UPSTREAM DETERMINANTS OF DOWNSTREAM DISPARITIES: THE CASE OF DIABETES

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1. OUTLINE OF TALK

• Introduction – race/ethnic disparities.
• Theoretical background (social construction).
• The research approach (factorial experimentation).
• Some results.
• Conclusions and Implications.
POVERTY
ACCESS TO CARE
ENVIRONMENTAL EXPOSURE
RACISM

WHY IS HE LOOKING AT RISK FACTORS AND BEHAVIORS WHEN THE KEY LIES IN SOCIAL DETERMINANTS?

LOOKING IN A DIFFERENT PLACE FOR THE KEY
OFFICIAL VIEW: THE AGE STANDARDIZED PREVALENCE OF DIABETES

NHANES: 1999-2006
LEVELS OF CAUSATION AND CORRESPONDING TYPES OF HEALTH INTERVENTION

I. SOCIAL STRUCTURE
   - Race/Ethnicity
   - Social Class
   - Age
   - Gender

II. ENVIRONMENTAL INFLUENCES
   - Geographic Location
   - Housing Conditions
   - Neighborhood economics
   - Healthcare Access, Use, Clinical Decision Making

III. INDIVIDUAL CHARACTERISTICS AND BEHAVIORS
   - Smoking
   - Diet
   - Physical Activity

IV. PHYSIOLOGIC INFLUENCES
   - Family History/Genetics
   - Insulin Resistance
   - Circulating hormones

HEALTHY PUBLIC POLICY
ORGANIZATION AND COMMUNITY INTERVENTIONS
PRIMARY AND SECONDARY PREVENTION
SECONDARY PREVENTION

Diabetes
GENETICS

• Some promising developments.

• Differences between people don’t explain magnitude of differences in disease.

• Genetic reductionism – “the new genetics is the old germ theory in disguise” (MacMichael).
BOSTON AREA COMMUNITY HEALTH SURVEY: TESTOSTERONE VERSUS AGE BY RACE/ETHNICITY
VARIANCE EXPLAINED

Unexplained (88.2%)
Random Medical News Du Jour

Can cause in:
- Sleep disorders
- Hypothermia
- Spontaneous bruising
- Emotional distress
- Sexual dysfunction
- Feelings of well-being
- Breast cancer
- Tinnitus
- Heart disease
- Nausea
- T samples
- Insomnia
- Bladder cancer
- Atrial fibrillation
- Men 40-10 yrs
- African American women
- Overweight smokers

According to public health experts...
PREVALENCE OF DIABETES BY RACE/ETHNICITY AND SES

BACH: 2002-2005
2. THEORETICAL BACKGROUND
WHO'LL BE COUNTED AT THE END?

WHAT'S COVERED?

DOCTOR'S DECISIONS

HEALTH INSURANCE

SYMPTOM RECOGNITION

THE TRACK TO AN EPIDEMIOLOGIC RATE

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A DOCTOR'S DECISIONS CONTRIBUTE TO DISEASE DISPARITIES...
THE PIVOTAL ROLE OF THE DOCTOR-PATIENT ENCOUNTER (CDM) IN THE CONSTRUCTION OF RATES
SELF-FULFILLING PROPHECY

“When people define situations as real, they become real in their consequences”

(W.I. Thomas)
“…in the beginning, a false definition of the situation evokes a new behavior which makes the originally false conception come true. (It) perpetuates a reign of error”

(Robert Merton)
3. THE RESEARCH APPROACH  
(Factorial Experimentation)
ASSOCIATION VS CAUSATION

• **Observational Studies** –
  Through multivariate techniques, provide “confounded” estimates of associations.

• **Randomized Experiments** –
  Provide unconfounded estimates of cause-effect relationships.
TWO EXPERIMENTS

“Patient” with

1. Undiagnosed symptoms clearly suggesting diabetes.

Physicians task is diagnoses and test-ordering

2. Already diagnosed diabetes with emerging peripheral neuropathy.

Physicians task is management
WHY DIABETES?

