outcomes disparities (Hirth, Ryan), and racial disparities in healthcare access and outcomes (Anthony, Creary, Hirth, Ladhania, Liang, Ryan, Jurgens,

Mezuk). Data-driven analyses will leverage infrastructure at collaborator IHPI, a 665-member faculty network that offers a data/methods hub that can provide resources for this theme.

Theme 4 activities strengthen units' roles in training anti-racist health professionals. UMSN has expertise in educational methods on implicit bias (Friese, Aebersold, Manojolovich), and researchers can utilize simulation laboratories at UMSN and UMMS-DLHS to prompt reflection upon implicit racial biases in interactions with simulated patients. Research in clinical decision support systems (Landis-Lewis, Veinot, Dorsch, Singh) can be expanded to address healthcare providers' racial biases. The hires will complement CoP's 2 Racial Equity to Advance Community Health (REACH) clinical pharmacy fellowships and numerous SPH initiatives regarding health workforce diversity (e.g., Summer Enrichment Program, Health Equity Leadership Pipeline Collaborative). Michigan Medicine will provide a testbed for studying novel point-of-care interventions.

The fifth theme will benefit from units' community-based participatory research efforts in Detroit, Ypsilanti, and Flint. Projects include: Center for Research on Ethnicity, Culture and Health and Detroit Community-Academic Urban Research Center projects; UMSN's culturally-responsive interventions using technology to improve health (Jones, Burns, Rosemberg, Robinson-Lane); online peer mentoring in hemodialysis care (Veinot); pharmacist-led telehealth (Coe, Farris); and Flint's Lead Exposure Registry (ICPSR). The Ginsberg Center and MICHR can provide infrastructures for this theme's community engagement.

Sustainability and Impact (1000 words):

How the proposed hires complement each unit's needs and strategy.

Although pharmacists are at the forefront of community healthcare, curricula on racism is grossly lacking in US pharmacy programs. The American Association of Colleges of Pharmacy held an Institute in January 2021 to increase the ability of faculty and staff to confront racial injustice (Vordenberg). Similar efforts to integrate racial DEI education are being spearheaded nationally through ASHP (58,000 pharmacist member organization) and chaired by CoP faculty (Walker). An opportunity to lead pharmacy-focused anti-racist education will bring significant value to the pharmacy profession.

For UM-DLHS, the cluster hire supports its mission to promote health improvement through cycles of discovery and implementation. UM-DLHS is committed to improving health through data-driven initiatives that combine informatics, learning analytics, implementation science, and educational pedagogy. Given UM-DLHS's focus on systems and scalability, DLHS is concerned with how technology could reduce systemic racism—or amplify it without safeguards. DLHS has created and sustained significant momentum around DEI issues, with a large and active DEI committee, and an Associate Chair for DEI position.

This cluster hire directly aligns with UMSI's identity as an interdisciplinary school with a mission to "create and share knowledge so that people will use information—with technology—to build a better world." It also complements UMSI's DEI Strategic Plan, which includes a strategic objective to "produce and disseminate faculty-led scholarship related to DEI across its many dimensions." Given that a recent NIH-commissioned study suggests that equity-focused research is of greater interest to African-American scientists, it has potential to support UMSI's strategic objective of increasing faculty diversity. UMSI has also made significant investments in the health area through the MHI program, and data science as a partner in U-Ms residential data science program and through UMSI's Master of Applied Data Science (MADS) program (635 students).

UMSN faculty named on this application (Jones, Burns, Rosemberg, Robinson-Lane) have active programs of research on interventions using technology to improve health outcomes in under-resourced populations. This cluster hire will allow deeper foundations of anti-racist and social justice methodology to undergird that intervention development as well as to expand to research in culturally responsive measures and outcomes. Importantly, the cluster hire would provide a team of scientists to catalyze and support this team of early stage investigators in this area.

