SEER-Medicare Linked Database

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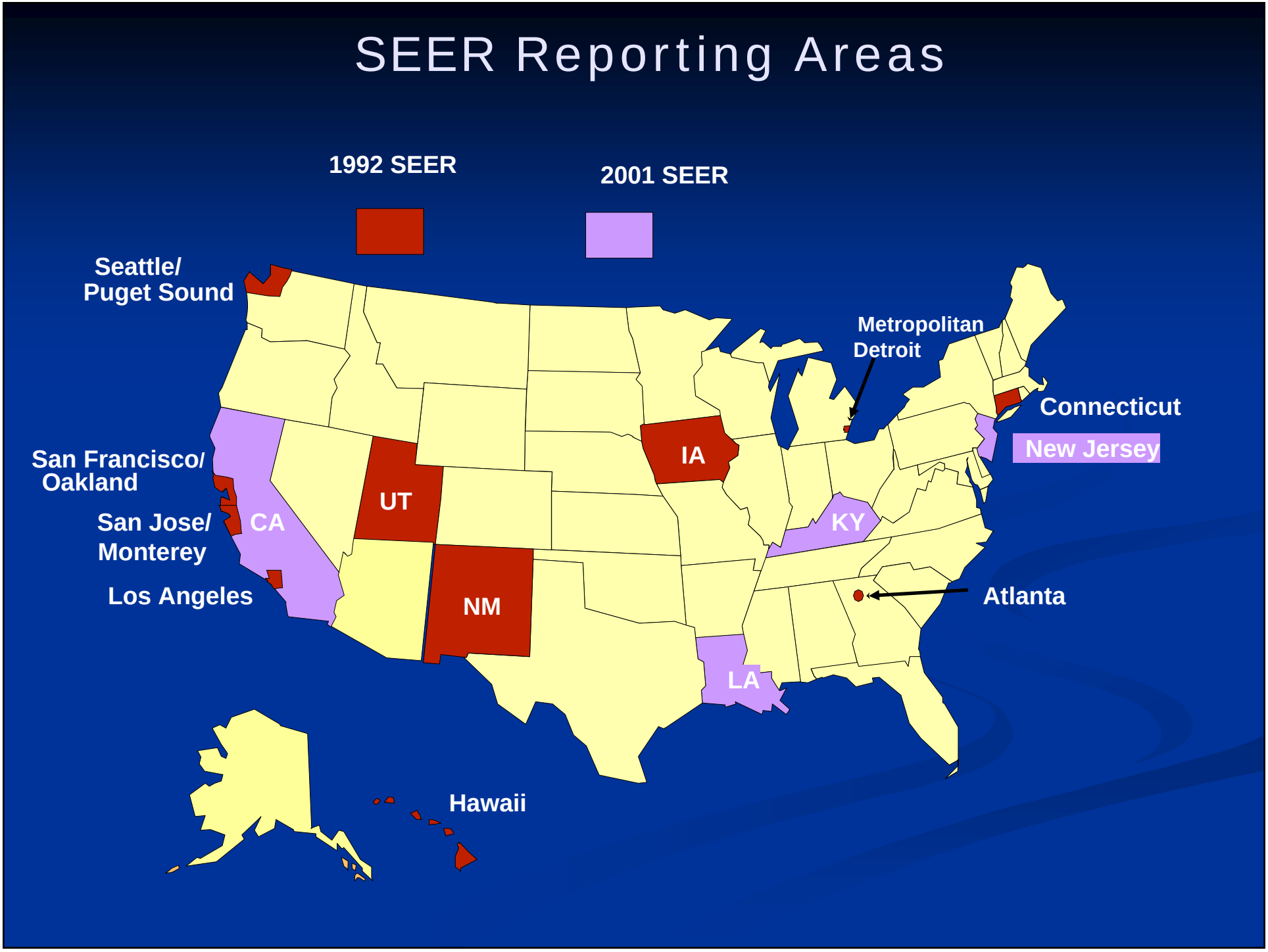
SEER Program

- NCI has contracted with universities and state health departments since 1973 to operate population-based cancer registries.
- All incident cases are captured, except non-melanoma skin cancer and in situ cervical cancer
- Recurrences not reported.
- Since 1992, 12 geographic areas, 14.5% of U.S. population; expanded in 2001 to include 25% of U.S. population

SEER Reporting Areas



SEER Data

- For each incident cancer:
  - month and year of diagnosis
  - site of cancer
  - histology
  - behavior
  - grade
  - extent of disease → staging
  - surgery and adjuvant radiation given or planned during the first course of treatment
- Follow-up vital status with cause of death

Medicare beneficiary-level data

- Enrollment data
- Medicare claims (all types) are available from 1991-2002, except for inpatient hospital data that are available back to 1986
- Continuous Medicare History Sample
  - Longitudinal 5% file combining enrollment and summary claims data from 1974 to 2005

Why link the SEER-Medicare Data?

