

Racial-Ethnic Disparities in Birth Outcomes

A Life-Course Perspective

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Equity, Race, and Access to Midwifery
National Association of Certified Professional Midwives

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*We hold these truths to be self-evident,
that all men are created equal*

Declaration of Independence

1776

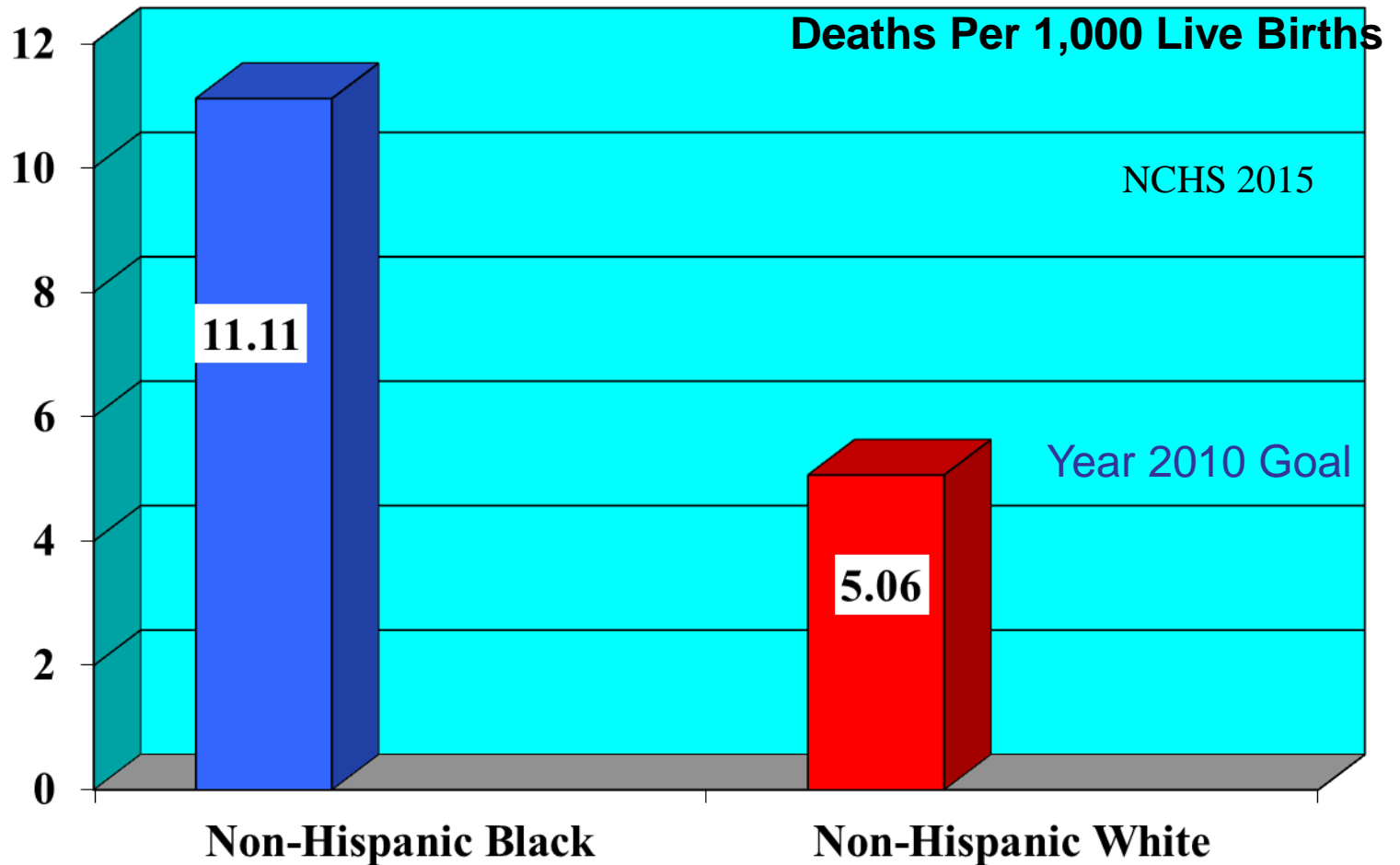


I have a dream that one day ... little black boys and black girls will be able to join hands with little white boys and white girls and walk together as sisters and brothers.

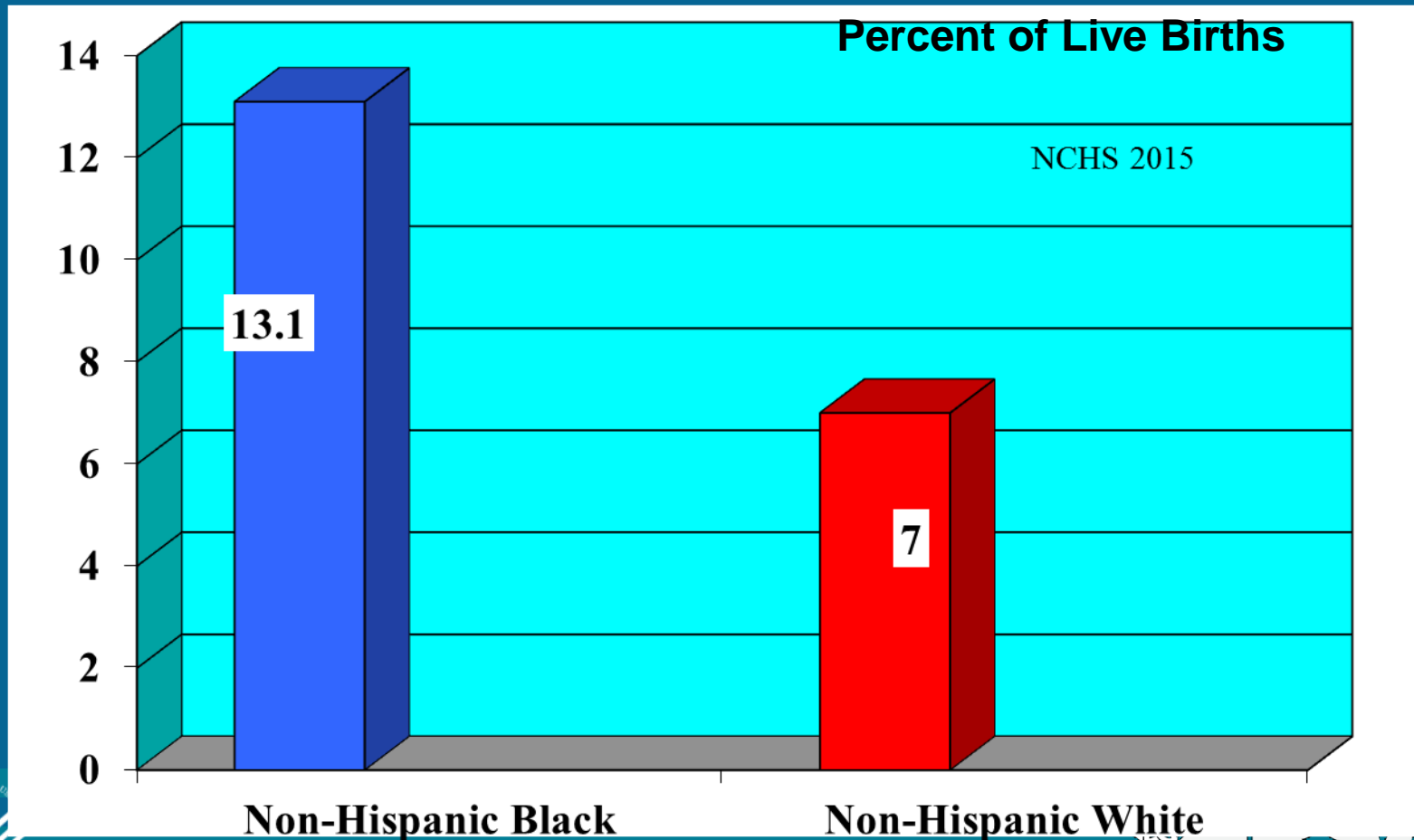
Martin Luther King, Jr (1963)



Racial & Ethnic Disparities Infant Mortality, 2013



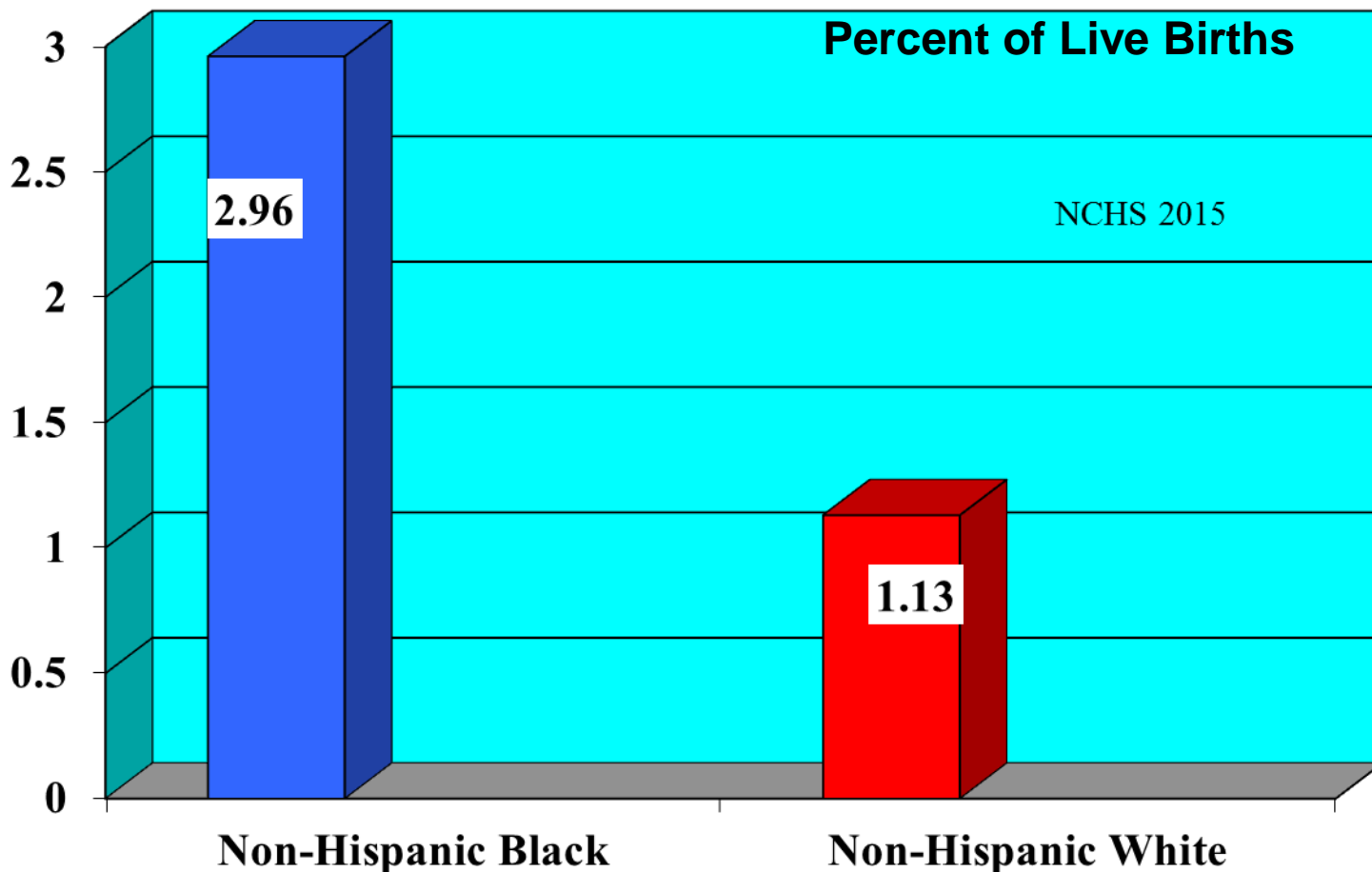
Racial & Ethnic Disparities Low Birth Weight < 2500g 2013



