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The Use of Race and Ethnicity in Biomedical Research: Race and Ethnicity in Biomedical AI Public Session

PUBLIC BRIEFING BOOK

March 15, 2024

VIRTUAL MEETING
Public Session, March 15 (8:30 AM – 9:30 AM ET)
Webcast Link: https://www.nationalacademies.org/event/41882_03-2024_the-use-of-race-and-ethnicity-in-biomedical-research-meeting-4

NATIONAL ACADEMIES Sciences Engineering Medicine

The Use of Race and Ethnicity in Biomedical Research

Meeting 4: March 15, 2024

Table of Contents

1. AGENDA.....3

Public Session Agenda.....4

2.STUDY INFORMATION.....5

Statement of Task.....6

Committee and Staff Roster.....7

Committee Biosketches.....8

3.PUBLIC SESSION INFORMATION.....14

Speaker Biosketches.....15

Speaker Guidance.....16

4.BACKGROUND MATERIALS.....18

Links to Additional Resources.....19

Agenda

Committee on the Use of Race and Ethnicity in Biomedical Research: Race and Ethnicity in Biomedical AI

Public Session
March 15, 2024

PURPOSE AND OBJECTIVES

- Hear from experts in artificial intelligence (AI) about the growing impact of this technology on biomedical research and implications for the use of race and ethnicity in research and algorithms
- Learn about potential applications of natural language processing (NLP) and large language models (LLMs) in biomedical research and how race and ethnicity are used in biomedical and clinical AI
- Explore whether and how race and ethnicity could be used in the development of future clinical algorithms

FRIDAY, MARCH 15, 2024

8:30 – 9:30 am ET

OPEN SESSION

Webcast Link

8:30 – 8:35 AM ET — **Welcome and Introduction to the Session**
M. Roy Wilson, *Committee Chair*
President Emeritus
Wayne State University

8:35 – 9:05 AM — **Speaker Presentations**
Tristan Naumann
Principal Researcher
Microsoft Research Health Futures

Monica Agrawal
Incoming Assistant Professor
Duke University

9:05 – 9:30 AM — **Q&A with the Speakers**
Genevieve Wojcik
Assistant Professor of Epidemiology
Johns Hopkins Bloomberg School of Public Health

9:30 AM — ***Adjourn Public Session***

Study Information

NATIONAL ACADEMIES Sciences Engineering Medicine

Committee on the Use of Race and Ethnicity in Biomedical Research

Study Sponsors: Doris Duke Foundation, Burroughs Wellcome Fund

Project Background

The Doris Duke Charitable Foundation has asked the National Academies of Sciences, Engineering, and Medicine to generate a report that guides the scientific community on the use of race and ethnicity in biomedical research, including identifying current research practices that are not grounded in rigorous scientific method and may ultimately exacerbate inequities in healthcare delivery and patient outcomes.

Statement of Task

An ad hoc committee of the National Academies of Sciences, Engineering, and Medicine will assess the current use of the social constructs of race and ethnicity in biomedical research and provide recommendations to guide the scientific community in the future use of race and ethnicity in biomedical research.
More specifically, the committee will:

- Document and evaluate how racialized group and ethnic categories are currently being used in biomedical research (e.g., as a descriptor, to stratify data, to apply race norming, to infer differences between groups due to environmental and social impacts), including describing consequences and contributions to health inequities in current clinical practices;
- Identify the circumstances in which it is appropriate to use the social constructs of race and ethnicity in biomedical research, for example in studying the health effects of racism, and the circumstances in which race and ethnicity should not be used to inform inferences;
- Review existing guidance for researchers on the use of race as a variable in biomedical research.

Based on its review of the literature and other expert input, the committee will develop a report with its findings, conclusions, and recommendations for entities such as researchers, funders, publishers, scientific and medical societies, health systems, and industry regarding:

- The use of race and ethnicity in biomedical research, including identifying current practices that should be continued, stopped, or modified;
- Policy changes to reform the use of race and ethnicity in biomedical research, with specific attention to the practice of race norming or race correction;
- Implementation strategies to help enhance the adoption of best practices across the biomedical research community.

