Prostate Cancer Detection
and Disparities in Health

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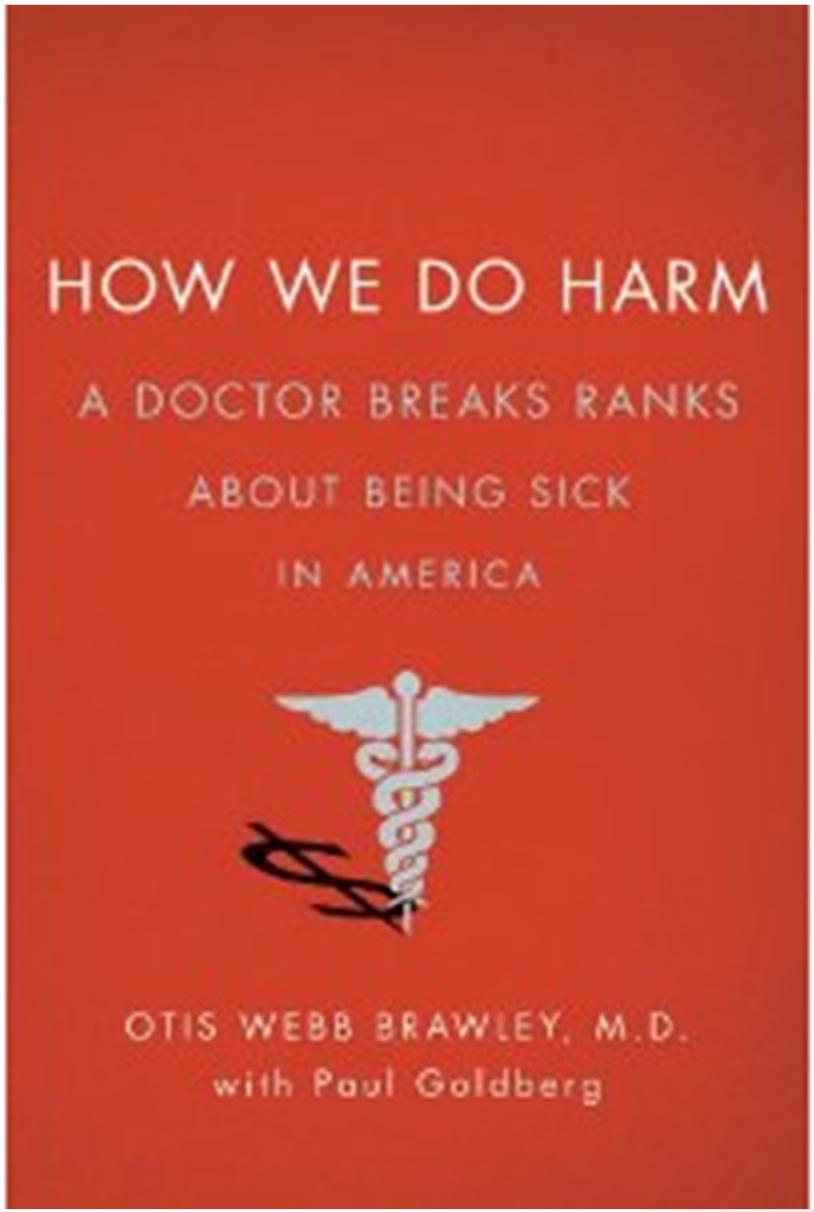
Disclosures

- Employment:
  - Johns Hopkins University
- Consulting
  - National Institutes of Health
  - Centers for Disease Control
  - Department of Defense
  - Genentech