Racial & Ethnic Disparities

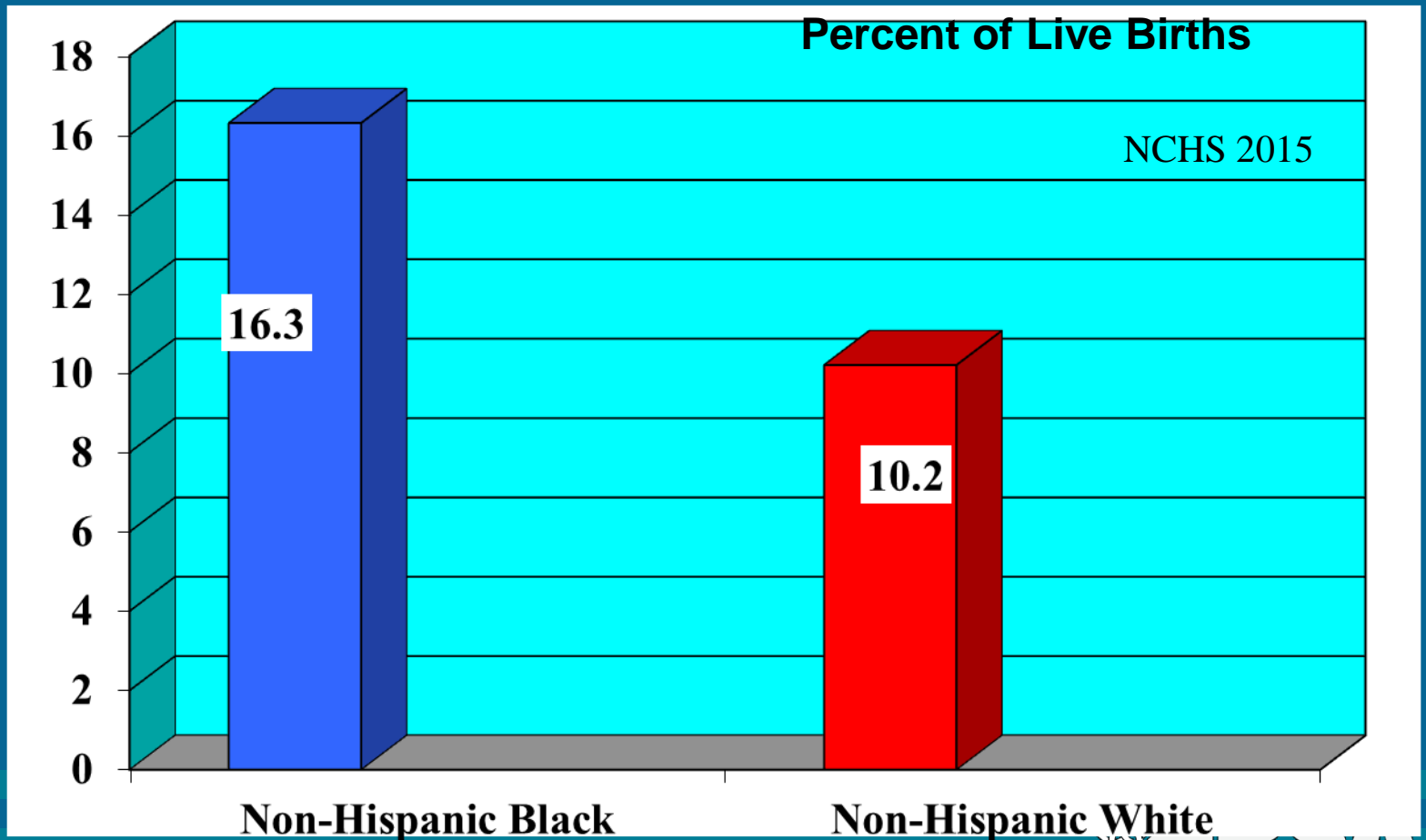
Very Low Birth Weight <1500g

2013



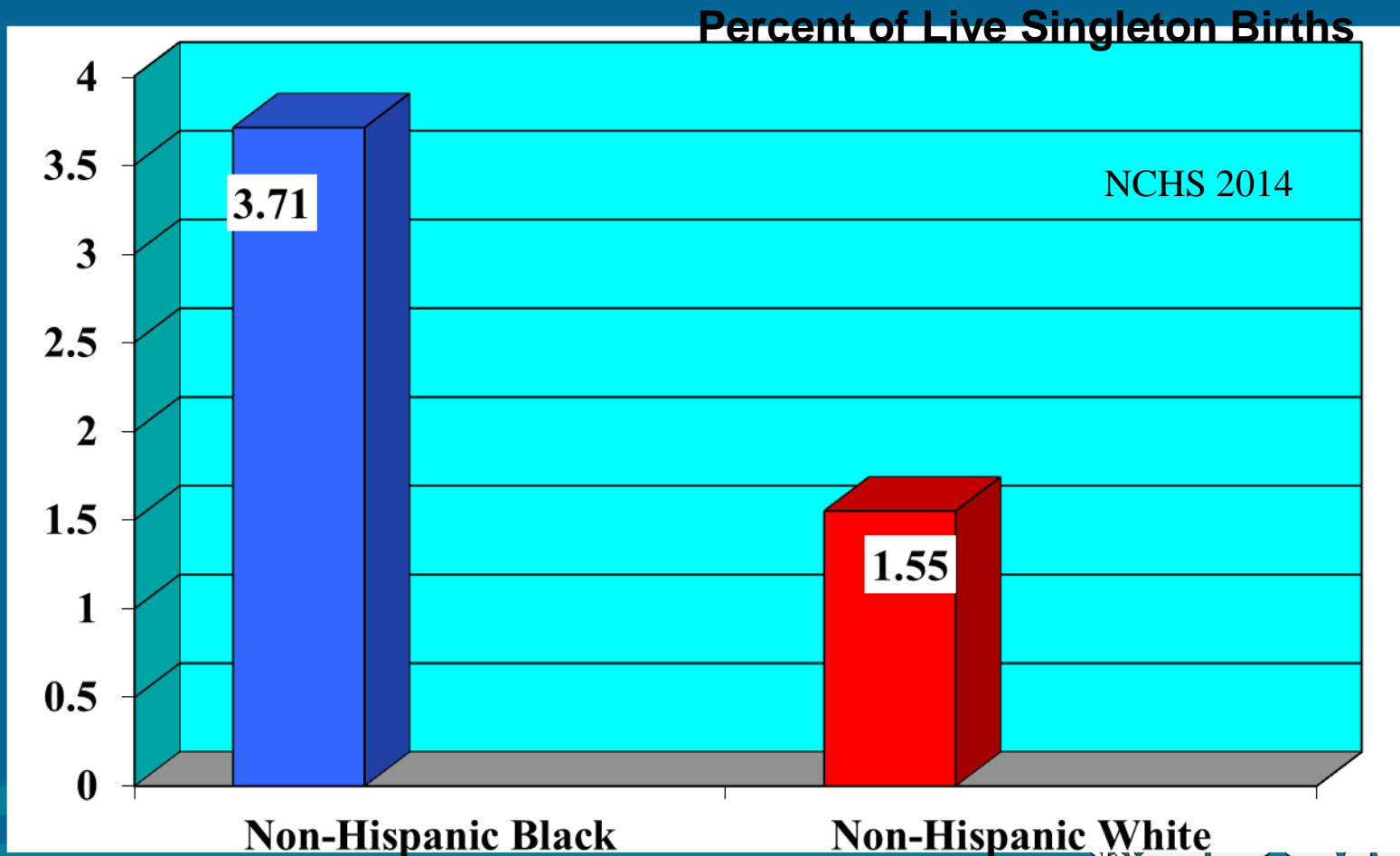
Racial & Ethnic Disparities

Preterm Births < 37 weeks, 2013

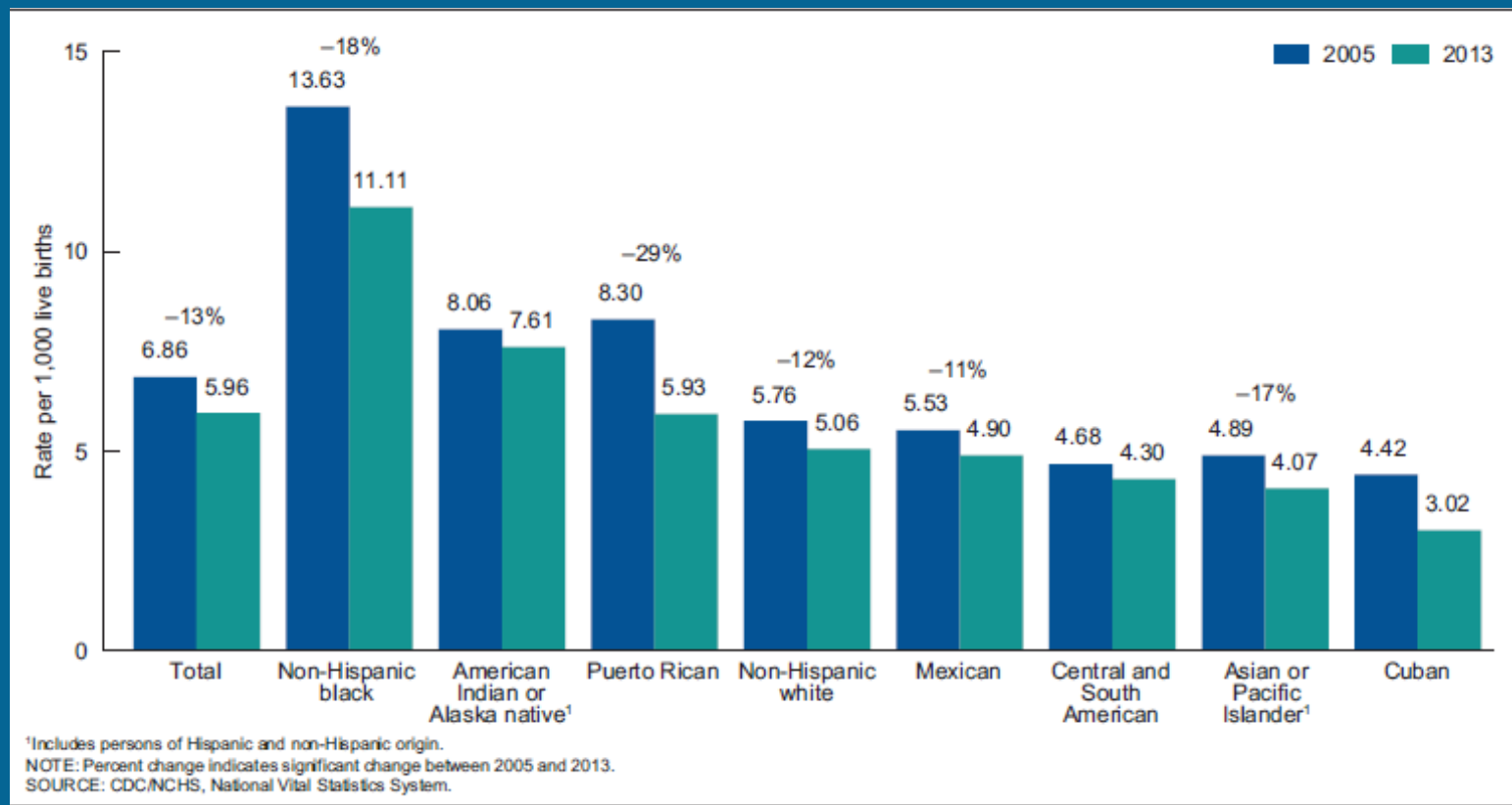


Racial & Ethnic Disparities

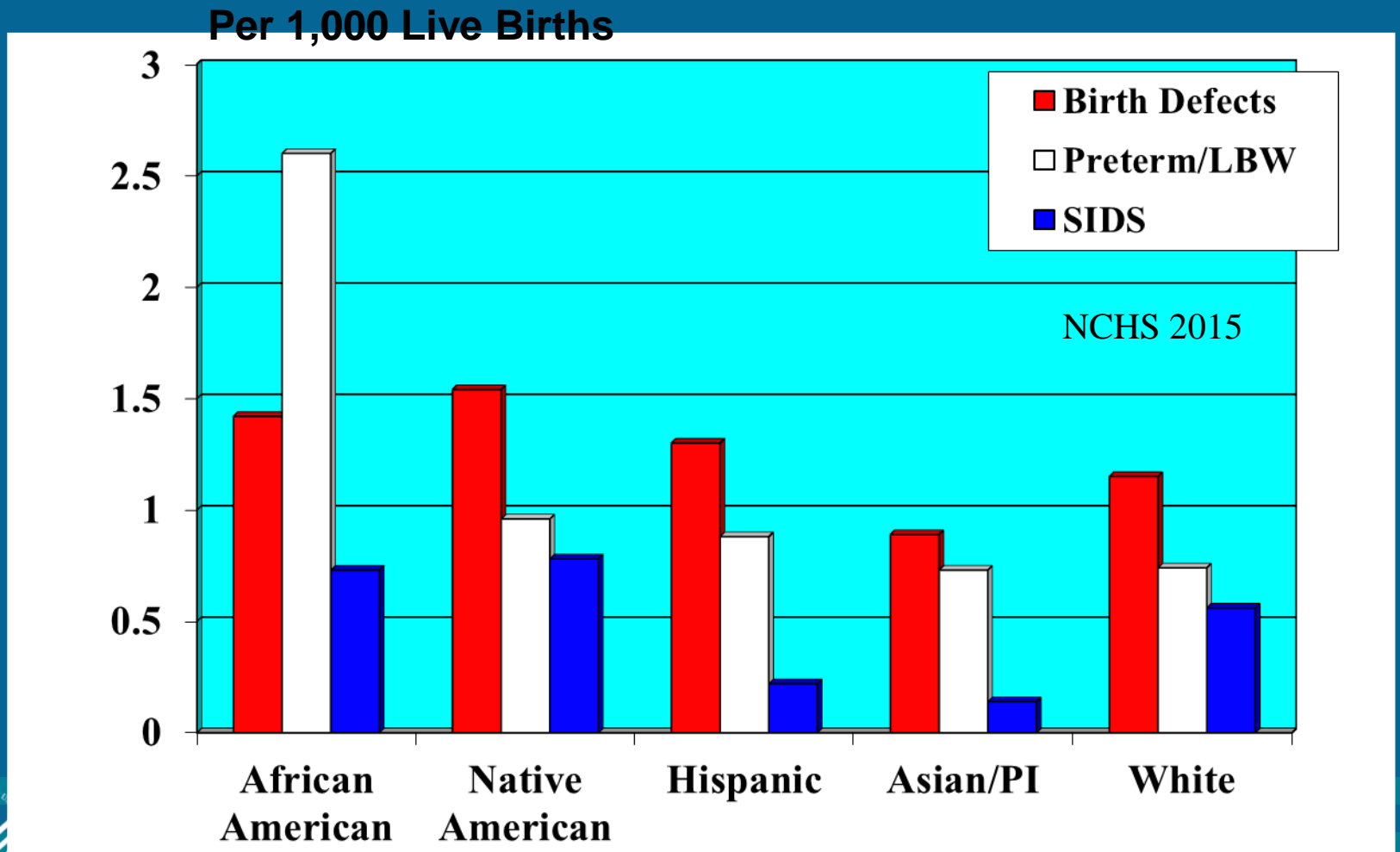
Very Preterm Births < 32 Weeks, 2013



Racial & Ethnic Disparities Infant Mortality, 2005, 2013



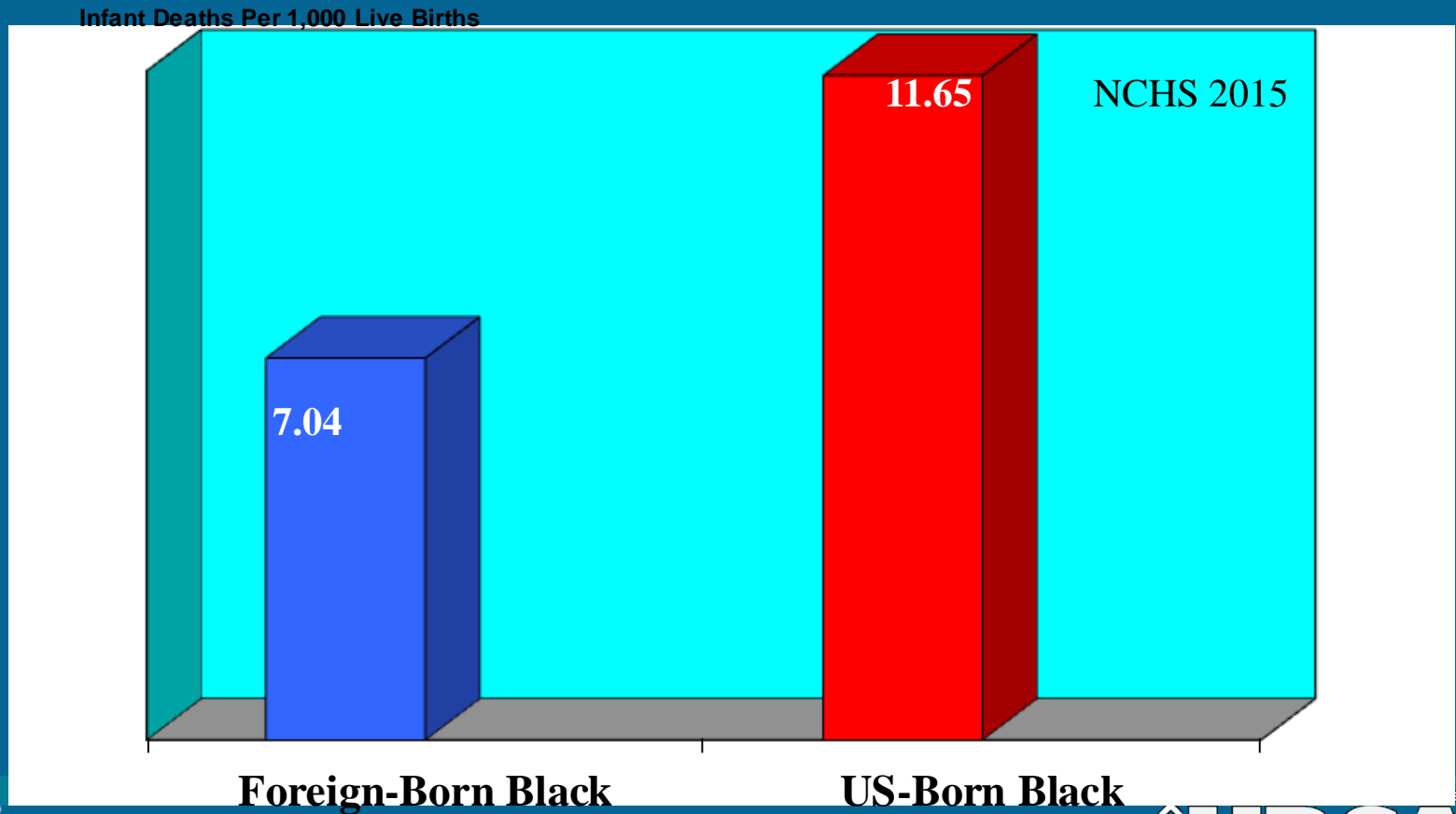
Racial & Ethnic Disparities Causes of Infant Deaths, 2013