The committee's work will focus on the use of racialized group and ethnic categories across the spectrum of biomedical research, including the development of clinical prediction models and other clinical decision tools. Related topics in the provision of clinical care, such as inequitable access to health care and racism in care delivery, are beyond the scope of this study.

Timeline

The committee will meet at least 5 times between October 2023 and July 2024, with the report being set to release in October 2024.

Project Website: https://www.nationalacademies.org/our-work/the-use-of-race-and-ethnicity-in-biomedical-research

Committee Membership

M. Roy Wilson, M.D., M.S. (Chair)
Wayne State University

Allison Aiello, Ph.D.
Columbia University

Efrén J. Flores, M.D.
Massachusetts General Hospital

Carmen Guerra, M.D., M.S.C.E.
University of Pennsylvania

Elizabeth Heitman, Ph.D.
University of Texas Southwestern Medical Center

Matthew F. Hudson, Ph.D., M.P.H.
Prisma Health

Husseini K. Manji, M.D.
Oxford University

Amy Moran-Thomas, Ph.D.
Massachusetts Institute of Technology

Margaret Moss, Ph.D., J.D., RN
University of Minnesota School of Nursing

Elizabeth O. Ofili, M.D., M.P.H.
Morehouse School of Medicine

Neil R. Powe, M.D., M.P.H., M.B.A.
University of California, San Francisco

Aliya Saperstein, Ph.D.
Stanford University

Roland Thorpe, Jr., Ph.D.
Johns Hopkins Bloomberg School of Public Health

Shyam Visweswaran, M.D., Ph.D.
University of Pittsburgh

Genevieve L. Wojcik, Ph.D.
Johns Hopkins Bloomberg School of Public Health

Ruqaiijah Yearby, J.D., M.P.H.
The Ohio State University

Study Staff

Sarah Beachy, Study Co-Director, RaceInBiomedResearch@nas.edu
Samantha Schumm, Study Co-Director
Joseph Tumfour, Associate Program Officer
Lydia Teferra, Research Associate
Ashley Pitt, Senior Program Assistant
Clare Stroud, Senior Board Director, Board on Health Sciences Policy
Francis Amankwah, Senior Program Officer, Board on Health Care Services
Ronique Taffe, Program Officer, Board on Population Health and Public Health Practice
Ben Weston, NAM Fellow

NATIONAL ACADEMIES Sciences Engineering Medicine

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Committee on the Use of Race and Ethnicity in Biomedical Research

Committee Member Biographies

M. Roy Wilson, M.D., M.S. (chair), is a physician, researcher, healthcare leader, and author. His 20-year history as leader of universities with budgets of $550 million to $1.8 billion is hallmarked by his successful efforts to expand access for underrepresented minorities, improve graduation rates, increase extramural funding, and execute ambitious fundraising campaigns. Dr. Wilson is chancellor emeritus of the University of Colorado Denver and Health Sciences Center and president emeritus of Wayne State University; he also served as deputy director of strategic scientific planning and program coordination at the National Institute on Minority Health and Health Disparities at the NIH. Previously, he was dean of the School of Medicine and Vice President for Health Sciences at Creighton University; president of the four-campus Texas Tech University Health Sciences Center; and dean of the medical school, president, and chair of the board of directors of Charles Drew University of Medicine and Science. He completed medical school and an ophthalmology residency at Harvard Medical School.