The linked data can be used for a number of analyses that span the course of cancer control activities

Diagnosis/ Tx →	Survivorship →	Second Occurrence →	Terminal Care
Patterns of care Peri-operative complications Volume outcomes studies Extent of staging Comorbidities	Late effects of treatment Post-diagnostic surveillance Treatment of prevalent cancers Survival	Rates of recurrence/ second primaries Relationship of second events to initial treatment and ongoing surveillance	Use of hospice services Patterns of care during the last year of life

← Health disparities, quality of care and cost of treatment →

Linking the SEER-Medicare data

Personal identifiers for people in the SEER registries are matched against CMS' master enrollment file (EDB). Persons found in the Medicare file are assigned their unique Medicare number (HIC)

The HIC is used to extract Medicare claims for the persons in SEER found to be Medicare beneficiaries

CMS removes identifiers and sends files to NCI's programming contractor for creation of analytic files

What constitutes a match?

- Matching is done using a deterministic algorithm derived from NCHS' match to NDI
- If SSN is present:
  - SSN, last name, first name
  - SSN, last name, MOB, sex
  - SSN, first name, MOB, sex
- If SSN is absent or did not match:
  - first name, last name, MOB and 7 digits of SSN or
  - 2 of the following: YOB, DOB, DOD, middle initial
  - Under 65 are excluded from non SSN match

Match rates for persons 65+ in SEER to the Medicare's master enrollment file

- Total 94.1
- White 95.7
- Hispanic 87.7
- Black 92.0
- Asian 90.2

Matched cases by selected cancer sites, 1991 – 2002 (approximate)

Prostate	302,898
Breast	240,426
Lung and bronchus	224,429
Colon and rectum	214,826
Urinary bladder	78,620
Non-Hodgkins lymphoma	58,996

- Cases matched using SSN, name, DOB, sex, date of death

Other SEER linkages

- Health Outcomes Survey
  - Measures changes in health status among Medicare managed care enrollees
- Medicare Consumer Assessment of Healthcare Providers and Systems Surveys (proposed)
  - Measures consumer experiences and satisfaction with health care

Other Medicare linkages

- Medicare Current Beneficiary Survey
- National Long Term Care Survey
- Health and Retirement Study
- Social Security administrative records
- New Beneficiary Data System (SSA)
- National Health and Nutrition Examination Survey
- National Health Interview Survey
- Longitudinal Studies of Aging

Linking SEER to Medicaid Claims:

Comparison of the procedures found in CCR and Medi-Cal Claims

Cancer Type	# of CCR-Medi-Cal enrollees with cancer diagnosed at any time during 1998	# (%) of 1998 CCR-Medi-Cal enrollees who had cancer directed surgery according to CCR records	# (%) of Patients with Medi-Cal claims corroborating cancer directed surgery recorded in CCR.
Breast	549	497	331 (67%)
Colorectal	274	203	143 (70%)
Uterine	86	76	55 (72%)
Ovarian	100	87	64 (74%)
Kidney	93	83	55 (66%)

Conclusion: Medi-Cal claims do not have sufficient information to be used to assess cancer treatment. This is primarily due to HMO enrollment. Findings may differ in other states with less HMO penetration.

