UNITING THE VISION FOR HEALTH EQUITY THROUGH PARTNERSHIPS: THE 2ND ANNUAL DR. ELIJAH SAUNDERS & DR. LEVI WATKINS MEMORIAL LECTURE

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Minority health research focuses on outcomes by race and ethnicity categories used in the United States census. Overall mortality has decreased significantly for African Americans, Latinos, and Asians over the past 20 years even though it has stopped improving for poor Whites and continues to increase for American Indians/Alaska Natives. Prevention and treatment of cardiovascular disease partly account for this trend, but there is room for improvement. Health disparities research also includes persons of less privileged socioeconomic status, underserved rural residents, and sexual and gender minorities of any race and ethnicity when the outcomes are worse than a reference population. Understanding mechanisms that lead to health disparities from behavioral, biological, environmental and health care perspectives will lead to interventions that reduce these disparities and promote health equity. Experiences with racism and discrimination generate a chronic stress response with measurable effects on biological processes and study is needed to evaluate long-term effects on health outcomes. A clinical example of effective approaches to reducing disparities is management of hypertension to promote stroke reduction that requires health system changes, patient-clinician partnerships and engagement of community organizations. Clinicians in health care settings have the potential to promote health equity by implementing standardized measures of social determinants, leveraging the power of health information technology, maximizing cultural competence and socially precise care and engaging communities to reduce health disparities. Strategic partnerships between health care institutions and community-based organizations need to parallel patient-clinician partnerships and are essential to promote health equity and reduce disparities. *Ethn Dis.* 2019;29(Suppl 1):193-200; doi:10.18865/ed.29.S1.193.

INTRODUCTION

The Saunders-Watkins lecture is named posthumously for Dr. Elijah Saunders, a Baltimore cardiologist, and Dr. Levi Watkins, a Baltimore cardiothoracic surgeon, and is organized around a scientific workshop with invited experts and early career investigators working in cardiovascular health and health disparities. Both Drs. Saunders and Watkins dedicated their lives to patient care, teaching, research, and community service. The lecture honors these two pioneers for their efforts to advance health equity for medically underserved communities in the United States and around the globe. The lecture is designed to stimulate a future generation of researchers committed to advancing health equity research in order to reduce health disparities locally and globally.

In this article, the history and mission of the National Institute on Minority Health and Health Disparities (NIMHD) emphasizes the role that the National Institutes of Health (NIH) plays in addressing health equity. We present revised definitions of minority health and health disparities research, identify the NIH disparity populations and present a broad perspective on the scientific methods that can be used to address health disparities. The emerging scientific discipline

> *The emerging scientific discipline of health disparities research requires a multi-level and inter-disciplinary approach to engage participants and patients in the context of health care settings and communities.*

Keywords: Minority Health; Health Disparities

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of health disparities research requires a multi-level and inter-disciplinary approach to engage participants and patients in the context of health care settings and communities. Partnerships between patient-clinician, health care clinics and community organizations and scientists and advocates are essential to advance the field.

HISTORY AND MISSION OF NIMHD

The foundation for NIMHD was established with the founding of the Office of Minority Health Research at NIH in 1990. Dr. John Ruffin was the founding director and he remained in the leadership role of these entities until he retired in 2014. The Office was elevated into a Center in 2000 through legislation and subsequently became NIMHD as part of the Affordable Care Act (ACA) in 2010. NIMHD's mission focuses on minority health and health disparities research. Minority health research covers all topics related to racial/ethnic minority groups in the United States, whether the outcomes are better or worse than a reference population. The US Census categories for racial/ethnic minority groups are: African American or Black, Asian, American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, and Hispanic or Latino with the option for identities of two or more races as well. Health disparity populations, as defined by NIMHD, include all racial and ethnic minorities, persons of less privileged socioeconomic status of any race, underserved rural residents, and sexual and gender minorities. From the NIMHD perspective, all these populations have been subjected to discrimination in society and this contributes to their social disadvantage and poor health outcomes. A health disparity is defined as a health outcome that is worse in these populations when compared with a reference group.