Allison Aiello, Ph.D., is the James S. Jackson Healthy Longevity Professor of Epidemiology at the Mailman School of Public Health and the Robert N. Butler Columbia Aging Center, where she leads a new program in Biosocial Science of Aging and Health Equity. Previously, Dr. Aiello led the Social Epidemiology Program as Professor of Epidemiology at the Gillings School of Global Public Health and became the Deputy Director of the National Longitudinal Study of Adolescent to Adult Health (Add Health) in 2021. She was awarded the 2019 Carol Rowland Hogue Award for Outstanding Mid-Career Achievement in Epidemiology from the Society for Epidemiological Research for her achievements. Dr. Aiello's research focuses on identifying the processes by which health inequities in aging emerge across the life course, with the goal of uncovering points of intervention. Her research program has focused on some of today's most pressing and complex health exposures and conditions, including socioeconomic inequalities, biological aging, Alzheimer's disease, immunity, and susceptibility to infectious diseases. She received her Ph.D. in epidemiology from Columbia University with distinction and was awarded the Anna C. Gelman Award for outstanding achievement and promise in epidemiology.

Efrén J. Flores, M.D., is an Associate Professor at Harvard Medical School and serves as faculty in Thoracic Imaging at Massachusetts General Hospital (MGH), where completed his Diagnostic Radiology residency and fellowship. Dr. Flores is a nationally recognized health services researcher focused on understanding health disparities and advancing health equity among historically underserved racial and ethnic minority communities. He has served in several leadership roles at MGH, including his current role as Vice-Chair for Radiology Diversity Equity, and Inclusion (DEI), and as the founding Director of the Radiology Inclusion and Systemic Equity (RISE) Center. Dr. Flores is recognized as a national thought leader in health disparities research as evidenced by numerous awarded grants, invited presentations

nationally, and peer-reviewed publications. His health equity work is guided by the overarching goal of fostering trust and a sense of belonging. In recognition for his work, Dr. Flores was selected as one of the inaugural NAM Scholars in Diagnostic Excellence in 2021, and he currently serves on several institutional and national committees, including as Co-Chair of the Health Equity Committee for the Radiological Society of North America and as Associate Editor of Health Equity for the Journal of the American College of Radiology.

Carmen Guerra, M.D., M.S.C.E., is the Ruth C. and Raymond G. Perelman Professor of Medicine at the Perelman School of Medicine at the University of Pennsylvania. She is also the Vice Chair of Diversity and Inclusion for the Department of Medicine, and the Associate Director of Diversity and Outreach for the Abramson Cancer Center (ACC) where she leads Community Outreach and Engagement, including a Genentech-funded Cancer Clinical Trials Ambassador Program that promotes clinical trial awareness through peer-to-peer education. A general internist trained in epidemiology and a health equity researcher, Dr. Guerra has designed and evaluated interventions to increase access to cancer screening and cancer clinical trials for underserved populations. Dr. Guerra serves on the American Cancer Society's Guideline Development Group and is an author of the American Cancer Society's current colorectal, cervical, and lung cancer screening guidelines as well as the current HPV vaccination guidelines. In recognition of her contributions, Dr. Guerra received the American Cancer Society's St. George Medal in 2017, the Association of Community Cancer Centers Research Award in 2022, and the American Society of Clinical Oncology Excellence in Health Equity Award in 2023. She is also a member of the advisory board of Guardant Health, a company developing blood tests for colorectal cancer, and is the US Deputy Chair of the Health Equity Workgroup of the Multicancer Early Detection Consortium.

Elizabeth Heitman, Ph.D., is Professor in the Program in Ethics in Science and Medicine and Department of Psychiatry at the University of Texas Southwestern Medical Center in Dallas, Texas. Her work focuses on cultural aspects of ethics in clinical medicine, biomedical science, and public health, particularly international standards of research ethics and education in the responsible conduct of research (RCR). Dr. Heitman teaches research ethics and RCR across UT Southwestern through the Center for Translational Medicine and Graduate School of Biomedical Sciences, and she leads ethics education for two NIH training grants on cardiovascular health disparities, Obesity Health Disparities PRIDE and the Jackson Heart Study Graduate Training and Education Center at the University of Mississippi Medical Center. Dr. Heitman co-directs a Fogarty International Center-sponsored research ethics education program with Eduardo Mondlane University in Mozambique and is an advisory committee member for similar programs in Colombia and the Caribbean. She is a National Associate of the US National Research Council and has been chair or member of eight US National Academy of Sciences programs in research integrity education in the Middle East, North Africa, Indonesia, and Malaysia. In 2015-16 she co-chaired the NASEM Committee on Gene Drive Research with Non-Human Organisms.

