

Exploring Cancer

Examining the Role of Biology, Race, Class, and Socioeconomics



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live webinar**

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Exploring Cancer

Examining the Role of Biology, Race, Class, and Socioeconomics



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NC Central
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LINEBERGER COMPREHENSIVE
CANCER CENTER



NORTH CAROLINA AGRICULTURAL
AND TECHNICAL STATE UNIVERSITY

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Exploring Cancer

Examining the Role of Biology, Race, Class, and Socioeconomics

Fridays

11:00 - 11:50 AM EST/EDT

August 25

Welcome to Cancer(s) and Health Disparities 101 - The Introduction

October 13

Breast Cancer Health Disparities

November 10

Precision Medicine and Immunotherapy

September 1

Radiation Oncology - What Is It, and What Is It Good For?

October 20

Pancreatic Cancer

November 17

Expanding Cancer Care Quality and Delivery in Sub-Saharan Africa: a collaborative approach

September 8

New Strategies in Treating GI Cancers

October 27

Careers in Cancer

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Exploring Cancer

Examining the Role of Biology, Race, Class, and Socioeconomics

September 8, 2023

Breast Cancer Health Disparities



Checo Rorie, PhD

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Checo Rorie, PhD

Checo J. Rorie, PhD, is originally from Marshville, NC, was raised by his grandparents and is a first-generation college student. Dr. Rorie attended Clark Atlanta University in Atlanta, GA, where he majored in Biology and graduated in 1998 with a bachelor of science degree. As an undergraduate, Dr. Rorie was a MARC Scholar and conducted breast cancer research in a Cancer Cell Biology laboratory. Dr. Rorie then attended the University of North Carolina at Chapel Hill's Curriculum in Toxicology graduate program earning a PhD in 2004. After graduating from UNC-CH, Dr. Rorie completed a postdoctoral fellowship at New York University, and then participated in a second postdoctoral fellowship back at UNC-CH in the Seeding Postdoctoral Innovators in Research & Education (SPIRE) program.

Dr. Rorie has been at North Carolina Agricultural and Technical State University since 2008, and is currently the Professor and Chair of the Department of Biology. Dr. Rorie has a Cancer Genetics and Cell Biology laboratory where his lab studies the mechanisms of breast cancer health disparities in African American Women.

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Professional Highlights

7

Professional Highlights

- 5.** Dr. Rorie attended Clark Atlanta University where he majored in Biology and graduated with a bachelors in science.

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- 3.** He earned his PhD from the University of North Carolina at Chapel Hill's Curriculum in Toxicology graduate program in 2004.

10

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Breast Cancer Health Disparities

Checo J. Rorie, PhD
Professor & Chair
Department of Biology

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My Journey

- Originally from Marshville, North Carolina; Forest Hills High School 1994
- Attended Clark Atlanta University, Atlanta, Georgia; B.S. Biology 1998 (John Browne)
- Attended UNC Chapel Hill; Ph.D. Toxicology 2004 (Bernard "Buddy" Weissman)
- Postdoc at New York University, New York, New York; Biochemistry 2005 (James "Jim" Boroweic)
- Postdoc in the SPIRE Program at UNC Chapel Hill; Radiation Oncology 2008 (YanPing Zhang)
- Currently: Professor and Chair of Biology, NC A&T State University



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Breast Cancer Health Disparities



Checo J. Rorie, PhD
Professor & Chair
Department of Biology

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Breast Cancer Awareness Month

In honor of
Aunt Francis
and our friend
Amanda



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“Is reducing racial disparities in healthcare *truly* possible?”
Anonymous, August 28, 2020

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Have you ever heard of the term cancer health disparity?

Yes	0%
No	0%

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Define what cancer health disparity means: place short definitions using poll everywhere or zoom chat.

Nobody has responded yet.
Hang tight! Responses are coming in.

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Defining Cancer Health Disparity

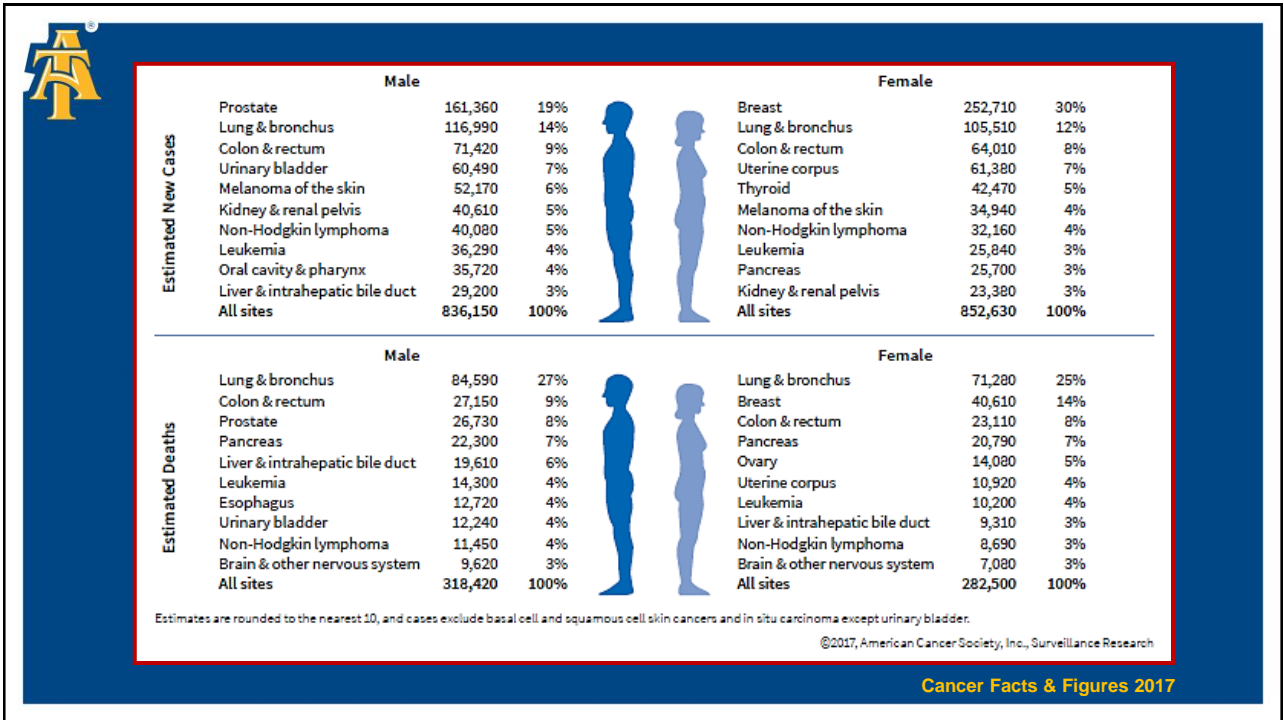
Cancer health disparities occur when certain groups bear a disproportionate (uneven, unequal) **burden** of cancer compared with other groups.



