



Advanced Practitioner  
Society for Hematology  
and Oncology

# APSHO AP Academy



# Healthcare Disparities in Breast Cancer

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# Disclosures

- Rose DiMarco is a Member of the BMS JADPRO APP Advisory Board, a Clinical Thought Leader for CE Synergy's Peak Exchange, and Faculty for the Lilly Lecture Bureau
- Christina Lew has no relevant financial relationships to disclose.

# Learning Objectives

- Differentiate between health disparity and health inequity
- Discuss how race, ethnicity, and socioeconomic status contribute to breast cancer disparities
- Describe the impact of culture, implicit bias, and institutional racism on treatment outcomes and mortality

# Outline

- Introductions
- Definitions
- Tumor Markers and Subtypes
- Breast Cancer Disparities
  - Race and Ethnicity
  - Tumor Biology
  - Socioeconomic Status
  - Lifestyle
  - Culture, Implicit Bias, and Institutional Racism

# Introduction

- In the United States, breast cancer continues to be the most common cancer after non-melanoma skin cancer, and it is the second leading cause of cancer death.
- During 2010-2019, breast cancer incidence rates have increased by 0.5% annually. In contrast, mortality rates have declined by 43% between 1989-2020.
- Reduction in mortality rates is related to advances in detection and treatment, but these breakthroughs have not benefited all groups equally.
- Differences in incidence, mortality, and survival occur by race and ethnicity. The gap in breast cancer incidence and outcome is complex and multifactorial.

Giaquinto AN, et al. *CA Cancer J Clin.* 2022;72:524-541.

# Definitions

# Health Disparity

- **Health differences ≠ Health disparities**
- **Health disparity:**
  - Healthy People 2030 defines a health disparity as "a particular type of health difference that is linked with social, economic, and/or environmental disadvantage," and that adversely affects groups of people who have systematically experienced greater obstacles to health.
  - The Centers for Disease Control and Prevention (CDC) defines health disparities as "preventable differences in the burden, disease, injury, violence, or in the opportunities to achieve optimal health experienced by socially disadvantaged racial, ethnic, and other population groups and communities."

CDC website. Health Disparities; U.S. Department of Health and Human Services website. Health Equity in Healthy People 2030.



# Health Equity

- The state in which everyone has a fair and just opportunity to attain their highest level of health
- Requires focused and ongoing societal efforts to
  - Address historical and contemporary injustices
  - Overcome economic, social, and other obstacles to health and healthcare
  - Eliminate preventable health disparities
- Therefore, inequities in health are responsible for many healthcare disparities.

CDC website. Minority Health.

# Brief Review: Breast Cancer Tumor Markers and Subtypes

# Tumor Markers

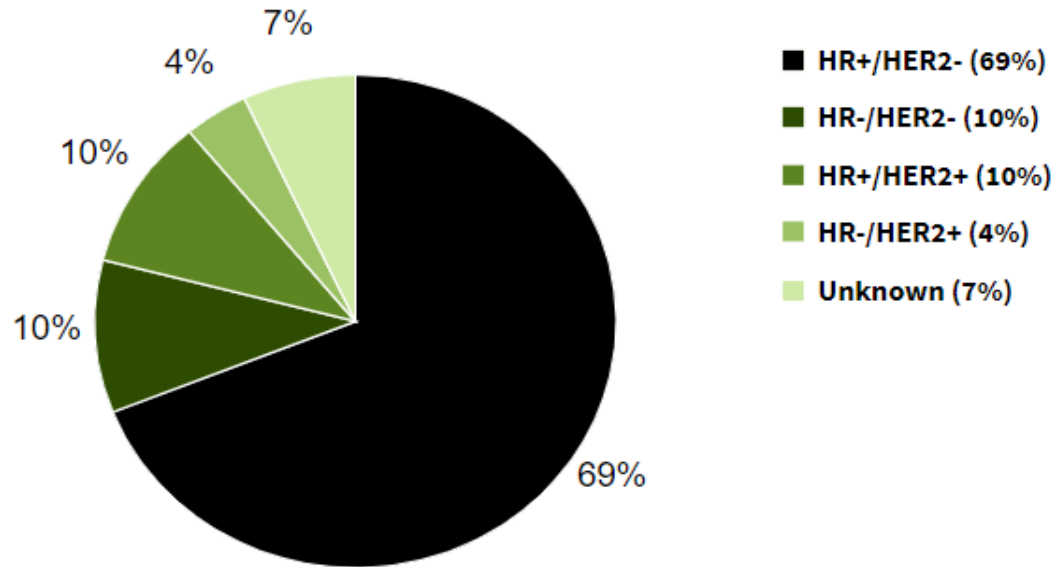
- **Hormone receptors**
  - Estrogen receptor (ER)
  - Progesterone receptor (PR)
- **Human epidermal growth factor receptor 2 (HER2)**

# Subtypes

- **HR+/HER2-**
  - Most common subtype
  - Associated with highest overall survival
- **HR-/HER2-** (triple-negative breast cancer or TNBC)
  - 15%-20% of all breast cancers
  - Associated with worse prognosis, early relapse after standard chemotherapy, high frequency of metastasis, and worse overall survival
- **HR+/HER2+** (triple-positive breast cancer)
  - Associated with second highest overall survival
- **HR-/HER2+**
  - Least common subtype

NCI website. Cancer Stat Facts: Female Breast Cancer Subtypes; Siddharth S, et al. Cancer. 2018;10:514.

