UNIVERSITY OF HAWAI'I
CANCER CENTER
50 Years of Progress

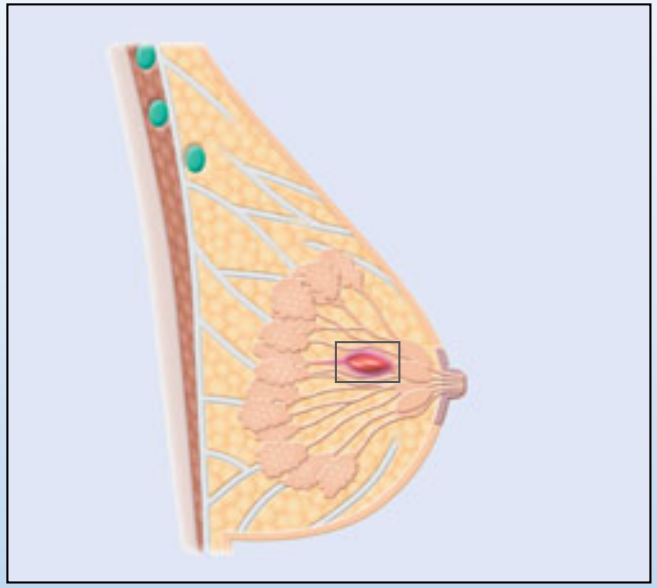
Breast Cancer in Hawai'i - From Population to Biology

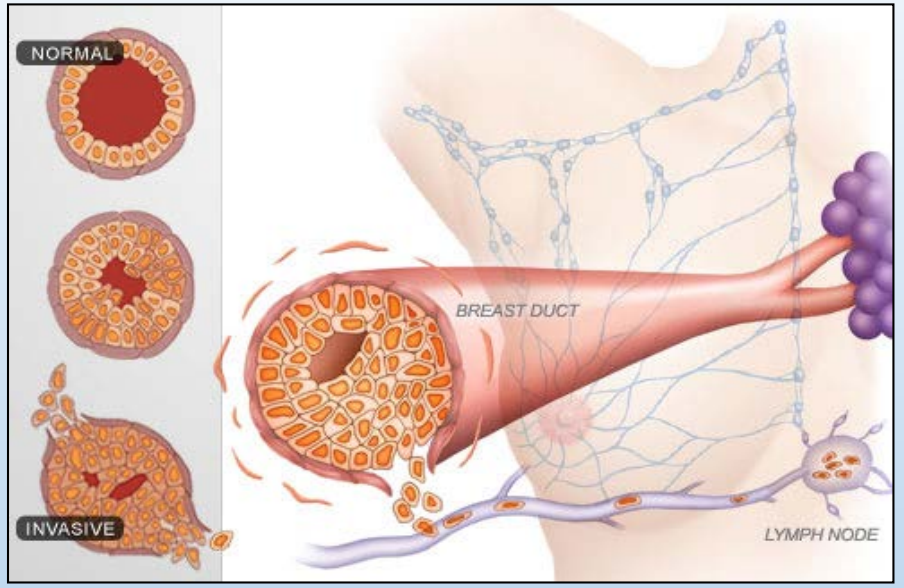
UH Cancer Center Starlight Lecture Series

Lenora WM Loo, PhD

October 14, 2021

Breast Cancer:





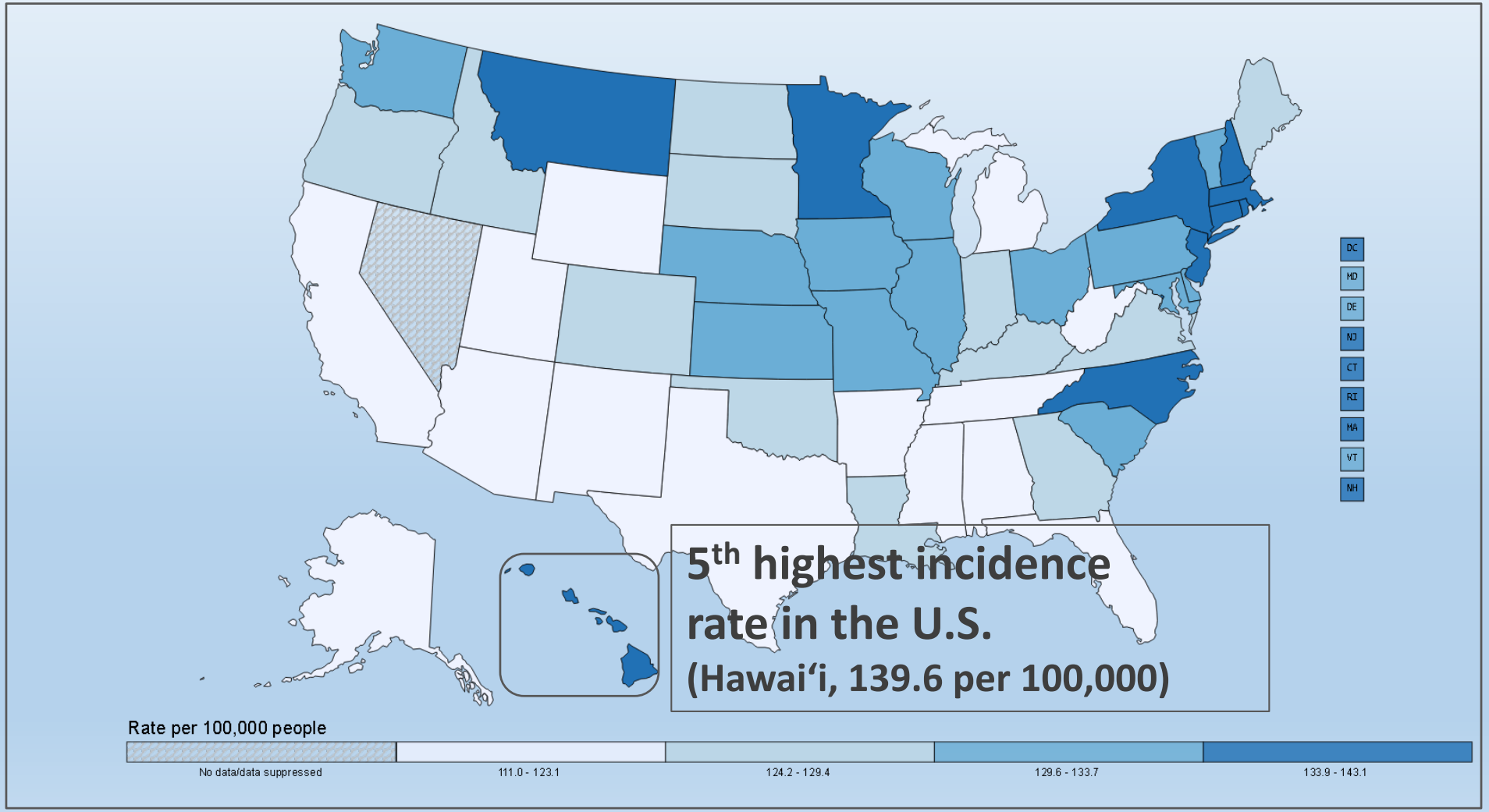
- Changes or mutations in the genome (DNA) can cause normal breast cells to become cancer cells.
- Breast cancers can start from different tissues in the breast.
- The most common form of breast cancer originates from epithelial cells that line the ducts; their function is to carry milk to the nipple.
- Breast cancer cells can go into the blood or lymph system and spread to different parts of the body.

Breast Cancer Risk Factors:

- A breast cancer risk factor is anything that contributes to an individual's risk of developing breast cancer. There are risk factors that you can change and others that you cannot.
- *Risk factors that are modifiable:*
  - being overweight or obese
  - physical activity
  - diet
  - drinking alcohol; smoking
  - having children; breast feeding
  - oral contraceptives; hormone replacement therapy
- *Risk factors that are not modifiable:*
  - gender – being a women
  - aging – getting older
  - genetics – gene mutations