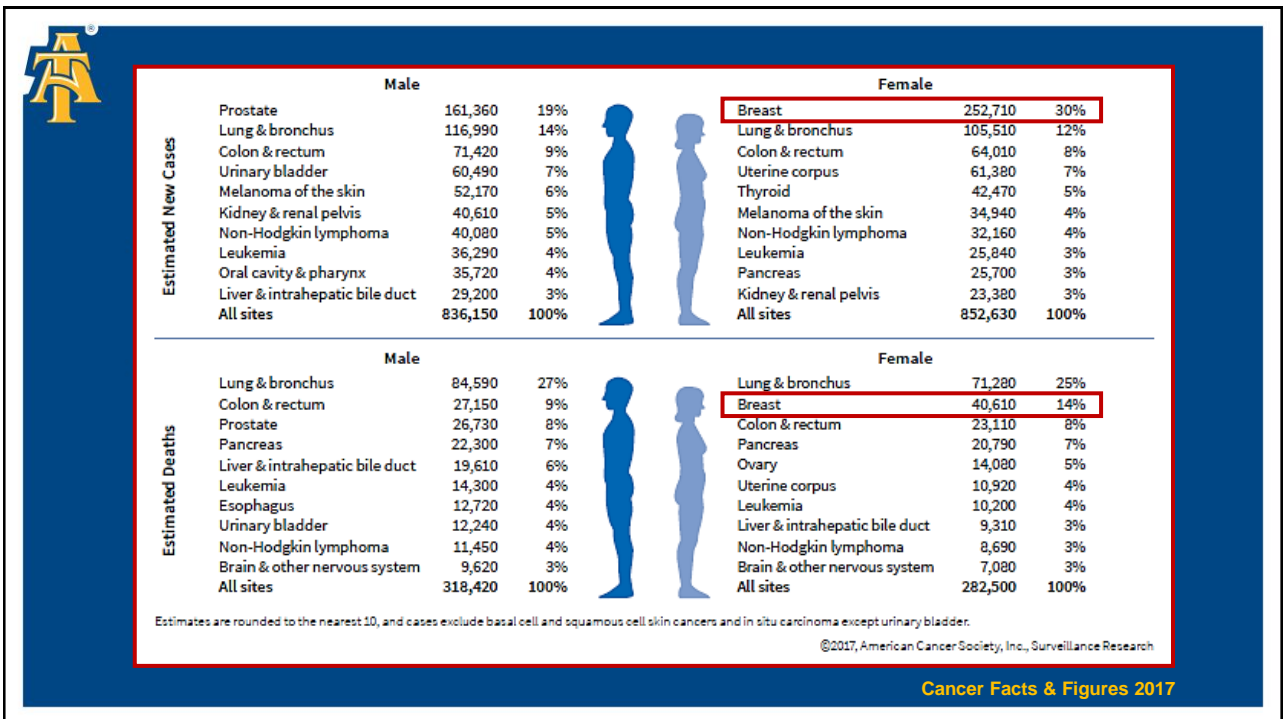
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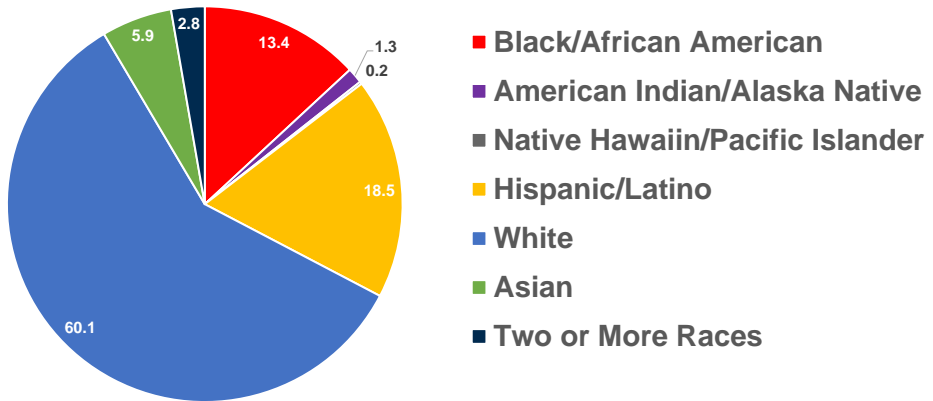


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U.S.A. Race and Hispanic Estimates, 2019

Race and Hispanic Origin



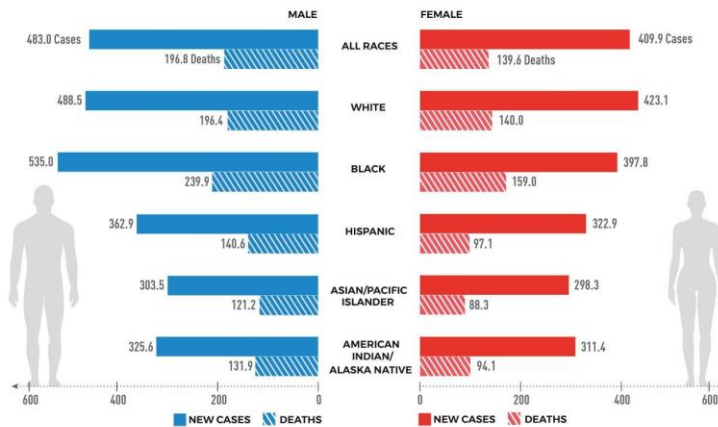
<https://www.census.gov/quickfacts/fact/table/US/PST045219>