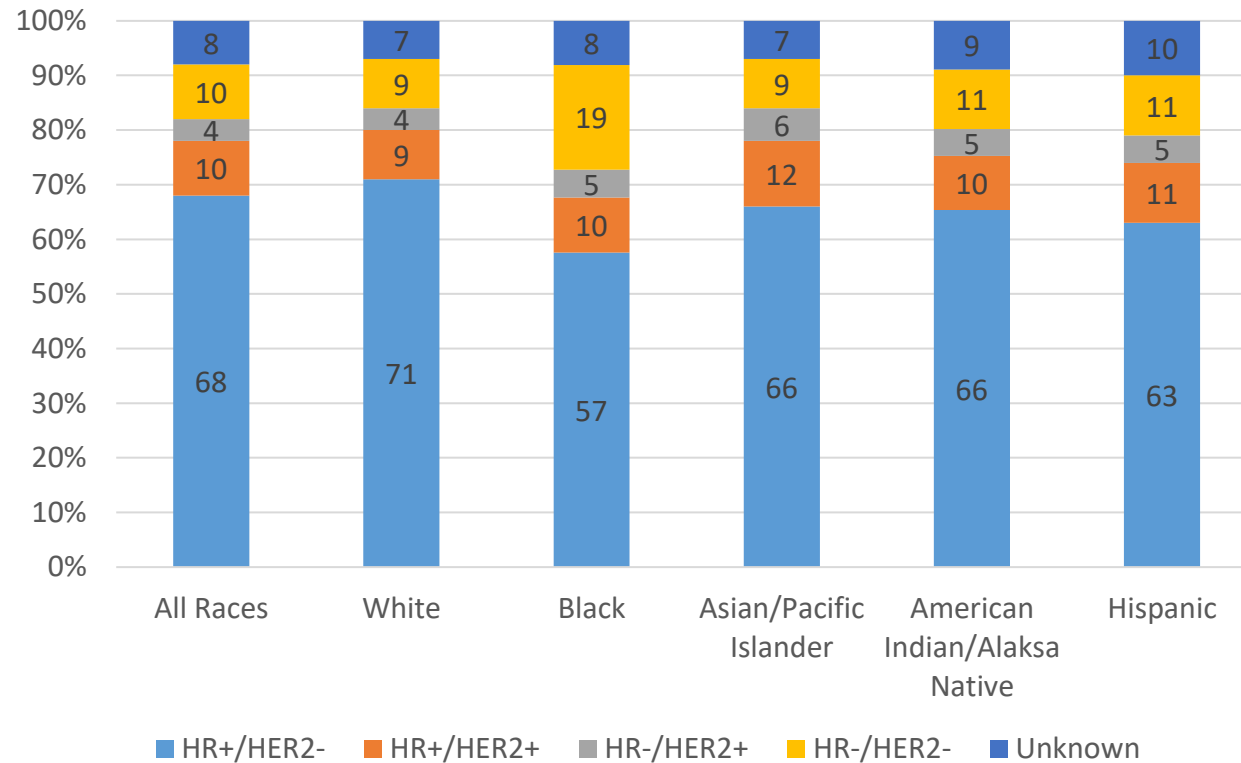
### Percent of Female Breast Cases by Cancer Subtype



SEER 22 2016-2020

NCI website. Cancer Stat Facts: Female Breast Cancer Subtypes.

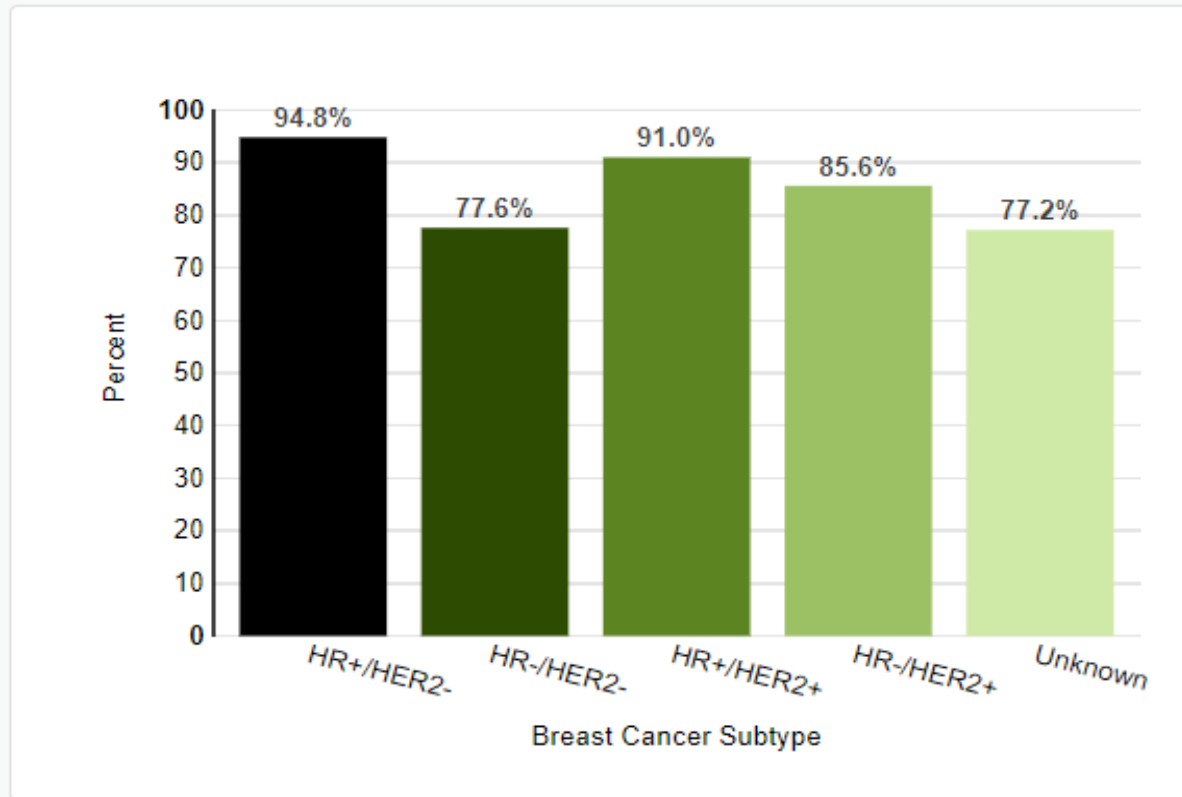
# Distribution of Female Breast Cancer Subtypes by Race/Ethnicity, Ages $\geq 20$ , US 2015-2019



Note: Except for all cares, race is exclusive of Hispanic origin. Data for American Indian/Alaska Native are based on Purchased/Referred Care Delivery Area (PRDA) counties.