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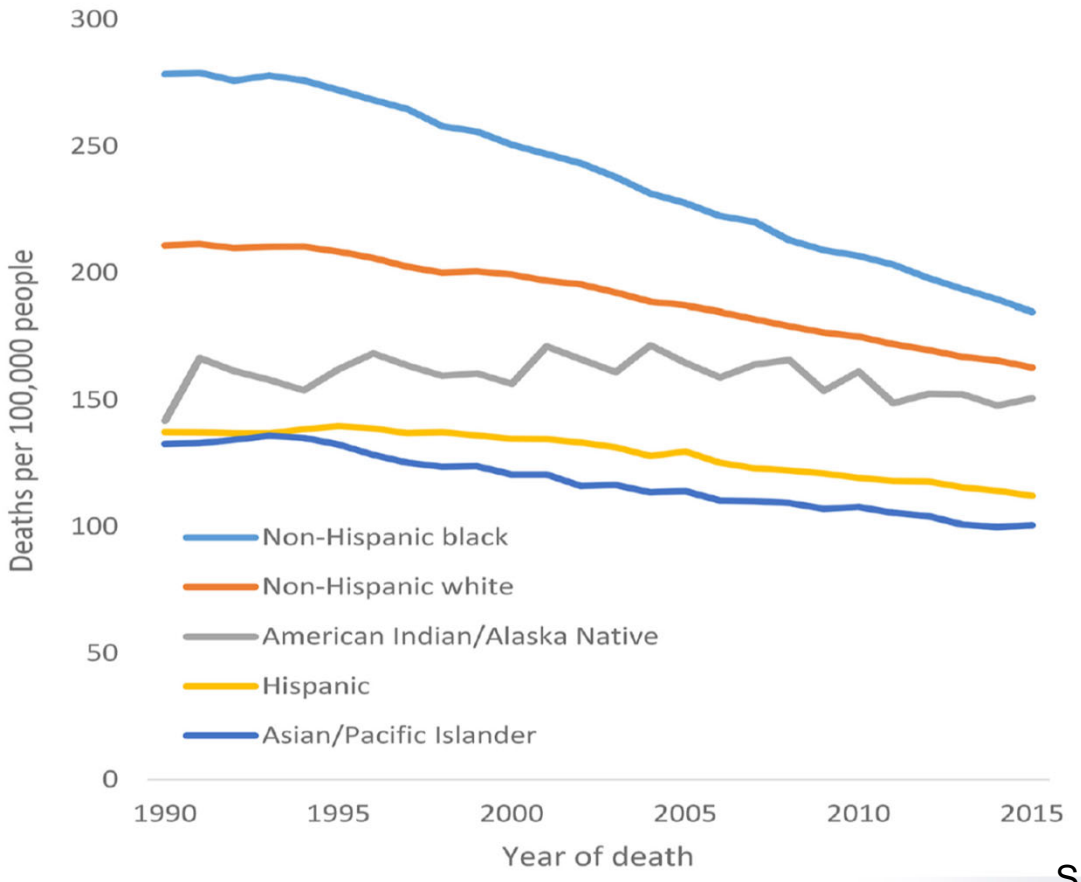
Objectives

- Discuss trends in cancer death rate over past three decades
- Define race and population categorization.
- Define disparities in the 21st century.
- Discuss approaches to overcoming disparities.

Cancer Mortality by Race/Ethnicity from 1990 to 2017



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

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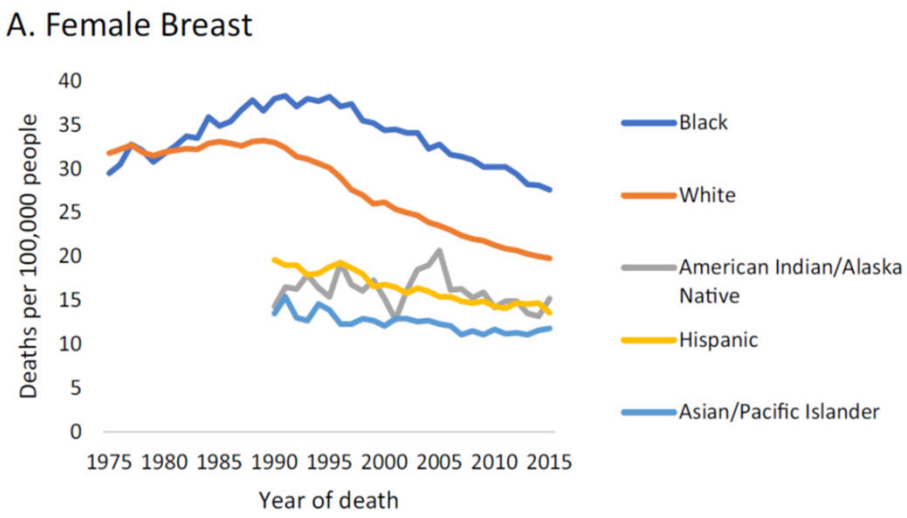