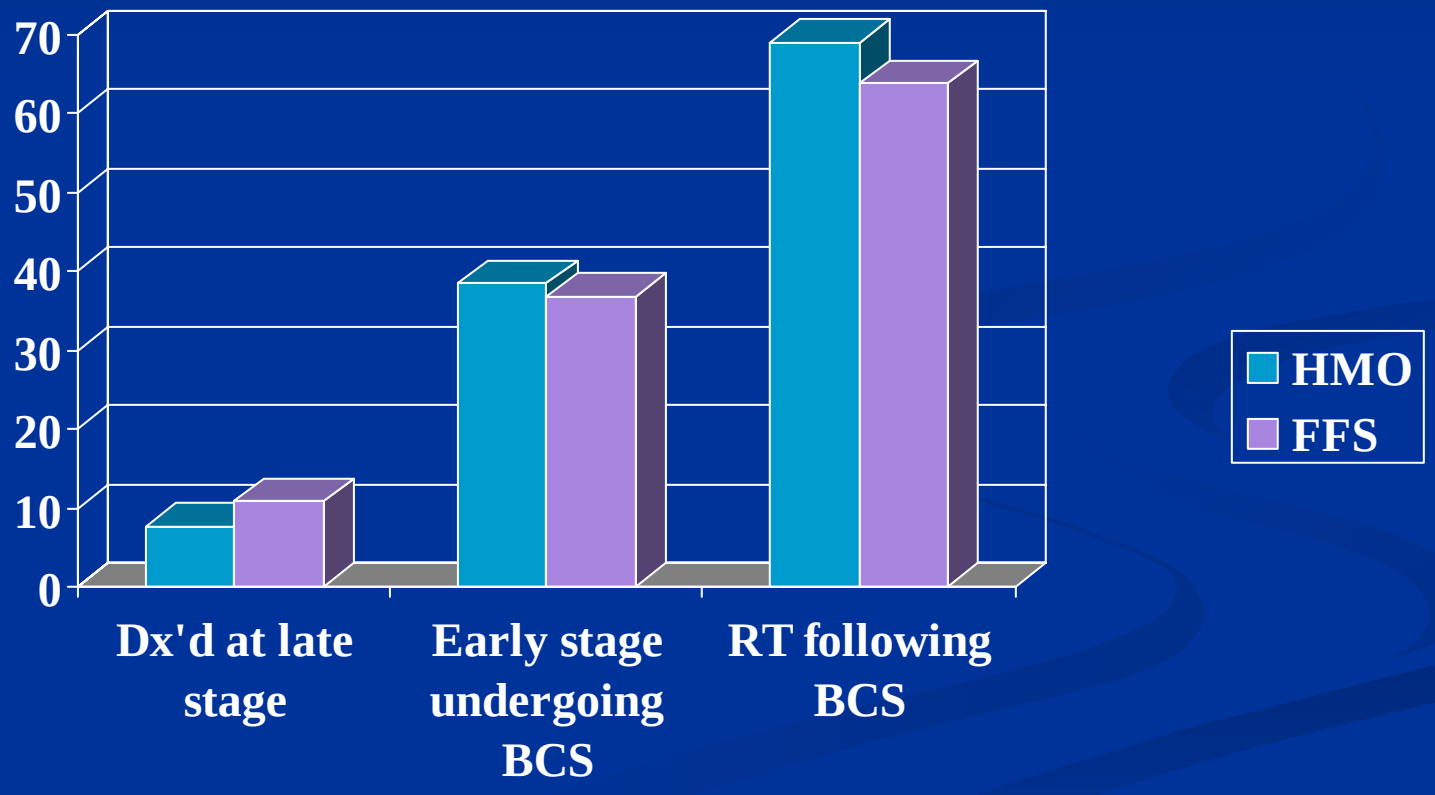
Uses of SEER-Medicare Data

- Data used in-house for mandated surveillance studies. Data used by extramural researchers for a range of projects

Frequent uses include:

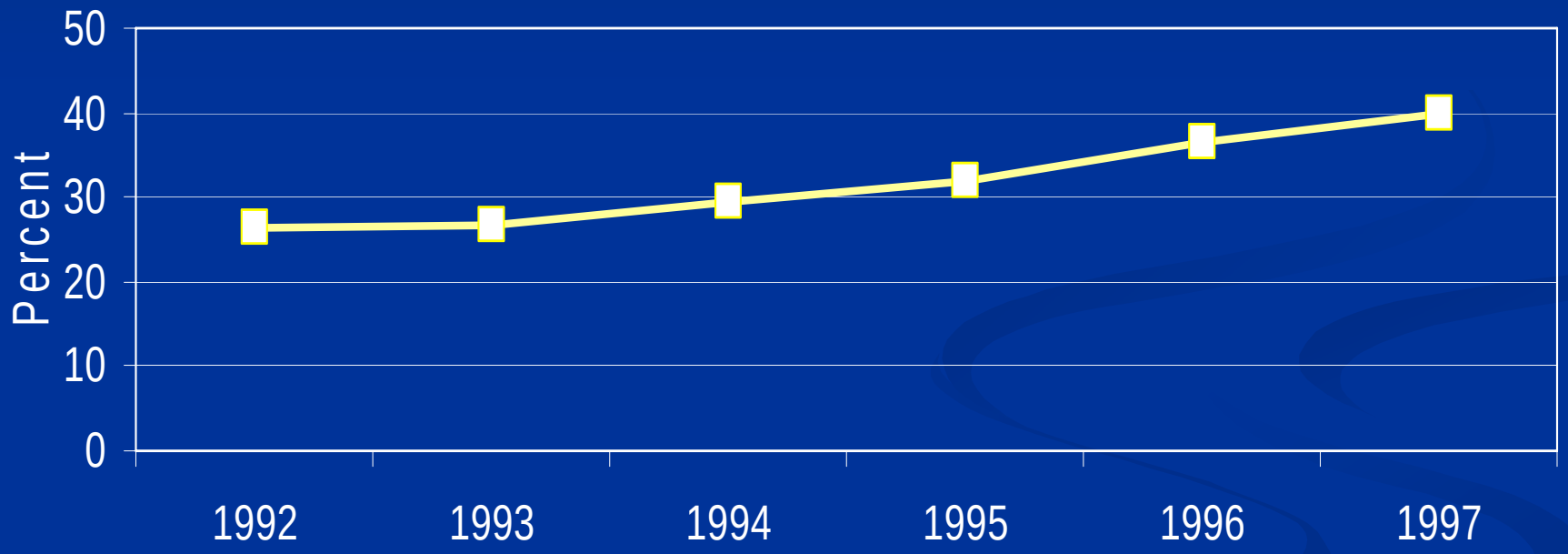
- Trends in use of cancer-related medical services, procedures, resources and cost
- Descriptions of disparities in the use of cancer care
- Patient, physician, health system and ecological determinants of patterns of care
- Volume-outcomes studies

Comparison of breast cancer diagnosis and treatment between HMO and FFS settings, 1988-93



Source: Riley et al. JAMA 1999 Feb 24;281(8):720-726.

Use of Androgen Deprivation Among Men With Prostate Cancer, 1992-1999



Source: Shahinian VB, et al. N Engl J Med 2005 Jan 13;352(2):154-64.

Treatment Cost

25-Year Incremental Costs for Long Term Colon Cancer Survivors* by Stage, Age and Gender at Diagnosis

