

Social Inequalities in Health: The Role of Tobacco Control

David R. Williams, PhD, MPH

Florence & Laura Norman Professor of Public Health
Professor of African & African American Studies and of
Sociology
Harvard University

We Are Not the Healthiest

- U.S. ranks near the bottom of industrialized countries on health, and we are losing ground
 - 1980 = 11th on Life Expectancy
 - 2006 = 33rd , tied with Slovenia
 - U.S. Ranked behind Cyprus, United Arab Emirates, South Korea, Costa Rica and Portugal
 - And it is not just the minorities doing badly!
 - In 2006, White America would be = 30th
 - In 2006, Black America would be 58th
-

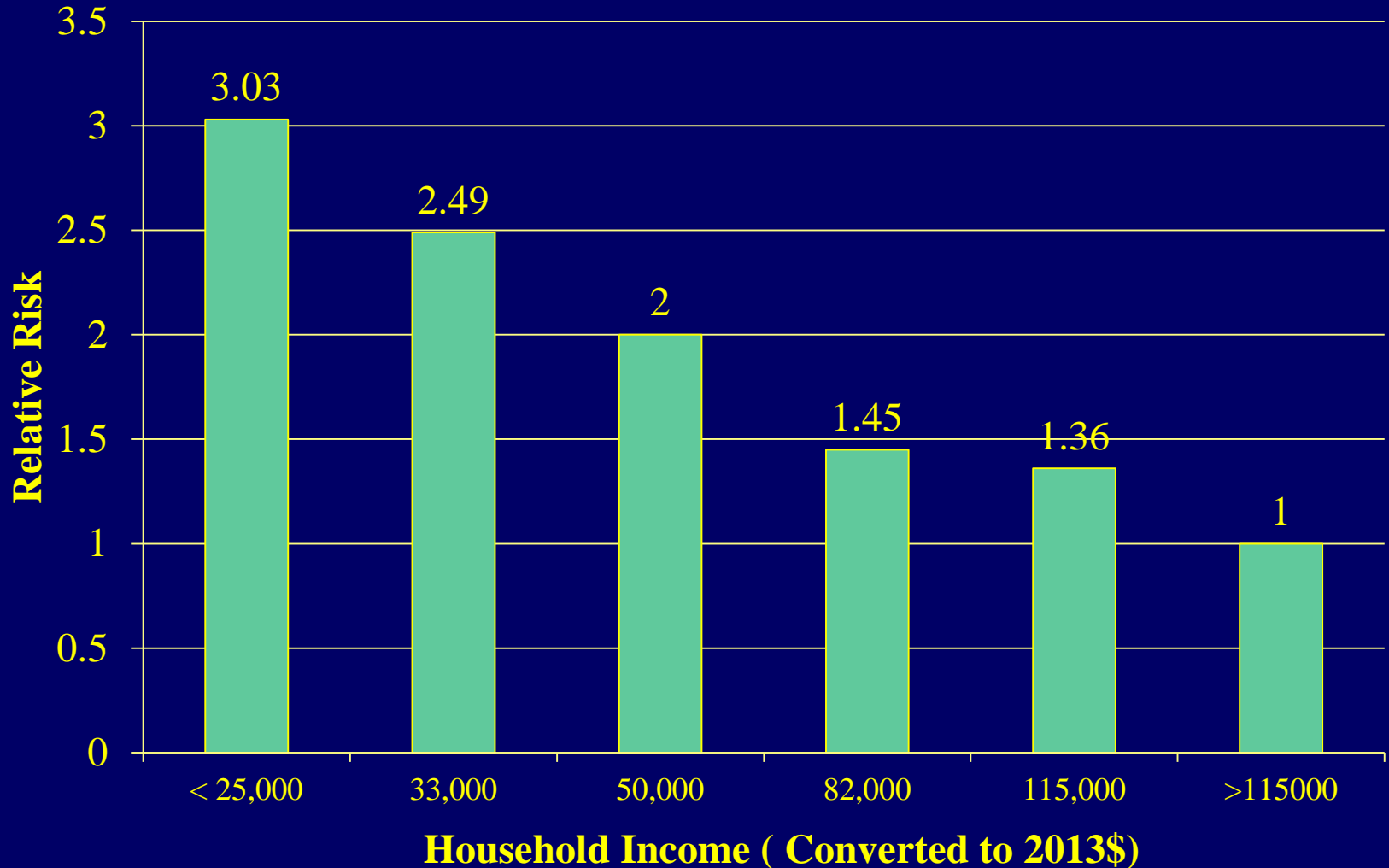
A Larger Context for Disparities

A 2013 IOM report indicated that the poorer health of Americans compared to people in other rich nations

- is evident at all ages, from birth to 75
- even the most advantaged Americans (high SES, healthy behaviors and health insurance) had worse health than their peers in other affluent countries

All Americans are far less healthy than we could, and should be

Relative Risks of All-Cause Mortality by Household Income Level: U.S. Panel Study of Income Dynamics



*There are Large Racial/Ethnic
Differences in SES*

Median Household Income and Race, 2013

Racial Differences in Income are Substantial:

1 dollar



White

1.15 dollar



Asian

70 cents



Hispanic

59 cents



Black

Median Wealth and Race, 2011

For every dollar of wealth that Whites have,



Asians have 81 cents



Blacks have only 6 cents



Latinos have only 7 cents



Race and Health: Two Patterns

- Racial groups with a long history characterized by economic exploitation, social stigmatization, and geographic marginalization have markedly elevated levels of poor health outcomes:
 - Blacks or African Americans
 - American Indians and Alaskan Natives
 - Native Hawaiians and other Pacific Islanders
 - Immigrant groups tend to have better health than the U.S. average, but their health tends to worsen over time and across subsequent generations:
 - Asians
 - Hispanics or Latinos
-

Allostatic Load

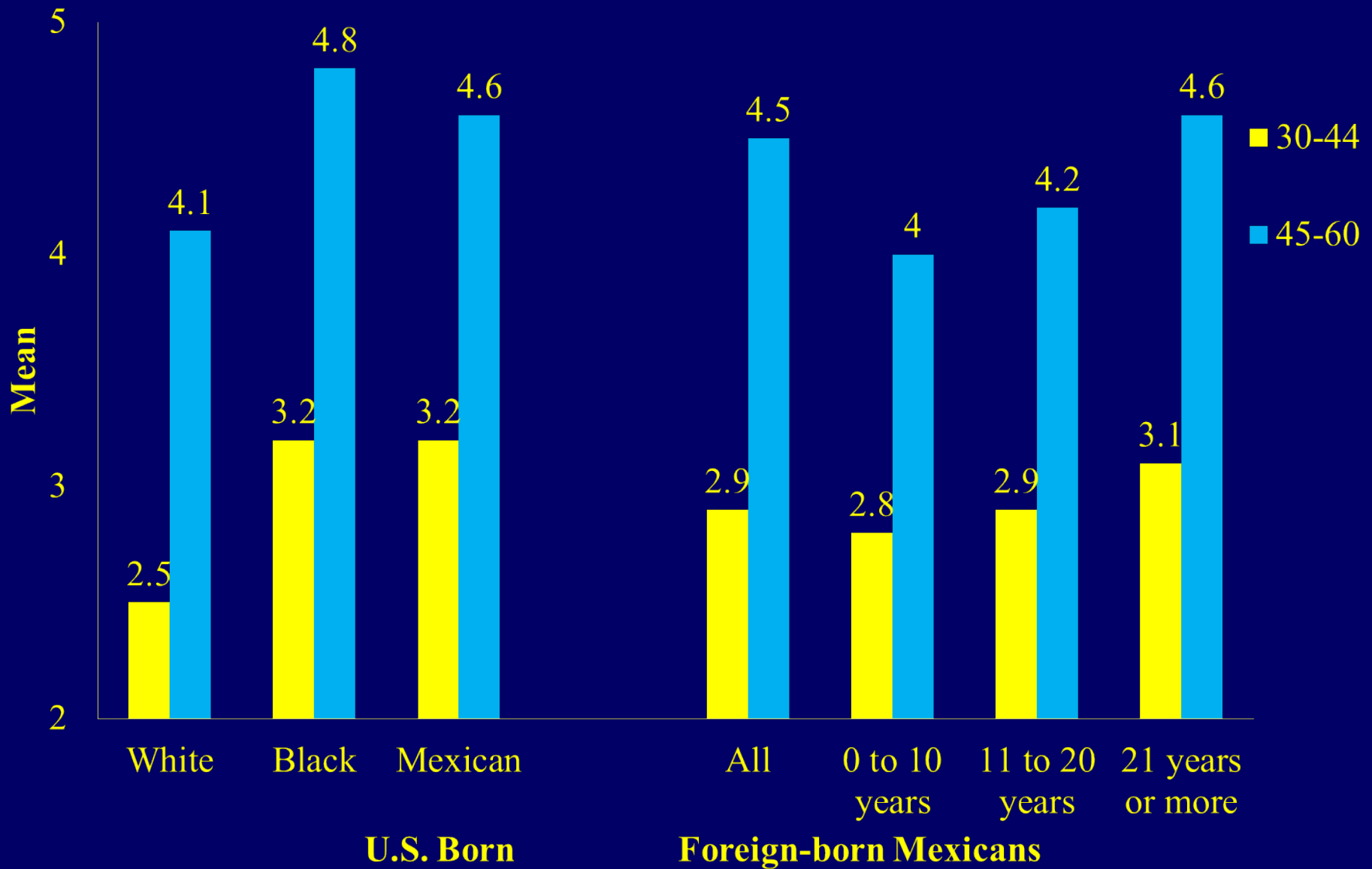
10 biomarkers

High-risk thresholds *

1.Systolic blood pressure	127 mm HG
2.Diastolic blood pressure	80 mm HG
3.Body Mass Index	30.9
4.Glycated hemoglobin	5.4%
5.Albumin	4.2 g/dL
6.Creatinine clearance	66 mg/dL
7.Triglycerides	168 mg/dL
8.C-reactive protein	0.41 mg/dL
9.Homocysteine	9 µmol/L
10.Total cholesterol	225

