National Cancer Institute

Annual Report to the Nation
2009

Clinical Trials &
Translational Research
Advisory Committee

March 10, 2010

Brenda K. Edwards

Surveillance Research Program
NCI

Monitoring the Impact of Cancer & Progress to Reduce Cancer

- **Important for ongoing surveillance**
  - **All sites, common or rare**
  - **All populations, by age, sex, race & ethnicity, geography**

- **Identifying unusual patterns**
  - **Rapid changes in incidence**
    - **Relevance to etiology**
    - **Relevance to public health**
      - Planning
      - Evaluating the impact of public health interventions

Annual Report to the Nation on the Status of Cancer

- **Coordinated & shared responsibility since 1998**
  - **National Cancer Institute**
  - **Centers for Disease Control & Prevention**
  - **American Cancer Society**
  - **North American Association for Central Cancer Registries**
- **Latest data on cancer incidence & mortality**
- **Requires data linkages, methods development**
- **Special feature:**
  - **Tobacco control & lung cancer**
  - **American Indian & Alaska Natives; Hispanics**
  - **Treatment patterns**
  - **Cancer control**
  - **Survival**
  - **Cancer and aging population**
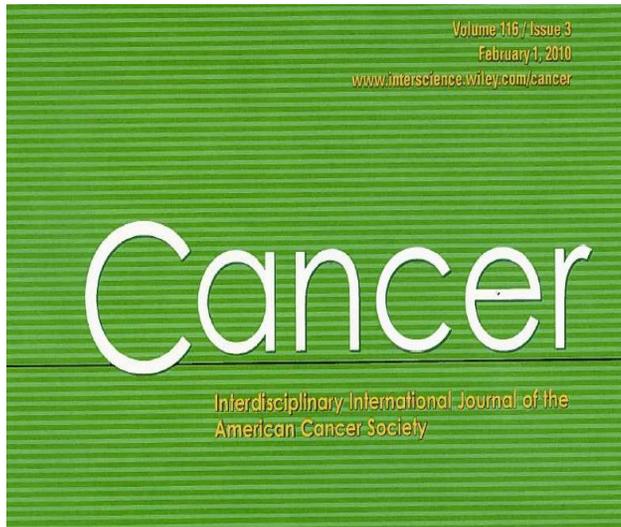
Commentary

Annual Report to the Nation on the Status Of Cancer, 1975-2006, Featuring Colorectal Cancer Trends and Impact of Interventions (Risk Factors, Screening, and Treatment) to Reduce Future Rates

Brenda K. Edwards, PhD[1];Elizabeth Ward, PhD[2];Betsy A. Kohler, MPH, CTR[3];Christie Eheman, PhD[4]; Ann G. Zauber, PhD[5];Robert N. Anderson, PhD[6];Ahmedin Jemal, DVM, PhD[2]; Maria J. Schymura, PhD[3,7];Iris Lansdorp-Vogelaar, MS, PhD[8];Laura C. Seeff, MD[4]; Marjolein van Ballegooijen, MD, PhD[8];S. Luuk Goede, MSc[8];and Lynn A. G. Ries, MS[1]

Rates of new diagnoses and rates of death from all cancers combined declined significantly in the most recent time period for men and women overall and for most racial & ethnic US populations

➢ **Incidence: - 0.7 % per year from 1999-2006**
➢ **Deaths: - 1.6% per year from 2001-2006**

U.S. Cancer Burden
2009 Estimates

Based on data from NAACCR 1995-2005 & CDC NCHS 1969-2006;   NCI statistical models

1,479,350 Cases

- 219,440 Lung
- 192,370 Breast (female)
- 192,280 Prostate
- 146,970 Colon/rectum
- 70,980 Bladder
- 65,980 NHL
- 68,720 Melanomas
- 57,760 Kidney
- 44,790 Leukemia
- 42,470 Pancreas
- 42,160 Corpus uteri
- 37,200 Thyroid

562,340 Deaths

- 159,390 Lung
- 49,920 Colon/rectum
- 40,170 Breast (female)
- 35,240 Pancreas
- 27,360 Prostate
- 21,870 Leukemia
- 19,500 NHL
- 18,160 Liver & IHBD
- 14,600 Ovary
- 14,530 Esophagus
- 14,330 Bladder
- 12,920 Brain

Death Rates Decline for Many Cancers

- **For men 10 of 15 major sites declined**

  - **Lung**
  - **Prostate**
  - **Colon & Rectum**
  - **Leukemia**
  - **NHL**
  - **Kidney**
  - **Stomach**
  - **Brain & CNS**
  - **Myeloma**
  - **Oral Cavity & Pharynx**

- **For women 10 of 15 major sites declined**

  - **Breast**
  - **Colon & Rectum**
  - **Ovary**
  - **NHL**
  - **Leukemia**
  - **Brain & CNS**
  - **Myeloma**
  - **Stomach**
  - **Kidney**
  - **Bladder**

Declines based on most recent trend in joinpoint analyses for 1975-2006

Rates are age-adjusted to the 2000 U.S. standard million population. Sources: Mortality data – CDC NCHS NVSS

United States improved coverage for population-based cancer incidence

NAACCR 2002-2006
86%

2006

NAACCR 1997-2006
71%

2000

1995

SEER 1975- 2006
10%

SEER 9: 1975-2006 (9.4%)
SEER 13: 1992-2006 (14%)
SEER 17: 2000-2006 (26%)
NAACCR: 2002-2006 (86%)
USCS: 2005 (01/08) (100%)

7

Top 15 Cancer Sites for Men and Women

| Cancer Type	Men: New Cases	Men: Deaths	Women: New Cases	Women: Deaths	Both Sexes: New Cases	Both Sexes: Deaths
Bladder	-0.4%	-0.2%	-0.6%	-0.8%	-0.4%	-0.1%
Brain	-0.7%	-1.1%	-0.2%	-1.4%	-0.4%	-1.2%
Breast	--	--	-1.8%	-1.9%	-1.9%	-2.1%
Cervix	--	--	-3.3%	-3.0%	--	--
Colon/rectum	-2.9%	-2.8%	-2.1%	-2.7%	-2.4%	-2.7%
Esophagus	-0.5%	+0.4%	--	--	--	+0.3%
Kidney	+1.8%	-0.6%	+2.8%	-0.6%	+2.3%	-0.5%
Leukemia	-1.4%	-0.8%	-0.5%	-1.2%	-0.9%	-0.9%
Liver	+2.4%	+2.1%	--	+1.3%	--	+2.0%
Lung	-2.3%	-2.0%	-0.6%	-0.1%	-1.5%	-1.1%
Melanoma	+1.7%	+0.2%	+1.6%	--	+1.6%	--
Myeloma	-0.8%	-1.1%	--	-1.5%	--	-1.2%
Non-Hodgkin Lymphoma	-0.1%	-3.0%	+0.4%	-3.5%	+0.1%	-3.2%
Oral	-1.7%	-1.8%	-1.4%	--	-1.5%	--
Ovary	--	--	-1.6%	-0.3%	-1.8%	-0.5%
Pancreas	+0.3%	+0.1%	+0.6%	+0.4%	+0.5%	+0.3%
Prostate	-1.6%	-4.0%	--	--	-1.2%	-3.4%
Stomach	-2.1%	-3.7%	--	-2.8%	-1.7%	-3.2%
Thyroid	--	--	+6.2%	--	+5.9%	--
Uterus	--	--	-0.8%	+0.3%	-1.0%	--