New Cancer Cases & Deaths

Number of New Cancer Cases and Deaths Each Year

Per 100,000 Persons by Race/Ethnicity & Sex: All Cancers



Source: SEER 18, 2011-2015
cancer.gov

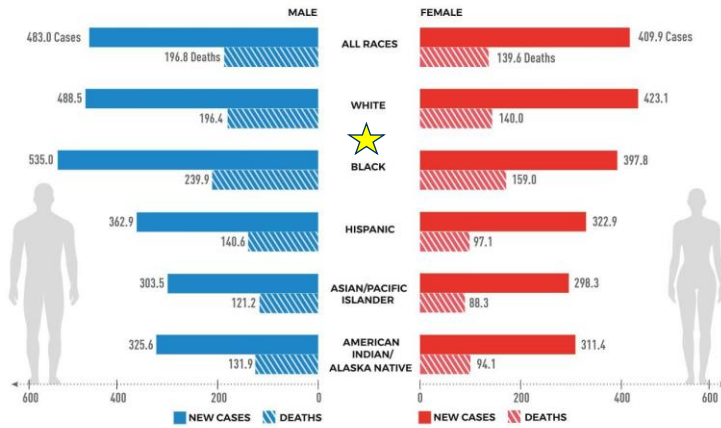




New Cancer Cases & Deaths

Number of New Cancer Cases and Deaths Each Year

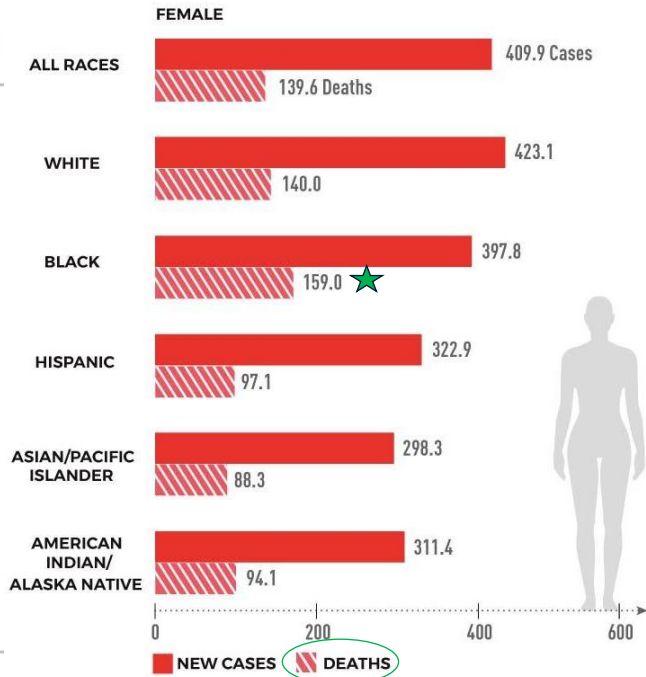
Per 100,000 Persons by Race/Ethnicity & Sex: All Cancers



Source: SEER 10, 2011-2016
cancer.gov



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Both men and women can get breast cancer.

True 0%

False 0%

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What is Breast Cancer Health Disparity?

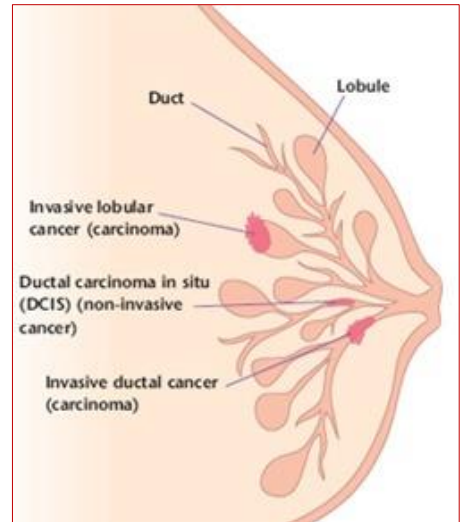
Breast cancer health disparities result when there are **differences** in the **expectations** of cancer measurements and outcomes

- Incidence or new cases diagnosed
- Prevalence or existing cases in a population
- Mortality or death related to cancer
- Survivorship or quality of life after cancer treatment
- Screening rates
- Stage at diagnosis

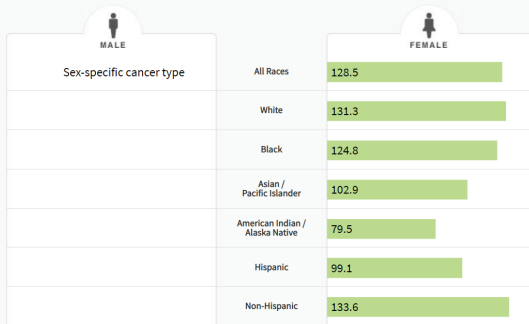
 <https://www.cancer.gov/about-cancer/understanding/disparities> ncat.edu 30

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- Most breast cancers begin in the lobules (milk glands) or in the ducts that connect the lobules to the nipple.
- Typically has no symptoms when the tumor is small and most easily treated, which is why screening is important for early detection.
- Most common physical sign is a painless lump.
- Men get breast cancer too (less than 1%)

