“Are some of us more equal?” Racial and Ethnic disparities in Pain Outcomes in the United States"

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\textsuperscript{c}Associate Fellow, Center for Bioethics
Outline

- Review evidence on pain treatment disparities in the U.S. by race/ethnicity
- Offer some perspectives to think about the issues of race/ethnicity in the context of socioeconomics (SES)
- Make a case for why the race/ethnicity effect in pain care is important and compelling despite limitations of this construct and body of literature.
Pain

- Pain’s fiscal cost in US: $530- 635 Billion/year\(^1\)

- Equals the GDP of 125 lowest income countries combined\(^2\)

- Incremental/ positive relation of pain & healthcare cost/utilization

  - Those with “moderate pain” generate “per capita” HC expenditures of $4,516 higher than a person in “no pain”; those with “severe pain” generate expenditures $3,210 higher than those with “moderate pain”\(^1\).

U.S.’ Capacity to Manage Pain

• The International Narcotics Control Board (INCB) uses “morphine consumption” in a country as a proxy to gauge “country’s access to pain medications”\(^1,2\)

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Consumption of Opioids for Medical Use by Rich and Poor Nations

1. Austria
2. Canada
3. United States
4. Denmark
5. Australia
6. New Zealand
7. France
8. Portugal
9. Norway
10. Switzerland

Amount available to 1 patient in the US = amount available to 290,000 patients in Ethiopia

10 countries accounted for 63% of total consumption--Developing countries combined account for only 7% of global morphine consumption.

N=154 Countries

Does Availability in the U.S = Availability for ALL?
“WE DON’T CARRY THAT” — FAILURE OF PHARMACIES IN PREDOMINANTLY NONWHITE NEIGHBORHOODS TO STOCK OPIOID ANALGESICS


Results  Pharmacist representing 347 of 431 eligible pharmacies (81 percent) responded to the survey. A total of 176 pharmacies (51 percent) did not have sufficient supplies of opioids to treat patients with severe pain. Only 25 percent of pharmacies in predominantly nonwhite neighborhoods (those in which less than 40 percent of residents were white) had opioid supplies that were sufficient to treat patients in severe pain, as compared with 72 percent of pharmacies in predominantly white neighborhoods (those in which at least 80 percent of residents were white) (P<0.001).

Conclusions  Pharmacies in predominantly nonwhite neighborhoods of New York City do not stock sufficient medications to treat patients with severe pain adequately. (N Engl J Med 2000;342:1023-6.)

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The Michigan Experience.....

Differences in Prescription Opioid Analgesic Availability: 1
Comparing Minority and White Pharmacies Across Michigan

Carmen R. Green,* S. Khady Ndao-Brumblay,* Brady West,† and Tamika Washington*

**Perspective:** Michigan pharmacies in minority zip codes were 52 times less likely to carry sufficient opioid analgesics than pharmacies in white zip codes regardless of income. Lower income areas and corporate pharmacies were less likely to carry sufficient opioid analgesics. This study illustrates barriers to pain care and has public health implications.

© 2005 by the American Pain Society

What about Workers’ Compensation?

• WC = Federally mandated insurance system administered by states

• Goal: To provide “fair” compensation to workers injured in the course of their employment regardless of their occupation, income, and type of health insurance.

• Low back pain is the most common form of Workers’ Compensation claim.
Unequal Access in Equal Access System

John T. Chibnall, PhD, and Raymond C. Tait, PhD

• African Americans are less likely than Caucasians to receive a diagnosis of disc injury (Chibnall et al., 2005).

• Even among those who received the diagnosis, whites were 110% more likely than African Americans to undergo surgery for back pain (Chibnall et al., 2006).

• African Americans with regional backache are less likely to be compensated across Workers’ Compensation variables including medical treatment, temporary disability, & case settlement (Chibnall et al., 2005).
Unequal Access in Equal Access System

John T. Chibnall, PhD, and Raymond C. Tait, PhD

• In the absence of legal representation, African Americans incur strikingly lower temporary disability costs of only $352 when compared to the cost incurred by Caucasians ($5,040) (Tait et al., 2001).