All Cancers, SEER Incidence and US Death Rates
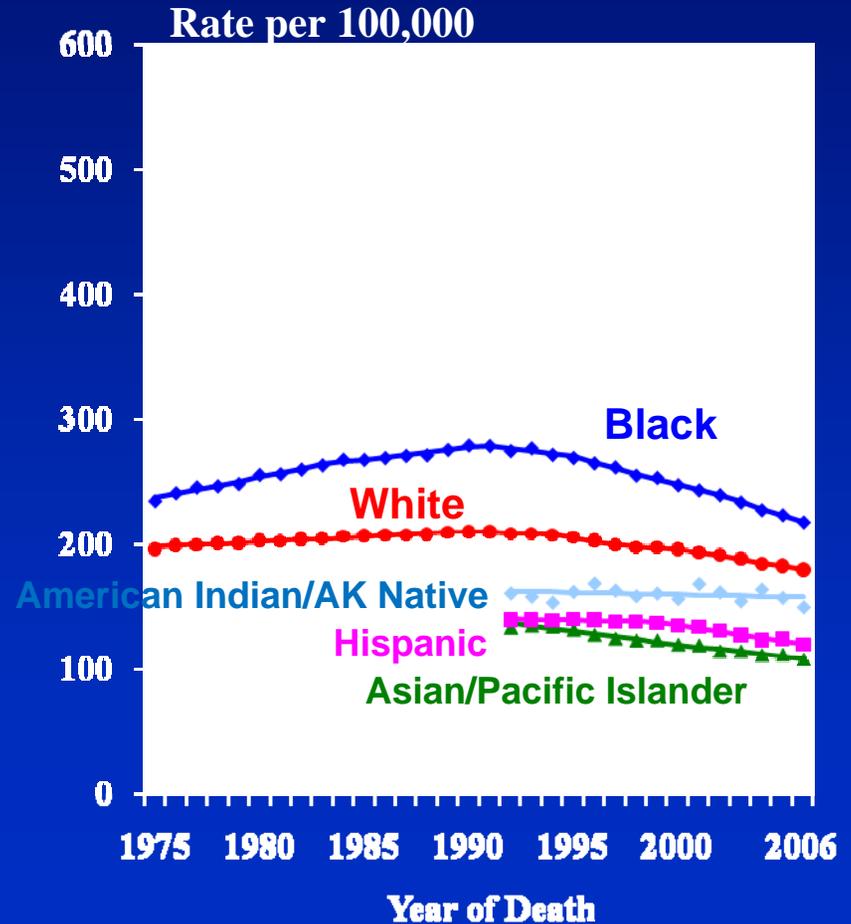## Joinpoint Analyses for Whites & Blacks 1975-2006
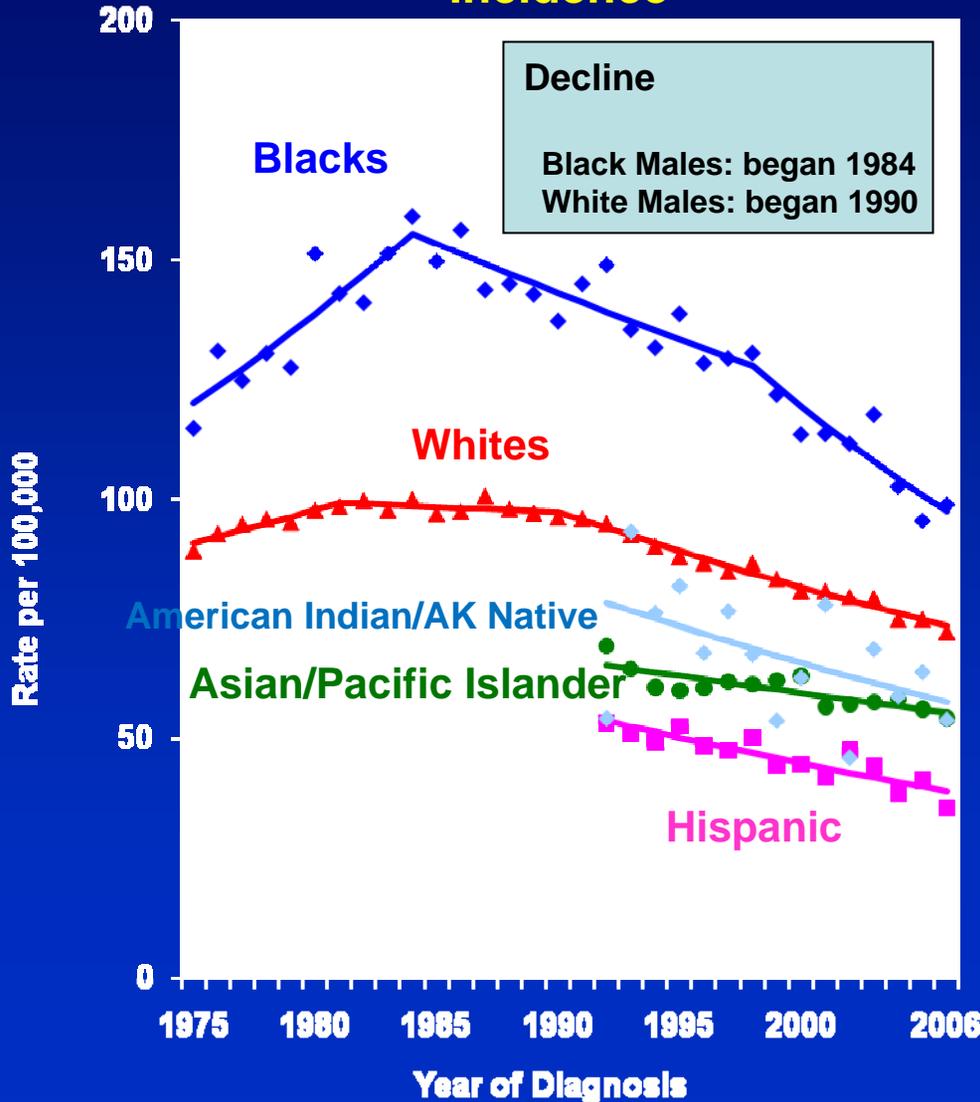## Asian/Pacific Islanders, American Indians/Alaska Natives & Hispanics 1992-2006
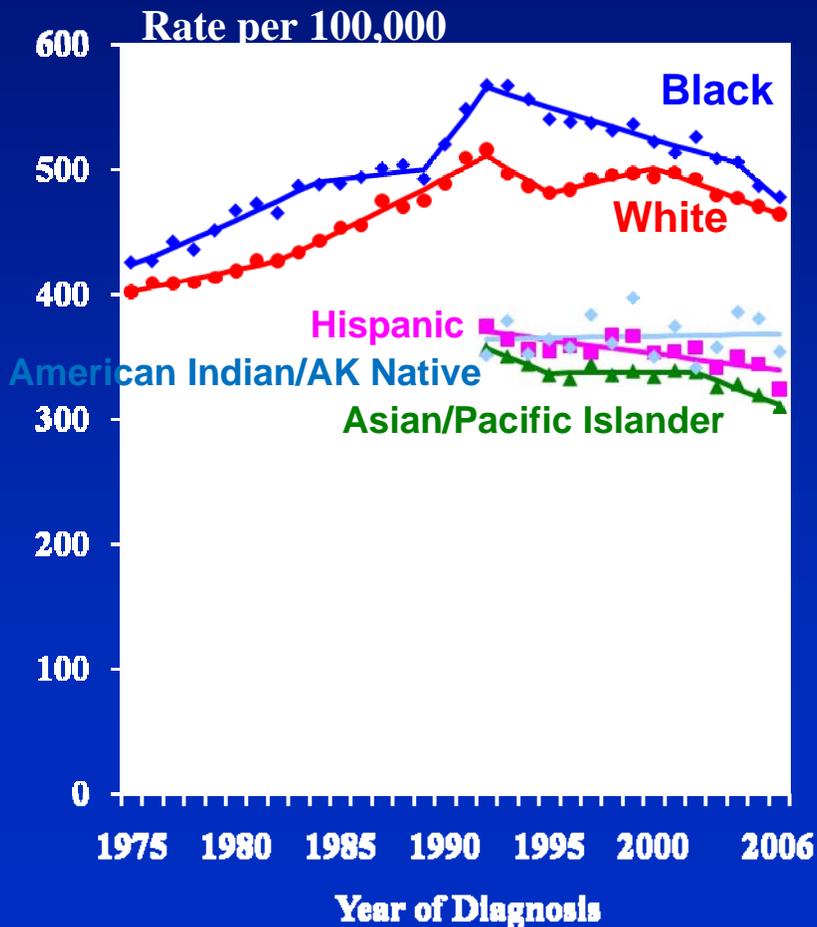
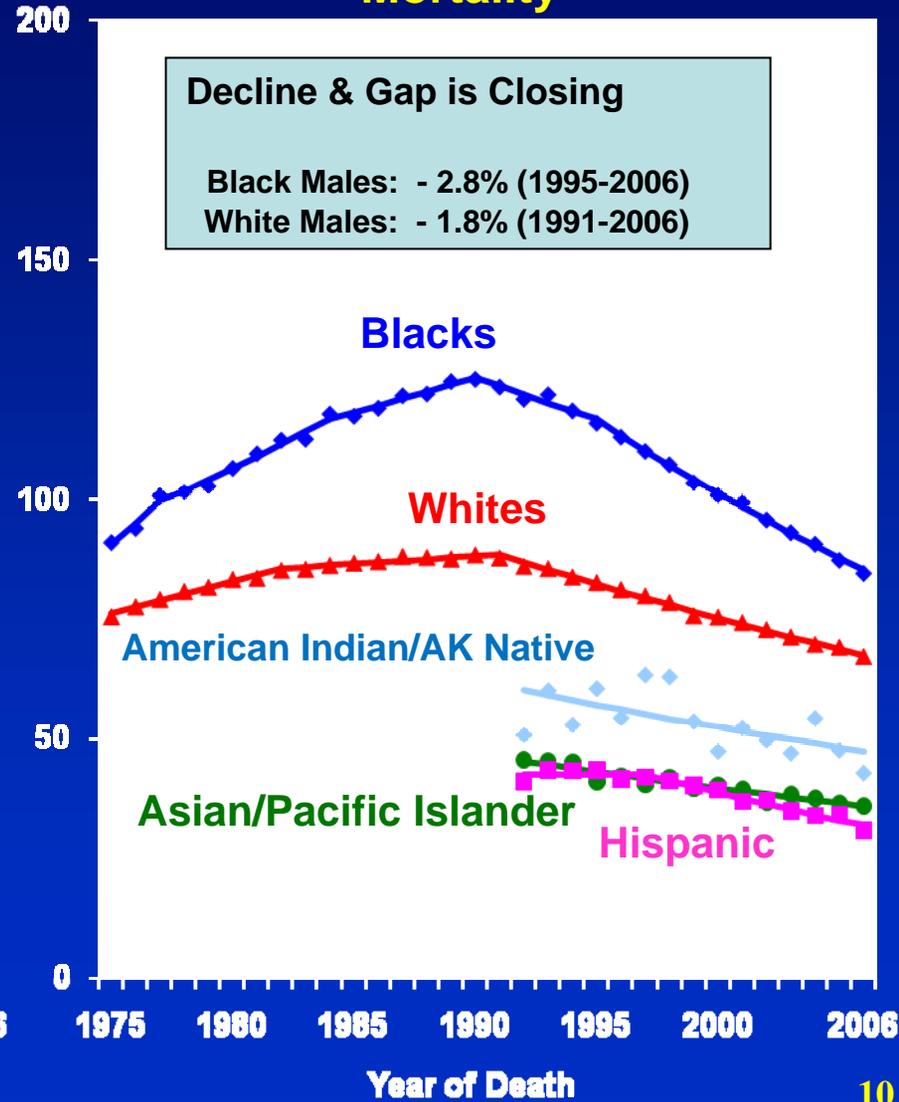Rates are age-adjusted to the 2000 U.S. standard million population. Sources: Incidence data – NCI SEER Program; Mortality data – CDC NCHS NVSS

Male Lung & Bronchus Cancer
SEER Incidence (delay adjusted) & US Death Rates
1975-2006

Incidence

Decline

Black Males: began 1984
White Males: began 1990

Blacks
Whites
American Indian/AK Native
Asian/Pacific Islander
Hispanic

Rate per 100,000

Year of Diagnosis

Mortality

Decline & Gap is Closing

Black Males: - 2.8% (1995-2006)
White Males: - 1.8% (1991-2006)

