



# Addressing Disparities in Autoimmune Disease

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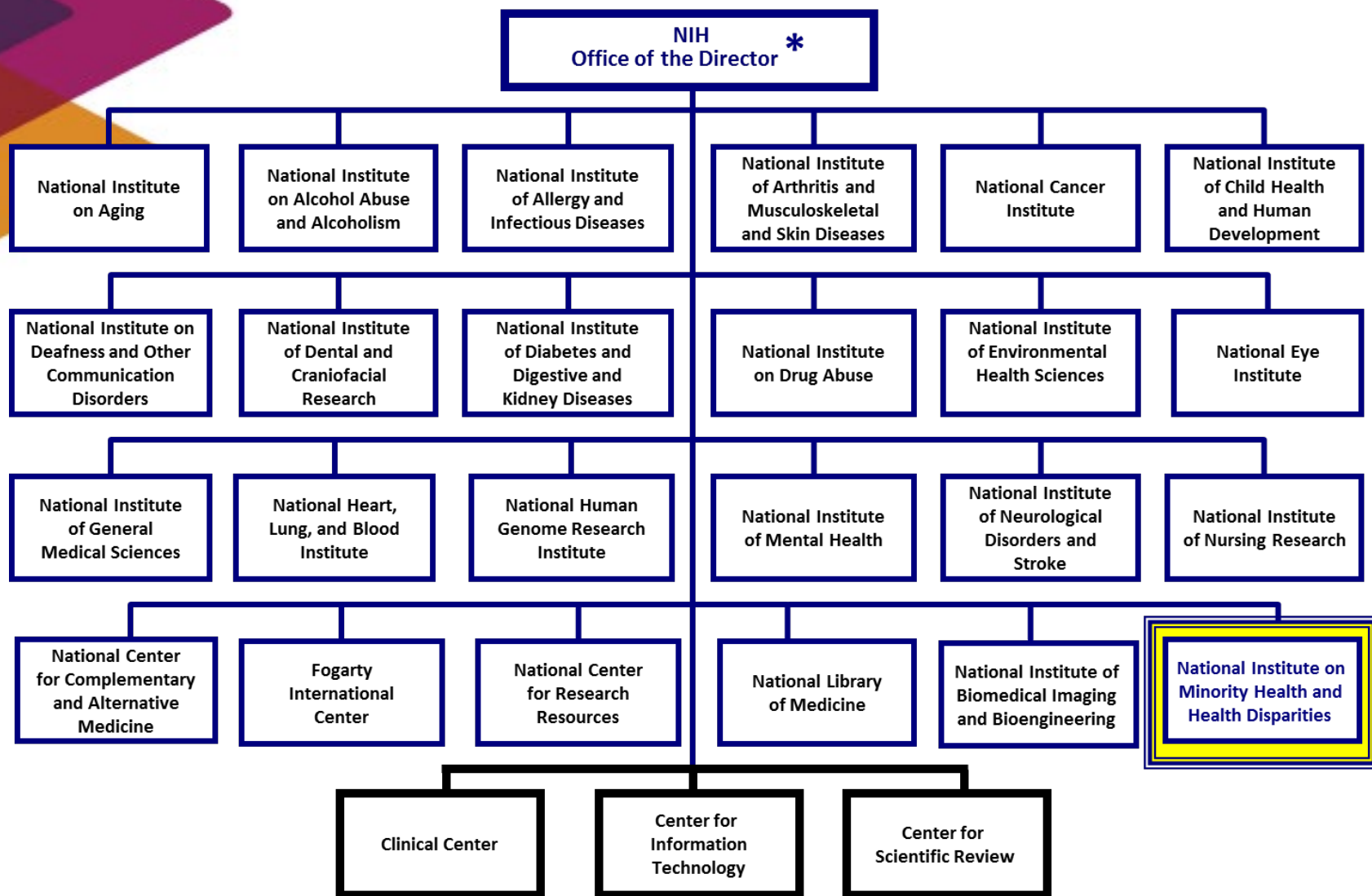
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National Academy of Sciences

Committee for the Assessment of NIH Research on Autoimmune Diseases

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National Institute  
on Minority Health  
and Health Disparities



## NIMHD Mission

NIMHD leads scientific research to improve minority health and eliminate health disparities. To accomplish this, NIMHD:

- Plans, reviews, coordinates, and evaluates all minority health and health disparities research and activities of the National Institutes of Health;
- Conducts and supports **research on minority health and health disparities**;
- Promotes and supports the **training of a diverse research workforce**;
- **Translates and disseminates research information**; and
- **Fosters collaborations and partnerships.**