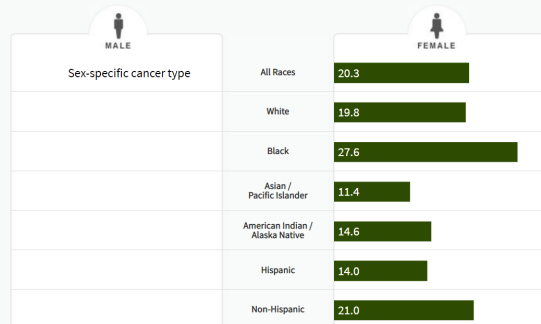


Rate of New Cases per 100,000 Persons by Race/Ethnicity: Female Breast Cancer

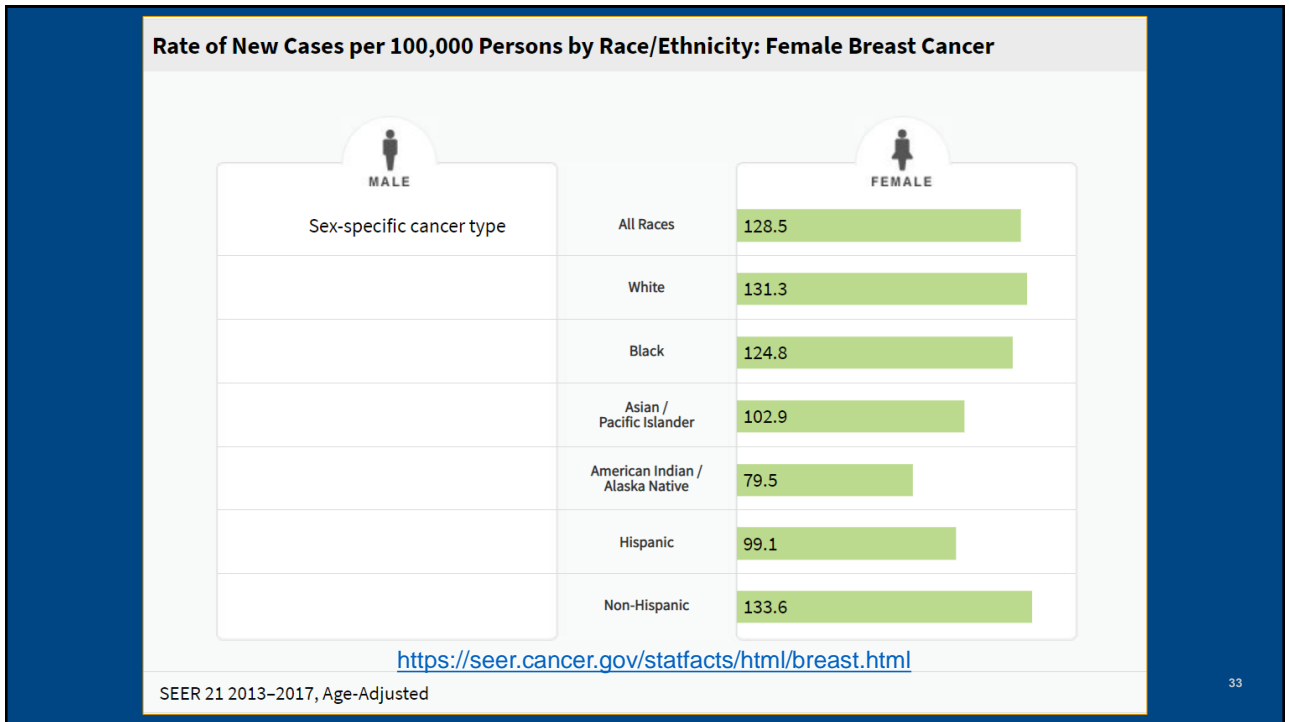


SEER 21 2013-2017, Age-Adjusted

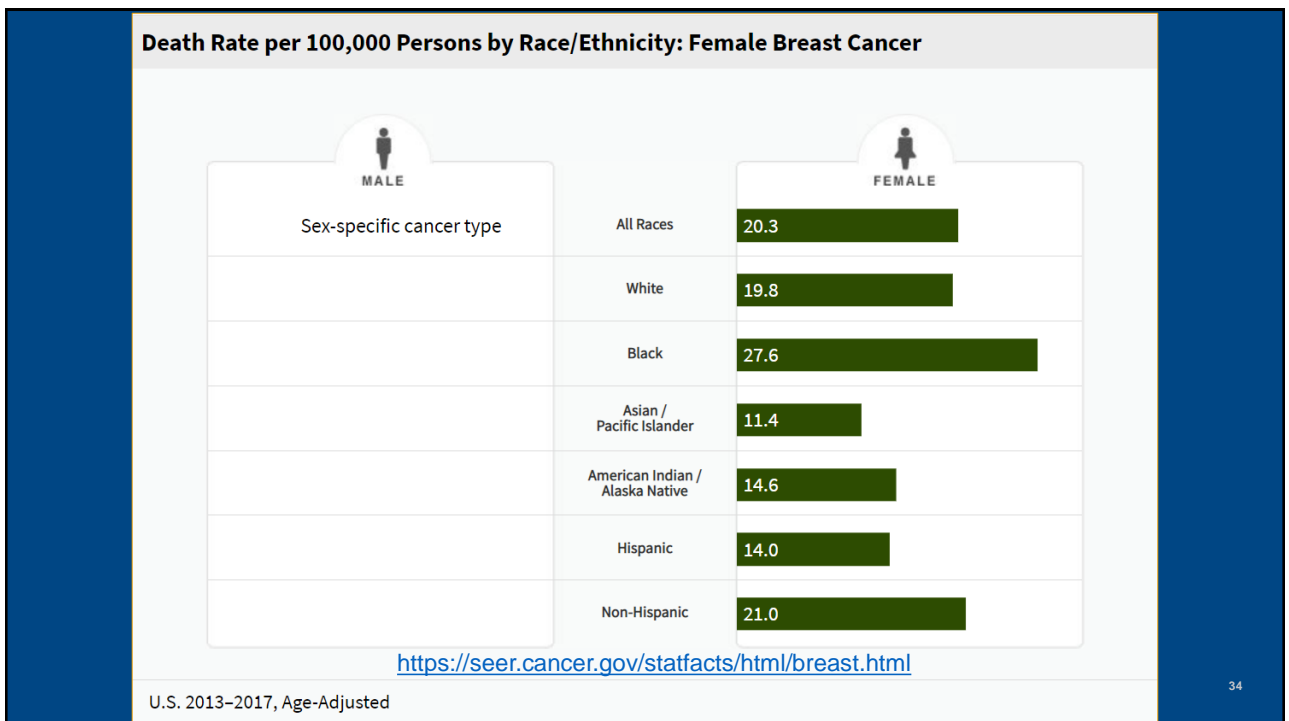
Death Rate per 100,000 Persons by Race/Ethnicity: Female Breast Cancer