Rate of New Breast Cancers in the U.S. by State

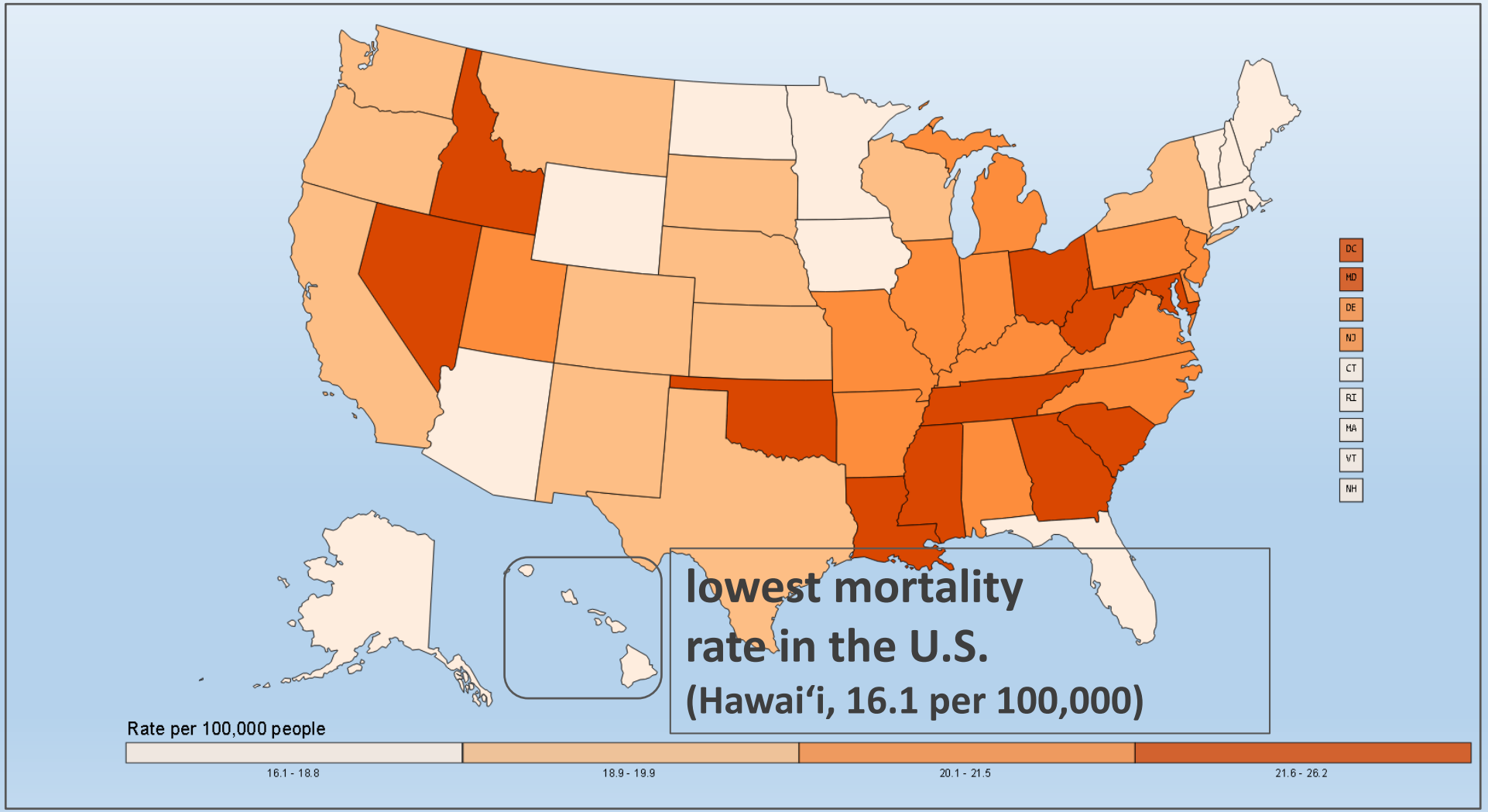
(2014-2018)



https://gis.cdc.gov/Cancer/USCS/#/AtAGlance/

Rate of Breast Cancer Deaths in U.S. by State

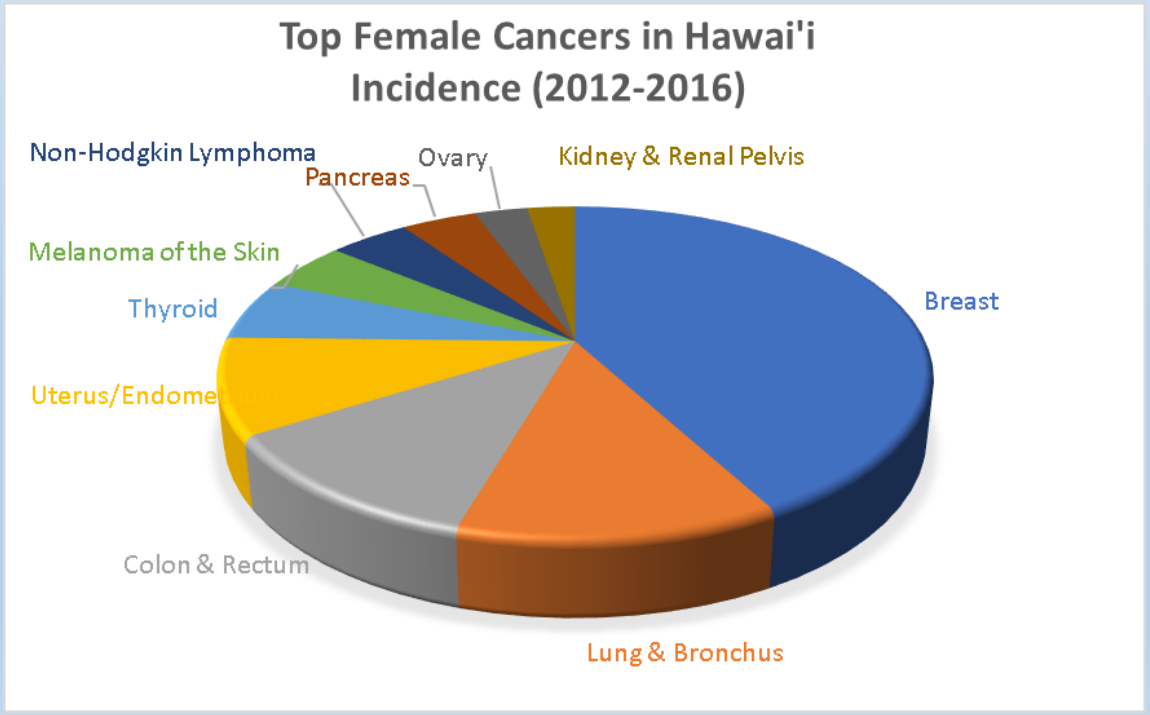
(2014-2018)

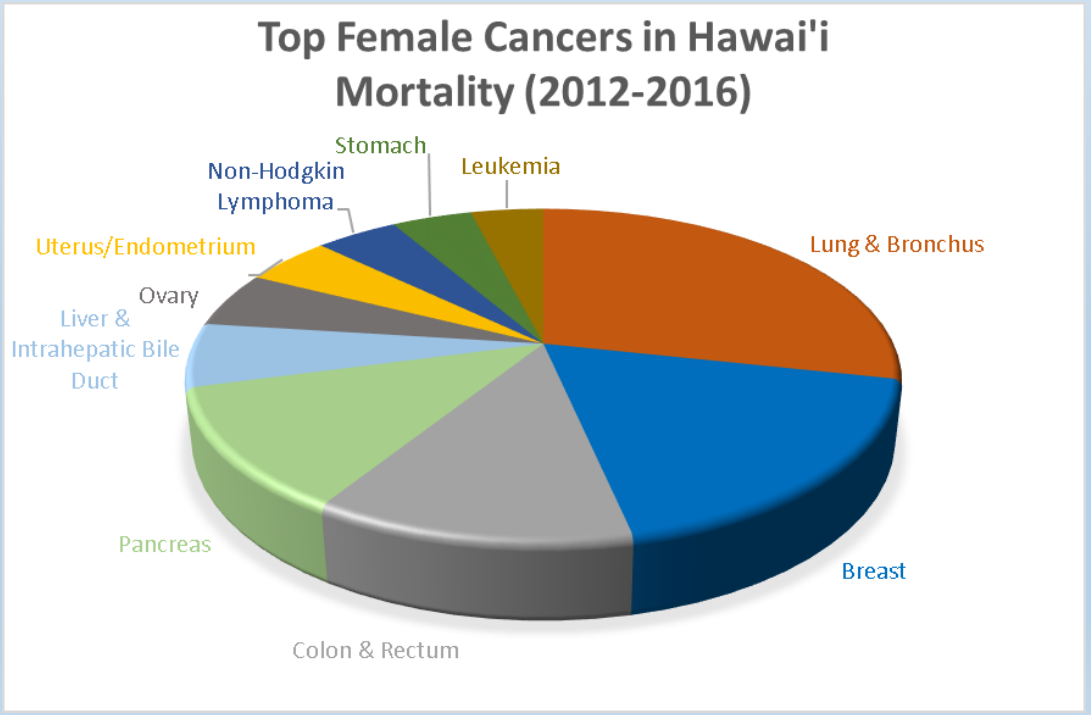


https://gis.cdc.gov/Cancer/USCS/#/AtAGlance/

Breast Cancer in Hawai‘i:

- Breast cancer is the most common cancer diagnosed in women in Hawai‘i.
- Second to lung cancer, breast cancer is one of the top causes of cancer death for women in Hawai‘i.