The cluster hire aligns directly with the SPH-HMP mission to promote population health worldwide and to develop more effective and socially just systems for producing health and knowledge. Recently, an SPH Anti-Racism working group made recommendations for combating systemic racism within SPH and to advance efforts to address racism as a public health crisis. Faculty in SPH committed to anti-racism pedagogy in the summer of 2020. In addition to school-wide efforts, the new hire will make important contributions to ongoing research in SPH-HMP in health equity, racial and ethnic disparities in health and healthcare, the role of racism in healthcare and public health, health workforce diversity, and the social determinants of health.

Impact on curriculum. SPH-HMP, UMSI, and UMMS-LHS have offered a joint Masters of Health Informatics degree since 2012. Students in this program take core courses in evaluation, management, tools and techniques, and facilitating change with health informatics. All of these courses are cross-listed at member units and contribute to requirements for other degree programs (e.g., MHSA, MSI, MS). Cluster hire faculty will teach some of these courses, and will be invited to imbue the curriculum with stronger anti-racist methods and perspectives.

Hiring a faculty member with training in race and health equity research is a critical need within CoP. A dedicated anti-racism faculty member will help CoP champion professional and graduate curricula in anti-racism with a medication outcome focus. The new hire will help lead pharmacy-focused anti-racist education, both within existing courses and with the potential opportunity to develop an elective for

students passionate about this topic.

Hiring a faculty member focused on racial health equity will fill a key need in UMMS-DLHS's Health Infrastructures and Learning Systems (HILS) MS/PhD programs, which cover: infrastructures, implementation, informatics, and policy/ethics. The new hire will assist the HILS Curriculum Committee in reviewing current courses and ensuring that DEI topics are meaningfully woven into each course. The new hire can advance students' thinking about how to instantiate learning health systems in racially diverse community settings. They will also have the opportunity to develop an elective course for students passionate about health equity.

At UMSI, this cluster hire will align with a five-year strategic objective to create an anti-racist curriculum and decolonize educational material, with the goal of developing anti-racist graduates. This involves a multi-year curriculum revision process led by UMSI's DEI Committee, and UMSI encourages all faculty to participate in CRLT's inclusive teaching training. These efforts can support the UMSI hire as they begin their teaching program. The new hire can contribute to core course content on anti-racism and design a new course focused on their research areas as desired.

UMSN has a strong inclusive teaching and DEI awareness program that successfully reaches students, faculty and staff and is led by its Chief Inclusion Officer. UMSN will use this strength upon which to build an equity pedagogy wherein anti-racist and social justice methods will be integrated into all of its degree programs (BSN, APRN, DNP, PhD) and its professional development programs for faculty. UMSN will integrate tenets of this content throughout all degree programs for broader reach, but can also offer some new courses on anti-racism, social justice and health equity.

In addition to the MHI, the SPH-HMP faculty member will contribute to its Health Services Organization and Policy PhD program, and professional master's degree programs in public health, health services administration. Over the past 2 years, SPH-HMP has conducted regular workshops for faculty and

doctoral students to build a more inclusive community that includes discussions and training in best practices for inclusive teaching, anti-racism and allyship, and mentoring (with support of Rackham Faculty Allies grant). The new hire will sit on the DEI Committee and assist with anti-racist curriculum revision.

Evidence of support for the work of new hires (500 words)

Commitment to collaboration and unit investments. Unit leadership will meet at least annually to further stimulate collaboration and promote cluster-hire faculty success. Units will plan a rotating seminar series with at least 1 cluster-hire-related talk per semester. New faculty will participate in NCID initiatives. CoP, UMSI and SPH will provide **matching funds for any small catalyst grants involving their units' faculty** secured under the Provost's Anti-racism initiative. UMSN has internal pilot funds that prioritize anti-racism-related research.

Partner units are committed to collaboration and team science. The MHI program is a multi-year educational initiative that demonstrates collaborative strengths between UMMS-LHS, UMSI, and SPH-HMP. Faculty from these units participate in a health informatics researchers meeting which offers opportunities for junior faculty and students to get feedback on their works-in-progress.