* = < 25th percentile for creatinine clearance; >75th percentile for others

Mean Allostatic Load, by Race & Nativity



Research & Policy Challenge

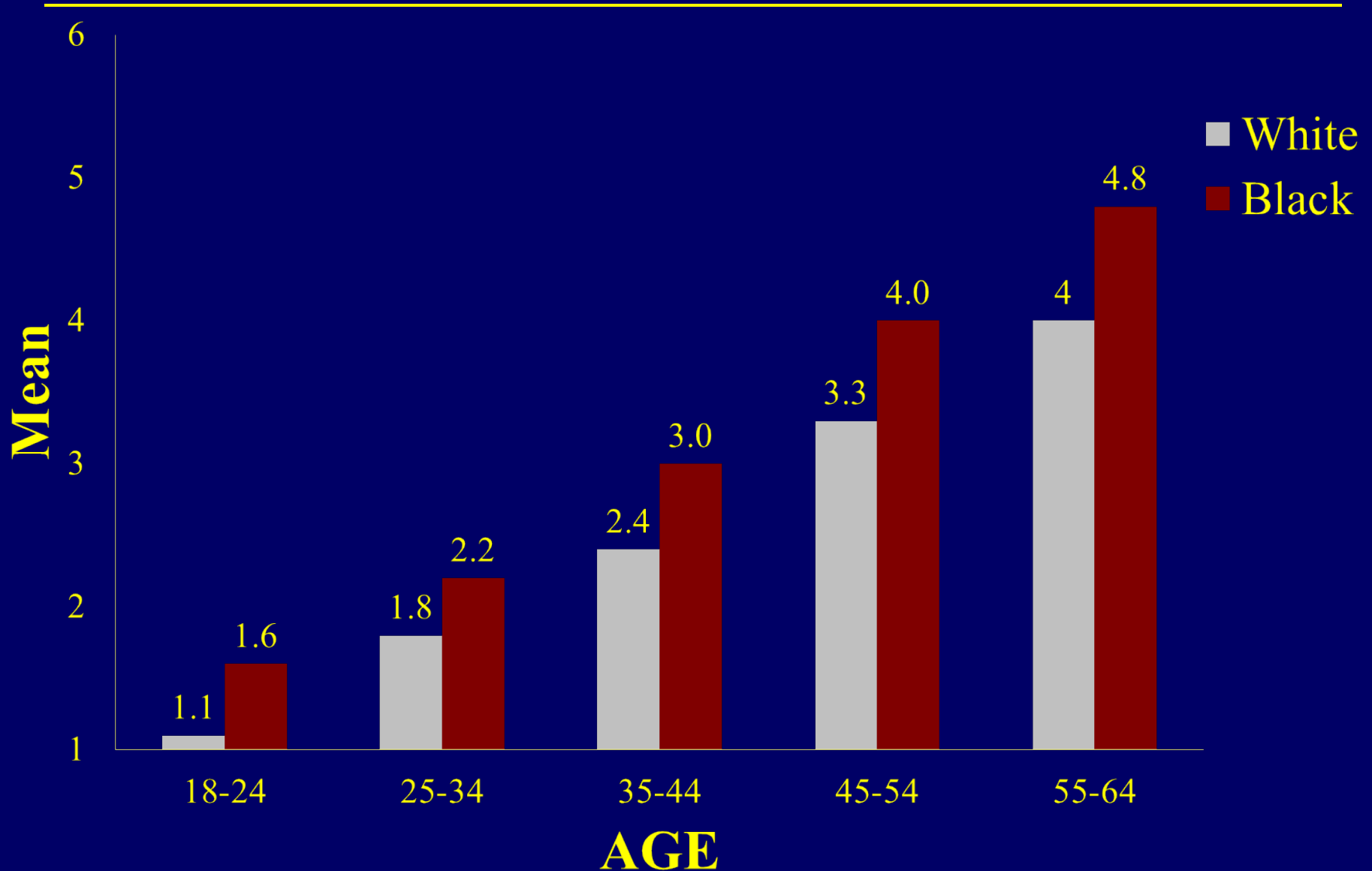
What interventions, if any, can reverse the downward health trajectory of immigrants with length of stay in the U.S.?

Massive Loss of Lives



265 Deaths Every Day

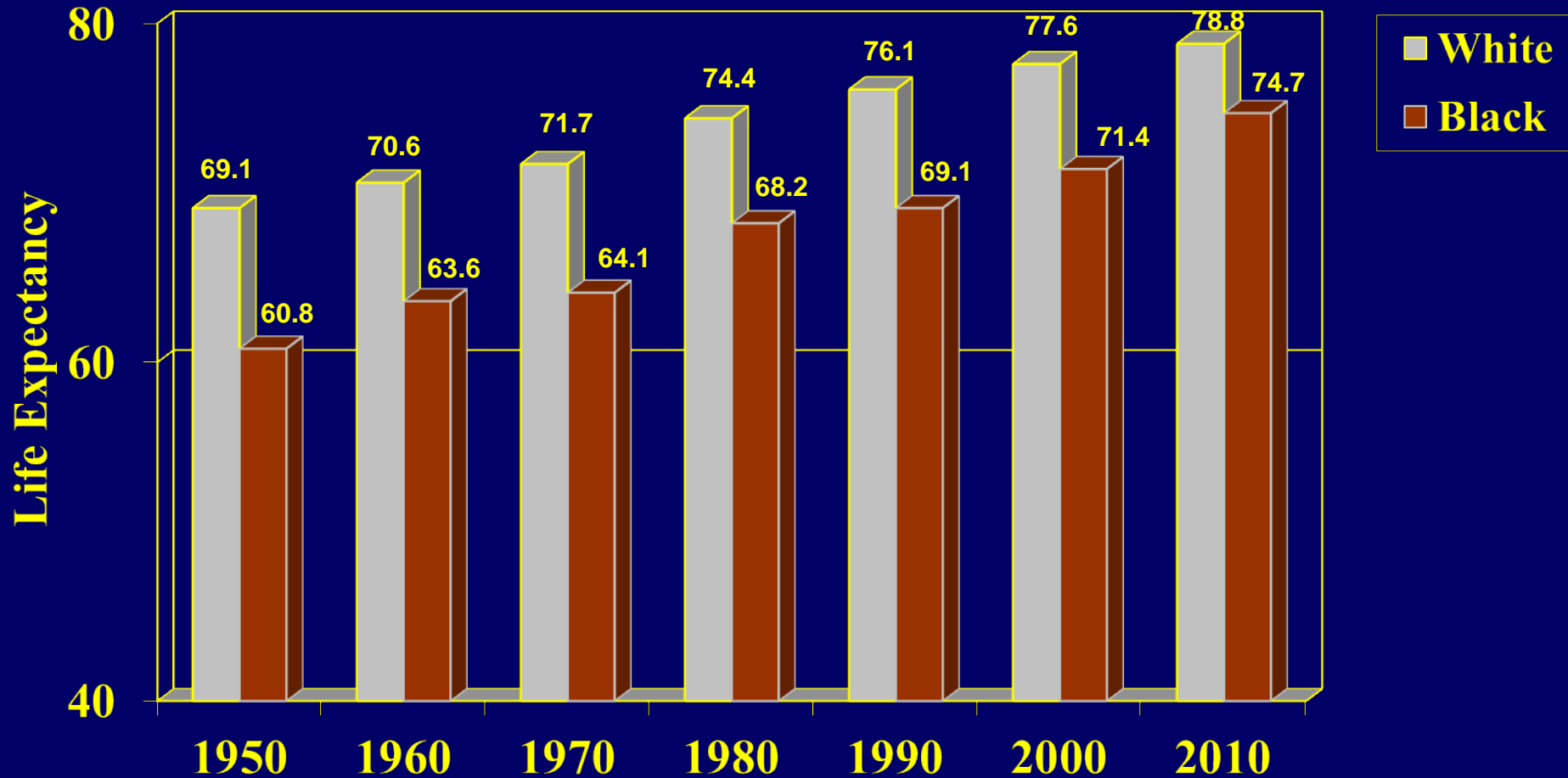
Mean Score on Allostatic Load by Age



Biological Weathering

- Chronological age captures duration of exposure to risks for groups living in adverse living conditions
- U.S. blacks are experiencing greater physiological wear and tear, and are aging, biologically, more rapidly than whites
- It is driven by the cumulative impact of repeated exposures to psychological, social, physical and chemical stressors in their residential, occupational and other environments, and coping with these stressors
- Compared to whites, blacks experience higher levels of stressors, greater clustering of stressors, and probably greater duration and intensity of stressors

Life Expectancy Lags, 1950-2010



Source: NCHS, Health United States, 2013

Racial/Ethnic Disparities in Health:

More than just Socioeconomic Status

Life Expectancy At Age 25

Group	White	Black	Difference
All	53.4	48.4	5.0

Life Expectancy At Age 25

Group	White	Black	Difference
All	53.4	48.4	5.0
Education			
a. 0-12 Years	50.1		
b. 12 Years	54.1		
c. Some College	55.2		
d. College Grad	56.5		
Difference	6.4		

Life Expectancy At Age 25

Group	White	Black	Difference
All	53.4	48.4	5.0
Education			
a. 0-12 Years	50.1	47.0	
b. 12 Years	54.1	49.9	
c. Some College	55.2	50.9	
d. College Grad	56.5	52.3	
Difference	6.4	5.3	

Life Expectancy At Age 25

Group	White	Black	Difference
All	53.4	48.4	5.0
Education			
a. 0-12 Years	50.1	47.0	3.1
b. 12 Years	54.1	49.9	4.2
c. Some College	55.2	50.9	4.3
d. College Grad	56.5	52.3	4.2
Difference	6.4	5.3	

Why Race Still Matters

1. Health is affected not only by current SES but by exposure to adversity over the life course.
 2. All indicators of SES are non-equivalent across race. Compared to whites, blacks & Hispanics receive less income at the same levels of education, have less wealth at the equivalent income levels, and have less purchasing power (at a given income level) because of higher costs of goods and services.
 3. Personal experiences of discrimination and institutional racism are added pathogenic factors that can affect the health in multiple ways.
 4. Higher Exposure to multiple stressors
-

Tobacco: Weapon of Mass Destruction



SMOKING KILLS MORE THAN 5 MILLION EVERY YEAR.
SAY NO TO THE DEADLIEST WEAPON OF MASS DESTRUCTION.