Matthew F. Hudson, Ph.D., M.P.H., is the Director of Cancer Care Delivery Research (CCDR) at Prisma Health (Greenville, South Carolina), and Professor of Medicine at the University of South Carolina School of Medicine Greenville. Dr. Hudson conducts and oversees research on patient, provider, and organization-based interventions improving cancer care outcomes and patient well-being. Dr. Hudson served on multiple National Institute of Minority Health and Health Disparities study sections designed to augment workforce diversity. Dr. Hudson's own research examines racial differences in pain reports and management experiences among patients with cancer. Dr. Hudson served the Patient Centered Outcomes Research Institute (PCORI) as a member of their Patient Engagement Advisory Panel; he also

co-authored the PCORI report, Equity and Inclusion Guiding Engagement Principles. Dr. Hudson received his Ph.D. from Dartmouth College, M.P.H. from the University of California at Berkeley, and B.A. from the University of San Francisco. Dr. Hudson also received a certificate from the National Cancer Institute's Multilevel Intervention Training Institute (MLTI), and subsequently served MLTI as a small group junior faculty member.

Husseini K. Manji, M.D., is Co-chair of the UK Mental Health Mission and a visiting professor at Oxford University. Previously, Dr. Manji was Global Head of Science for Minds at Johnson & Johnson (J&J), where he led a global team to discover and develop new therapeutics for major neurologic, psychiatric, and pain-related diseases with a high unmet need for effective treatments. Dr. Manji's research has helped to conceptualize severe neuropsychiatric disorders as genetically influenced disorders of synaptic and neural plasticity and led to the investigation of key novel therapeutics. The major focus of his research has been the investigation of disease- and treatment-induced changes in gene and protein networks that regulate synaptic and neural plasticity in brain and behavior disorders. Before joining J&J, Dr. Manji was Director of the Mood and Anxiety Disorders Program, the largest research program of its kind in the world, at the National Institute of Mental Health. His work led to approval of the first novel antidepressant mechanism in decades, SPRAVATO (esketamine) nasal spray for adults with treatment-resistant major depressive disorder, by the U.S. Food and Drug Administration, Canada, and the European Commission. Dr. Manji is a member of the National Academy of Medicine. He also serves on the scientific advisory boards of the Dana Foundation and of Vanna Health.

Amy Moran-Thomas, Ph.D., is Associate Professor of Anthropology at the Massachusetts Institute of Technology and a faculty member in the program in History, Anthropology, and STS (Science, Technology, and Society). She is interested in how social perspectives on design can contribute to producing more equitable technologies. Her work combines insights from ethnographies of science and medicine; material histories of design; and STS perspectives on health and environment. Her essays helped draw attention to longstanding racial biases encoded in color-sensing medical devices and catalyzed clinical reexaminations of the pulse oximeter, including recent FDA hearings that led to new safety advisories. Prof. Moran-Thomas' writings have appeared in publications such as New England Journal of Medicine and Wired. Her first book, Traveling with Sugar: Chronicles of a Global Epidemic (2019), offers an anthropological account of diabetes technologies in use and the lives they shape in global perspective. Research and writing were supported by the Mellon-American Council of Learned Societies (ACLS), the Wenner-Gren Foundation, and the Rachel Carson Center for Environment and Society and received five book awards, including the Wellcome Foundation's Medal for Anthropology as Applied to Medical Problems. Professor Moran-Thomas received her Ph.D. in Anthropology from Princeton University in 2012.

