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Improved Survival but Continued Disparities in Cancer: Planning for the Future but Looking through the Rear View Mirror

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Philadelphia, Pennsylvania

116th President National Medical Association

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Disclosures

- None.

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Objectives

- To describe decline in cancer mortality rates
- To describe historical events that impacted cancer outcomes
- To describe impact of Medicare and cancer disparities
- To describe disparities in breast and colorectal cancers and multiple myeloma
- To describe future direction in cancer research

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Declining Cancer Mortality

- **"Know from whence you came. If you know whence you came, there are absolutely no limitations to where you can go."**

James Baldwin

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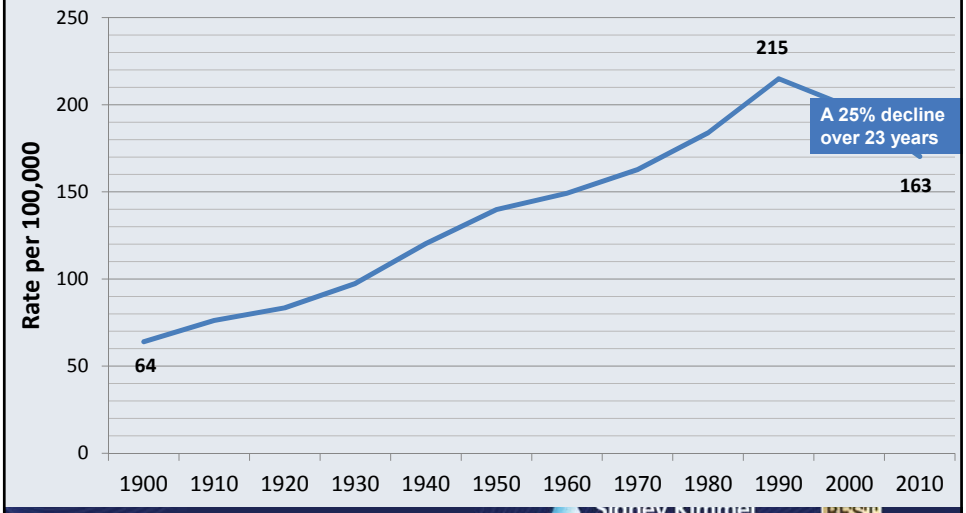
US Cancer Death Rate

1900 to 2014



1900-1970, US Public Health Service, Vital Statistics of the US, Vol. 1 and Vol 2; 1971-2010, US National Center for Health Statistics, Vital Statistics of the U.S

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ACS Cancer Statistics, 2018

- 25% decline in age-adjusted cancer mortality rate over 23 years
- Approximately 2.5 million Americans did not die of cancer

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Why the Decline?

- Prevention (especially tobacco control)
- Wise early detection (especially colon, breast, cervix)
- Improvements in cancer treatment

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Historical Cancer Events and Outcomes

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Jane Cooke Wright, MD

1919 – 2013

- One of seven original founding members of the American Society of Clinical Oncology, the only woman and only African American among the founders.

Jane Cooke Wright, MD

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Disparities in Cancer Outcomes: Medicare

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President Johnson signed July 30, 1965

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Medicare

- U.S. national social health insurance program
- Administered by the U.S. federal government since 1966
  - -Americans aged 65 and older who have worked and paid into the system
  - -Younger people with disabilities
- In 2014, 15.6% of Americans were covered

National Center for Health Statistics, *Health, United States, 2013* (Washington D.C.: U.S. Department of Health and Human Services, May 2014).

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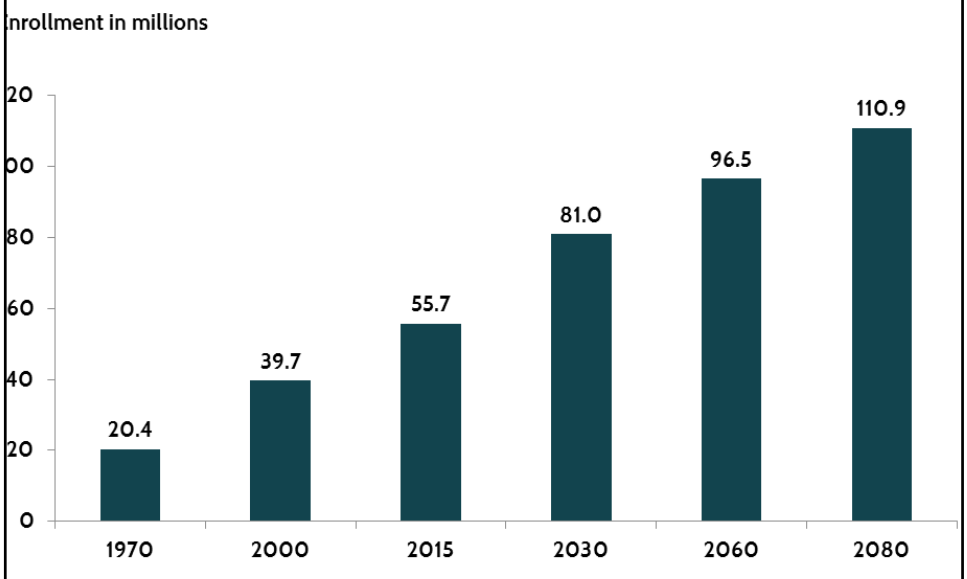
Exhibit 2. Medicare Enrollment, 1970–2080



ource: Centers for Medicare and Medicaid Services, *2013 Annual Report of the Boards of Trustees of the Federal Hospital Insurance and ederal Supplementary Medical Insurance Trust Funds* (Washington, D.C.: CMS, 2013).

Reducing Disparities

- Major force for racial desegregation of health care facilities
- Reduced disparities in access to care by vigorous enforcement of the Civil Rights Act, a condition of hospital participation
- Hospitals integrated their medical staffs, waiting rooms, and hospital floors in less than four months
- Between 1961 and 1968, hospitalization rates for whites age 65 and older rose 38 percent, while rates for blacks 65 and older jumped 61 percent
- Disparities in access to hospital services for people of all ages narrowed, with the difference in hospitalization rates between whites and blacks falling from 30 percent in 1961 to 17 percent by 1968

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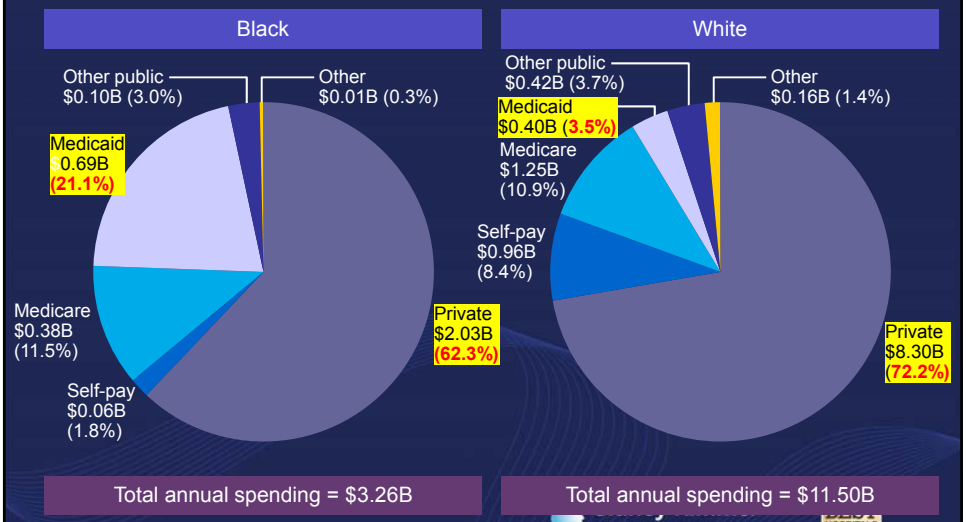
Racial Differences in Cancer:

