

An Overview of Health Disparities in Cancer

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M E D I C I N E

Disclosure Information

Dr. Otis W. Brawley

I have the following financial relationships to disclose:

**Consulting for Genentech/Roche, Grail, PDS Biotech, Lyell
Immunopharma, Incyte, and Agilent**

– and –

**I will not discuss off label use and/or investigational use in my
presentation.**

The Leading Causes of Death in US, 2019

1) Heart disease:	647,457	23.1%
2) Cancer:	599,108	21.7%
3) Accidents (unintentional injuries):	169,936	5.9%
4) Chronic lower respiratory diseases:	160,201	5.6%
5) Stroke (cerebrovascular diseases):	146,383	5.2%
6) Alzheimer's disease:	121,404	4.2%
7) Diabetes:	83,564	2.9%
8) Influenza and pneumonia:	55,672	1.9%
9) Renal disease:	50,633	1.8%
10) Intentional self-harm (suicide):	47,173	1.6%

CDC Vital Statistics Report

<https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm>

Advocating the Study of Disparities in Health



David Satcher, MD, PhD
16th Surgeon General of the United States (1998-2002)
11th Assistant Secretary for Health (1998-2001)

Disparities in Health

Health Disparities is the concept that some populations (however defined) unnecessarily do worse than others. It logically leads to:

- The concept of “Health Equity”
- The concept of “Health Justice”

Disparities in Health

Populations can be defined or categorized by:

- Sex or Gender
- Race
- Area of geographic origin
- Genetic ancestry
- Family/Tribe
- Ethnicity and Culture
- Area of Residence
- Socioeconomic Status

Disparities in Health

The measure can be:

- Incidence
- Mortality
- Survival
- Quality of life

Heart Disease Demographics by Race/Ethnicity

Race/Ethnicity	Age-Adjusted Death Rate per 100,000	Proportion of Adults with Heart Disease by Race
NH Black	208.0	9.5%
NH White	168.9	11.5%
Hispanic	114.1	7.4%
NH Asian/Pacific Islander	85.5	6.0%

NCHS National Health Interview Survey
Centers for Disease Control and Prevention.
Heart disease risk factors. Atlanta, GA.

https://www.cdc.gov/heartdisease/risk_factors.htm.

<https://www.cdc.gov/nchs/hus/spotlight/2019-heart-disease-disparities.htm>

Cancer Health Disparities State by State

Age Adjusted Cancer Mortality Rate 2021:

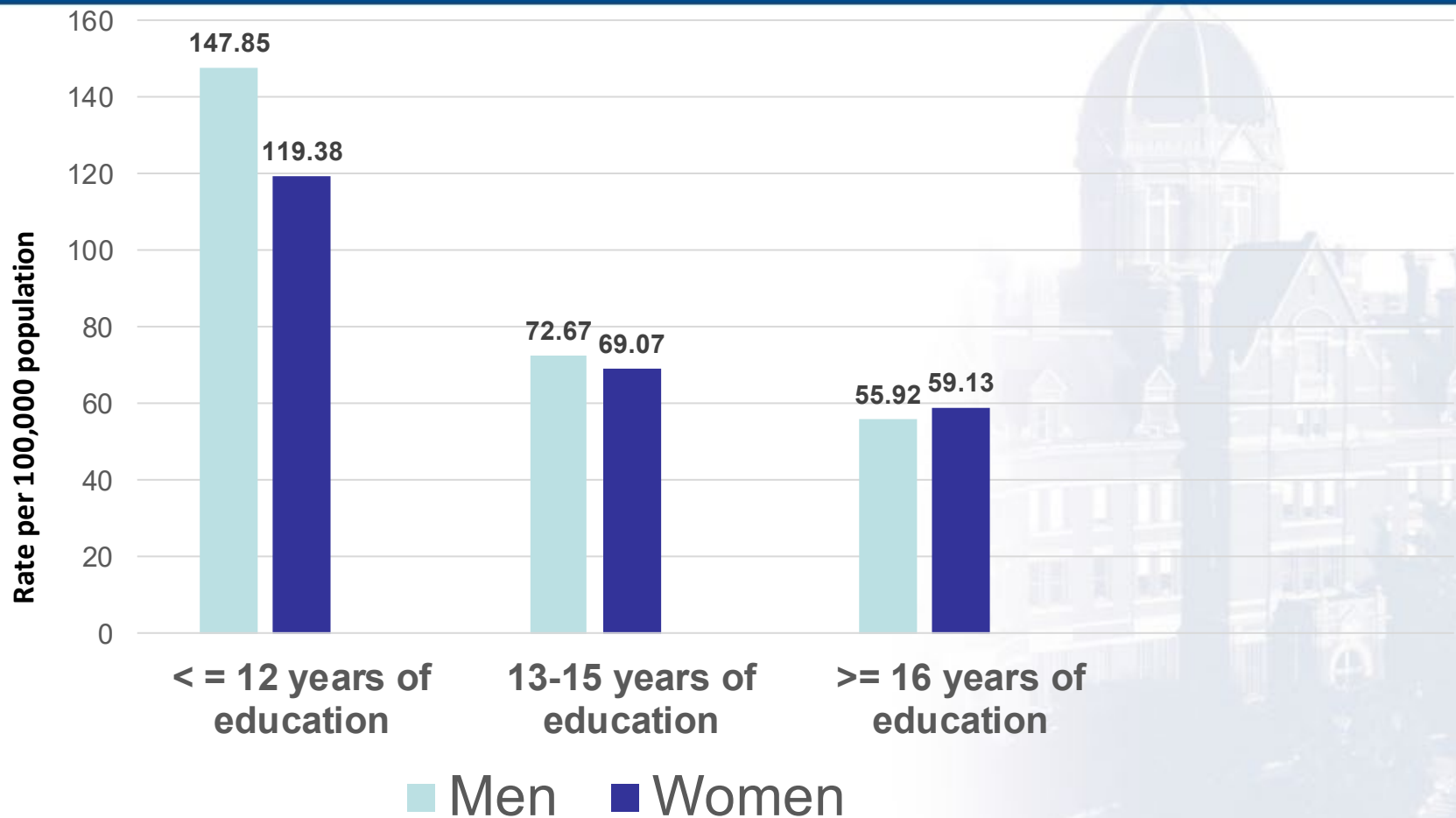
- 121 deaths per 100,000 in Utah
- 185 deaths per 100,000 in West Virginia

