

Social Determinants of Birth Outcomes in Chicago:

How far have we come? Where do we go from here?

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Birth Outcomes in America

- One of the most sensitive indicators of a society's function
- A focus of many commissions, blue-ribbon panels and improvement campaigns
- Disappointing results

Infant Mortality in the US

- Glaring racial disparity
- Higher than other countries
- Disparities are widening
- High white infant mortality rate, too

2005 Infant Mortality Rates

Population	IMR (deaths/1000)	Int'l Rank
Hong Kong	2.3	1
United States (all)	6.9	29
US (white non- Hispanic)	5.8	24
US (African American)	13.6	52

Social determinants of birth outcome: Known risk factors

- Poverty
- Low educational attainment
- Maternal age
- Smoking
- Poor nutrition

Social determinants of birth outcome: More recently described risk factors

- Neighborhood violence
- Stressful life events
- Domestic violence
- Perceived racial discrimination
- Job strain

Social environment over the lifecourse

- Illinois Transgenerational Birth File
- Births from 1989-91
- Linked to parents' birth records (1956-76)
- Linked to US Census data (1960, 1970, 1990)

Infant-Mother-Father Record Linkage Success

File Description	N =	% previous line	% all 1989-91 births
All Illinois live births	583,601	–	100%
Illinois-born mothers	379,049	65%	65%
Mother born 1956-76	344,148	91%	59%
Matched to mother's 1956-76 birth certificate	267,303	<u>78%</u>	46%
Fathers named on matched record	216,468	81%	37%
Father born in Illinois	169,450	78%	29%
Father born 1956-76	145,940	86%	25%
Matched to father's 1956-76 birth certificate	125,949	<u>86%</u>	22%

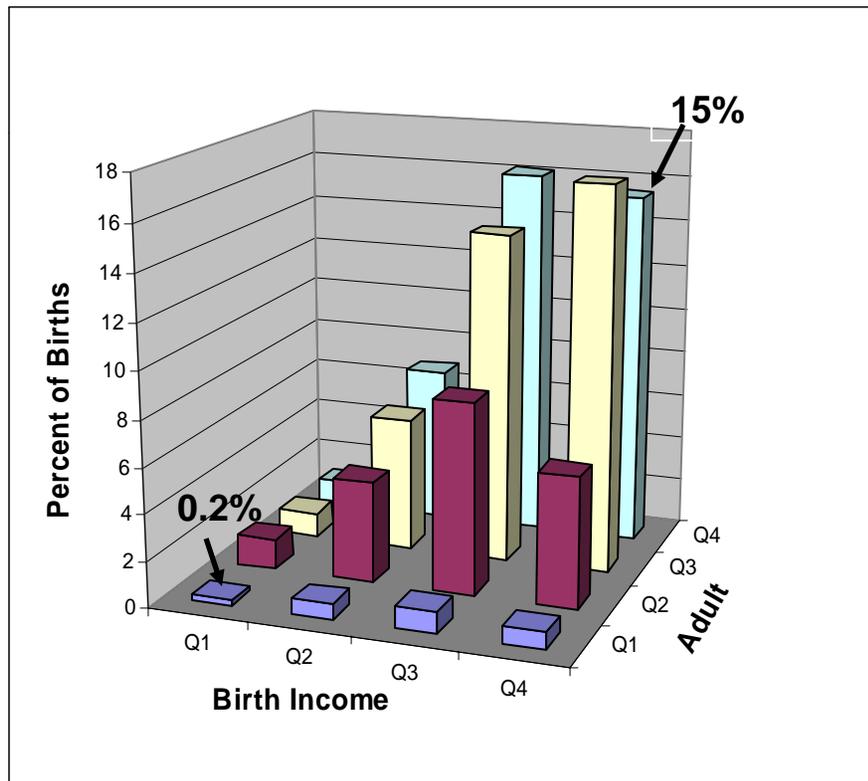
How different are neighborhood
income experiences between
white and African American
women over their lives?