A Comparison of Black and White Adults in the United States

Robin Hertz, Ph.D
Edith Mitchell, MD, FACP

Annual Direct Medical Spending for Total Cancer Treatment by Race and Payment Source, Age 40-64



Total annual spending = $3.26B

Total annual spending = $11.50B

Source: MEPS 1998–2002 annual average
Direct medical spending adjusted to year 2002 dollars
Note: Percents and spending may not add to totals because of rounding

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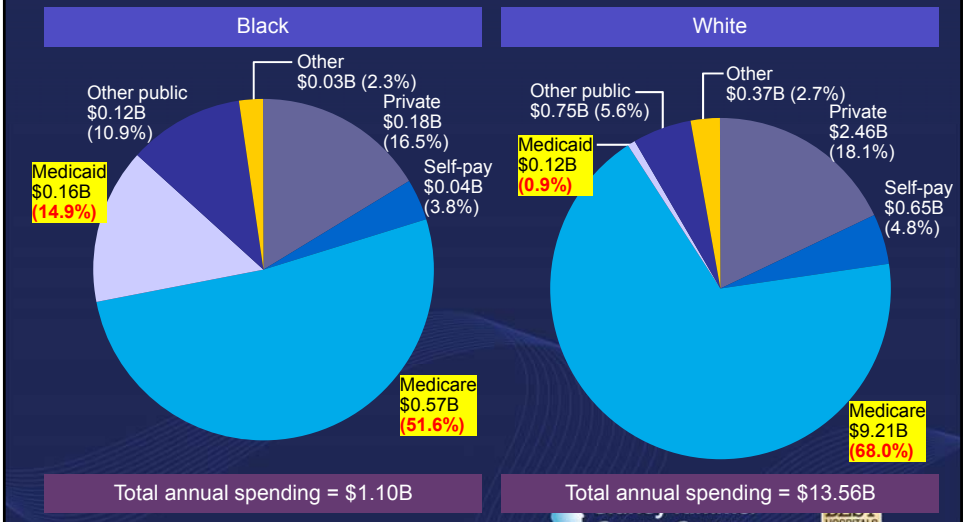
Annual Direct Medical Spending for Total Cancer Treatment by Race and Payment Source, Age 65 and Older



Total annual spending = $1.10B

Total annual spending = $13.56B

Source: MEPS 1998–2002 annual average
Direct medical spending adjusted to year 2002 dollars
Note: Percents and spending may not add to totals because of rounding

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Disparities in Cancer Outcomes

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National Cancer Act, December 23, 1971

- National Cancer Institute
- National Cancer Advisory Board (NCAB)
- National Cancer Centers Program, including training and research programs
- The Cooperative Group Program
- Cancer Control Program
- The Surveillance Epidemiology and End Results (SEER) Program

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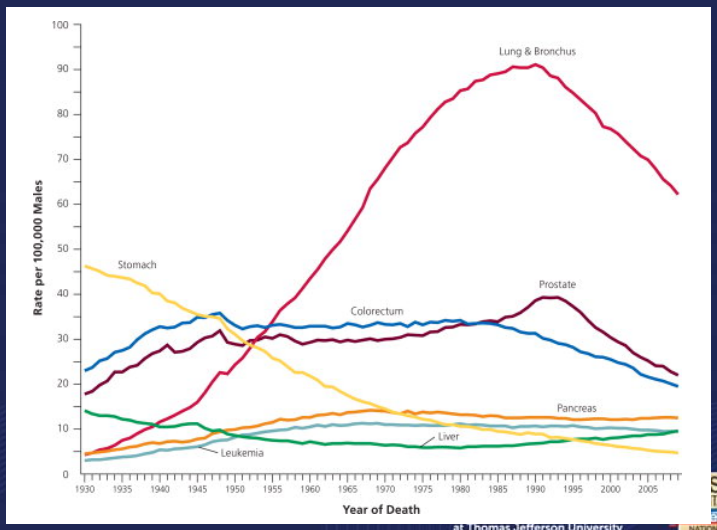
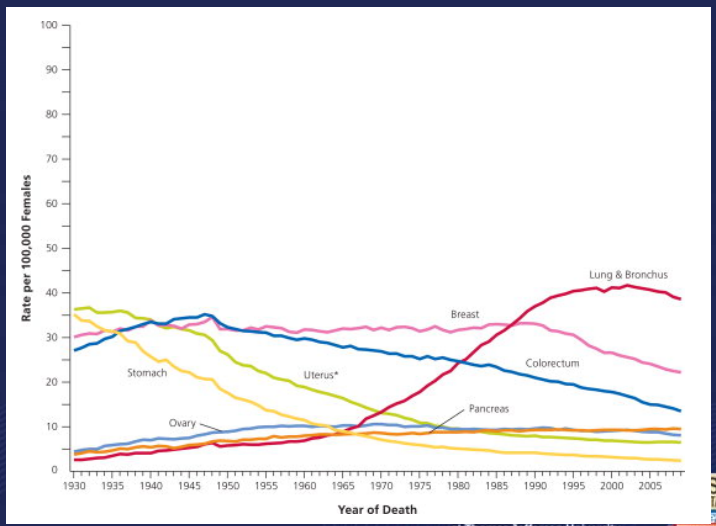
Trends in Death Rates Among Males for Selected Cancers: 1930-2009

