Colorectal cancer and colorectal cancer screening: natural history and epidemiology

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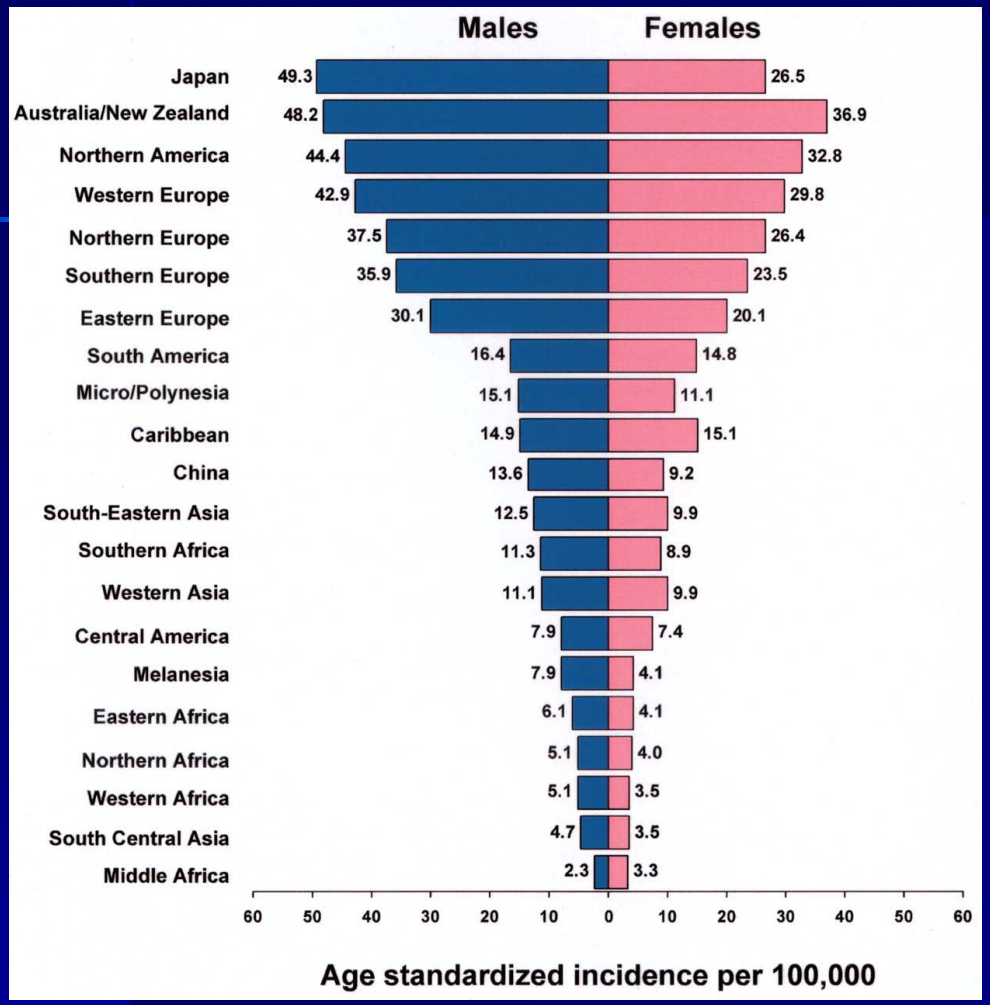
Special thanks to Dr. Laura Seeff