The difference is heavily influenced by lung, colon and breast cancer differences.

[Seer.cancer.gov](https://seer.cancer.gov)

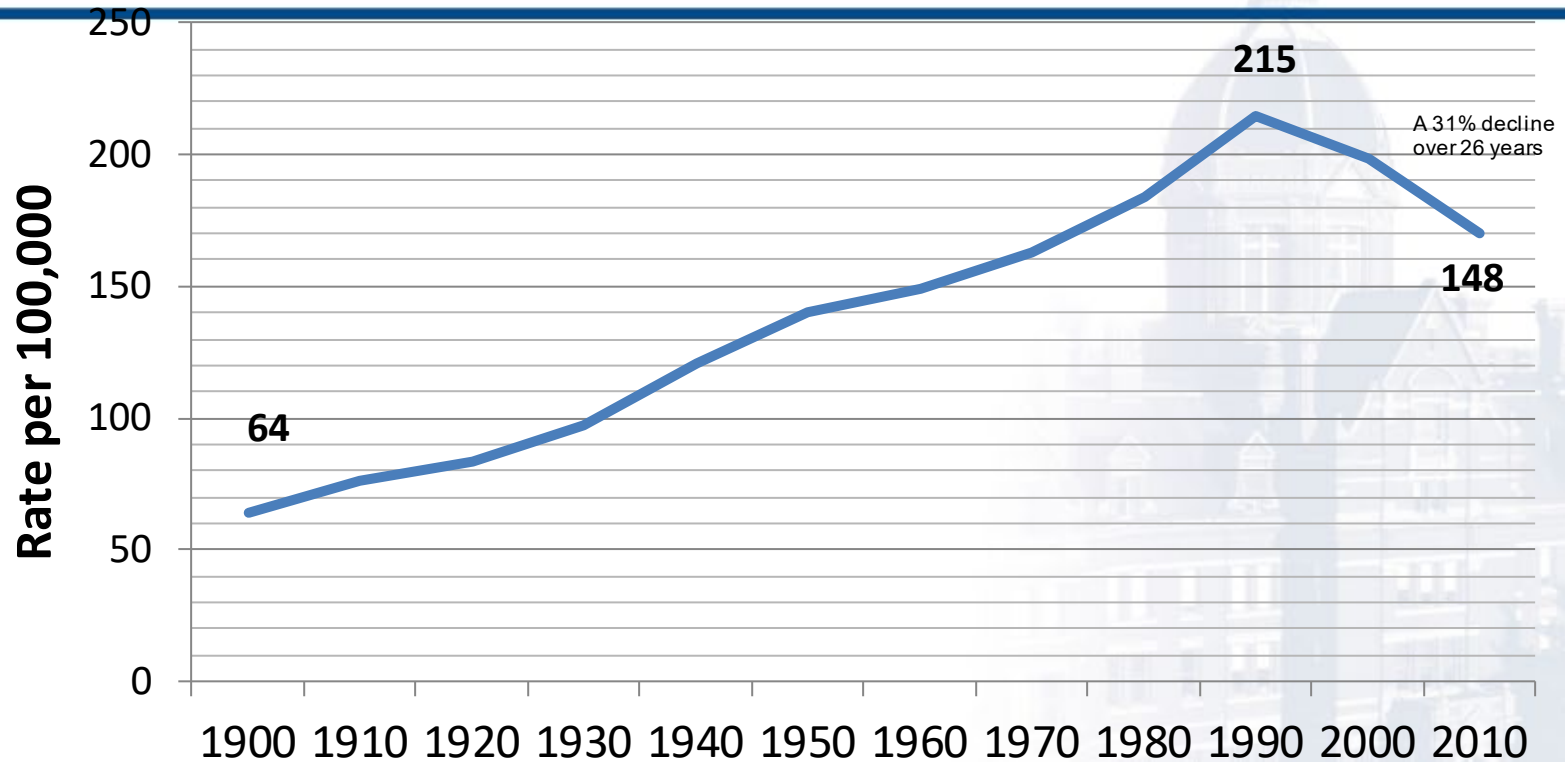
www.wonder.cdc.gov

The Social Determinants of Health Cancer Death Rate by Educational Attainment



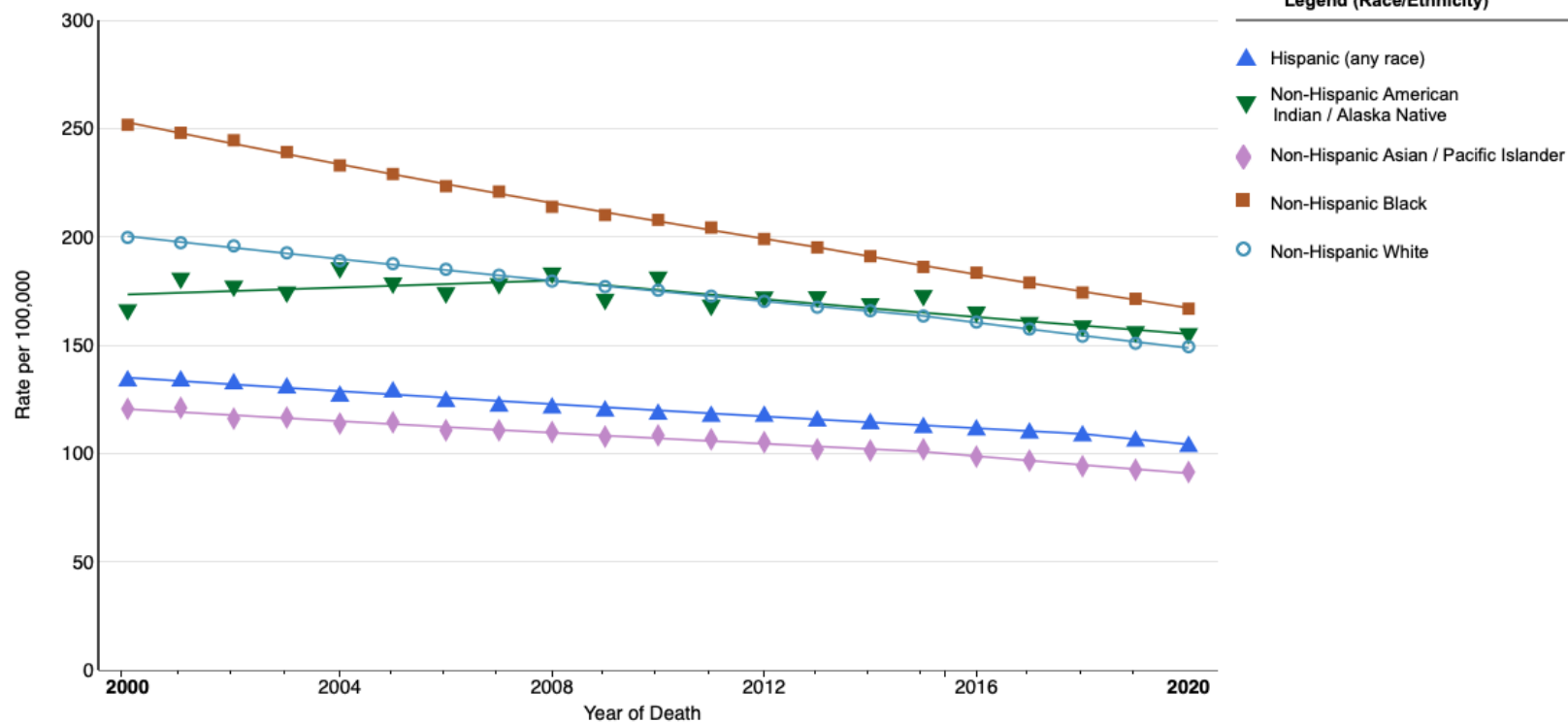
US Cancer Death Rate

1900 to 2018



Age Adjusted to 2000 Standard
1900-1970, US Public Health Service, Vital Statistics of the US, Vol. 1 and Vol 2;
1971-2020, US National Center for Health Statistics, Vital Statistics of the U.S

All Cancer Sites Combined **Recent Trends in U.S. Age-Adjusted Mortality Rates, 2000-2020** **By Race/Ethnicity, Both Sexes, All Ages**