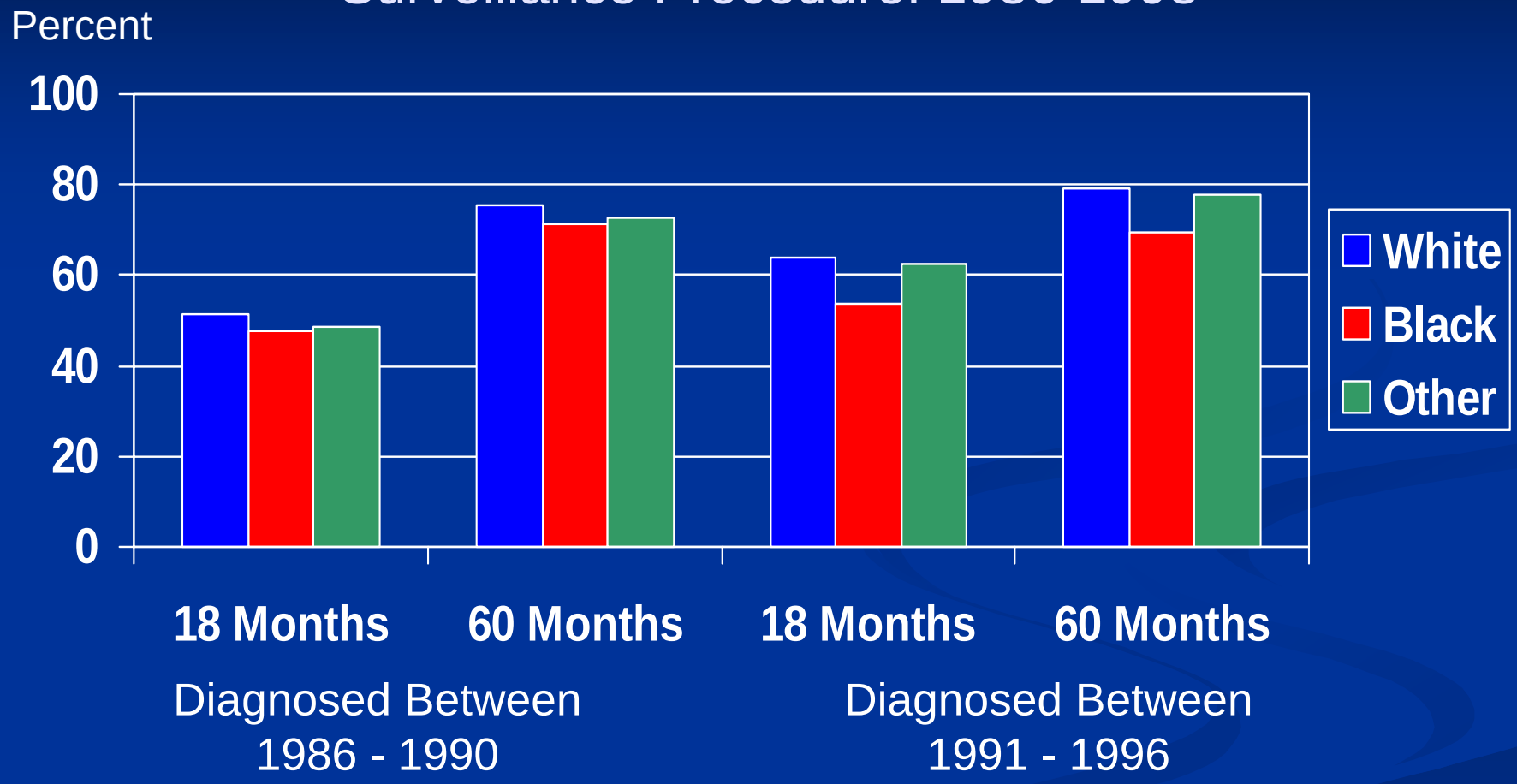
	Male			Female		
Stage	Case Cost	Control Cost	Net Cost	Case Cost	Control Cost	Net Cost
Stage 1	$52,001	$36,380	$15,621	$47,103	$37,153	$9,950
Stage 2	$43,126	$35,220	$7,906	$38,531	$35,768	$2,762
Stage 3	$36,381	$36,437	-$55	$34,874	$37,200	-$2,327
Stage 4	$22,348	$36,245	-$13,897	$21,794	$37,722	-$15,927

*Persons surviving at least 5 years from the date of diagnosis

Source: Ramsey et al. Am J Gastroenterol. 2002 Feb;97(2):440-5.

Health Disparities

Adjusted Probability of Receiving the 1st Bowel Surveillance Procedure: 1986-1998



Source: Ellison et al. Racial Differences in the receipt of bowel surveillance following potentially curative colorectal cancer surgery Health Serv Res 2003;38:1885-1903