Margaret Moss, Ph.D., J.D., RN, is an enrolled member of the Mandan, Hidatsa, and Arikara Nation in North Dakota. She is currently Professor and Associate Dean for Nursing and Health Policy at the University of Minnesota, School of Nursing. She holds both Nursing and Juris Doctorates. She has been a nurse for 34 years and an academic for 23 years across four universities. Previously at the University of British Columbia (UBC), she was a Professor in the Faculty of Applied Science, School of Nursing (20%) and Director of the UBC First Nations House of Learning (80%). During this time, she served as Interim Associate Vice President Equity & Inclusion at UBC (2022). Dr. Moss sat on the American Academy of Nursing Board of Directors in 2021-2023, is a new member of the National Academy of Medicine (2022) and is a member of the National Academies Board on Population and Public Health. Dr. Moss was a

committee member on the recent consensus report (2023) *Federal Policy to Advance Racial, Ethnic and Tribal Health Equity*. She wrote an award-winning text, *American Indian Health and Nursing* (2015) followed by *Health Equity and Nursing* (2020). She co-led the development and launch of the *UBC Indigenous Strategic Plan* (2020) and was a consultant on the *In Plain Sight Report: Addressing Anti-Indigenous Racism in Healthcare in BC* for the Minister of Health (2020). Dr. Moss was named an Inaugural member of the *Forbes 50 over 50 Impact list 2021.* She was a RWJF Health Policy Fellow, staffing the US Senate Special Committee on Aging, and was a Fulbright Chair at McGill University-Montreal, QC, Canada.

Elizabeth O. Ofili, M.D., M.P.H., is a Professor of Medicine at Morehouse School of Medicine and a practicing cardiologist with Morehouse Healthcare in Atlanta, Georgia. She serves as Chief Medical Officer for Morehouse Choice Accountable Care Organization, a Center for Medicare and Medicaid Services Shared Savings Program, which includes Federally Qualified Health Centers across the state of Georgia. Dr. Ofili is a nationally and internationally recognized clinician scientist with particular focus on cardiovascular disparities and women's health. In 2002, as president of the Association of Black Cardiologists (ABC), she led the initiative to implement the landmark African American Heart Failure Trial (AHEFT), whose findings changed practice guidelines for the treatment of heart failure in African Americans. Dr. Ofili is the Founder and Chief Executive Officer of AccuHealth Technologies Inc./Health 360x™ a patient-centered platform for population health management and clinical trial diversity. Dr. Ofili is the immediate past Chair of the Board of the Association of Black Cardiologists. She serves as Chair of the Board of Directors of Alliant Health Group, a nonprofit Quality Improvement Organization. Dr. Ofili is a principal investigator (PI) in the National Research Mentoring Network and contact PI of the Coordination and Evaluation Center for the NIH Faculty Institutional Recruitment for Sustainable Transformation (FIRST) Program for Inclusive Excellence. She serves as PI of the Amgen-sponsored African American Heart Study, multi-PI of the Georgia Clinical and Translational Science Alliance, and contact PI of the Research Centers in Minority Institutions Coordinating Center. She serves in advisory roles for Amgen's Rise program and the Bristol-Meyers-Squib-Pfizer alliance initiative. Dr. Ofili has received many awards for her contributions and is an elected member of the National Academy of Medicine. Dr. Ofili graduated with distinction from Ahmadu Bello University School of Medicine in Nigeria and received an M.P.H from Johns Hopkins University.

Neil R. Powe, M.D., M.P.H., M.B.A., is Chief of Medicine at the Priscilla Chan and Mark Zuckerberg San Francisco General Hospital and the Constance B. Wofsy Distinguished Professor at the University of California, San Francisco. He also serves as the Chief Science Officer for the Commonwealth Fund. Dr. Powe led the National Kidney Foundation-American Society of Nephrology Task Force on Reassessing the Inclusion of Race in Diagnosing Kidney Diseases that led to elimination of race from estimation of kidney function. As member and now chair of the Journal of the American Medical Association Oversight Committee, he provided important decision making regarding a podcast on structural racism. Dr. Powe is a member of the National Academy of Medicine and has served on previous National Academies consensus study committees. Among his honors are the Herbert W. Nickens Award for Promoting Justice in Medical Education and Health Care Equity from the Association of American Medical Colleges, the Diversity Award from the Association of Professors of Medicine, the John M. Eisenberg Award for Career Achievement in Research and the Robert J. Glaser Award from the Society of General Internal Medicine, the David Hume Memorial Award from the National Kidney Foundation, the 2021 John Phillips Memorial Award for Distinguished Contributions in Clinical Medicine from the American College of