Data Source:
 • U.S. Mortality Data (1969-2020), National Center for Health Statistics, CDC.
Methodology:

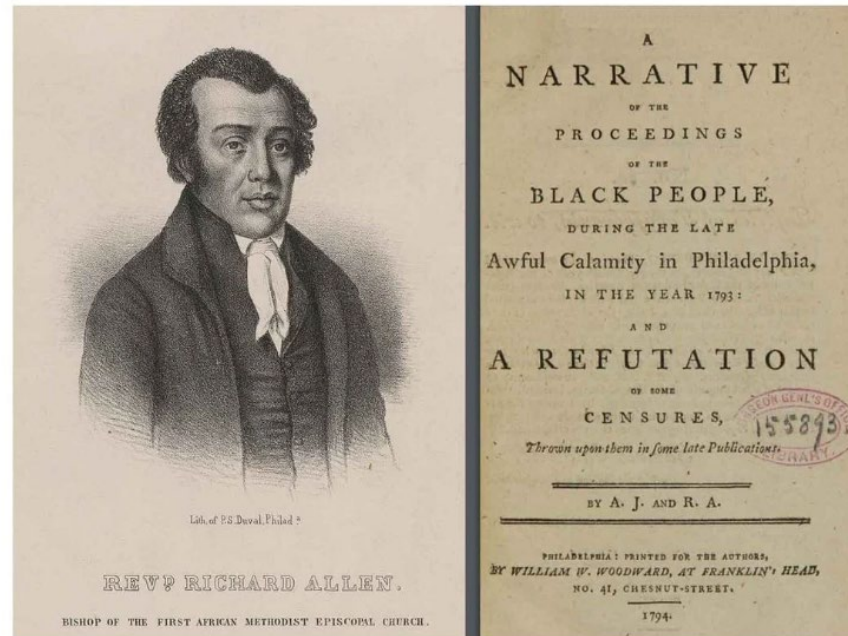
Race

5 categories defined by US Office of Management and Budget every ten years before the census.

- Sociopolitical and not biologic by OMB definition
- Rejected by Anthropological community as non-scientific
- Recent AMA statements condemn the biologic use of race

Racial Essentialism

Philadelphia 1793, The Yellow Fever Epidemic



Racial essentialism: The concept that there are inherent, immutable differences in biology among the races.

POPULATIONS DO DIFFER

This should be kept in mind when studying carcinogenesis and treatment outcomes.

“To divide the US population into 5 racial groups is like trying to slice soup.”

Other appropriate ways to categorize populations with attention to admixture:

- Area of Geographic Origin
- Genetic Ancestry

Poverty Rate by Race/Ethnicity US 2019

Race/Ethnicity	Proportion of US Population	Proportion of Racial/Ethnic Group in Poverty
White NH	60.1%	9.0%
Black NH	12.2%	21.2%
Hispanic	18.5%	17.2%
Asian/Pacific Islander NH	5.9%	9.7%
American Indian/Alaska Native NH	1.3%	24.2%

Disparities in Health

Social Determinants of Health
(Causal)

Versus

Social Needs
(Used to address the situation)