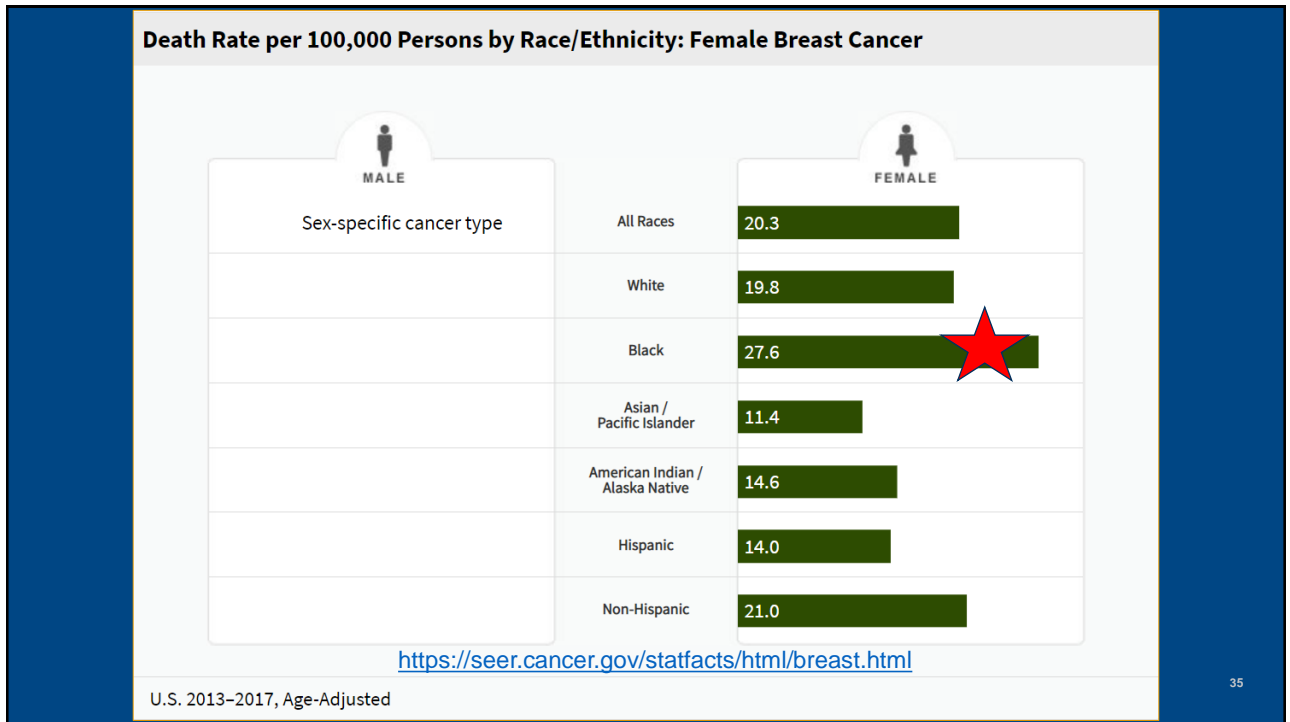
U.S. 2013-2017, Age-Adjusted



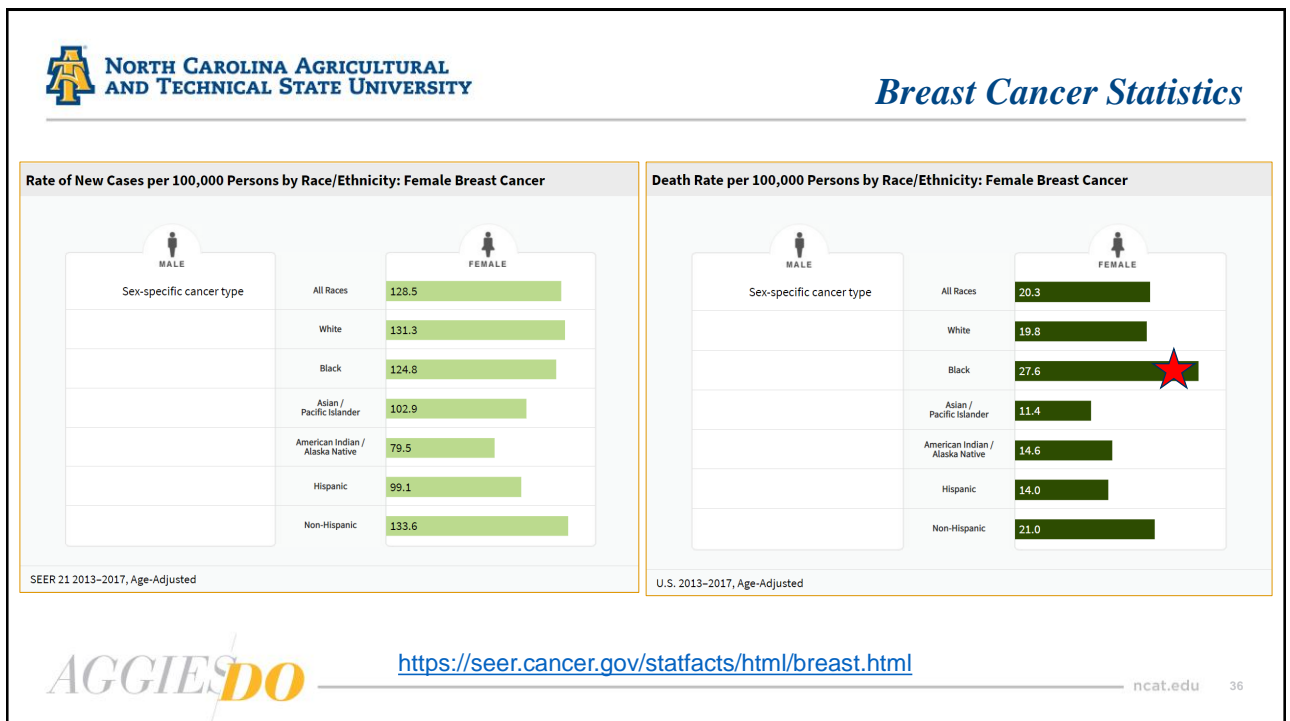
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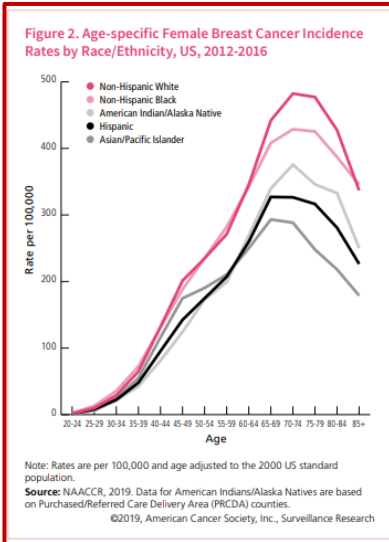
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Incidence and Death by Ethnicity



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Breast Cancer Histology & Subtypes

Histological subtypes	Ductal	Lobular	Molecular subtypes	Triple negative	HER2+	Luminal B	Luminal A
				ER-, PR-, HER2-			
Preinvasive cancer 25% Cells limited to basement membrane	Ductal carcinoma in situ (DCIS) 80% May spread through ducts and distort duct architecture 1% progress to invasive cancer per year Usually unilateral	Lobular carcinoma in situ (LCIS) 20% Does not distort duct architecture Same genetic abnormality as ILC - E-cadherin loss 1% progress per year Can be bilateral	% of breast cancers	15-20%	10-15%	20%	40%
Invasive cancer 75% Extension beyond the basement membrane	Invasive ductal carcinoma (IDC) 79% Usually from DCIS precursor Cause fibrous response, producing a palpable mass on examination Metastasis through lymphatics and blood	Invasive lobular carcinoma (ILC) 10% Usually from LCIS precursor Minimal fibrous response, presents less often with palpable mass Metastasis through abdominal viscera to GI, ovaries, uterus Almost always ER+	Receptor expression		HER2		ER+/PR+
			Histologic grade Level of cell differentiation	High (grade III)			Low (grade I)
			Prognosis Correlates to histologic grade	Poor			Good
			Response to medical therapy	Chemotherapy	Trastuzumab		Endocrine

