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Title: Disparities in the Quality of Critical Care

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The views presented here do not represent those of the U.S. Department of Veterans’ Affairs or the U.S. Government.
Disparities in the Quality of Critical Care: A Mechanistic Approach to Differential Diagnosis

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Defining a Disparity

“Differences in the quality of healthcare that are not due to access-related factors or clinical needs, preferences, and appropriateness of intervention.” - *Institute of Medicine*
Are there Disparities in U.S. Critical Care? Yes.

- Substantial evidence of widespread disparities in ICUs, AMI and other acute cardiac treatment, and in trauma.
- Disparities in both race and, where looked, often in insurance status.
- Much less data to allow us to distinguish race/insurance status from socio-economic status.
Are there Disparities in Canadian Critical Care? Maybe.

- Limited, but pioneering, work suggesting that there are important socioeconomic and gender disparities in Canadian critical care.
- Rapid change in Canada’s ethnocultural composition may present future challenges.
- Agenda today is not an exhaustive review, but an approach to the problem.
Mechanisms Generating Disparities

Is this the problem?


Figure from Institute of Medicine (2003) Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care.
Why Consider Patient Preferences?

- Differences that are based on patient medical need and patient preferences are **good care not disparities**.
- Given how often differences in patient preferences are invoked in discussions, we ought ask:
  - “Do we have good evidence that those differences actually exist?”

Essentially all the data control for clinical appropriateness, so we will not discuss that further.
U.S. Racial Differentials in Preferences for EOL care

- National probability sample of community dwelling U.S. Medicare beneficiaries
- Large unadjusted differences versus non-Hispanic whites for both self-reported Blacks and Hispanics

<table>
<thead>
<tr>
<th>Heavily adjusted model including age, sex, education, financial strain and belief in the effectiveness of mechanical ventilation</th>
<th>Black vs. White</th>
<th>Hispanic vs. White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Want to spend last days in a hospital</td>
<td>2.3 (1.6 – 3.2)</td>
<td>2.2 (1.3 – 4.0)</td>
</tr>
<tr>
<td>Want life-prolonging drugs</td>
<td>1.9 (1.4 – 2.6)</td>
<td>1.2 (0.7 – 2.1)</td>
</tr>
<tr>
<td>Want palliative drugs</td>
<td>0.4 (0.3 – 0.5)</td>
<td>0.5 (0.3 – 0.7)</td>
</tr>
<tr>
<td>Want a respirator for 1 weeks’ life extension</td>
<td>2.1 (1.6 – 2.9)</td>
<td>1.4 (0.8 – 2.5)</td>
</tr>
</tbody>
</table>

• M&M traditions that argue to look at our own behavior first.

• Implementing—even defining—patient preferences is often shaped by physician and nurse guidance.

• SUPPORT suggested that patient preferences often not influential for care.

• Ergo: evidence of differences in patient preferences is not proof that those differences are driving disparities in practice or outcome.
Mechanisms Generating Disparities


Figure from Institute of Medicine (2003) Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care.
Differential Treatment Recommendations by Race &

Randomized vignette survey of 720 full-time physicians at 1997 American College of Physicians and 1996 American Academy of Family Practice annual meetings

Key question: Given that this patient is having chest pain, would you refer them for cardiac catheterization?
### Table 5. Predictors of Referral for Cardiac Catheterization. *

<table>
<thead>
<tr>
<th>MODEL AND VARIABLE</th>
<th>ODDS RATIO (95% CI)†</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race and sex as separate factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.6 (0.4–0.9)</td>
<td>0.02</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>0.6 (0.4–0.9)</td>
<td>0.02</td>
</tr>
<tr>
<td>Interaction of race and sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White male</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Black male</td>
<td>1.0 (0.5–2.1)</td>
<td>0.99</td>
</tr>
<tr>
<td>White female</td>
<td>1.0 (0.5–2.1)</td>
<td>&gt;0.99</td>
</tr>
<tr>
<td>Black female</td>
<td>0.4 (0.2–0.7)</td>
<td>0.004</td>
</tr>
</tbody>
</table>

*Both models included all experimental factors as covariates, as well as the probability of coronary artery disease as estimated after the results of the stress tests were known. The first analysis included only the main effects. The second analysis explored a race–sex interaction.

†CI denotes confidence interval.

Is That Enough? (Half-time Summary)

- All else equal, U.S. physicians sometimes take race into account in treatment recommendations in ways not driven by evidence, physiology or preferences.
- Within a given hospital, there is often evidence of differential treatment.
- Where examined (and it is not often), disparities are typically not fully explained by differences in preferences.
- Do these within hospital differences explain all the disparities? No.
Mechanisms Generating Disparities

Wide-Spread Racial and Economic Segregation

- *A truism*: hospitals care for local populations


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*MAP KEY*
- One dot = 500 people
- White
- Black
- Hispanic
- Asian
- Other

*Note*: Data are only distributed across major Census tract or block. Dollar amounts are adjusted for inflation.
Segregation is Not Just the U.S.
Sometimes, It is Which Hospital

- Dramatic population-level disparities can exist even if every hospital treats all of its patients *exactly* the same.