IMPORTANCE OF SOCIAL DETERMINANTS OF HEALTH

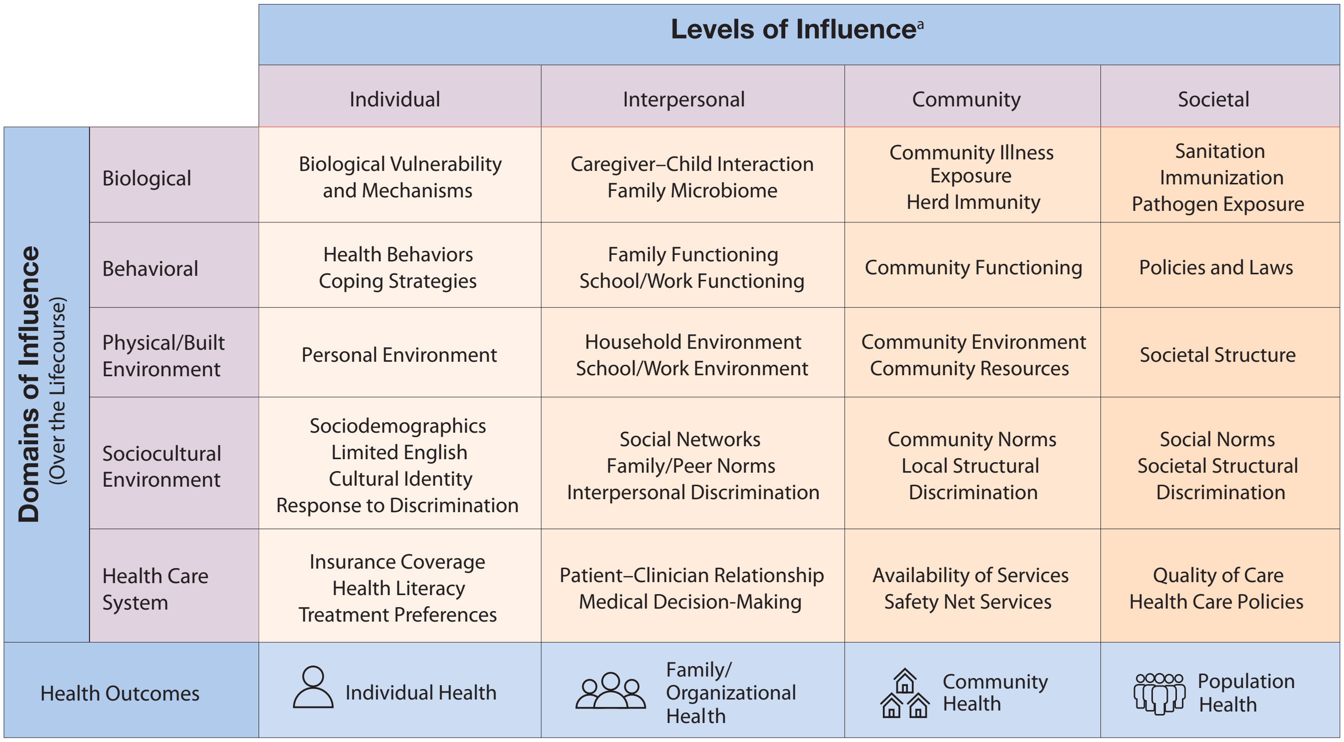
Race and ethnicity are fundamental predictors of many health and health care outcomes and thus should always be considered as a demographic variable in evaluating human research or any clinical care. For example, life expectancy and mortality in the United States is predicted not only by gender but also by race and ethnicity. Although life expectancy for African Americans is shorter than for Whites by 3 to 4.5 years, mortality rates for African Americans aged >65 years have improved to the point that these are now lower than for Whites of the same age.[1] Furthermore, Latino life expectancy for both men and women have continued to improve and exceed that for Whites.[2]

Measurement of socioeconomic status is often a challenge for many clinician scientists with limited time to measure wealth. Years of formal education is more reliable for assessing socioeconomic status, less threatening and more robust across the lifespan than annual household income.[3] Limitations of these two simple measures become clear when one considers an example of two individuals with the same educational attainment and widely differed income because of the resources they had growing up, and assets that exist in their family, and the neighborhood in which they live. Regardless, most clinical systems have not prioritized addressing social class in patients and clinical scientists are not required by NIH to collect such data in research participants even though it is a strong predictor of health outcomes.

A person with a household income at the poverty level has an overall mortality rate that is three times higher than a person with a household income of more than $115,000.[4] These analyses[4] showed that life expectancy for women and men based on the poorest 1% compared with the richest 1% had gaps of 10 and 14 years. This observation has persisted for decades and as income inequality worsens, there is an associated increase in the life expectancy gap between rich and poor. However, if one examines the life expectancy of the population in the bottom income quintile by selected communities, the difference may vary by as much as 3 to 4.5 years.[4] An important and unanswered question is: what are those communities doing right to allow their most vulnerable to actually live longer?