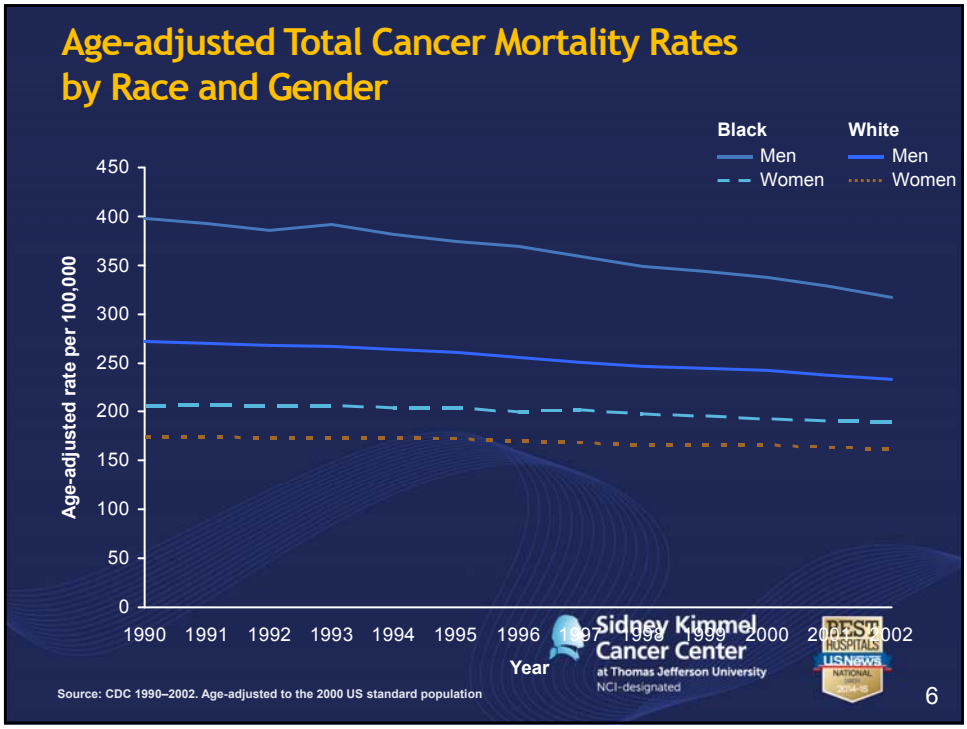


Siegel R, et al. *CA Cancer J Clin*. 2013;63(1):11-30.

Trends in Death Rates Among Females for Selected Cancers: 1930-2009



Siegel R, et al. *CA Cancer J Clin*. 2013;63(1):11-30.


Age-adjusted Total Cancer Mortality Rates by Race and Gender
Black
Men
Women
White
Men
Women
Age-adjusted rate per 100,000
450
400
350
300
250
200
150
100
50
0
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002
Year
Source: CDC 1990–2002. Age-adjusted to the 2000 US standard population
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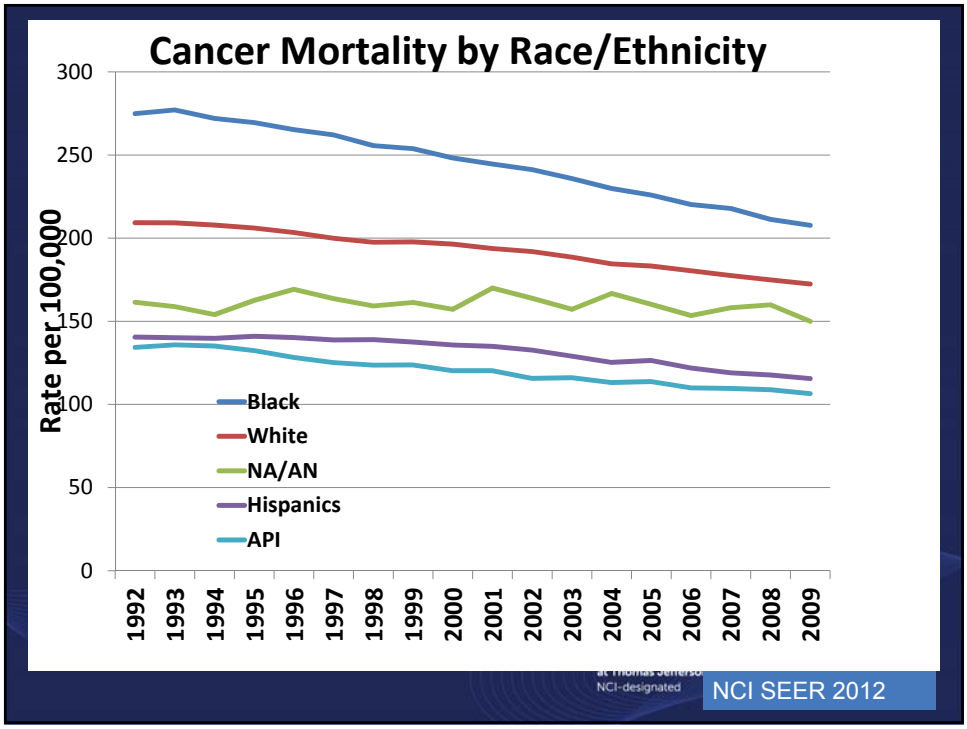
Cancer Mortality by Race/Ethnicity
Rate per 100,000
300
250
200
150
100
50
0
Black
White
NA/AN
Hispanics
API
1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
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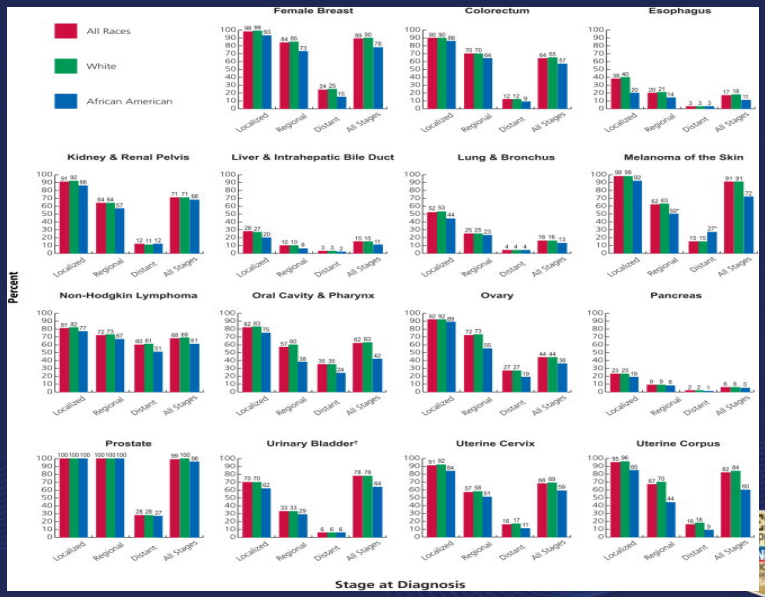
NCI SEER 2012

Five-Year Relative Survival Rates for Selected Cancers by Race and Stage at Diagnosis: 2002-2008



Siegel R, et al. *CA Cancer J Clin.* 2013;63(1):11-30.

The NCI Black/White Study 1987-1999

Documented Black/White Differences:

NCI Surveillance Epidemiology and End Results

- Incidence
  - Pathology
  - Stage at Diagnosis
- Mortality*
- Survival
- Treatment

*Mortality from NCI SEER and CDC funded state registries

Howard J, Hankey BF, Greenberg RS, Austin DF, Correa P, Chen VW, Durako S. A collaborative study of differences in the survival rates of black patients and white patients with cancer. Cancer. 1992;69:2349-2360.

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The NIH Revitalization Act of 1993

"Minorities must be included in Federally sponsored clinical trials."

"In phase III trials, there must be valid subset analysis of the differences among the races."

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Disparities in Health

The National Cancer Institute (NCI) defines "cancer health disparities" as:

Adverse differences in cancer incidence, cancer prevalence, cancer mortality, cancer survivorship, and burden of cancer or related health conditions that exist among specific population groups in the United States.

Translated, "disparities in health" is the concept that some populations (however defined) do worse than others.