**No difference in the presence of legal representation** *(Tait et al., 2001).*
What about Clinical Disparities in Analgesic Treatment?

- Racial/ethnic minority patients are:
  - Less likely than white patients to receive “any” pain medication\textsuperscript{1-3}
  - More likely to receive lower doses of pain medications\textsuperscript{4}
  - More likely to have longer wait times to receipt of analgesics in the Emergency Department\textsuperscript{5}
  - Less likely to receive opioids as treatment for pain\textsuperscript{6-8}
  - Less likely to be treated in a manner consistent with the WHO recommendations\textsuperscript{4}
  - Some studies have not found evidence of disparities

Time to Take Stock: A Meta-Analysis and Systematic Review of Analgesic Treatment Disparities for Pain in the United States

Salimah H. Meghani, PhD, MBE,* Eeeseung Byun, PhD(c),* and Rollin M. Gallagher, MD, MPH†
Cumulative Evidence on Analgesic Rx Disparities?

Scopus: 1989-2011
(Search conducted, 2-8-2011)

390 records

Articles screened for inclusion

Final set of articles (n=34)

Syntax:
TITLE-ABS-KEY (minority OR minorities OR race OR racial OR ethnic OR ethnicity AND pain treatment OR pain management OR pain medication OR analgesia OR analgesic) AND DOCTYPE (ar) AND PUBYEAR AFT 1989) AND AFFIL (U.S. OR US or USA or United States)

Excluded records (n=356)
Chest pain (n=3)
Children (n=14)
No White comparison group (n=3)
Non-analgesic pain treatment (n=3)
Pain experience not treatment (n=6)
Qualitative studies (n=3)
Self-reported utilization of treatment (n=3)
Vignettes/experimental study (n=7)
No match with study goals (n=301)
Eligible but outcomes do not accumulate across studies or insufficient information to calculate effect size (n=13)

Odds for Receiving Analgesia for Hispanics/Latinos v. Whites

### “Any” Analgesia

<table>
<thead>
<tr>
<th>Study name</th>
<th>Odds ratio</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>p-Value</th>
<th>Relative weight</th>
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<td>0.406</td>
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<td>Epps (2008)</td>
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<td>3.65</td>
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<td>Fuentes (2002)</td>
<td>0.925</td>
<td>0.421</td>
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<td>Heins (2010)</td>
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<td>0.603</td>
<td>1.225</td>
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<td>Karpman (1997)</td>
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<td>1.56</td>
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<td>Kposowa (2002)</td>
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<td>Michael (2007)</td>
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<td>Quazi (2008)</td>
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<tr>
<td>Tamayo-Sarver (2003)</td>
<td>0.799</td>
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<td>Won (1999)</td>
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<td>0.328</td>
<td>1.490</td>
<td>0.308</td>
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<tr>
<td><strong>Total</strong></td>
<td>0.909</td>
<td>0.773</td>
<td>1.069</td>
<td>0.251</td>
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</table>