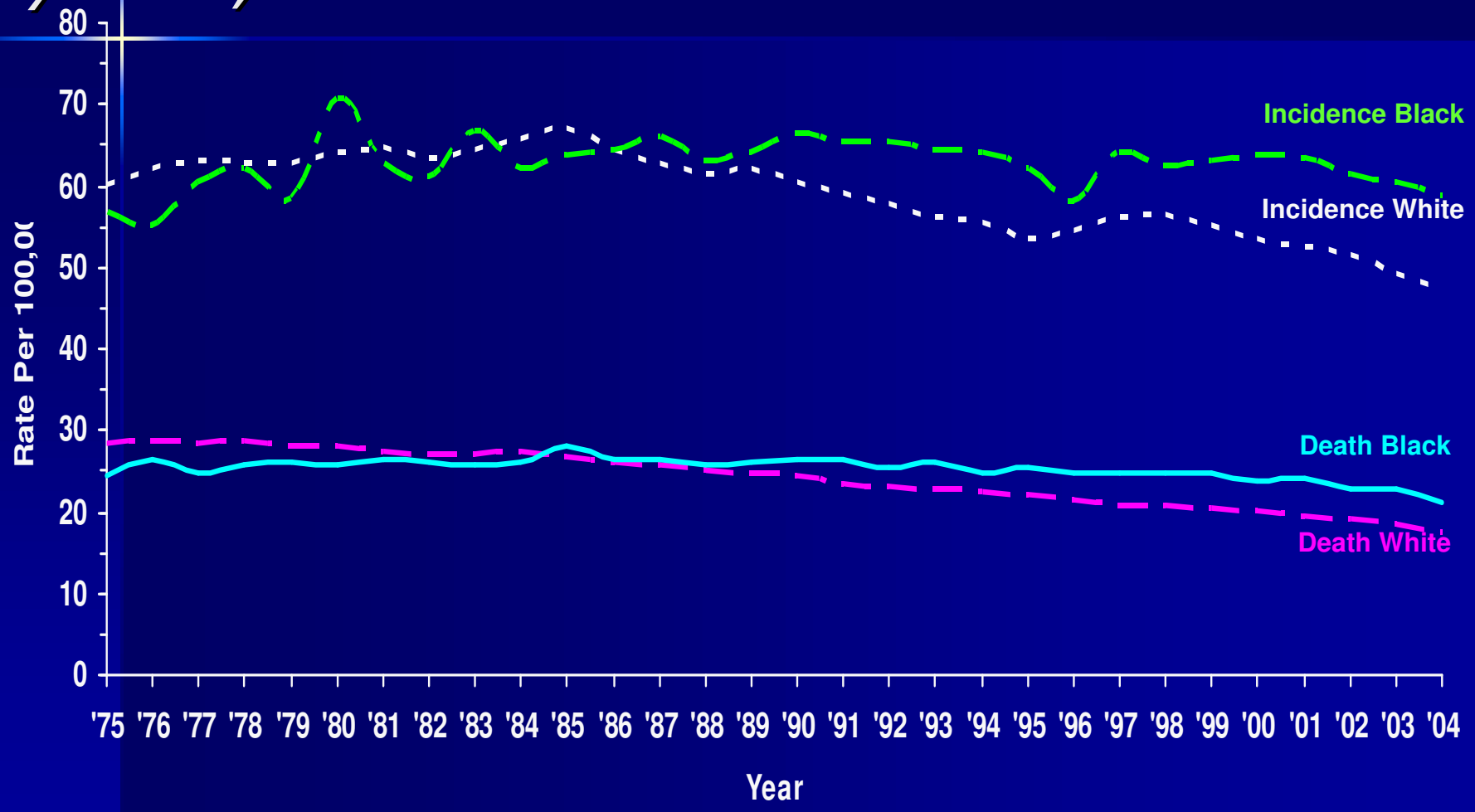
Age-Standardized Incidence Rates for Colorectal Cancer