Blacks
Whites
American Indian/AK Native
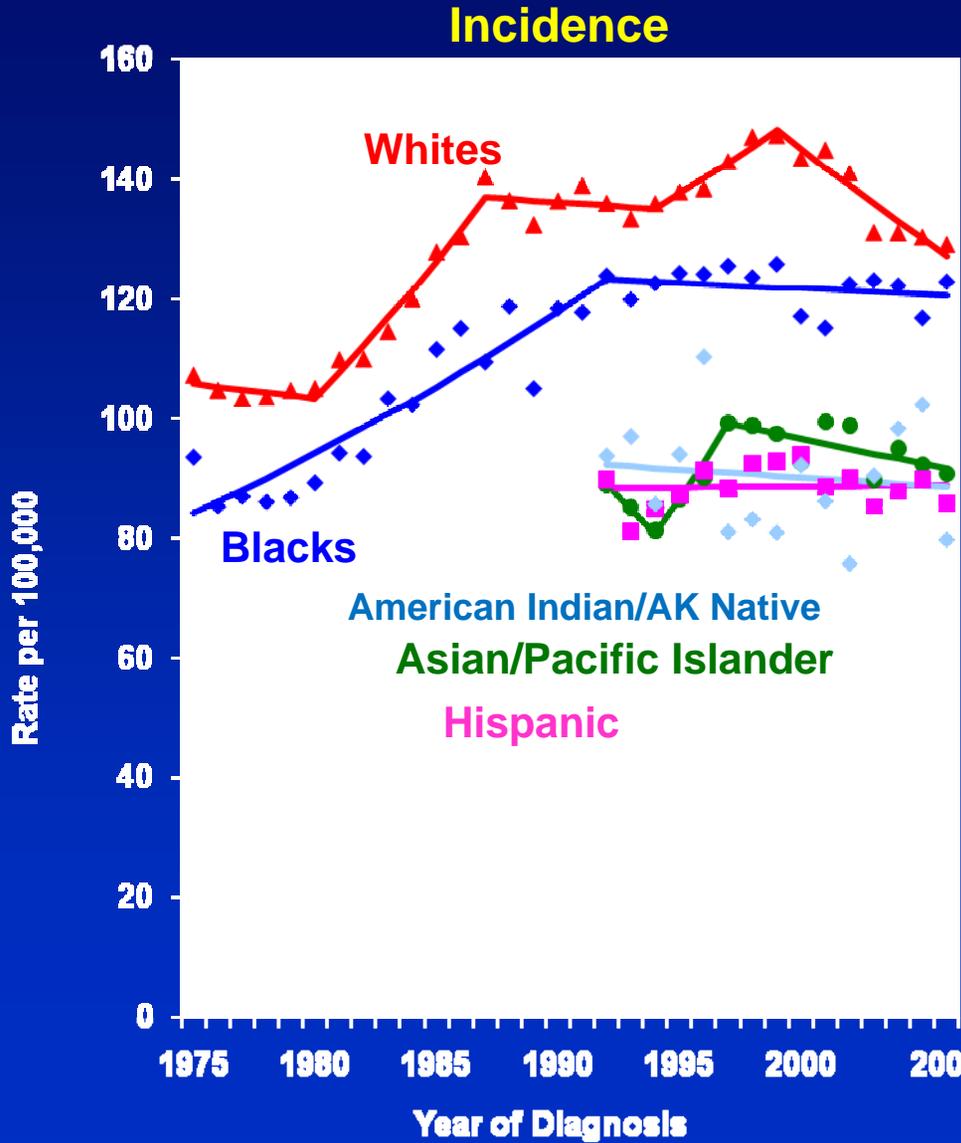Asian/Pacific Islander
Hispanic

Year of Death

10

Female Lung & Bronchus Cancer
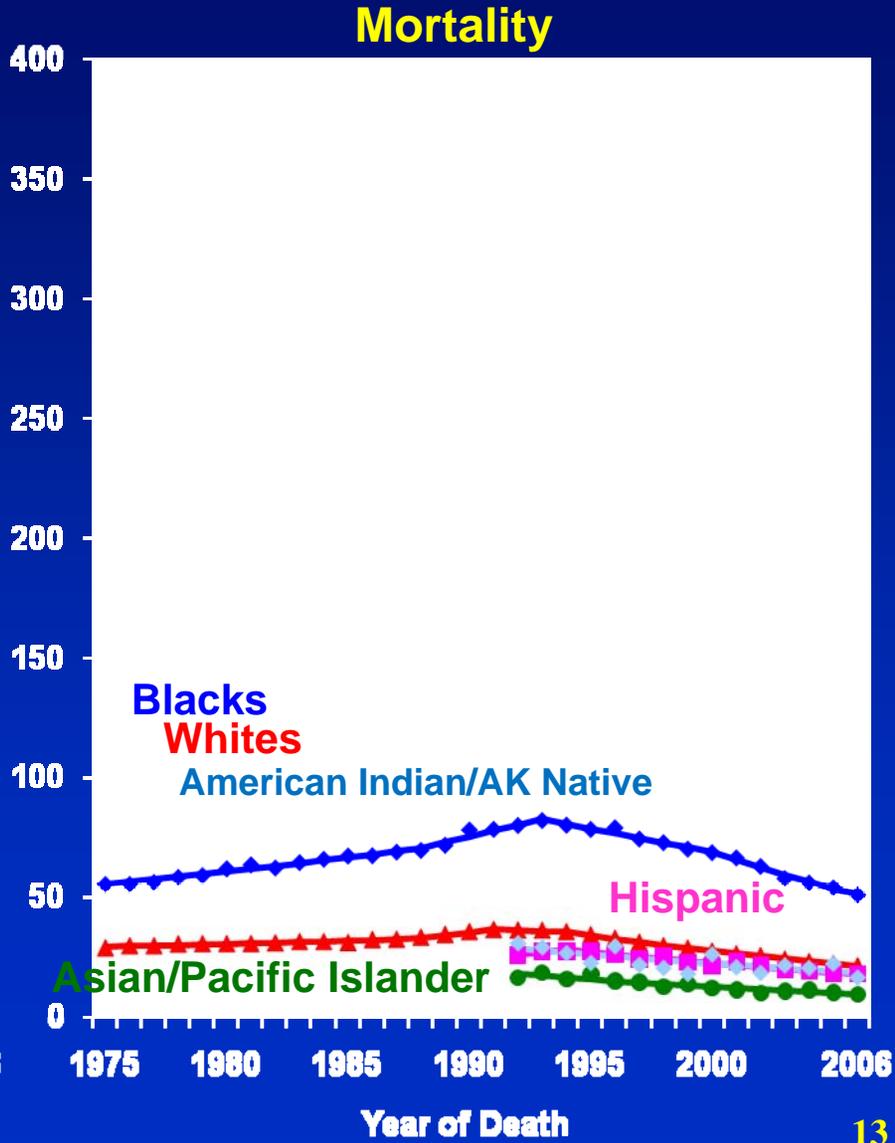## SEER Incidence (delay adjusted) & US Death Rates
1975-2006
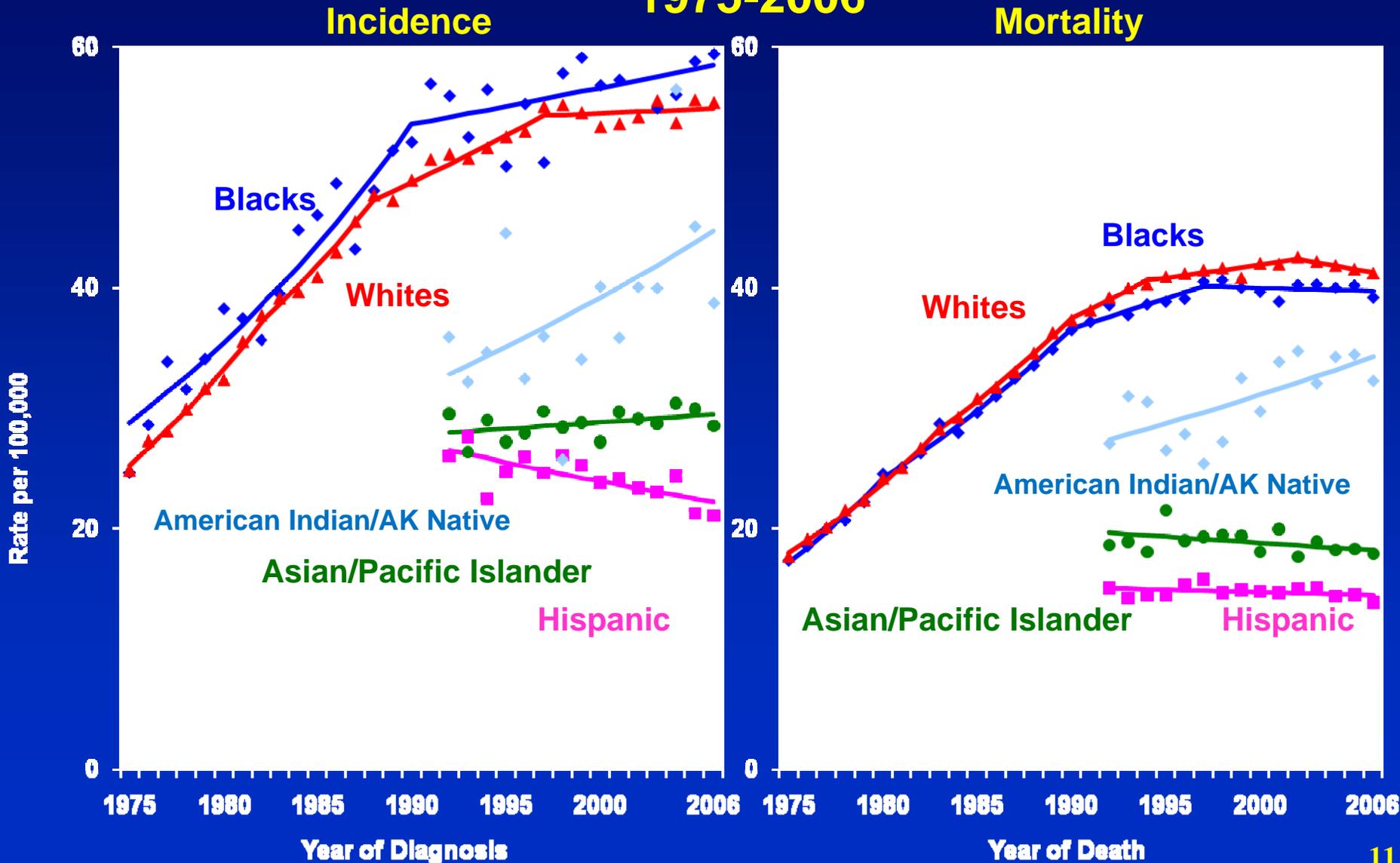
Rates are age-adjusted to the 2000 U.S. standard million population. Sources: Incidence data – NCI SEER Program; Mortality data – CDC NCHS NVSS