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Disparities in Health

- Populations can be defined or categorized by:
  - Gender
  - Race
  - Ethnicity and Culture
  - Area of geographic origin
  - Socioeconomic Status

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Cancer Occurrence by Race/Ethnicity

- **African American men have a 14% higher incidence rate and a 33% higher death rate than white men.**
- **African American women have a 6% lower incidence rate but a 16% higher death rate than white women.**

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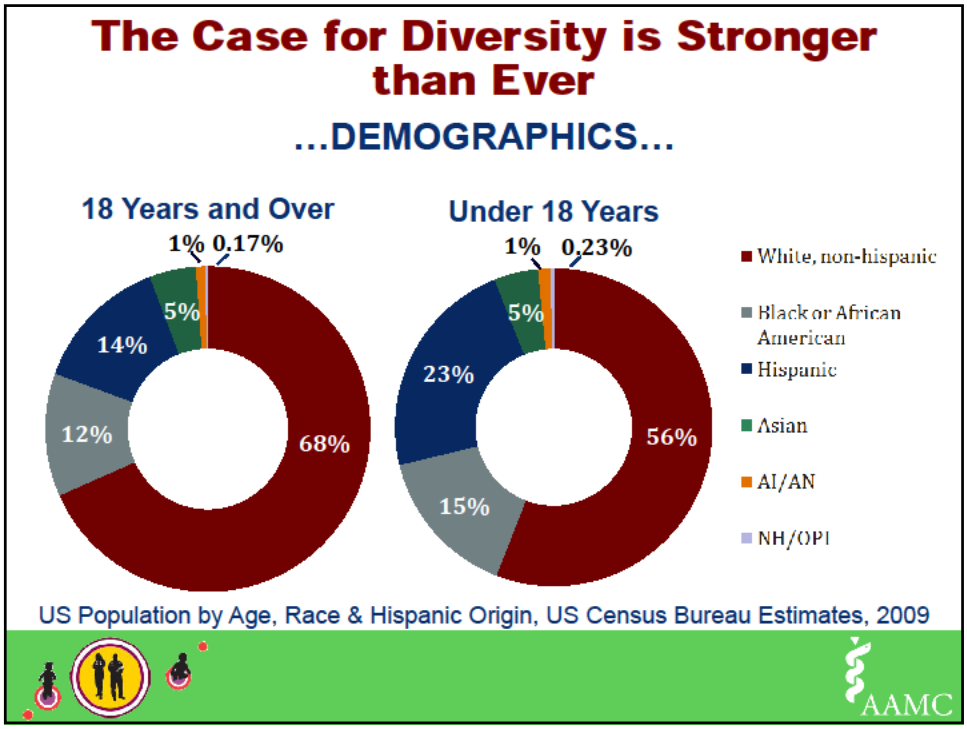
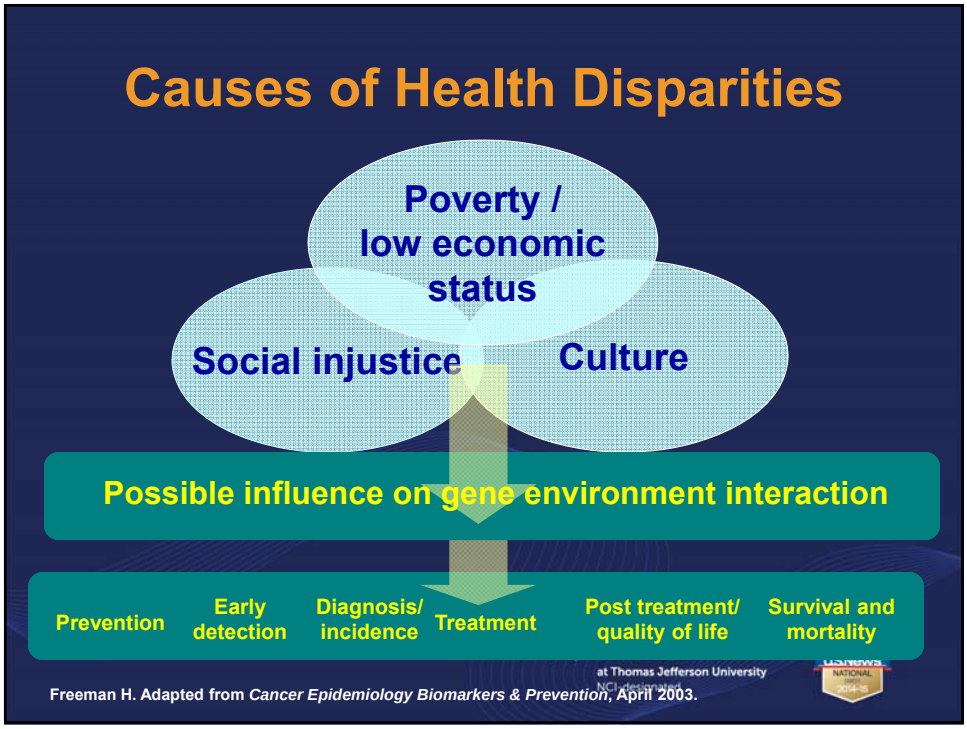
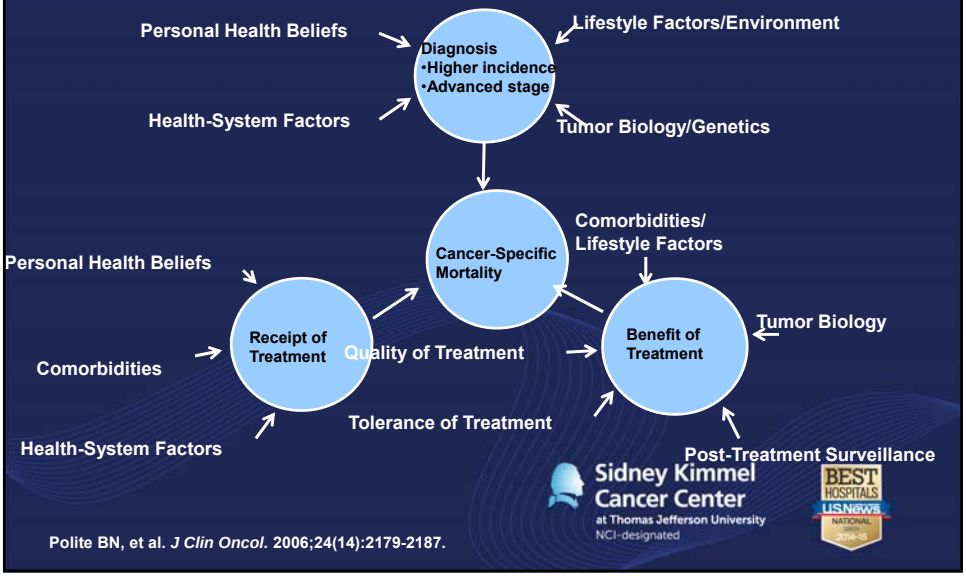
Siegel R, et al. *CA Cancer J Clin.* 2013;63(1):11-30.