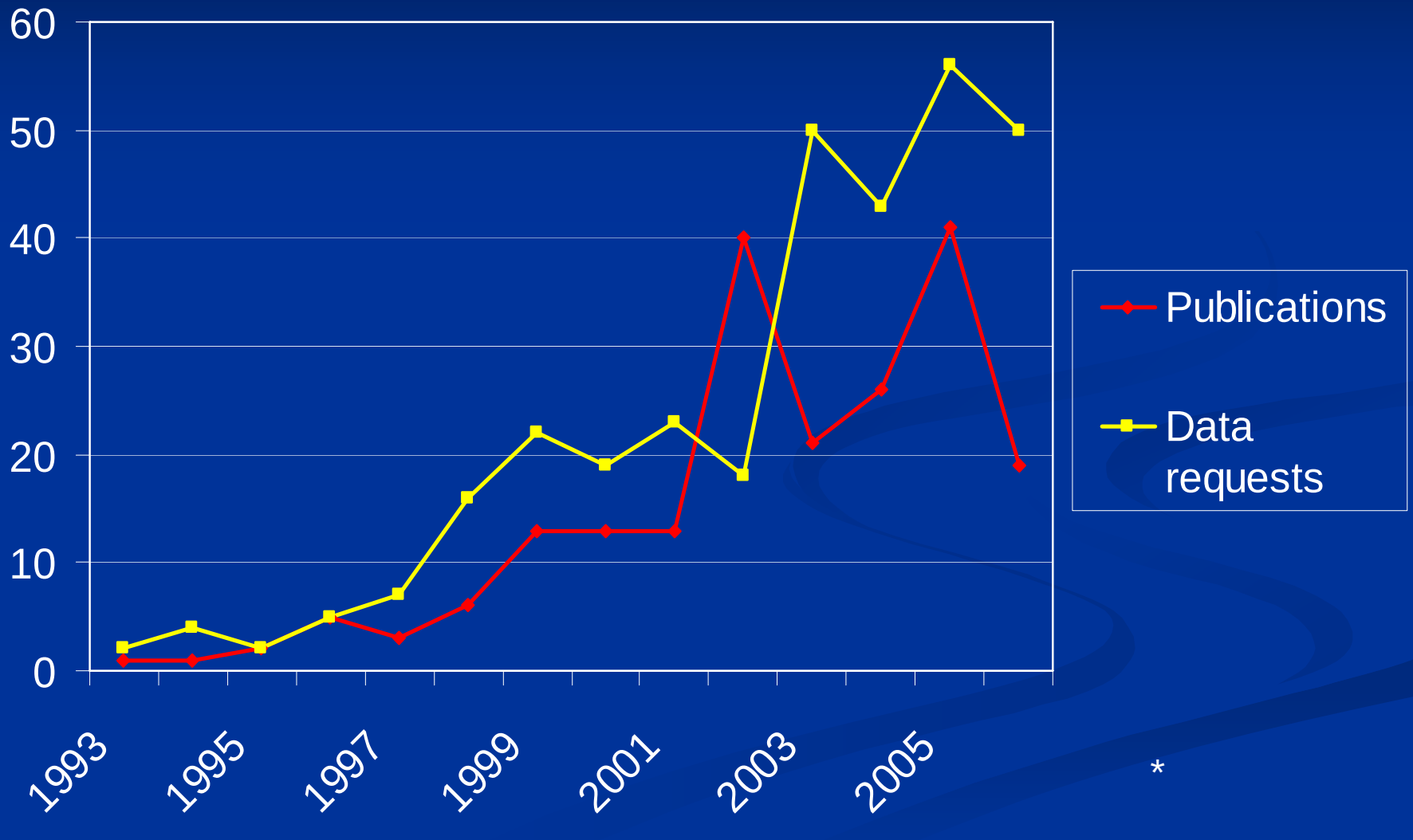
Volume/Outcome Study

Two year mortality rates following colon resection

Surgeon Volume Quartiles	Hospital Volume Quartiles			
	Very Low	Low	Medium	High
Very Low	37.2	36.4	36.1	29.8
Low	34.1	34.2	33.7	32.1
Medium	33.0	33.7	31.4	30.1
High	33.4	32.1	31.4	29.0

Source: Schrag, et al. J Surg Oncol. 2003 Jun;83(2):68-78

SEER-Medicare data requests and publications 1993-2006



* 2006 data through August

Advantages of SEER-Medicare Data

- Link to SEER provides reliable data on cancer data on diagnosis, stage at diagnosis, date of death, cause of death
- Link to Medicare provides longitudinal data on medical services and procedures prior to and subsequent to date of diagnosis
- Pre-diagnostic comorbidity information can be extracted
- Five percent Medicare file provides matched controls

Limitations of SEER-Medicare Data

- Medicare data limited to those over the age of 64 and the disabled
- Detailed claims data not currently available for HMO enrollees
- Oral medications not covered (prior to Part D data)
- Codes for cancer screening difficult to interpret
- SEER registry areas may not be totally representative of patterns of care
- Long time lag to obtain data (e.g. currently available data through cancer diagnosis year 2003)

Efforts to Overcome Limitations

- NIH-CMS efforts to improve efficiency of data linkage
- Linking SEER and other cancer registry systems directly to HMO data systems (e.g. HMO Cancer Research Network)

How to obtain SEER-Medicare data

- SEER-Medicare are de-identified. Because of the remote possibility of re-identification, these data are not available as public use files.
- Researchers must submit to NCI a proposal or copy of grant submission that describes
  - Use of the data
  - How data will be protected
  - Investigators using the data
  - SEER-Medicare data use agreement

Support for SEER-Medicare data users

- SEER-Medicare WEB site: http://healthservices.cancer.gov/seermedicare/
- Medical Care Vol. 40, no. 8 August 2002 Supplement
- SEER web site: http://seer.cancer.gov
  Publications, Manuals, Cancer Statistics,
  Scientific Systems: SEER*Stat, DEVCAN, etc.
- RESDAC support for Medicare data users
  http://www.resdac.umn.edu/