Female Breast Cancer
SEER Incidence (delay adjusted) & US Death Rates
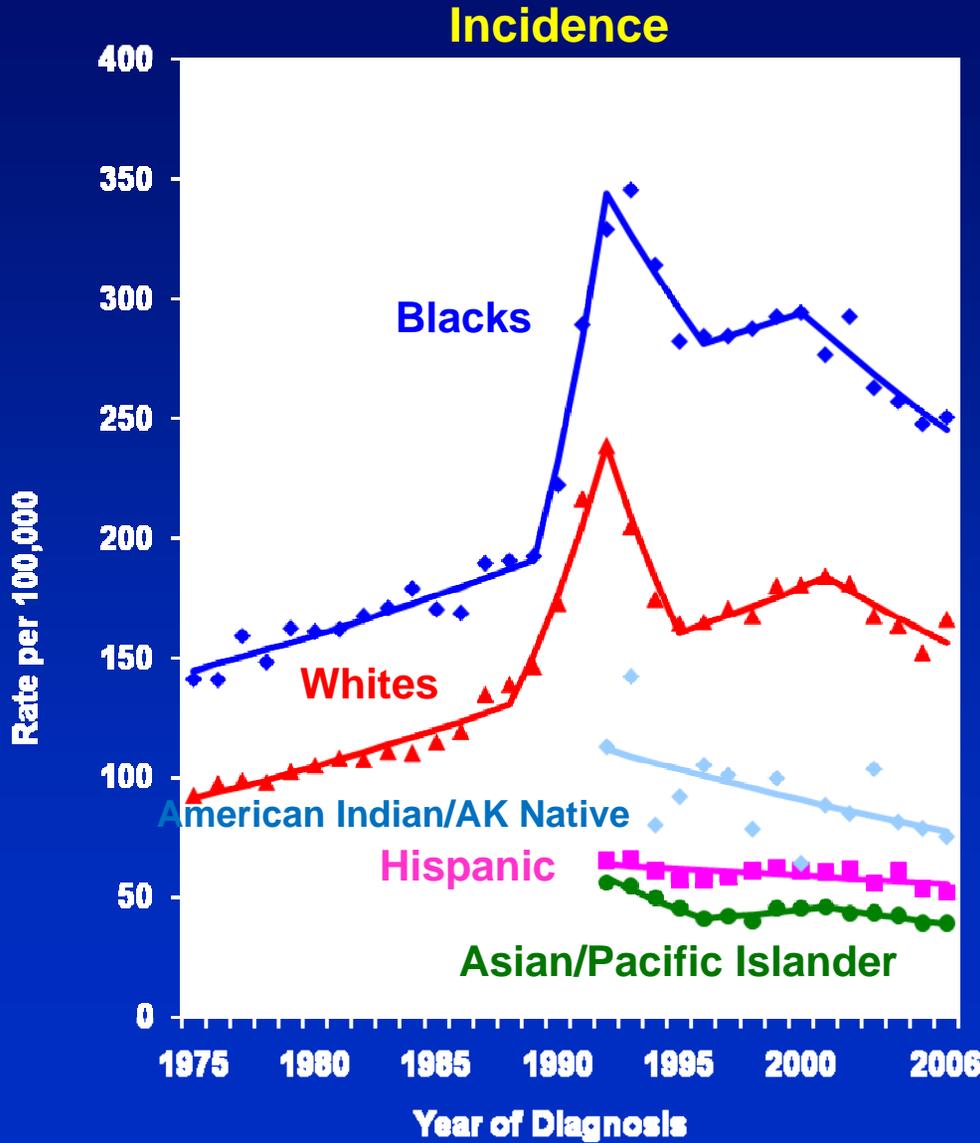## 1975-2006
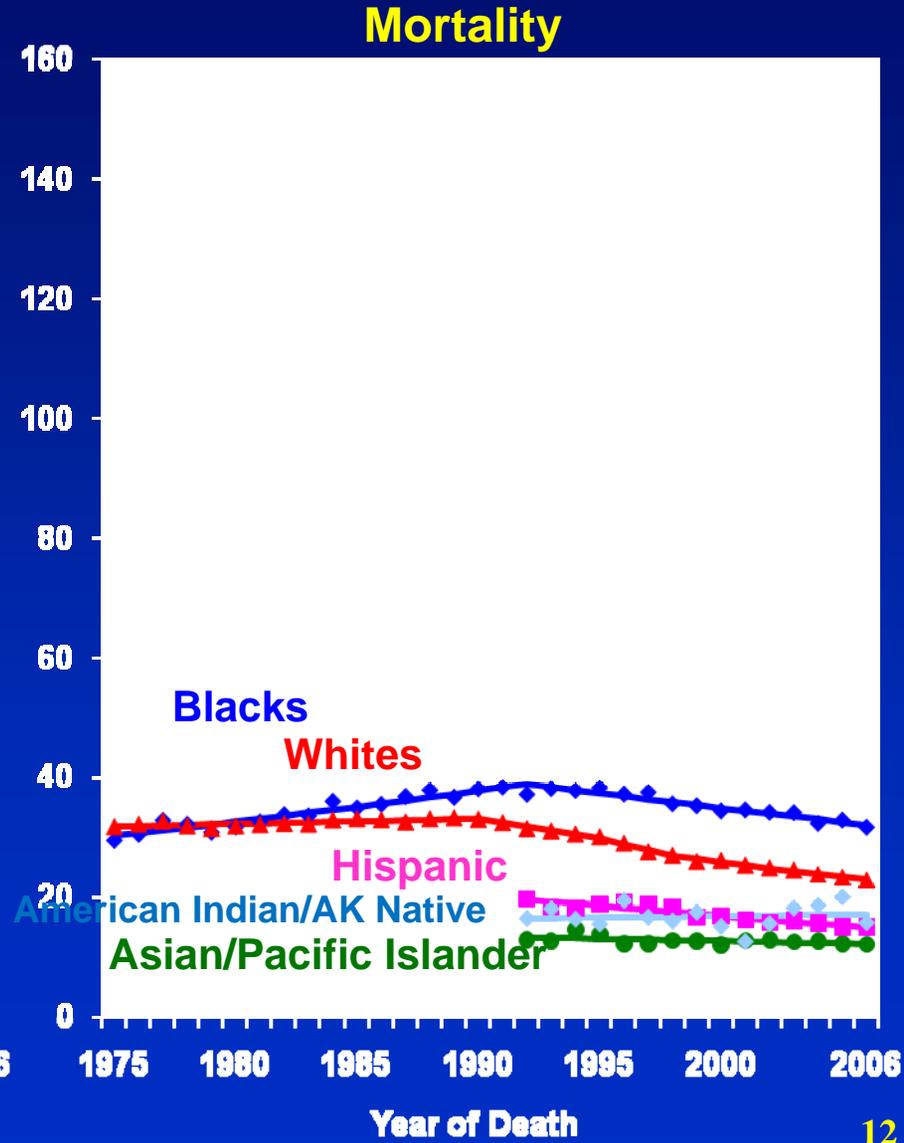
Rates are age-adjusted to the 2000 U.S. standard million population. Sources: Incidence data – NCI SEER Program; Mortality data – CDC NCHS NVSS

