Understanding and Addressing Social Inequalities in Cancer: Challenges and Opportunities

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I have no relevant financial relationships to disclose

Issue: Data Limitations

Methodological issues linked to how racial/ethnic data are

-- Measured

-- Analyzed and/or

-- Presented

can obscure a clear picture of the existence, nature, and extent of racial/ethnic differences in health

Validity of Race on Death Certificate

Race on CPS	Race on Death Certificate % Discrepant	% White
White	0.8	99.2
Black	1.8	1.1
American Indian	26.4	25.0
Asian/Pacific Islander	17.6	12.1

Sorlie et al., 1992

Accuracy of Race/Ethnicity in Registry Data

- Study comparing self-reported data to the Greater Bay Area Cancer Registry
- Misclassification is minimal for blacks and whites
- One-third of Hispanics misclassified as NH Whites
- The underestimate of cases was 63% for American Indians, 16% for Chinese, 37% for Vietnamese
- Accuracy of registry race/ethnicity has not improved over time
- Need for systematic policy of using uniform data collection instruments

Gomez & Glasel, Cancer Causes Control, 2006

Limits of Age Standardization

- Age-adjusted rates are calculated using the age structure of a standard population
- Age-standardization provides an equal biases for comparing populations with different age structures
- There is no theoretical justification for using one standard over another -- the choice is arbitrary
- The age structure of a standard population can introduce biases by favoring one population over another

Fu, Todem, Fu & Ma., Stat.ME Arsciv.org, 2014

Challenges of Age Standardization

Age standardization provides useful indices for comparison but is not a measure of actual risk

Age standardization can lead to

-- inaccurate estimation of risk,

-- incorrect interpretation

and confuse both health researchers and the general public

Fu, Todem, Fu & Ma., Stat.ME Arsciv.org, 2014; National Center for Health Statistics

All-Cause Mortality for Native Americans
Age-Adjusted versus Age-Specific

- The age-adjusted mortality rate for American Indians is lower (0.90) than that of whites
- In contrast, age-specific death rates for American Indians (compared to whites) are

-- Twice as high at ages 1-4

-- Equivalent at ages 5-14 and 65-74

-- 70% higher at ages 15-24 and 35-44

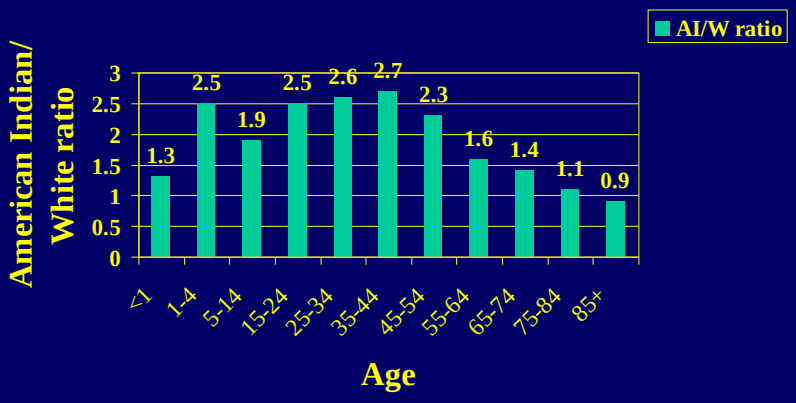
-- 80% higher at ages 25-34

-- 30% higher at ages 45-54

-- 20% higher at ages 55-64

Williams, J of Gerontology, 2005; National Center for Health Statistics

American Indian/ White Mortality IHS Service Area



Source: Trends in Indian Health 2000-2001; IHS, 2004

Keeping Our Priorities Clear

- Extensive analysis of genetic and environmental factors linked to 15 common cancers using the national Swedish Family-Cancer Database
- The proportion of cancer susceptibility accounted for by environmental factors exceeds that of genetic effects for all human cancers, except for thyroid cancers (53%)
- Most of the environmental factors have not been identified

Czene et al., Int J Cancer, 2002

Racism creates conditions of life that lead to racial ethnic differences in Cancer and other diseases

The House that Racism Built

Place Matters

- Segregation is a striking legacy of racism

- As is the forced removal and relocation of indigenous peoples in many contexts
- These institutionalized isolation and marginalization of racial populations has adversely affected health in multiple ways

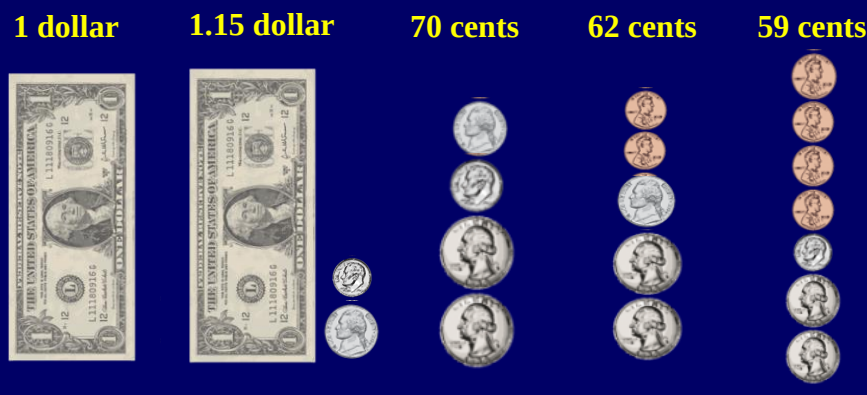
How Segregation Can Affect Health

1. Segregation determines SES by affecting 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 medical care and to high-quality care.

Williams & Collins, Pub Health Reports, 2001

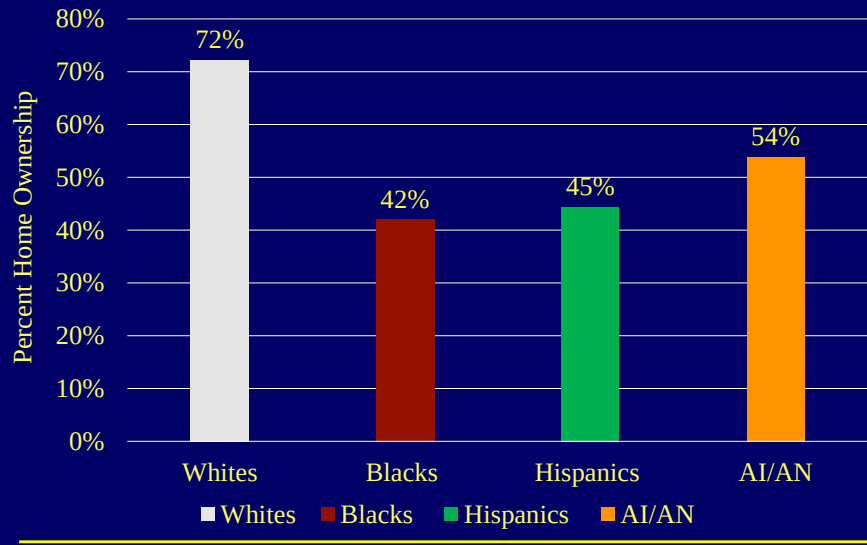
Median Household Income and Race, 2013

Racial Differences in Income are Substantial:



U.S. Census Bureau (DeNavas – Walt and Proctor 2014)

Home Ownership by Race/Ethnicity, 2014



Callis and Kresin, 2015

Median Wealth and Race, 2011

For every dollar of wealth that Whites have,

Asians have 81 cents

Blacks have only 6 cents

Hispanics have only 7 cents

U.S. Census Bureau, 2014

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

Cutler, Glaeser & Vigdor, 1997

Large Racial/Ethnic Differences in SES that are consequential for health are not acts of God, or random events – they reflect the successful implementation of social policies, many of which are rooted in racism

Where you Live Matters

It Matters A LOT for your Health

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."

Sampson & Wilson 1995

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Commission to Build a Healthier America

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

ROBERT WOOD JOHNSON FOUNDATION
Commission to Build a Healthier America

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**
Lack of public transportation, walking or biking paths 		 Accessible, safe public transportation, walking and bike paths

How do low Socioeconomic Status (SES), poor residential conditions and higher exposure to stressors affect cancer risks and outcomes?

Breast Cancer: A case study of unpacking the social context

Race and Breast Cancer

- Black women have lower overall incidence of breast cancer compared to whites, and lower incidence of breast cancer at ages 40 and older
- But, black women have higher incidence under age 40 compared to their white peers, with markedly higher incidence under age 30
- Black women are more likely to be diagnosed at a later stage, less likely to receive stage-appropriate treatment, and more likely to have lower stage-for-stage survival rates

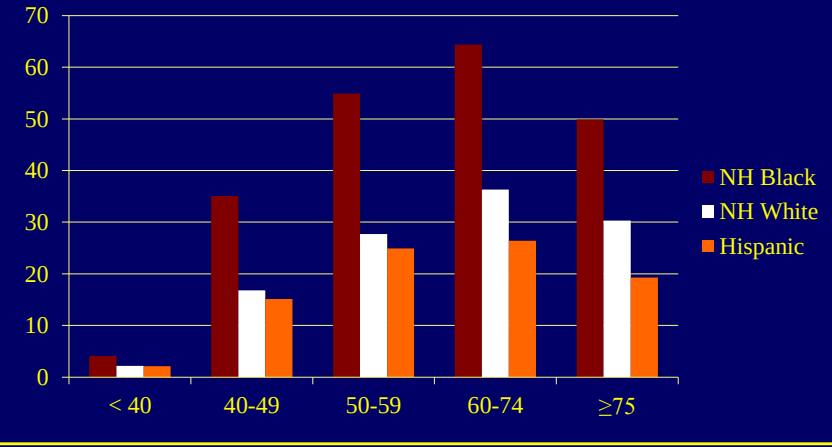
B Dunn et al., Breast Cancer Res Treat, 2010

Black Women and Breast Cancer -II

- Compared to whites, black women are less likely to get breast cancer every year but more likely to die of breast cancer each year
- Black women, especially premenopausal, more likely to present with poor prognosis tumors: more aggressive, more resistant to treatment, and lack obvious molecular targets (estrogen receptor negative (ERneg) tumors and ERneg subtypes, including "triple negative" (TN) – also the progesterone receptor negative (PRneg) and HER2
- These tumors overlap and resemble "basal-like" breast cancers

B Dunn et al., Breast Cancer Res Treat, 2010

Breast Cancer Incidence: Triple Negative



Amirikia et al., Cancer, 2011

What Drives these Differences?

- Aggressive ERneg subtypes are also common in black women in
  - West Africa (Nigeria, Ghana)
  - Great Britain
  - the Caribbean
- This pattern may reflect genetic factors
- OR, it could be common adverse exposures
- And/or, common adverse exposures that may lead to gene by environment interactions or gene expression differences

B Dunn et al., Breast Cancer Res Treat, 2010

SES and Breast Cancer

- Low SES, especially low income, is associated with increased risk of basal-like cancers, ERneg breast cancers and TN breast cancer, late-stage of diagnosis and poorer survival
- Social deprivation also associated with increased risk of ERneg breast cancer
- SES may affect breast cancer through risk behaviors

B Dunn etal. Breast Cancer Res Treat, 2010

Median Household Income, 2009/10-2012/13

For every £ of weekly income that White majority earns

Other Whites earn 79p 

Indians earn 86p 

Pakistanis earn 57p 

Bangladeshis earn 52p 

Fisher & Nandi, Joseph Rowntree Foundation, 2015

Medium Household Income, 2009/10-2012/13

For every £ of weekly income that the White majority earns

Chinese earn 76p 

Black Caribbeans earn 77p 

Black Africans earn 60p 

Fisher & Nandi, Joseph Rowntree Foundation, 2015

Race and Wealth, UK, 2009

For every £ of wealth that Whites have

Caribbean Blacks have 34p 

Bangladeshis have 10p 

Black Africans have 7p 

Source: The Runnymede Trust

A Larger Context

Accelerated aging - earlier onset of disease

What are the underlying drivers?