Smoking and Health

- Worldwide 5 million die from tobacco each year
- In the US: Almost 500,00 deaths annually
- Tobacco causes 1 in 5 deaths in the US
- 21 Diseases caused by smoking ... and counting
- Death rates are 2 to 3 times higher for smokers than non-smokers
- On average, smokers die more than 10 years earlier than non-smokers

Most Preventable Cause of Death

**Start taking your
life back today**

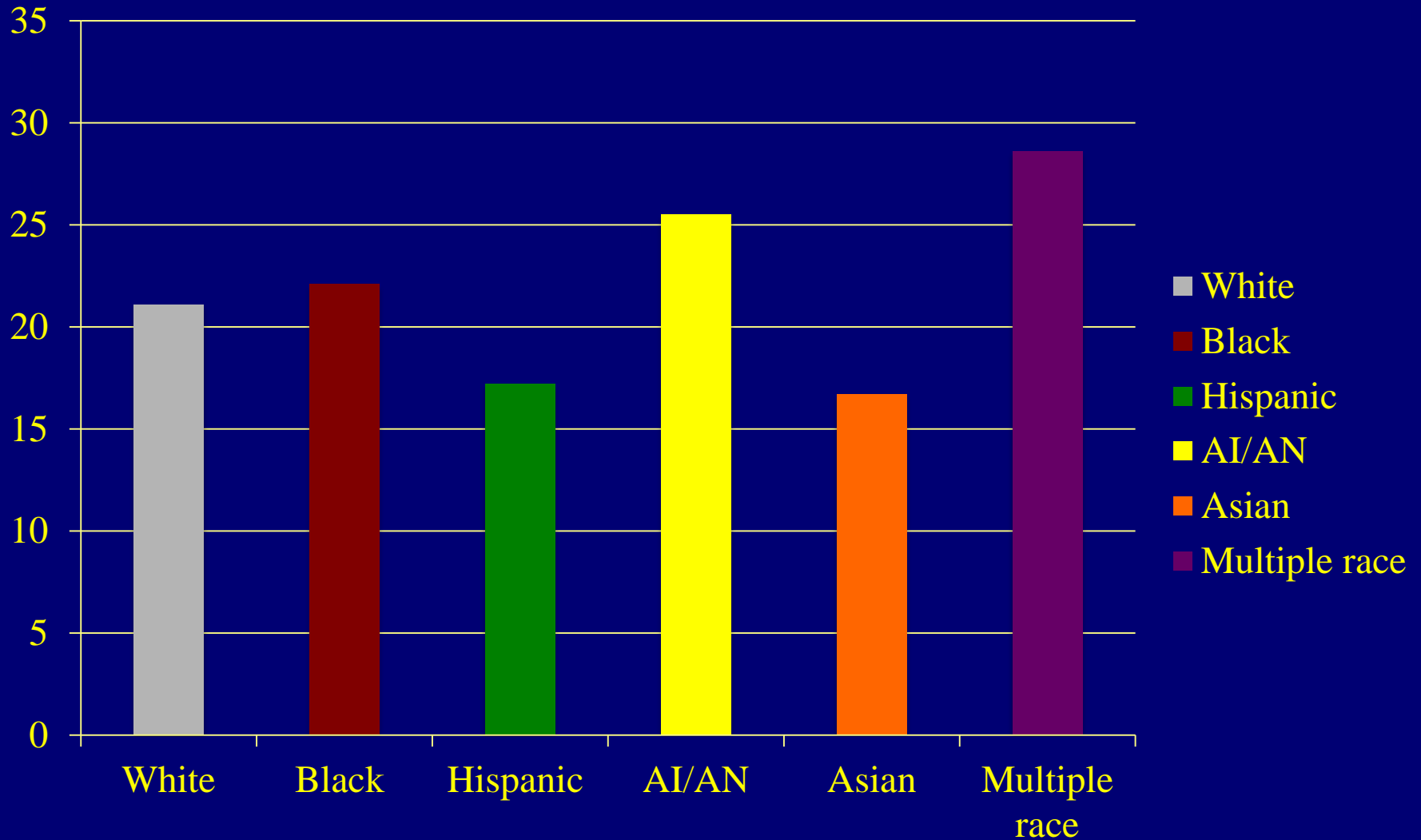


- Despite declines in cigarette use, smoking is still the single most preventable cause of death
- Smoking causes more deaths than overweight and obesity, high cholesterol, alcohol, and the low intake of fruits and vegetables combined
- The gap in overall mortality between smokers and non-smokers is larger than that between low and high SES groups of the same smoking status

Lung Cancer

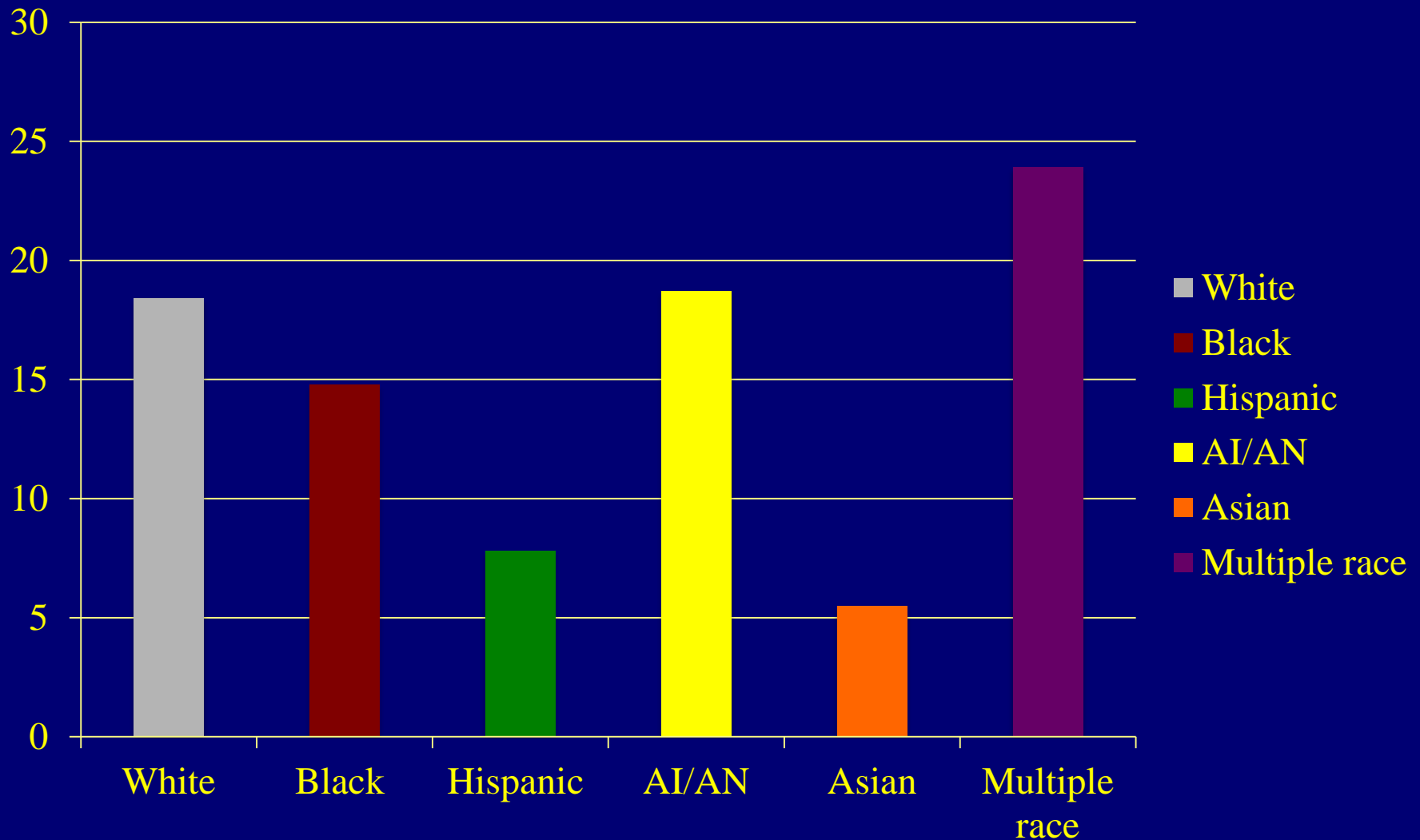
- The number one cause of cancer deaths in the US
- The number one cause of cancer deaths in the world
- Lung cancer is responsible for 80% of all deaths from tobacco-related illnesses
- Kills more Americans annually than breast, prostate, colon and pancreatic cancer combined!

Race and Cigarette Smoking, Men, 2012



Source: Morbidity and Mortality Weekly Report, Vol.63/No.2

Race and Cigarette Smoking, Women, 2012



Source: Morbidity and Mortality Weekly Report, Vol.63/No.2

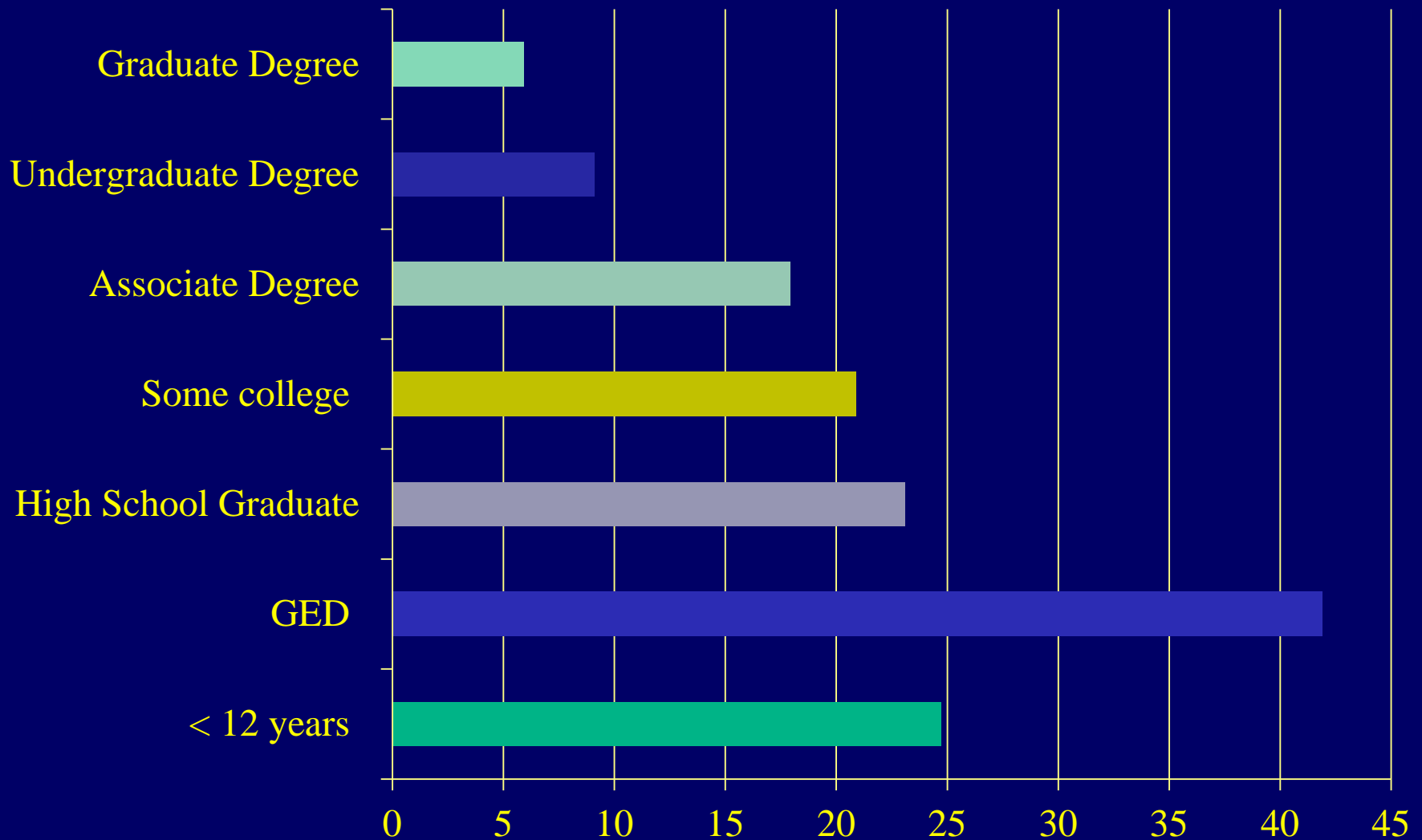
Lung Cancer: Racial Disparities

- Lung Cancer kills more black men and women and Hispanic men than any other cancer
- Compared to whites, Blacks have a higher incidence of lung cancer (primarily among men, especially for younger age groups)
- Blacks, Hispanics, and low SES persons have lower stage-specific survival rates than Whites
- A given level of smoking more adversely affects Blacks than Whites