Prostate Cancer
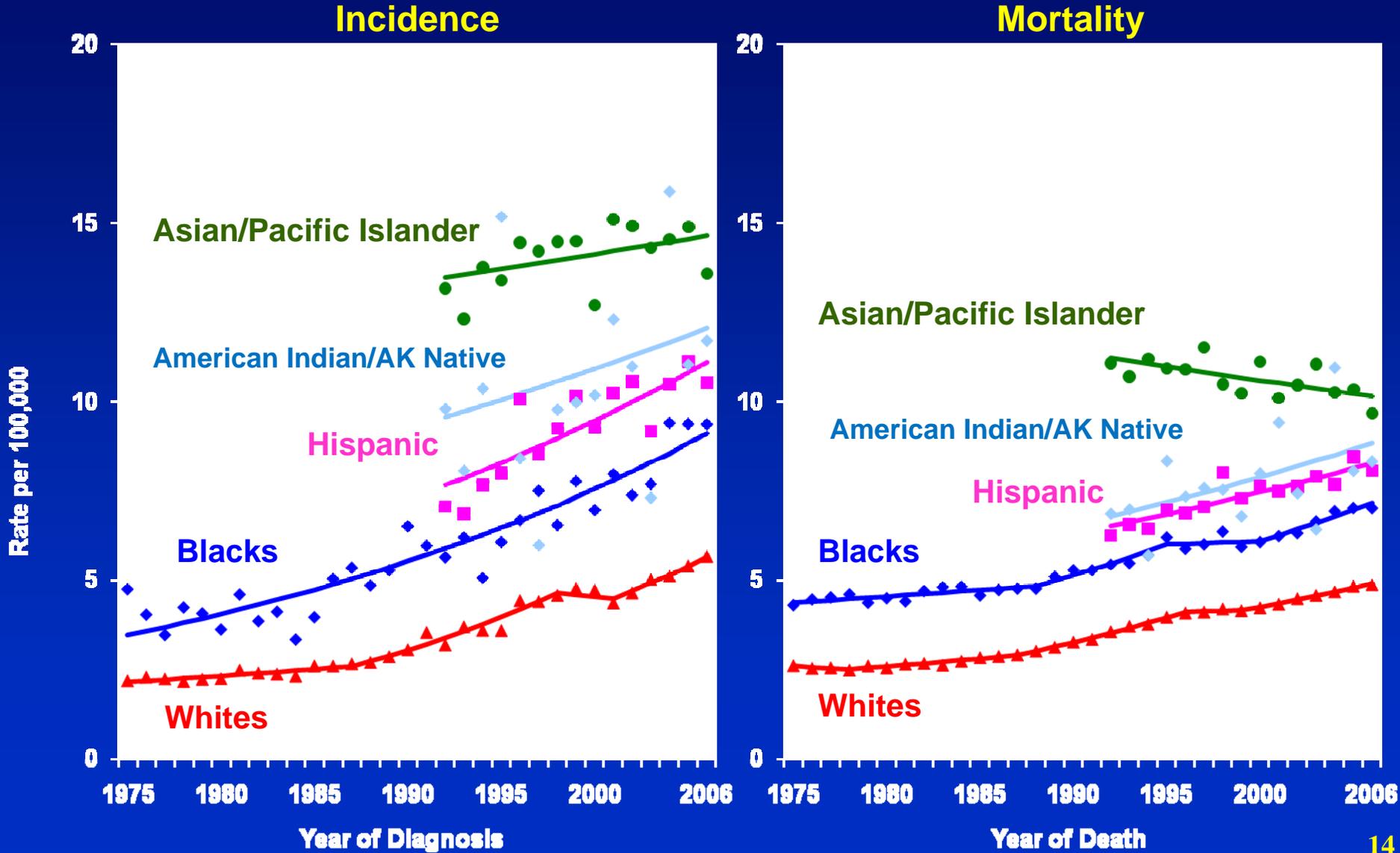## SEER Incidence (delay adjusted) & US Death Rates
Males, 1975-2006

Rates are age-adjusted to the 2000 U.S. standard million population. Sources: Incidence data – NCI SEER Program; Mortality data – CDC NCHS NVSS

Liver & Intrahepatic Bile Duct Cancer
SEER Incidence (delay adjusted) & US Death Rates
1975-2006

Incidence

Mortality

Rate per 100,000

Asian/Pacific Islander

American Indian/AK Native

Hispanic

Blacks

Whites

Asian/Pacific Islander

American Indian/AK Native

Hispanic

Blacks

Whites

Year of Diagnosis
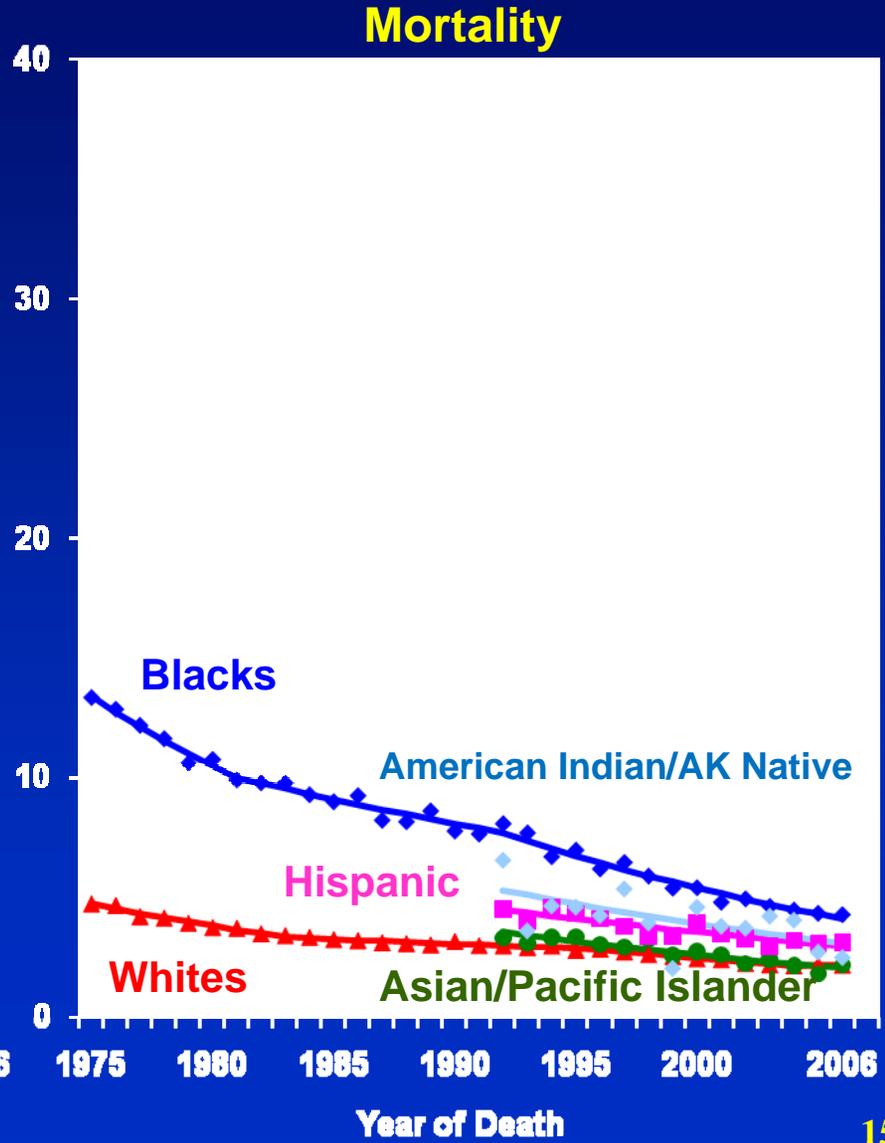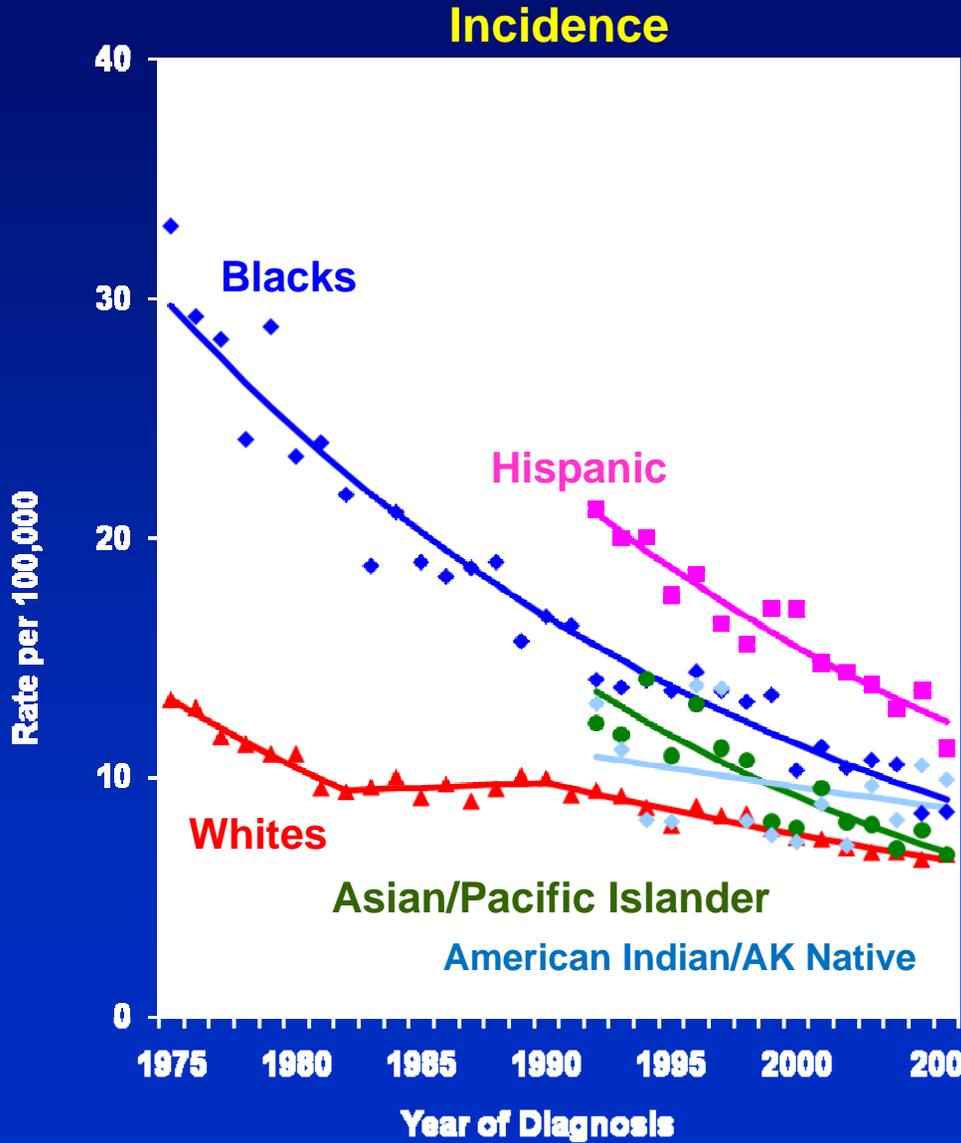
Year of Death