Causes of the Decline in Disease Mortality

The Spectrum of Disease Control

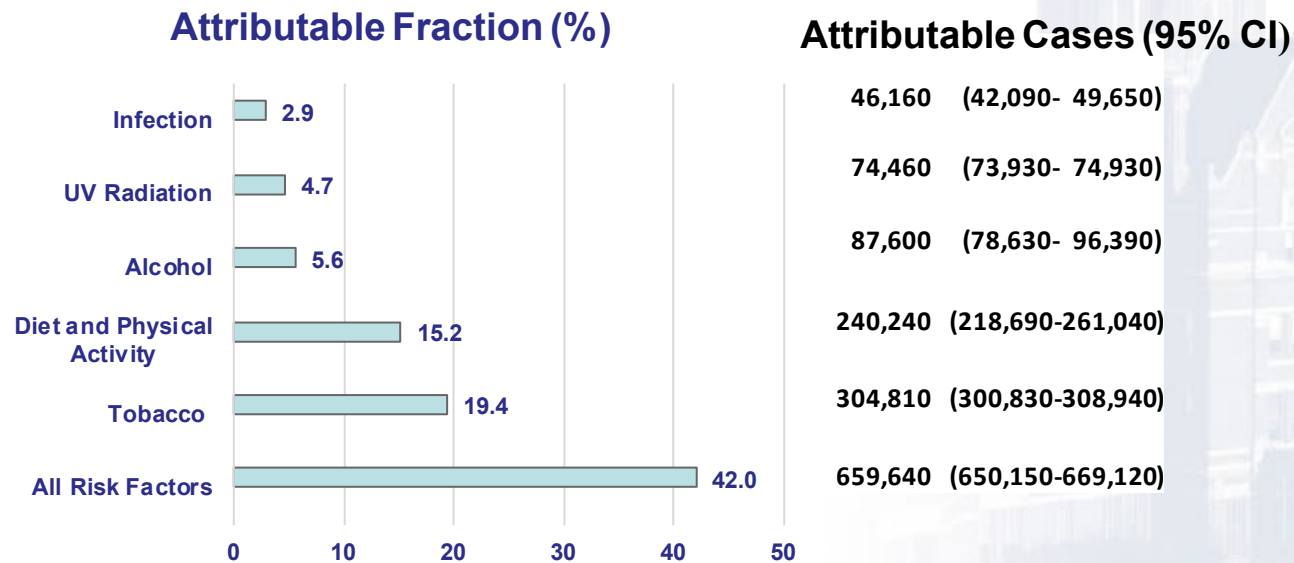
Appropriate

Prevention/Risk Reduction ➡ Screening ➡ Diagnostics ➡ Treatment

In the US, the emphasis is too much on diagnosis and treatment and not enough emphasis is placed on disease prevention (or risk reduction).

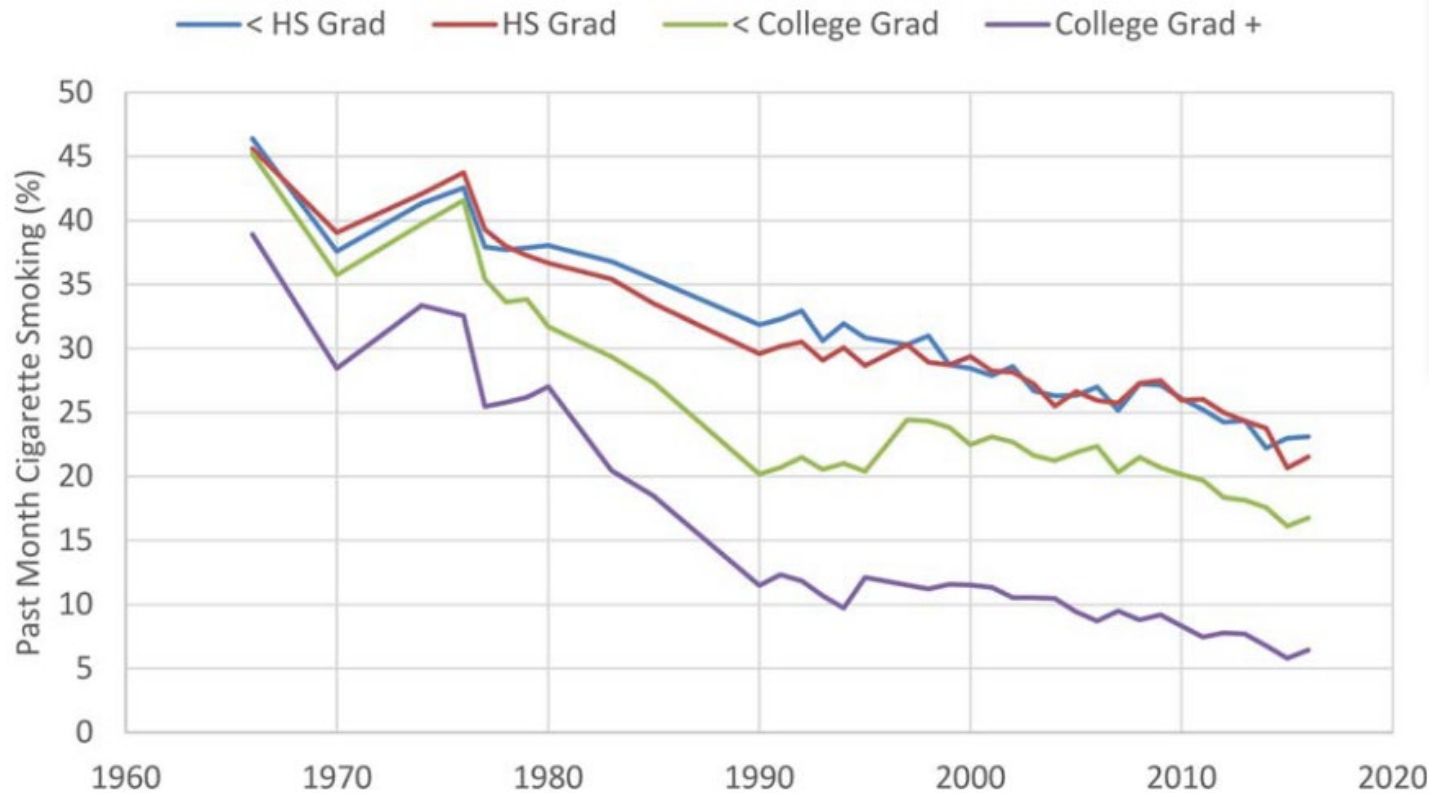
Lack of emphasis on prevention/risk reduction is a cause of some disparities.