The Case for Diversity is Stronger than Ever
...DEMOGRAPHICS...
18 Years and Over
1% 0.17%
5%
14%
12%
68%
Under 18 Years
1% 0.23%
5%
23%
15%
56%
White, non-hispanic
Black or African American
Hispanic
Asian
AI/AN
NH/OPI
US Population by Age, Race & Hispanic Origin, US Census Bureau Estimates, 2009
AAMC


Causes of Health Disparities
Poverty / low economic status
Social injustice
Culture
Possible influence on gene environment interaction
Prevention
Early detection
Diagnosis/ incidence
Treatment
Post treatment/ quality of life
Survival and mortality
at Thomas Jefferson University
Freeman H. Adapted from Cancer Epidemiology Biomarkers & Prevention, April 2003.

Oncology Health Disparities Model



Polite BN, et al. *J Clin Oncol.* 2006;24(14):2179-2187.

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Disparities in Cancer Outcomes: Breast Cancer

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Breast Cancer Burden of African Americans

- *Higher mortality*
- *Advanced stage distribution*
- Until recently, lower lifetime incidence
- Younger age distribution
- Increased frequency of adverse tumor features
- Higher incidence of male breast cancer

- *Socioeconomic Disparities*
- Delivery of care
- Tumor biology
- Genetics
- Lifestyle and reproductive experiences
- Environmental exposures
- Diet/Nutrition

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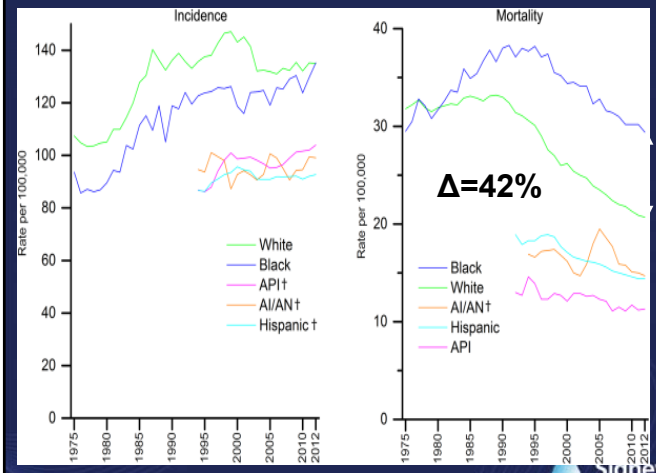
Breast Cancer Statistics, 2015: Convergence of Incidence Rates Between Black and White Women



Systemic therapy advances:

- Endocrine Therapy
- Anti-HER2 therapy
- ↑ Mortality disparity

DeSantis CE, et al. *CA Cancer J Clin.* 2016;66(1):31-42.

Differences in breast carcinoma characteristics in newly diagnosed African-American and Caucasian patients; a single-institution compilation compared with the National Cancer Institute SEER database (Morris et al).

- **Results: More AA pts presented with advanced stage (AS) tumors in both databases, and higher histologic grade (p<0.001) and nuclear grade than C pts (p<0.001).**
- **AA pts had lower ER-positivity (51.9% vs. 63.1%, p<0.001) but significantly higher ki-67 (42.4% vs. 28.7%, p<0.001) and p53 expression (19.4% vs. 13.1%, p<0.05) than C pts with all stages of tumors.**
- **Basal or "triple-negative" breast cancer phenotype was found to be more common in AA pts as compared with C pts (20.8% vs 10.4%, p<0.0001), associated with higher histologic and nuclear grade (p<0.0001).**

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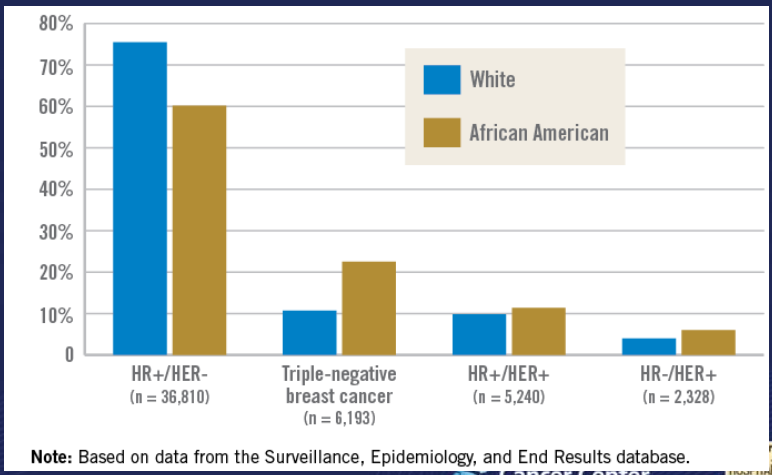
Breast Cancer Stage Distribution By Receptor Status and Race, 2010



Note: Based on data from the Surveillance, Epidemiology, and End Results database.

Howlander N, et al. *J Natl Cancer Inst.* 2014;106(5):dju055.

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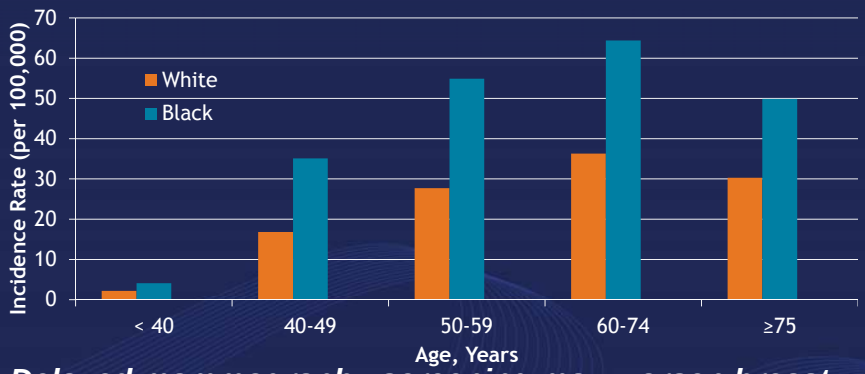
Population-Based Incidence Rates of TNBC By Race/Ethnicity and Age

Implications for Screening Recommendations



Delayed mammography screening may worsen breast cancer outcome disparities between AA and WA women

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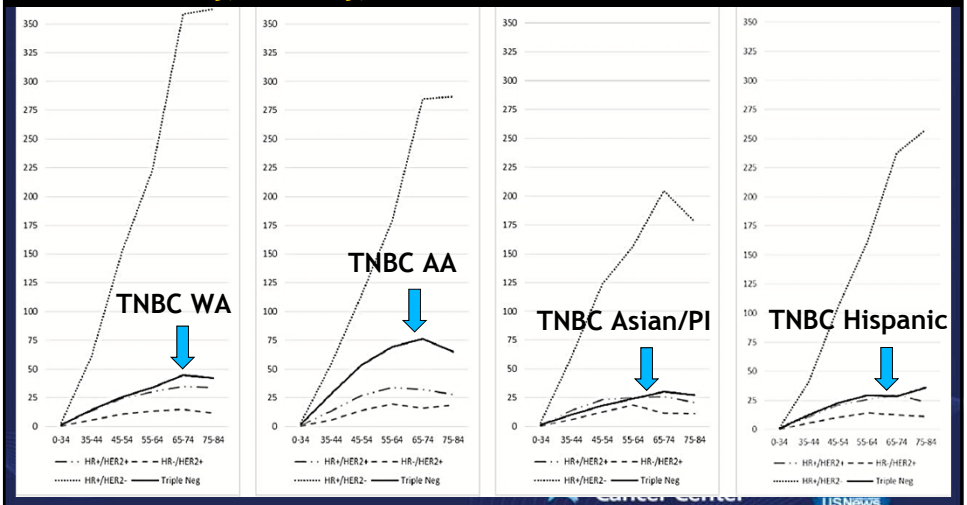
AA, African American; TNBC, triple negative breast cancer; WA, white American

Amirikia KC, Mills P, Bush J, Newman LA. *Cancer.* 2011;117(12):2747-2753.