Rates are age-adjusted to the 2000 U.S. standard million population. Sources: Incidence data – NCI SEER Program; Mortality data – CDC NCHS NVSS
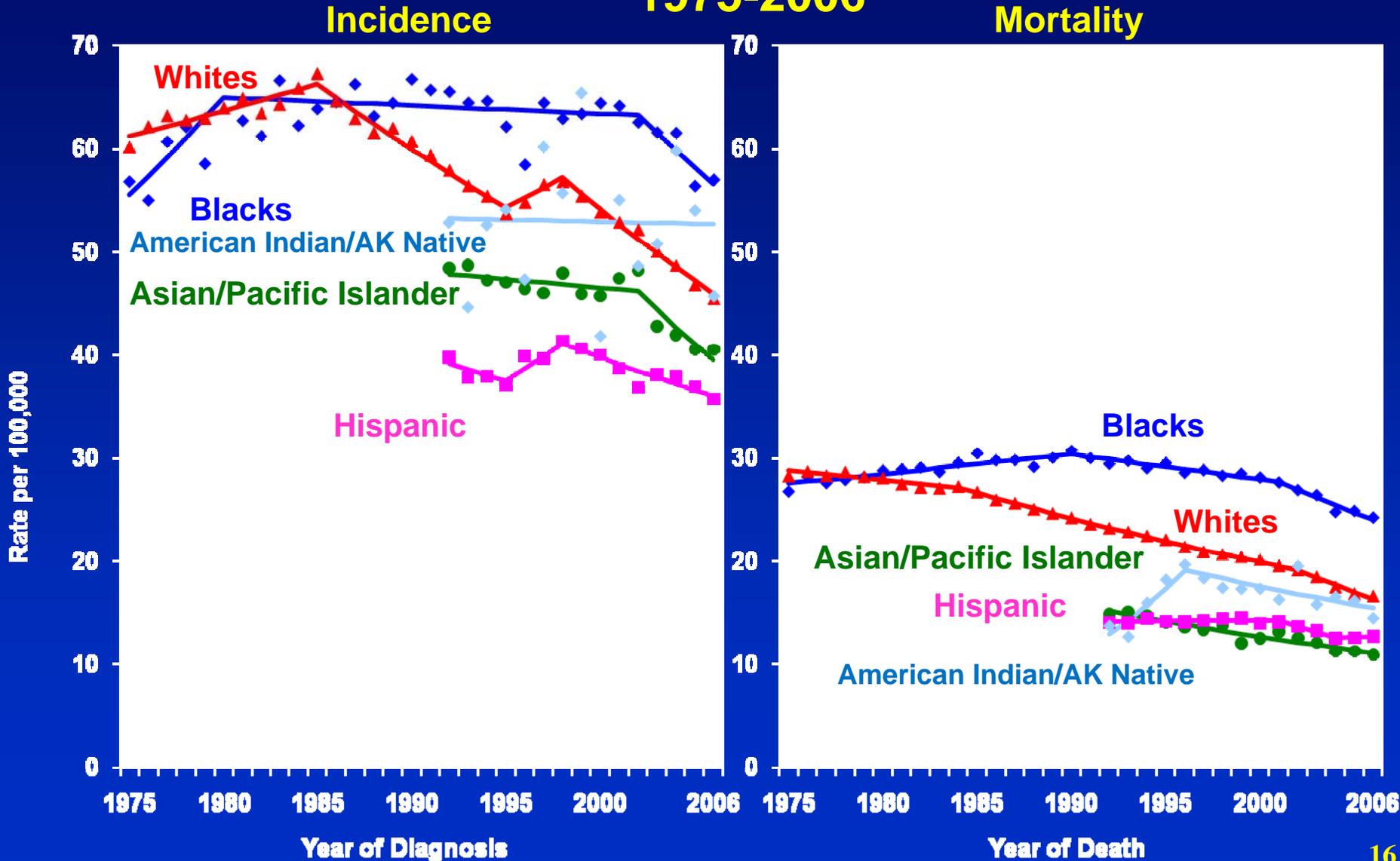
Cervical Cancer
SEER Incidence (delay adjusted) & US Death Rates
1975-2006

Incidence

Mortality

Rate per 100,000

Blacks

Hispanic

Whites

Asian/Pacific Islander

American Indian/AK Native

Year of Diagnosis

Blacks

American Indian/AK Native

Hispanic

Whites

Asian/Pacific Islander

Year of Death

15

Rates are age-adjusted to the 2000 U.S. standard million population. Sources: Incidence data – NCI SEER Program; Mortality data – CDC NCHS NVSS

Both Sexes Colon & Rectum Cancer SEER Incidence (delay adjusted) & US Death Rates 1975-2006

Incidence

Mortality

Rate per 100,000

Whites
Blacks
American Indian/AK Native
Asian/Pacific Islander
Hispanic

Year of Diagnosis

Blacks
Whites
Asian/Pacific Islander
Hispanic
American Indian/AK Native
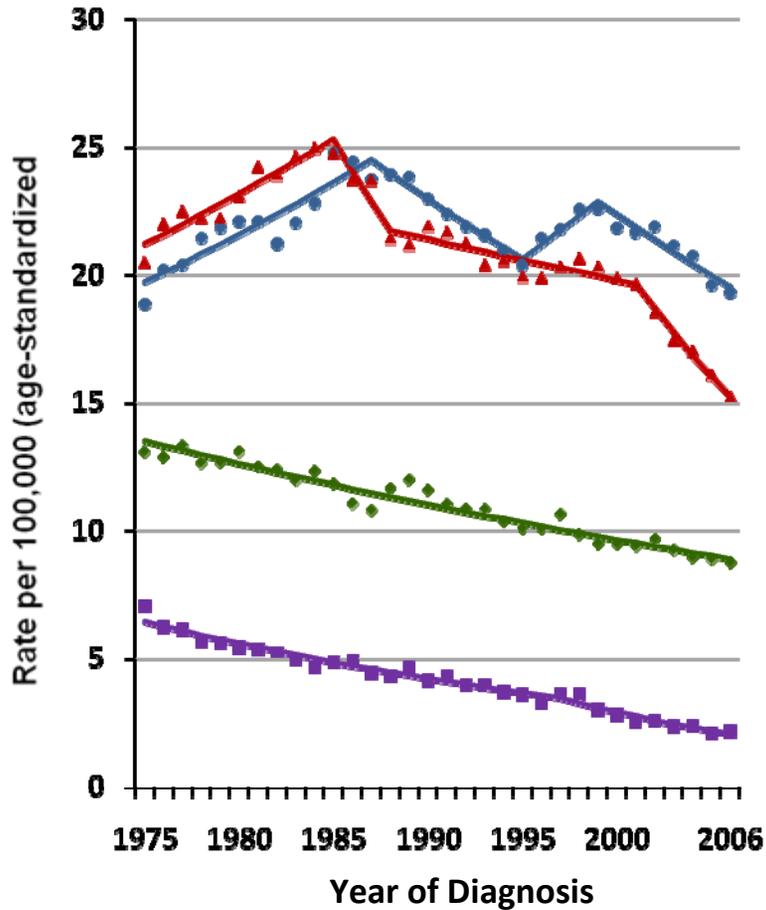
Year of Death

16

Rates are age-adjusted to the 2000 U.S. standard million population. Sources: Incidence data – NCI SEER Program; Mortality data – CDC NCHS NVSS
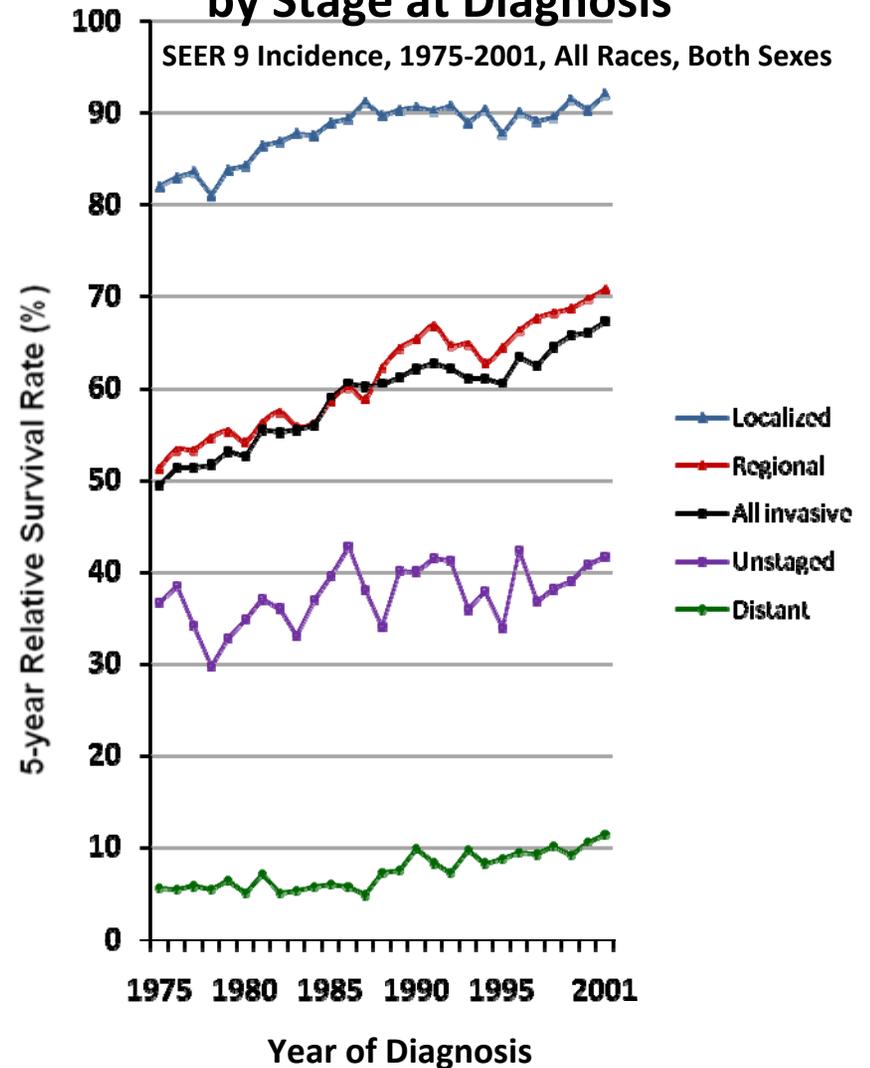
Colorectal Cancer

Age-Standardized Incidence Rates by Stage at Diagnosis
### SEER 9 Incidence, 1975-2006, All Races, Both Sexes

5-Year Relative Survival Rates by Stage at Diagnosis
### SEER 9 Incidence, 1975-2001, All Races, Both Sexes