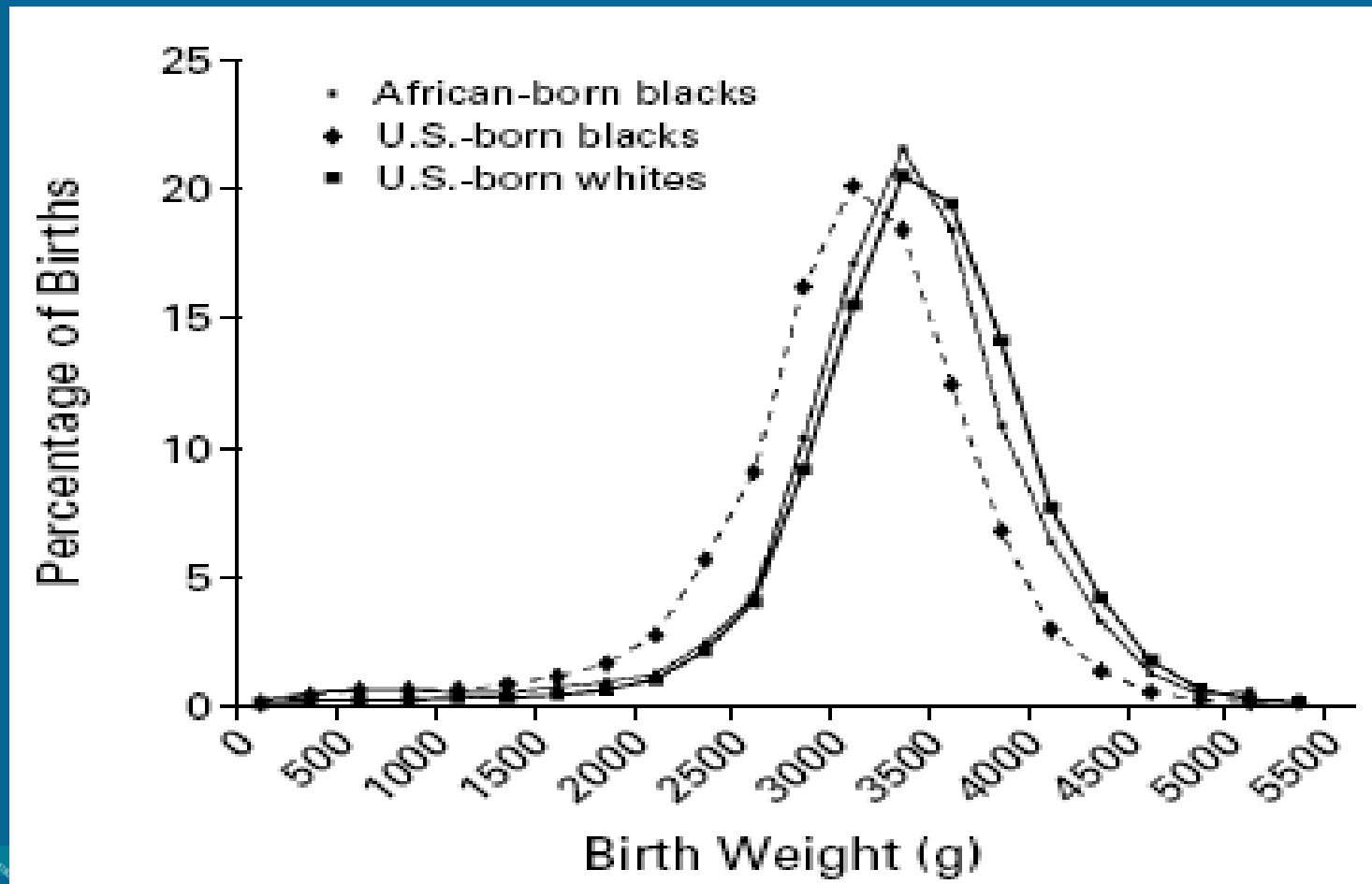
Why?

Genetics?

Genetics?



Birth weight distribution of African-born blacks is more closely related to US-born whites than to US-born blacks

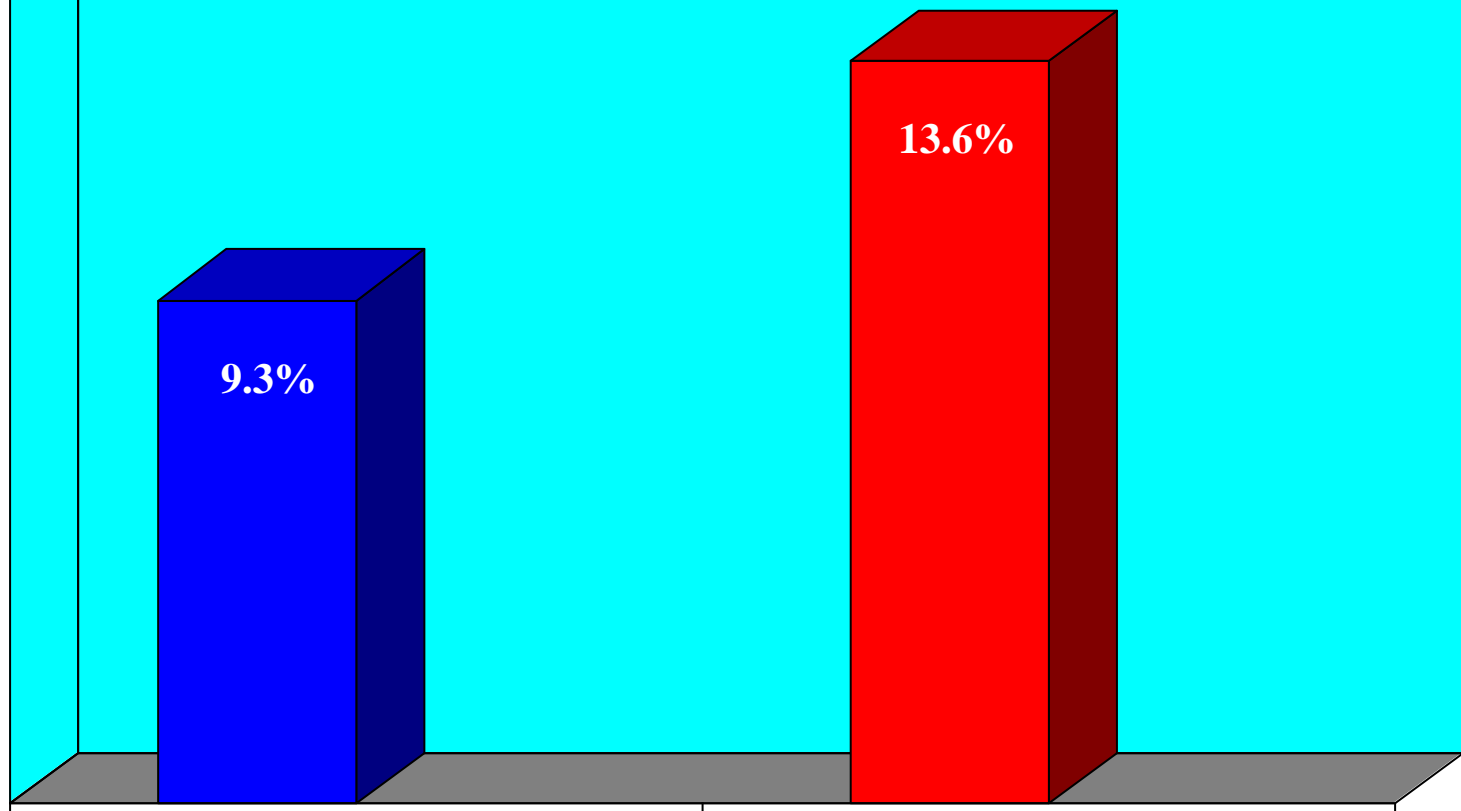


David RJ, Collins JW. Differing birth weight among infants of U.S.-born blacks, African-born blacks, and U.S.-born whites. N Engl J Med. 1997 Oct 23;337(17):1209-14.

Behavior?

Maternal Smoking?

