Minority Health Definition

• Minority Health Research focuses on health determinants that lead to specific outcomes within a minority group and in comparison to others

• Race and ethnic minorities share a social disadvantage and/or are subject to discrimination as a common theme
OMB Race/Ethnic Classification

• African American or Black
• Asian (>20 countries)
• American Indian and Alaska Native
• Native Hawaiian and other Pacific Islander
• Latino or Hispanic (20 countries)
• White (Middle Eastern/North African)
Health Disparity Populations

–Health disparity populations include:
  • racial/ethnic minorities defined by OMB
  • less privileged socio-economic status
  • underserved rural residents, and/or
  • sexual gender minorities

–Populations have poorer health outcomes often attributed in part to social disadvantage, being subject to discrimination, and underserved in the full spectrum of health care.
Mechanisms Leading to Health Disparities

**Individual Behaviors, Social Determinants, Beliefs:**
Response to chronic stress, racism, childhood adverse conditions, food insecurity, witness to or victim of violence, immigrant stress, limited English proficiency

**Biological Processes and Genetics:** earlier age of onset, gene variants, metabolic differences, susceptibility, faster progression or greater severity, brain networks, microbiome, extracellular RNA

**Physical and Cultural Environment:** place, social system, neighborhood, green space, infrastructure, family, social interactions, community cohesion

**Clinical Events and Health Care:** differential treatments, poor communication, adverse events to medications, progression of disease, access, use/abuse of appropriate services, end of life care
### Health Disparity Populations: Race/Ethnicity, Low SES, Rural, Sexual/Gender Minority
### Other Fundamental Characteristics: Sex/Gender, Disability, Geographic Region

#### Domains of Influence

<table>
<thead>
<tr>
<th>Biological</th>
<th>Behavioral</th>
<th>Physical/ Built Environment</th>
<th>Sociocultural Environment</th>
<th>Healthcare System</th>
<th>Health Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Levels of Influence</td>
<td>Community</td>
<td>Societal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological Vulnerability and Mechanisms</td>
<td>Caregiver-Child Interaction</td>
<td>Community Illness Exposure</td>
<td>Sanitation Immunization Pathogen exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Behaviors Coping Strategies</td>
<td>Family Functioning</td>
<td>School/Work Functioning</td>
<td>Policies and Laws</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Environment</td>
<td>Household Environment</td>
<td>Community Environment</td>
<td>Societal Structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sociodemographic Limited English Cultural Identity Response to Discrimination</td>
<td>Social Networks Family/Peer Norms Interpersonal Discrimination</td>
<td>Community Norms Local Structural Discrimination</td>
<td>Societal Norms Societal Structural Discrimination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insurance Coverage Health Literacy Treatment Preferences</td>
<td>Patient-Clinician Relationship Medical Decision-Making</td>
<td>Availability of Health Services Safety Net Services</td>
<td>Quality of Care Healthcare Policies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual Health</td>
<td>Family/ Organizational Health</td>
<td>Community Health</td>
<td>Population Health</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NIMHD Areas of Research

• **Integrative Biological and Behavioral Sciences:** Focus on mechanisms and etiology (not basic science)

• **Community Health and Population Science:** Leverage track record in Community-Engaged research and expand to Population Health

• **Clinical and Health Services Research:** What happens in the clinical setting unrelated to a specific disease
Relative risk of All-Cause Mortality by US Annual Household Income Level

- < $25,000: 3.03
- $25,000 - $33,000: 2.49
- $33,000 - $50,000: 2
- $50,000 - $82,000: 1.45
- $82,000 - $115,000: 1.36
- > $115,000: 1

US Annual Household Income (Converted to 2013 US Dollars)
# Life Expectancy in the U.S., 2014

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites</td>
<td>76.5</td>
<td>81.1</td>
</tr>
<tr>
<td>Blacks</td>
<td>72.0</td>
<td>78.1</td>
</tr>
<tr>
<td>Latinos</td>
<td>79.2</td>
<td>84.0</td>
</tr>
<tr>
<td>AI/AN and NH (2007-09)</td>
<td>68.0</td>
<td>74.3</td>
</tr>
</tbody>
</table>