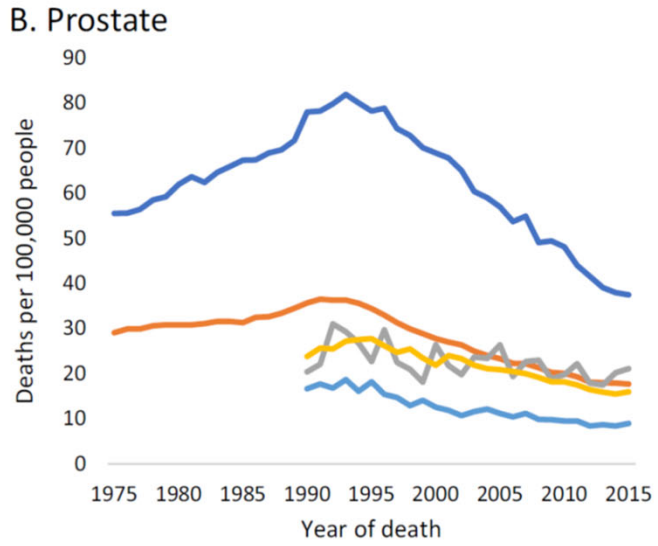

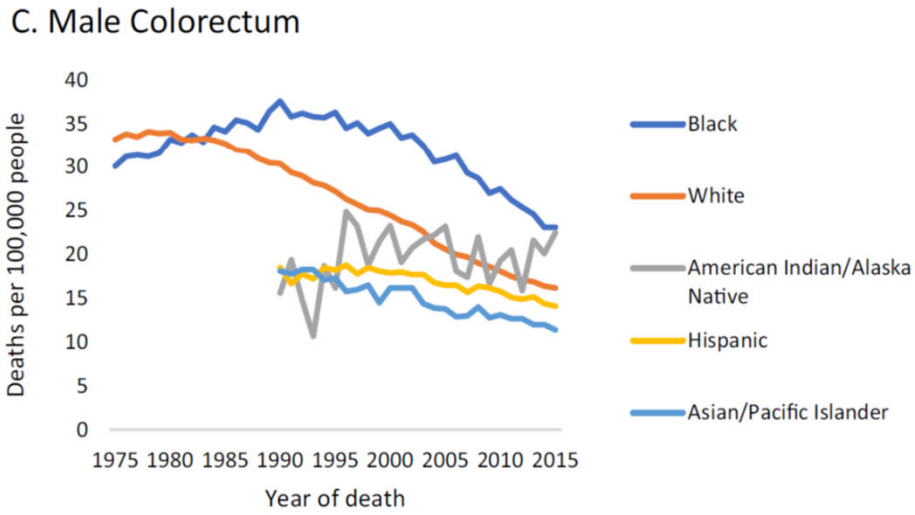

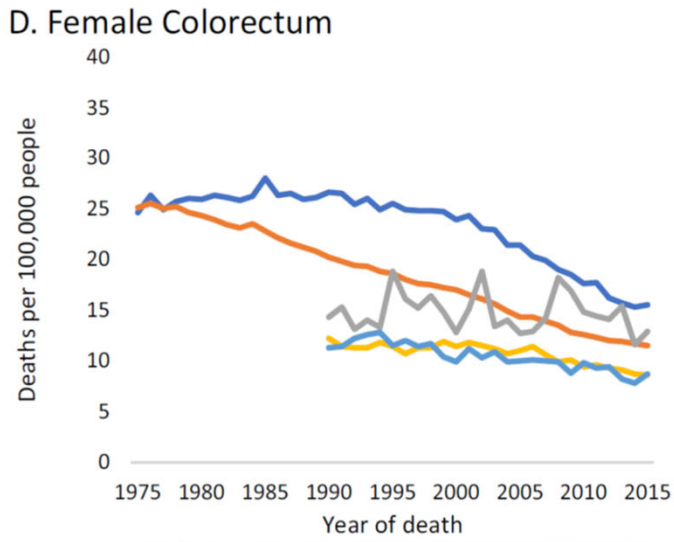

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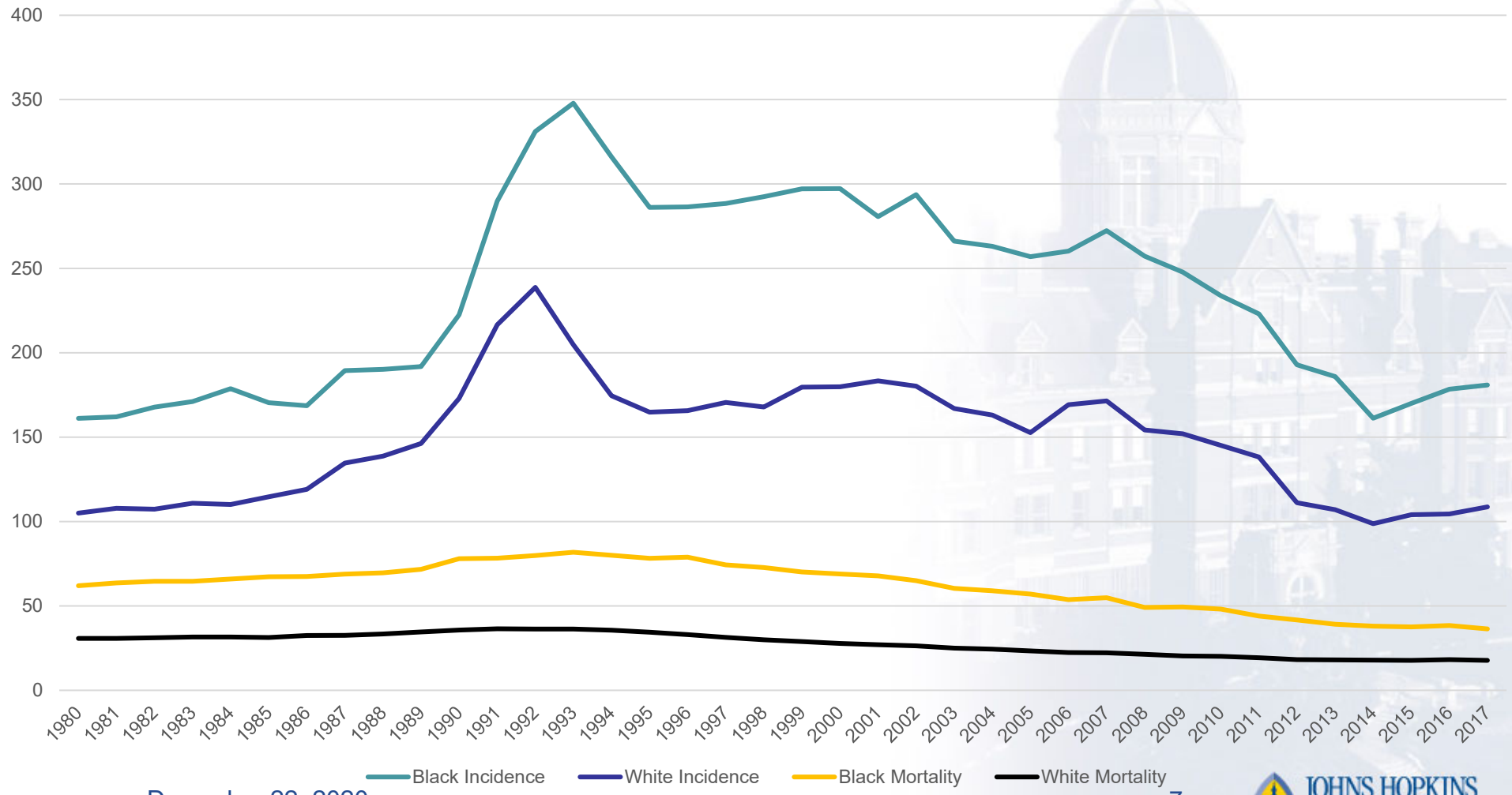
Prostate Cancer Incidence and Mortality (Age-Adjusted) 1980 - 2017



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Regional Differences in Prostate Mortality

SEER Data

- Whites high: 22.3 – low 16.1 US 17.9

  Rural Ga. Detroit

- Blacks high: 45.0 – low 24.1 US 37.9

  L.A. New Mexico

Rates are per 100,000
Age-Adjusted to 2000 US Standard

Race

Defined by US Office of Management and Budget before every decennial census.

- White
- Black
- Asian
- Pacific Islander
- Native American/Alaskan Native

In US population data Ethnicity is defined as Hispanic or non-Hispanic

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Race

Defined by US Office of Management and Budget every ten years.