# Definition: Health Disparity Populations

- Racial/Ethnic Minority Populations  
*(African Americans, Hispanics/Latinos, Asian Americans, American Indians/Alaska Natives, Native Hawaiians and other Pacific Islanders)*
- Socioeconomically disadvantaged populations
- Rural populations
- SGM Populations





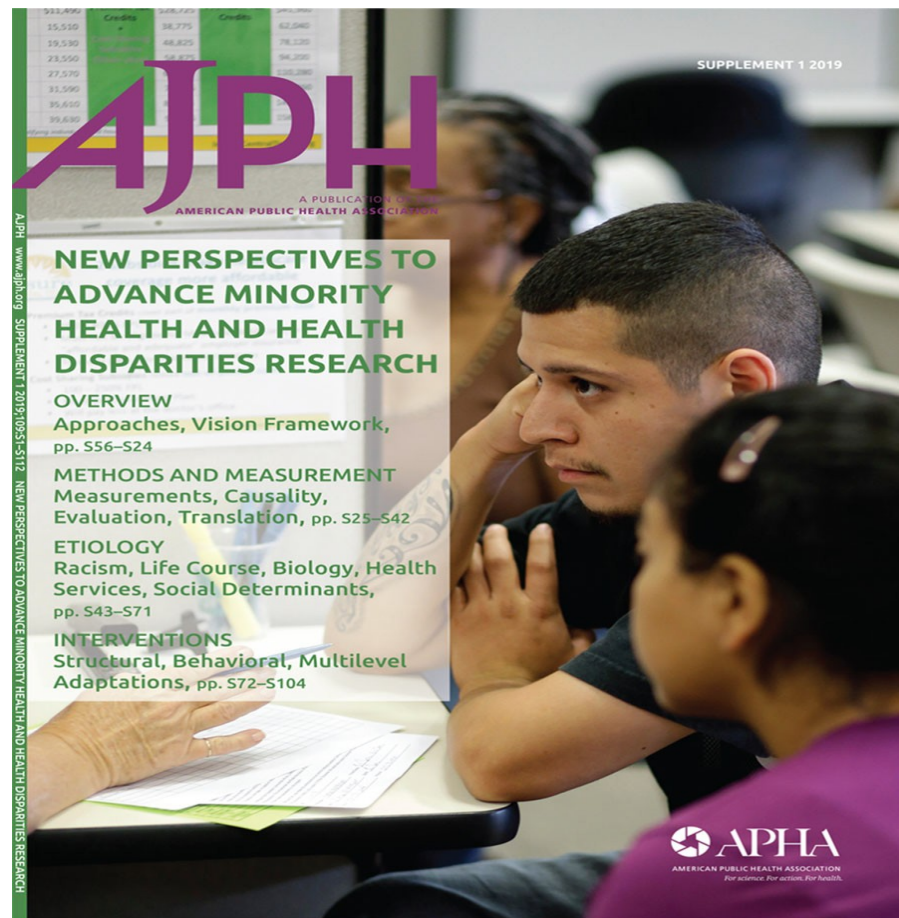
## Health Disparities Definition:

**Health Disparity** - A health disparity is defined as a health difference that adversely affects disadvantaged populations, based on one or more of the health outcomes.

# NIMHD SCIENCE VISION

*New Perspectives to Advance Minority Health and Health Disparities Research  
AJPH 2019, Vol 109, No. S1*

- Editor's choice by NIMHD Director Dr. Eliseo J. Pérez-Stable and NIH Director Dr. Francis S. Collins
- Definitions for minority health, health disparities, and NIMHD Research Framework
- Thirty research strategies in methods and measurement, etiology, and interventions
- Multi-year process with more than 100 authors, including NIH intramural and extramural scientific staff, along with external scientists



<https://www.nimhd.nih.gov/about/overview/science-visioning/>

# Strategies to Promote the Advancement of Health Disparities Science



## Methods and Measurement

- ▶ Indicators for Measuring Health Disparities
- ▶ Methods for Analyzing Health Determinants Contributing to Health Disparities
- ▶ Evaluating Health Disparities Research
- ▶ Health Disparities in The Era of Big Data



## Etiology

- ▶ Social Determinants
- ▶ Environmental Exposures, Biological Pathways and Mechanisms
- ▶ Life Course Approaches
- ▶ Health Services



## Interventions

- ▶ Guiding Principles
- ▶ Approaches
- ▶ Methods and Evaluation
- ▶ Dissemination and Implementation (Scalability)