Physicians, and the Cato Laurencin Lifetime Research Award from the National Medical Association. Dr. Powe holds an M.D. and M.P.H from Harvard, and at the University of Pennsylvania, he completed residency, was a Robert Wood Johnson Clinical Scholar, and earned an M.B.A.

Aliya Saperstein, Ph.D., is the Benjamin Scott Crocker Professor in human biology and a professor of sociology at Stanford University. Her research focuses on the conceptualization and measurement of race/ethnicity and the consequences of these methodological decisions for studies of stratification and health disparities, including in the field of precision medicine research. Her work has been published in *Science*, the *Proceedings of the National Academy of Sciences*, *American Journal of Sociology*, *and* the *Annual Review of Sociology,* among others*.* Dr. Saperstein has been a Visiting Scholar at Sciences Po and the Russell Sage Foundation. Her scholarship has been honored with multiple articles awards as well as the Early Achievement Award from the Population Association of America. Saperstein has a Ph.D. in sociology and demography from the University of California-Berkeley.

Roland J. Thorpe, Jr., Ph.D., is a Professor in the Department of Health, Behavior, and Society, Founding Director of the Program of Men's Health Research in the Hopkins Center for Health Disparities Solutions, and Director of the Johns Hopkins Alzheimer's Disease Resource Center for Minority Aging Research at the Johns Hopkins Bloomberg School of Public Health. Dr. Thorpe is a social epidemiologist and gerontologist whose research focuses on how social determinants of health impact health and functional outcomes among men across the life course. Dr. Thorpe serves as principal investigator (PI) on several NIH-funded grants and is a multiple PI of the Artificial Intelligence/Machine Learning consortium to Advance Health Equity and Researcher Diversity (AIM-AHEAD). Dr. Thorpe is the inaugural Associate Vice Provost for Faculty Diversity at Johns Hopkins University. He is a Fellow of the Gerontological Society of America and the Academy of Behavioral Medicine Research. Dr. Thorpe earned a bachelor's in theoretical mathematics from Florida A&M University, a master's in statistics, and a Ph.D. in clinical epidemiology with a graduate minor in gerontology from Purdue University. He received postdoctoral training in health disparities and gerontology from the Division of Geriatric Medicine and Gerontology at the Johns Hopkins School of Medicine. Dr. Thorpe is a member of scientific advisory boards, including the National Center for Health Statistics Board of Scientific Counselors, and is the editor-in-chief of *Ethnicity & Disease*.

Shyam Visweswaran, M.D., Ph.D., is a professor and Vice Chair of Clinical Informatics in the Department of Biomedical Informatics at the University of Pittsburgh. His research broadly focuses on computerized clinical decision support driven by machine learning; patient-specific modeling, in which statistical models are tailored to the characteristics of the patient at hand and optimized to perform well for that patient; and the development of statistical machine learning methods for causal discovery using electronic health record data, molecular data, or both. His current research focuses on cataloging clinical algorithms that incorporate a person's race and ethnicity and developing computational methods for understanding the effect of race and ethnicity on model bias. He holds an M.B., B.S. degree (M.D. equivalent) from the Jawaharlal Institute of Post-Graduate Medical Education and Research in Pondicherry, India, an M.S. degree in Physiology and Biophysics from the University of Illinois at Urbana-Champaign, and a Ph.D. in Intelligent Systems (artificial intelligence) from the University of Pittsburgh. He completed his neurology residency at Boston University.