American Cancer Society website. Breast Cancer Facts & Figures 2022-2024.

## 5-Year Relative Survival Percent, Female Breast Cases by Cancer Subtype



Total 5-Year  
Relative Survival

**90.8%**

SEER 22 (Excluding IL/MA) 2013-2019

NCI website. Cancer Stat Facts: Female Breast Cancer Subtypes.

# Breast Cancer Disparities

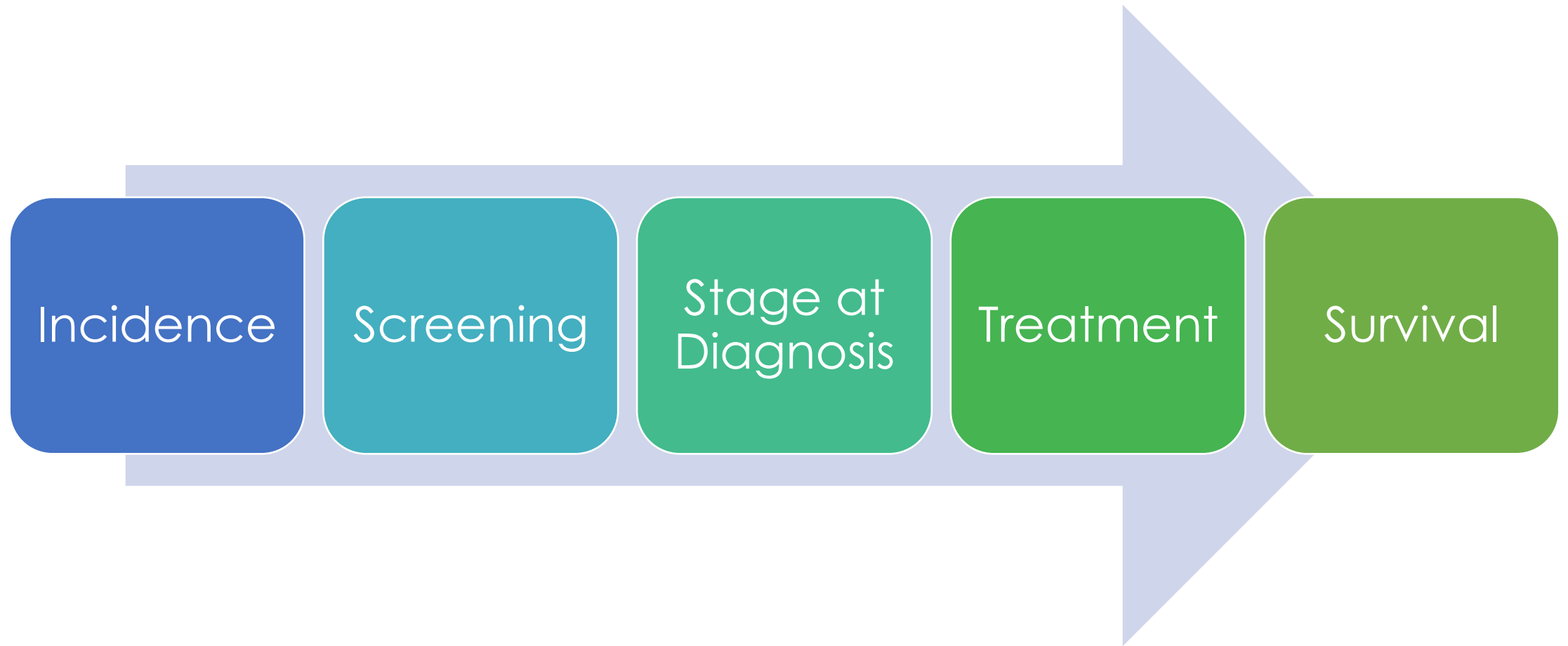
- Interplay among many factors including social determinants of health, behavior, biology, and genetics
- Differences in risk factors and comorbidity burden also contribute, largely due to socioeconomic inequalities
- Certain groups in the United States experience cancer disparities because they are more likely to encounter obstacles in healthcare access
- Race and ethnicity are highly correlated with socioeconomic status; however, disparities in breast cancer risk and outcomes are reduced but not eliminated after adjusting for socioeconomic status
- Urgent need to identify novel strategies that can be equitably implemented to address breast cancer disparities

Hirko KA, et al. *BMC Medicine*. 2022;20:72.