Test of heterogeneity: $I^2 = 32.4\%$; $p = 0.109$

### “Opioid” Analgesia

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<th>Study name</th>
<th>Odds ratio</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>p-Value</th>
<th>Relative weight</th>
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<tbody>
<tr>
<td>Bijur (2008)</td>
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<td>0.613</td>
<td>1.776</td>
<td>0.876</td>
<td>7.39</td>
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<tr>
<td>Bijur (2008a)</td>
<td>1.305</td>
<td>0.712</td>
<td>2.393</td>
<td>0.389</td>
<td>6.15</td>
</tr>
<tr>
<td>Epps (2008)</td>
<td>1.012</td>
<td>0.589</td>
<td>1.739</td>
<td>0.966</td>
<td>7.22</td>
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<tr>
<td>Heins (2010)</td>
<td>0.695</td>
<td>0.483</td>
<td>1.000</td>
<td>0.050</td>
<td>11.55</td>
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<tr>
<td>Ng (1996)</td>
<td>0.116</td>
<td>0.026</td>
<td>0.518</td>
<td>0.005</td>
<td>1.31</td>
</tr>
<tr>
<td>Ng (1996a)</td>
<td>1.563</td>
<td>0.634</td>
<td>3.655</td>
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<td>Olsen (2006)</td>
<td>0.670</td>
<td>0.557</td>
<td>0.806</td>
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<td>Quazi (2008)</td>
<td>0.710</td>
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<td>Tamayo-Sarver (2003)</td>
<td>0.848</td>
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<td>Terrell (2010)</td>
<td>0.827</td>
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<tr>
<td>Todd (1993)</td>
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<td><strong>Total</strong></td>
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<td>0.932</td>
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Test of heterogeneity: $I^2 = 49.4\%$; $p = 0.31$
Odds for Receiving Analgesia for Blacks v. Whites

“Any” Analgesia
23%

“Opioid” Analgesia
29%
Is Race/Ethnicity Effect for Opioids Moderated By “Pain Type” for Hispanic/Latinos?

A  “Traumatic/surgical” pain

<table>
<thead>
<tr>
<th>Study name</th>
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<td>Bijur (2008a)</td>
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<td>2.393</td>
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<td>Epps (2008)</td>
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<td>Ng (1996)</td>
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<td>0.026</td>
<td>0.518</td>
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<td>2.70</td>
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<tr>
<td>Ng (1996a)</td>
<td>1.563</td>
<td>0.634</td>
<td>3.855</td>
<td>0.332</td>
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<td>Quazi (2008)</td>
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<td>Tamayo-Sarver (2003)</td>
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<td>0.595</td>
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<td>Todd (1993)</td>
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Test of heterogeneity: $I^2 = 53.6\%$; $p = .027$

B  “Non-traumatic/non-surgical” pain

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<th>Study name</th>
<th>Odds ratio</th>
<th>Lower Limit</th>
<th>Upper Limit</th>
<th>p-Value</th>
<th>Relative weight</th>
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<tr>
<td>Heins (2010)</td>
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<td>0.483</td>
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<td><strong>Total</strong></td>
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<td>0.637</td>
<td>0.771</td>
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Test of heterogeneity: $I^2 = 0.0\%$; $p = .956$
### A "Traumatic/surgical" pain

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<th>Study name</th>
<th>Statistics for each study</th>
<th>Odds ratio</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>p-Value</th>
<th>Odds ratio and 95% CI</th>
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<td><strong>0.034</strong></td>
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Test of heterogeneity: $I^2=0.0\%$; $p=.784$

### B "Non-traumatic/non-surgical" pain

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<tr>
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<th>Statistics for each study</th>
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<td><strong>0.000</strong></td>
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Test of heterogeneity: $I^2=69.8\%$; $p=.000$
Main Conclusions

- Racial disparities in analgesic treatment exists
- Magnitude of disparities varies by:
  - Subgroups
  - Treatment goals
    - Opioids vs. Non-opioids
    - Traumatic pain vs. non-traumatic
- WHY?
Theories of Implicit Bias (Social Cognition)

• Humans have *limited capacity to process complex information*.  
• Act as “*cognitive misers*” when circumstances exceed cognitive reserves.  
  – Rely on “rules of thumb” and “heuristics” that are easy to process.  
  • E.g., “social constructions”, “pre-conceived categories”.

• These processes are “*automatic*” do not occur out of tardiness/ill-intention, but necessity to maintain efficiency.

• **BUT** outcomes are suboptimal and biased!