Our Treat Options Oncol. 2000 Aug;1(3):199-209. Clin Transl Oncol. 2008 Dec;10(12):777-85. Nat Clin Pract Oncol. 2007 Sep;4(9):516-25. Robbins 8E

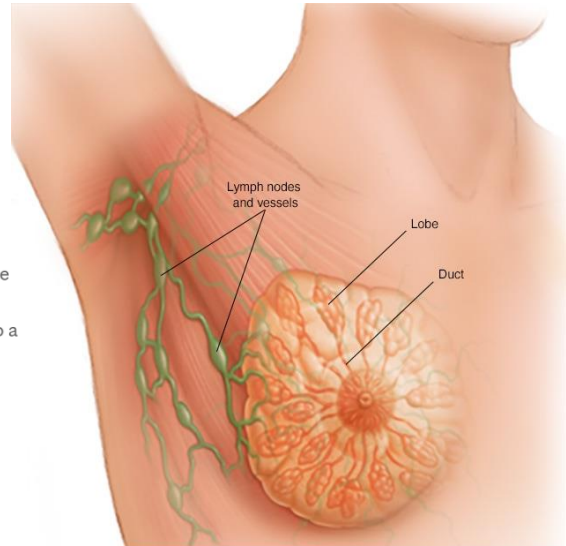
Triple negative tumours respond best to chemotherapy, similar to other aggressive cancers. Luminal A tumours respond best to endocrine therapy, e.g. antestrogen or aromatase inhibitor.



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Breast anatomy

Each breast contains 15 to 20 lobes of glandular tissue, arranged like the petals of a daisy. The lobes are further divided into smaller lobules that produce milk for breastfeeding. Small tubes (ducts) conduct the milk to a reservoir that lies just beneath your nipple.



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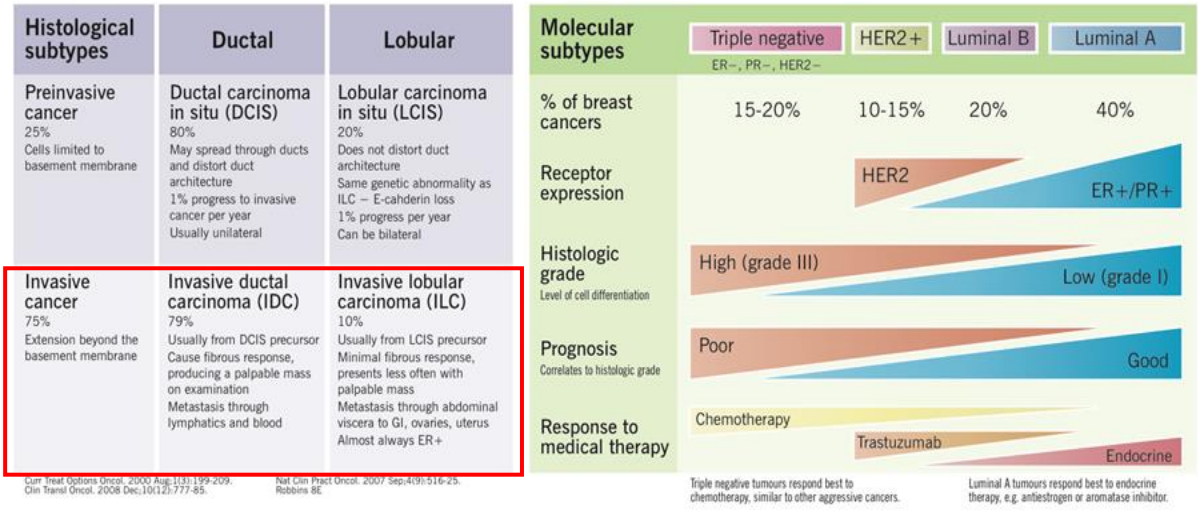
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Breast Cancer Histology & Subtypes



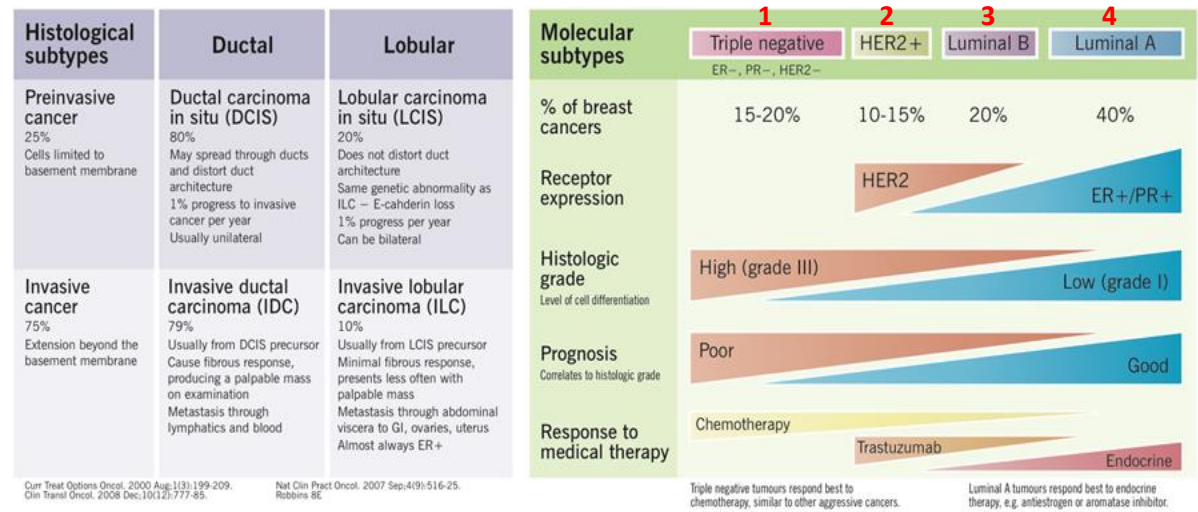
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<http://www.pathophys.org/breast-cancer/breastcancer-copy/>