Arias E, NCHS, CDC, 2016
All-Cause Mortality: Whites and Blacks

FIGURE 1. Death rates among blacks and whites, by age group (years) — United States, 1999–2015

## Trends in Stroke Death Rates

*Age-standardized Rates, 2000-2015, age ≥ 35 y*  
*MMWR, September 6, 2017, 66: 1-7*

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites</td>
<td>115.2</td>
<td>71.3</td>
</tr>
<tr>
<td>Blacks</td>
<td>161.1</td>
<td>102.0</td>
</tr>
<tr>
<td>Asians/PI</td>
<td>103.3</td>
<td>58.5</td>
</tr>
<tr>
<td>AI/AN</td>
<td>97.2</td>
<td>62.1</td>
</tr>
<tr>
<td>Latinos</td>
<td>89.7</td>
<td>62.5</td>
</tr>
</tbody>
</table>
Racial Difference in Effects of Elevated SBP

• Reasons for Geographic and Racial Differences in Stroke: 27,748 Black and White persons, followed 4.5 y to 2011

• 715 incident strokes

• SBP 10 mm Hg increases stroke risk by 8% in Whites and 24% in Blacks

• HR = 2.38 for stage 1 HTN, age 45-64 y

• SBP elevations have differential effects on stroke incidence by race: More intense treatment of Blacks?

Health Disparities in Blood Pressure Control

BP control by sex and race/ethnicity US 2011-2014

Source: CDC/NCHS, NHANES 11-14
### Trends in Suicide Rates

**Age-adjusted Incidence, 1996-2013, age 10 y and older**

**MMWR, March 17, 2017, 66: 270-273**

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>1999-07</th>
<th>2008-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites</td>
<td>14.9</td>
<td>18.1</td>
</tr>
<tr>
<td>Blacks</td>
<td>6.3</td>
<td>6.5</td>
</tr>
<tr>
<td>Asians/PI</td>
<td>6.5</td>
<td>7.0</td>
</tr>
<tr>
<td>AI/AN</td>
<td>15.8</td>
<td>20.0</td>
</tr>
<tr>
<td>Latinos</td>
<td>6.7</td>
<td>6.8</td>
</tr>
</tbody>
</table>
Place, Income and Life Expectancy

• Income categories defined life expectancy inequality gap (Chetty, JAMA, 2016)

• Bottom quintile in income in some areas lived an average 4.5 years longer than in other areas

• Lower income persons have higher mortality in high-SES community; high income persons do better (Yen, AJE, 1999)

• Rural residence c/w metropolitan have higher death rates for 5 leading causes of death (MMWR, 2017)
Distribution from Metropolitan to Rural
Widening Rural–Urban Disparities in All-Cause Mortality and Mortality from Major Causes of Death in the USA, 1969–2009

RURAL–URBAN TRENDS IN US MORTALITY

[Bar chart showing age-adjusted death rates per 100,000 US standard population for different groups: All Races, Non-Hispanic White, Black, American Indian/Alaska Native, Asian/Pacific Islander, Hispanic, with categories Large Metro, Medium Metro, Small Metro, Urban Nonmetro, Rural Nonmetro.

For example:
- All Races: Large Metro 735, Medium Metro 703, Small Metro 646, Urban Nonmetro 1013, Rural Nonmetro 1063.
- American Indian/Alaska Native: Large Metro 409, Medium Metro 590, Small Metro 646, Urban Nonmetro 1073, Rural Nonmetro 1073.
- Asian/Pacific Islander: Large Metro 425, Medium Metro 485, Small Metro 496, Urban Nonmetro 392, Rural Nonmetro 520.
- Hispanic: Large Metro 540, Medium Metro 606, Small Metro 604, Urban Nonmetro 401, Rural Nonmetro 520.]
Rural Residents

- About 17% of Americans
- 65% of all U.S. counties
- 445 “frontier” counties
- Rurality Matters

Health Issues in Rural Areas

- Older (51 vs. 45)
- Less education, less poverty
- Sicker
- Lower life expectancy (76.7 vs 79.1)
- Fewer MDs, hospitals