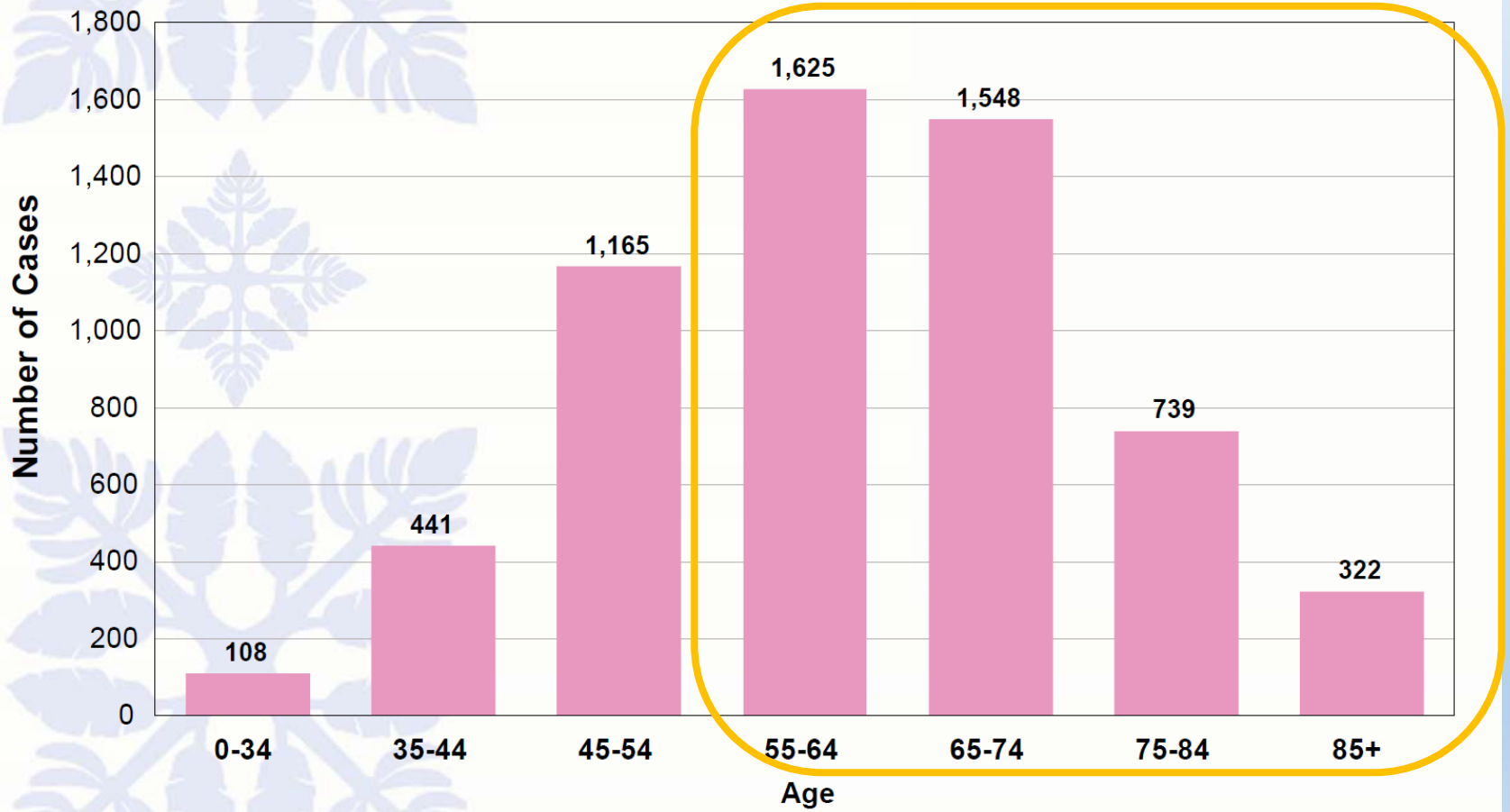




Source: Hawai‘i Tumor Registry, University of Hawai‘i Cancer Center

Breast Cancer Cases by Age at Diagnosis
(Hawai'i, 2021-2016)

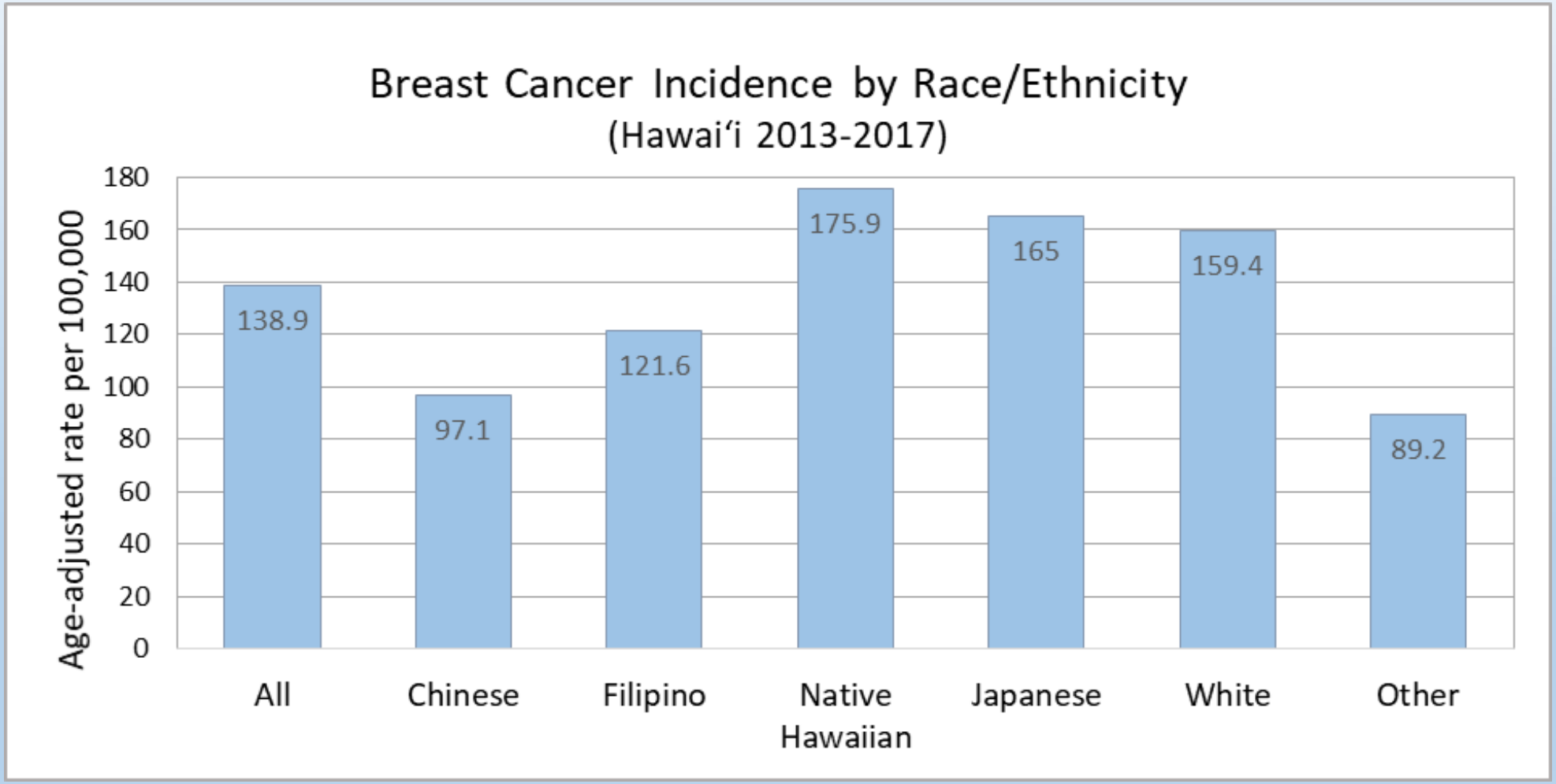
- The majority of breast cancer cases are over the age of 55 years old.



Source: Hawai'i Tumor Registry, University of Hawai'i Cancer Center
All cases are invasive.

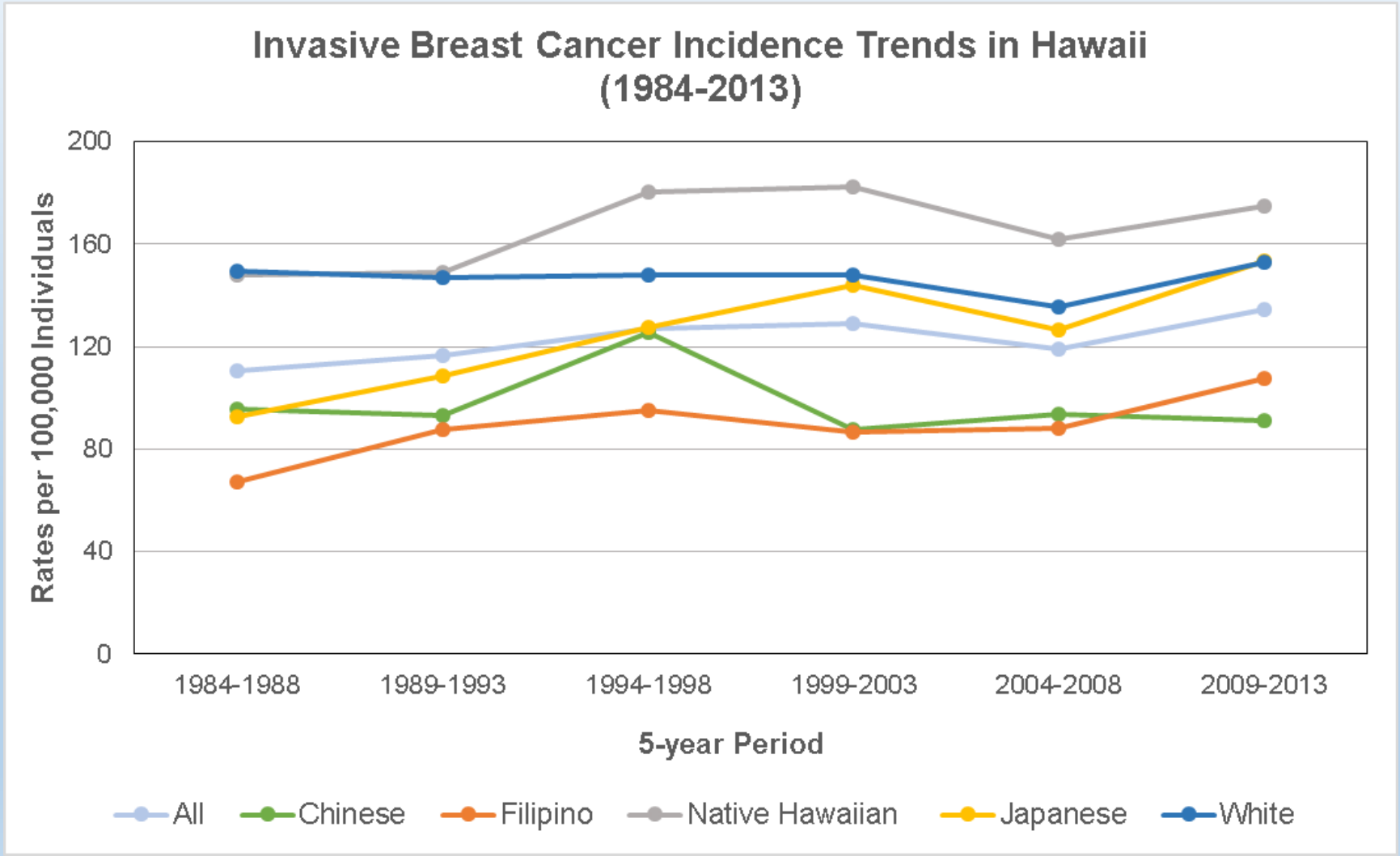
Racial/Ethnic Differences in Breast Cancer Incidence and Mortality Rates in Hawai‘i