SCIENCE OF MINORITY HEALTH AND HEALTH DISPARITIES

To guide its scientific portfolio, NIMHD has identified four categories of mechanisms that determine minority health and lead to health



		Levels of Influence[a]			
		Individual	Interpersonal	Community	Societal
Domains of Influence (Over the Lifecourse)	Biological	Biological Vulnerability and Mechanisms	Caregiver–Child Interaction Family Microbiome	Community Illness Exposure Herd Immunity	Sanitation Immunization Pathogen Exposure
	Behavioral	Health Behaviors Coping Strategies	Family Functioning School/Work Functioning	Community Functioning	Policies and Laws
	Physical/Built Environment	Personal Environment	Household Environment School/Work Environment	Community Environment Community Resources	Societal Structure
	Sociocultural Environment	Sociodemographics Limited English Cultural Identity Response to Discrimination	Social Networks Family/Peer Norms Interpersonal Discrimination	Community Norms Local Structural Discrimination	Social Norms Societal Structural Discrimination
	Health Care System	Insurance Coverage Health Literacy Treatment Preferences	Patient–Clinician Relationship Medical Decision-Making	Availability of Services Safety Net Services	Quality of Care Health Care Policies
Health Outcomes		Individual Health	Family/ Organizational Health	Community Health	Population Health

Figure 1. The NIMHD research framework

Source: National Institute on Minority Health and Health Disparities. NIMHD Research Framework. 2018. PDF available at: https://www.nimhd.nih.gov/about/overview/research-framework.html.

a. Health Disparity Populations: Race/Ethnicity, Low SES, Rural, Sexual/Gender Minority;Other Fundamental Characteristics: Sex/Gender, Disability, Geographic Region

disparities. Staff created a framework published on our website (Figure 1) to reflect the complexity of our type of research. The framework is intended to be a non-comprehensive guide and not an explanatory or causal model.

Although most health disparities researchers started in the health behavior category, with a focus on individual lifestyle differences among groups, the field has moved to other areas. For example, adverse childhood events and their effects on adult health have provided scientists with a plausible model that helps us to understand how exposure to violence, poverty, racism and immigration (eg, language barriers, barriers to accessing health care, and immigration-related discrimination and stress) at an early age can lead to excess chronic diseases. This early life adversity can now be evaluated using biological measures such as allostatic load and telomere length and thus lead to an integration of such scientific approaches into minority health and health disparities research.

The increase in scientific discoveries reflected in developments in the areas of human genetics, epigenetics, the microbiome, extracellular RNA and neural networks demand that social, behavioral, population and clinical scientists stay connected to these in order to better understand potential mechanisms. On the other hand, basic scientists need clinical and population scientists to collaborate and ask the question about differences not only by gender and age, but also by race and ethnicity and socioeconomic status.

The empirical evidence on the importance of the built or physical environment on an individual's or a community's health has been consolidated in the last 20 years. Population scientists have addressed the role of neighborhood segregation, identified and defined food deserts and addressed how structural determinants in societal organizations affect health. In parallel, the importance of visible trash, broken windows, abandoned houses, physical safety, sidewalks and green space are factors that scientists have begun to incorporate into public health science and behavioral research. Mobile technology has expanded options for empirical data collection with tools to track individual and group behavior, register experiences in real time and apply a scientific approach to social networks. Community resilience and positive social interactions may be important protective factors that promote better health in the face of economic adversity.

The clinical setting also offers an opportunity to study minority health and health disparities with or without being tied to a specific disease. Patient engagement with the health system happens daily in a primary care or specialty outpatient practice or in an emergency room or hospital. Because a greater proportion of patients face multiple co-morbidities, health disparities researchers have an opportunity to fill a gap in the research on these patients that are not otherwise allocated to a disease topic specific to other NIH institutes. Health disparities can be ameliorated or generated in the clinical setting, within patient-clinician communication, through management of common chronic diseases, and with appropriate use of medications and tests in clinical management. For example, analysis of a cohort of patients with atrial fibrillation showed that African Americans were less likely to be prescribed direct-acting oral anticoagulants and had lower quality of anticoagulation when compared with Whites.[5]

Diversity of the Biomedical Workforce

There is a crisis in the lack of racial/ethnic diversity in the biomedical scientific and clinical workforce. In 2015, about 12% of medical school graduates were either Latino, African American, American Indian/Alaska Native and Native Hawaiian/Pacific Islanders.[6] The latest data on US recipients of PhD degrees in the life and physical sciences showed about 13% were from underrepresented racial/ethnic groups.[7] Clearly, the pipeline is not full, but it is not as unpopulated as in the past. Despite these data, only about 7% of NIH-awarded R01 principal investigators are either African American or Latino/a, and about 3% of newly appointed assistant professors are from these groups.[7] We must have our populations engage in scientific research careers and current faculty and scientists need to generously mentor and support new and diverse scientists. Programs to make all communities aware, to overcome overt and unconscious bias, and to enhance recruitment, retention and leadership roles for diverse scientists are a priority for NIMHD.