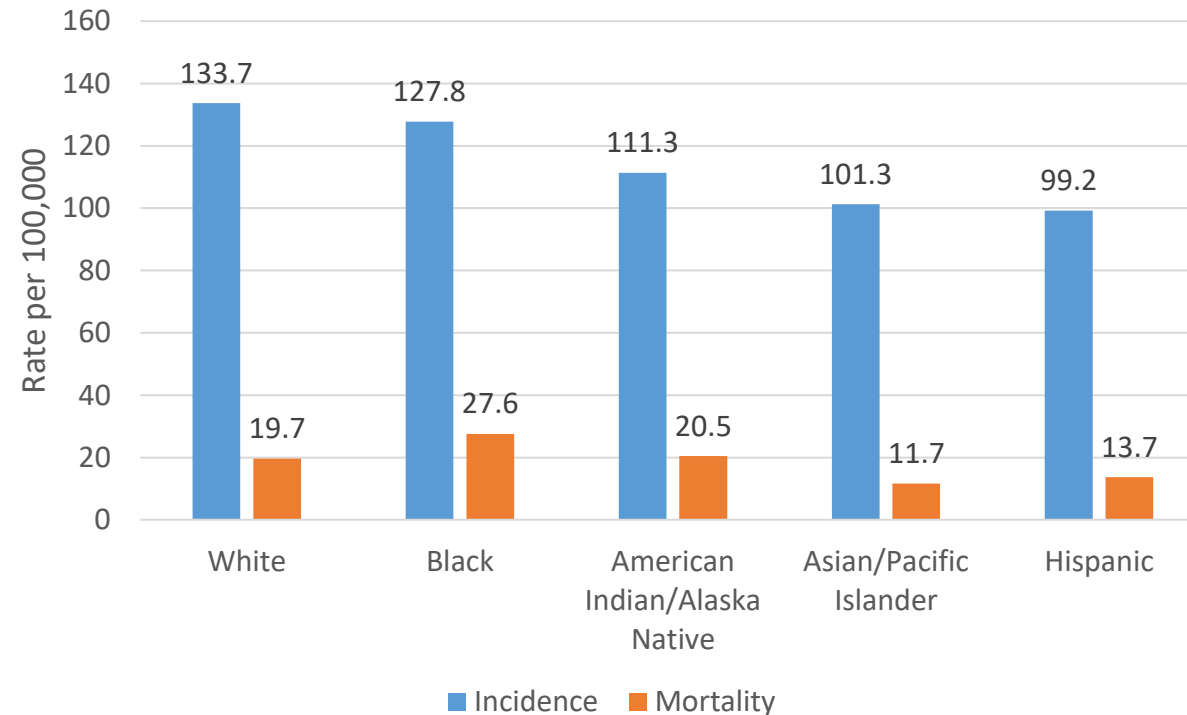


# Race and Ethnicity

# Disparities Evident Along Cancer Care Continuum



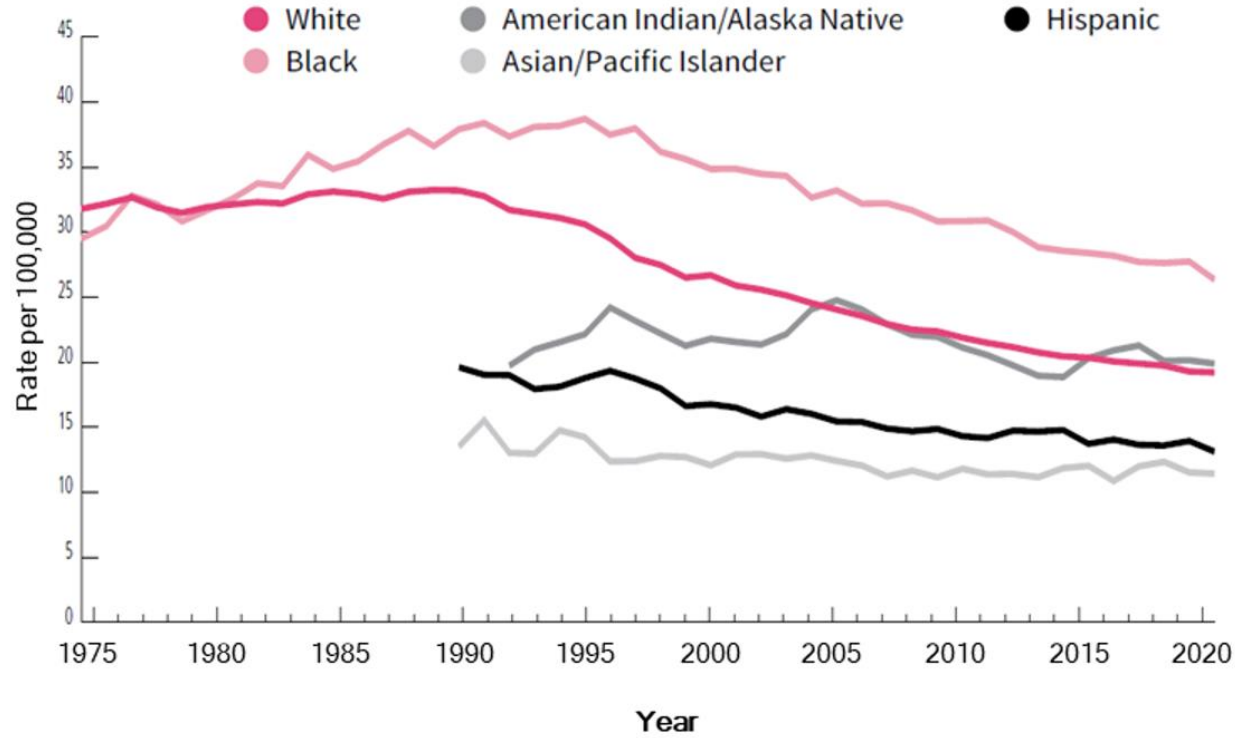
# Female Breast Cancer Incidence (2015-2019) and Mortality (2016-2020) Rates by Race, US



Rates are per 100,000 and age adjusted to the 2000 US standard population. Race is exclusive of Hispanic origin. To reduce racial misclassification, incidence data for American Indian/Alaska Native women are confined to PRCDA counties, while mortality data are for the entire US with adjustment factors for racial misclassification from Arias et al. 2019.

American Cancer Society website. Breast Cancer Facts & Figures 2022-2024.

# Trends in female breast cancer mortality by race and ethnicity, US, 1975-2020



American Cancer Society website. Breast Cancer Facts & Figures 2022-2024.

Rates are per 100,000 and age adjusted to the 2000 US standard population. Race is exclusive of Hispanic origin except for years 1975-1989 for Black and White women. Rates for American Indian/Alaska Native are 3-year moving averages and are adjusted for racial misclassification using Arias, et al. 2019.

Source: National Center for Health Statistics, Centers for Disease Prevention and Control, 2022.



# What Caused the Mortality Divergence After 1980?

# Incidence and Mortality

- Before the 1980s, breast cancer mortality in the United States was stable for several decades and the mainstay of treatment was mastectomy.
- In the 1980s, mammography screening and adjuvant endocrine therapy were widely implemented in the United States, which resulted in overall reductions in breast cancer mortality.
- Death rates diverged sharply after 1980, and the emergence of a large racial disparity in mortality was observed and has been persistent.
- In the United States, age-adjusted breast cancer mortality is about 40% higher among Black women than non-Hispanic White women, despite a lower incidence of breast cancer among Black women.