Differences in Breast Cancer Incidence Rates by Race/Ethnicity



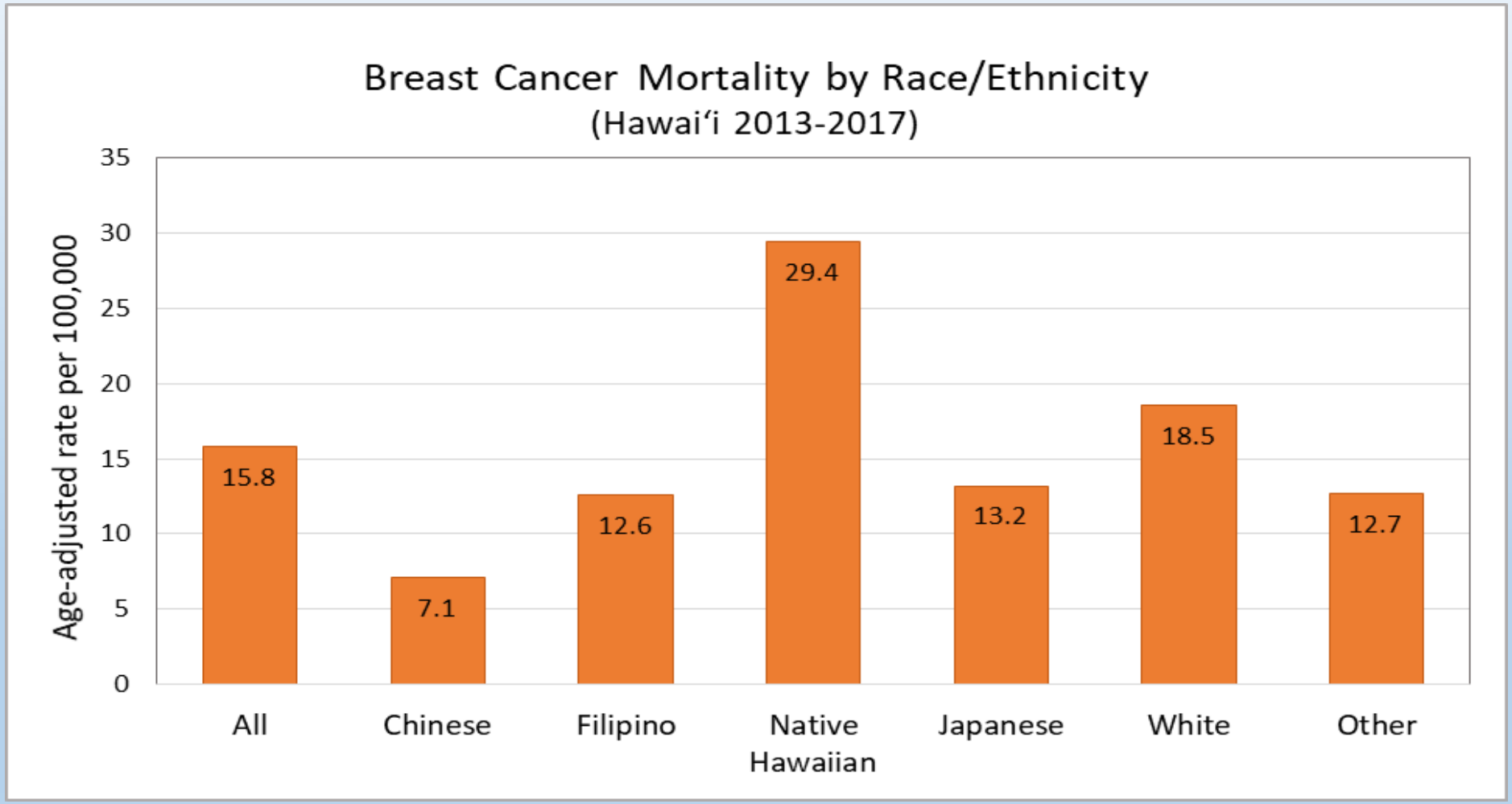
Source: Hawai'i Tumor Registry, University of Hawai'i Cancer Center
All cases are invasive.
Rates are over the 5-year period and are per 100,000 and age-adjusted to the 2000 U.S. Standard population.

Differences in Breast Cancer Incidence Trends by Race/Ethnicity



Source: Hawai‘i Tumor Registry, University of Hawai‘i Cancer Center; Loo, Williams, and Hernandez. *Cancer Epidemiology*. 2019

Differences in Breast Cancer Mortality Rates by Race/Ethnicity



Source: Hawai'i Tumor Registry, University of Hawai'i Cancer Center
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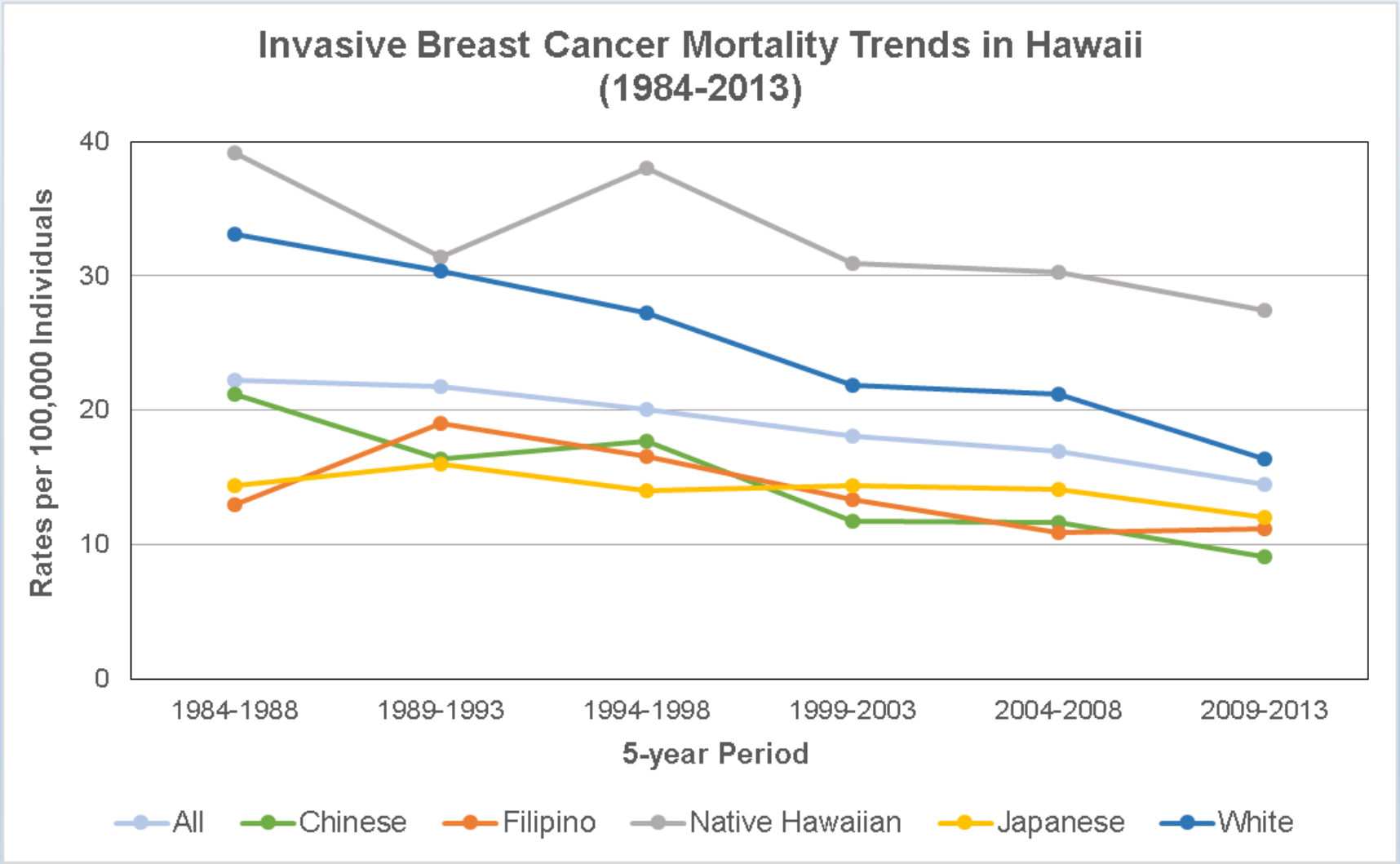
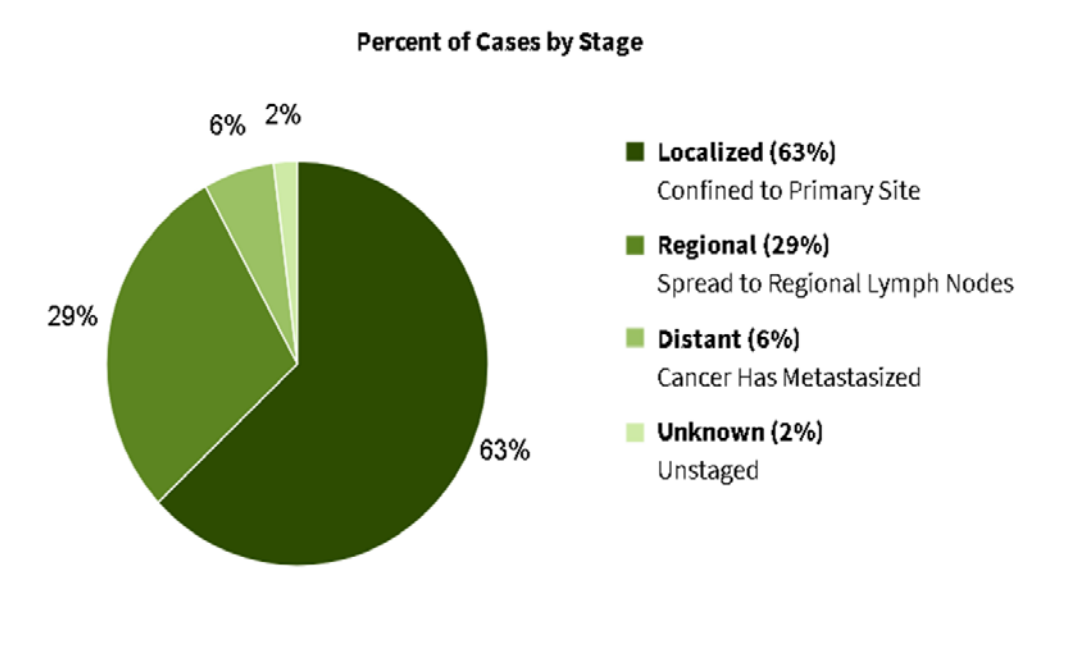
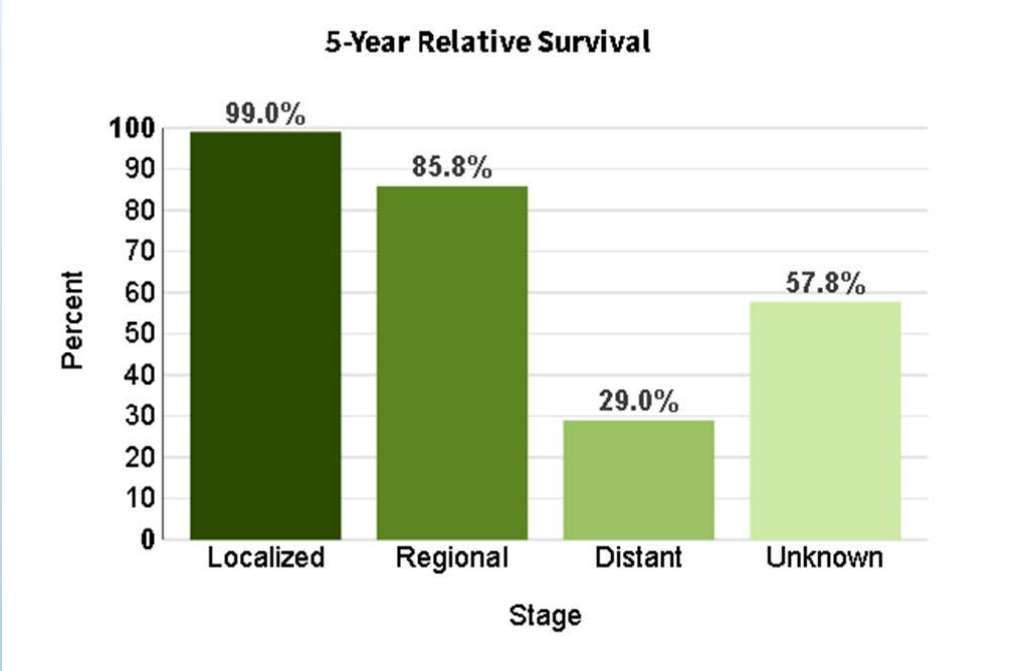