[https://www.census.gov/newsroom/blogs/random-samplings/2016/12/a_glance_at_the_age.html](https://www.census.gov/newsroom/blogs/random-samplings/2016/12/a_glance_at_the_age.html)

- Distribution varies: Blacks and Latinos in the South, Whites in South/Midwest, AI in West/Midwest, Asian/PI in West
- Blacks and Latinos have less CRC and breast cancer screenings; Pap screening is similar
- Binge drinking highest in Whites (16.3%)
- Current smoking highest in AI/AN (36.7%)
- Leisure time physical inactivity highest in Blacks (38.2%) and Latinos (35.4%)
- BMI ≥30: Blacks 45%, Latinos 36%, AI 39%, Whites 32%
Opioid Epidemic and Rural America

- CDC Reports Drug overdose death rates are higher in rural areas
  - 4.0 vs 6.4 in 1999; converged in 2004; 17.0 vs 16.2 in 2015

Source: https://www.cdc.gov/mmwr/volumes/66/ss/ss6619a1.htm?s_cid=ss6619a1_w
## Trends in Suicide Rates by Race and Urbanization

**MMWR, Surveillance Summaries, October 6, 2017, 66: 1-9**

<table>
<thead>
<tr>
<th>Race/Group</th>
<th>2001-03</th>
<th>2013-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites</td>
<td>13.7/16.8</td>
<td>17.2/22</td>
</tr>
<tr>
<td>Blacks</td>
<td>6.2/6.2</td>
<td>6.6/6.1</td>
</tr>
<tr>
<td>Asians/PI</td>
<td>6.1/8.3</td>
<td>6.7/9.4</td>
</tr>
<tr>
<td>AI/AN</td>
<td>10.6/20.3</td>
<td>14/29.1</td>
</tr>
<tr>
<td>Latinos</td>
<td>6.4/9.2</td>
<td>6.4/10.2</td>
</tr>
</tbody>
</table>
COPD by Urban-Rural Status of County

• Prevalence in adults
  o 8.2% in rural; 4.7% in large metro

• Medicare hospitalizations:
  o 13.8/1000 rural; 11.4/1000 metro

• Deaths per 100,000:
  o Rural = 54.5; metro 32.0

*MMWR 2018 Feb 23; 67 (7): 205-211*
## Cigarette Smoking in the U.S., 2015

<table>
<thead>
<tr>
<th>Race</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>17.2%</td>
<td>16.0%</td>
</tr>
<tr>
<td>Black</td>
<td>20.9%</td>
<td>13.3%</td>
</tr>
<tr>
<td>Latino</td>
<td>13.1%</td>
<td>7.1%</td>
</tr>
<tr>
<td>AI/AN</td>
<td>19.0%</td>
<td>24.0%</td>
</tr>
<tr>
<td>Asian</td>
<td>12.0%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Multiple race</td>
<td>23.0%</td>
<td>17.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational Level</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school graduate</td>
<td>21.8%</td>
<td>17.9%</td>
</tr>
<tr>
<td>Undergraduate degree</td>
<td>8.2%</td>
<td>6.6%</td>
</tr>
</tbody>
</table>

*National Health Interview Survey, MWWR-November 11, 2016. 65(44);1205-1211*
Tobacco Related Disparities

• Overall lower prevalence rates by race/ethnicity; men have higher rates
• Light and non-daily smoking is the new paradigm — not addiction
• Cessation interventions lacking
• Second-hand smoke exposure affects Blacks and poor disproportionately
• Biological factors affect lung cancer
Genome-wide association study of heavy smoking and daily/nondaily smoking in the HCHS/SOL

- Genetic associations with smoking behavior among 12,741 Latinos with smoking data and 5,119 ever smokers
- CHRNA5, encodes the α5 cholinergic nicotinic receptor subunit, associated with heavy smoking at genome-wide significance ($p \leq 5 \times 10^{-8}$)
- Loci on chromosome 2 and 4 achieved genome-wide significance for association with non-daily smoking, but replication attempts were limited by small Latino samples

Saccone NL, et al, Nicotine & Tobacco Research, 2017 online
Latinas GWAS Results for Breast Cancer and Controls