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Salimah H. Meghani, Ph.D. (2014)
Dual process modeling: A useful framework to understand clinical disparities

• Automatic stereotypes
  • **Unconscious implicit** beliefs/expectations about a group (stereotype activation)
  • Stereotype influencing behaviors (stereotype application)
  • *Do not serve any treatment goals*

• Goal-modified stereotypes
  • *Serves some treatment/comprehension goal*
    – E.g., statistical stereotype based on population *distribution of data or “its perception.”*

Quiz

• Rank order the following groups according to their “abuse” of prescription opioids

• Whites
• Hispanics
• Blacks
• Asians
Non-Medical Use of “Prescription Drug” by Race/Ethnicity in the U.S.

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Use Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites</td>
<td>2.8</td>
</tr>
<tr>
<td>Hispanics</td>
<td>2.4</td>
</tr>
<tr>
<td>Blacks</td>
<td>1.7</td>
</tr>
<tr>
<td>Asians</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Source: National Survey of Drug Use and Health; SAMHSA
Percent of web respondents with each score:

- Strong automatic preference for White people compared to Black people: 27%
- Moderate automatic preference for White people compared to Black people: 27%
- Slight automatic preference for White people compared to Black people: 16%
- Little to no automatic preference between Black and White people: 17%
- Slight automatic preference for Black people compared to White people: 6%
- Moderate automatic preference for Black people compared to White people: 4%
- Strong automatic preference for Black people compared to White people: 2%

Click for detailed summary

https://implicit.harvard.edu/implicit/research/
Did We “Control” for SES?

• Did not.. Could not..
  
• Heterogeneity in employing SES
  
  – SES variable not uniformly collected
  
  – (Personal income, family income, insurance types, educational levels, occupational status, language proficiency, health literacy)
Race a Proxy for SES?

Let’s assume that SES variable was uniformly available...
A Word of Caution about “Statistical Control”

Statistical control = When all else is equal

i.e., Does race matter when other variables (e.g., SES) are held “constant”
Population-Based Survey of Pain in the United States: Differences Among White, African American, and Hispanic Subjects

Russell K. Portenoy, * Carlos Ugarte, † Ivonne Fuller, ‡ and Gregory Haas§

Self-Reported Pain and Utilization of Pain Treatment Between Minorities and Nonminorities in the United States

Salimub H. Meghani and Eunbee Cho
Population-Based Survey of Pain in the United States: Differences Among White, African American, and Hispanic Subjects

Russell K. Portenoy,* Carlos Ugarte,† Ivonne Fuller,‡ and Gregory Haas§

Table 6. Multivariate Associations between Demographic Characteristics of the Respondents and Disabling Pain*: Odds Ratios from Binary Logistic Regression (95% Confidence Intervals for Odds Ratios)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Odds Ratio</th>
<th>95% CI for Odds Ratio</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.00</td>
<td>0.66–1.17</td>
<td>38</td>
</tr>
<tr>
<td>Male</td>
<td>0.88</td>
<td>0.66–1.17</td>
<td></td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥45 y</td>
<td>1.00</td>
<td>0.90–1.17</td>
<td></td>
</tr>
<tr>
<td>&lt;45 y</td>
<td>0.93</td>
<td>0.69–1.25</td>
<td>63</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;$75,000</td>
<td>1.00</td>
<td>0.94–2.98</td>
<td>08</td>
</tr>
<tr>
<td>$25,000–$75,000</td>
<td>1.68</td>
<td>0.94–2.98</td>
<td></td>
</tr>
<tr>
<td>&lt;$25,000</td>
<td>2.54</td>
<td>1.39–4.64</td>
<td>00</td>
</tr>
<tr>
<td>Community type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>1.00</td>
<td>0.72–1.36</td>
<td>.94</td>
</tr>
<tr>
<td>Urban</td>
<td>0.99</td>
<td>0.72–1.36</td>
<td>.94</td>
</tr>
<tr>
<td>Suburban</td>
<td>0.72</td>
<td>0.48–1.07</td>
<td>.10</td>
</tr>
<tr>
<td>Race or ethnic group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.00</td>
<td>0.60–1.43</td>
<td>.74</td>
</tr>
<tr>
<td>White</td>
<td>0.93</td>
<td>0.60–1.43</td>
<td>.74</td>
</tr>
<tr>
<td>African American</td>
<td>0.92</td>
<td>0.60–1.42</td>
<td>.71</td>
</tr>
</tbody>
</table>

*Disabling pain refers to pain that interferes with daily activities.