Source: Hawai‘i Tumor Registry, University of Hawai‘i Cancer Center; Loo, Williams, and Hernandez. *Cancer Epidemiology*. 2019

Racial/Ethnic Differences in Breast Cancer Stage at Diagnosis in Hawai‘i

Stage at Diagnosis & 5-Year Relative Survival

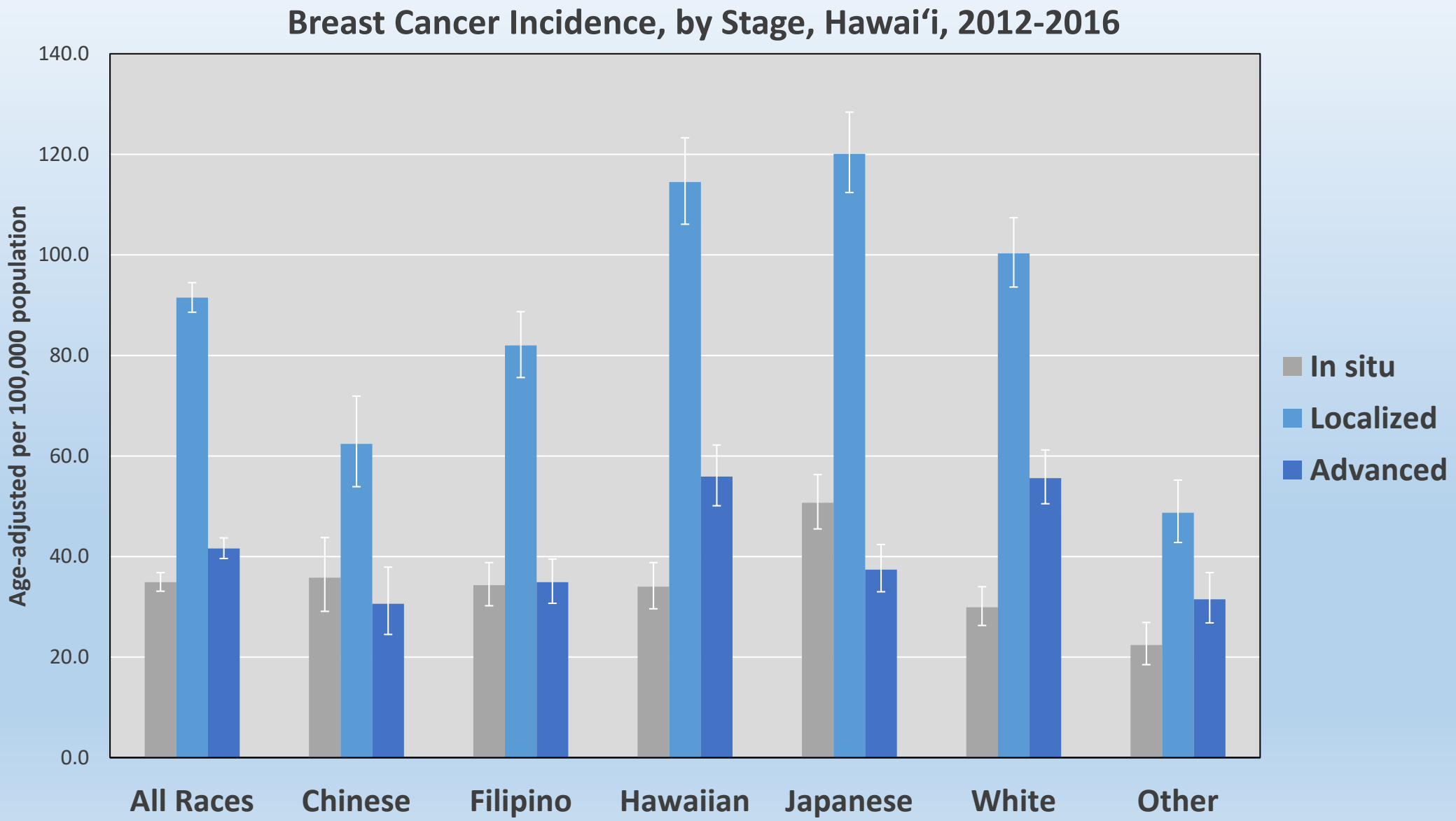




- Cancer stage at diagnosis refers to extent of cancer spread in the body.
- It helps to determine treatment strategies.
- Stage information can also be informative about an individual's relative survival.

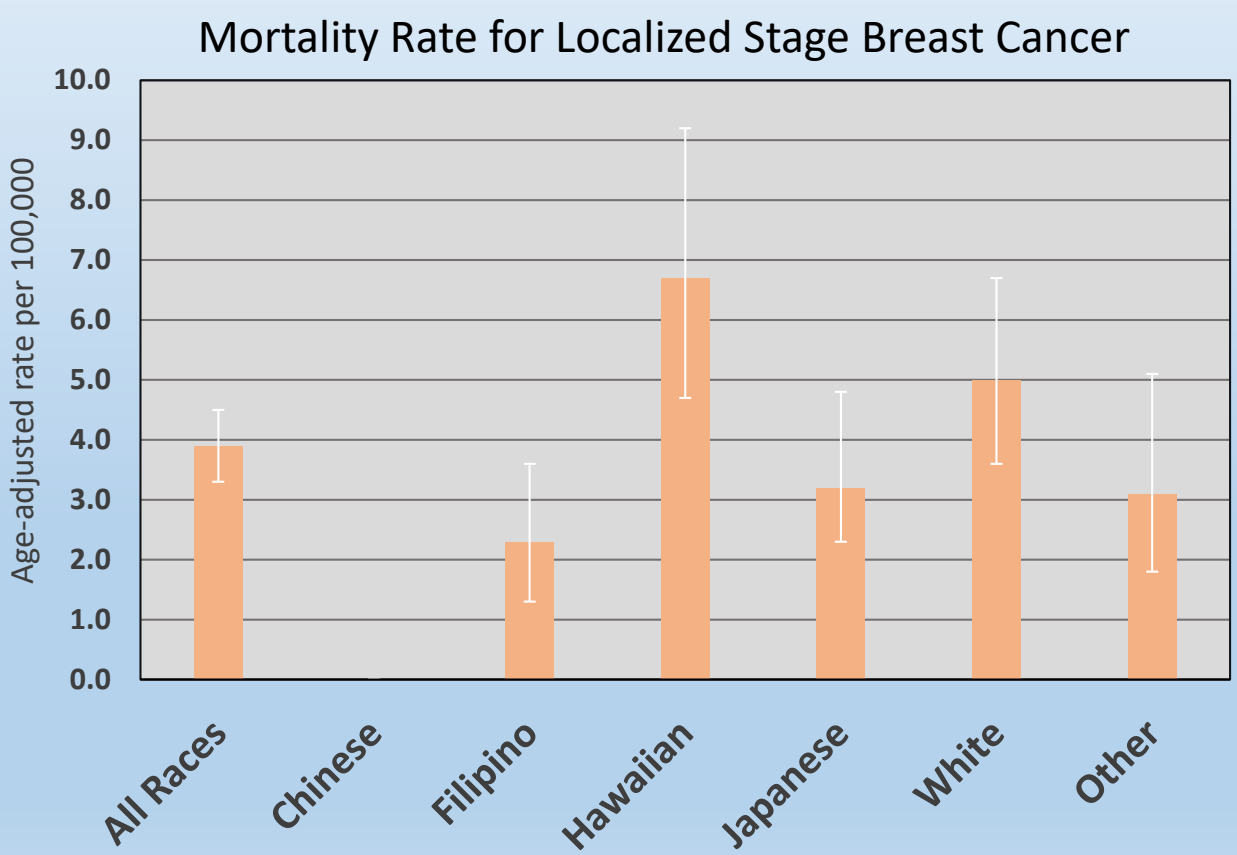
SEER 18 2011–2017, All Races, Females by SEER Summary Stage 2000