Early Onset: Heart Failure

A 20-year follow-up of young adults in the CARDIA study found that incident heart failure before the age of 50 was 20 times more common in Blacks than Whites, with the average age of onset being 39 years old

Bibbins-Domingo et al., NEJM, 2009

Biological Weathering

- Chronological age captures duration of exposure to risks for groups living in adverse living conditions
- Blacks have greater physiological wear and tear, and are aging, biologically, more rapidly than whites
- Driven by cumulative impact of repeated exposures to psychological, social, physical and chemical stressors in environments (work, residential, etc.)
- Compared to whites, blacks experience higher levels of stressors, greater clustering of stressors, and probably greater duration and intensity of stressors
- Fewer resources to cope with these stressors

Geronimus et al, Hum Nature, 2010; Sternthal et al 2011

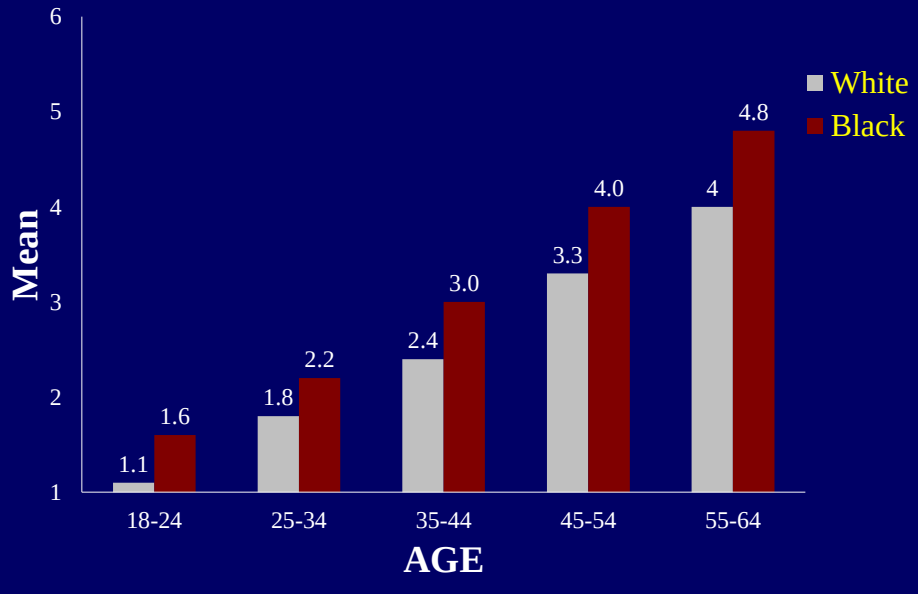
Allostatic Load

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

Geronimus, et al., AJPH, 2006

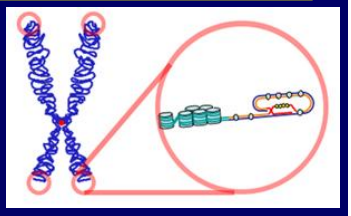
Mean Score on Allostatic Load by Age

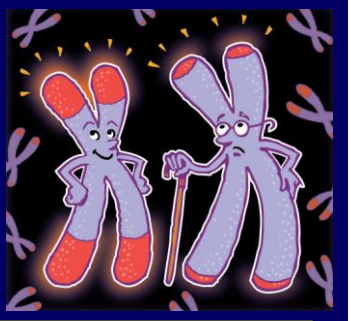


Geronimus, et al., AJPH, 2006

Racial Differences in Telomere Length

- Telomeres are sequences of DNA at end of chromosome. Telomere length is viewed as an overall marker of biological aging
- Study found that Black women had shorter telomeres than White women
- At same chronological age, black women had accelerated biological aging of about 7.5 years





Geronimus et al., Human Nature, 2010

Added Burden of Race

Life Expectancy At Age 25

Group	White	Black	Difference
All	53.4	48.4	5.0

Murphy, NVSS 2000; Braveman et al. AJPH, 2010; NLMS 1988-1998

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		

Murphy, NVSS 2000; Braveman et al. AJPH, 2010; NLMS 1988-1998

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	

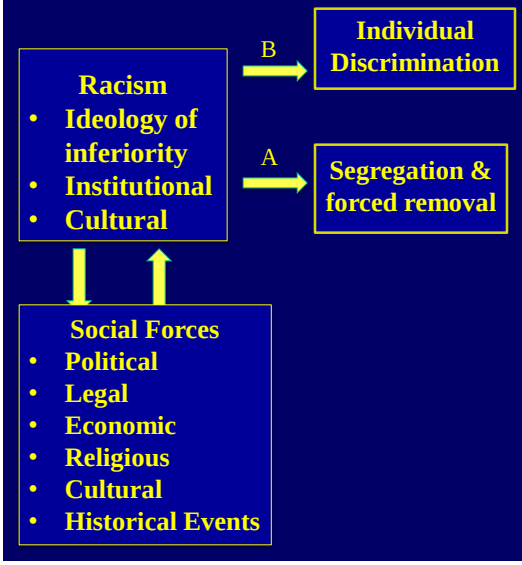
Murphy, NVSS 2000; Braveman et al. AJPH, 2010; NLMS 1988-1998

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	

Murphy, NVSS 2000; Braveman et al. AJPH, 2010; NLMS 1988-1998

The House that Racism Built



Perceived Discrimination:

Experiences of discrimination are a neglected psychosocial stressor

Every Day Discrimination

In your day-to-day life how often have any of the following things happened 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?

Williams et al., J Health Psychology, 1997

Discrimination & Health: Tene Lewis

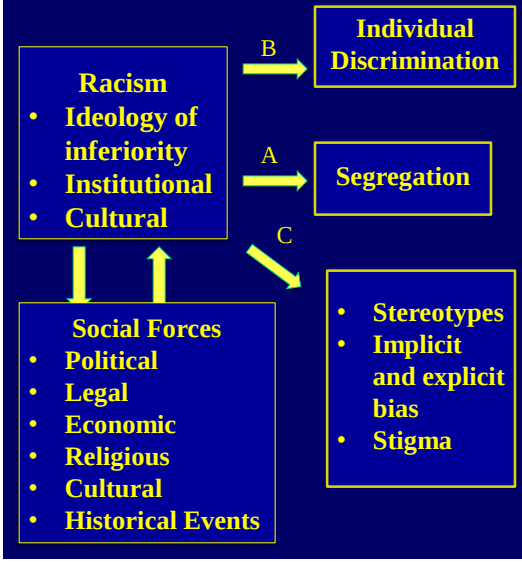
- Everyday Discrimination: positively associated with:
  - -- coronary artery calcification (Lewis et al., Psy Med, 2006)
  - -- C-reactive protein (Lewis et al., Brain Beh Immunity, 2010)
  - -- blood pressure (Lewis et al., J Gerontology: Bio Sci & Med Sci 2009)
  - -- lower birth weight (Earnshaw 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)

Discrimination and Breast Cancer

- In the Black Women's Health Study, the largest cohort of black women in the U.S., racial discrimination was associated with increased incidence of breast cancer
- This association was stronger among women aged 50 years or younger and among those who reported discrimination in multiple contexts
- Discrimination was also associated with increased incidence of obesity