Each unit is interdisciplinary, and each has mechanisms for fostering faculty dialogue and collaboration. At CoP, regular research retreats and intramural funding solidify relationships. UMMS-DLHS has "collaboratives" that bring faculty together by topical interest to expand collaboration, and hosts regular faculty luncheons and discussion groups. UMSN has training and opportunities to discuss operationalizing UMSN's vision of leadership in team science to advance health. UMSI has research labs that bring together faculty, and ongoing seminar series. SPH-HMP has significant participation and research funding in IHPI and ISR, and has multiple research and training centers that stimulate collaboration.

Proposed career development plans. Each unit has robust faculty mentorship practices. UMSI, SPH, and CoP have LAUNCH committees for new faculty members; these entail a four-member committee of

senior faculty meeting regularly during a faculty member's first year. Similarly, UMMS-DLHS assigns each junior faculty member a primary senior faculty advisor and a mentorship team. UMSN will also provide a cross-campus mentoring team. Each unit assigns individual mentors to faculty at the assistant level, and UMSI, UMSN and DLHS make individual mentors available to mid-career and/or senior faculty. New full professors may participate in the ADVANCE program's leadership coaching.

Cluster hire faculty will participate in peer-to-peer mentoring. Units provide group mentoring through mechanisms such as IHPI's R01 boot camp program for NIH proposals and UMSI's program for junior faculty completing NSF proposals. All participating units include DEI contributions and/or training in faculty evaluations, with UMSI and UMMS considering such contributions in Promotion and Tenure (P&T) Reviews.

Plan to ensure that new hires will be given equitable workloads and service roles. At all units, teaching loads will be equal to those for other new faculty at the same rank (e.g., UMSN and UMMS-DLHS do not assign teaching in faculty members' first years; SPH requires a 1-course load in year 1, and a 2-course load in year 2). Units will take cluster-hire activities into consideration when allocating service, and each unit typically requires that faculty serve on only one internal committee. Where appropriate, units will offer service holidays per usual practice. For example, the CoP offers a one-year service grace period for new hires, and UMSI offers a service holiday in the year in which faculty submit their P&T materials.

Support letter by the dean of participating unit(s). See attached.

