The unsolved mystery of racial disparities in infant health: Do we know enough to act?

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Racial disparities in infant health at birth

- “Birth outcomes”: Born too small (low birth weight) or too early (premature/preterm birth)
- Focusing on African Americans (Blacks) and European Americans (Whites)
- Current knowledge of likely causes
- Why the differences are likely to involve social factors
  - Why psychological stress could be important, particularly cumulative lifetime effects
- Policy implications
Disparities in infant health

- Compared with babies born to European American ("White") mothers, babies born to African American ("Black") mothers are around twice as likely to:
  - Have low birth weight (born too small)
  - Be premature (born too early)
  - Die in infancy
Persistent disparities: low birth weight

(Health, U.S., 2006)
Born too early, too small

- Infant mortality
- Serious disability
  - Cognitive
  - Emotional-behavioral
  - Physical
- Family burden
- Economic costs
  - Medical care
  - Special ed.
  - Social services
  - Productivity lost

(NY Times 2/27/07. Photo: Dilip Vishwanat. Article: Nicholas Bakalar)
Causes of being born too early and/or too small

**Known:**
- Tobacco
- Excessive alcohol
- Drugs
- Nutrition
- Short maternal stature
- Chronic disease

**Suspected:**
- Infections
- Environmental toxins
- Physically demanding work
- Genes/Gene-environment interactions
- Stress (psychological)
Causes of disparities?

Not explained by:
- Tobacco
- Excessive alcohol
- Drugs
- Nutrition
- Maternal height
- Chronic disease

?????
- Infections
- Environmental toxins
- Physically demanding work
- Genes/Gene-environment interactions
- Stress (psychological)
Causes of disparities in being born too early or too small

- More questions than answers
- What can we learn from the patterns?
  - By income
  - By birthplace in U.S. (vs immigrant)
Ratio of low birth weight rates among Blacks vs Whites at different income levels

<table>
<thead>
<tr>
<th>Family income in relation to the federal poverty level *</th>
<th>Black to White ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor: at or below the poverty line</td>
<td>1.3 times</td>
</tr>
<tr>
<td>Near-poor: 1-2 times the poverty line</td>
<td>1.6 times</td>
</tr>
<tr>
<td>Not low-income: more than 2 times the poverty line</td>
<td>Around 2.5 times</td>
</tr>
</tbody>
</table>

California Maternal & Infant Health Assessment (MIHA), ’99-’05
* During ’99-’05, federal poverty level for a family of 4 was around $17,000-$20,000.
Disparities by birthplace

- US-born African-Americans have adverse birth outcomes
- Black African/Afro-Caribbean immigrants have relatively good birth outcomes by comparison
  - If genes were the basis, wouldn’t immigrants do worse?
US-born vs immigrant patterns hard to explain by genes alone

- Healthier behaviors?
- Healthy immigrant selection?
- Stress?
  - But immigration is stressful, so difficult to explain by stress in general
  - What about type of stress (challenge vs threat)?
  - What about duration &/or timing at critical periods, e.g., childhood?
  - Resources that buffer effects of stress?
    - Optimism
    - Social support
How could stress influence birth weight and/or prematurity?

- Biologically plausible
- Physiological pathways have been documented in animals & humans, beginning with psychological stress and leading to effects on:
  - **Sympathetic nervous system**: Brain ➔ epinephrine & norepinephrine
  - **Neuro-endocrine pathways**: Brain ➔ adrenal glands ➔ cortisol
  - **Stress hormones** could trigger diverse effects including effects on immune system leading to premature labor and/or poor fetal growth
Who has more stress?

- We studied several major psychosocial stressors experienced during pregnancy
  - Divorce/separation, job loss of partner/self, financial difficulties, food insecurity, homelessness, domestic violence, incarceration of partner/self
  - And lack of social support
- Postpartum women in California and 17 other states
Separated or divorced during pregnancy: disparities by race

California MIHA 2002-2004 (n = 10,750)
Partner lost his job during her pregnancy: disparities by race

California MIHA 2002-2004 ($n=10,750$)
Food insecurity during pregnancy: disparities by race

California MIHA 2002-2004 (n = 10,750)
**Number of hardships* during pregnancy: disparities by race**

Separation/divorce, homelessness, job loss of spouse/partner, involuntary job loss of respondent, food insecurity, incarceration of respondent or her spouse/partner, domestic violence, hard to live on her family income, unpaid bills, no practical support, no emotional support.