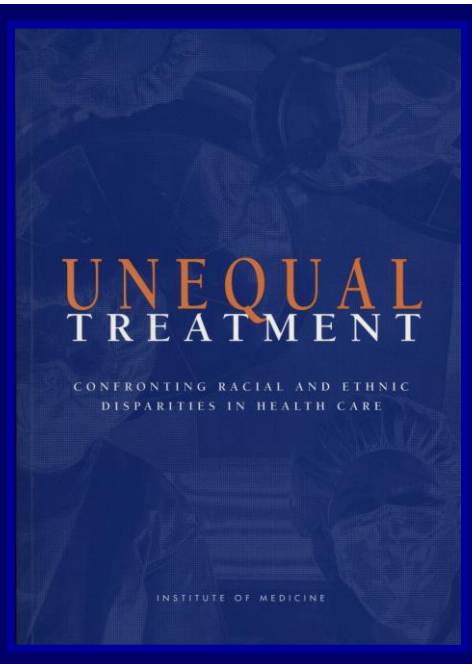
TR Taylor et al, *Am J of Epi*, 2007; YC Cozier et al., *Am J of Epi*, 2014

The House that Racism Built



Consequences of Implicit Bias

It leads to pervasive discrimination across societal sectors among persons who are egalitarian in orientation



Racial Bias in Medical Care

Race and Medical Care

- Across virtually every therapeutic intervention, ranging from high technology procedures to the most elementary forms of diagnostic and treatment interventions, minorities receive fewer procedures and poorer quality medical care than whites.
- These differences persist even after differences in health insurance, SES, stage and severity of disease, co-morbidity, and the type of medical facility are taken into account.
- Moreover, they persist in contexts such as Medicare and the VA Health System, where differences in economic status and insurance coverage are minimized.

Institute of Medicine, 2002

Race and Breast Cancer Care Access Factors

Compared to Whites, Black breast cancer patients were:

- Less likely to have have health insurance
- Less likely to be treated by experienced board-certified physician More likely to be treated in large public hospitals

Diehr et al. 1989. Study of 7,781 in 107 hospitals

Race and Breast Cancer: Quality of Care Differences

Adjusting for these factors, blacks were less likely than whites to receive:

- appropriate prognostic test (progesterone receptor assay)
- radiation therapy in combination with radical/modified mastectomy
- rehabilitation support services after a mastectomy

Diehr et al. 1989. Study of 7,781 in 107 hospitals

Disparities in the Clinical Encounter: The Core Paradox

How could well-meaning and highly educated health professionals, working in their usual circumstances with diverse populations of patients, create a pattern of care that appears to be discriminatory?

Unconscious Discrimination

- **When one holds a negative stereotype about a group and meets someone who fits the stereotype s/he will discriminate against that individual**
- **Stereotype-linked bias is an**
  - **Automatic process**
  - **Unconscious process**
- **It occurs even among persons who are not prejudiced**

Racial Stereotypes in Our Culture

- BEAGLE Project
- 10 million words
- Sample of books, newspapers, magazine articles, etc. that average college-level student would read in lifetime
- Allows us to assess how often Americans have seen or heard words paired together over their lifetime

Verhaeghen et al. British J Psychology, 2011

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

Verhaeghen et al. British J Psychology, 2011

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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

Verhaeghen et al. British J Psychology, 2011

Implicit Bias & Care for Blacks

- More Implicit bias associated with:
  - -- more clinician verbal dominance*
  - -- less patient centered dialogue
  - -- lower patient positive affect*
  - -- lower perception of respect from clinician*
  - -- less patient liking of clinician*
  - -- lower trust and confidence in clinician
  - -- less likely to recommend clinician to others*
  - -- less perception of clinician as participatory*
  - -- longer visits and slower speech (compensation for mistrust?)

Cooper et al., AJPH, 2012; * = significant interaction with race

Reducing Racial Bias Among Health Care Providers: Lessons from Social-Cognitive Psychology

Diana Burgess, PhD[1,2], Michelle van Ryn, PhD, MPH[1,3], John Dovidio, PhD[4], and Somnath Saha, MD, MPH[5]

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Counteracting unconscious prejudice and stereotypes: Individuation

- Individuation*:* provider focuses on the individual attributes of specific patient (vs c*ategorization:* perceiving patient through filter of group (e.g, race)
- With adequate motivation, cognitive resources, and effort, people can learn to focus on the unique qualities of individuals, rather than the groups they belong to, in forming impressions and behavior
- Even automatically activated prejudice and stereotypes can be inhibited when people are perceived more in terms of their particular qualities vs. primarily as members of social categories.

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Burgess, Van Ryn, Dovidio, and Saha, J Gen Intern Med (2007)

Summary

- Negative stereotypes about race remain deeply embedded in our culture
- Negative Stereotypes Trigger Racial Discrimination
- Discrimination leads to unequal access to goods and services, including medical care
- Experiences of discrimination are a source of toxic stress

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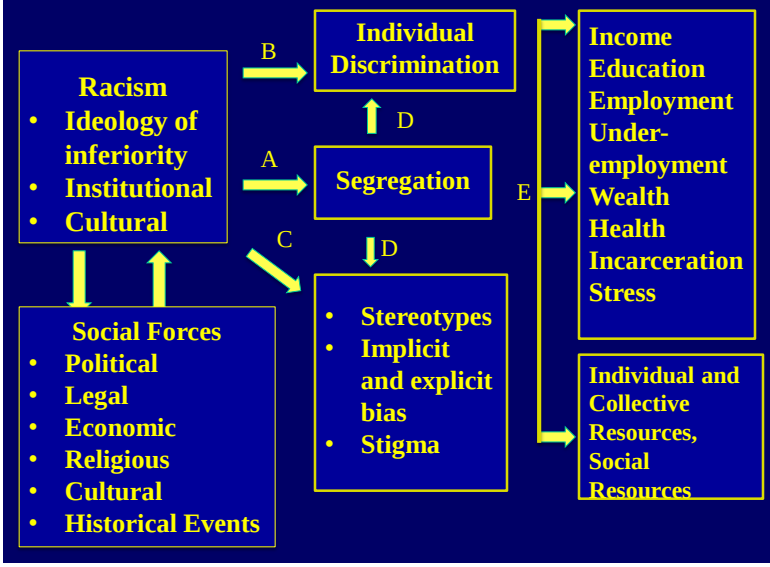
The House that Racism Built



Understanding how the social environment affects breast cancer risk requires that we take lifecourse exposures more seriously

Stress and Breast Cancer
Need for a lifecourse perspective

Stress and Breast Cancer

- Review of research on life events, work stress and perceived global stress in relation to breast cancer incidence (13 studies) and breast cancer relapse (5 studies)

- Stress does not increase the risk of breast cancer
- Insufficient evidence to conclude that there is a role for stress in breast cancer relapse