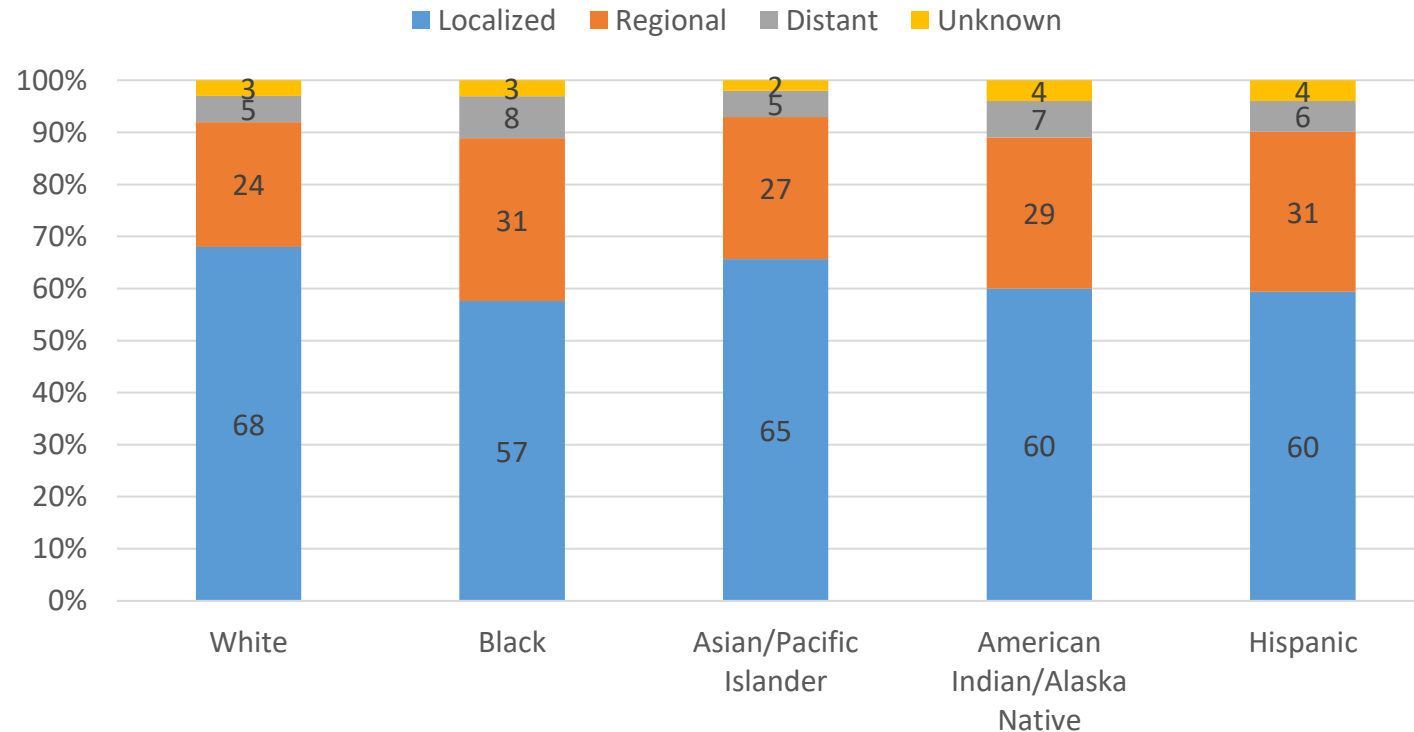
Jatoi I, et al. *N Engl J Med*. 2022;386:2349-2352.

# Incidence and Mortality (cont)

- Since 1990, there has been a 40% overall reduction in breast cancer mortality in the United States.
- Screening, adjuvant endocrine therapy, and decreases in the incidence of HR-negative cancer have contributed to reductions in mortality among both Black and White women, but the rates of decline are not equal.
- Mortality for HR-positive breast cancer is 19% higher among Black women than among White women, despite a 22% lower incidence among Black women.
- Mortality for HR-negative breast cancer is more than twice as high among Black women as among White women—a disparity that is substantially larger than the 65% relative difference in incidence.

Jatoi I, et al. *N Engl J Med.* 2022;386:2349-2352.

# Distribution of Female Breast Cancer Stage at Diagnosis by Race/Ethnicity, Ages 20 Years and Older, US, 2015-2019



Race is exclusive of Hispanic origin. Estimates may not sum to 100 due to rounding. Data for American Indian/Alaska Native women are based on Purchased/Referred Care Delivery Area (PRCDA) counties.

American Cancer Society website. Breast Cancer Facts & Figures 2022-2024.



# Mammography and Endocrine Therapy

- Benefit is primarily in patients with HR-positive breast cancers, the most common subtype among both Black and White women.
  - HR-positive tumors are more likely to be detected by mammogram and can be targeted with endocrine therapy.
- HR-negative tumors are often detected during the interval between mammography-screening exams as symptomatic, palpable cancers.
  - HR-negative cancers include TNBC (ER-, PR-, HER2-), which is an aggressive subtype that is more frequently diagnosed in later stages and among younger women than other breast cancer subtypes.
- Compared to non-Hispanic White women, Black women have a 65% higher rate of any HR- cancer with an 81% higher rate of TNBC and derive less benefit from the introduction of mammography screening and adjuvant endocrine therapy.
  - Thus, Black women derived less benefit from the introduction of mammography and adjuvant endocrine therapy due to the higher incidence of HR- cancers.