Challenges for Hispanics

- Incidence and death rates for Hispanics are lower than for non-Hispanic whites
- The cancer burden for Hispanics in the U.S. is similar to that seen in their countries of origin
- With increasing time in the U.S. cancer rates increase for Hispanics
- Latinos more likely to be diagnosed with advanced stage of disease
- Hispanics have lower survival rates for most cancers

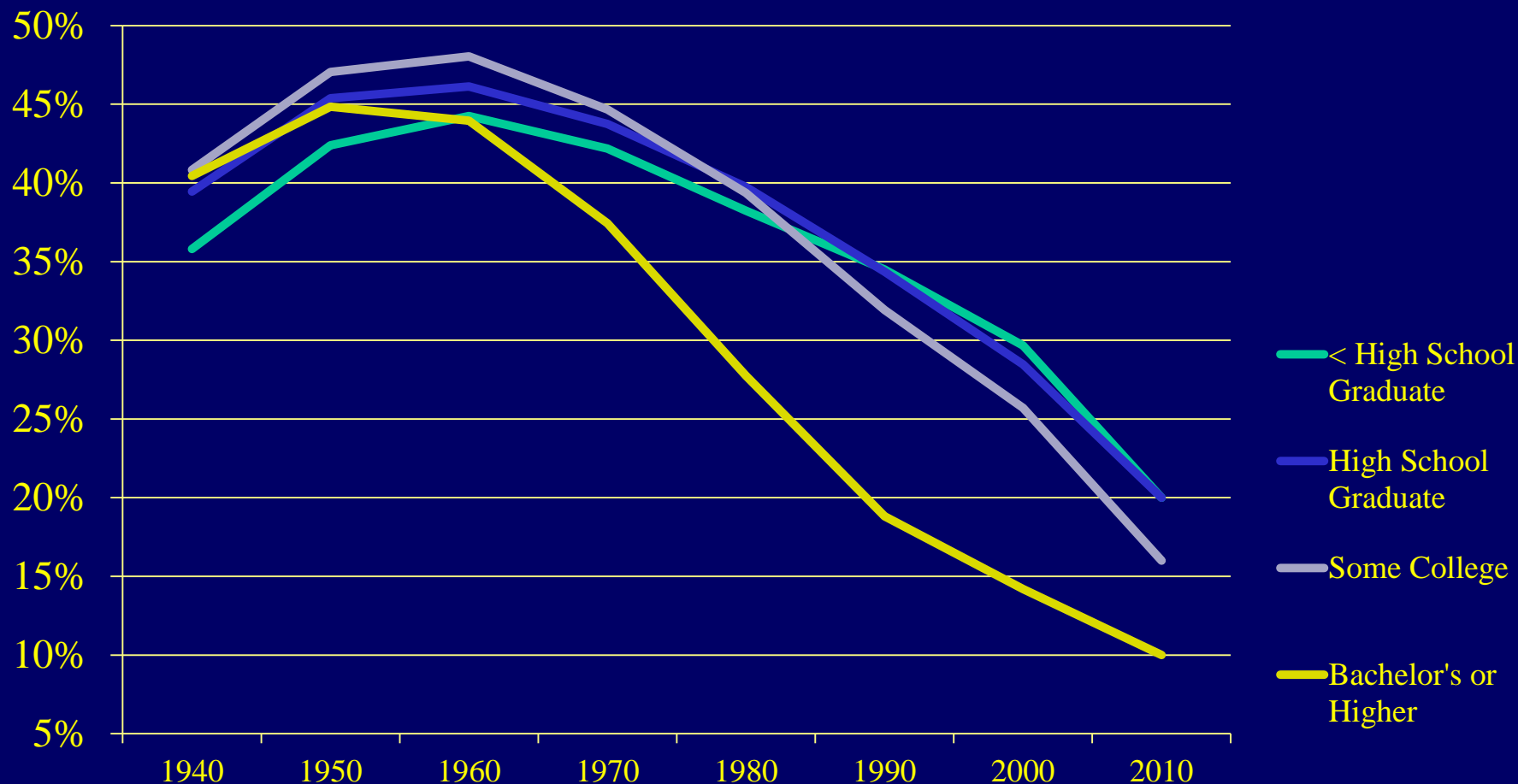
Education and Cigarette Smoking, 2012



SES Disparities

- Low income men and women, regardless of race and ethnicity, are more likely to be current smokers than higher income persons
- Differences in lung cancer mortality by education are markedly larger than those by race
- White men with 8 or less years of education have a lung cancer mortality rate that is 9 times higher than their peers with 17+ years of education
- Most of the decline in lung cancer mortality in recent years has occurred among highly educated

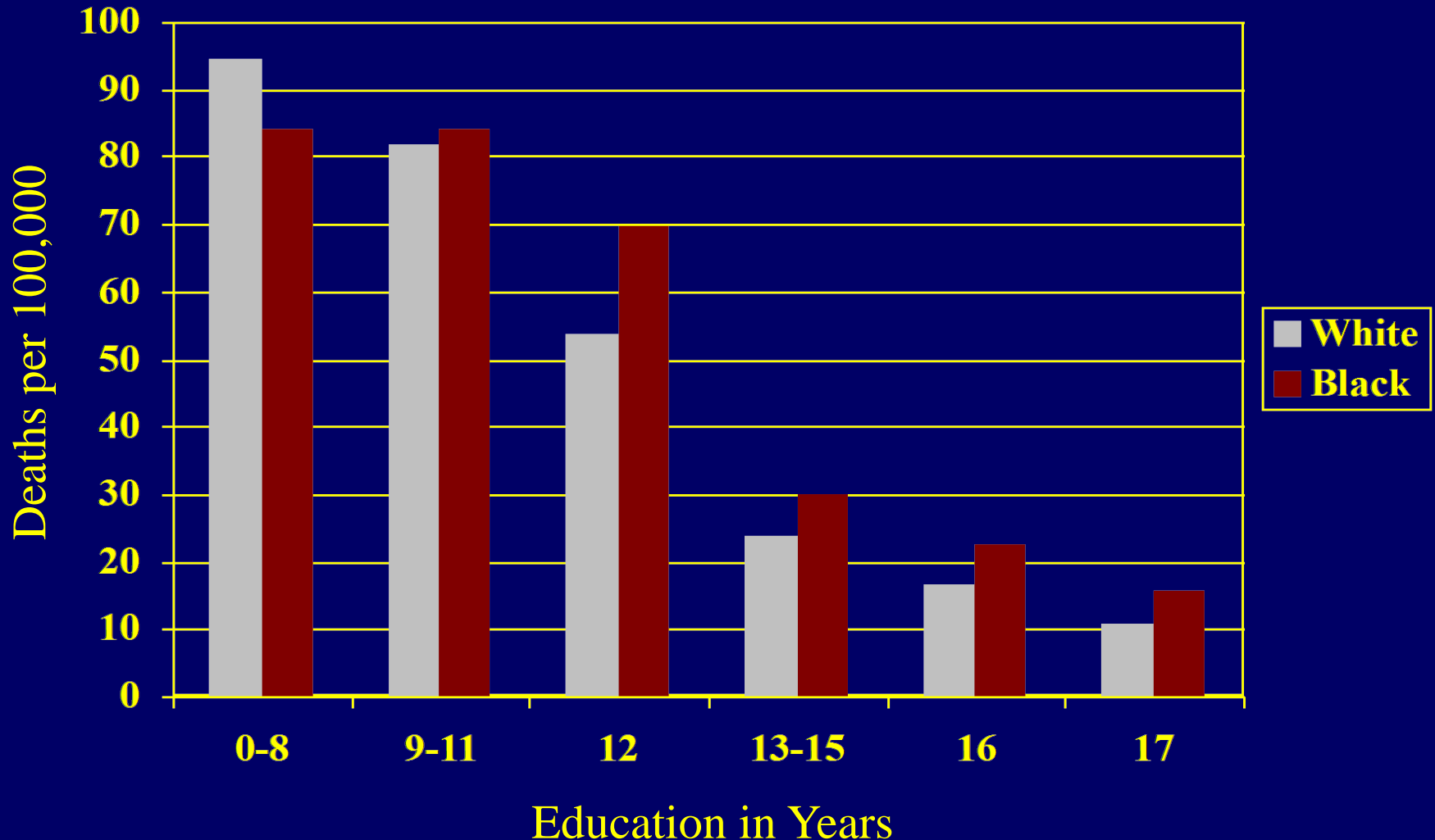
Smoking in the U.S 1960 -2010 by Education