Nielsen & Gronbaek, Nat Clin Practice Oncology, 2006

Limitations of Studies of Stress

- The assessment of stress relatively primitive
- Life events were serious (divorce, death), but limited
- Focus has been on a few recent stressors in adults
- Some studies over-control for confounders (e.g., SES, health practices, BMI) which may be proximal mediators of adversity on physiology
- Research indicates that failure to measure stress comprehensively can dramatically understate the effects of stress on health

Nielsen & Gronbaek, Nat Clin Practice Oncology, 2006; Thoits, J Hlth Soc B, 2010

Physical Abuse as a Child and Cancer

- Study of 13,092 Canadians
- Physical abuse as a child by someone close to respondent associated with 49% higher odds of cancer (adjusted age, sex and race)
- The odds ratio decreased only slightly (47% higher odds) when adjusted for other childhood stressors (parental divorce, addictions, unemployment), adult health behavior (smoking, BMI, physical activity, alcohol) and adult SES (education and income)

Fuller Thompson & Brunononstul, Cancer, 2009

Abuse by Parents and Cancer

- Study of 3,032 respondents in MIDUS national study
- Specificity to type of adversity and sex differences
- For men, physical abuse by father (OR=2.6) and frequent emotional and physical abuse by either parent (OR=3.6) increased cancer risk
- For women, physical abuse by mother (OR=2.2) and frequent emotional and physical abuse by either parent (OR=2.2) increased cancer risk
- Additive adversity predicts cancer risk only for men
- Association robust after adjustment for adult SES, health behavior (smoking, BMI, and psychosocial factors)
- Sexual abuse not assessed in the study

Morton et al., J Aging and Health, 2012

Maternal Death and Breast Cancer

- Study of 1,213 women in the Baltimore ECA Study followed from 1980 to 1995
- Maternal death in childhood (OR=2.56) and chronic depression with severe episodes (OR=14.0) predicted increased risk of breast cancer
- Both stressors occurred at least 20 years prior to breast cancer hospitalization
- Associations significant after adjustment for family history, alcohol use and smoking
- Recent life events, depressive and anxiety disorders were NOT associated with breast cancer risk

Jacobs & Bovasso, Psychological Med, 2000

Obesity: A Plausible Pathway

- Obesity (body fat) is a major risk factor for breast cancer, although the risk may be greater in postmenopausal breast cancer
- Weight gain in adulthood predicts breast cancer risk
- The link between body fat and breast cancer is mediated by age-related changes in estrogen synthesis
- Weight loss through calories restriction by gastric bypass surgery leads to a reduction in circulating estrogens (e.g. Cleary & Grossman) and the risk of breast cancer (Chistou et al., 2008)

Change in Skirt Size and Breast Cancer

- One unit increase in skirt size every 10 years from the 20s to current age increased breast cancer risk by 33%.
- Going up 2 skirt sizes associated with a 77% increase

Cohort study of 92,834 postmenopausal women in England who were free of breast cancer at baseline

E. Fourkala et al., BMJ Open, 2014

We need to understand the early life determinants of adult obesity

It Starts Early

- Data from prebirth cohort of 1,116 mother-child pairs
- By age 7, compared to whites, black and Hispanic kids have twice the prevalence of overweight and obesity
- SES and parental obesity contribute to this pattern
- Early life risk factors more common in blacks and Hispanics than whites
- Early feeding behaviors (non-optimal breast feeding, early solid foods), accelerated weight gain, obesity-related risk factors (TV in child's bedroom; inadequate sleep; sugar-sweetened drinks, fast food)
- Adj. for early risk factors reduce BMI diffs 69% to 83%

Elsie Taveras et al., JAMA Pediatr, 2013

Childhood Sexual Abuse and Adult Obesity

- Study of 2,461 adults: birth cohort study in Australia
- Risk of being overweight at age 21 was greater (OR=1.85) among women who experienced penetrative childhood sexual abuse (CSA)
- Association remained significant after adjustment for maternal education, income, lifestyle, mental health, marital status and childhood and adolescent behavioral problems and family dysfunction
- No association between non-penetrative CSA and weight among women and no association between either form of CSA and weight among men

Mamun et al., Obesity, 2007

Future research needs to measure stress more comprehensively to fully capture its impact on breast cancer and risks factors for cancer such as obesity

Neighborhood Stressors

- Neighborhoods where black women live have more health-damaging conditions (poverty, crime, residential instability, overcrowding, unemployment, etc)
- Neighborhood conditions are also associated with other factors that affect health (medical care, access to nutritious food, safe places to exercise, access and quality of public services and physical and chemical environmental pollutants
- Research needs to assess how all of these factors combine, over time, to affect breast cancer risk

ML Miranda et al., *Epidemiologic Reviews*, 2009

Chemicals and Breast Cancer

- Laboratory studies reveal:
  - -- Hundreds of common chemicals that activate biological pathways and cause mammary tumors in rodents
  - -- Hormone disrupters that interact with the estrogen receptor and promote tumor proliferation
  - – Developmental toxicants that alter mammary gland development and cancer susceptibility in rodents
- These chemicals are widespread in air and water pollution, consumer products, house, dust and human tissues
- More research attention should be given to the potential contribution of these environmental factors and their interaction with psychosocial factors

Julia Brody et al., Science, 2014

Prenatal Stress and Childhood Cancer

- Study of all children born in Denmark from 1968 to 2007 and Sweden from 1973 to 2006
- Stress: maternal bereavement - loss of a 1st degree relative (child, spouse, parent, sibling) the year before pregnancy, or during pregnancy
- Children born to women who lose a child or spouse (but not other relatives) had a 30% increased risk of any cancer
- The hazard ratios (HR) were largest for non-Hodgkin disease (HR=3.40), hepatic cancer (HR=5.51) and testicular cancer (HR = 8.52)
- There was no variation linked to 12-7 months before conception, 6-0 months before conception, and pregnancy

J.Li, et al. Br J Cancer, 2012

Health behaviors and Breast Cancer: Need for a lifecourse perspective

Physical Activity

- Both occupational and non occupational physical activity are associated with reduced with breast cancer risk (meta-analysis of prospective studies of physical activity with breast cancer)
- Protective effect of physical activity more marked in premenopausal women and for ERneg and PRneg breast tumors
- Physical activity in early life and adulthood could help to reduce obesity in early & adult life