• Major public health problem ("21st century epidemic").
• Subject to "rule of halves".
• Most is presented to and managed by primary care doctors.
• Race/ethnic disparities widely accepted as real.
FACTORIAL EXPERIMENT

Patient Factors

- Age (35 or 65)
- Gender (Female or Male)
- Race/Ethnicity (Black, Hispanic, White)
- Socioeconomic status (occupation janitor or lawyer)

Physician Factors

- Gender (Female or Male)
- Experience (year of graduation from medical school – more experienced graduated between 1969 and 1983, less experienced graduated between 1993 and 1999)
- (US trained)

All factors are orthogonal.
## COMPONENT FACTORS OF THE INTERVENTION

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>35 years</th>
<th>65 years</th>
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</thead>
<tbody>
<tr>
<td><strong>AGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>35 years</td>
<td>65 years</td>
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<tr>
<td>Female</td>
<td>35 years</td>
<td>65 years</td>
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<td><strong>GENDER</strong></td>
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<tr>
<td>Hispanic</td>
<td>Black</td>
<td>Hispanic</td>
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<tr>
<td><strong>RACE/ETHNICITY</strong></td>
<td>Janitor</td>
<td></td>
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<tr>
<td><strong>SES (occupation)</strong></td>
<td>Janitor</td>
<td>Lawyer</td>
</tr>
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SIGNS / DISTRACTIONS
DIABETES

Signs
• Thirst
• Fatigue
• Weight loss for more than 5 months without changing diet
• Not feeling well
• Overweight (nonverbal)

Distractions
• High blood pressure (135/95)
• Patient concern about heart disease
• Drinking a lot of caffeine
• Hasn’t been to doctor for several years
ADVANTAGES OF VIDEOTAPED CLINICAL SCENARIOS (OVER STANDARDIZED PATIENTS AND WRITTEN VIGNETTES)

• Strict experimental control (standardization) assured (vs SP).
• Patients do not present on paper (vs. written vignette).
• Cost (vs SP).
• Can embed non-verbal cues (obesity, low affect, anxiety, demographics).

“It’s not what the patient says, it’s how they look”
## Selecting the Doctors

<table>
<thead>
<tr>
<th></th>
<th>More Experienced Graduation</th>
<th>Less Experienced Graduation</th>
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<tbody>
<tr>
<td><strong>1969-1983</strong></td>
<td>48</td>
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<tr>
<td><strong>1993-1999</strong></td>
<td>96</td>
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<table>
<thead>
<tr>
<th></th>
<th>MALE</th>
<th>FEMALE</th>
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<td>48</td>
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<td>96</td>
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</table>

Total: 96
Total: 96
Total: 192
STATISTICAL POWER

• With 192 physicians

- 78.7% chance to detect a difference of .20 between two groups (e.g. 40% of physicians do a monofilament/vibration test for lower SES vs. 60% for upper SES).

- 93.1% chance to detect a difference of .25.
MEASURE TO ENHANCE EXTERNAL VALIDITY

- Clinical scenarios developed through role playing with doctors.
- Field tested with other doctors.
- Use of professional talent (actors/actresses).
- Experienced clinicians present at filming.
- All interviews in doctors’ offices during regular clinic.
- Requested to treat “patient”, as if their own real patient.
- Asked how typical is patient in video (92%).
DIAGNOSES GIVEN BY PHYSICIAN SUBJECTS

Potential Diagnoses

- Diabetes
- Mental Health
- Thyroid Disease
- Heart Disease
- Cancer
- Anemia
CERTAINTY OF THESE DIAGNOSES

Diagnosis

- Diabetes
- Mental Health
- Thyroid
- Heart Disease
- Cancer
- Anemia
DIAGNOSIS OF DIABETES VARIES BY RACE/ETHNICITY

Experimental Results

(p=0.009)
DIAGNOSIS OF DIABETES VARIES BY RACE/ETHNICITY

Experimental Results

US: NHANES 1999-2006
Age 20-80
SALIENT POINTS

- All “patients” presented exactly the same signs and symptoms of diabetes;
- Only 60 percent of doctors could correctly identify diabetes.
- There were significant (p=0.009) race/ethnic differences
  - Black patients (73%)
  - Hispanic patients (60%)
  - White patients (48%)
- The Differences in diagnostic certainty were significant and mirrored the above differences.
- Many other conditions diagnosed, with even higher levels of certainty.
- 24% of doctors initially diagnosing diabetes would not order any blood glucose test (as is recommended by clinical guidelines).
5. CONCLUSIONS/IMPLICATIONS

• Many factors contribute to health disparities – some are immutable, some mutable.

• Physicians are pivotally involved in the social construction of race/ethnic disparities (and this remains understudied).

• Optimal research approach to disentangle the process is factorial experimentation – only way to get definitive (unconfounded) results.
CONCLUSIONS

1. Widely accepted race/ethnic differences in diabetes do not accurately reflect the true epidemiologic prevalence of diabetes in the population.

2. While health care providers work to reduce/eliminate race/ethnic disparities they are pivotally involved (probably unconsciously) in their creation/amplification.