Transgenerational studies of social environment over the life course - 1

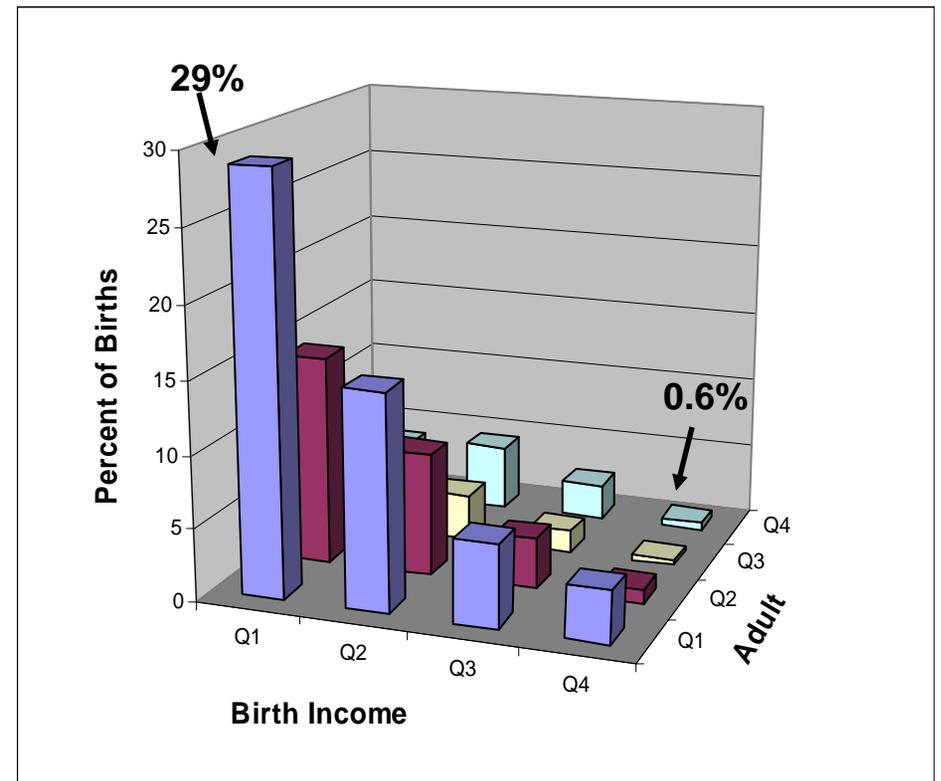
- How different are neighborhood income experiences between white and African American women over their lives?
- Matrix of income exposures:
 - 4 quartiles of neighborhood income
 - a woman's location as infant, adult

Lifetime Exposure to Poorer or to More Affluent Neighborhoods by Race

White Women



African American Women



Transgenerational studies of social environment over the life course - 2

- What is the LBW risk from lifelong exposure to low income for white and African American women -- Relative risk and population attributable risk?

Risk of lifelong poverty: *relative*

- White women

always poor	10.1%
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never poor	5.1%
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→ RR = 2.0 (1.4-2.9)

- African American women

always poor	17.1%
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never poor	11.7%
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→ RR = 1.5 (1.2-1.8)

Risk of lifelong poverty: *population*

- Attributable risk for the whole population of White women from the risk factor **lifelong poverty**:

1.6%

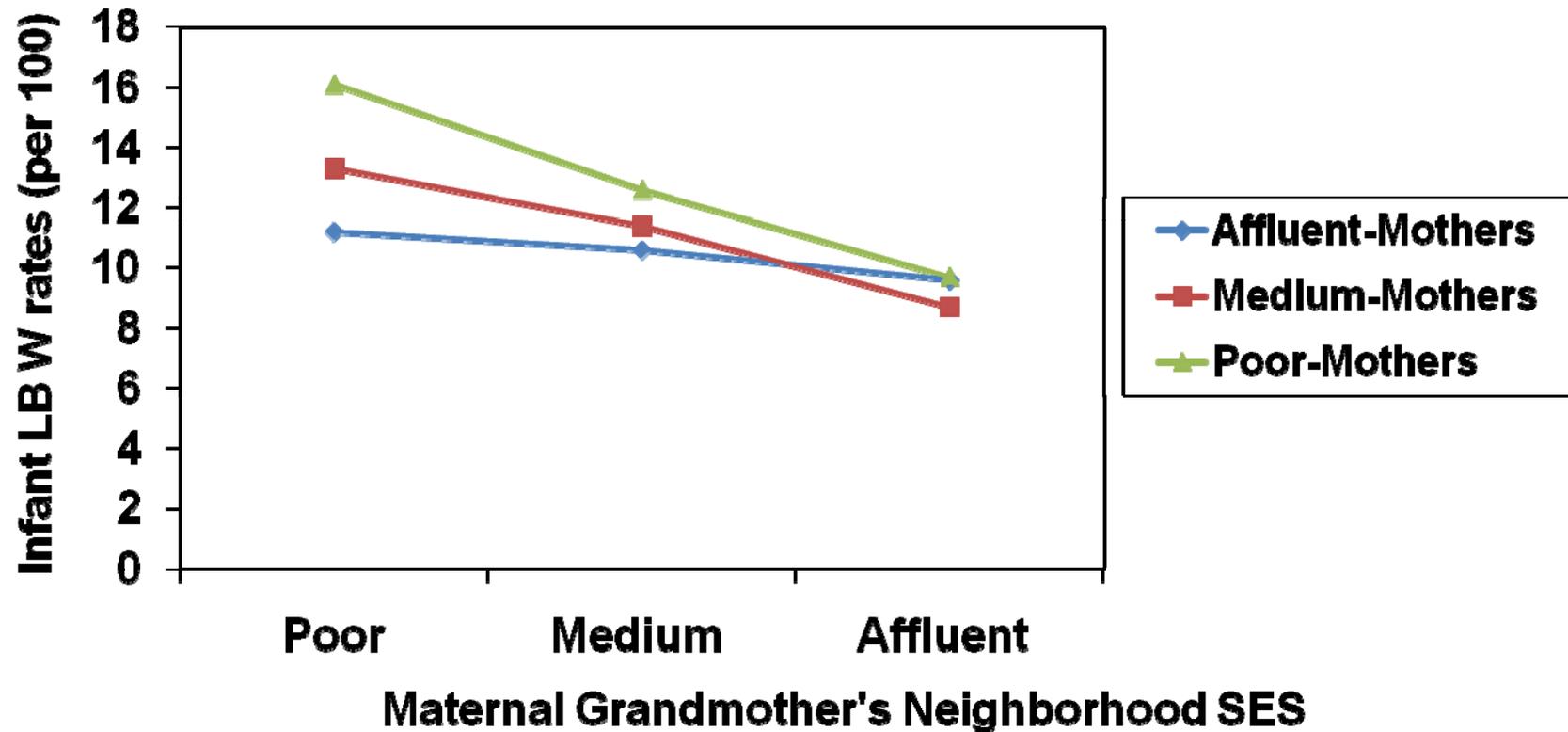
- Attributable risk for the whole population of African American women from the risk factor **lifelong poverty**:

23.6%

Transgenerational studies of social environment over the life course - 3

- Does the maternal grandmother's economic environment impact her grandchild's LBW risk, after controlling for her daughter's current neighborhood income?
- (Evidence for fetal programming?)