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Breast Cancer Histology & Subtypes



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<http://www.pathophys.org/breast-cancer/breastcancer-copy/>

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Breast Cancer Histology & Subtypes

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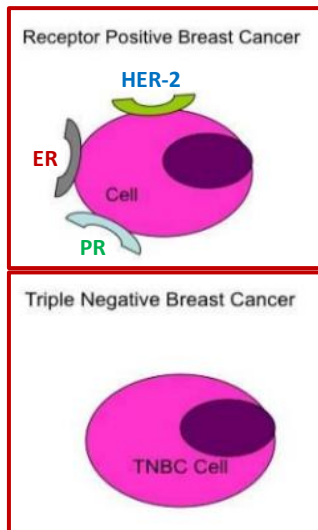
Cur Treat Options Oncol. 2000 Aug;13(3):199-209. Clin Transl Oncol. 2008 Dec;10(12):777-85. Nat Clin Pract Oncol. 2007 Sep;4(9):516-25. Robbins 8E

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Breast Cancer Subtypes by Ethnicity

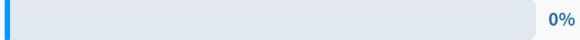


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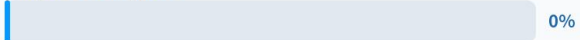
Based upon the bar graph shown, why do you think Black women have a worse breast cancer prognosis or predictable outcome compared to their White counterparts?



Because black women have the largest percentage of HR+/HER2+ diagnosis



Because black women have the largest percentage of HR-/HER2+ diagnosis



Because black women have the largest percentage of HR-/HER2- diagnosis



Because black women have the largest percentage of HR+/HER2- diagnosis

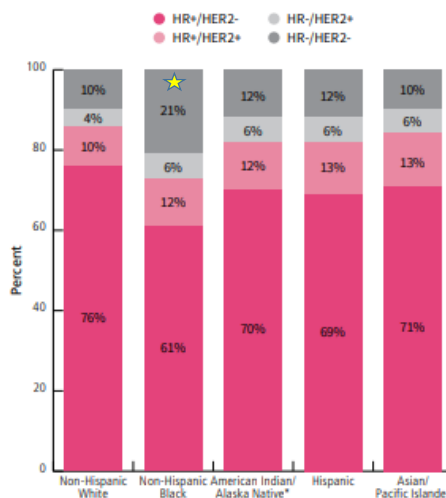


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Non-Hispanic Black women have the largest percent at 21% diagnosis of Triple-Negative Breast Cancer, the most aggressive form of breast cancer

Figure 4. Distribution of Breast Cancer Subtypes by Race/Ethnicity, Ages 20 and Older, US, 2012-2016



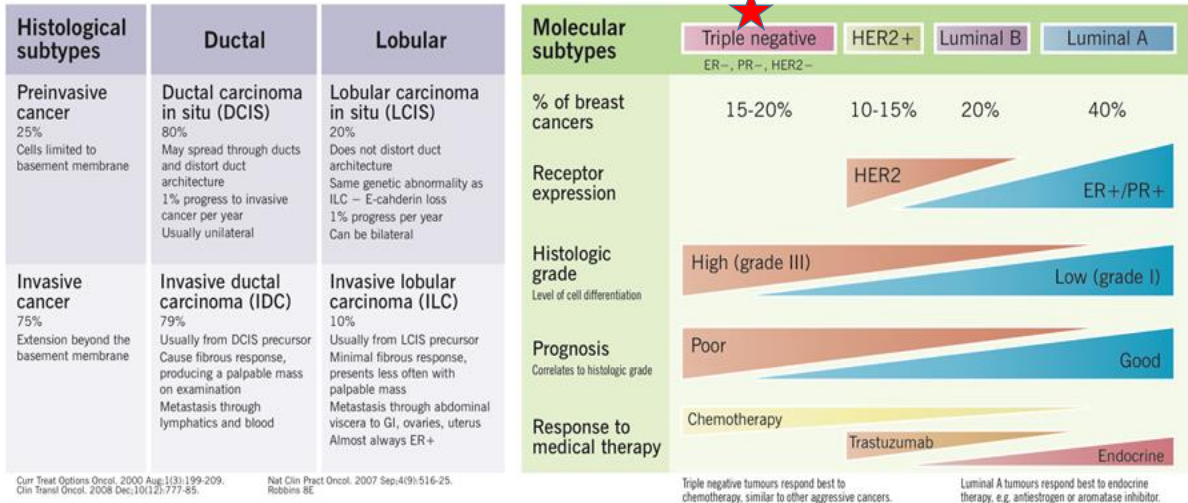
HR = hormone receptor, HER2 = human epidermal growth factor receptor 2. Statistics based on data from PRCDA counties. Source: NAACCR, 2019. ©2019, American Cancer Society, Inc., Surveillance Research

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Breast Cancer Histology & Subtypes



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Background: Triple negative breast cancer

- Lack of estrogen receptors (ER), progesterone receptors (PR) and human epidermal growth factor receptor-2 (HER2) expression resulting in **lack of targeted therapies**
- Typically stains positive for **mutant-p53** (80% of cases)
- Account for 10-17% of all breast cancer
- More prevalent in **African-American women** with a higher death rate in those **age <35**
- Significantly more aggressive (high growth rates, highly invasive/metastatic) than other subgroups with a peak **risk of recurrence (survival rate 40%)** in visceral and soft tissue between the first- and third-years following therapy



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Difference in Survival Rates

- **African American (AA) women-lower 5-year survival rate**

- » 81% compared to 92% among non-Hispanic/White women
- » Premenopausal AA women appear to have a higher risk of triple negative and basal-like breast cancers
- » Have higher rate of occurrence of TNBC (39% versus 15%)

Why the differences in survival rates?