<https://www.nimhd.nih.gov/about/overview/science-visioning/visioning-strategies.html>



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**Launched**  
May 11, 2020

# Common Data Elements for Social Determinants of Health

## Toolbox of Measures on SDOH



Adoption of CDEs will promote and facilitate:

- Data harmonization
- Domestic and international cross-study analysis
- Accelerated translational research
- Greater understanding of the causes of health disparities
- Effective interventions to reduce disparities



# National Institute on Minority Health and Health Disparities Research Framework

<https://nimhd.nih.gov/about/overview/research-framework/nimhd-framework.html>

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

National Institute on Minority Health and Health Disparities, 2018

\*Health Disparity Populations: Race/Ethnicity, Low SES, Rural, Sexual/Gender Minority

Other Fundamental Characteristics: Sex/Gender, Disability, Geographic Region



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# NIMHD Extramural Scientific Program Areas



Clinical and  
Health Services  
Research

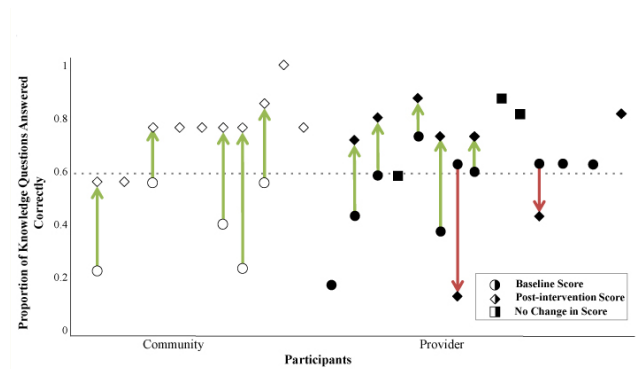
Integrative  
Biological and  
Behavioral  
Sciences

Community  
Health and  
Population  
Sciences

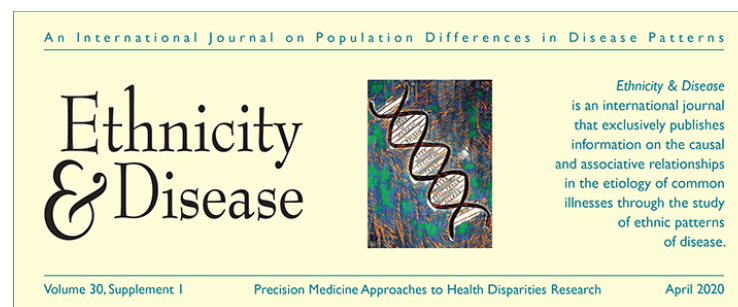
# *Ethnicity & Disease Supplement*

## Precision Medicine & Health Disparities Research

- 11-article journal supplement focused on precision medicine approaches to health disparities research
- All research NIMHD-supported
- Cross-TCC collaboration with guest editors from NIMHD and all five NIMHD-funded PM-TCCs
- Manuscripts highlight research in
  - Resiliency and allostatic load in prostate cancer outcomes
  - Pharmacogenomics in FQHCs
  - Polymorphisms and response to metformin
  - Machine learning methods to reduce disparities
  - Biologic predictors of response disparities to atypical antipsychotics
  - Barriers to precision medicine implementation racial and ethnic minorities



Cardiovascular pharmacogenomics knowledge increase with educational intervention



Foreword: NIMHD Transdisciplinary Collaborative Centers for Health Disparities Research Focused on Precision Medicine . . . . .  
*Nishadi Rajapakse, Michael H. Sayre, Eliseo J. Pérez-Stable*



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# NIMHD Funded Autoimmune Disease Research



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# NIH-EPA Centers of Excellence on Environmental Health Disparities Research Program 2011-2025

- Promote **basic and applied research** to assess and mitigate environmentally driven health disparities
- Develop **capacity** to expand ability of stakeholders to participate in research
- Develop methods to **integrate** the multiple factors that contribute to EHDs
- Disseminate **knowledge** that is culturally appropriate and that will **benefit** affected communities