Effect of income over 2 generations

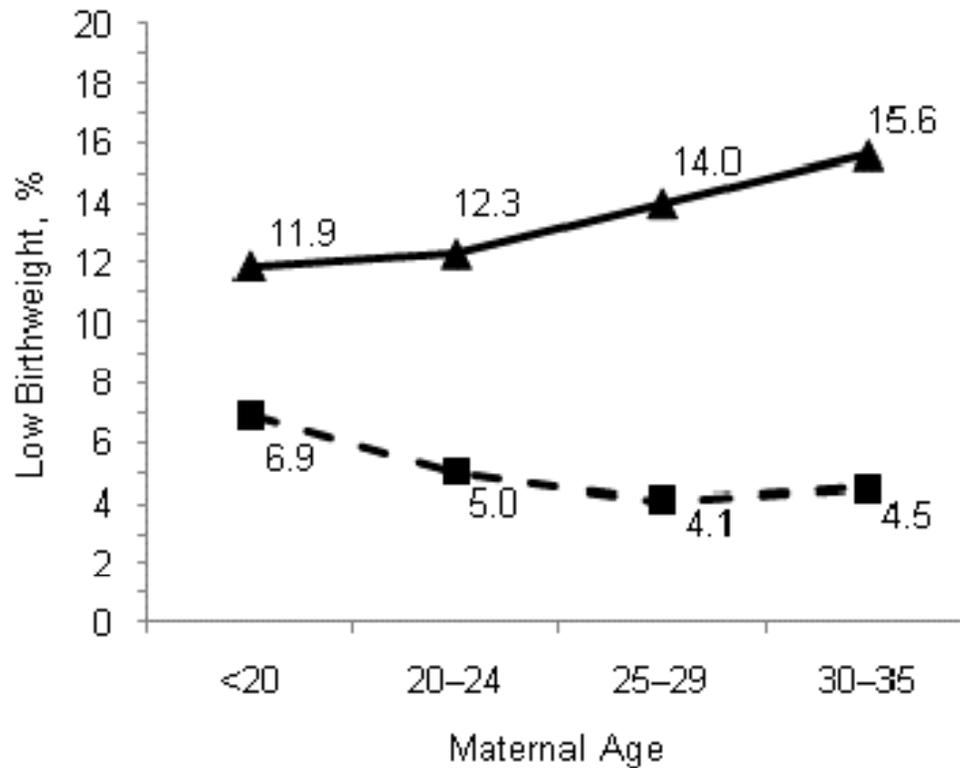


Collins, David, Rankin, Desireddi. *Am J Epidemiol*, 2009.

Transgenerational studies of social environment over the life course - 4

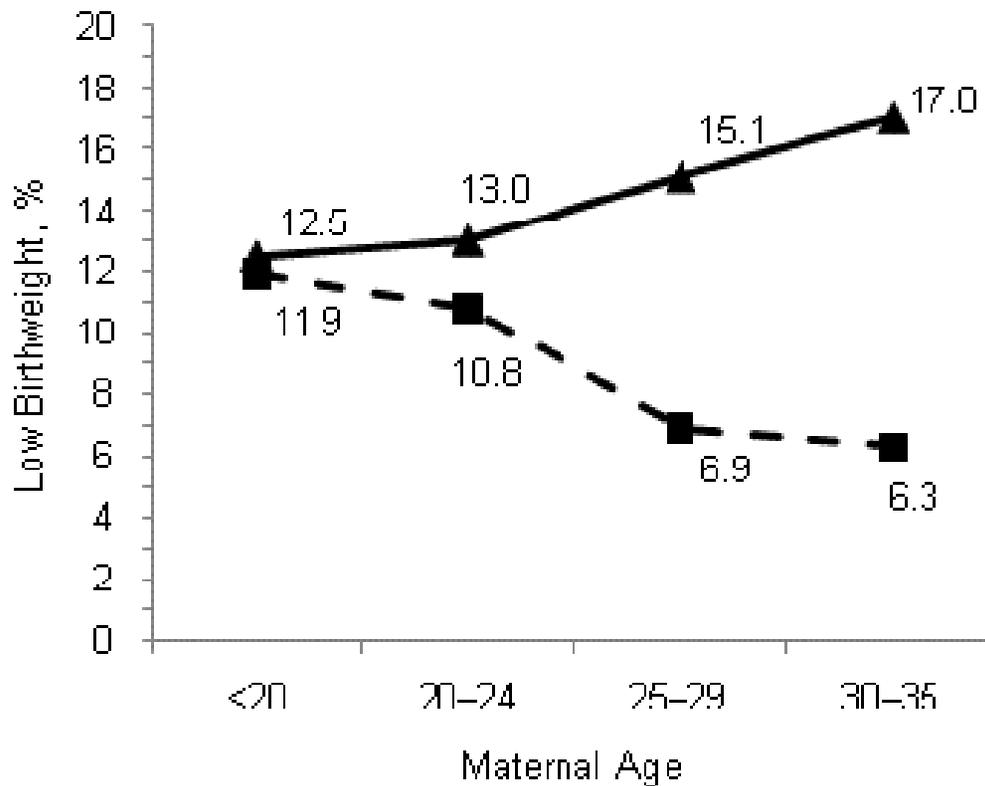
- Are there sectors of the African American population that do not experience “weathering” or some whites who do?