Annual Report to the Nation on the Status of Cancer, 1975-2011, Featuring Incidence of Breast Cancer Subtypes by Race/Ethnicity, Poverty, and State



PI, Pacific Islander

Kohler BA, et al. *J Natl Cancer Inst.* 2015;107(6):djv048.

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Disparities in Cancer Outcomes: Colorectal Cancer

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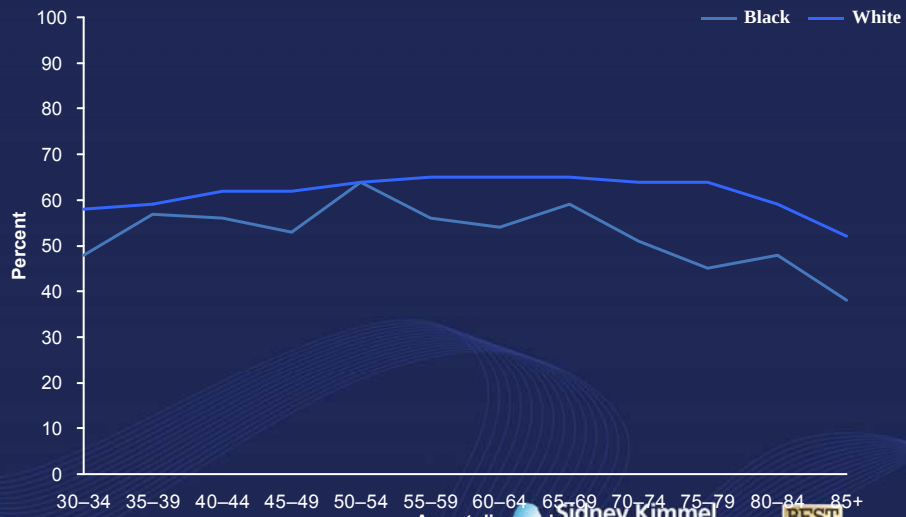
Five-year Relative Survival in Men With Colon and Rectum Cancer by Race and Age



Source: SEER 1992–2001
Note: Graphs may not begin at age 20 due to sample size limitations

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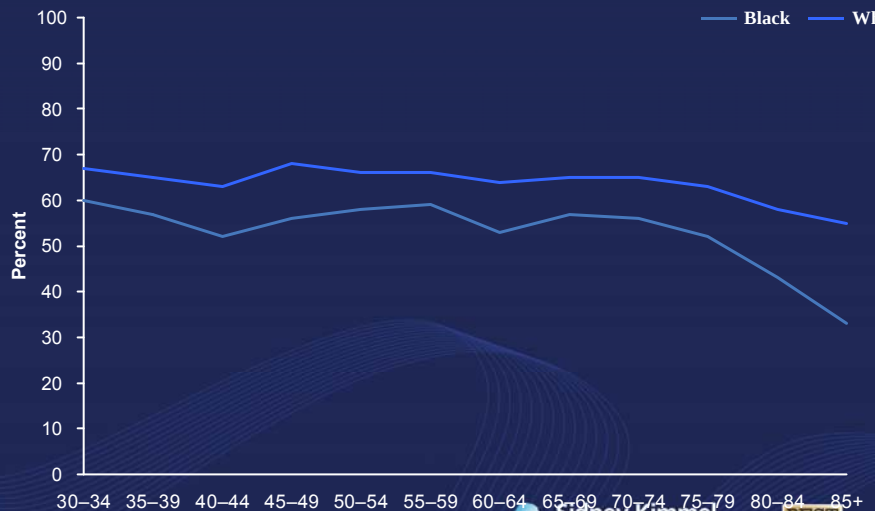
Five-year Relative Survival in Women With Colon and Rectum Cancer by Race and Age



Source: SEER 1992–2001
Note: Graphs may not begin at age 20 due to sample size limitations

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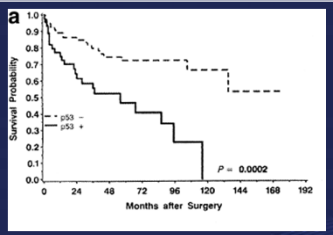
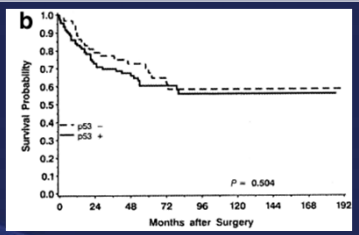
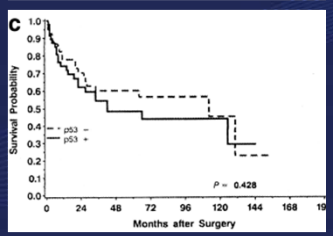
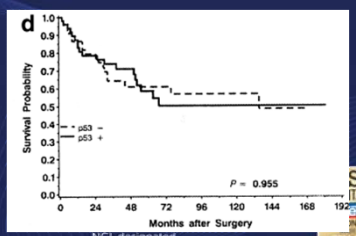
Molecular Phenotypes of Aggressive Subtypes of Colorectal Cancer

CRCs in Caucasian		CRCs in African-American	
Proximal	Distal	Proximal	Distal
$p53^{nac}$, + MUC-1 – Bcl-2^{-}, – $p27^{kip-1}$	+ MUC-1, – Bcl-2– $p27^{kip-1}$	– Bcl-2 (weak)	– Bcl-2









Grizzle WE, et al. Int J Cancer. 2002;97(4):403-409.

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Outcomes Among Black Patients With Stage II and III Colon Cancer

Black patients were:

- Younger than whites (58 vs 61 years)
- More likely to be female (55% vs 45 %; *P* = .001)
- Worse overall survival (HR + 1.22)
- Five-year OS for blacks and whites 68% vs 72.8%
- Worse recurrence-free survival (HR 1.14, *P* + .0045)

Conclusion: Black patients with resected stage II and stage III colon cancer who were treated with the same therapy as white patients experienced worse overall and recurrence-free survival, but similar recurrence-free interval, compared with white patients.

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Yothers et al. J Natl Cancer Inst 2011;103:1498-1506

American College of Gastroenterology 2009

- Screening is recommended in African Americans beginning at age 45 years
- CT colonography every 5 years replaces double contrast barium enema, when patients decline colonoscopy
- Fecal immunochemical testing replaces older guaiac-based fecal occult blood testing
  - Annual Hemoccult Sensa and fecal DNA testing every 3 years are alternative cancer detection tests
- A family history of only small tubular adenomas in first-degree relatives is not considered to increase the risk of CRC
- Individuals with a single first-degree relative with CRC or advanced adenomas diagnosed at age ≥60 years can be screened like average-risk persons

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Rex DK, et al. Am J Gastroenterol. 2009;104(3):739-750.