Estimated Proportion and Number of Cancer Cases Attributable to Risk Factors (U.S. Both Sexes)

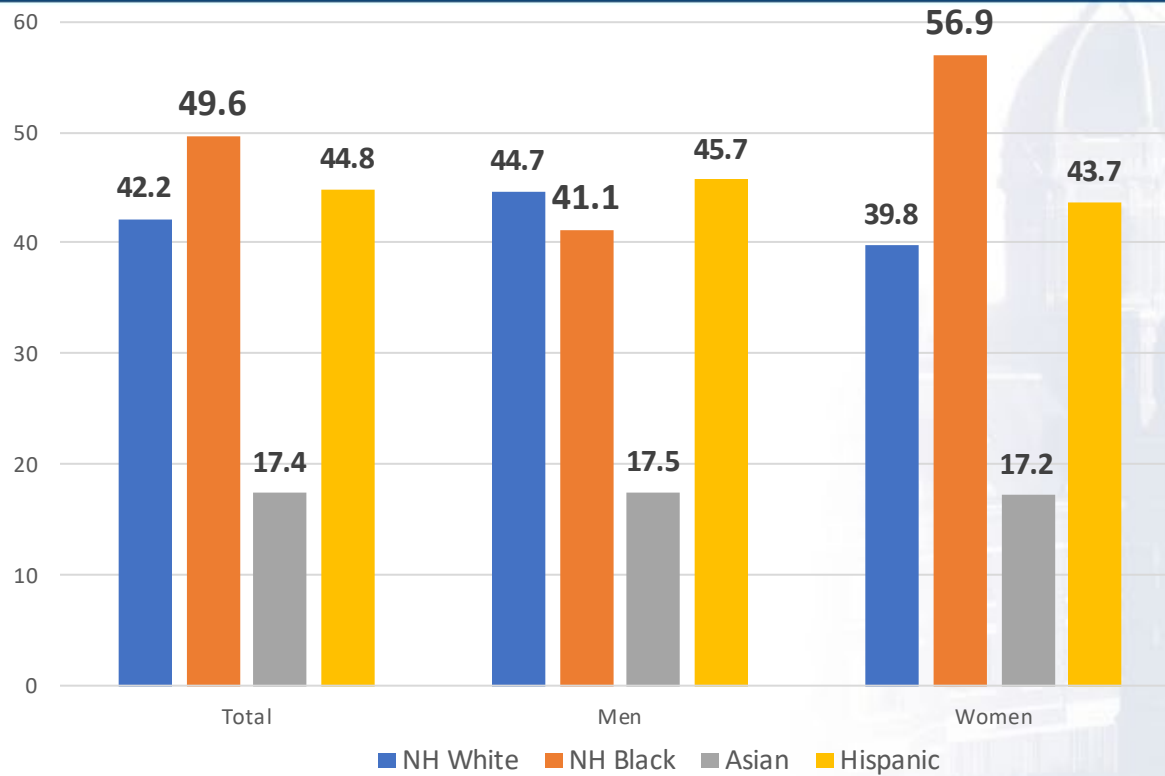


Islami et al, CA 2018

Smoking Prevalence by Education (1965-2018)