- The extent to which variation is within or between hospitals depends on the outcome of interest.
• Improvements in low-performing hospitals might disproportionately improve care of Black patients.
• Sometimes, QI is social justice.
• Targeting within hospital differential treatment would be unlikely to impact these sorts of disparities.

Conclusion

- There is a clear differential diagnosis for disparities, which can be informed by mechanistic social science.
- Disparities may be multifactorial; each case requires data-driven investigation for its etiology.
- As so often in medicine, fixing a disparity may require both personal behavior change by providers and systematic interventions to improve quality of care.

My email is tiwashyn@umich.edu. Please email me if you want a copy of these slides or to discuss further.
Insurance Status Disparities Within the Same Hospital

- Detailed risk-adjustment including chart abstraction

<table>
<thead>
<tr>
<th>After controlling for</th>
<th>Uninsured vs. Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Venous Line</td>
<td>0.84 (0.72-0.97)</td>
</tr>
<tr>
<td>Tracheostomy</td>
<td>0.43 (0.29-0.64)</td>
</tr>
<tr>
<td>Acute dialysis</td>
<td>0.59 (0.39-0.91)</td>
</tr>
<tr>
<td>PAC</td>
<td>No different</td>
</tr>
<tr>
<td>Bronchoscopy</td>
<td>No different</td>
</tr>
</tbody>
</table>

After controlling for hospital

<table>
<thead>
<tr>
<th></th>
<th>Uninsured vs. Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-Day Mortality</td>
<td>1.25 (1.04-1.50)</td>
</tr>
</tbody>
</table>

And It is Not Just the Hospital

- Strong consistent neighborhood effect in rates of bystander CPR year to year
- In Chicago in ’87-’88, neighborhood racial integration was particularly important
- In Atlanta in ‘05-’08, neighborhood income seems particularly important

Census tract variables
- Med. Inc. <$21,600
- Med. Inc. $21,601–30,500
- Med. Inc. $30,501–54,200
- Med. Inc. $42,001–62,000
- Med. Inc. >$62,001

Reference group
- Med. Inc. <$21,600: 0.94 (0.49–1.81)
- Med. Inc. $21,601–30,500: 1.57 (0.72–3.40)
- Med. Inc. $30,501–54,200: 2.02 (0.83–4.93)
- Med. Inc. >$62,001: 4.98 (1.65–15.04)
• The education literature has taken as a valid question: *What forms of organization of school can reduce the disparities in achievement?*

• Further: *Are there ways to organize schools that can overcome the profound differences in student background and environment?*

• Little equivalent research in health care
Less Differential

- High-fidelity simulation with 32 full-time attendings from Pittsburgh in 2010
- No difference in ICU use or EOL care, although 10% differences were not excluded
- Getting better?
- Was the big differential really vs. black women?
- Or too few respondents to detect a difference?

Figure 1. Actors portraying the role of the patient. Two black and two white patient simulators portrayed the roles of Mr. Jenkins, a 78-yr-old man with metastatic gastric cancer and a chief symptom of dyspnea, and Mr. Thomas, a 76-yr-old man with metastatic pancreatic cancer and a chief symptom of abdominal pain. The vital signs tracings on a bedside monitor next to the patient were identical, regardless of race.
Thinking about Disparities: Outline of Talk

- Opening Thought: Putting it on the Table
- Differences in Doctor-Patient Relationships
  - Discriminatory treatment
  - Differential preferences
- Differences Between Hospitals
  - Asymmetric selection
  - Organizational factors that reduce/exacerbate
The Original Sin

- Race has been a contentious issue in the United States since well before we were the United States.
- Racism is now widely accepted as a bad thing, even, in my experience, by people who are rather racist.
- For many (*including me*), issues of racism have profound moral implications—particularly about remediating injustice.
- This often impedes frank and rigorous conversation.
Most of today’s talk is about race because race is where the best U.S. data is.

U.S. data on wealth and class are particularly hard to obtain on a large scale basis.

My mandate in this talk is to lay out some empirical regularities that raise concerns, but to focus on the empirical regularities rather than moral judgment.

Please note: I am going to dodge the entire contentious issue of how exactly one measures quality in critical care, and point out that across a variety of metrics, there look to be a variety of disparities of note.
But what about patients?

- Not all differences are evidence that bad things are happening.
- When we customize our care to our patient’s preferences, that’s a good thing.
- Many historical, religious, cultural and other reasons have been hypothesized for race and class differentials in preferences for care.