Genevieve L. Wojcik, Ph.D., is an Assistant Professor of Epidemiology at the Johns Hopkins Bloomberg School of Public Health. As a statistical geneticist and genetic epidemiologist, her research focuses on

method development for diverse populations, specifically understanding the role of genetic ancestry and environment in genetic risk in admixed populations. Dr. Wojcik integrates epidemiology with statistical and population genetics to better understand existing health disparities in minority populations, as well as underserved populations globally. In 2021, she was the recipient of one of NHGRI's Genomic Innovator Awards (R35). She is a long-standing member of multiple NHGRI consortia focused on diverse populations, such as the Population Architecture using Genomics and Epidemiology (PAGE) Study and the PRIMED consortium. Prior to her faculty appointment, Dr. Wojcik was a postdoctoral research scholar at Stanford University in the Departments of Genetics and Biomedical Data Science. She received her Ph.D. in Epidemiology and M.H.S. in Human Genetics/Genetic Epidemiology from the Johns Hopkins Bloomberg School of Public Health and her B.A. in Biology from Cornell University. She was recently a member of the National Academies Committee on the Use of Race, Ethnicity, and Ancestry as Population Descriptors in Genomics Research, which published its report in 2023.

Ruqaiijah Yearby, J.D., M.P.H., is the inaugural Kara J. Trott Professor in Health Law at the Moritz College of Law, Professor in the Department of Health Services Management and Policy at the College of Public Health, and a faculty affiliate of the Kirwan Institute for the Study of Race and Ethnicity at The Ohio State University. An expert in health policy and civil rights, Professor Yearby has received over $5 million from the National Institutes of Health (NIH) to study structural racism and discrimination in vaccine allocation and from the Robert Wood Johnson Foundation to study the equitable enforcement of housing laws and structural racism in health care. She was a keynote speaker for the 5th Annual Conference of the ELSI Congress and has served as a reviewer for NIH, the Swiss National Science Foundation, and the Wellcome Trust. Yearby is on the editorial board of the American Journal of Bioethics and is a Committee Member for the U.S. Department of Health and Human Services, Secretary's Advisory Committee on Human Research Protections. Her work has been published in the American Journal of Bioethics, American Journal of Public Health, Health Affairs, and the Oxford Journal of Law and the Biosciences.

Public Session Information

Community Perspective on the Use of Race and Ethnicity in Biomedical Research

March 15th, 2024

Speaker Biographies

Monica Agrawal, Ph.D., is an incoming assistant professor at Duke University, joint between the Department of Biostatistics and Bioinformatics and the Department of Computer Science. Her research tackles diverse challenges across clinical natural language processing including scalable clinical information extraction, smarter electronic health records, and human-in-the-loop systems. Her work has been published at venues in machine learning, natural language processing, computational health, and human-computer interaction. Dr. Agrawal is also a co-founder of Layer Health, a healthcare AI company committed to solving the information problem in healthcare. She holds a Ph.D. in Computer Science from MIT CSAIL in the Clinical Machine Learning Group and a B.S./M.S. in Computer Science from Stanford University. There, she researched in the SNAP Group under Jure Leskovec and Marinka Zitnik, where I used biological networks to predict disease-gene associations and polypharmacy side effects. Dr. Agrawal has been the recipient of a Takeda Fellowship, a Tau Beta Pi Fellowship, and an MIT EECS Edgerton Fellowship, and she was selected as a 2022 Rising Star in EECS.

Tristan Naumann, Ph.D., is a Principal Researcher at Microsoft Research's Health Futures, where he works on problems related to clinical natural language processing and machine reading. His research focuses on exploring relationships in complex, unstructured healthcare data using natural language processing and unsupervised learning techniques. Previously, he completed a Ph.D. in the Clinical Decision Making group at MIT CSAIL with Prof. Peter Szolovits, where the research focused on leveraging text representations for clinical predictive tasks, combining structured and unstructured healthcare data. His work has appeared in KDD, AAAI, AMIA, JMIR, Science Translational Medicine, and Nature Translational Psychiatry. While at MIT, Dr. Naumann was an Instructor for HST.953 (Collaborative Data Science for Medicine) and co-authored its textbook, "Secondary Analysis of Electronic Health Records." He served as the General Chair for the NIPS 2018 Machine Learning for Health (ML4H) workshop. He also co-organized the NIPS 2017 ML4H workshop, the COLING 2016 Clinical NLP workshop, and several "datathon" events, which bring together participants to address problems of clinical interest. Dr. Naumann also served as a mentor for the MIT Summer Research Program (MSRP) and has spent time as a Software Engineering Intern at Intel Corporation. Prior to MIT, he was a Program Manager at Microsoft Corporation, an Associate Product Manager Intern at Google, and received B.S. and M.S degrees in computer science from Columbia University.