References

1. Agency for Healthcare Research and Quality. *2019 National Healthcare Quality and Disparities Report.* Rockville, MD: Agency for Healthcare Research and Quality; 2021.
2. Nong P, Raj M, Creary M, Kardia SLR, Platt JE. Patient-Reported Experiences of Discrimination in the US Health Care System. *JAMA Network Open.* 2020;3(12):e2029650-e2029650.
3. Phelan JC, Link BG. Is Racism a Fundamental Cause of Inequalities in Health? *Annual Review of Sociology.* 2015;41(1):311-330.
4. American Public Health Association. The Impact of Racism on the Health and Well-Being of the Nation. American Public Health Association. https://www.apha.org/events-and-meetings/webinars/racism-and-health. Published 2015. Accessed July 31, 2021.
5. Karaca-Mandic P, Georgiou A, Sen S. Assessment of COVID-19 Hospitalizations by Race/Ethnicity in 12 States. *JAMA Internal Medicine.* 2021;181(1):131-134.
6. Ogedegbe G, Ravenell J, Adhikari S, et al. Assessment of Racial/Ethnic Disparities in Hospitalization and Mortality in Patients With COVID-19 in New York City. *JAMA Network Open.* 2020;3(12):e2026881-e2026881.
7. Millett GA, Jones AT, Benkeser D, et al. Assessing differential impacts of COVID-19 on black communities. *Annals of Epidemiology.* 2020;47:37-44.
8. Dalsania AK, Fastiggi MJ, Kahlam A, et al. The Relationship Between Social Determinants of Health and Racial Disparities in COVID-19 Mortality. *Journal of Racial and Ethnic Health Disparities.* 2021.
9. Kaholokula JKa, Samoa RA, Miyamoto RES, Palafox N, Daniels S-A. COVID-19 Special Column: COVID-19 Hits Native Hawaiian and Pacific Islander Communities the Hardest. *Hawaii J Health Soc Welf.* 2020;79(5):144-146.
10. Podewils LJ, Burket TL, Mettenbrink C, et al. Disproportionate Incidence of COVID-19 Infection, Hospitalizations, and Deaths Among Persons Identifying as Hispanic or Latino - Denver, Colorado March-October 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69(48):1812-1816.
11. Arrazola J, Masiello MM, Joshi S, et al. COVID-19 Mortality Among American Indian and Alaska Native Persons - 14 States, January-June 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69(49):1853-1856.
12. Centers for Disease Control and Prevention. Key Updates for Week 3, ending January 23, 2021. *COVIDView.* 2021. https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html. Accessed January 31, 2021.
13. Torralba E. COVID-19 exposes how Native Hawaiians and Pacific Islanders face stark health care disparities. UCLA. https://newsroom.ucla.edu/stories/covid-19-stark-differences-NHPI. Published 2020. Accessed January 31, 2021.
14. Williams DR, Lawrence JA, Davis BA. Racism and Health: Evidence and Needed Research. *Annual Review of Public Health.* 2019;40(1):105-125.
15. Hicken MT, Kravitz-Wirtz N, Durkee M, Jackson JS. Racial inequalities in health: Framing future research. *Social Science & Medicine.* 2018;199:11-18.
16. Bonilla-Silva E. The Structure of Racism in Color-Blind, "Post-Racial" America. *American Behavioral Scientist.* 2015;59(11):1358-1376.
17. Bleich SN, Findling MG, Casey LS, et al. Discrimination in the United States: Experiences of black Americans. *Health Services Research.* 2019;54(S2):1399-1408.
18. Findling MG, Bleich SN, Casey LS, et al. Discrimination in the United States: Experiences of Latinos. *Health Services Research.* 2019;54(S2):1409-1418.
19. Findling MG, Casey LS, Fryberg SA, et al. Discrimination in the United States: Experiences of Native Americans. *Health Services Research.* 2019;54(S2):1431-1441.
20. Qato DM, Daviglus ML, Wilder J, Lee T, Qato D, Lambert B. 'Pharmacy deserts' are prevalent in Chicago's predominantly minority communities, raising medication access concerns. *Health Aff (Millwood).* 2014;33(11):1958-1965.
21. Freeman Anderson K. Racial Residential Segregation and the Distribution of Health-Related Organizations in Urban Neighborhoods. *Social Problems.* 2017;64(2):256-276.

22. Gaskin DJ, Dinwiddie GY, Chan KS, McCleary RR. Residential Segregation and the Availability of Primary Care Physicians. *Health Services Research.* 2012;47(6):2353-2376.
23. Prakash S, Rodriguez RA, Austin PC, et al. Racial Composition of Residential Areas Associates with Access to Pre-ESRD Nephrology Care. *Journal of the American Society of Nephrology.* 2010;21(7):1192.
24. Vyas DA, Eisenstein LG, Jones DS. Hidden in Plain Sight — Reconsidering the Use of Race Correction in Clinical Algorithms. *New England Journal of Medicine.* 2020;383(9):874-882.
25. Ahmed S, Nutt CT, Eneanya ND, et al. Examining the Potential Impact of Race Multiplier Utilization in Estimated Glomerular Filtration Rate Calculation on African-American Care Outcomes. *Journal of General Internal Medicine.* 2020.
26. Sjoding MW, Dickson RP, Iwashyna TJ, Gay SE, Valley TS. Racial Bias in Pulse Oximetry Measurement. *New England Journal of Medicine.* 2020;383(25):2477-2478.
27. Bickler Philip E, Feiner John R, Severinghaus John W. Effects of Skin Pigmentation on Pulse Oximeter Accuracy at Low Saturation. *Anesthesiology.* 2005;102(4):715-719.
28. Feiner JR, Severinghaus JW, Bickler PE. Dark Skin Decreases the Accuracy of Pulse Oximeters at Low Oxygen Saturation: The Effects of Oximeter Probe Type and Gender. *Anesthesia & Analgesia.* 2007;105(6):S18-S23.
29. Greenwood BN, Hardeman RR, Huang L, Sojourner A. Physician–patient racial concordance and disparities in birthing mortality for newborns. *Proceedings of the National Academy of Sciences.* 2020;117(35):21194-21200.