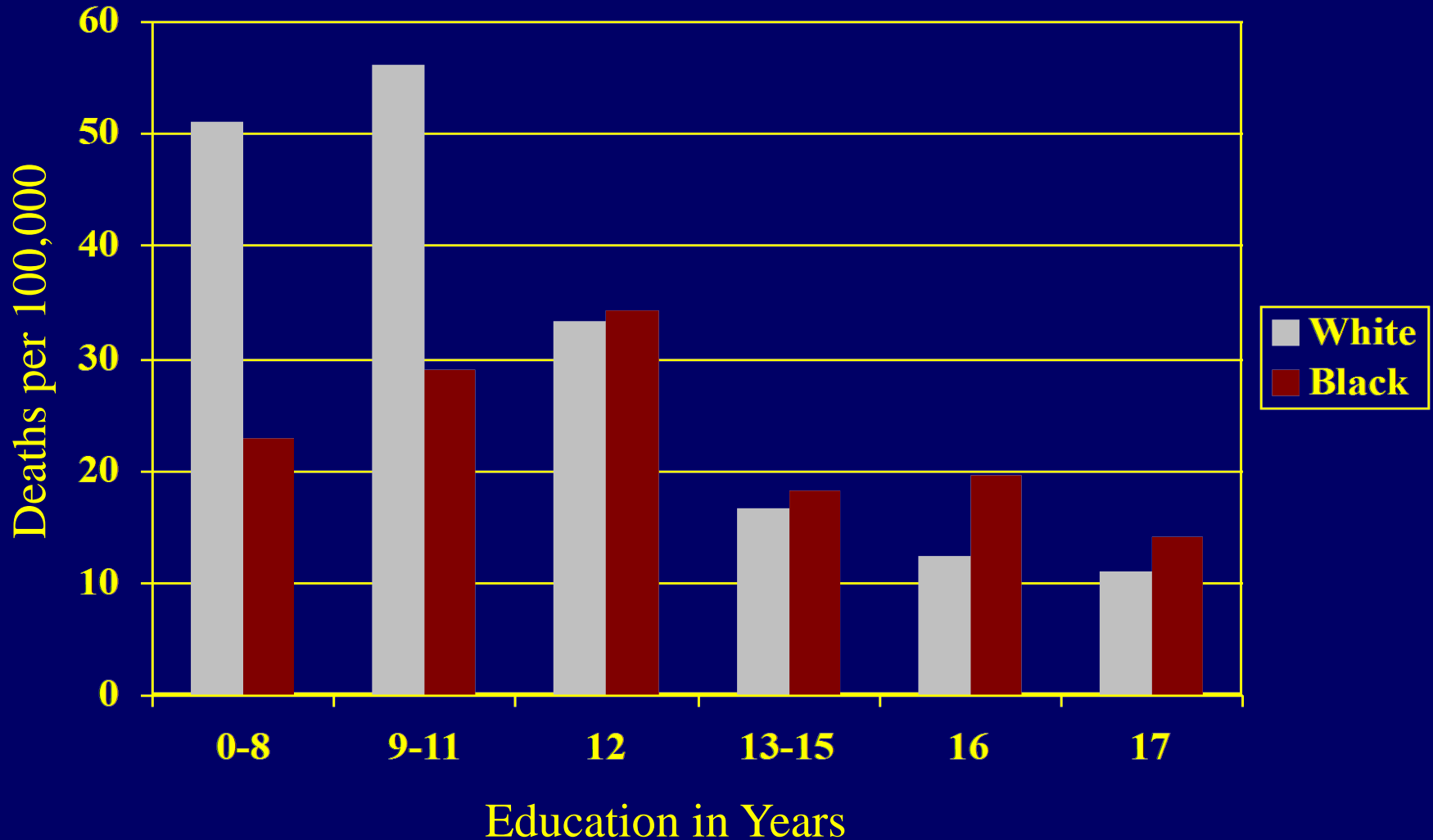
Smoking Rates Among Individuals Ages 25 and Older, by Education Level, 1960–2010

Source: DeWalque, 2004; National Center for the Health Statistics, 2009, table 61; NCHS 2014

Lung Cancer Death Rates, Men, 2001



Lung Cancer Death Rates, Women, 2001



Challenge of Tobacco:

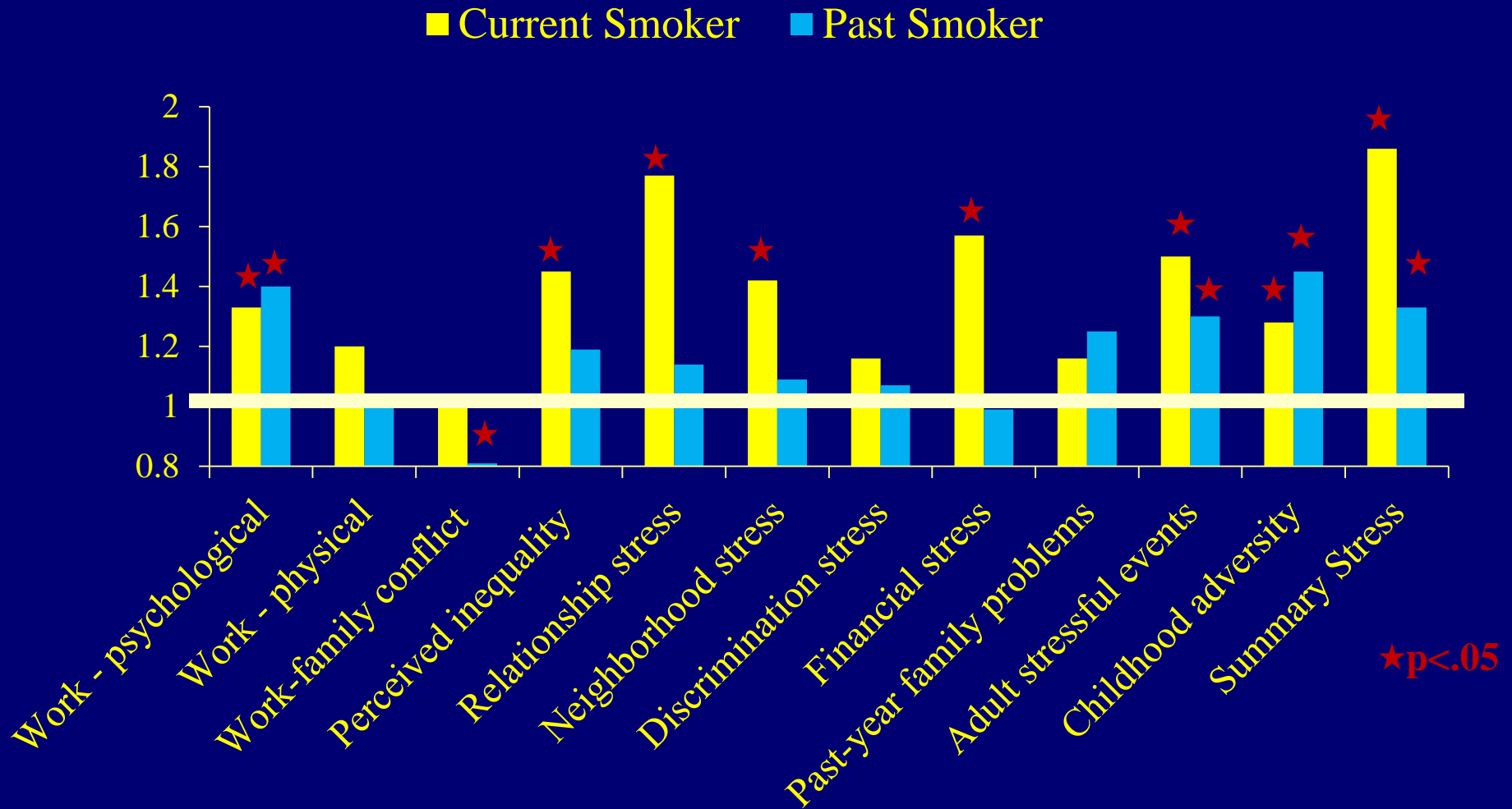
*How to reduce smoking in low SES,
economically marginalized and socially
stigmatized populations*

*We need to address the underlying
conditions that give rise to smoking in
the first place*

Psychosocial Stressors

Psychosocial Stress and Odds of Current & Previous Smoking

Multinomial models estimated independently; Reference Group = Never smokers



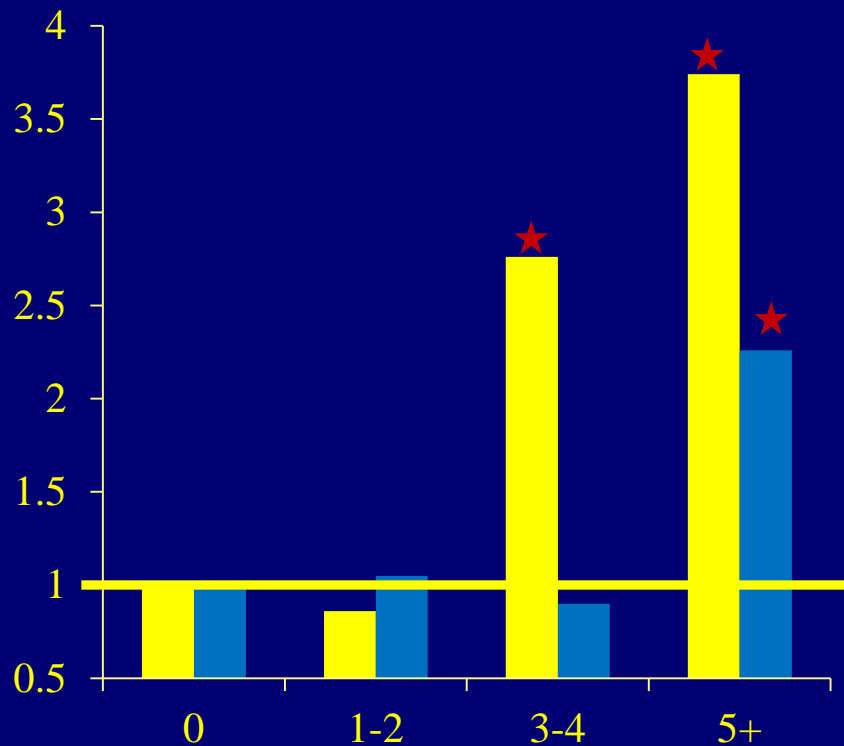
Slopen, Dutra, Williams et al., *Nicotine & Tob Res*, 2012;
adjusted for age, gender, education, & income.