Prevalence of obesity among adults by sex, race, and ethnicity 2017-2018



NCHS, National Health and Nutrition Examination survey, 2017-2018

Triple Negative Breast Cancer (Distribution by Race/Ethnicity)

Race/Ethnicity	Proportion
NH White	12%
NH Black	24%
American Indian/Alaskan Native	10%
Hispanic/Latina	10%
Asian/Pacific Islander	8%

Risk Factors for Triple Negative

SDOH influences genetic markers and behavior of disease

Factors with a strong correlation for triple-negative disease

- Obesity
- Dietary Differences (high carbohydrate diet)
- Reproductive patterns
 - Multiparity
 - Early age at first pregnancy
 - **Lower rates of breast feeding!!!!**

Dietze et al Nat Rev Cancer 2015;15:248-254

Millikan et al Cancer Res Treat 2008;109:123-139

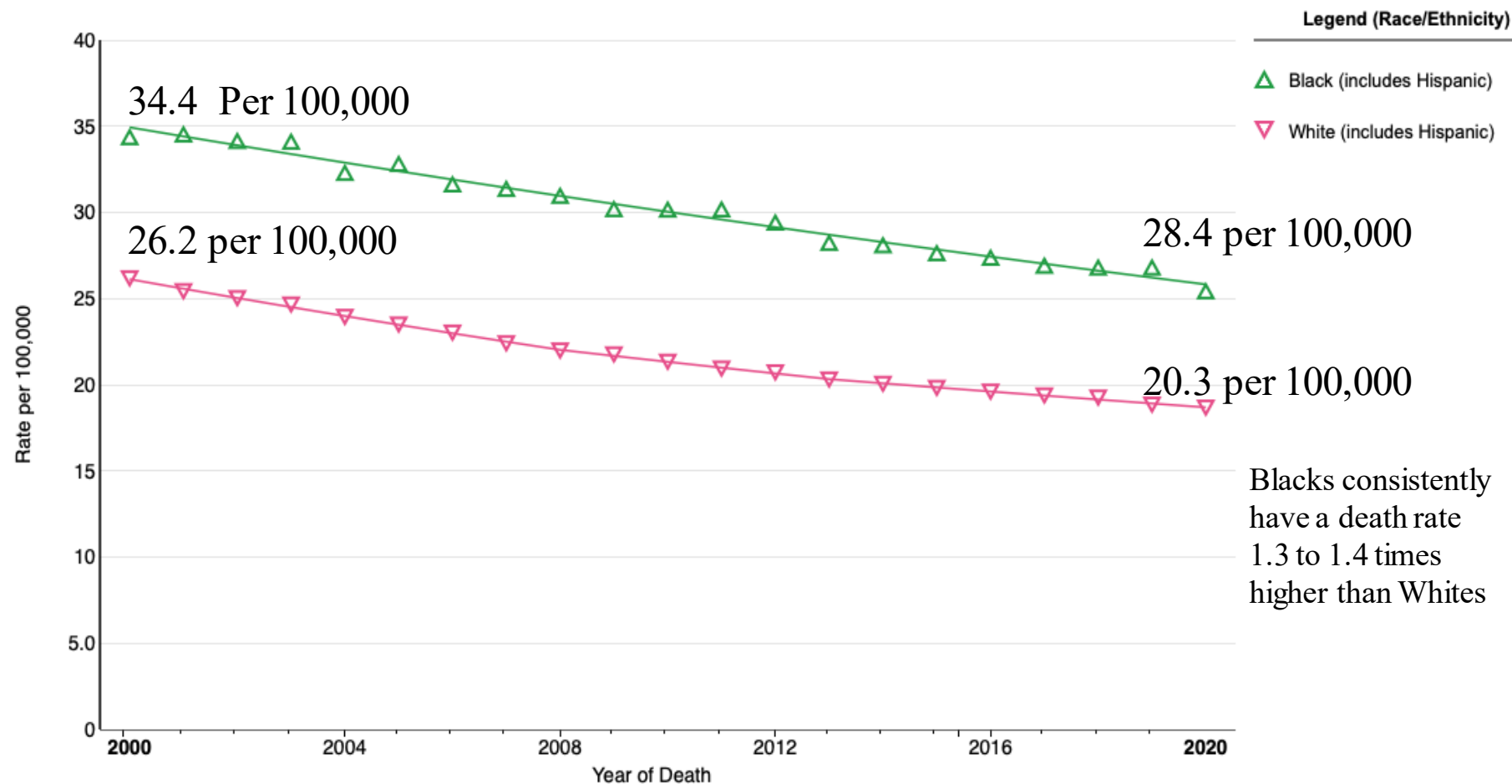
Palmer et al. JNCI 2014; 106:dju237



Breast

Recent Trends in U.S. Age-Adjusted Mortality Rates, 2000-2020

By Race/Ethnicity, Female, All Ages



Varying Breast Cancer Mortality Black/AA Women by Registry(2014-2018)

	17.5	New Mexico
	18.3	Massachusetts
	19.8	Iowa
	20.3	Connecticut
Average	21.7	Seattle-Puget Sound
Black 28.4 per 100,000	23.0	New York City
White 20.3 per 100,000	25.1	Kentucky
	25.7	SF Bay Area
	28.3	Georgia
	28.8	Detroit
	29.8	Atlanta
	30.2	Los Angeles
	32.1	Louisiana

Rates are per 100,000 population age-adjusted to 2000 standard

Breast Cancer Mortality

- The B-W death rate is essentially equal in five states. They are among the lowest in the US.
- The White mortality rate in 11 states is higher than the rate for Black women in Massachusetts and New Mexico.

NCI SEER 2024
www.Seer.Cancer.Gov

Key Point

The Most Important Question in Disease Control

How can we provide adequate high-quality care (to include preventive services) to populations that so often do not receive it?

- Unnecessary care consumes limited resources and interferes with abilities to provide necessary care.
- The provision of unnecessary care is a cause of health disparities.

Overemphasis on Screening

(and not enough emphasis on provision of adequate care)

CISNET Breast Cancer Modeling Estimates assessing annual and biannual screening.

- Failure to follow accepted screening guidelines accounts for 9.5 to 11.3% of all breast cancer deaths.
- Failure of the diagnosed to receive appropriate treatment accounts for 21.2 to 27.0% all of breast cancer deaths.

- » Mandelblatt Stout, Schechter, et al, Cancer 2016