- Sociopolitical and not biologic according to OMB definition
- Rejected by Anthropological community as non-scientific
- Race changes over time*

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Clinical Trials

-Much discussion of diversity in clinical trials

-Much (not all) of this discussion is political and not scientific

- NIH Revitalization of 1993 calls for valid subset analysis among the races and ethnicities
- Subset analysis are not statistically significant by nature.
- Race is a social, not a biological, construct

-Clinical trials participation should be encouraged as especially participation in NCI sponsored clinical trials provides greater assurance of high-quality care.

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Clinical Trials

- Race is not a biologic categorization
- Race is a sociopolitical construct
- Area of geographic origin can be a biologic categorization, but *Ancestry.Com* has demonstrated this can be very complicated.

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Population Categorization

- Race is broad
- Area of geographic origin is more specific and scientific, although still broad
- Admixture complicates this dramatically

Race is broad

Black or African comprises 109 regions such as:

- Benin and Togo
- Cameroon, Congo and West Bantu
- Ivory Coast and Ghana
- Mali
- Nigeria
- Senegal
- Eastern Bantu
- Ethiopia and Eritrea
- Mali
- Senegal
- Southern Bantu

Race is broad

Ancestral Areas

European	840
Asia	56
West Asia	5
America	133
Africa	109

A Note on Clinical Variation

There is variation among populations, but race is not the appropriate way to categorize populations, e.g.:

- Forms of G6PD deficiency is more common amongst people originating in the Mediterranean, certain areas of Africa, India and the middle east.
- The HLA-B*1502 allele is common among people living within 150 kilometers of the Thai-Burmese border. They have a Stevens-Johnson reaction to Carbamazepine (Tegretol).
- The sickle cell mutation has a prevalence among people originating in southern Greece, Southern Italy, the middle east and has a higher prevalence in Sub Saharan Africa.

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Geographic Variation in Prostate Cancer

There may be pathogenic variants in cancer predisposition genes that cluster in certain geographic areas.

Matejcic et al. JCO Precis Oncol, 2020

Koga et al. Clin Cancer Res, 2020

Race does not matter, biologically

But

Race does matter!!

Lack of Adequate Care

Much of the surgical literature focuses on racial/ethnic minorities. Compared to whites, blacks less commonly receive:

- Arthritis-related knee and hip surgery
- Radical prostatectomy for high grade prostate cancer
- Pulmonary resection for operable lung cancer

Lack of Adequate Care

Black women with screen detected and diagnosed breast cancer are less likely to receive breast surgery compared to white women.

Blacks who were treated were 4 to 5 fold more likely to begin definitive therapy more than 60 days after initial diagnosis.

Lund et al Breast Ca Res Treat, 2007

Lack of Adequate Care

Compared to Whites, Blacks with bladder cancer treated with radical cystectomy have inferior quality of care.

Gild P, Wankowicz SA, Sood A, et al. Urol Oncol, 2018

Lack of Adequate Care

There are racial differences in patterns of treatment among men diagnosed with prostate cancer.

Beebe-Dimmer JL, Ruterbusch JJ, Cooney KA et al. Cancer Med. 2019

Schmid M, Meyer CP, Reznor G, eta al JAMA Oncol. 2016

Clinical Research and Minority Health/Health Disparities

- Accruing a diverse population to trials
- Gathering rigorous demographic data on individual patients (SES, income, insurance, education, etc.)
- Building cohorts for larger meta-analysis.

A True Contribution to Minority Health/Health Disparities

In a study of multiple cohort studies of men from the VA, DOD, SEER and 4 RTOG trials that rigorously adjusted for demographic data, Black race was not associated with inferior stage-for-stage prostate cancer specific mortality.

Dess RT, Hartman HE, Mahal BA et al. Association of Black race with prostate cancer-specific and other-cause mortality. JAMA Oncol 2019

Cancer Control in the 21st Century

The development and use of tailored drugs will have to rely on response rate in 30 to 50 person phase II studies as a surrogate for improvement in survival.

From the scientific standpoint there will be less emphasis on racial differences and more emphasis on genomic targets and markers of drug metabolism.

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Clinical Research and Minority Health/Health Disparities

Certain questions will merit focused studies of subjects with specific markers.