Inclusion of Minority Participants in Clinical Research

Inclusion of diverse participants is not just about social justice and common sense, but it is a demographic mandate because 40% of the US population will identify as non-White by the 2020 census. Inclusion of diverse participants is also about discovery and advancing knowledge and requires community engagement by the scientists doing the research. Community members have expressed a willingness to engage with scientists and meet as equals on common ground.[8-10] However, research in communities of color presents unique challenges that create discomfort among many scientists. Investigators who are successful in recruiting diverse participants are committed to this goal and allocate the needed resources to achieve it. Researchers need to have more face time with the community by attending activities, interacting with potential participants outside of the clinic or study setting, and be seen as an approachable person. Scientists must be willing to invest the time and take the risk. Although minority scientists may be more effective, there is no empirical data to support this contention. NIH studies should be more accountable, so that the proposed recruitment targets for minorities and women when the grant is awarded are re-visited on an annual basis. Ideally, there should be rewards for scientists who meet or exceed expectations of recruiting diverse samples in studies. At NIH, about 26% of all participants each year are from a racial/ethnic minority group and a majority are women. However, ongoing monitoring is necessary and other demographic factors such as education, birthplace and primary language would enhance our understanding of inclusion. Although not every study needs to be powered to analyze the data by race and ethnicity, when the observational data indicate large differences in outcomes by a demographic factor, then prospective clinical trials should be powered to evaluate their results stratified by the demographic variables of interest. However, if inclusion of minorities is completely ignored in clinical studies, large effects or differences by race and ethnicity will be missed.

EXAMPLES WHEN RACE AND ETHNICITY MATTER IN CLINICAL OUTCOMES

We have observed several examples of large effects of race and ethnicity on a clinically relevant outcome or an important research construct. When a person smokes a cigarette, nicotine is metabolized to cotinine, which is a more stable and measurable substance. Defining a smoker by serum cotinine level varies by racial or ethnic group as different cut-points for defining a biochemical smoker were identified for Mexican Americans, Whites and African Americans.[11] This may be due to differences in the rate of nicotine metabolism, how different individuals smoke cigarettes, as well as differing levels of exposure to secondhand smoke. Similarly, a BMI of 23, vs 25, has been defined as more sensitive and specific for Asians and Pacific Islanders in order to recommend a screening test for diabetes.[12,13] Among both Latinos and African Americans, the optimal BMI cut-point to define an increase in morbidity and mortality is probably closer to 30 even though this has not affected clinical practice.[14,15] There are differential effects of smoking intensity on development of lung cancer by racial and ethnic group as African Americans and Pacific Islanders are at a higher risk compared with Whites, Latinos or Japanese Americans.[16] An example of genetic protection, the gene 6q25 is associated with 40% decreased odds of breast cancer among women of Latin America with Indigenous ancestry.[17] Outcomes of myocardial infarction and end stage renal disease among patients with diabetes differed by race and ethnicity over a 10-year follow-up. Even though all patients with diabetes had similar access to care and treatment, all racial/ethnic minorities tended to have lower rates of heart attacks by up to 30% and have 1.5 to 2.0 higher rates of end stage renal disease.[18,19] Pharmacogenomic studies indicate important differences that may account for lower quality of care such as clopidogrel that does not work in half of Pacific Islanders, but this was not discovered until after the drug was marketed for years in Hawaii.[20] Finally, a differential response to inhaled albuterol showed that the bronchodilator effect among Puerto Ricans and African Americans with asthma was inferior to that of Mexican Americans and Whites, which parallels the morbidity and mortality from asthma.[21]

RACISM AND DISCRIMINATION

Racism and discrimination persist in American society today. A survey conducted by the Kaiser Family Foundation asked a large sample of Americans, "In the last 30 days, were you treated unfairly because of your race or ethnicity?" In all settings combined, 53% of African Americans and 36% of Latinos reported unfair treatment compared with 15% of Whites. Even in health care settings, Latino (14%) and African American (12%) patients were more likely to perceive discrimination compared with their White (5%) counterparts.[22] Racism and discrimination are best conceptualized as models of chronic stress that lead to cumulative biological effects. Interpersonal racism has been operationalized, and can be quantified, with reliable self-report scales about daily societal activities including in health care settings.[23,24] Structural racism is a system construct that has critical research aspects that have been understudied. This is an area in need of innovative scientific work to evaluate the contributions of historical, cultural and institutional practices. Finally, racism is often internalized without an individual's acknowledgement but in a way that it affects health through biological responses over time.[23-25] Internalized racism may lead to epigenetic changes in the individual's interactions with the environment, maladaptive inflammatory responses or mental health and behavioral consequences.[26] Perceived discrimination is associated with cardiovascular reactivity related to blood pressure changes especially when anger is an emotional response. Blood pressure, glucose homeostasis, lipids, and the inflammatory and immune response have been grouped together as allostatic load to reflect chronic stress.[27]