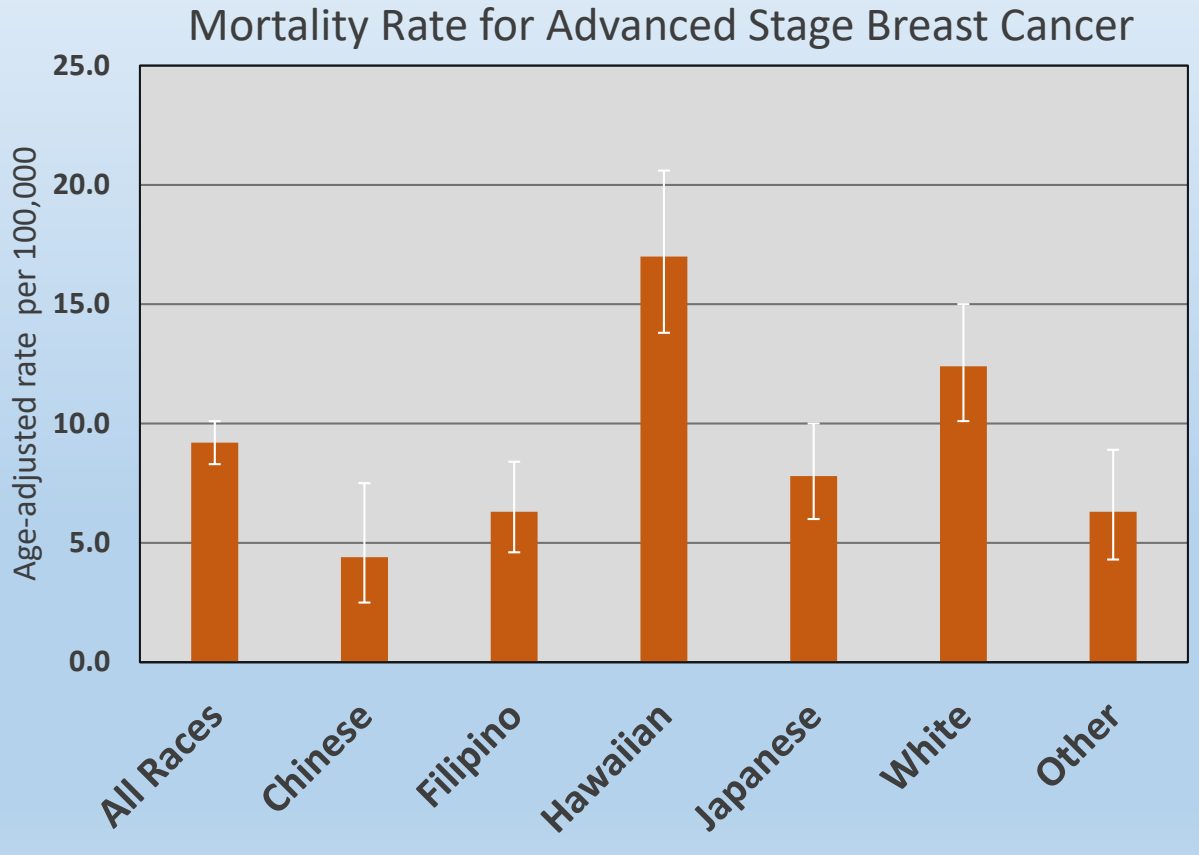
Differences in Breast Cancer Stage at Diagnosis by Race/Ethnicity



Rates age-adjusted to the 2000 U.S. Standard Population

Breast Cancer Incidence-Based Mortality by Stage and Race/Ethnicity (Hawai'i; 1998-2016)





Rates with counts less than 10 not shown; Rates age-adjusted to the 2000 U.S. Standard Population

Racial/Ethnic Differences in Breast Cancer Subtype at Diagnosis in Hawai‘i

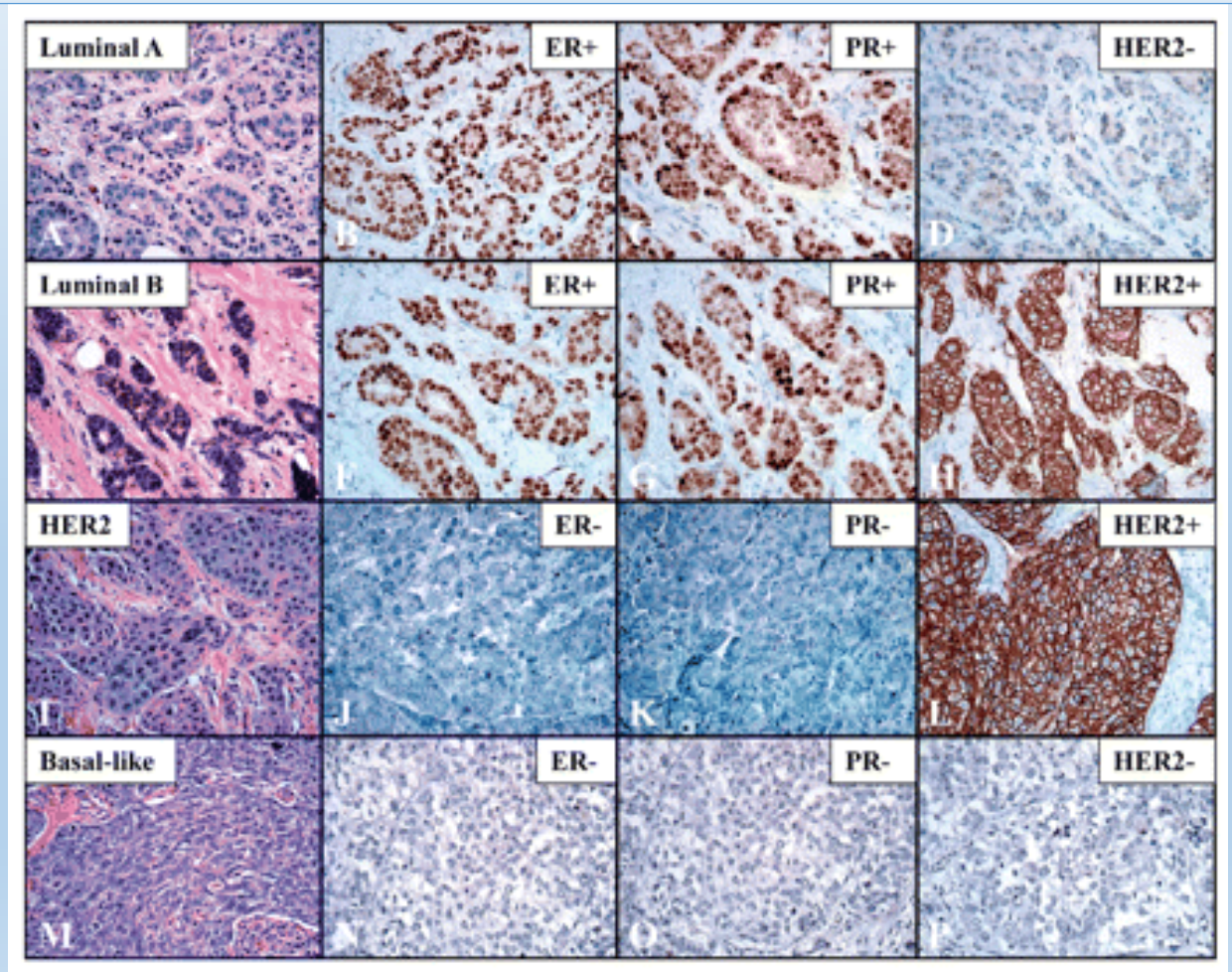
Breast Cancer Subtype Classification based on Immunohistochemical Staining of Estrogen Receptor (ER), Progesterone Receptor (PR), and Human Epidermal Growth Factor Receptor (HER2)

Luminal A
(ER+, PR+, HER2-)

Luminal B
(ER+, PR+, HER2+)