Rate of LBW changes with age but differently for whites and African Americans



Love, David, Collins, Rankin. *Am J Epidemiol*, 2010.

The weathering effect is seen strongly for African American women always living in low income, but not for those never exposed to neighborhoods below the median.



Love, David, Collins, Rankin. *Am J Epidemiol*, 2010.

How long will it take to change these patterns of inequality?

- 35-year study period, 1956 to 1991
- Percent of all African American mothers in lowest quartile went from 52% to 66%
- Percent of White women in highest quartile fell slightly, from 38% to 34%
- (During this same period, overall shift of income to the richest 5% in the U.S.)

“Social Determinants of Health in the United States: Are We Losing Ground?”

L. Berkman, *Annu Rev Public Health*, 2010

Rose, 1985

- “Causes of cases vs. causes of incidence”
- “Why do some individuals have hypertension?”
vs
“Why do some population have much hypertension whilst in others it is rare?”

G. Rose. Sick individuals and sick populations. *Int J Epidemiol* 14:32-38, 1985.

Krieger, 1994

- Describing the “web of causation,” focusing on multivariable methodology
- Tacitly assuming a biological, individualistic model (“risk factors”)
- Presumes biomedical solutions, not social programs

N. Krieger. Epidemiology and the web of causation: Has anyone seen the spider? *Soc Sci Med* 39:887-903, 1992

Krieger, 1994

- “...by excluding any sense of history or origins, the ‘web’ sans ‘spider’ discourages epidemiologists from considering *why* population patterns of health and disease exist and persist or change over time.”
- The social system *is* the causal agent

N. Krieger. Epidemiology and the web of causation: Has anyone seen the spider? *Soc Sci Med* 39:887-903, 1992

Why don't epidemiologists discuss causal theories?

- Post WW II: “Chilling effect” of the Cold War and McCarthyism on social (socialistic?) theory
- Even civil rights activists were investigated as likely communist agents
- DNA, the Genome Project, biotechnology as ideology: “From the New Deal to BiDiI”

Why don't epidemiologists discuss causal theories?

- Post-Berlin Wall accepted wisdom: “Socialism was tried and it doesn't work.”
- Fundamental social change is not possible or desirable

1989: Collapse of Communism



"We won, man, we won!"

However...

- First universal healthcare system: USSR, 1920s
- Fastest rise in life expectancy ever observed for a large population: China 1949-1979
- Most dramatic decline in life expectancy ever recorded in peacetime: post-Soviet Russia, 1990s
- Cuba passed the US in lowering infant mortality, 2003

Why social theory is important

- If social determinants are important, they won't be fixed by "lifestyle" changes or gene therapy
- Logical consistency: If problems are systemic and of social origin, we must change the social system.

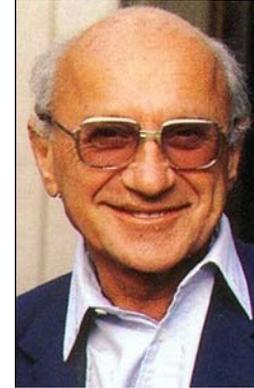
What sort of change?

- Eliminate racism and sexism
- Real life equal opportunity: universal free health care and free education through university level
- Prioritize human needs over geopolitical aims
- “Tackle the inequitable distribution of power, money and resources” (WHO Commission on Social Determinants of Health)



WHO
Commission
on Social
Determinants
of Health

VS.



'The Brick' social
program enacted
by the 'Chicago
Boys for Gen.
Pinochet

“The philosophers have only interpreted the world in various ways; the point, however, is to change it.”

K. Marx

“If there is no struggle, there is no progress.”

F. Douglass