HEALTH CARE ACTIONS TO PROMOTE EQUITY

Implementation of known practices to promote health equity and reduce health disparities is a priority for NIH. Observational studies have identified these contributors as important for promoting health equity: 1) expanding access to care through health insurance; 2) an accessible place to obtain care; and 3) a primary clinician to coordinate care.[28,29] There are also areas where there is public health consensus about specific interventions. For example, childhood immunization rates >90% have been achieved in all racial/ethnic groups in the United States with marked reduction in morbidity and mortality.[30] Stroke deaths in the United States continued to decline over the past 15 years and the major contributor to this is adequate control of hypertension. However, even though it is known that a given level of systolic blood pressure carries a two-fold greater risk of stroke for African Americans compared with Whites,[31] adequate hypertension control is better for Whites in analyses of Medicare data.[32,33]

Coordination of care is a central component of health care settings. People still want to see and consult with "doctors," but clinicians cannot function alone and need a system that provides support. Medical assistants, nurses, nutritionists, mental health clinicians and social workers all form part of this team in a patient-centered medical home with electronic information systems. A patient-centered medical home facilitates addressing issues around communication and cultural competence and creates quality measures for population and individual health. Health care organizations need to shift to population health models to enhance efficiency, provide better quality and promote health equity. In this health care model, identifying ways to decrease disparities and engage community resources in promoting health would be standard practice.

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Community-Engaged Partnerships to Promote Health Equity

Community health research requires engagement and partnerships with organizations, institutions and leaders in the community of interest. This focus overlaps with population science by reaching out to communities where disparities have been identified and leveraging big data that are increasingly relevant. For example, NIMHD funded a Health Disparities Research on Chronic Disease Prevention Center in Flint, Michigan that required an upfront investment of groundwork on collaboration, academic and community organizations, as well as political partners using community-engagement approaches. The main research project is an evidence-based study to promote physical activity within a faith-based community; the project is derived from prior work.[34] Another NIMHD-funded study in Miami aims to improve the health of South Florida's vulnerable populations through collaborative participatory research leveraging community health workers and different levels of facilitators. The researchers' objective is to screen for HIV, hepatitis C, colorectal cancer, and cervical cancer in nonclinical settings.[35]

In promoting health equity, clinical and community organizations can learn to use population data to identify "hot spots," such as cases of preventable hospitalizations, opioid use overdoses, uncontrolled diabetes or hypertension, low-birth weight babies, and tuberculosis cases to name a few. Another approach is to target the most vulnerable patients who often are the most elderly, racial/ethnic minorities, the marginalized poor, and to address practical barriers to care (eg, housing, transportation, food access, trust/mistrust of individuals and institutions, and adherence with therapies). We also need to recognize and learn from disparity populations that do well clinically and are buffered by the resilience and networking that exist in their communities. Researchers need to be aware of community needs, visit and live within communities, employ members, engage the leaders, and promote partnerships to create the empirical data to support health equity. A recent example in California addressed how to impact the unexpectedly high rates of maternal mortality and the experience showed that maternal mortality was reduced by 50% in 7 years with a reduction in Black-White disparities.[36]

Conclusions

NIMHD's mission is to fund innovative research in minority health and health disparities so that we understand mechanisms of these health outcomes to be able to develop and implement interventions that reduce disparities, improve minority health and promote health equity. Strategic partnerships between health care institutions, community-based organizations and patient-clinician partnerships are essential components to promote health equity and reduce disparities. Health care organizations need to leverage resources to enhance quality and efficiency and promoting health equity will benefit all patients. Public health departments and researchers can provide the data and methodological expertise to standardize data collection, identify health care disparities and evaluate programs to reduce these inequities so that all Americans will have an equal opportunity to live long, healthy, and productive lives.

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Conflict of Interest

No conflicts of interest to report.

Author Contributions

Research concept and design: Pérez-Stable; Acquisition of data: Rodriquez; Manuscript draft: Pérez-Stable, Rodriquez; Administrative: Pérez-Stable, Rodriquez

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