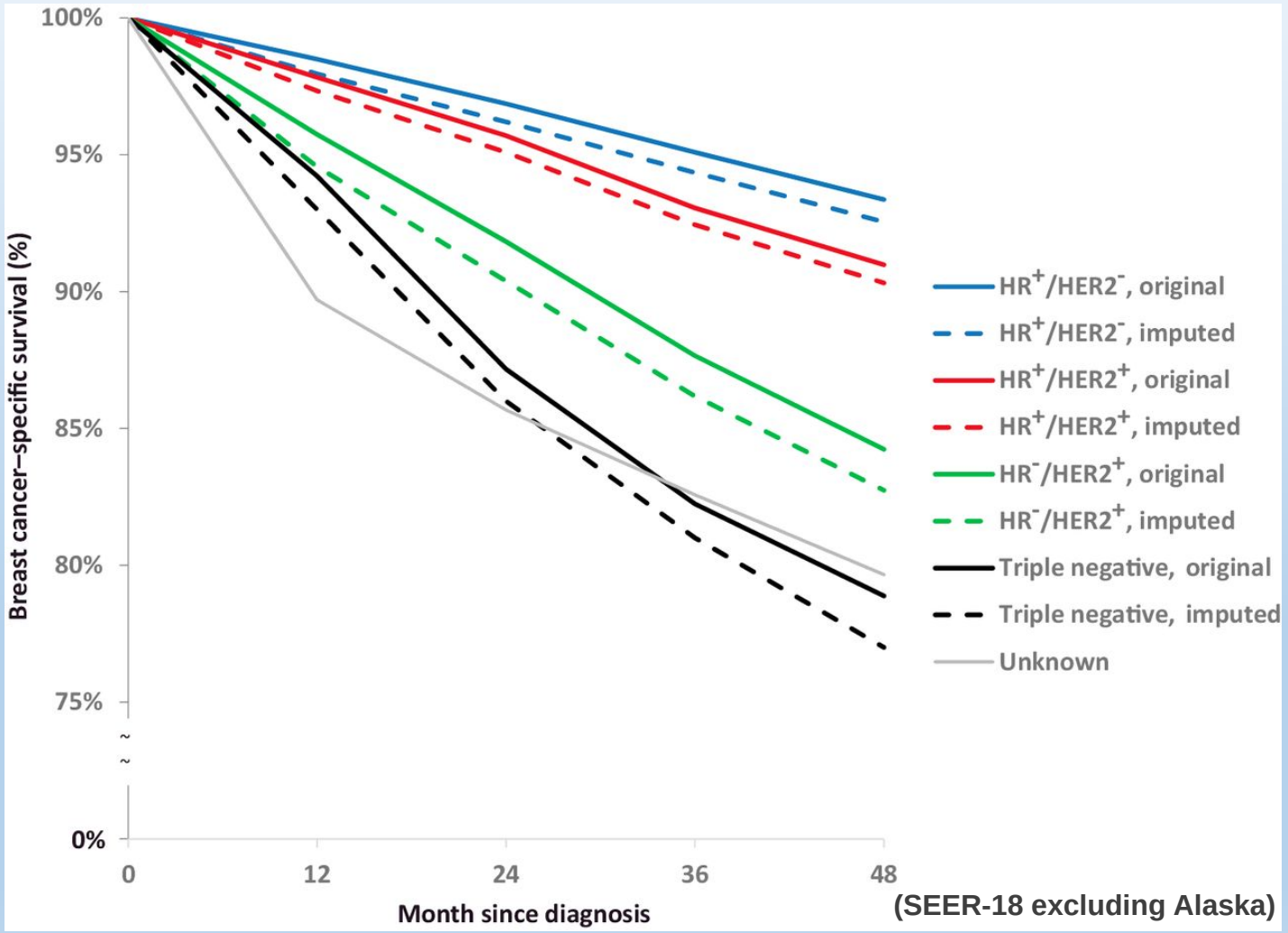
HER2-positive
(ER-, PR-, HER2+)

Basal-like
(ER-, PR-, HER2-)



Sandhu et al. LabMedicine 2010

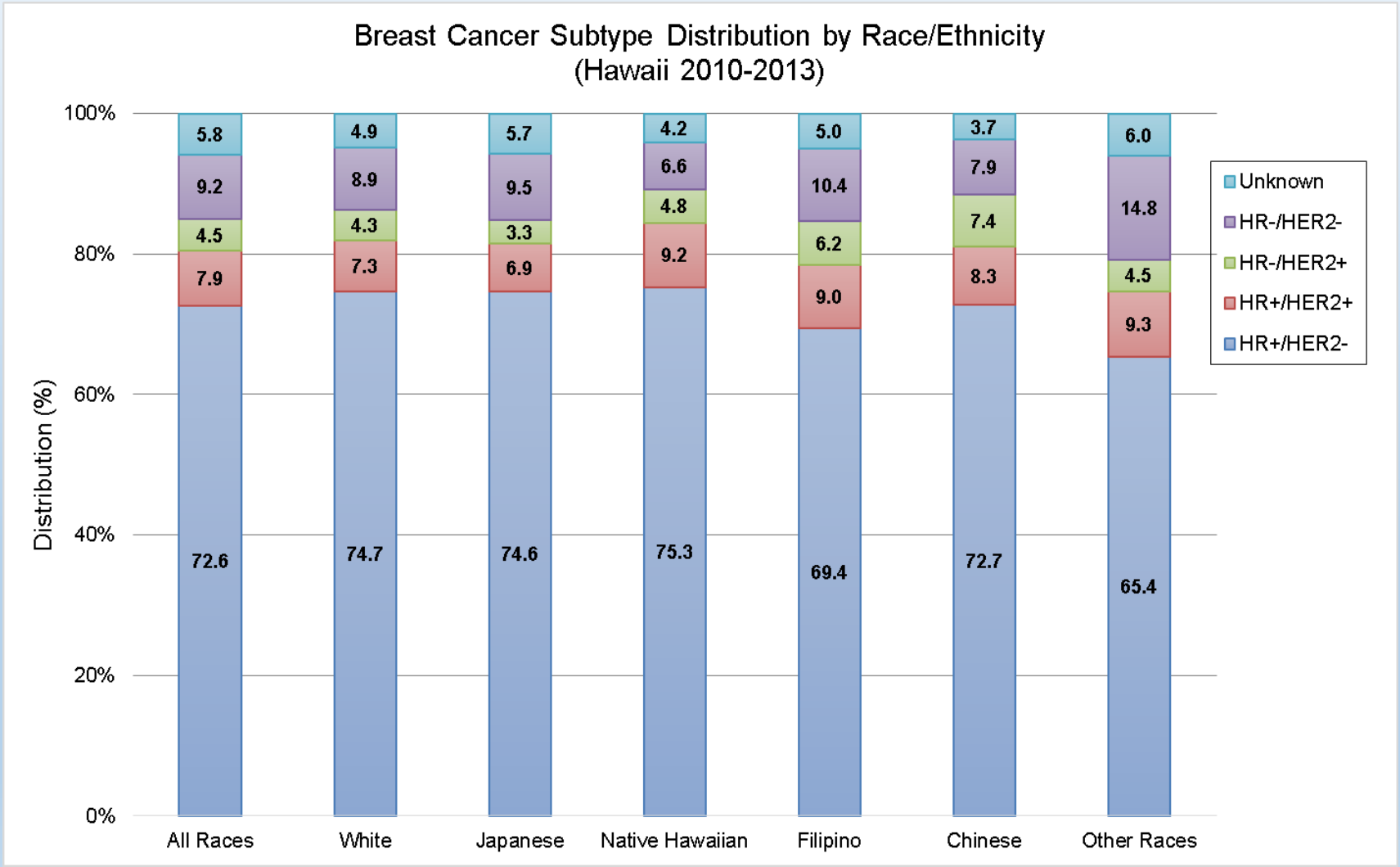
Differences in Breast Cancer–Specific Survival by Molecular Subtypes



Nadia Howlader et al. Cancer Epidemiol Biomarkers Prev 2018;27:619-626

AACR American Association for Cancer Research
Cancer Epidemiology, Biomarkers & Prevention

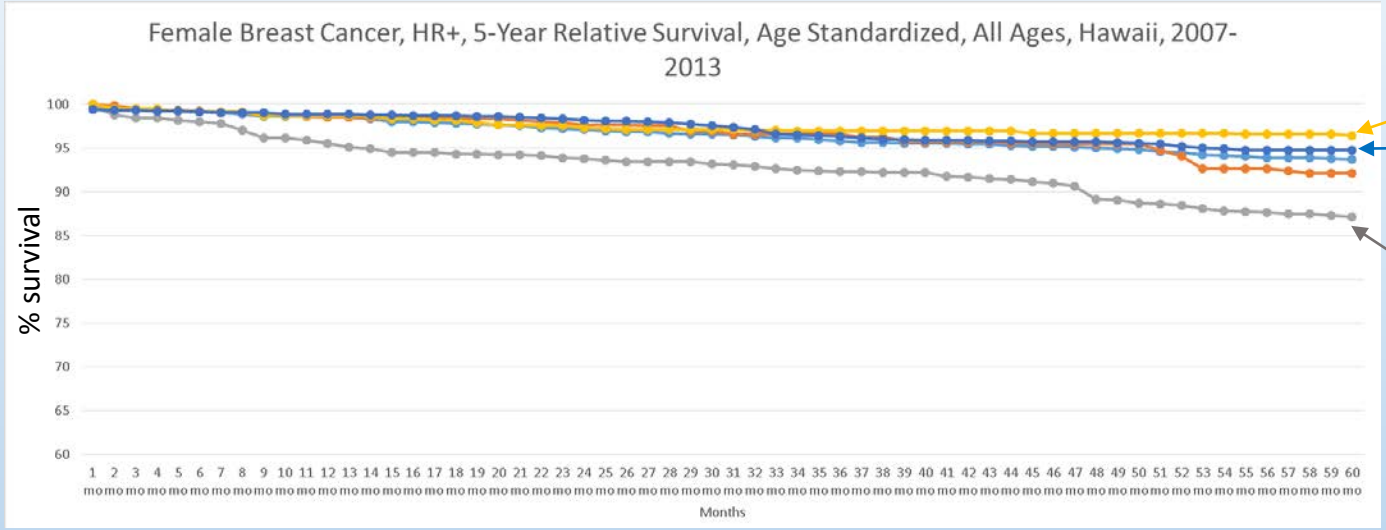
Differences in Breast Cancer Subtype Distribution by Race/Ethnicity