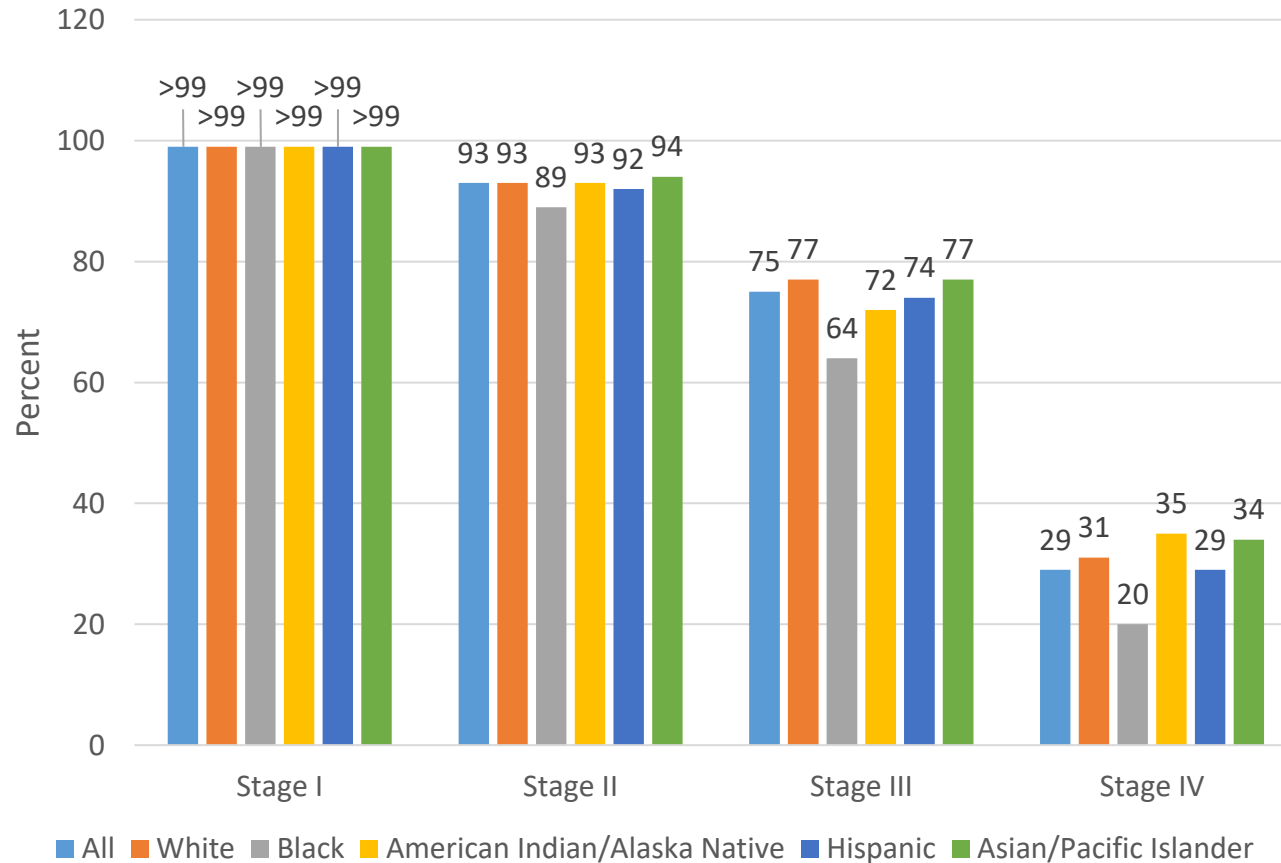
Jatoi I, et al. *N Engl J Med.* 2022;386:2349-2352.

# Screening

- Screening rates between Black and White women are similar; however, nearly twice as many Black women (9%) are diagnosed with advanced breast cancer compared with White women (5%).
- Factors include longer intervals between screening, delayed follow-up of abnormal results, and screening at lower-resourced facilities.
- Barriers may include cost, transportation issues, lack of recommendation from healthcare provider, lack of knowledge of risks and screening methods, lack of child/elder care, lack of sick leave, fear of bad news or pain from mammogram, and geographic location.
- Data from the 2000 National Health Interview Study indicated 41% of Black women vs 28% of White women stated their doctor never suggested mammography

American Association for Cancer Research website. AACR Cancer Disparities Progress Report 2022; Susan G. Komen website. How Do Breast Cancer Screening Rates Compare Among Different Groups in the U.S.?<sup>2</sup>; Yedjou CG, et al. *Adv Exp Med Biol.* 2019;1152:31-49.

# 5-Year Breast Cancer Relative Survival Rates (%) by Stage at Diagnosis and Race/Ethnicity, US, 2012-2018



Giaquinto AN, et al. *CA Cancer J Clin.* 2022;72:524-541.

# Treatment Delays

- Disparities exist between Black and White women in diagnostic and treatment patterns, including treatment delays.
- Compared to White women, Black women experience delays:
  - Between first symptom or screening and diagnosis
  - In surgical treatment after new diagnosis
  - In radiation treatment, in part due to geographic access to radiation facilities
  - Initiating and completing chemotherapy
  - Initiation of endocrine therapy
- Individual, patient-level data is lacking; however, race and social determinants of health, such as insurance access or geographic factors have all been implicated in causing treatment delays.

Reeder-Hayes KE, et al. *Cancer*. 2019;125:3985-3992.

# Tumor Biology

# Genomics

- African American patients have distinct genomic signatures and are more likely to have a basal subtype and TP53 mutations in which chemotherapy is the mainstay.
- African American patients also have a lower frequency of PIK3A mutations than White Americans, in which targeted therapy has been shown to improve survival.
- Differences in genetics and tumor biology of TNBC may contribute to disparities in incidence, aggressiveness, and response to treatment of the subtype.

NCI website. Cancer Disparities.

# Socioeconomic Status

# Poverty

- Low-income women have significantly lower rates of screening and greater probability for late-stage diagnosis and often receive inadequate treatment, resulting in higher mortality.
- Poverty is linked to less education and lack of information on breast cancer prevention and the importance of early detection.
- Poor environmental conditions, such as communities that lack clean water or air, may expose people to cancer-causing substances.
- The built environment, encompassing the physical parts of where we live and work, influences one's behaviors and can promote poor diets, physical inactivity, and obesity, all of which are risk factors for cancer.
- Lack of primary care physician, geographic location, comorbidities, lack of insurance, poor lifestyle, and lower education contribute to disparity.

NCI website. Cancer Disparities; CDC website. Impact of the Built Environment on Health; Jatoi I, et al. *J Clin Oncol*. 2005;23:7836-7841.