Vitamin D and Racial Disparity in Death From Colorectal Cancer

- Methods: Serum 25(OH)D levels using NHANES III data
- Results: Black race (HR, 2.04), no insurance, and a history of CRC, and vitamin D deficiency were statistically significant
- Conclusion: Vitamin D deficiency contributes to excess African American mortality from CRC.

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Fiscella et al. Cancer 2011;117:1061-9

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Disparities in Cancer Outcomes:Multiple Myeloma

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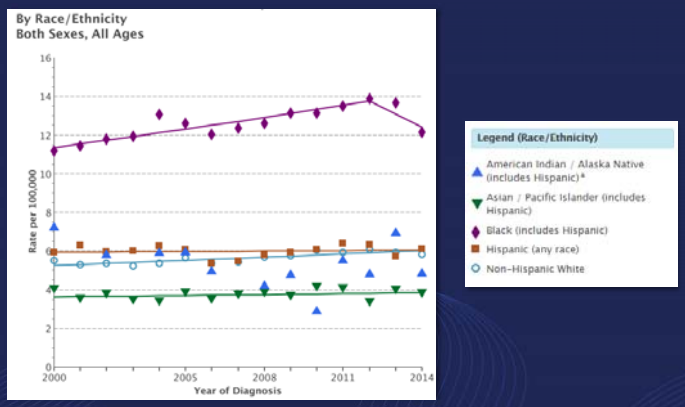
Multiple Myeloma: Trends in SEER Incidence Rates 2000-2014



Data Source: SEER 18 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana, New Jersey and Georgia excluding ATL/RG).

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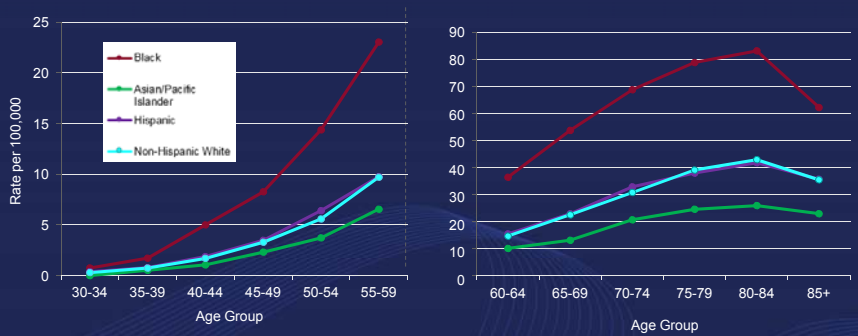
Multiple Myeloma Incidence: By Age Group and Race/Ethnicity



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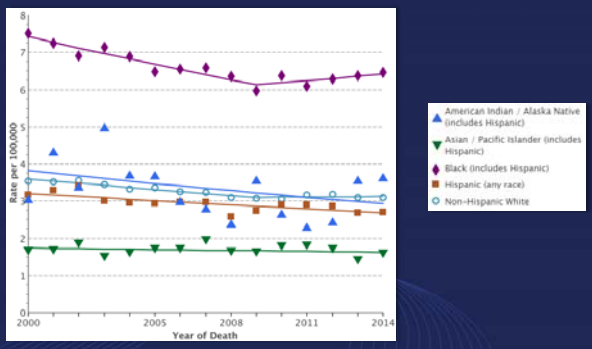
Multiple Myeloma: Mortality Rates 2000-2014



Data Source: US Mortality Files, National Center for Health Statistics, CDC.

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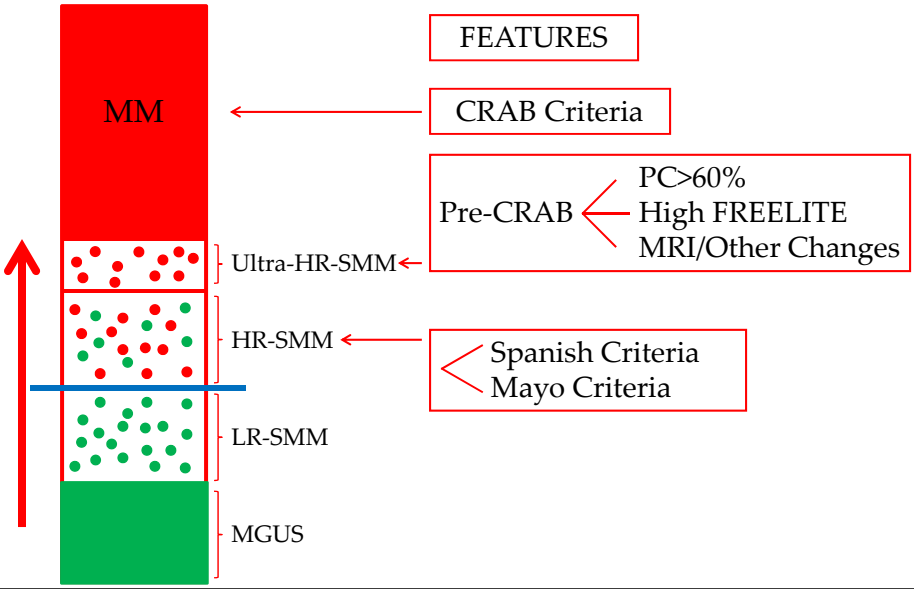
DEFINITIONS OF MYELOMA AND EARLY MYELOMA



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Disparities in Cancer Outcomes: 2016 Cures Act and the Future

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The Precision Medicine Initiative (PMI)

A federal effort launched in 2015

MISSION: To enable a new era of medicine through research, technology, and policies that empower patients, researchers, and providers to work together toward development of individualized care

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NCI-Molecular Analysis for Therapy Choice (NCI-MATCH / EAY131)

Overview

A phase II precision medicine cancer trial

Co-developed by the ECOG-ACRIN Cancer Research Group and the National Cancer Institute

NCI·CC

Version Date: 10/13/2017

NCI-MATCH Objective

- To determine whether matching certain drugs or drug combinations in adults whose tumors have specific gene abnormalities will effectively treat their cancer, regardless of the cancer type
- A signal-finding trial
- Treatments that show promise can advance to larger, more definitive trials

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All of Us Mission and Objectives

Nurture relationships
with one million or more participant partners, from all walks of life, for decades

Our mission
To accelerate health research and medical breakthroughs, enabling individualized prevention, treatment, and care for all of us

Deliver the largest, richest biomedical dataset ever
that is easy, safe, and free to access

Catalyze a robust ecosystem
of researchers and funders hungry to use and support it

All of Us RESEARCH PROGRAM | The Precision Medicine Initiative

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Early Onset Malignancy Initiative

Cancer sites	Age cut offs	Populations
Breast	≤ 45	Black
Colorectal	≤ 45	Caucasian
Liver	≤ 55	Hispanic
Multiple Myeloma	≤ 50	Native American
Prostate	≤ 55	
Renal	≤50	

- A collaboration between the Center for Cancer Genomics (CCG), the Center for Research Strategy (CRS), and the Division of Cancer Prevention's NCI Community Oncology Research Program (NCORP)