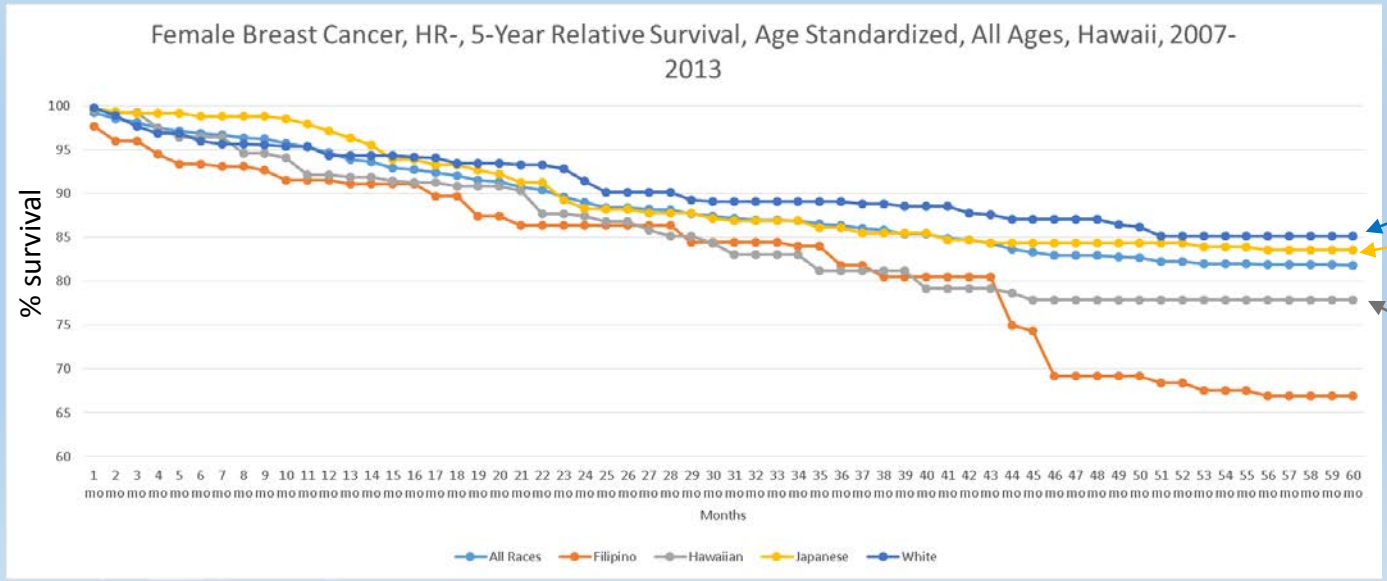
Source: Hawai‘i Tumor Registry, University of Hawai‘i Cancer Center; Loo, Williams, and Hernandez. *Cancer Epidemiology*. 2019

Racial/Ethnic Differences in 5-year Female Breast Cancer Survival by Hormone Receptor (HR) Status

HR-positive



HR-negative



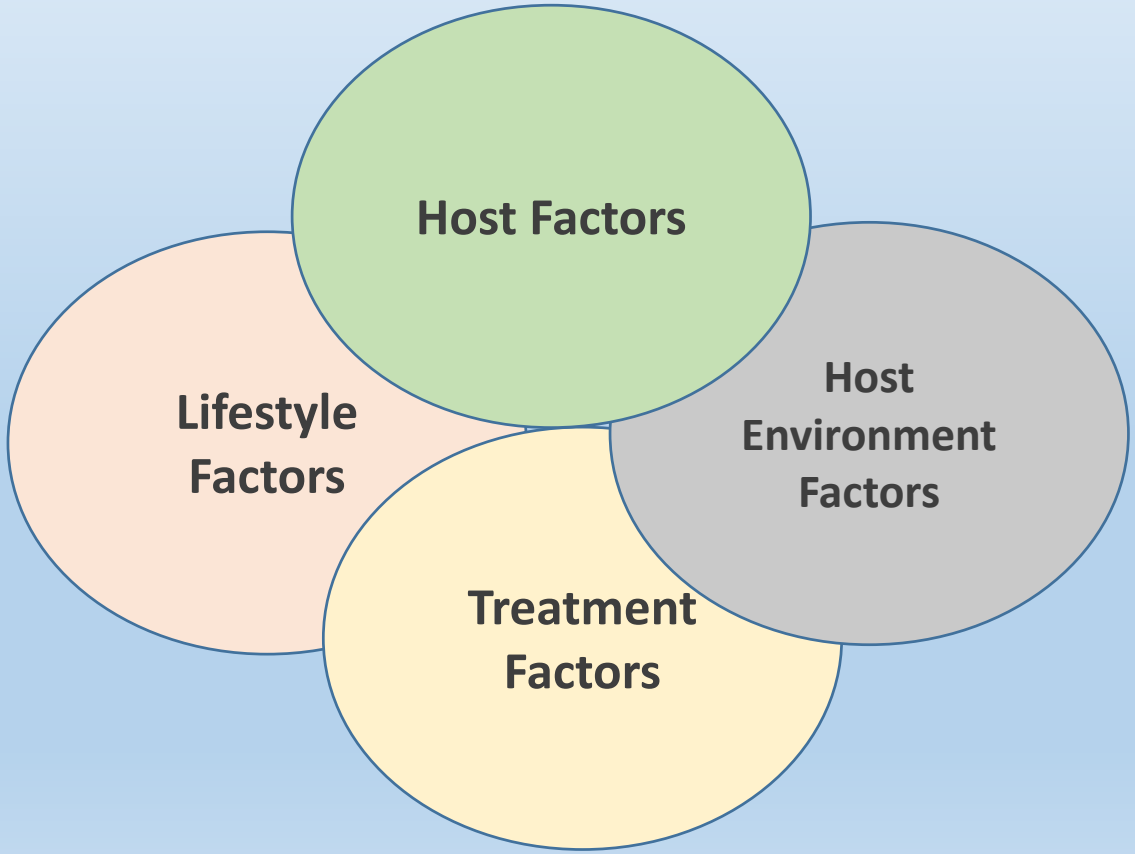
Loo, Williams, and Hernandez. *Cancer Epidemiology*. 2019

Breast cancer research at UH Cancer Center is focused on understanding the factors that influence differences in breast cancer risk and survival in Hawai‘i. Our goal is to decrease risk and improve breast cancer survival in our multiethnic-multicultural community.

Interacting Factors That Affect Breast Cancer Risk and Survival

age, race/ethnicity, genetics, epigenetics, inflammatory response, metabolic state, microbiome

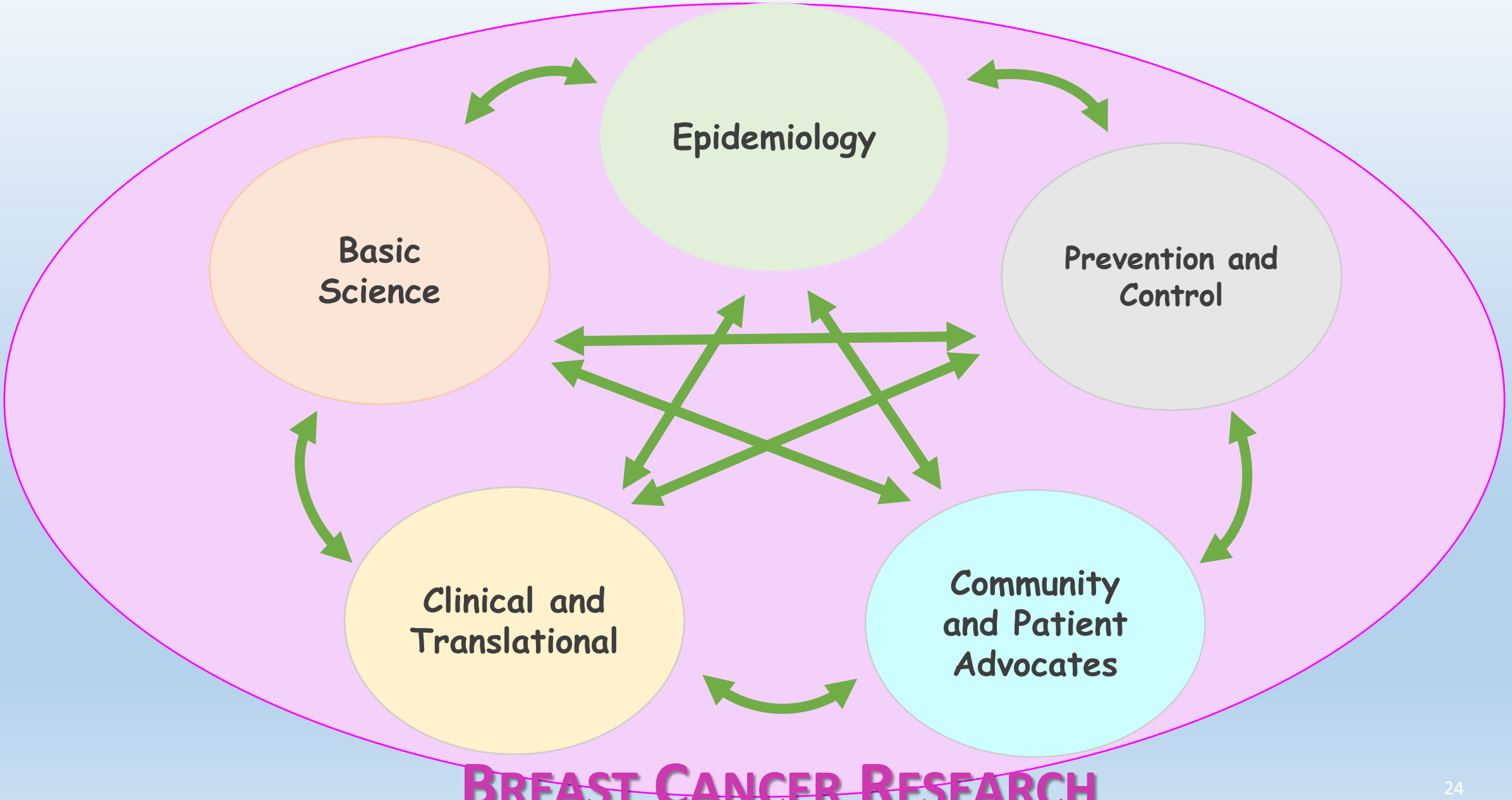
diet, obesity, comorbidities, physical activity, alcohol consumption, smoking, psychosocial state



built environment, access to healthcare, environmental pollutants

tumor biology, stage, NCCN Guidelines

Breast Cancer Research at the University of Hawai'i Cancer Center



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Thank You!