Percent of Women Who Reported Smoking During pregnancy



African American

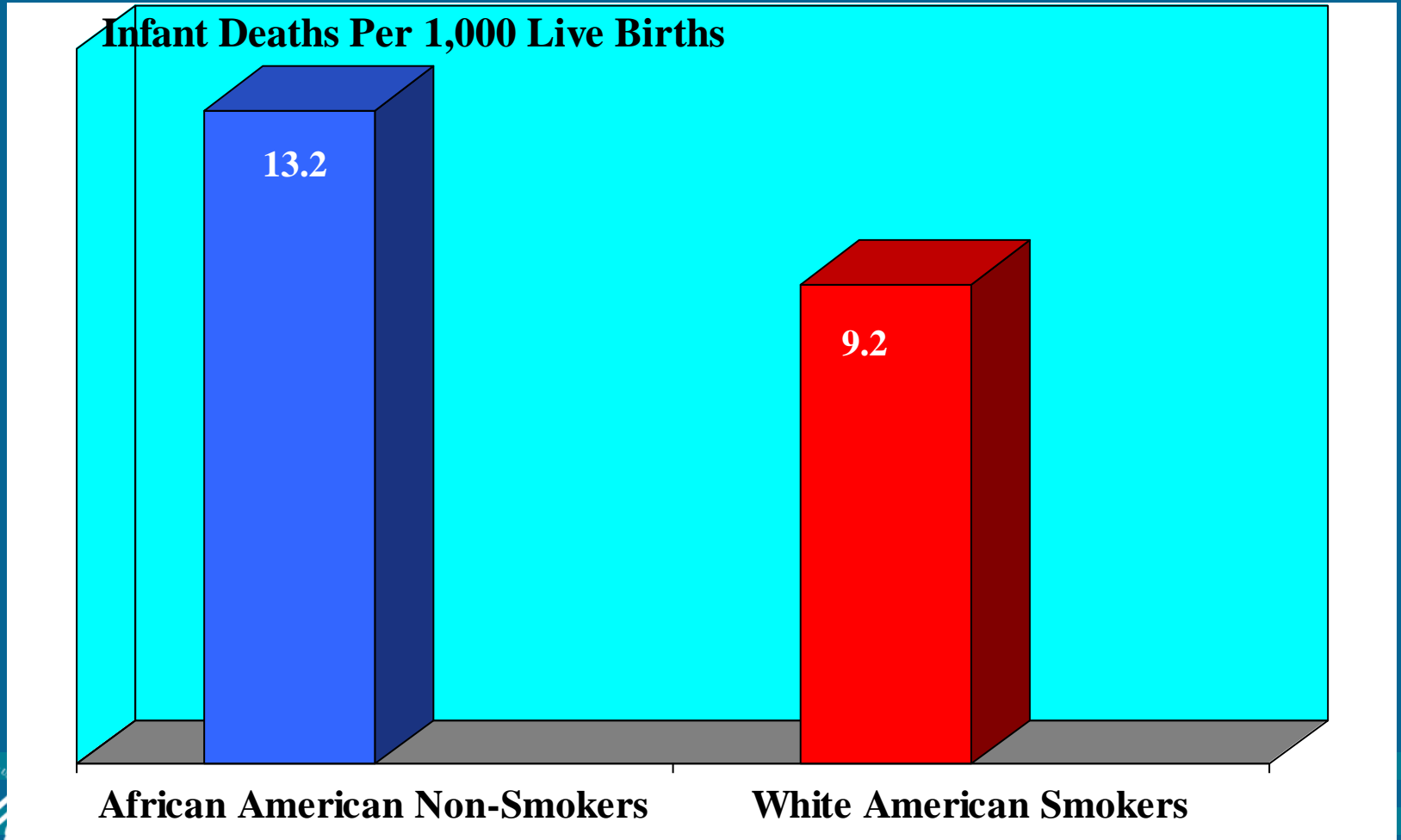
White

NCHS 2002

Health Resources and Services Administration

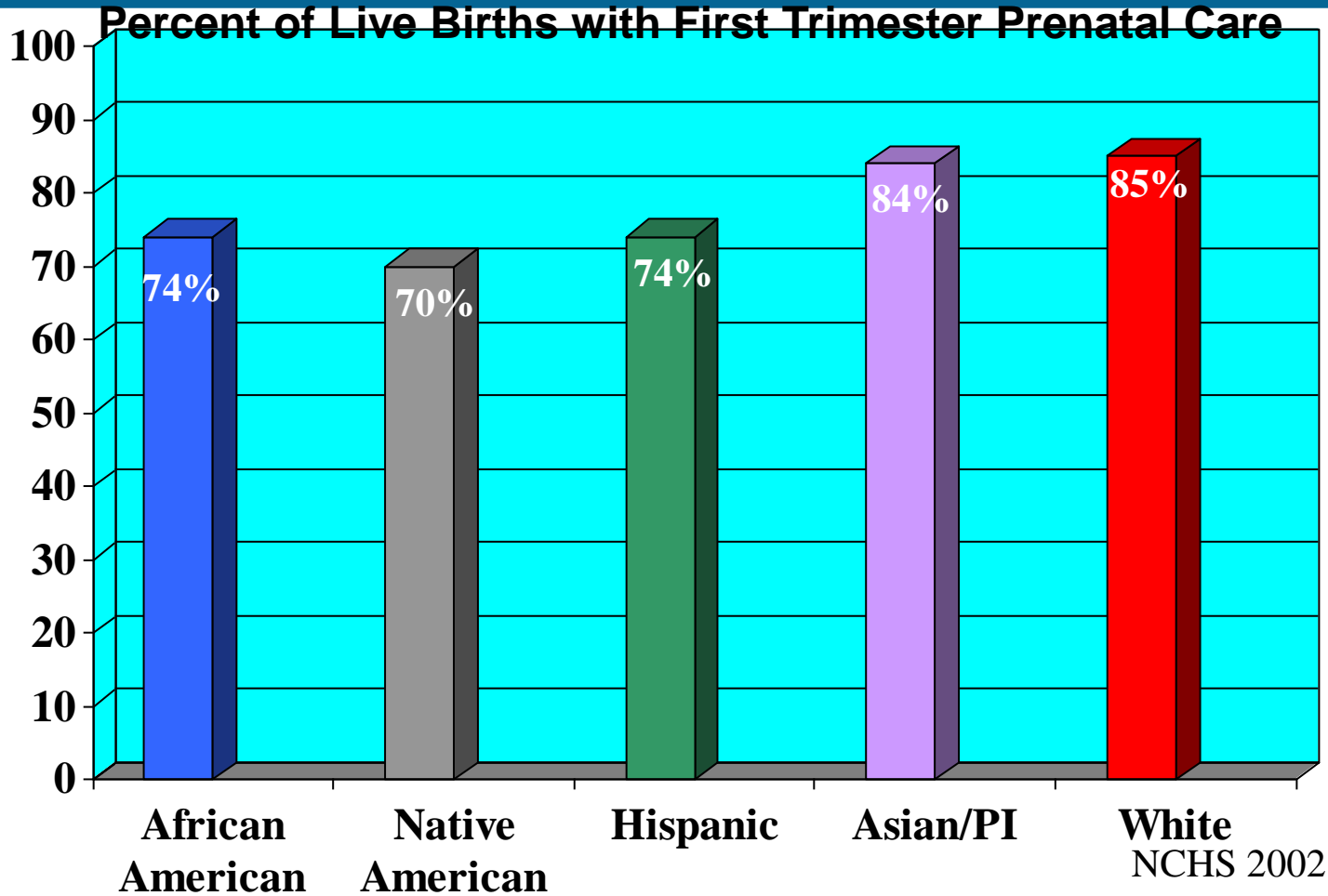


Maternal Smoking?



Prenatal Care?

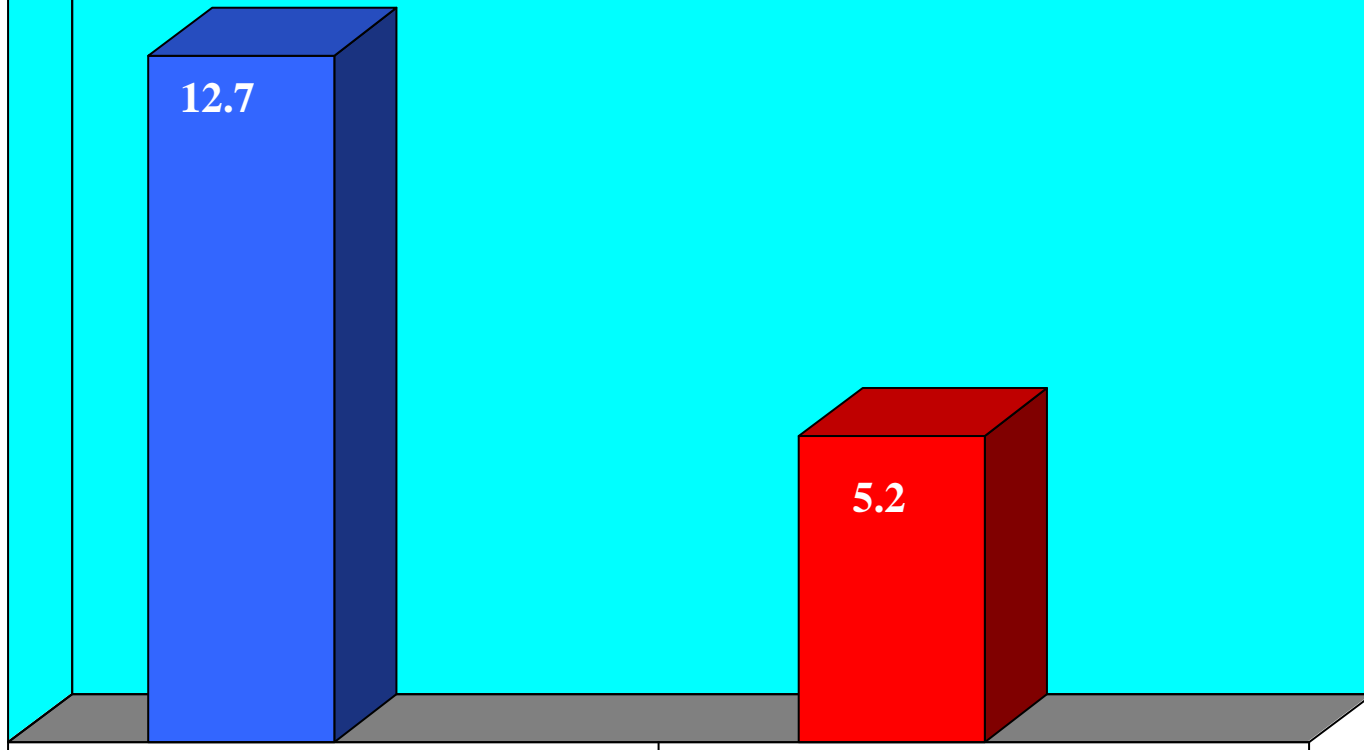
Prenatal Care?



Prenatal Care?

NCHS 1999

Infant Deaths Per 1,000 Live Births

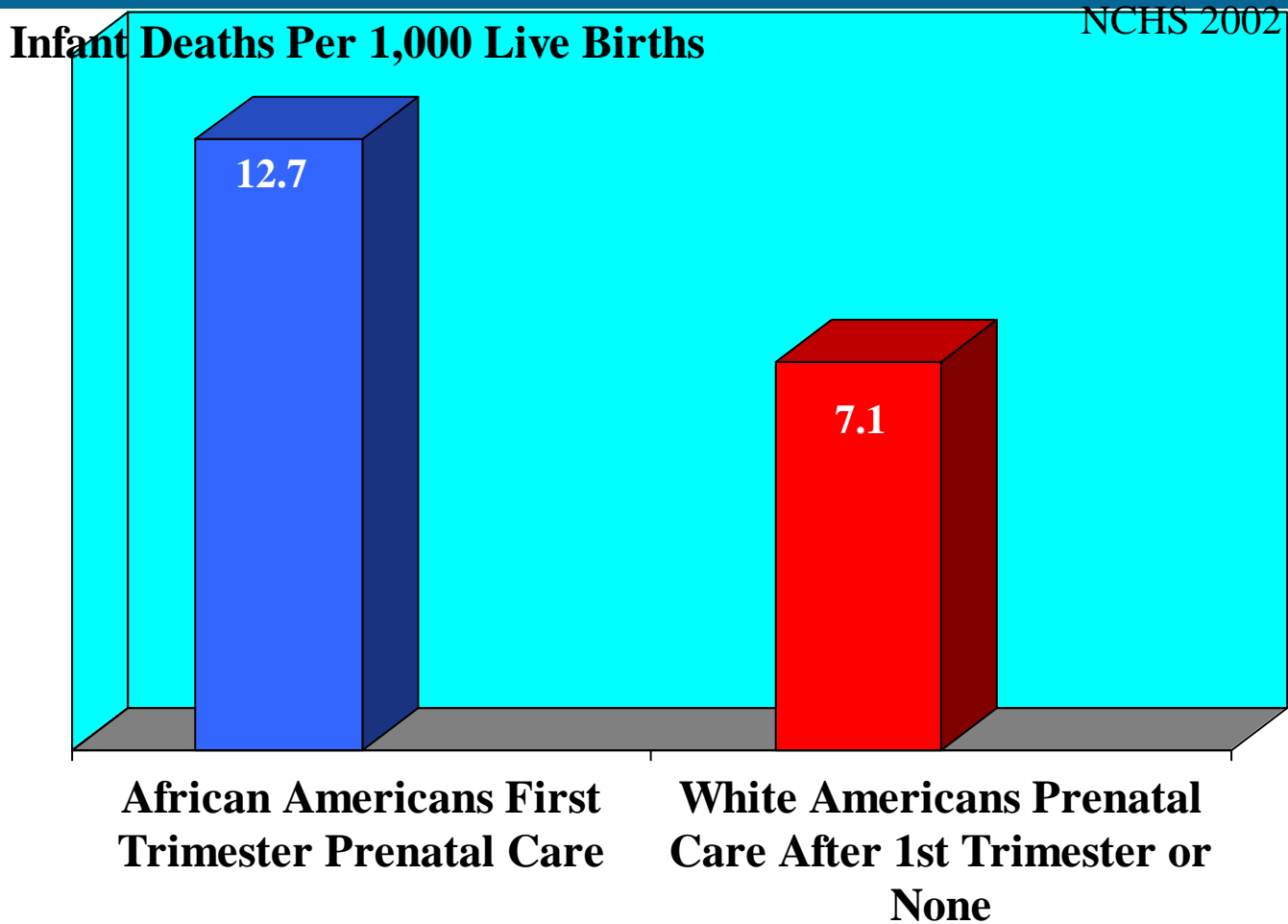


African Americans First Trimester Prenatal Care

White Americans First Trimester Prenatal Care



Prenatal Care?

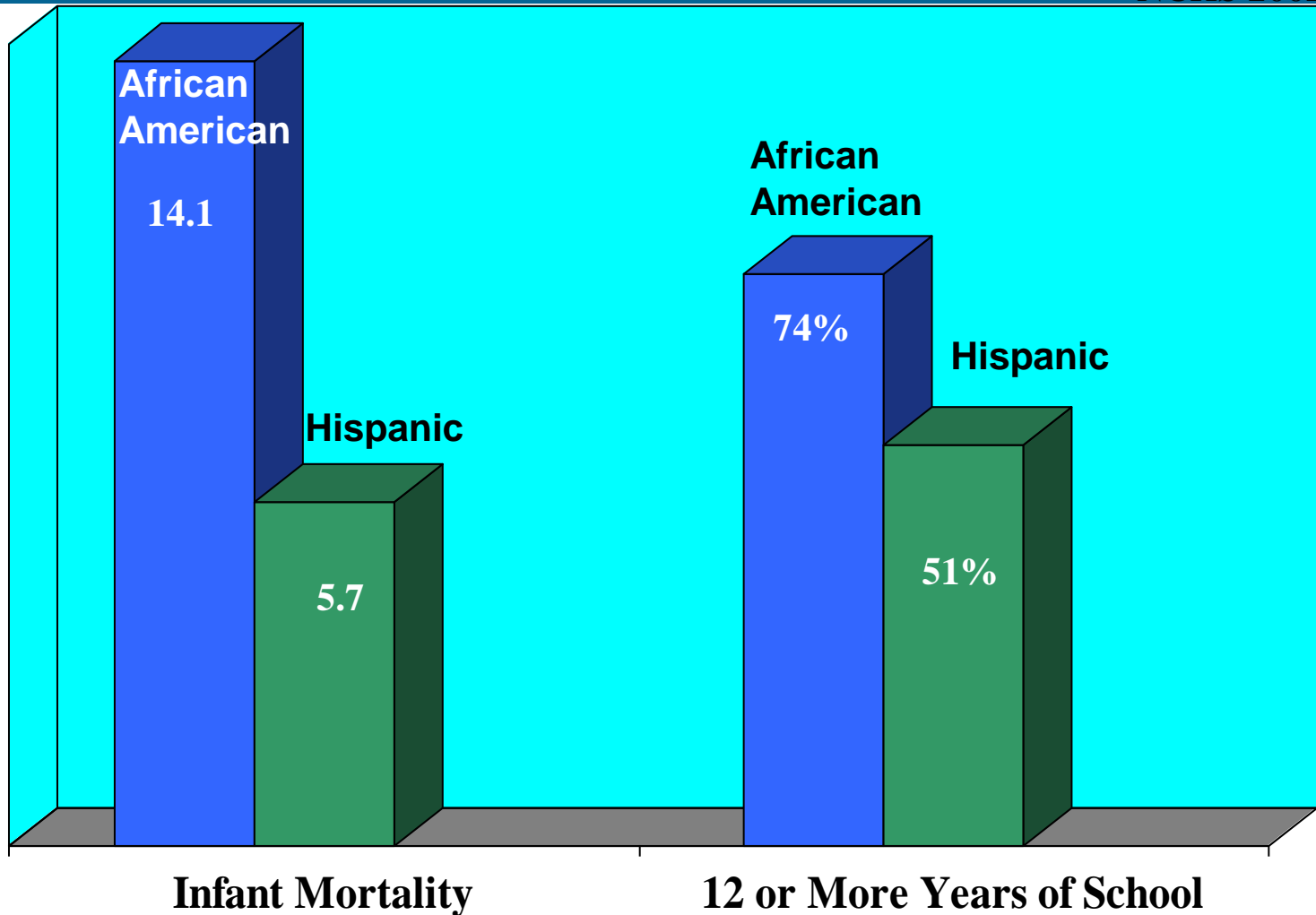


SES?