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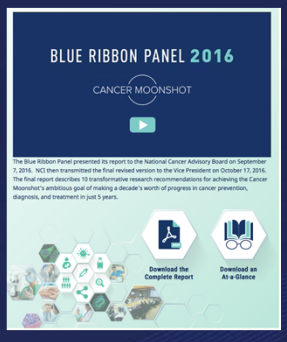
President Obama State of the Union Address January 12, 2016

- The goal of the Cancer Moonshot is to make a decade's worth of progress in five years in the prevention, diagnosis, and treatment of cancer
- "I'm putting Joe in charge of Mission Control"
  President Obama

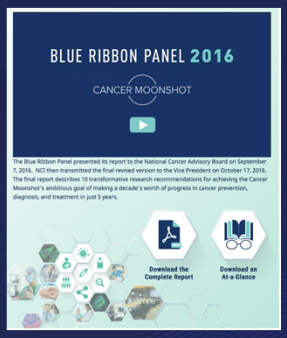
Blue Ribbon Panel Goals



available at:
cancer.gov/brp

- Identify major scientific opportunities poised for acceleration by additional emphasis and funding
- Develop ~10 recommendations to be pursued through the Cancer Moonshot

Blue Ribbon Panel Recommendations



available at:
cancer.gov/brp

A. Network for direct patient engagement
B. Cancer immunotherapy translational science network
C. Therapeutic target identification to overcome drug resistance
D. Creation of a national cancer data ecosystem
E. Fusion oncoproteins in pediatric cancer
F. Symptom management research
G. Precision prevention and early detection
H. Retrospective analysis of biospecimens from patients treated with standard of care
I. Creation of human tumor atlas
J. Development of new enabling technologies

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Future Directions

- Increase minority provider and patient participation in clinical trials
- Engage patients and communities to participate in strategies
- Design and implement cancer prevention trials applicable to specific populations
- Create a climate that enhances accrual and retention of minority participation
- Expand opportunities for access and participation to underserved populations
- Define and understand possible biological and molecular differences
- Enhance cultural competence
- Expand collaborations with healthcare providers in underserved populations
- Apply existing cancer control measures
- Institute standard guidelines for diagnosis and treatment
- Maximize supportive care and hospice use

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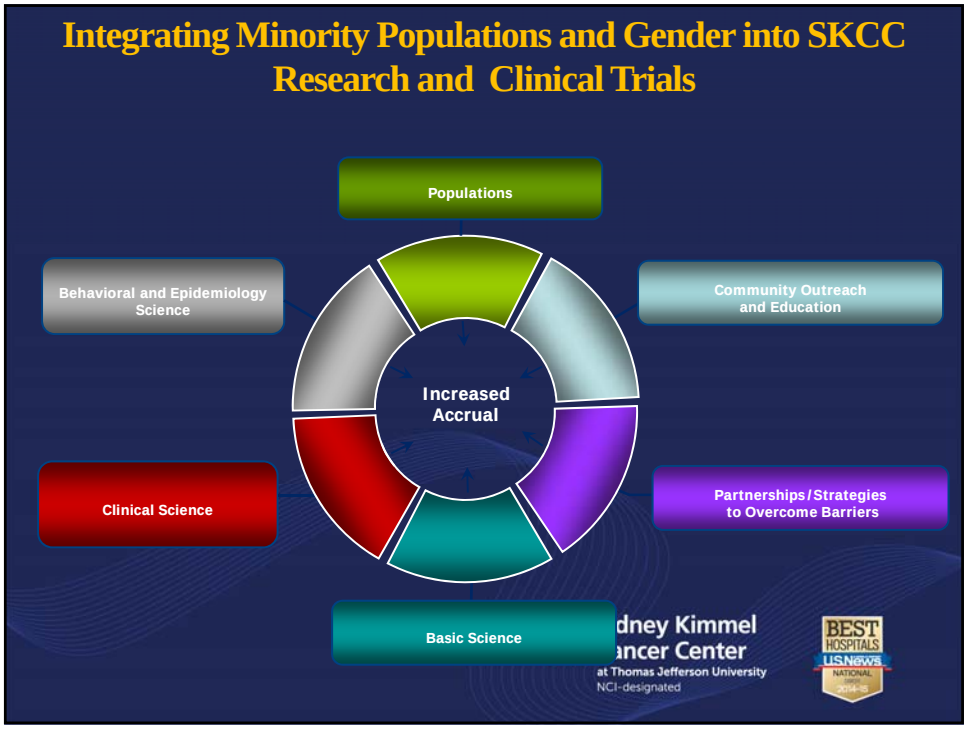
Integrating Minority Populations and Gender into SKCC Research and Clinical Trials
Populations
Behavioral and Epidemiology Science
Community Outreach and Education
Increased Accrual
Clinical Science
Partnerships/Strategies to Overcome Barriers
Basic Science
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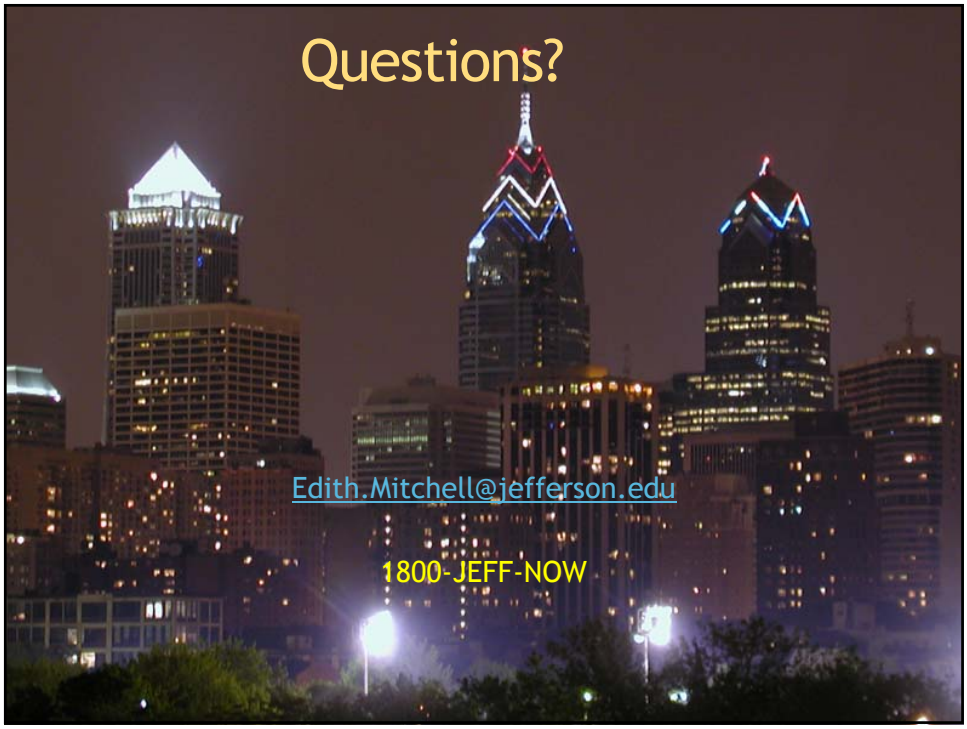
Questions?
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