Wu, Zhang, & Kang, *Breast Ca Res & Treat*, 2013

Breastfeeding and Breast Cancer

- Breastfeeding, (incl. duration & number breastfed) is associated with reduced risk of aggressive premenopausal breast cancer
- Whites have higher levels of breastfeeding and longer breastfeeding duration than blacks
- One study: increasing breastfeeding and reducing abdominal obesity could eliminate 68% of basal-like breast cancers in young black women and over half of breast cancer in general population
- Hospitals that serve blacks less likely to offer patients recommended practices supportive of breast feeding

RC Millikan et al., *Breast Ca Res & Treat*, 2008; JN Lind et al.,, *MMWR*, 2014

Red Meat and Alcohol

- Red meat consumption in midlife is not a consistent predictor of breast cancer risk
- But red meat in early adulthood and especially in adolescence is associated with breast cancer overall and especially premenopausal breast cancer
- Alcohol is a human carcinogen, with a dose-response association between alcohol and breast cancer
- One drink/day, regardless of type, linked to 10% increase and 3 drinks/day with 40% increase in breast cancer
- The more alcohol a woman drinks between puberty and 1st full-term pregnancy, greater the risk of breast cancer

Farvid et al, BMJ, 2014; Nelson et al, AJPH, 2013; Yang et al, *AJE*, 2007; Liu et al, *JNCI*, 2013

Fiber (Fibre) and Breast Cancer

- Women who ate more high-fiber foods during adolescence and young adulthood, -- especially lots of fruits and vegetables had had lower breast cancer risk as adults
- High fiber in adolescence associated with a 16% lower overall risk of breast cancer and a 24% lower risk of breast cancer before menopause
- High fiber in early adulthood associated with a 12% to 19% lower breast cancer risk
- Each additional10 gm/day fiber (1 apple, 1 C cooked beans, 2 slices ww bread) breast cancer risk declines 13%

MS Farvid et al, Pediatrics, 2016

Interventions

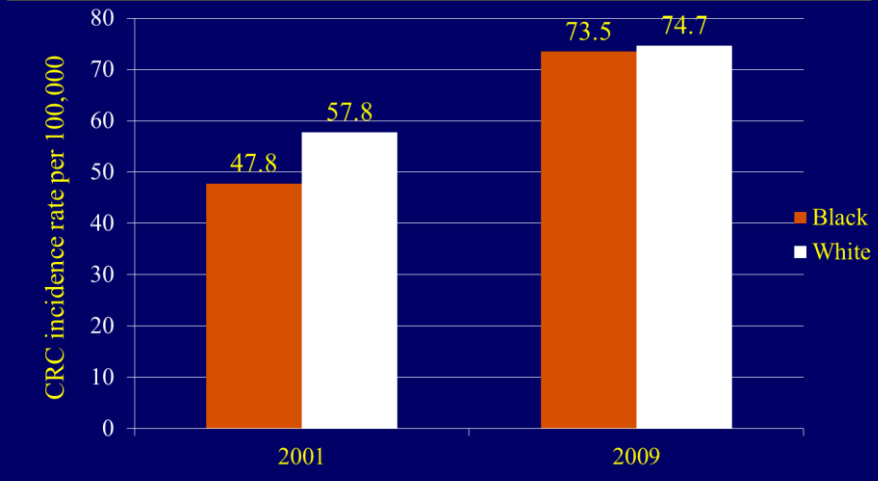
We need to better understand and assess the conditions under which interventions within the healthcare system can reduce racial disparities in health status

Colorectal Cancer (CRC) Intervention

- State of Delaware fully funds a CRC screening program promoting colonoscopy in 2002
- Provides reimbursement for uninsured residents up to 250% of Federal poverty level (FPL)
- Other state residents eligible through other insurance
- Cancer screening nurse navigator system added in 2004, at each of the 5 acute care hospital sites
- Cancer treatment program added in 2004: covers costs of cancer care for 2 years for newly diagnosed uninsured if income under 650% FPL
- Special outreach efforts for African Americans

S Grubbs et al. J Clin Oncology, 2013

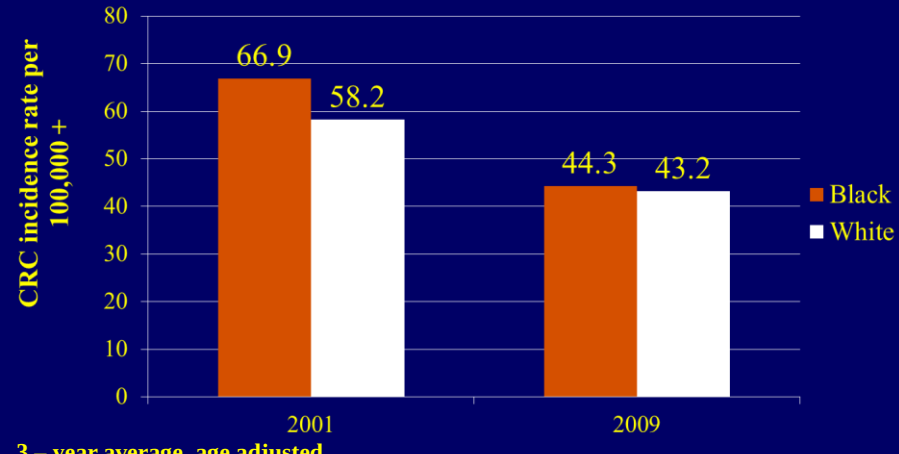
Eliminated screening disparities



3 – year average, age adjusted

S Grubbs et al. J Clin Oncology, 2013

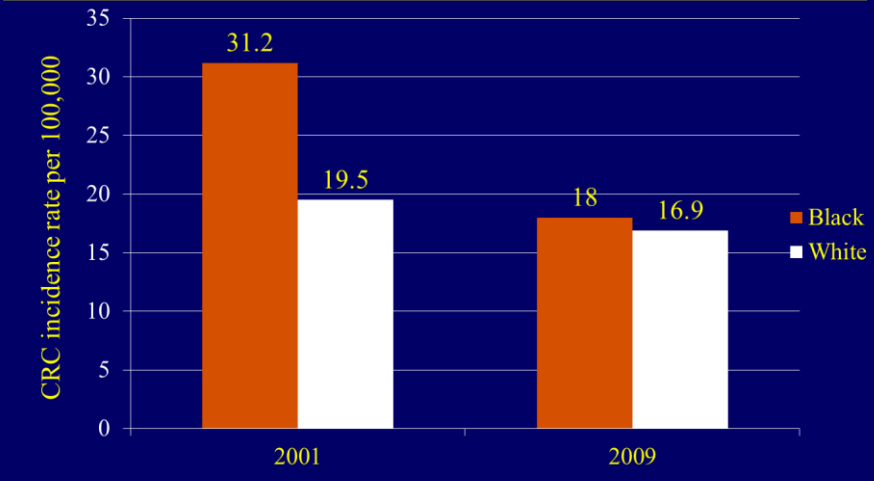
Equalized Incidence rates



3 – year average, age adjusted

S Grubbs et al. J Clin Oncology, 2013

Near Elimination of Mortality Difference



3 – year average, age adjusted

S Grubbs et al. J Clin Oncology, 2013

Lessons from Delaware

- If done nationally, 4,200 fewer blacks would get CRC each year, and 2,700 fewer would die
- The Delaware screening program cost $1 million annually
- It saved $8.5 million annually from reduced incidence and earlier diagnosis
- The annual cost of treatment was $6 million
- CRC screening program with outreach and patient navigation can reduce inequities