Reference group
Population-Based Survey of Pain in the United States: Differences Among White, African American, and Hispanic Subjects

Russell K. Portenoy,* Carlos Ugarte,† Ivonne Fuller,‡ and Gregory Haas§

Survey of Pain in the US: Racial and Ethnic Differences

Table 1. Demographics

<table>
<thead>
<tr>
<th>Income, N (%)</th>
<th>OVERALL (n = 1335)</th>
<th>WHITE (n = 454)</th>
<th>AFRICAN AMERICAN (n = 447)</th>
<th>HISPANIC (n = 434)</th>
<th>PAIRWISE COMPARISONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; $25,000</td>
<td>535 (40)</td>
<td>125 (28)</td>
<td>195 (44)</td>
<td>215 (50)</td>
<td>C vs AA,§ C vs H§</td>
</tr>
<tr>
<td>$25,000–$74,999</td>
<td>489 (37)</td>
<td>197 (43)</td>
<td>155 (35)</td>
<td>137 (32)</td>
<td>C vs AA,* C vs H†</td>
</tr>
<tr>
<td>≥$75,000</td>
<td>101 (8)</td>
<td>63 (14)</td>
<td>15 (3)</td>
<td>23 (5)</td>
<td>C vs AA,§ C vs H§</td>
</tr>
<tr>
<td>Do not know</td>
<td>210 (16)</td>
<td>69 (15)</td>
<td>82 (18)</td>
<td>59 (14)</td>
<td>NS</td>
</tr>
</tbody>
</table>
The problem of “all else equal” analysis is that... “all else” is not equal.

Distribution of Race and Income

Economically “Advantaged”

Economically “Disadvantaged”

Whites

Blacks

Blacks

Whites
“SES is not just a confounder of racial differences in health but part of causal pathway by which race affects health. Race is an antecedent and determinant of SES”

Williams, DR (1996, p. 177)
American Apartheid: Segregation and Making of Underclass

• Concentrated disadvantages

• Perpetuated by historical federal policies, real state/lending norms, and maintained by racism

• Affects equality of social access and opportunities

• Perpetuates all social disparities including health

• Residential segregation stable overtime
Access to Pain Treatment is No Exception....

Differences in Prescription Opioid Analgesic Availability: Comparing Minority and White Pharmacies Across Michigan
Carmen R. Green,* S. Khady Ndao-Brumblay,* Brady West,† and Tamika Washington*

Perspective: Michigan pharmacies in minority zip codes were 52 times less likely to carry sufficient opioid analgesics than pharmacies in white zip codes regardless of income. Lower income areas and corporate pharmacies were less likely to carry sufficient opioid analgesics. This study illustrates barriers to pain care and has public health implications.
© 2005 by the American Pain Society

Of the 965 randomly selected zip codes, 96.6% were classified as either ≥70% white residents or ≥70% minority residents. Only 3.4% of all zip codes were not amenable to this classification, confirming “an important level of geographic segregation by race and ethnicity”.

What Does This Mean for the Patients?

Salimah H. Meghani, PhD
Implicit Bias and Feeling Believed

“The only thing I just want to add is that a lot of black people feel, especially when we’re in pain, that we aren’t believed, and that is the main problem with us. And we accept that, that we’re not gonna be believed. So therefore we don’t make that a major issue. And then when anything is offered to us, the first thing that’s being thrown up in our face is that, well, it’s got a street value, you know. You don’t need to hear that.”