Racial & Ethnic Disparities

Infant Mortality & Education

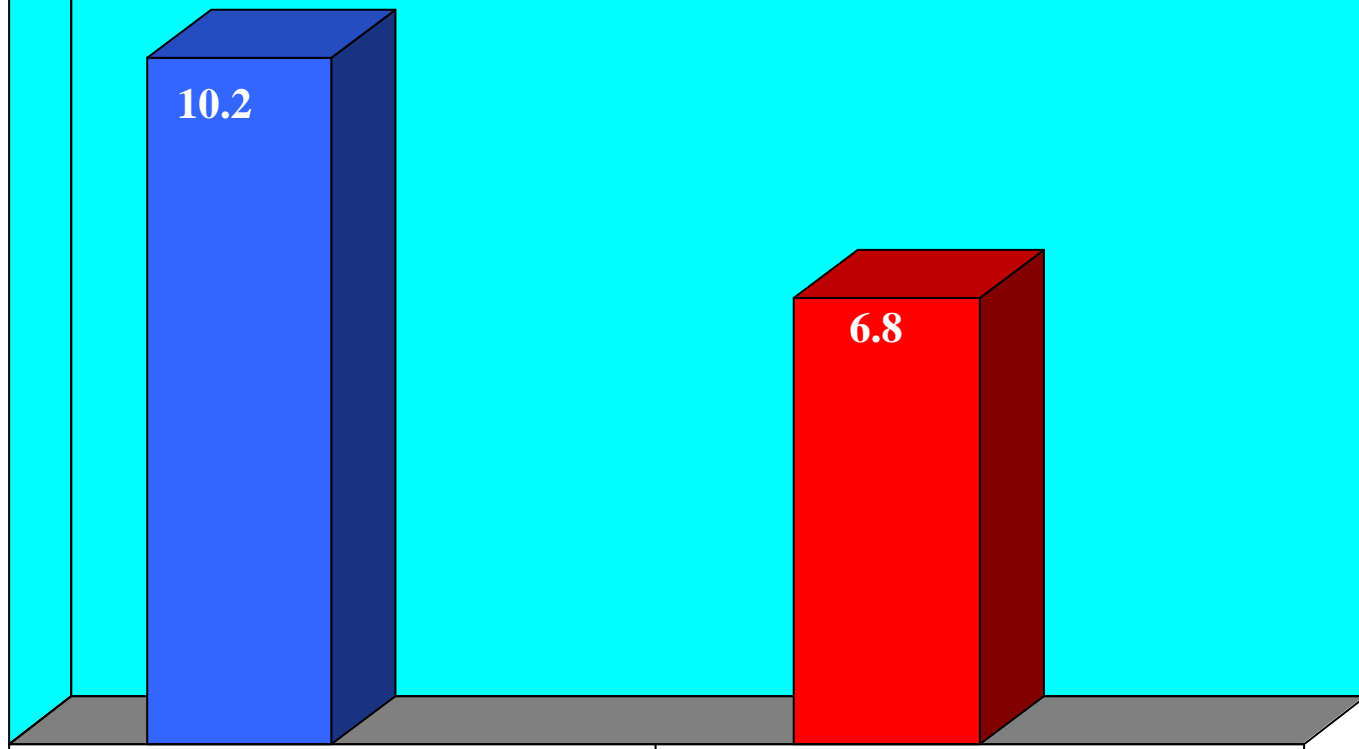
NCHS 2002



SES?

NCHS 2002

Infant Deaths Per 1,000 Live Births



**African Americans 16+ years
of schooling**

**White Americans <9 years of
schooling**



**Multiple
Risk
Factors?**

Racial and Ethnic Disparities

Multiple Determinants of Birth Outcomes

- Shiono et al AJPH 1997
- Controlled for 46 risk factors (demographic characteristics, medical risks, level of living, psychological, social, exposures, “newly defined”)
- 236 g mean birthweight difference between African Americans & whites remained
- Maternal age, smoking, BMI, housing & locus of control only significant covariates
- 46 risk factors explained less than 10% of variation in birthweight



Life Course Perspective

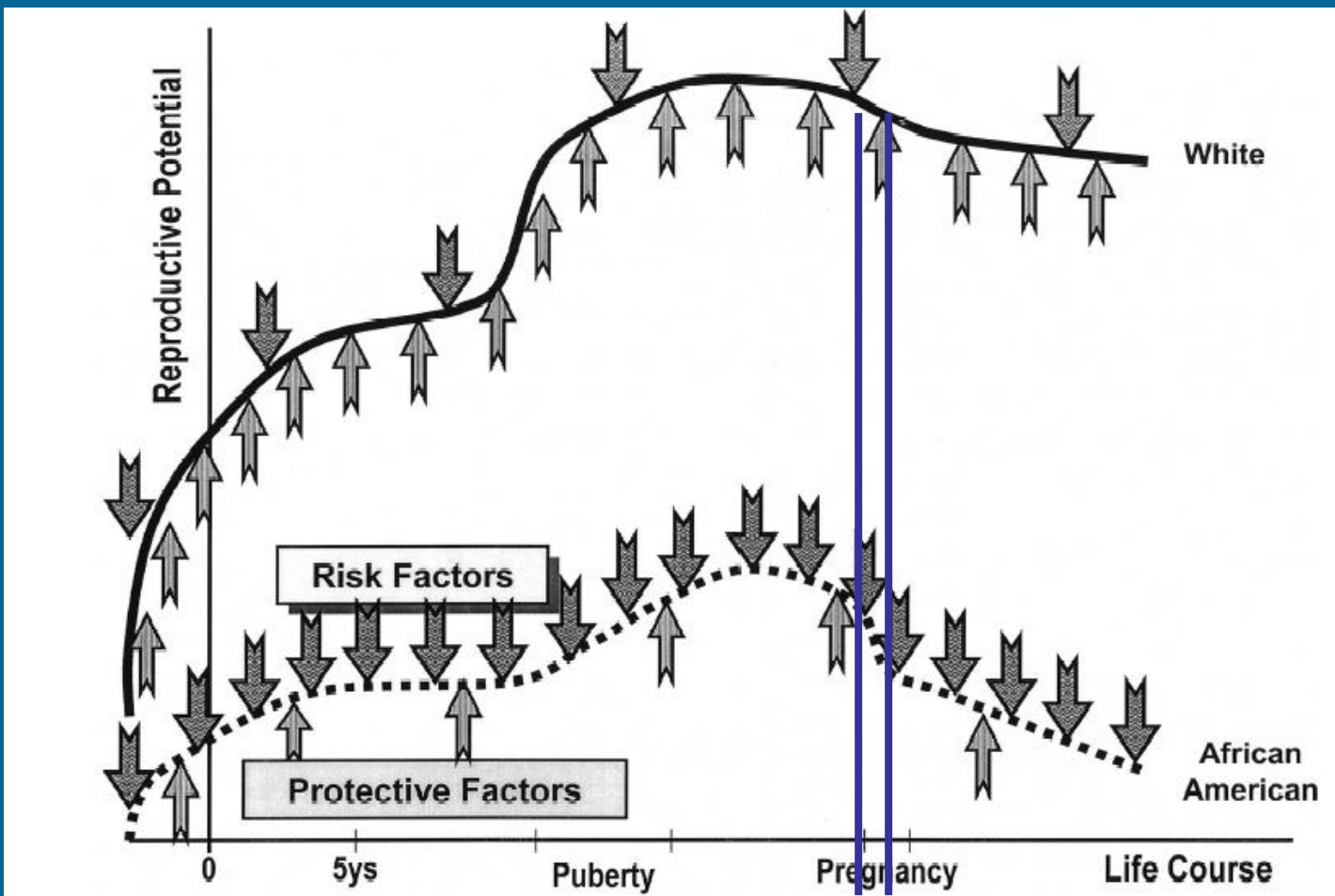


Life-Course Perspective

- A way of looking at life not as disconnected stages, but as an integrated continuum



Life Course Perspective



Lu MC, Halfon N. Racial and ethnic disparities in birth outcomes: a life-course perspective. *Matern Child Health J.* 2003;7:13-30

Life Course Perspective

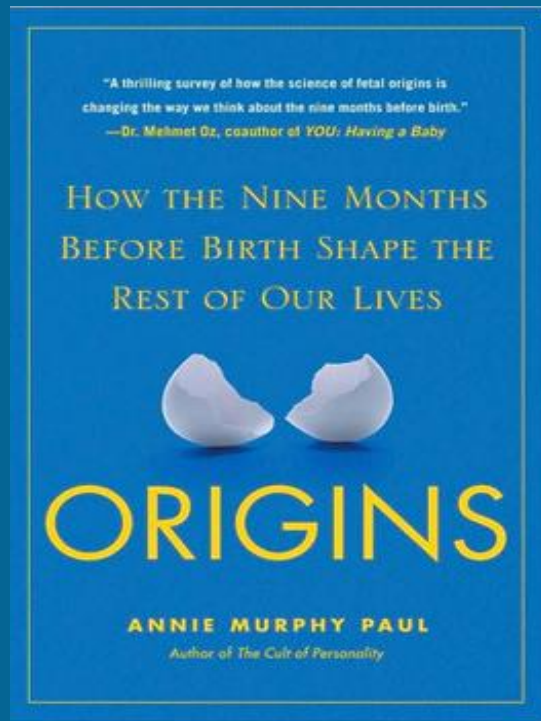
- Early programming
- Cumulative pathways



Early Programming

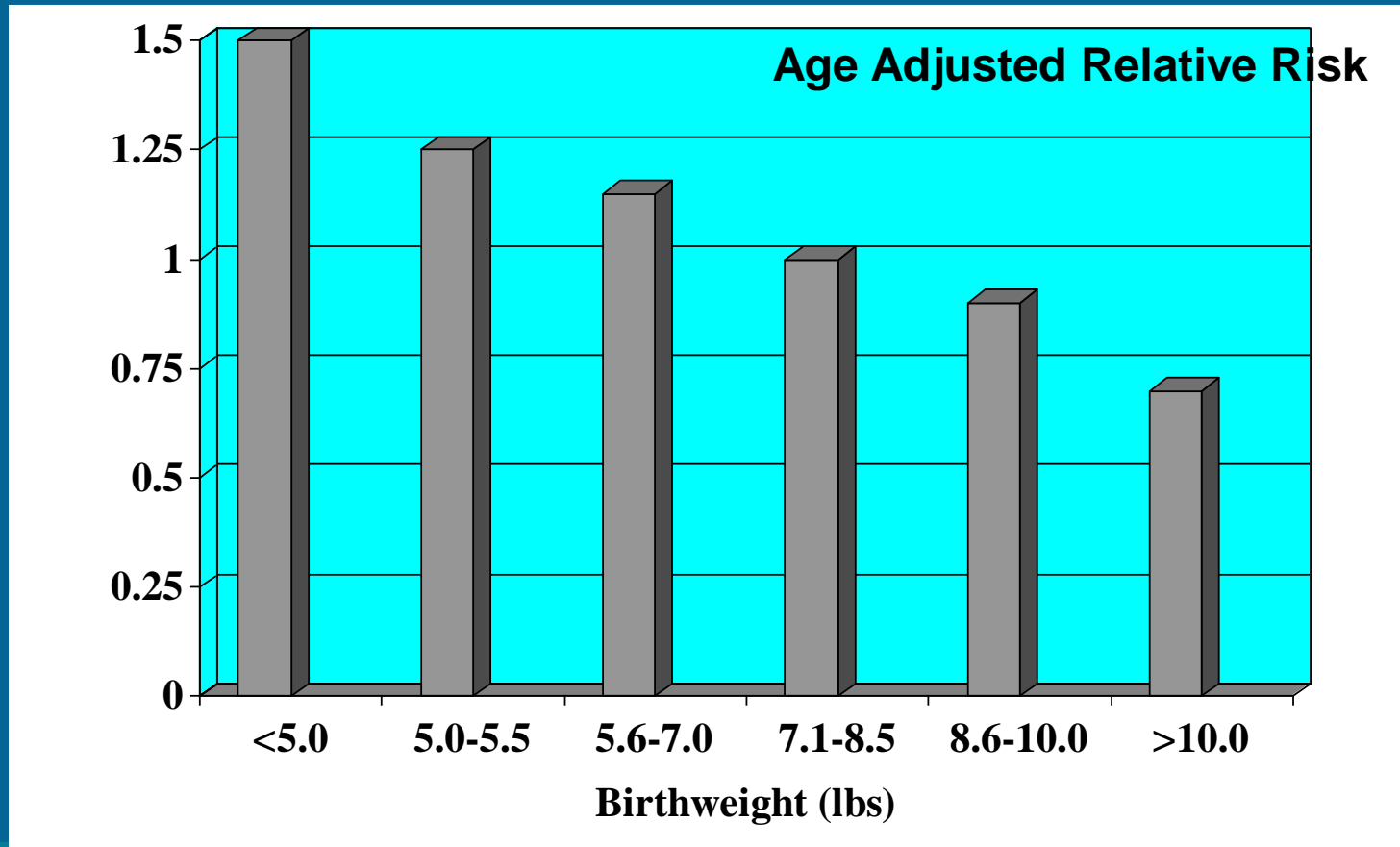


Developmental Origins of Health & Disease



Barker Hypothesis

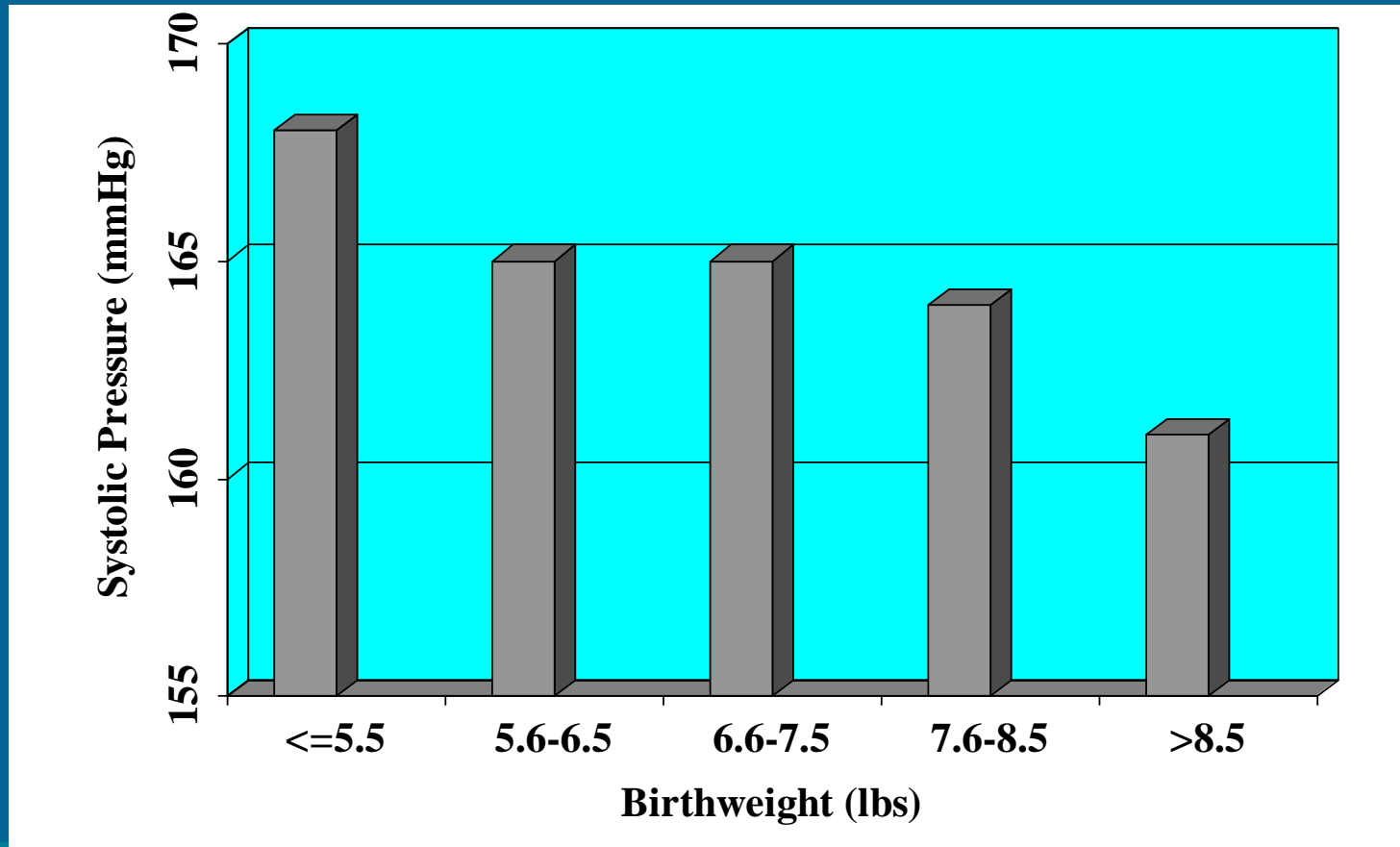
Birth Weight and Coronary Heart Disease



Rich-Edwards JW, Stampfer MJ, Manson JE, Rosner B, Hankinson SE, Colditz GA et al. Birth weight and risk of cardiovascular disease in a cohort of women followed up since 1976. Br Med Jr 1997;315:396-400