- Examples from the past - enrolling patients with Her2+ cancer to trials studying drugs that block the Her2 receptor.

The Most Important Question in Cancer Control

- How Can We Provide Adequate High Quality Care (to Include Preventive Services) to Populations That So Often Do Not Receive It?
  - Unnecessary care interferes with institutional abilities to provide necessary care.
  - State by state disparities are increasing with the Affordable Care Act!!

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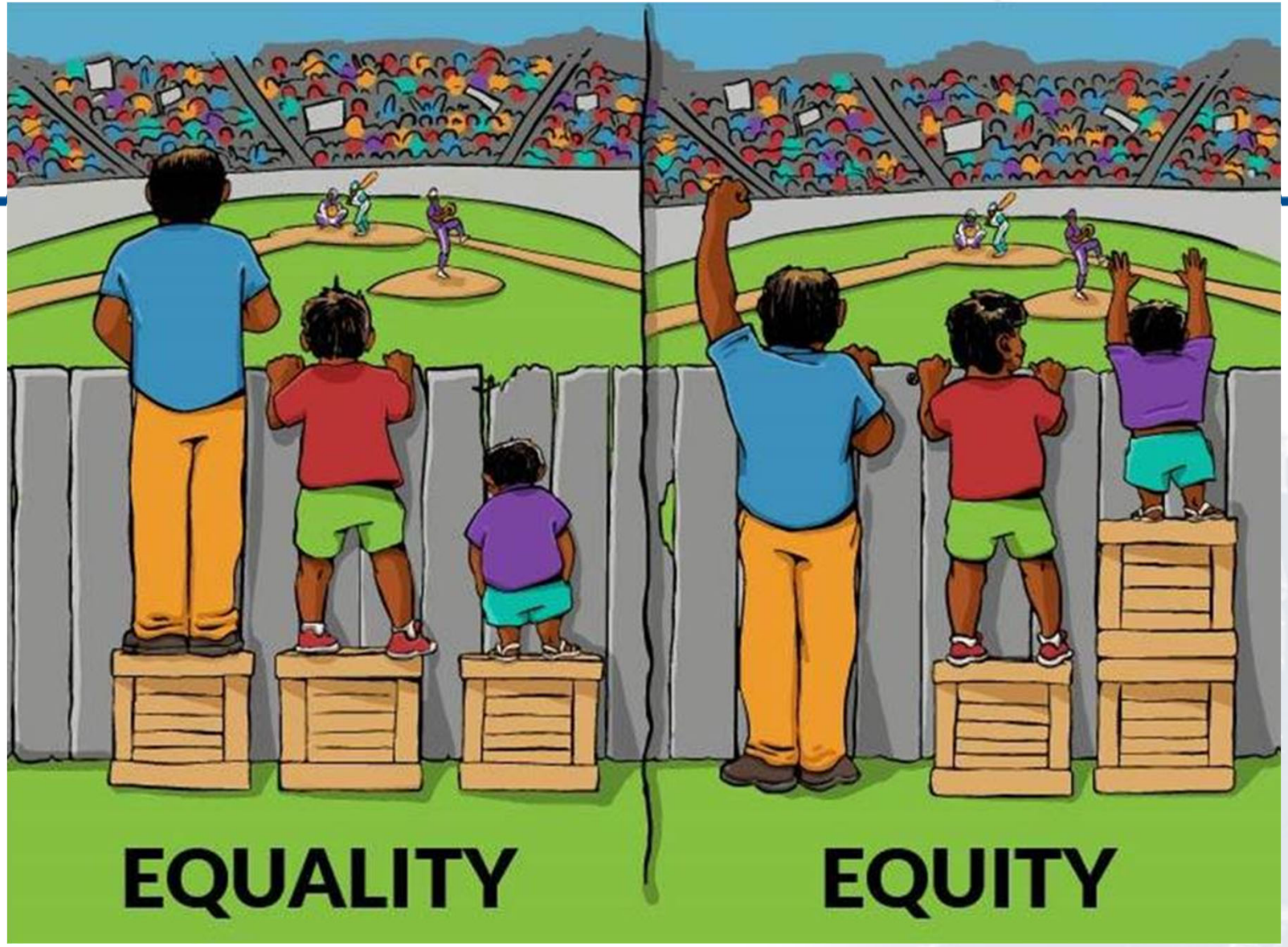

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