- » Mandelblatt van Ravesteyn, Schechter, et al, Cancer 2011

Breast Cancer and Quality of Care

- In 2000, 7.5% of Black Women in Atlanta diagnosed with localized highly curable breast cancer did not receive a surgical removal of the tumor in the first year after diagnosis.
- Provision of adequate care is a logistical issue and not new medical science.

Lund et al. Breast Cancer Res Treat, 2008

Poverty and Radiation Therapy

- The poor (including poor whites) more often present with distant disease and are not candidates for radiation
- When candidates for radiation therapy, the poor are less likely to receive it.
- Quality of radiation therapy is an issue for those who get it.
 - Aiming of the beam
 - Quality of machine (poor people often have lower energy, older machines available to them).

Mattes MD, Suneja G, Gaffty BG et al. Adv Radiat Oncol. 2021

Washington C, Goldstein DA, Moore A, et al. Am Soc Clinical Oncol Educ Book. 2022

Breast Cancer and Quality of Care

- A substantial number of women of all races and incomes get less than optimal breast cancer care!
 - No screening or poor quality screening
 - No diagnostics or poor quality diagnostics
 - No surgery or poor quality care
 - No radiation therapy or poor quality radiation therapy
 - No chemotherapy or inappropriate dosing of chemotherapy
- Racial minorities and the poor are more likely to get less than optimal breast cancer care.

Equal Treatment Yields Equal Outcome

There is not Equal Treatment

Studies suggest that disparities in treatment may be due to:

- Cultural differences in acceptance of therapy.
- Disparities in comorbid diseases making aggressive therapy inappropriate.
- Lack of convenient access to quality treatment (insurance and transportation are major issues).
- Racism and SES discrimination.

Lannin DR, Mathews HF, Mitchell J, et al. JAMA 10;279(22) 1998

Applying Known Science (Prevention and Treatment)

- At least 132,000 (22% of the more than 600,000) deaths per year are preventable if all Americans received known medical prevention and treatment.
- The United States leads the western world in preventable cancer deaths.
- The majority of these preventable deaths are among white Americans.
- The issue of disparities in health are not just a racial minority health issue.

Siegel, et al. CA 2018;68:329-339

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The Johns Hopkins Medical Institutions



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