Committee on the Use of Race and Ethnicity in Biomedical Research

March 15, 2024
8:30 – 9:30 AM ET

Speaker Guidance
Race and Ethnicity in Biomedical AI

BACKGROUND AND CONTEXT

The National Academies Committee on the Use of Race and Ethnicity in Biomedical Research was convened to assess ways that researchers can improve the use of race and ethnicity data in biomedical research. After careful deliberation, the committee will release a report on their findings. The committee will use information from open sessions like this one as a resource to develop their conclusions and recommendations for the report. The report is expected to be released in October 2024.

As part of the information gathering phase of their work, the committee would like to learn more about how AI, specifically natural language processing, is being used in biomedical research and clinical algorithms, and how this use implicates race and ethnicity.

RACE AND ETHNICITY IN BIOMEDICAL AI

Session Objectives

- Hear from experts in AI about the growing impact of this technology on biomedical research and implications for the use of race and ethnicity in research and algorithms
- Learn about potential applications of natural language processing (NLP) and large language models (LLMs) in biomedical research and how race and ethnicity are used in biomedical and clinical AI
- Explore whether and how race and ethnicity could be used in the development of future clinical algorithms

Questions for Speakers

1. What are applications of NLP and LLMs in biomedical research and clinical settings? How do race and ethnicity affect these use cases?
2. How are race and ethnicity categories used in clinical algorithms and tools? What factors should be considered or evaluated to avoid misuse?

3. When considering health equity, what are potential risks and benefits of the integration of LLMs or other AI in biomedical research or clinical settings?
4. How could race and ethnicity, or related variables, be used more appropriately in algorithms and clinical decision-making tools in the future? What changes need to occur to improve their clinical utility and reduce their potential for harm?
5. What are current examples that could be good models for future research in this area?

Background Materials

Links to Additional Resources

March 15th Open Session – Race and Ethnicity in Biomedical AI

Agrawal, M., S. Hegselmann, H. Lang, Y. Kim, and D. Sontag. Large language models are few-shot clinical information extractors, 2022. https://aclanthology.org/2022.emnlp-main.130/

Ferryman, K., M. Mackintosh, and M. Ghassemi. 2023. Considering biased data as informative artifacts in AI-assisted health care. *New England Journal of Medicine* 389(9):833-838. https://www.nejm.org/doi/full/10.1056/NEJMra2214964

Ghassemi, M., T. Naumann, P. Schulam, A. L. Beam, I. Y. Chen, and R. Ranganath. 2020. A review of challenges and opportunities in machine learning for health. *AMIA Summits on Translational Science Proceedings* 2020:191. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7233077/

Singhal, K., S. Azizi, T. Tu, S. S. Mahdavi, J. Wei, H. W. Chung, N. Scales, A. Tanwani, H. Cole-Lewis, S. Pfohl, P. Payne, M. Seneviratne, P. Gamble, C. Kelly, A. Babiker, N. Schärli, A. Chowdhery, P. Mansfield, D. Demner-Fushman, B. Agüera Y Arcas, D. Webster, G. S. Corrado, Y. Matias, K. Chou, J. Gottweis, N. Tomasev, Y. Liu, A. Rajkomar, J. Barral, C. Semturs, A. Karthikesalingam, and V. Natarajan. 2023. Large language models encode clinical knowledge. *Nature* 620(7972):172-180. https://www.nature.com/articles/s41586-023-06291-2

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