Odds of Current and Previous Smoking By Number of Stress Domains

Reference Group = Never smokers

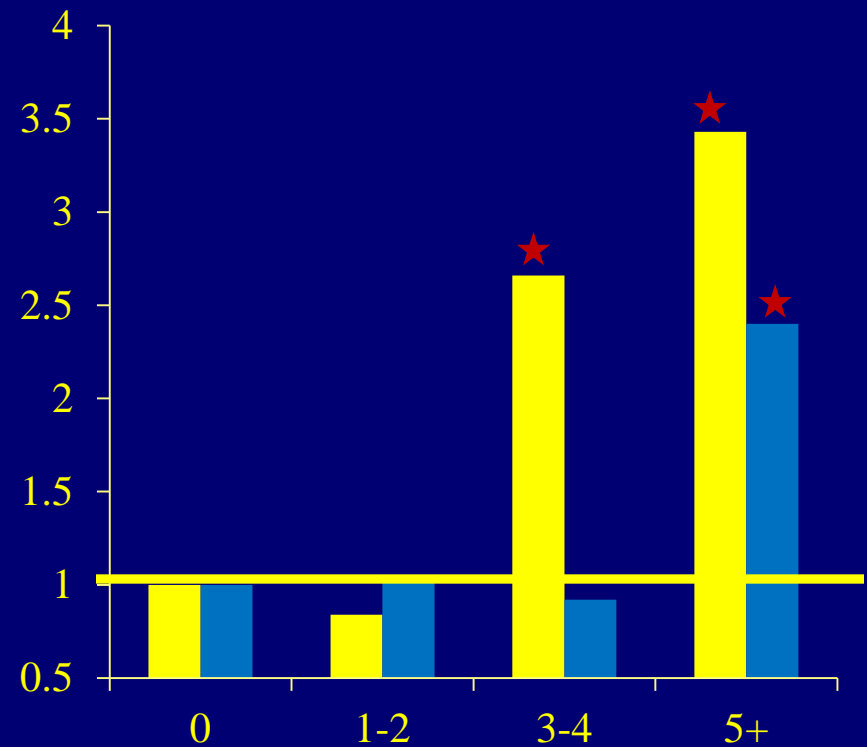
Unadjusted for Negative Affect

■ Current Smoker ■ Past Smoker



Adjusted for Negative Affect

■ Current Smoker ■ Past Smoker



★ p<.05

Slopen, Dutra, Williams et al., *Nicotine & Tob Res*, 2012;
adjusted for age, gender, education, & income

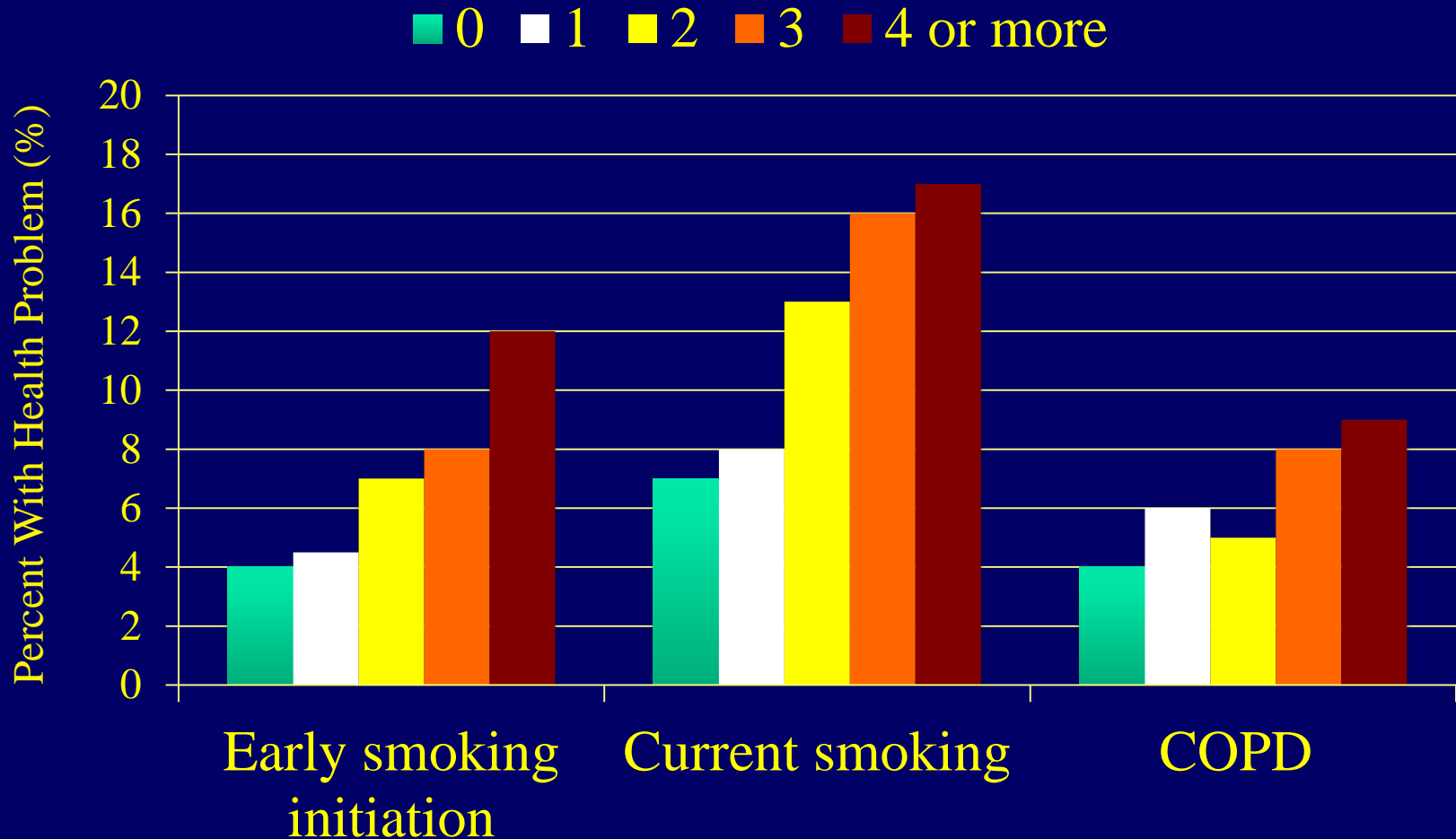
Stress and Quitting Smoking

- National sample of adults followed for 9 to 10 years:
- Persons high on on 8 domains of stress (e.g., relationship, financial, work), at both interviews were more likely to be persistent smokers
- Persons persistently high on stress who tried to quit in past 10 years, were less likely to succeed
- Stress keeps people smoking & makes it harder to quit
- Creating smoke free environments requires interventions that reduce modifiable stressors, and enhance individual & community-level resources to cope with stressors

Expanding our Understanding of the role of stress in Health:

- Early Life Adversity
- Experiences of Discrimination

ACE Score, Smoking, and Lung Disease



Perceived Discrimination:

Experiences of discrimination are
a neglected psychosocial stressor

Chronic Stress: Every Day Discrimination

In your day-to-day life how often do the following things happen to you?

- You are treated with less courtesy than other people.
- You are treated with less respect than other people.
- You receive poorer service than other people at restaurants or stores.
- People act as if they think you are not smart.
- People act as if they are afraid of you.
- People act as if they think you are dishonest.
- People act as if they're better than you are.
- You are called names or insulted.
- You are threatened or harassed.

What do you think was the main reason for these experiences

Detroit Area Study 1995; Williams et al. 1997



Discrimination & Health: Tene Lewis

- **Everyday Discrimination: positively associated with:**
 - coronary artery calcification (Lewis et al., Psy Med, 2006)
 - C-reactive protein (Lewis et al., Brain Beh Immunity, 2010)
 - blood pressure (Lewis et al., J Gerontology: Bio Sci & Med Sci 2009)
 - **lower** birth weight (Earnshaw et al., Ann Beh Med, 2013)
 - cognitive impairment (Barnes et al., 2012)
 - poor sleep [**object. & subject.**] (Lewis et al, Hlth Psy, 2012)
 - mortality (Barnes et al., J Gerontology: Bio Sci & Med Sci, 2008).
 - visceral fat (Lewis et al., Am J Epidemiology, 2011)
-

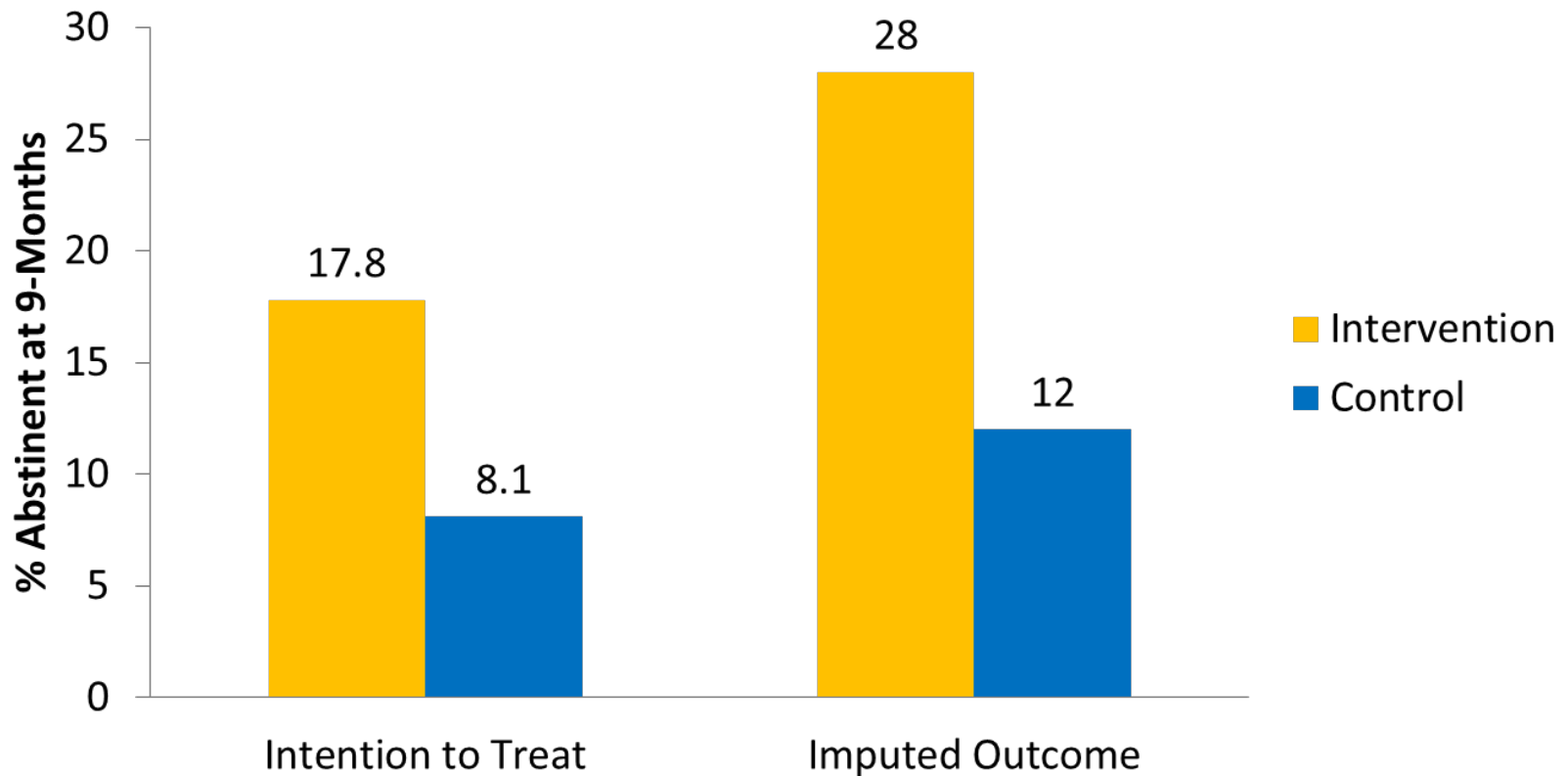
Perceived Discrimination and Health

- Discrimination is associated with elevated risk of
 - diabetes risk (Hemoglobin A1c)
 - substance use (smoking, alcohol, other drugs)
 - breast cancer incidence
 - uterine myomas (fibroids)
 - subclinical carotid artery disease (IMT; intima-media thickness)
 - Delays in seeking treatment, lower adherence to treatment regimes, lower rates of follow-up
- Discrimination accounts, in part, for racial/ethnic disparities in health, in U.S., and elsewhere