Barker Hypothesis

Birth Weight and Hypertension

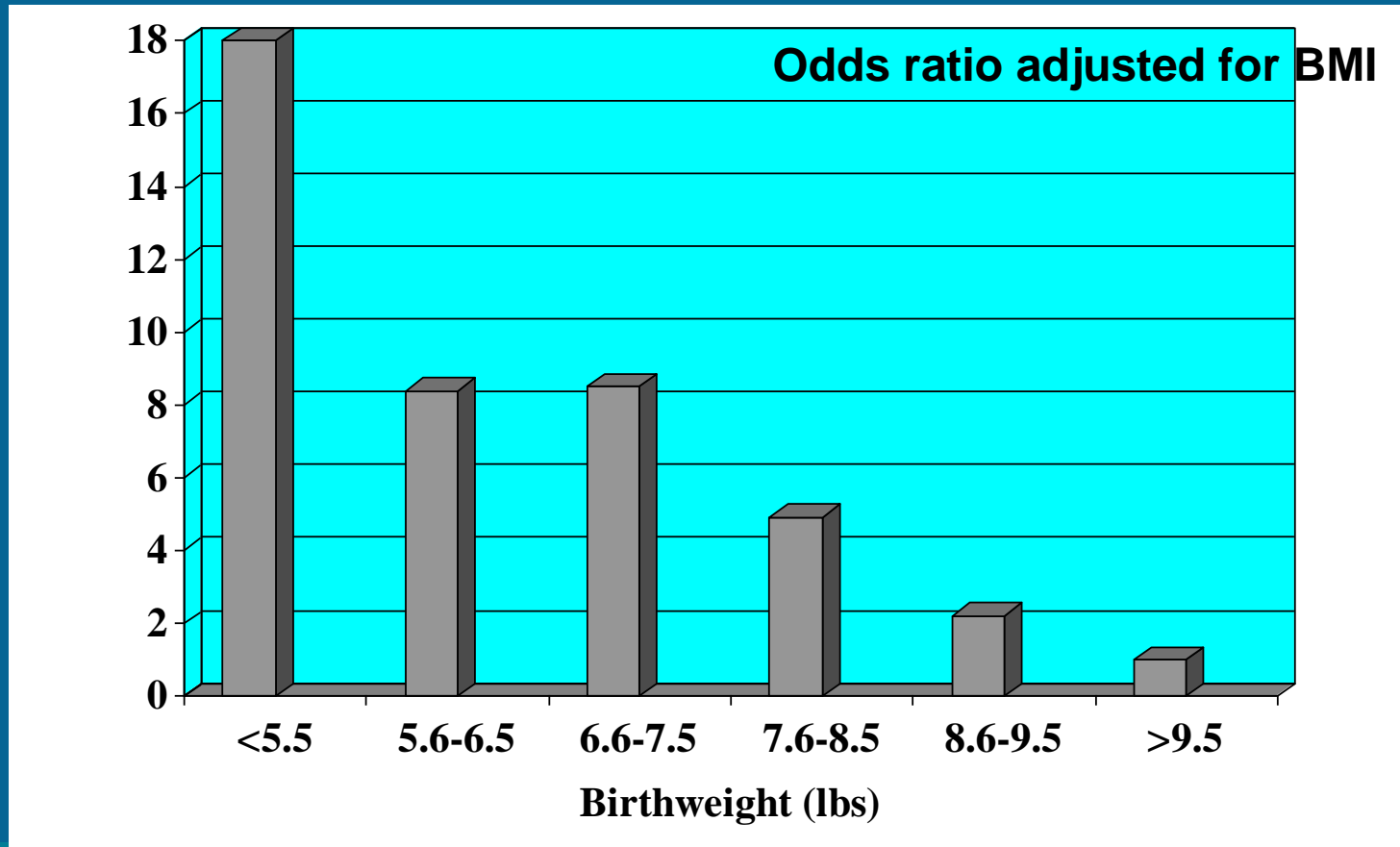


Law CM, de Swiet M, Osmond C, Fayers PM, Barker DJP, Cruddas AM, et al. Initiation of hypertension in utero and its amplification throughout life. *Br Med J* 1993;306:24-27.



Barker Hypothesis

Birth Weight and Insulin Resistance Syndrome



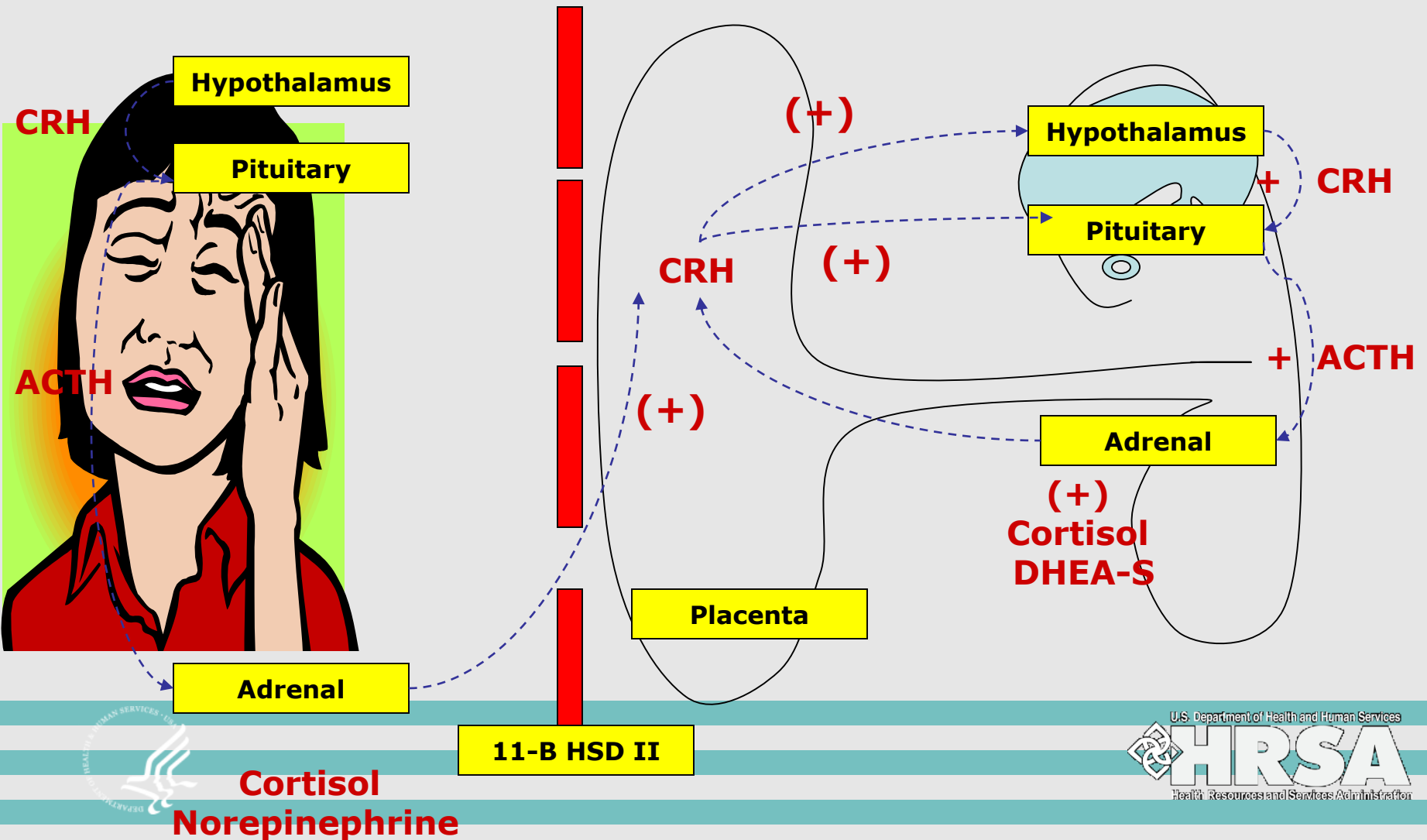
Barker DJP, Hales CN, Fall CHD, Osmond C, Phipps K, Clark PMS. Type 2 (non-insulin-dependent) diabetes mellitus, hypertension and hyperlipidaemia (Syndrome X): Relation to reduced fetal growth. Diabetologia 1993;36:62-67.



Maternal Stress & Fetal Programming



Maternal Stress & Fetal Programming

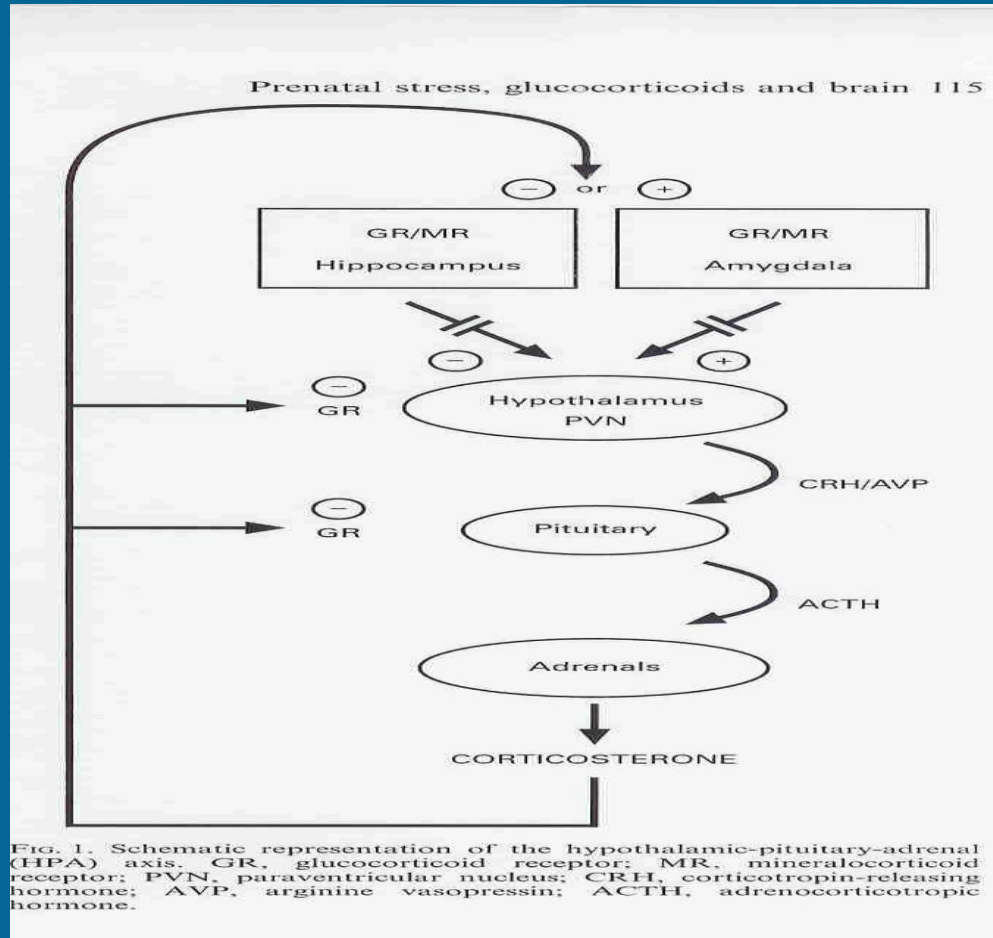


Prenatal Stress & Programming of the Brain

- Prenatal stress (animal model)
 - **Hippocampus**
 - Site of learning & memory formation
 - Stress down-regulates glucocorticoid receptors
 - Loss of negative feedback; overactive HPA axis
 - **Amygdala**
 - Site of anxiety and fear
 - Stress up-regulates glucocorticoid receptors
 - Accentuated positive feedback; overactive HPA axis



Prenatal Programming of the Hypothalamic-Pituitary-Adrenal Axis



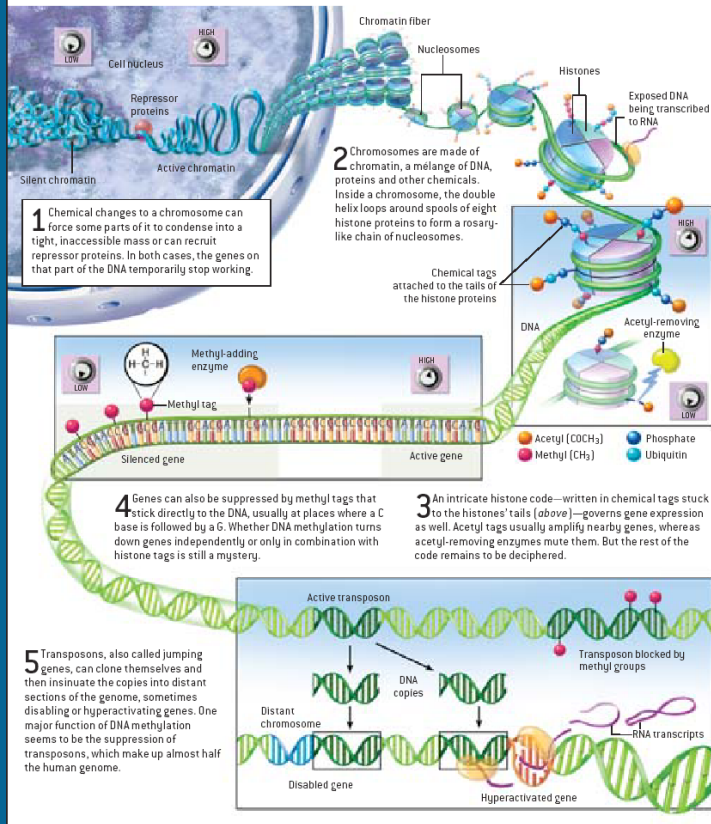
Welberg LAM, Seckl JR. Prenatal stress, glucocorticoids and the programming of the brain. *J Neuroendocrinol* 2001;13:113-28.