(African American patient with lung cancer, age 47)
Negotiation of pain treatment with providers

MaxD Utility: important to be strong by not talking about pain

Health Literacy
- 5.00
- 6.00
- 7.00
- 8.00
- 9.00
- 10.00
- 11.00
- 12.00
- 13.00
- 14.00
- 15.00

African Americans
Whites

Funding: Meghani, S.
(NIH/NINR 5K01NR010886-01)
Negotiation of pain treatment with providers

MaxD Utility: Important to be strong by not talking about pain

Pain Worst
- 1.00
- 2.00
- 3.00
- 4.00
- 5.00
- 6.00
- 7.00
- 8.00
- 9.00
- 10.00

Funding: Meghani, S. (NIH/NINR 5K01NR010886-01)
Pain and Side-effects are not adequately managed in African Americans

<table>
<thead>
<tr>
<th>Pain &amp; Adherence Variables*</th>
<th>AA &lt;60 (n=77)</th>
<th>WH &lt;60 (n=92)</th>
<th>AA ≥60 (n=25)</th>
<th>WH ≥60 (n=47)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Worst pain” last week</td>
<td>7.69</td>
<td>6.65</td>
<td>7.60</td>
<td>5.79</td>
<td>.000</td>
</tr>
<tr>
<td>“Least pain” last week</td>
<td>4.51</td>
<td>2.87</td>
<td>3.84</td>
<td>2.62</td>
<td>.000</td>
</tr>
<tr>
<td>Pain-related functional interference</td>
<td>40.22</td>
<td>35.45</td>
<td>34.64</td>
<td>30.19</td>
<td>.008</td>
</tr>
<tr>
<td># of analgesic barriers</td>
<td>9.03</td>
<td>6.93</td>
<td>7.92</td>
<td>5.21</td>
<td>.000</td>
</tr>
<tr>
<td>MEMS® adherence</td>
<td>52.35</td>
<td>73.18</td>
<td>54.48</td>
<td>74.94</td>
<td>.000</td>
</tr>
</tbody>
</table>

Choice-based Conjoint Analysis analgesic decision-making (N=241)

Meghani, SH NIH ARRA Challenge Grant [NIHRC1NR011591]
Bringing It All Together...

Macro-level Factors “Overt-Access”

Social determinants (Poverty, Availability in neighborhoods)

Micro-level Factors “Covert-Access”

Implicit bias/Communication

Clinical Decision

• Patients’ negotiation/
  • Communication
Despite U.S.’s tremendous capacity to manage pain, pain remains under-treated

Race and ethnicity matters in pain treatment outcomes

Not all minorities have the same “types” or “levels” of risks

The fact that more minorities are disproportionately affected by low SES in itself is a “race effect”

Need to be careful about all-else-equal analysis as “all else” is not equal

Need more deliberate efforts to identify personal biases and stereotypes that renders “irrelevant characteristics” relevant in clinical pain treatment decision-making.
Extra Slides
4 Constructs of Interest..

• Race & Ethnicity
• Socioeconomics
• Pain
• Disparities
Race & Ethnicity...

- Race
  - Social construct that describes groups based on physical characteristics (e.g., skin color)

- Ethnicity
  - Sense of identity based on common cultural origins (e.g., transmission of common beliefs or expectations)
Race & Ethnicity (OMB Directive 15, effective 01/02)

- Hispanic/Latino
- Non-Hispanic

- White
- Black/African American
- Asian
- American Indian/Alaska Native
- Native Hawaiian/Pacific Islander
- Multiracial

Socioeconomics (SES)...

- Refers to heterogeneous sets of variables
  - Income levels
    - Personal, household, family
  - Insurance types
    - Private, public insurance (e.g., Medicaid), self-pay, no insurance, and degree of managed care environment
  - Education levels
  - Health literacy
  - Employment status
  - Residential characteristics
    - Minority versus white neighborhoods
    - Zip code/census block/neighborhood income
  - Types of facilities where care is received
    - Metropolitan shortage area for health providers; urban/rural
That We Understand “Disparities…”

Disparities “in Defining” Disparities...

NIH (2004)

• “...differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States”¹

IOM (2002)

• “...racial or ethnic differences in the quality of health care that are not due to access-related factors or clinical needs, preferences and appropriateness of intervention”²