- Biologic and genetic differences in tumors
- Prevalence of risk factors
- Barriers to health care access
- Later stage of breast cancer at diagnosis

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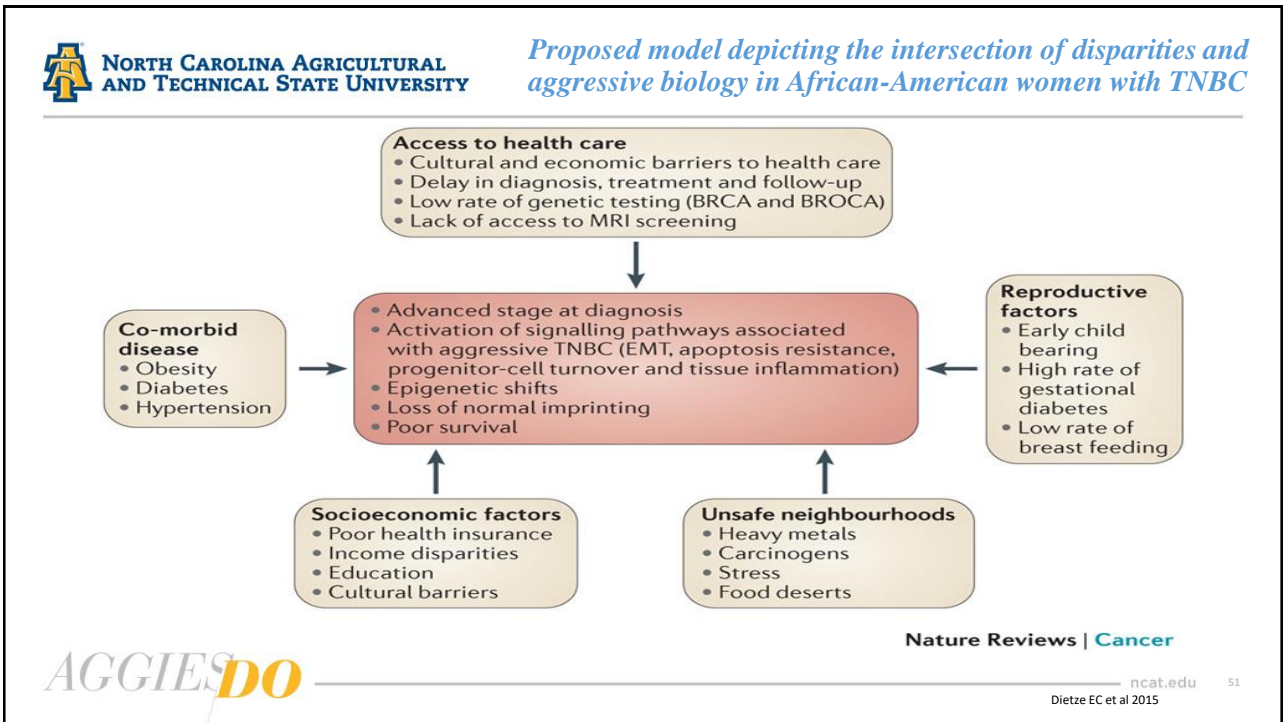
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What are some ideas you have to address or help reduce the disparity of breast cancer health outcomes?

Nobody has responded yet.
Hang tight! Responses are coming in.

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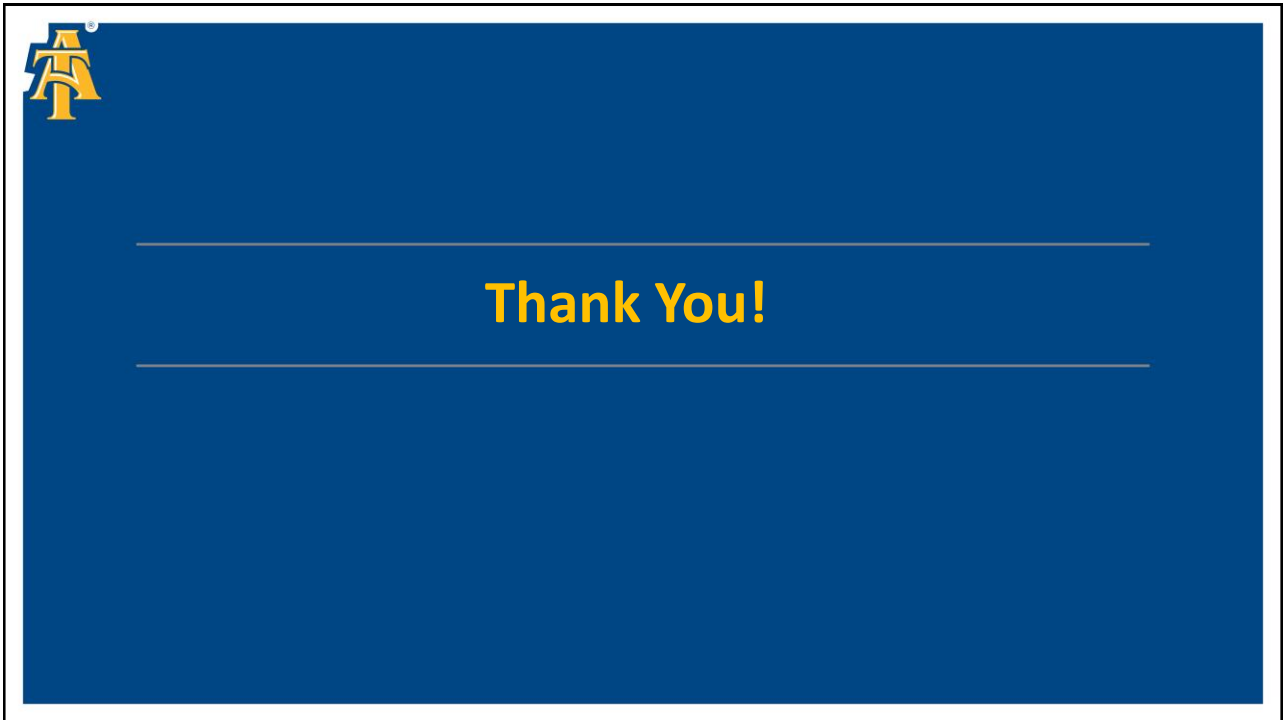
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“Is reducing racial disparities in healthcare *truly* possible?”
Anonymous, August 28, 2020

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Exploring Cancer is a webinar series taught by cancer biologists, physicians, public health experts, and other cancer specialists from NCCU, UNC-Chapel Hill, and NC A&T.

UNC Lineberger Cancer Network



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Exploring Cancer

Examining the Role of Biology, Race, Class, and Socioeconomics

Upcoming Live Webinar



**October 20
11:00 AM**

Pancreatic Cancer: Overview, Health Disparities, and Survivor Interview



Yolanda VanReil,
PhD, RN, MEDSURG-BC,
OCN, CNE, ACUE, ANEF



Karyn Green



Sydney Taylor

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Exploring Cancer

Examining the Role of Biology, Race, Class, and Socioeconomics

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Email: unclcn@unc.edu

Call: **(919) 445-1000**