Micro-Simulation Modeling Projections of Colorectal Cancer (CRC) Rates

- **CISNET Consortium's MISCAN-Colon model**
  - **Tool to analyze historical impact of changes in risk factors, screening & treatment practices and to project future mortality trends for CRC**
  - **Increase risk (e.g., smoking, obesity & red meat consumption)**
  - **Decrease risk (e.g., NSAID use, supplements, and physical activity)**
  - **Screening use (e.g., national data on FOBT, endoscopy)**
  - **Treatment (4 chemotherapy regimens for advanced CRC)**
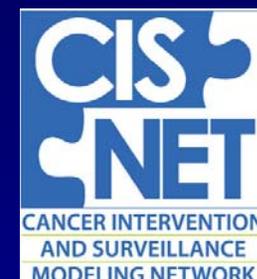
Micro-Simulation Modeling Projections of Colorectal Cancer (CRC) Rates
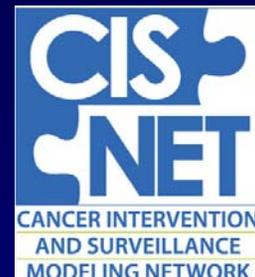
- **Declines in CRC death rates consistent with**
  - **Relatively large contribution from screening**
  - **Smaller demonstrable impact of risk factor reductions (long term) & treatment (short term)**
- **Declines projected to continue**
- **Declines could be accelerated with favorable trends in risk factors, higher utilization of screening & optimal treatment (e.g., 50% reduction by 2020)**

Partition of Past Trends in Colorectal Cancer Incidence* (1975-2000)

Year of Diagnosis

CRC Incidence rate per 100,000 (age-standardized)

Risk Factors

Additional Contribution of Screening

SEER (9)
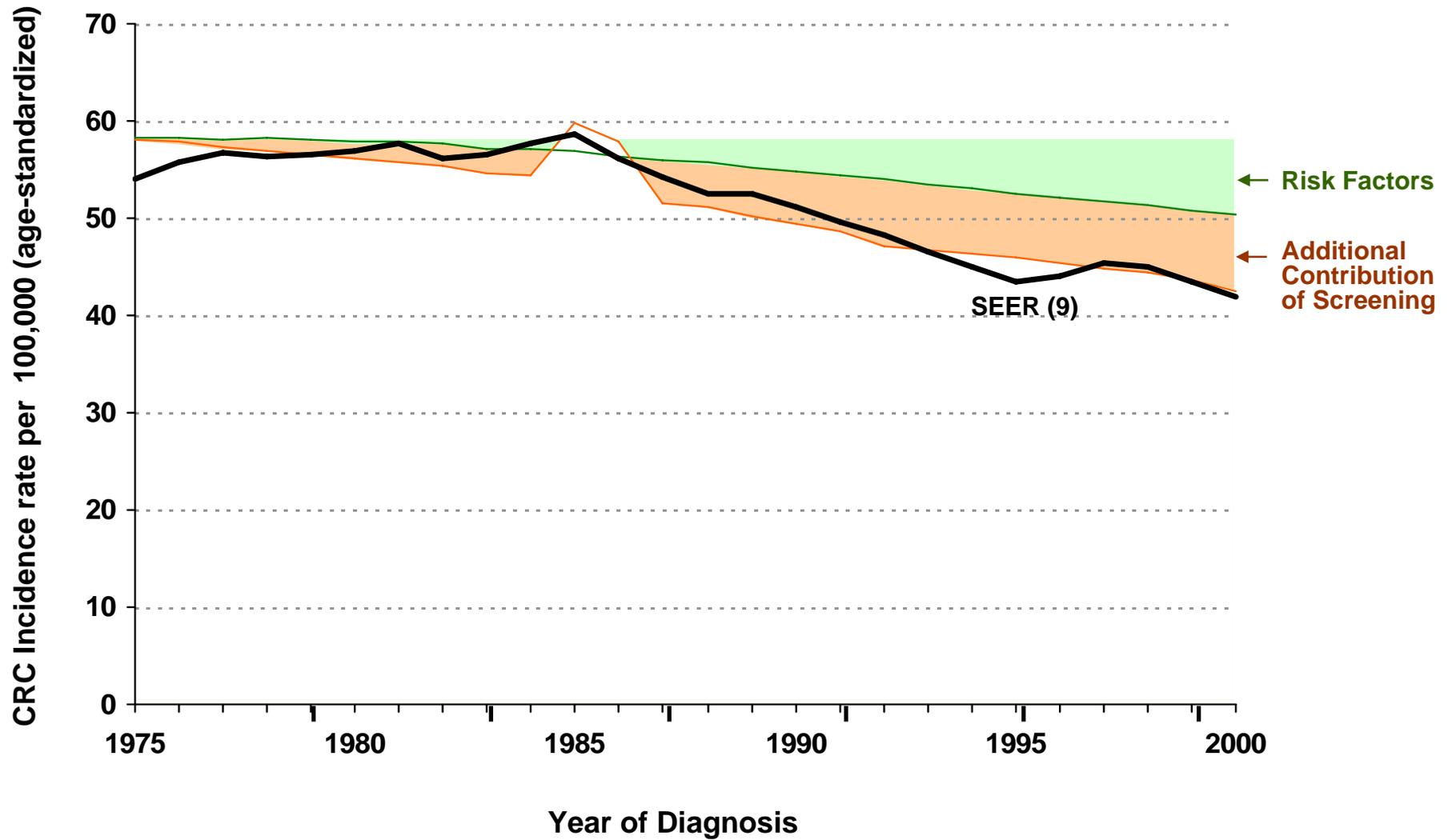
* Rates are based on the first primary colorectal cancer and include the primary sites of C18.0 C18.2-C18.9, C19.9, C20.9 and the ICD-03 histologies of: 8000-8001,8010,8020,8140,8210-8211. Rates do not include cases that are from a reporting source of death certificate only or autopsy only.

Partition of Past Trends in Colorectal Cancer Mortality (1975-2000)

Figure: Partition of Past Trends in Colorectal Cancer Mortality (1975-2000). The y-axis shows "CRC Incidence rate per 100,000 (age-standardized)" ranging from 0 to 35. The x-axis shows "Year of Death" ranging from 1975 to 2005. Labeled regions: Risk Factors, Additional Contribution of Screening, Additional Contribution of Treatment, and US Mortality.
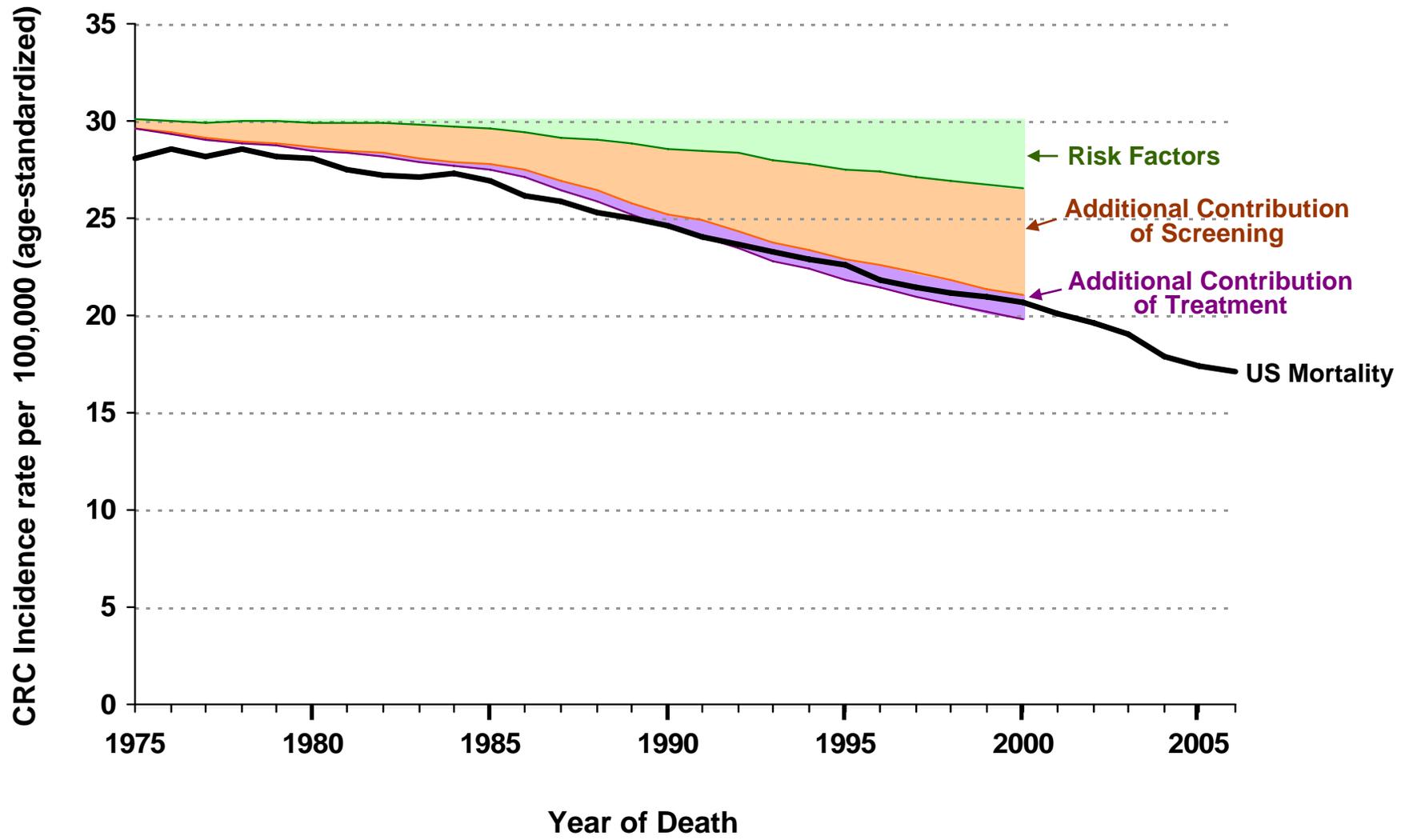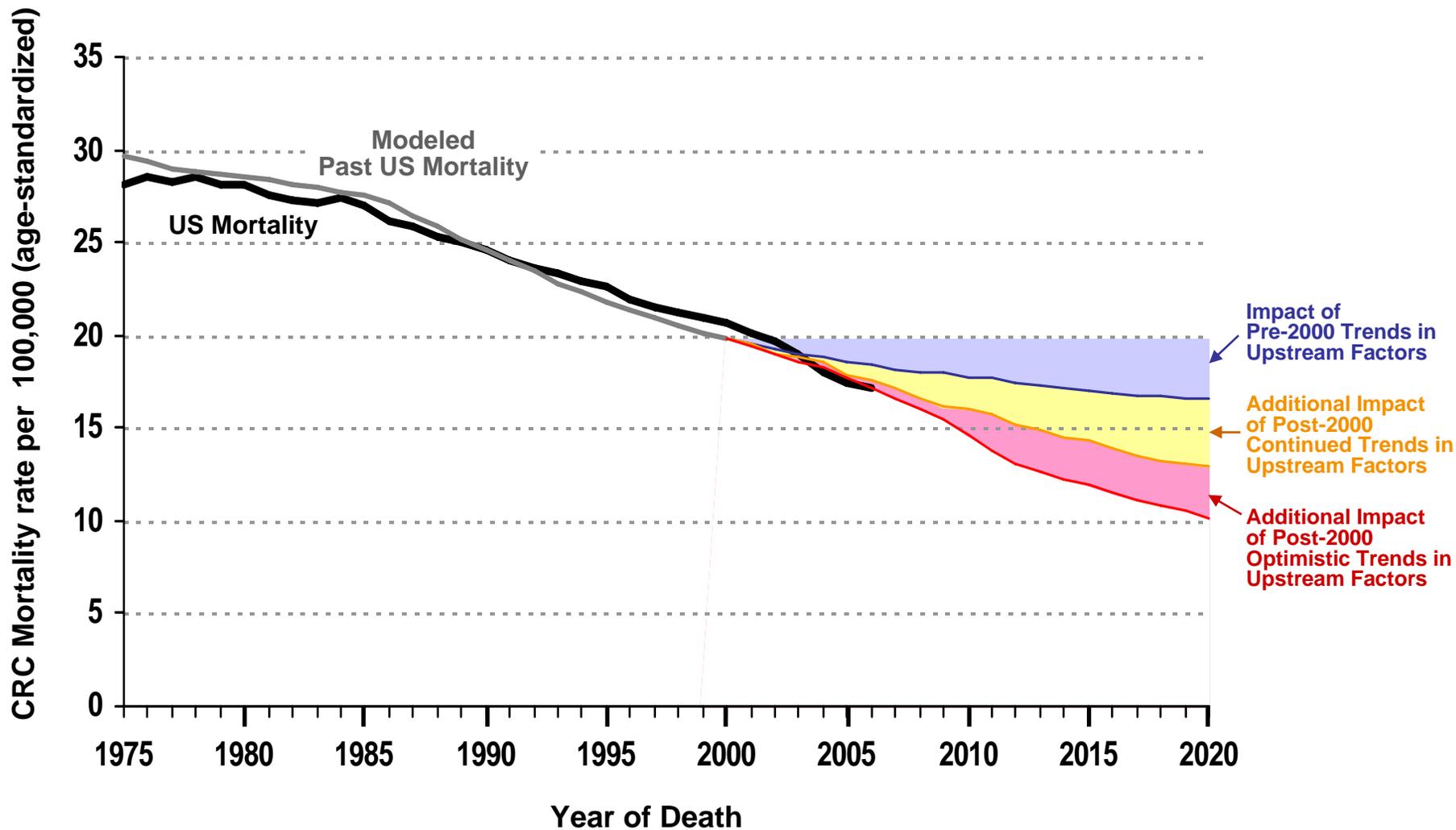
Figure 6. Projections of Colorectal Cancer Mortality with Differing Intensities of Cancer Control (2000 – 2020)