Epigenetics

VOLUME CONTROLS FOR GENES

THE DNA SEQUENCE is not the only code stored in the chromosomes. So-called epigenetic phenomena of several kinds can act like volume knobs to amplify or mute the effect of genes. Epigenetic information is encoded as chemical attachments to

the DNA or to the histone proteins that control its shape within the chromosomes. Among their many functions, the epigenetic volume controls muffle parasitic genetic elements, called transposons, that riddle the genome.



Gibbs WW. The Unseen Genome: Beyond DNA. Scientific American 2003

Epigenetics

Same Genome, Different Epigenome



R.A. Waterland, R.A. Jirtle, "Transposable elements: targets for early nutritional effects on epigenetic gene regulation," *Mol Cell Biol*, 23:5293-300, 2003.

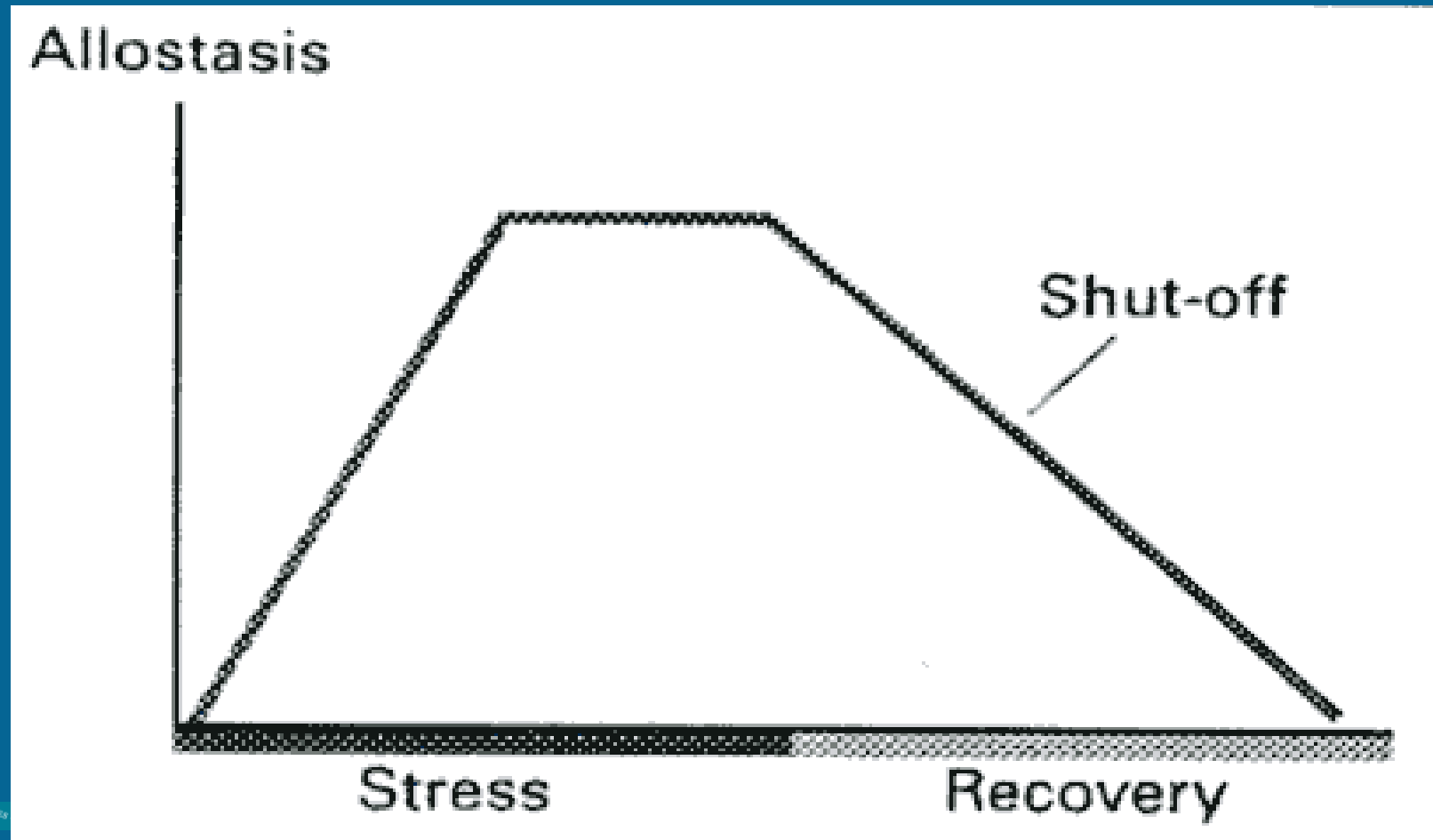
Cumulative Pathways



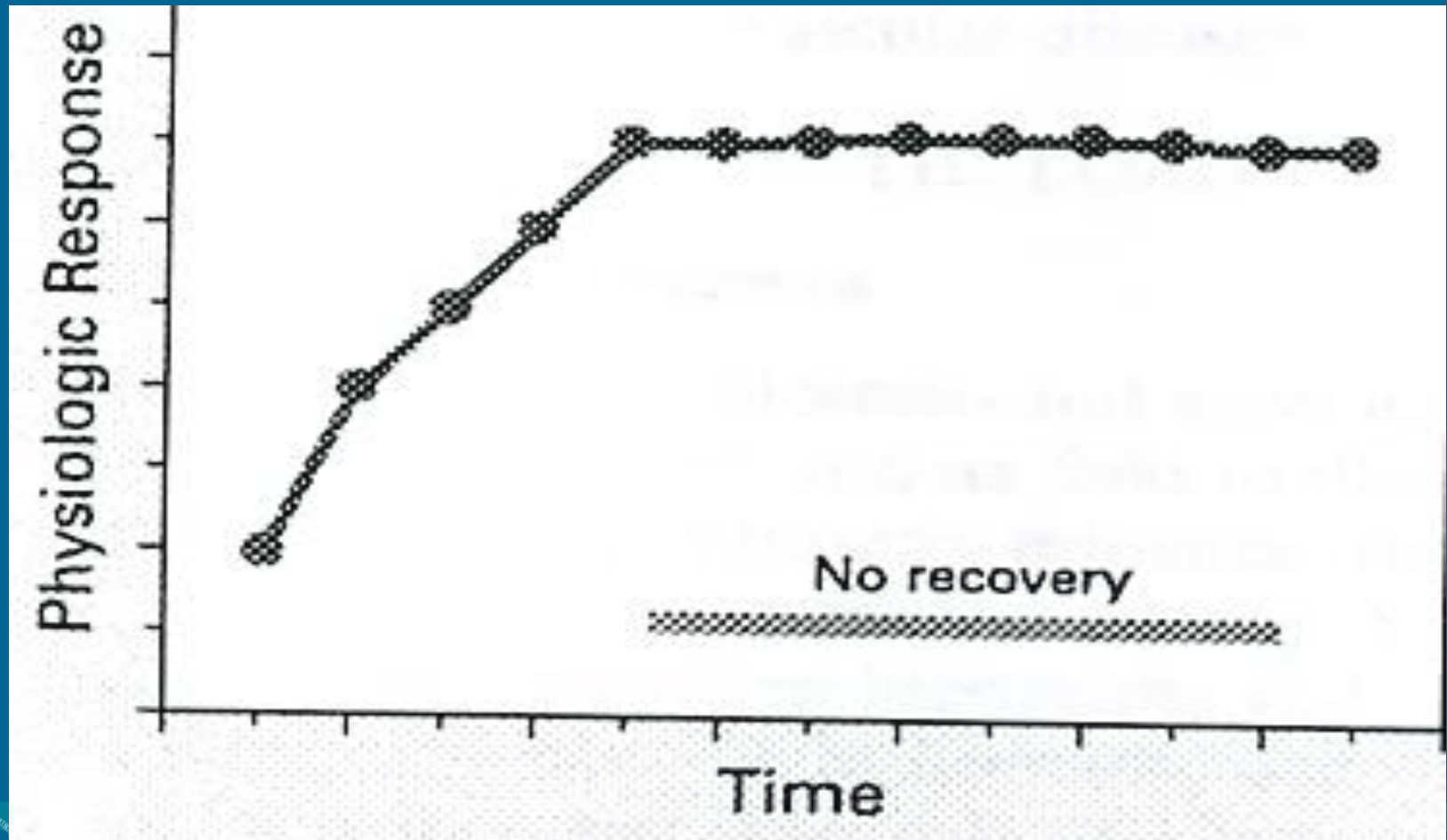


Allostasis:

Maintain Stability through Change



Allostatic Load: Wear and Tear from Chronic Stress



McEwen BS. Protective and damaging effects of stress mediators. *N Eng J Med.* 1998;338:171-9.

Stressed vs. Stressed Out

• Stressed

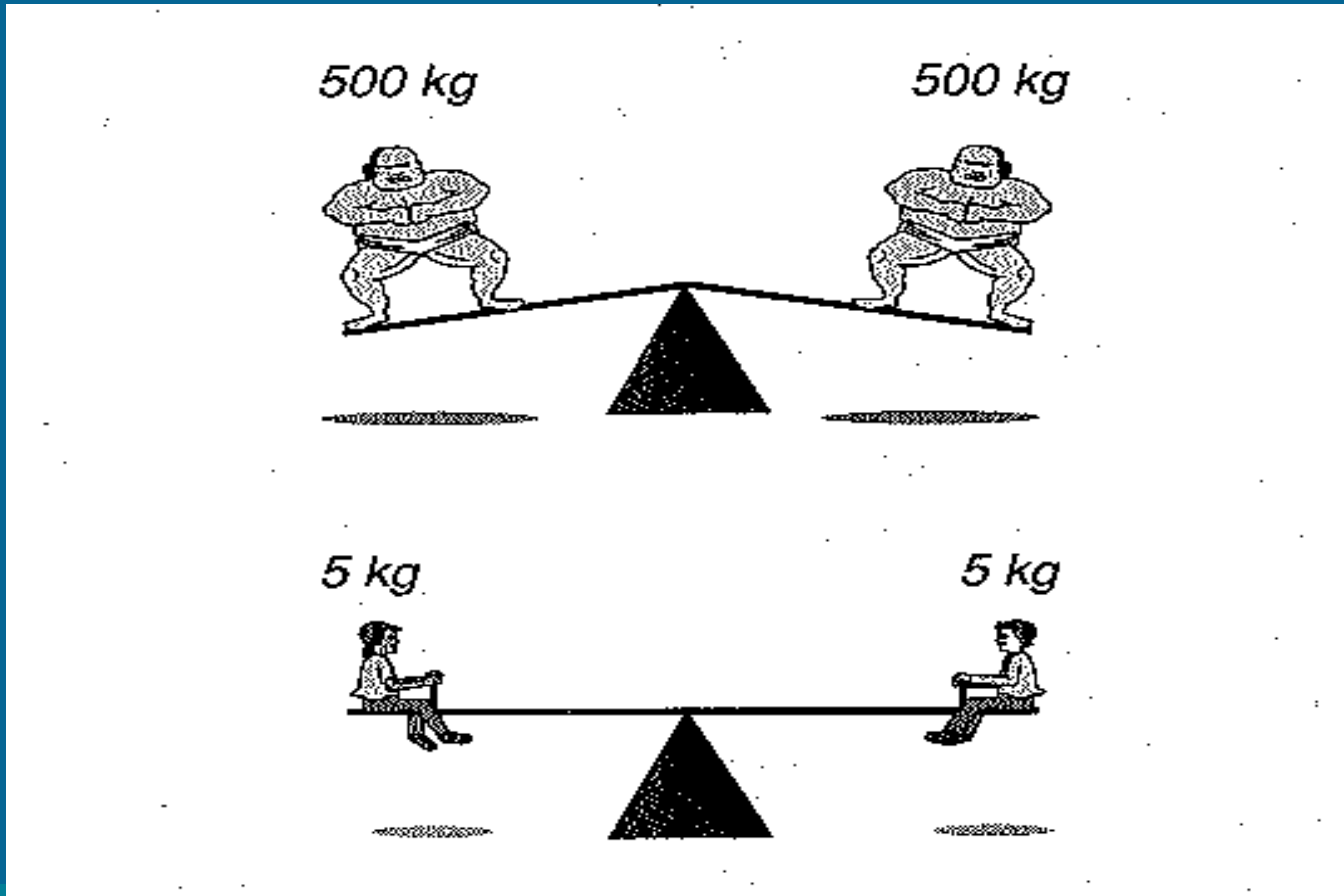
- Increased cardiac output
- Increased available glucose
- Enhanced immune functions
- Growth of neurons in hippocampus & prefrontal cortex

• Stressed Out

- Hypertension & cardiovascular diseases
- Glucose intolerance & insulin resistance
- Infection & inflammation
- Atrophy & death of neurons in hippocampus & prefrontal cortex