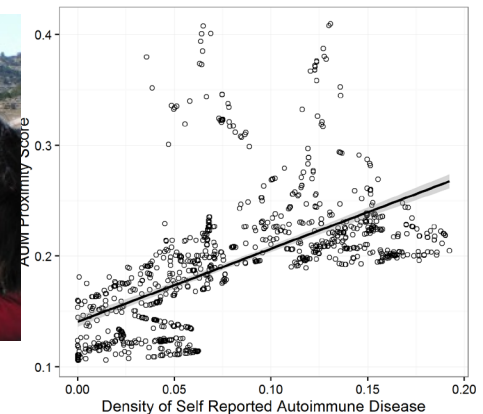
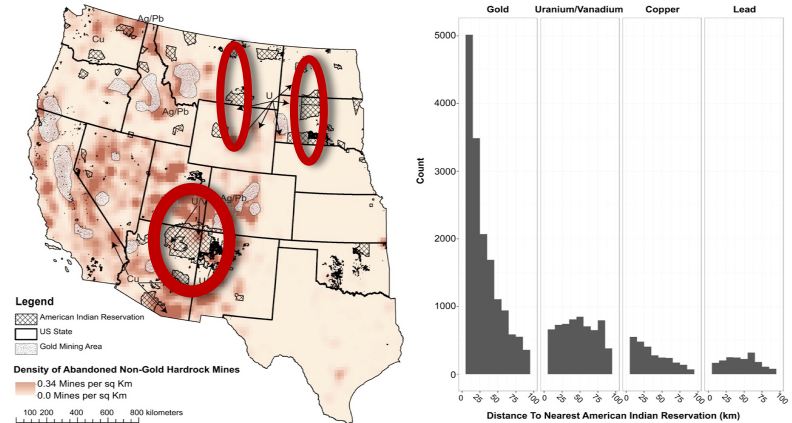
NIMHD, NIEHS, EPA Collaboration



# Science Advance: Elevated Autoimmunity in Residents Living Near Abandoned Uranium Mine Sites on the Navajo Nation

## DiNEH Study

- Ongoing environmental legacy exposures- leads to increased risk for autoimmunity, multiple chronic diseases and hypertension.
- Self reported autoimmune disease associated with proximity to Abandoned Uranium Mines (AUM) (n=1304).
- ~30% of individuals (n=239; average age  $55 \pm 14$  yrs) had detectable anti-nuclear antibodies (ANA)-also associated with proximity AUM.
- Environmentally-induced production of denatured DNA and histone-specific autoimmunity markers were found to be predicted by water contamination and proximity to waste sites



*Hund et al., 2015, Journal of Royal Statistical Society, Series A, Statistics in Society*

*Erdei et al., 2019, Journal of Autoimmunity*

# Science Advance: Online Professional Training for Promotoras on Lupus

- Lupus is an autoimmune disorder that disproportionately affects women and common among African American, Latina, Asian, American Indian, and Alaska Native women than White women
- Promotoras, or lay health workers, are well-positioned to conduct outreach, raise awareness, provide psychosocial support and practical assistance, provide referrals, build health care navigation skills, and promote self-advocacy to mitigate Latina lupus health disparities
- A six-module, bilingual course that uses both text and telenovela-style video. Promotoras will practice each module's skills with a virtual client modeled after virtual patients.

Grant# 5R44MD010392-03Eric C. Twombly and Kristen D. Holtz, KDH Research & Communication Robin M. Campbell, The American College of Rheumatology



# Science Advance: Wearable Ultrasound Therapy for Osteoarthritis Management in Underserved Populations

- Mobile health and other technologies has the potential to reduce burden of musculoskeletal disorders among low SES and underserved populations
- Therapeutic ultrasound has shown promise as a non-pharmaceutical treatment for OA
- The investigative team proposes to developed a portable, wearable, self-applied ultrasound device to deliver multi-hour Sustained Acoustic Medicine for OsteoArthritis (SAMOA).
- Demonstrated that the SAMOA device could be engineered for daily therapeutic self-application by the participants at home, and that SAMOA significantly reduced the pain of knee OA over the placebo device.

Grant #2R44MD008597-03, Grant#R43MD015912 PI: Lewis, George Kenneth



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# Science Advance: Ancestry, Genetic Risk and Health Disparities in Immune-mediated Nephritis

- Immune-mediated glomerular disorders represent the third-most common cause of end-stage renal disease (ESRD), represents 14% of the dialysis population.
- Blacks and Hispanic populations more likely to progress to end-stage renal disease than white patients with glomerular diseases, such as lupus nephritis.
- Genetic variation between ethnicities could account for underlying differences in disease severity and clinical manifestations and identifying those variants could improve the diagnosis and treatments for African Americans and other minorities who have the disease.
- IgA nephropathy (IgAN), membranous nephropathy (MN), and lupus nephritis (SLE-N) are the leading causes of primary and secondary immune-complex glomerular diseases.

Grant#5R01MD009223-05 PI: Gharavi, Ali



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