S Grubbs et al. J Clin Oncology, 2013

Interventions

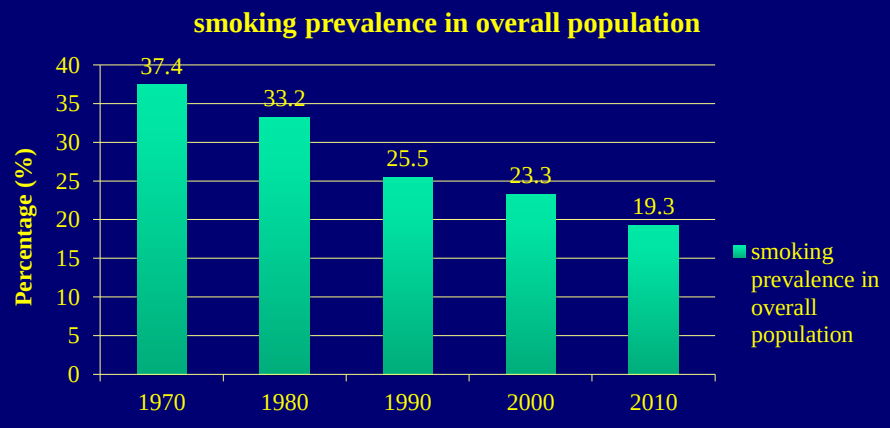
We need to clearly recognize that improving health and reducing disparities are not synonymous

We Need to Identify Strategies that Will Enable us to Improve Health and Reduce Social Inequalities Simultaneously

There is the reality of improving overall health but widening social inequalities

How can we improve the health of the disadvantaged more rapidly than that of the rest of the population?

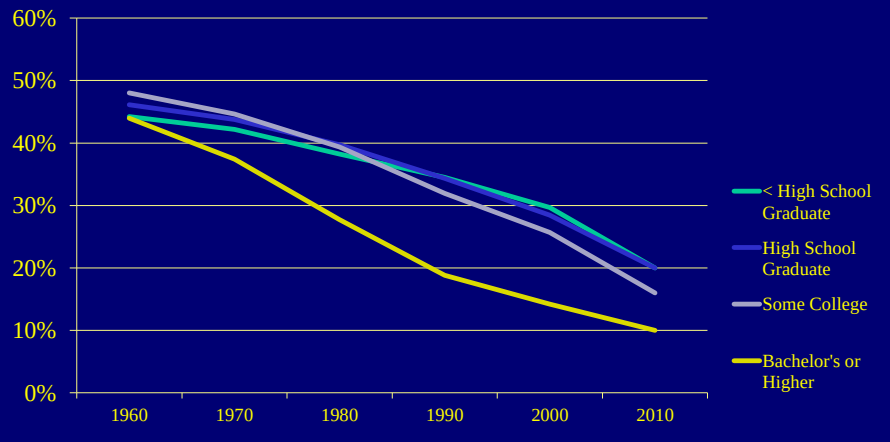
Smoking Levels in the U.S., 1970 -2010



18 years of age and older

Centers for Disease Control and Prevention. National Center for Health Statistics. National Health Interview Survey 1965-2011

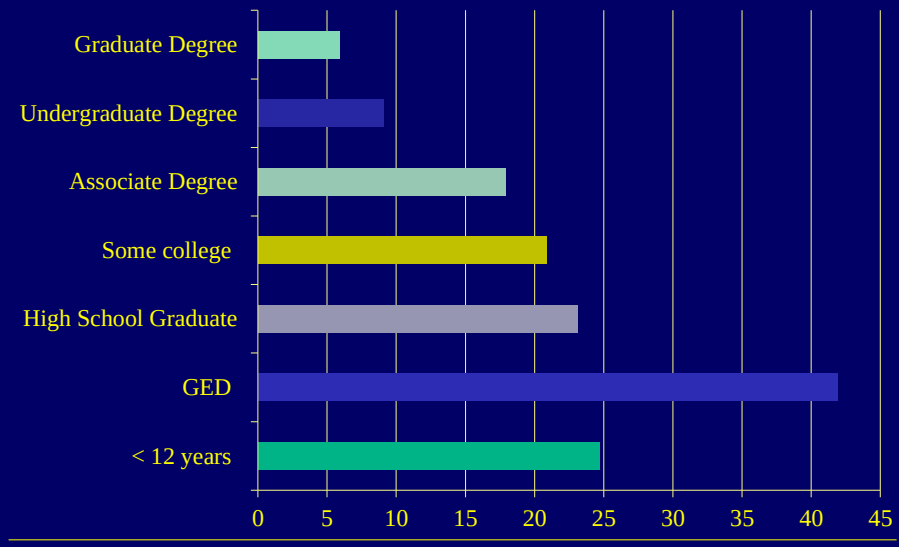
Smoking prevalence in the U.S 1960 -2010 by Education



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

Source: National Center for Health Statistics, 2009,

Education and Cigarette Smoking, 2012



Morbidity and Mortality Weekly Report, 2014,Vol.63/No.2

Challenge of Tobacco:

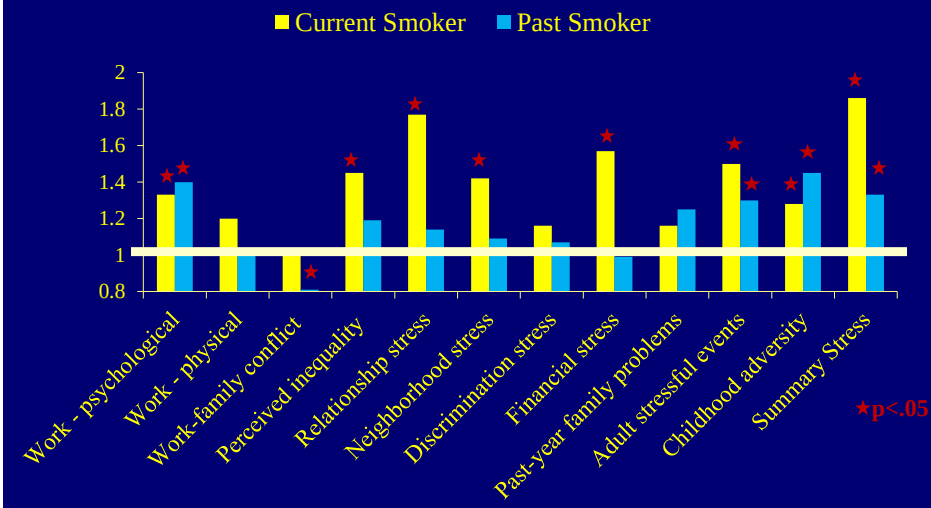
How to reduce smoking in low SES, economically marginalized and socially stigmatized populations

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

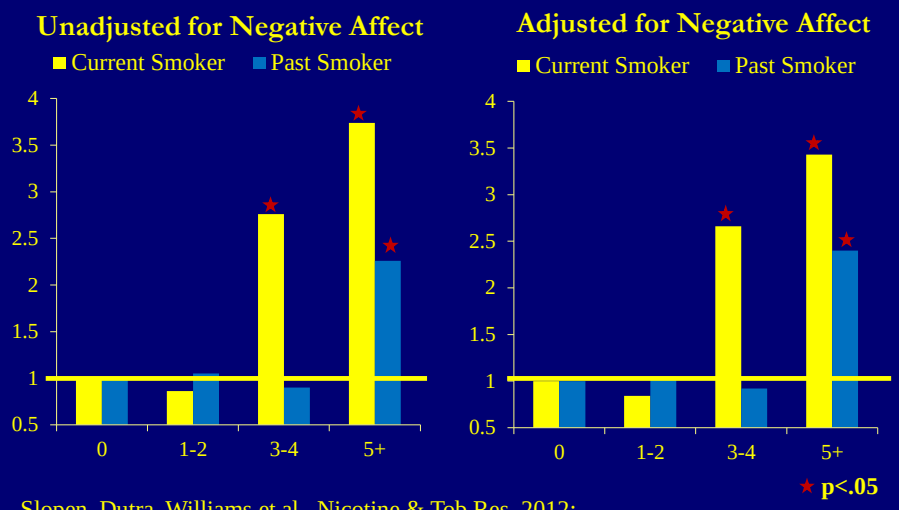


Slopen, Dutra, Williams et al., Nicotine & Tob Res, 2012;
adjusted for age, gender, education, & income.

100

Odds of Current and Previous Smoking By Number of Stress Domains

Reference Group = Never smokers



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

101

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 strategies that reduce stressors, and enhance individual & community-level resources to cope with stressors

Slopen, Kontos, ……Williams, Cancer Causes & Control, 2013

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 my be diminishing over time as the baseline price of tobacco increases

Hill et al, Tobacco Control, 2014

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

Hill et al, Tobacco Control, 2014

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

Hill et al, Tobacco Control, 2014

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

Farrelly et al., Am J Preventive Med, 2009

Undoing Racism

Dismantling Institutional Racism

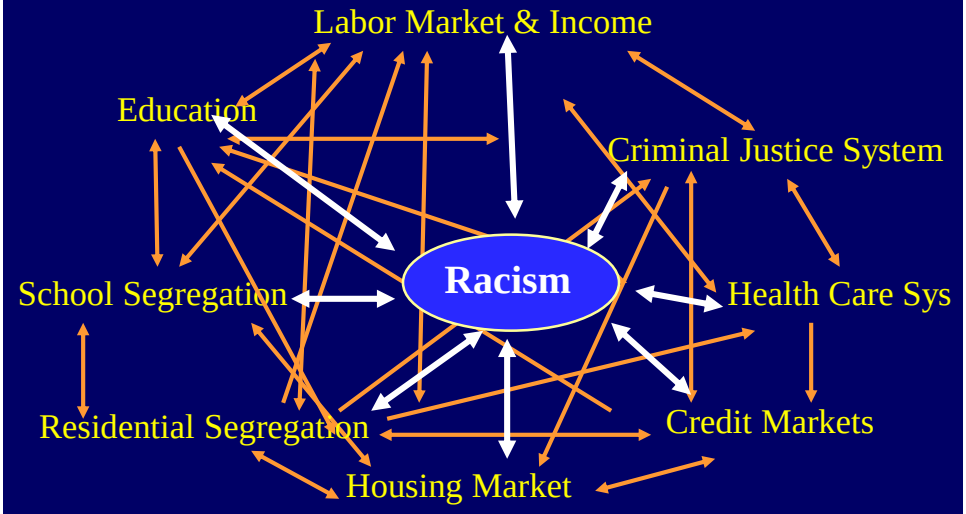
Racism as a System: Implications

- Inequities in one societal domain are not independent of those in other domains
- Racism is a set of dynamically related components of subsystems
- There is reciprocal causality of inequities across domains
- Inequities in one domain are a product of causal processes across multiple subsystems
- "It is impossible" to come up with remedies for inequities if we fail to acknowledge and address the interdependence across domains

Reskin, Ann Review of Sociology, 2012

Racism as a System

Arrows reflect emergence of racism and the effects of subsystems (white arrows)



Adapted from Reskin, Ann Rev Sociology, 2012

Options for Reducing Racial Inequalities

1. An exogenous force that acts on every subsystem: authoritative entity with mandate to act
2. Act on leverage points
   -- Residential segregation is one
3. Removing institutions from the discrimination system
   -- Success of the Army
4. Increasing accountability, reducing discretion

Effective solutions to reducing racism must be comprehensive

Reskin, Ann Review of Sociology, 2012

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Racism and Health II: A Needed Research Agenda for Effective Interventions

David R. Williams[1,2,3] and Selina A. Mohammed[4]

Abstract

This article reviews the empirical evidence that suggests that there is a solid foundation for more systematic research attention to the ways in which interventions that seek to reduce the multiple dimensions of racism can improve health and reduce disparities in health. First, research reveals that policies and procedures that seek to reduce institutional racism by improving neighborhood and educational quality and enhancing access to additional income, employment opportunities, and other desirable

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.

"True compassion is more than flinging a coin to a beggar; it understands that an edifice which produces beggars needs restructuring."

- - Dr. Martin Luther King, Jr.