Allostasis & Allostatic Load



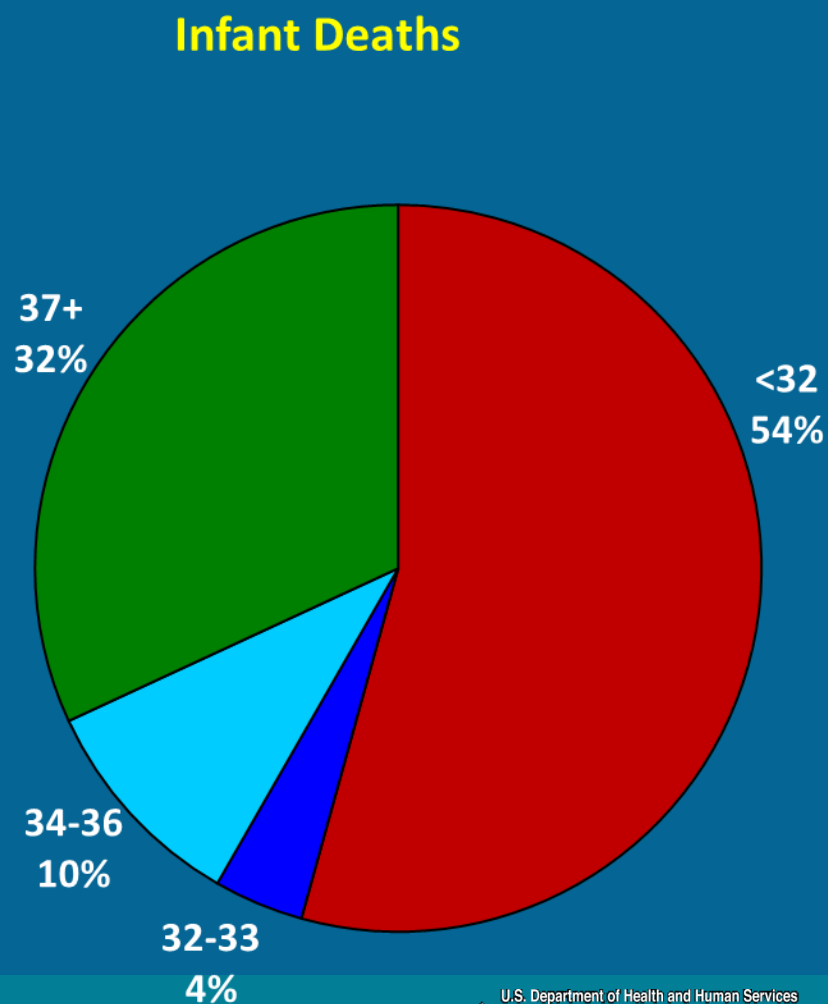
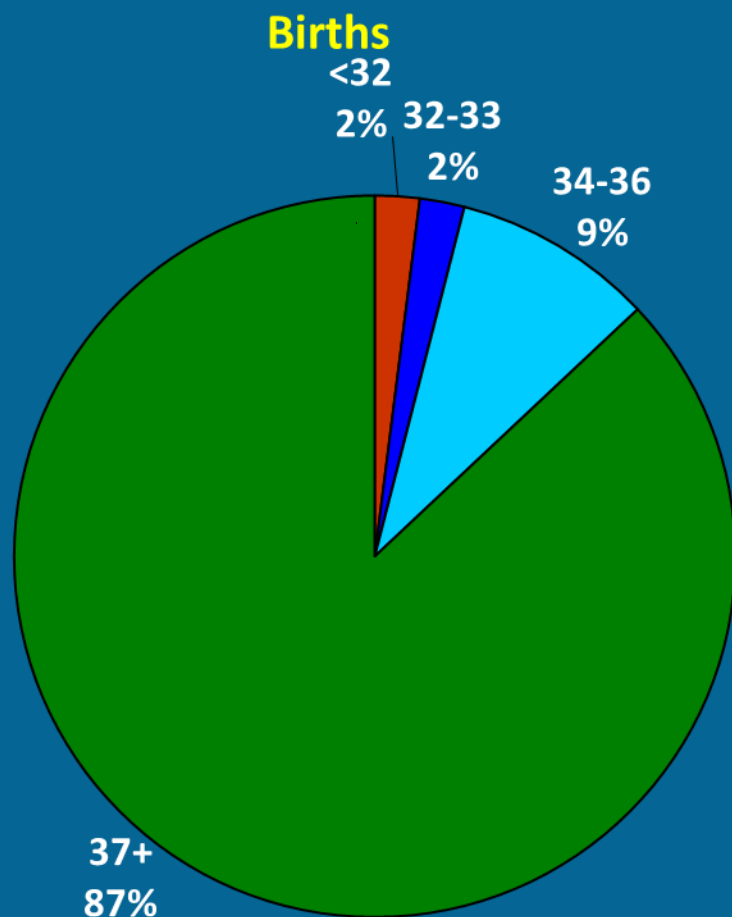
McEwen BS, Lasley EN. The end of stress: As we know it.
Washington DC: John Henry Press. 2002



Rethinking Preterm Birth



Preterm Birth & Infant Mortality, US, 2007



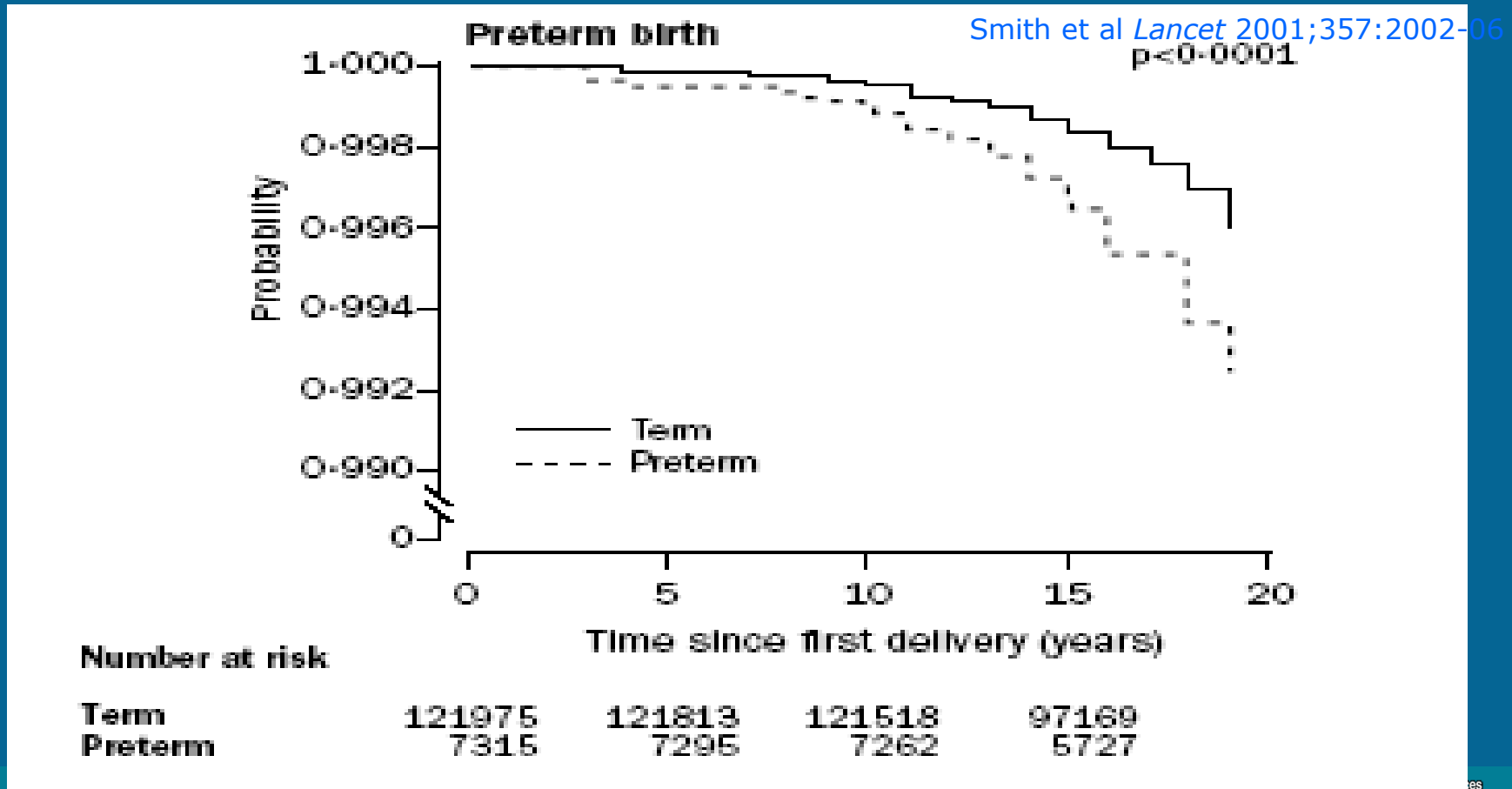
Source: NCHS, linked birth/infant death data set



Rethinking Preterm Birth

Vulnerability to preterm delivery may be traced to not only exposure to stress & infection during pregnancy, but host response to stress & infection (e.g. stress reactivity & inflammatory dysregulation) patterned over the life course (early programming & cumulative allostatic load)

Preterm Birth & Maternal Ischemic Heart Disease



Kaplan-Meier plots of cumulative probability of survival **without** admission or death from ischemic heart disease after first pregnancy in relation to preterm birth

Equity, Race and Access to Midwifery



Closing the Black-White Gap in Birth Outcomes: **A 12-Point Plan**

1. Provide interconception care to women with prior adverse pregnancy outcomes
2. Increase access to preconception care for African American women
3. Improve the quality of prenatal care
4. Expand healthcare access over the life course
5. Strengthen father involvement in African American families
6. Enhance service coordination and systems integration
7. Create reproductive social capital in African American communities
8. Invest in community building and urban renewal
9. Close the education gap
10. Reduce poverty among Black families
11. Support working mothers and families
12. Undo racism



Lu MC, Kotelchuck M, Hogan V, Jones L, Jones C, Halfon N. Closing the Black-White gap in birth outcomes: A life-course approach. *Ethnicity and Disease* 2010;20:S2-62-76

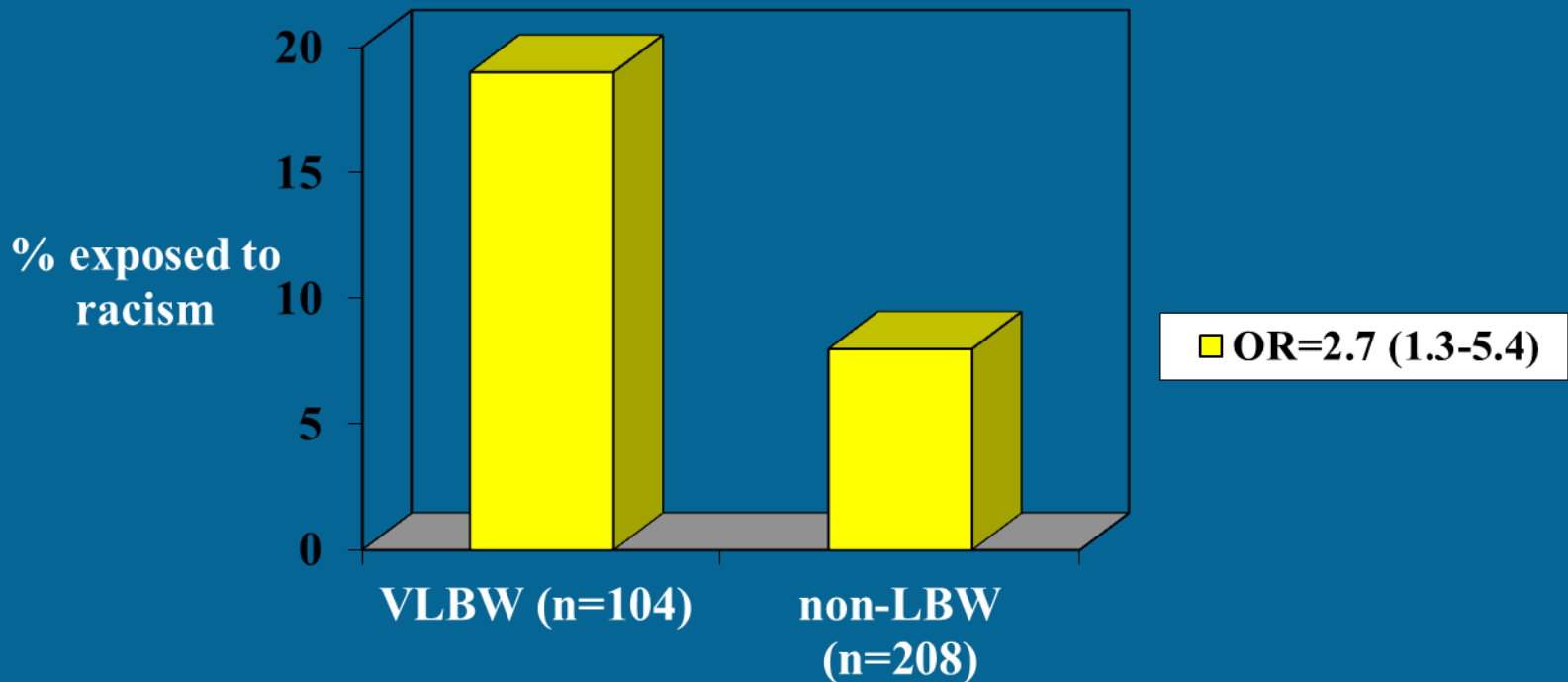


Racism



MATERNAL LIFETIME EXPOSURE TO INTERPERSONAL RACISM IN 3 OR MORE DOMAINS AND INFANT BIRTH WEIGHT

(Collins et al, AJPH, 2004)



Going Public

Levels of Racism: A Theoretic Framework and a Gardener's Tale

Camara Phyllis Jones, MD, MPH, PhD

ABSTRACT

The author presents a theoretic framework for understanding racism on 3 levels: institutionalized, personally mediated, and internalized. This framework is useful for raising new hypotheses about the basis of race-associated differences in health outcomes, as well as for designing effective interventions to eliminate those differences.

She then presents an allegory about a gardener with 2 flower boxes, rich and poor soil, and red and pink flowers. This allegory illustrates the relationship between the 3 levels of racism and may guide our thinking about how to intervene to mitigate the impacts of racism on health. It may also serve as a tool for starting a national conversation on racism. (*Am J Public Health*. 2000;90:1212-1215)

Race-associated differences in health outcomes are routinely documented in this country, yet for the most part they remain poorly explained. Indeed, rather than vigorously exploring the basis of the differences, many scientists either adjust for race or restrict their studies to one racial group.¹ Ignoring the etiologic clues embedded in group differences impedes the advance of scientific knowledge, limits efforts at primary prevention, and perpetuates ideas of biologically determined differences between the races.

The variable race is only a rough proxy for socioeconomic status, culture, and genes, but it precisely captures the social classification of people in a race-conscious society such as the United States. The race noted on a health form is the same race noted by a sales clerk, a police officer, or a judge, and this racial classification has a profound impact on daily life experience in this country. That is, the variable "race" is not a biological construct that reflects innate differences,^{2,4} but a social construct that precisely captures the impacts of racism.

For this reason, some investigators now hypothesize that race-associated differences in health outcomes are in fact due to the effects of racism.^{5,6} In light of the Department of Health and Human Services' Initiative to Eliminate Racial and Ethnic Disparities in Health by the Year 2010,^{7,8} it is important to be able to examine the potential effects of racism in causing race-associated differences in health outcomes.

Levels of Racism

I have developed a framework for understanding racism on 3 levels: institutionalized, personally mediated, and internalized. This framework is useful for raising new hypotheses about the basis of race-associated differences in health outcomes, as well as for designing effective interventions to eliminate those differences. In this framework, *institutionalized racism* is defined as differential ac-

cess to the goods, services, and opportunities of society by race. Institutionalized racism is normative, sometimes legalized, and often manifests as inherited disadvantage. It is structural, having been codified in our institutions of custom, practice, and law, so there need not be an identifiable perpetrator. Indeed, institutionalized racism is often evident as inaction in the face of need.

Institutionalized racism manifests itself both in material conditions and in access to power. With regard to material conditions, examples include differential access to quality education, sound housing, gainful employment, appropriate medical facilities, and a clean environment. With regard to access to power, examples include differential access to information (including one's own history), resources (including wealth and organizational infrastructure), and voice (including voting rights, representation in government, and control of the media). It is important to note that the association between socioeconomic status and race in the United States has its origins in discrete historical events but persists because of contemporary structural factors that perpetuate those historical injustices. In other words, it is because of institutionalized racism that there is an association between socioeconomic status and race in this country.

Personally mediated racism is defined as prejudice and discrimination, where prejudice means differential assumptions about the abilities, motives, and intentions of others accord-

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