: http://progressreport.cancer.gov

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Cancer Trends Progress Report – 2009/2010 Update

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Feedback
We welcome your questions and comments about the Cancer Trends Progress Report.

The Cancer Trends Progress Report, first issued in 2001 as the Cancer Progress Report, summarizes our nation's progress against cancer in relation to Healthy People 2010 targets set forth by the Department of Health and Human Services. The report includes key measures of progress along the cancer control continuum and uses national trend data to illustrate where advances have been made.

New in the CTPR 2009/2010 Update
- Measures
- Differences by demographics
- Methodology
- Show all

Report Highlights
Major conclusions

Trends-at-a-Glance
Trends and summary tables

Prevention
Tobacco, Physical activity, Diet, Sun protection, more…

Treatment
Bladder, breast, colorectal, kidney, lung, ovary, prostate cancer treatment

Early Detection
Breast, cervical, colorectal cancer screening

Life After Cancer
Survival
Costs of cancer care
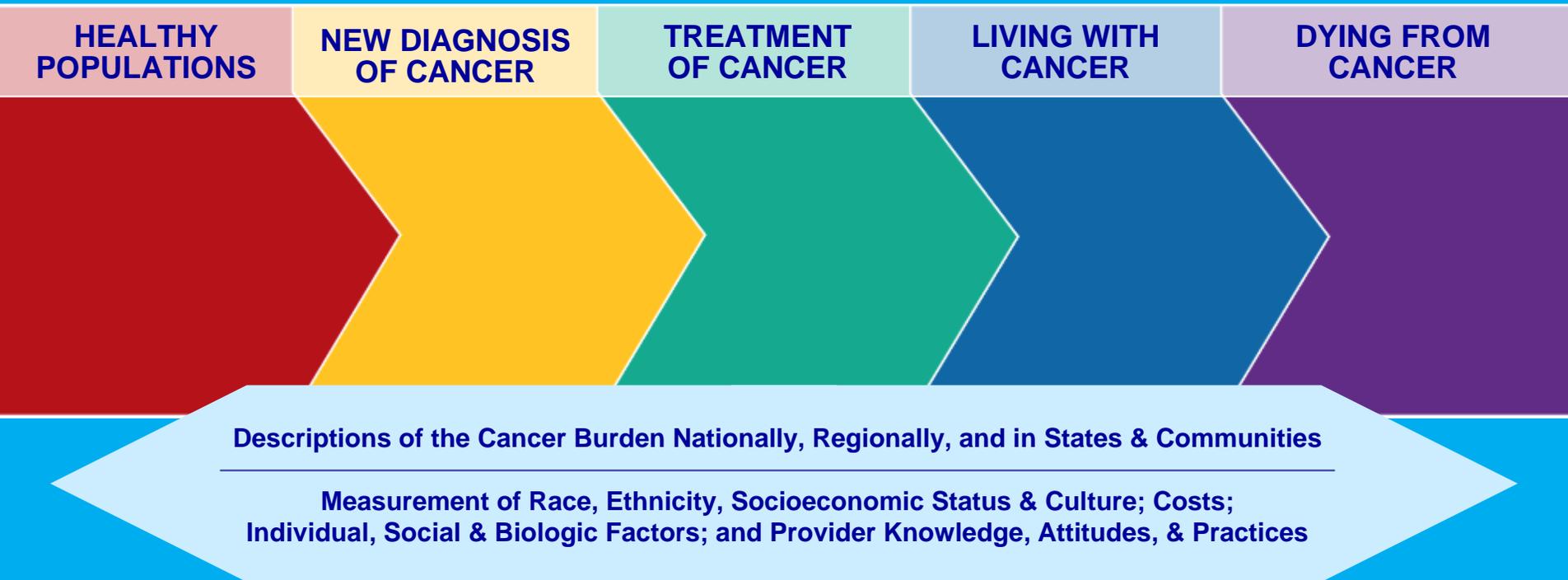
Diagnosis
Incidence
Stage at diagnosis

End of Life
Mortality
Person-years of life lost

The report, available only online, can be printed in part or in its entirety. Portions of the report are updated annually, while other sections are updated as new data become available. The full report will next be updated in 2011.

A National Framework for Cancer Surveillance

HEALTHY POPULATIONS	NEW DIAGNOSIS OF CANCER	TREATMENT OF CANCER	LIVING WITH CANCER	DYING FROM CANCER

Descriptions of the Cancer Burden Nationally, Regionally, and in States & Communities

Measurement of Race, Ethnicity, Socioeconomic Status & Culture; Costs; Individual, Social & Biologic Factors; and Provider Knowledge, Attitudes, & Practices

Wingo PA, Howe HL, Thun MJ, Ballard-Barbash R, Ward E, Brown ML, Sylvester J, Friedell GH, Alley L, Rowland JH, Edwards BK, Cancer Causes and Control 2005;16:151-170

Swan J, Wingo P, Clive R, West D, Miller D, Hutchison C, Sondik EJ, Edwards BK, Cancer 1998; 83:1282-1291

Challenges

- **Increasing demands on SEER for more data:**
  - Comorbidity
  - Recurrence
  - Prognostic factors & clinically relevant characteristics
  - Biospecimens
  - Diagnosis, treatment, and medical management
  - Delivery of care
- **Reliance on electronic health records (EHR)**
- **Automated data collection and processing**
- **Database linkage (protected patient identifiers)**
- **Better understanding of population differences**
- **Coordination & integration (surveillance partners)**

Questions for CTAC

- **How can we provide more meaningful cancer data to researchers?**

- **How can we leverage population-based data such as SEER with the contemporary studies that are clinic-based with biospecimens (e.g., NCCCP, caHUB) ?**

- **With resource constraints, should we continue to focus on depth (details) rather than breadth (population coverage), improve collaborations with hospitals & cancer centers or team only with federal agencies, and/or expand the use of statistical methods to compensate for limited empirical data?**

Web addresses

- **seer.cancer.gov**

- **surveillance.cancer.gov**

- **cancer.gov**

- **cancercontrolplanet.cancer.gov**