Addressing Stressors

- Outreach using (IVR) calls to low-SES/minority smokers from EHR
 - Nicotine replacement patches (NRT)
 - Phone-based counseling with tobacco treatment specialist (TTS)
 - Referrals to community resources (HealthSteps)
- Pragmatic trial
- Control patients referred to state quit line
- Outcome measure: 7-day tobacco abstinence @ 9 month follow-up

Primary Outcome: 7-day abstinence



*We need to focus more on the equity
impact of anti-smoking policies*

Equity Impact: Tobacco Taxes

- Tobacco price increases is the intervention with the greatest potential to reduce SES gaps in smoking
- Low-income individuals are more responsive to price increases
- However, when the price of cigarettes increases, some low SES smokers may opt for lower cost or roll-your-own cigarettes
- The effectiveness of price increases may be diminishing over time as the baseline price of tobacco increases

Equity Impact: Smoking Bans

- Smoking restrictions (e.g. workplace) reduce tobacco including secondhand smoke exposure, and can lead to increased cessation
- Workplace restrictions have been more likely to be implemented in professional than in manual workplaces
- Some evidence that bans less likely to be enforced in disadvantaged areas and that bans could increase social isolation in older smokers
- Little clear evidence of greater benefit to low SES groups

Equity Impact: Media Campaigns

- Mass media campaigns against smoking or promoting quit lines tend to have similar effect by SES or greater benefit to high SES
- TV campaigns tend to have greater benefit for high SES but ads using personal testimony appear equally beneficial to all SES groups
- Internet campaigns less effective for low SES

The National Truth Campaign

- Developed and implemented with substantial involvement of youth
- Had a distinctive appeal to adolescents aged 12 to 17 years
- Focused on unmasking the deceptive practices and exploitative marketing strategies of the tobacco industry
- Greater effect on Blacks and Hispanics than on Whites

Equity Impact: Smoking Bans

- Smoking restrictions (e.g. workplace) reduce tobacco including secondhand smoke exposure, and can lead to increased cessation
- Workplace restrictions have been more likely to be implemented in professional than in manual workplaces
- Some evidence that bans less likely to be enforced in disadvantaged areas and that bans could increase social isolation in older smokers
- Little clear evidence of greater benefit to low SES groups

*We need to create healthy living and
working environments*

Racism and Health: Mechanisms

- Institutional discrimination can restrict socioeconomic attainment and group differences in SES and health.
 - Segregation can create pathogenic residential conditions.
 - Discrimination can lead to reduced access to desirable goods and services.
 - Internalized racism (acceptance of society's negative characterization) can adversely affect health.
 - Racism can create conditions that increase exposure to traditional stressors (e.g. unemployment).
 - Experiences of discrimination may be a neglected psychosocial stressor.
-

*Residential Segregation: Example of
Institutional Discrimination*



How Segregation Can Affect Health

1. Segregation determines quality of education and employment opportunities.
2. Segregation can create pathogenic neighborhood and housing conditions.
3. Conditions linked to segregation can constrain the practice of health behaviors and encourage unhealthy ones.
4. Segregation can adversely affect access to high-quality medical care.

Residential Segregation and SES

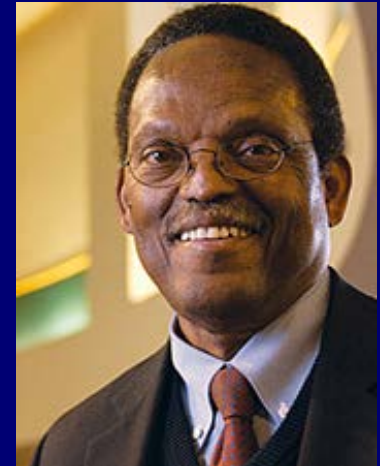
A study of the effects of segregation on young African American adults found that the elimination of segregation would erase black-white differences in

- Earnings
- High School Graduation Rate
- Unemployment

And reduce racial differences in single motherhood by two-thirds

Racial Differences in Residential Environment

- In the 171 largest cities in the U.S., there is not even one city where whites live in equal conditions to those of blacks
- “The worst urban context in which whites reside is considerably better than the average context of black communities.” p.41





Our Neighborhood Affects Our Health

Unhealthy Community

vs

Healthy Community

Unsafe even in daylight



Safe neighborhoods, safe schools, safe walking routes

Exposure to toxic air, hazardous waste



Clean air and environment

No parks/areas for physical activity



Well-equipped parks and open/spaces/organized community recreation

Limited affordable housing is run-down; linked to crime ridden neighborhoods



High-quality mixed income housing, both owned and rental

Convenience/liquor stores, cigarettes and liquor billboards, no grocery store



Well-stocked grocery stores offering nutritious foods



Our Neighborhood Affects Our Health

Unhealthy Community

vs

Healthy Community

Streets and sidewalks in disrepair



Clean streets that are easy to navigate

Burned-out homes, littered streets



Well-kept homes and tree-lined streets

No culturally sensitive community centers, social services or opportunities to engage with neighbors in community life



Organized multicultural community programs, social services, neighborhood councils or other opportunities for participation in community life

No local health care services



Primary care through physicians' offices or health center; school-based health programs

Lack of public transportation, walking or biking paths



Accessible, safe public transportation, walking and bike paths

Tip: Healthy Behaviors Travel Together

- Smokers drink more, eat worse & exercise less
- The gap in exercise progressively increased over 10 year period for smokers who quit compared to those who remained smokers
- Those who quit exercise more than continuing smokers
- Two factors:
 - declining exercise among ongoing smokers
 - increases in exercise among ex-smokers
- Engaging in other healthy behaviors enhances long-term success

Community Resources and Smoking

- Poor, rural children at age 9 followed to age 17
- Poverty at age 9 predicts smoking and BMI at age 17
- Community youth resources markedly reduces this association
 - Community cohesion (social ties and interdependence)
 - informal social control (adult supervision and willingness to intervene)
 - Youth (9 yr olds) reports of supportive ties (I feel there are adults I can talk to for help or advice)

Purpose Built Communities

Instead of addressing poverty, urban blight, failing schools, crime and unemployment piecemeal, community activists and philanthropists in Atlanta took them on at once (integrative strategies include cradle-to-college educational opportunities, mixed-income housing, early child development, recreational opportunities).

Atlanta's East Lake District results:

- A 95% reduction in crime since its launch in 1995
 - Employment rate of low-income: from 13% to 70%
 - Striking school achievement: East Lake students at or above grade level increase from 5% at start to 96%
 - Purpose Built Communities in Atlanta, New Orleans, Indianapolis, Charlotte, among others.
-

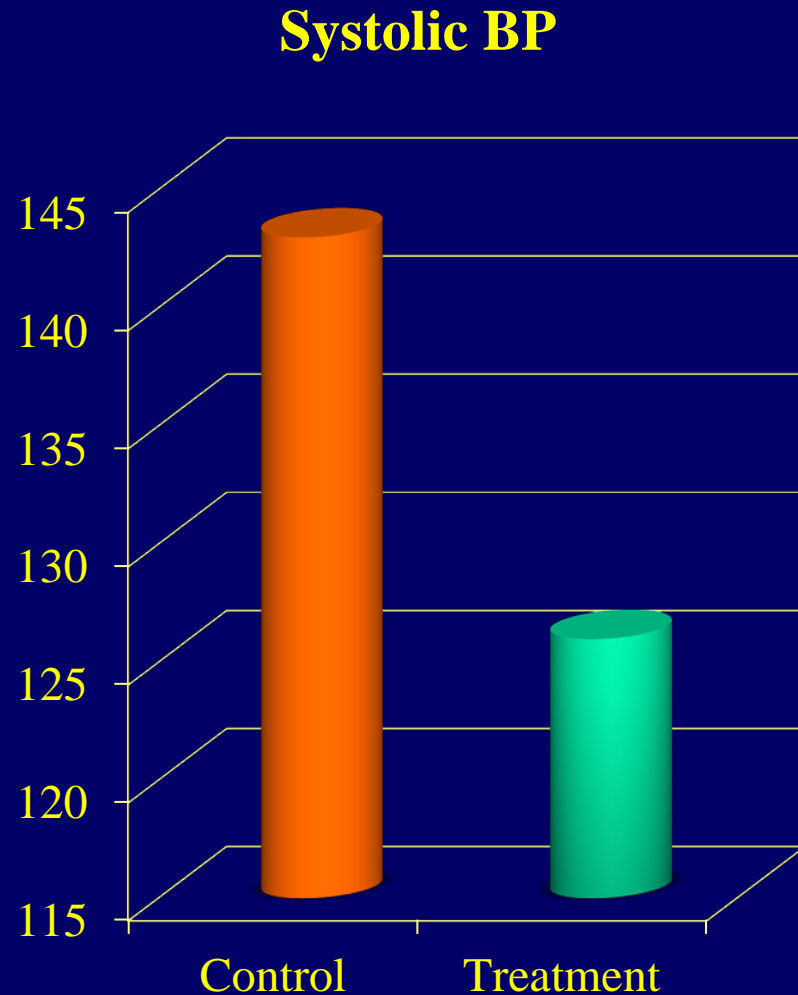
We need to start early

Carolina Abecedarian Project (ABC)