$P = 5 \times 10^{-8}$
## Protective Variants on 6q25

<table>
<thead>
<tr>
<th>rs140068132/rs147157845</th>
<th>OR</th>
<th>95% CI</th>
<th>P-value</th>
<th>MAF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discovery</td>
<td>0.60</td>
<td>0.49-0.72</td>
<td>3x10⁻⁷</td>
<td>9%</td>
</tr>
<tr>
<td>Replication Mexicans</td>
<td>0.63</td>
<td>0.53-0.75</td>
<td>3x10⁻⁷</td>
<td>15%</td>
</tr>
<tr>
<td>Replication COLUMBUS</td>
<td>0.54</td>
<td>0.41-0.71</td>
<td>1x10⁻⁵</td>
<td>10%</td>
</tr>
<tr>
<td>Replication WHI</td>
<td>0.61</td>
<td>0.31-1.22</td>
<td>0.16</td>
<td>7%</td>
</tr>
<tr>
<td>Meta-Analysis all samples</td>
<td>0.60</td>
<td>0.53-0.67</td>
<td>9x10⁻¹⁸</td>
<td></td>
</tr>
</tbody>
</table>

GG Homozygous women **2.8 fold reduction** of the odds of developing breast cancer
Factors that Influence Shared Decision Making Communication

- Social Distance — a given for most
- Health literacy
- Numeracy
- Trust in clinician — discrimination
- Limited English Proficiency: concordance
- Participation preference in SDM
- Individual autonomy vs. collectivism
- Concordance: race/ethnicity, gender
Strategies to Reduce Health Care Disparities and Promote Health Equity

• Expand Access: Health insurance, place and clinician as fundamental
• Public Health Consensus: Do it!
• Coordination of Care: Systems, navigators, and target conditions
• Patient-Centered: PCMH, effective communication, cultural competence
• Performance measurement—value: Risk
Standardized Measures

• Measure of basic demographic and social determinants must become standardized
• Census for race/ethnicity and valid measures of social class such as years of education
• Country of Origin, immigration, family background, Limited English Proficiency, sexual orientation
• Health literacy, numeracy, food insecurity
• Neighborhood, place, housing: zip code
Health IT Innovation to Close the Gap

- Facilitate access to older, limited HL, LEP, through touch screen technology, family support, navigator, teaching as part of the visit
- Portal access to clinician and test results with proxy if needed or in concordant language
- Develop video “doctor” communication for visual or hearing impairment, limited literacy, language other than English
- Health IT influence preferences for involvement in medical decision making
- Creative use of tele-medicine, electronic consults to provide easier access to specialists
Precision Medicine and Clinical Care

• When is “more precise” individualized approach better than a standard one with demonstrated efficacy?
• One size fits all approach can work to improve outcomes in many clinical situations
• New is not always better and is usually more expensive — cost has to be considered
• Precision in patient-clinician interactions
• Enhance cultural competence and reduce structural discrimination
Future Research Directions

• Multi-level interventions needed to address disparities

• Identify mechanisms that lead to disparities: biological pathways, social determinants, behavior, system

• Assess specific communication strategies between patients—clinicians to maximize trust

• Implement structural change to modify behavior
Early stage investigators, senior postdoc fellows or junior faculty. You must already have basic research training and be engaged in minority health and health disparities research. Researchers from diverse backgrounds are encouraged to apply.

The online application is now open on the NIMHD website: https://www.nimhd.nih.gov/programs/edu-training/hd-research-institute/hdri_logon.asp

The due date for submitting is April 27, 2018, 5:00 pm EST
NIMHD Research Areas for FY 2018

- Immigrant Populations: etiology/interventions
- Disparities in Surgical Care and Outcomes
- Social Epigenomics
- Caribbean Initiative
- Sleep Disparities
- Liver Cancer and Chronic Liver Disease
- Opioid Use Disorders
- Lung Cancer Etiology, Screening and Care
- Health Information Technologies
Legacy of Inequality in Healthcare

"Of all the forms of inequality, injustice in health care is the most shocking and inhumane."

Excerpt from comments made in a Civil Rights protest against racially discriminatory practices of Chicago hospitals. March 1966.
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