# Insurance

- Lack of health insurance or inadequate coverage limits access to timely, effective treatments.
- African Americans are twice as likely as White Americans to be uninsured and to depend on public insurance such as Medicaid, largely due to low wages and jobs without employer-paid health benefits.
- Inadequate coverage results in the lack of prevention, screening, and access to care, as well as delays in diagnosis, leading to a later stage of disease at diagnosis.
- Black, Indigenous, and Hispanic women are >30% more likely to be diagnosed with advanced breast cancer compared with White women, with half of delayed diagnoses resulting from insurance issues.
- Breast cancers diagnosed at a late stage are much more expensive to treat than those diagnosed at an early stage, further increasing cost of care and financial burden to underprivileged communities.

Ko NY, et al. *JAMA Oncology*. 2020;6:385-392.

# Healthcare Access

- Underprivileged communities may have limited access to primary care clinics and physicians for diagnosis, treatment, and follow-up.
- Healthcare providers in underserved communities are not always equipped and trained to provide adequate information or treatment to the population they serve
  - These physicians are less likely to be board-certified and may have decreased access to high-quality subspecialists.
- Some communities may only have access to centers without digital mammography and/or breast imaging specialists, potentially leading to disparate patterns of care.
- Rural communities are at increased risk for insufficient mammography due to limited access (<1.2 machines per 10,000 women >40 years old).

Bach P, et al. *N Engl J Med*. 2004;351:575-584; Yedjou CG, et al. *Adv Exp Med Biol*. 2019;1152:31-49.

# Education

- Poverty is linked to less education and lack of information on breast cancer prevention and the importance of early detection, leading to late-stage diagnosis of breast cancer and lower survival rates.
- Breast cancer risk is significantly increased among patients with medium and high education levels.
  - May be related to known risk factors including:
    - Advanced age at first pregnancy
    - Birth and fewer children
    - Higher alcohol intake
    - Higher prevalence of hormone therapy
- Increased screening and compliance can reduce breast cancer mortality but increase incidence.

Jiang R, et al. *BMC Womens Health*. 2023;23:91.

# Lifestyle

# Obesity

- Obesity is defined as a body mass index (BMI)  $\geq 30$  kg/m<sup>2</sup> and affects more than 40% of adults in the United States.
- Black adults have the highest level of adult obesity at 49.9%, followed by Hispanic adults at 45.6%.
- Obesity is associated with shorter time to disease recurrence and greater mortality for both pre- and post-menopausal patients with breast cancer.

Farberman R, Bright W. State of Obesity 2022: Better Policies for a Healthier America. Trust for America's Health.

# Obesity (cont)

- Obesity is caused by a combination of factors including societal, biological, genetic, and environmental, which are often beyond personal choice.
- Key drivers of differences in obesity rates across racial and ethnic groups:
  - Structural racism
  - Discrimination
  - Poverty
  - Food insecurity
  - Housing instability
  - Lack of access to quality healthcare
- The social and economic factors that drive obesity also drive food insecurity, including poverty and limited or no access to healthy, affordable foods.
  - A diet rich in fruits and vegetables may be linked to a decreased risk of breast cancer.
  - Many low-income urban areas lack grocery stores and access to fresh fruits and vegetables.
  - Food insecurity often means families consume food that is inexpensive but high in calories and low in nutrition.

Farberman R, Bright W. State of Obesity 2022: Better Policies for a Healthier America. Trust for America's Health; USDA website. Food Access, Food Waste.

# Physical Activity

- Physical activity lowers the risk of breast cancer
  - Reduced risk seen in both pre- and post-menopausal women; however, association is stronger for postmenopausal breast cancer
- A 1994 retrospective study demonstrated women  $\leq 40$  years old who engaged in  $\geq 4$  hours of physical activity per week lowered their breast cancer risk by  $>50\%$  compared with less active women the same age.
- Exercise lowers the levels of estrogen and other growth factors associated with breast cancer development.
- Hispanics, non-Hispanic Blacks, and adults with lower education levels more likely to be inactive.

Cho D, et al. *Eur J Cancer Care (Engl)*. 2018;27:e12772; Elshahat S, et al. *Int J Behav Nutr Phys Act*. 2021;18:50; NCI website. Obesity; CDC website. Adult Physical Inactivity Prevalence Maps by Race/Ethnicity.

# Barriers to Physical Activity



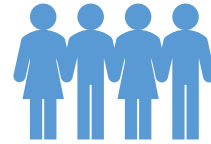
## Physiological

Treatment-related side effects:

Fatigue

Gastrointestinal issues

Joint pain



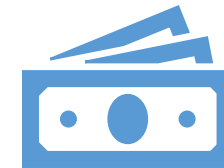
## Psychosocial and Cultural

Embarrassment

Concerns about appearance

Kinesiophobia

Lack of social support



## Economic and Environmental

Cost of gym memberships

Inaccessible facilities

Poor weather

Cho D, et al. *Eur J Cancer Care (Engl)*. 2018;27:e12772; Elshahat S, et al. *Int J Behav Nutr Phys Act*. 2021;18:50; NCI website. Obesity.



# Pregnancy Patterns and Behaviors

- Pregnancy and higher parity increase the risk of TNBC but reduces the risk of ER/PR+ breast cancer.
- Hormonal contraceptive use and nulliparity (defined as no children or first child at >30 years old) increase breast cancer risk.
- Breastfeeding may lower breast cancer risk.
- It is observed that Black women have more children especially at a younger age and have a lower rate of breastfeeding than White women.
- Black mothers disproportionately experience barriers to breastfeeding including:
  - Lack of knowledge about breast feeding
  - Lack of social support
  - Insufficient education and support from healthcare settings
  - Concerns about navigating breastfeeding and employment

Beauregard JL, et al. *MMWR Morb Mortal Wkly Rep.* 2019;68:745-748; Yedjou CG, et al. *Adv Exp Med Biol.* 2019;1152:31-49.

# Alcohol Use

- Alcohol affects estrogen and progesterone levels and is associated with an increased breast cancer risk in both pre- and post-menopausal women.
- Acute consumption has been shown to increase estrogen levels by slowing down the breakdown of estrogen in the liver and upregulating the conversion of testosterone to estrogen.
- Estrogen levels are higher in women who drink alcohol compared to non-drinkers, which increases the risk of breast cancer.
  - 1 drink and 2-3 drinks per day is associated with ~7%-10% and 20% increase in breast cancer risk, respectively.
- Additionally, hormone alteration can lead to dysregulation of calcium, which adversely affects bone metabolism and increases the risk of osteoporosis.