California MIHA 2003-2004 (n = 7,272)
Chronic stress in childhood?
Cumulative effects of stress?

- Poverty/low income is often stressful
- Higher-income/education Black women less likely than Whites to have grown up in well-off households
- Cumulative stress over lifetime
- Childhood stress or chronic stress could lead to adverse birth outcomes even if pregnancy itself is relatively stress-free
  - via neuro-endocrine dysregulation
How could your neighborhood affect your health?

- Physical danger
- Safe places to exercise
- Lead, air pollution, mold
- Access to healthy food
- Role models, peer pressure
  - Substance abuse
- Social networks & support
- Stress, fear, anxiety, despair
- Blacks & Whites of similar income levels live in different kinds of neighborhoods
Racial discrimination as a source of chronic stress across life course

- Could experiences associated with racism explain the patterns?
- Some studies have linked racism with adverse birth outcomes; some have not; are the measures—generally reflecting incidents—adequate?
- Current work to develop measures for birth outcomes research
- Our findings: considerable stress not tied to specific incidents; generalized anxiety/fear about others’ reactions toward oneself or loved ones; constant vigilance; lasting impact of childhood & vicarious experiences
More questions than answers

- Many hypotheses
- Inadequately studied
- Widespread assumption that the basis for the racial differences must be bad behaviors and genes
  - Taking us somewhat off-the-hook in policy arena
- Many studies have concluded a racial difference must be genetic because the difference was still seen even after the researcher “controlled for socioeconomic status (SES)”?
A word of caution

- Beware of studies claiming to have controlled for SES (socioeconomic status)
- Studies rarely measure more than education or current income
- At a given income/education level, there are large Black : White differences in:
  - Wealth
  - Quality & rewards of education
  - Neighborhood socioeconomic conditions
  - Childhood socioeconomic conditions
To claim that a given racial disparity is independent of SES, one would have to measure all relevant socioeconomic factors:

- Income
- Educational quality and quantity
- Wealth
- Occupation
- Neighborhood characteristics
- One’s perception of one’s status/position
- All of above throughout one’s life

That isn’t possible
No study can “control for” SES

- Unmeasured wealth, educational quality, occupational factors, childhood and generational experiences, neighborhood context
- Be skeptical of studies concluding that an observed racial disparity must be genetic because the disparity was still present after they “controlled for” SES
Summing up: Where do the clues lead us?

- More biomedical research needed on environmental toxins, infections, and gene-environment interactions.
- Patterns of Black:White disparities in infant health across socioeconomic groups and by birthplace suggest that social factors—potentially experiences across the life course—play powerful roles.
- Important role for stress is plausible albeit not conclusive.
- Policy implications?
Do we know enough to justify action? What actions?

- More intensive action to reduce the known adverse risk factors before and during pregnancy
  - E.g., tobacco, alcohol, illicit drugs, chronic disease
  - Poverty and low education are the strongest risks
  - Increase protective factors in households and in neighborhoods

- Bold experiments testing effects of biologically plausible, promising interventions, including ones that reduce stress and increase social support (which buffers health effects of stress)
Find a way to keep your stress level down. What works for me is making a ton of money & having practically free health care.
Policy implications: Bold experiments to reduce stress & increase social support

- Need for bold experiments with social factors
  - Will require bold policies
  - Multi-factorial interventions
  - Can’t be conducted in test tubes or small-scale
  - But scientific rigor is essential

- Limited documentation of health effects of socio-economic adversity during pregnancy in affluent countries

- But body of evidence on early childhood economic adversity warrants improving social and economic factors among pregnant women and infants
Unequal chances at birth

- When do we know enough to recommend policy change?
- Acting on the best available knowledge
- Costs of status quo
- Known effects of early childhood economic adversity
- Compelling economic & ethical reasons to act

(NY Times 2/27/07. Photo: Dilip Vishwanat. Article: Nicholas Bakalar)