- 1972-77, economically disadvantaged children, birth to age 5, randomized to early childhood program
- Program offered a safe and nurturing environment, good nutrition and pediatric care
- At age 21, fewer symptoms of depression, lower smoking & marijuana use, more active lifestyle, & educational & vocational assets benefits
- In mid-30's, lower levels of multiple risk factors for CVD and metabolic disease. Effects stronger for males

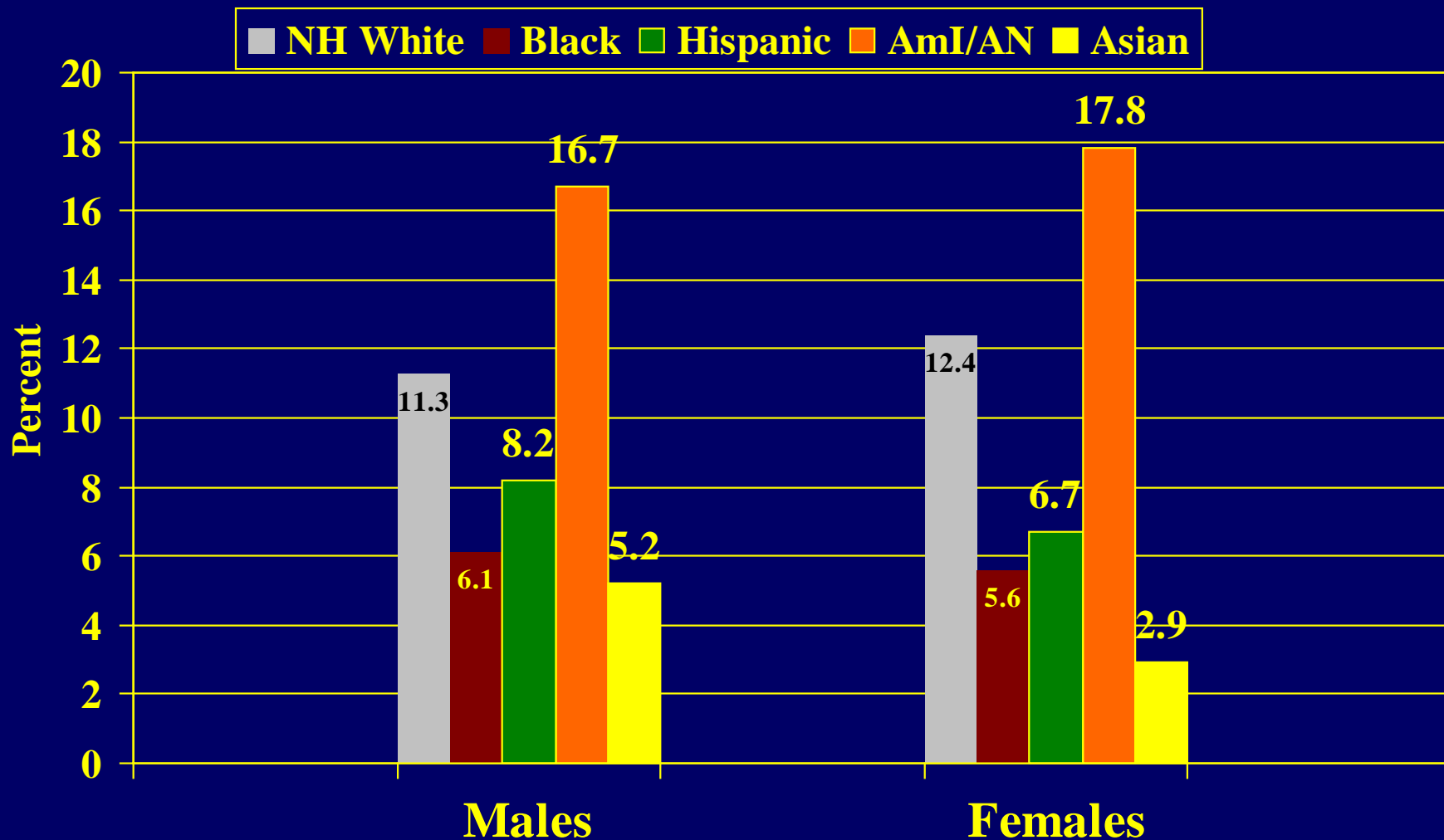
Carolina Abecedarian Project (ABC)

- Example: systolic BP
143 mm Hg in male
controls vs. 126mm Hg
in the treatment group
- One in 4 males in
control group met
criteria for metabolic
syndrome compared to
none in the treatment
group
- Lower BMI at zero to 5
yrs equals a lower BMI
in their 30s



Resilience and Protective factors

Smoking among 12-17 year olds, 2006-2008



Religion and Adolescent Risk Behavior

- Religious high school seniors less likely than non-religious to
 - Carry a weapon (gun, knife, club) to school
 - Get into fights or hurt someone
 - Drive after drinking
 - Ride with driver who had been drinking
 - Smoke cigarettes
 - Engage in binge drinking (5 or more drinks in a row)
 - Use marijuana
- Religious seniors were more likely to
 - Wear seat belts
 - Eat breakfast, green vegetables and fruit
 - Get regular exercise
 - Sleep at least 7 hours per night

Alameda County Study

- Began in 1965 with 6,928 adults aged 17- 95
 - Alameda County is on San Francisco Bay and includes Oakland and Berkeley
 - 2,676 survivors from 1965 to 1994
 - Examined the association of 1965 frequency of attendance with 1994 improved or maintained healthy behaviors
 - Adjusted for age, sex, education, and self-rated health
-

Improved Healthy Behaviors for Weekly Attenders

Quit smoking	1.78
Started physical activity	1.54
Stopped being depressed	2.31
Got and stayed married	1.57
Increased personal relationships	1.62
Stopped heavy drinking	1.39
Started medical checkups	0.98

We need to build a science base that will guide us in developing the political will to support the needed policies to effectively address social inequalities in health

Effective Communication Strategies are
Vital

The Need to Build Empathy
in order to Build Political Will

Recent research suggests that we
think with our hearts

The role of emotion is central in inter-
racial interactions and preferences for
policy

Creating the Conditions for Change

The Empathy Gap?

“The most difficult social problem in the matter of Negro health is the peculiar attitude of the nation toward the well-being of the race. There have... been few other cases in the history of civilized peoples where human suffering has been viewed with such peculiar indifference”
W.E. B. Du Bois (1899 [1967], p.163).

Emotions: Consequences

- Across 4 countries in Europe, the absence of positive emotions was a strong predictor of opposition to policies regarding immigrant out-groups
- This measure of subtle contemporary prejudice was a stronger predictor than measures of traditional prejudice
- Feelings are a good covert indicator of subtle prejudice

Brief measure of No Positive Emotions

- Two questions captured the absence of positive emotions:

How often do you feel sympathy for Blacks?

How often do you feel admiration for Blacks?

Response options: 5-point scale of very often to never

Variable coded so that a high score equals a lack of sympathy and admiration

- The absence of positive emotions is an important component of subtle prejudice

Power of No Positive Emotions

- The absence of positive emotions for Blacks was the strongest predictor of White's opposition to affirmative action in employment and opposition to an active role of government in reducing racial inequalities
- Other predictors considered included: age, gender, income, education, individual and group self interests, political party preference, stratification beliefs (economic individualism, social dominance), conservatism, traditional prejudice, modern racism scale

Stereotypes in Our Culture

- **BEAGLE** (Bound Encoding of the Aggregate Language Environment) Project contains about 10 million words from a sample of books, newspapers, magazine articles, etc.
- A good representation of American culture
- Equivalent to what the average college-level student has read in her lifetime
- Statistically analyzed the associative strength between pairs of words
- Provides estimate of how often Americans have seen or heard words paired over their lifetime

Stereotypes in Our Culture

BLACK	poor	.64	WHITE	wealthy	.48
BLACK	violent	.43	WHITE	progressive	.41
BLACK	religious	.42	WHITE	conventional	.37
BLACK	lazy	.40	WHITE	stubborn	.32
BLACK	cheerful	.40	WHITE	successful	.30
BLACK	dangerous	.33	WHITE	educated	.30
FEMALE	distant	.37	MALE	dominant	.46
FEMALE	warm	.35	MALE	leader	.31
FEMALE	gentle	.34	MALE	logical	.31
FEMALE	passive	.34	MALE	strong	.31

Stereotypes in Our Culture

BLACK	poor	.64	WHITE	wealthy	.48
BLACK	violent	.43	WHITE	progressive	.41
BLACK	religious	.42	WHITE	conventional	.37
BLACK	lazy	.40	WHITE	stubborn	.32
BLACK	cheerful	.40	WHITE	successful	.30
BLACK	dangerous	.33	WHITE	educated	.30
BLACK	charming	.28	WHITE	ethical	.28
BLACK	merry	.28	WHITE	greedy	.22
BLACK	ignorant	.27	WHITE	sheltered	.21
BLACK	musical	.26	WHITE	selfish	.20

Keys to Long-term Success

- Building the perspective of Health into all policy-making
 - Including an explicit focus on health equity into policy-making
 - Convening, enabling and supporting cross-sectoral collaborations
 - Developing institutional mechanisms to provide policy coherence and the constant need for action
 - Developing consensus-based standard data and methods for surveillance systems linking health, health equity and their determinants
 - Ensure data is available at the local level
 - Investing in strengthening community capacity and the potential for community advocacy
-

Sustaining Action

- Identify and nurture a core of champions in the public, private and voluntary sectors
 - Develop and maintain a steady drumbeat of policy-relevant data and information with regards to how factors outside the healthcare system can improve population health and reduce shortfalls in health
 - There should be explicit communication strategies targeted at policy-makers and the engaged public
 - Emphasis should be given to highlighting interventions that are working now.
-

Scientific and Policy Opportunity

- Smokers at all levels of SES have elevated mortality risk
- Smokers at all levels of SES have poorer survival than never smokers
- Thus, the potential to reduce overall SES (and racial) disparities in health is limited unless low SES smokers can successfully quit smoking
- There is a unique opportunity to save millions of lives if we can effectively focus on both the causes and exemplar solutions to lung cancer

Conclusions

- Inequalities in health are created by larger inequalities in society.
 - SES and racial/ethnic disparities in health reflect the successful implementation of social policies.
 - Eliminating them requires political will for and a commitment to new strategies to improve living and working conditions.
 - We need research that takes the complexity of the social context seriously
 - Our great need is to begin in a systematic and comprehensive manner, to use all of the current knowledge that we have.
-

A Call to Action

“Each time a man stands up for an ideal, or acts to improve the lot of others, or strikes out against injustice, he sends forth a tiny ripple of hope, and those ripples build a current which can sweep down the mightiest walls of oppression and resistance.”

- Robert F. Kennedy