De Angelis C, et al. *Reprod Biol Endocrinol*. 2020;18:21; American Cancer Society website. Lifestyle-related Breast Cancer Risk Factors.

# Impact of Culture, Implicit Bias, and Institutional Racism

# Cultural Beliefs

- Spirituality, misconception on susceptibility of breast cancer, cultural beliefs, and medical mistrust can influence decisions regarding screening, diagnosis, and treatment.
- Culture-specific fears and beliefs about breast cancer have been associated with differential screening practices.
- Fears often center on the mammography procedure itself including fear of pain, discomfort, embarrassment, and radiation.

Yedjou CG, et al. *Adv Exp Med Biol.* 2019;1152:31-49.

# Cultural Barriers

- Older adults, patients with limited English proficiency, and patients with hearing loss may face more difficulties navigating the electronic health record.
- Patients should be asked about their preferred mode of communication.

DiMarco R, et al. *J Adv Pract Oncol*. 2023;14:195-199.

# Implicit Bias

- **Bias:** Preference or aversion to a certain person or group, reflected in attitudes and actions
- **Implicit bias:** Bias that occurs unintentionally but can still affect judgment, decisions, and behaviors
  - Influenced by family upbringing, past experiences, culture, religion, and media
  - Affects patient care, particularly in vulnerable populations such as marginalized racial and ethnic groups, the LGBTQI+ population, patients with disabilities, and patients with low socioeconomic status or low health literacy

DiMarco R, et al. *J Adv Pract Oncol*. 2023;14:195-199.

# Structural Racism

- The ways organizations institute racial discrimination through criminal justice, education, employment, income, housing, and healthcare systems
- Racial health inequities are entrenched with policies and systems that disproportionately affect minority and low-income communities.
- Historic redlining has led to residential racial segregation, which perpetuates economic deprivation, concentrated poverty, subpar education, unhealthy food, reduced access to healthcare, the opportunity gap, and crime.
- Chronic stress from financial instability or crime may be embodied as dysfunctional inflammatory and endocrine regulatory biomarkers, altered patterns of DNA methylation, or telomere length attenuation.
- Accumulation over time may contribute to tumor initiation and the differential development of prognostically poor vs favorable breast cancer types.

Eldrige L, et al. *Health Equity*. 2022;6:116-123; McCullough LE. *JNCI Cancer Spect*. 2022;6:pkac018; Plascak JJ, et al. *JAMA Netw Open*. 2022;5:e2220908.

# Institutional Racism

- Racially discriminatory policies and practices embedded in social institutions
  - Results in unequal wealth distribution, lack of employment opportunities, inequitable education, legal injustices, few leadership roles occupied by minorities, and low funding and staffing at safety net hospitals, which leads to inadequate access to healthcare for segments of the population
- In the United States, the COVID-19 pandemic further widened these disparities.
- Redlining, or the practice of denying credit to individuals based on discriminatory factors, affects access to resources (eg, education, income, employment, wealth) that influence breast cancer outcomes.
  - May be due to intergenerational transmission of wealth and socioeconomic status not afforded to individuals residing in redlined areas, who tend to be from racial and ethnic minority groups
- In the United States, 3% of oncologists are Black, which adds to structural racism, underrepresentation, lack of a diverse work field, and lack of trust in the minority communities.

Eldrige L, et al. *Health Equity*. 2022;6:116-123; McCullough LE. *JNCI Cancer Spect*. 2022;6:pkac018; Plascak JJ, et al. *JAMA Netw Open*. 2022;5:e2220908.



# Allostatic Load

- A chronic stress state that increases neural and neuroendocrine responses, which results from the experience of racism and associated environmental challenges
  - Includes conditions in which people are born, live, work, grow, and age, contributing to health promoting vs health damaging resources
- A high allostatic load results in adverse consequences from increased fragility to more severe comorbid conditions.
- In breast cancer, a higher allostatic load is associated with advanced stage diagnosis, biologically aggressive tumors, and worse quality of life.
  - Studies have noted that Black women diagnosed with breast cancer have higher allostatic loads compared to non-Hispanic White women.

Hirko KA, et al. *BMC Medicine*. 2022;20:72.

# Medical Mistrust

- Mistrust is not based on specific knowledge but is rooted in a general sense of suspicion.
- Medical mistrust is prevalent across many different racial and ethnic groups and contributes to less uptake of healthcare services, dissatisfaction with care, and disparate outcomes.
- Healthcare factors that may influence medical mistrust:
  - Provider communication
  - Patient satisfaction

Sutton AL, et al. *J Cancer Educ.* 2018;34:600-607.

# Summary

- Health disparities are differences linked with social, economic, and/or environmental disadvantages that adversely affect a group of people.
- Despite treatment advances and an overall reduction in breast cancer mortality, a significant disparity persists among different racial and ethnic groups.
- Understanding the driving factors contributing to breast cancer disparities uniquely position healthcare providers to implement strategies to progress toward health equity.
- Disparities are evident along the breast cancer care continuum with advanced practitioner influence at each stage.
- Focus should be directed toward prevention, early detection, and treatment.

# Pre/Post Test: Multiple Choice Question # 1

Which statement is correct regarding health disparities?

- A. All health differences between groups of people are health disparities.
- B. Health inequity is the state in which everyone has a fair and just opportunity to attain their highest level of health.
- C. **Health inequities cause health disparities.**
- D. Health disparities are linked to better health outcomes.

# Pre/Post Test: Multiple Choice Question #2

True or False: The introduction of mammography and endocrine therapy benefit Black and White women equally, but Black women are less likely to get screening, resulting in disparity.

True

**False**

# Pre/Post Test: Multiple Choice Question #3

Implicit bias and structural racism can impact:

- A. Treatment decisions that can affect health outcomes
- B. Screening rates due to lack of patient education
- C. The way patients are treated throughout the healthcare system
- D. **All the above**