	Worldwide	USA
Incidence	945,000	153,760
Mortality	492,000	52,180

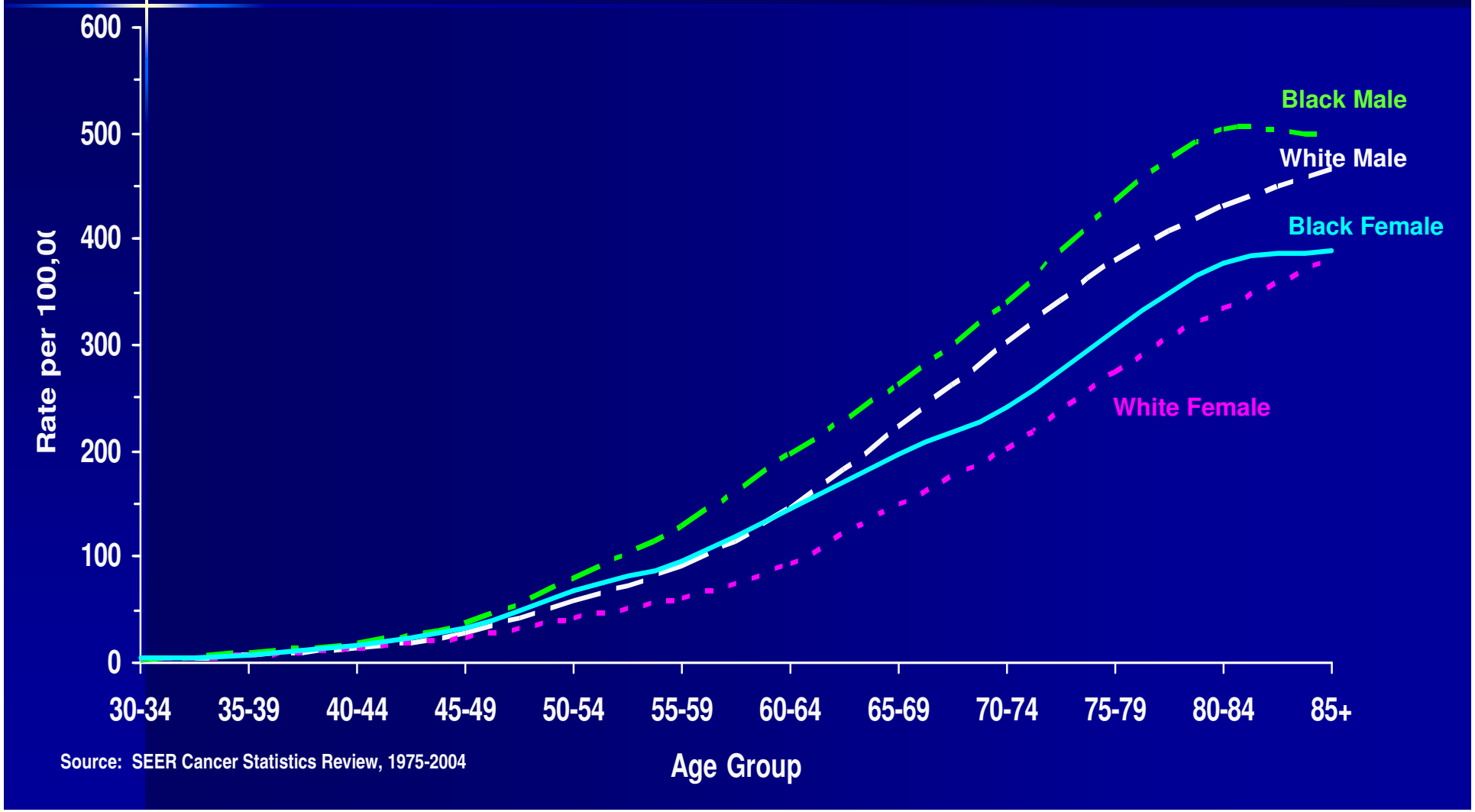
From: Parkin, D. M. et al.
CA Cancer J Clin 2005;55:74-108

Cancers of the Colon and Rectum (Invasive): SEER Incidence and U.S. Death Rates* By Race, 1975-2004



*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.
Source: SEER Cancer Statistics Review, 1975-2004

Cancers of the Colon and Rectum (Invasive) Average Annual Age-Specific SEER Incidence Rates By Race and Sex, 2000-2004



Source: SEER Cancer Statistics Review, 1975-2004

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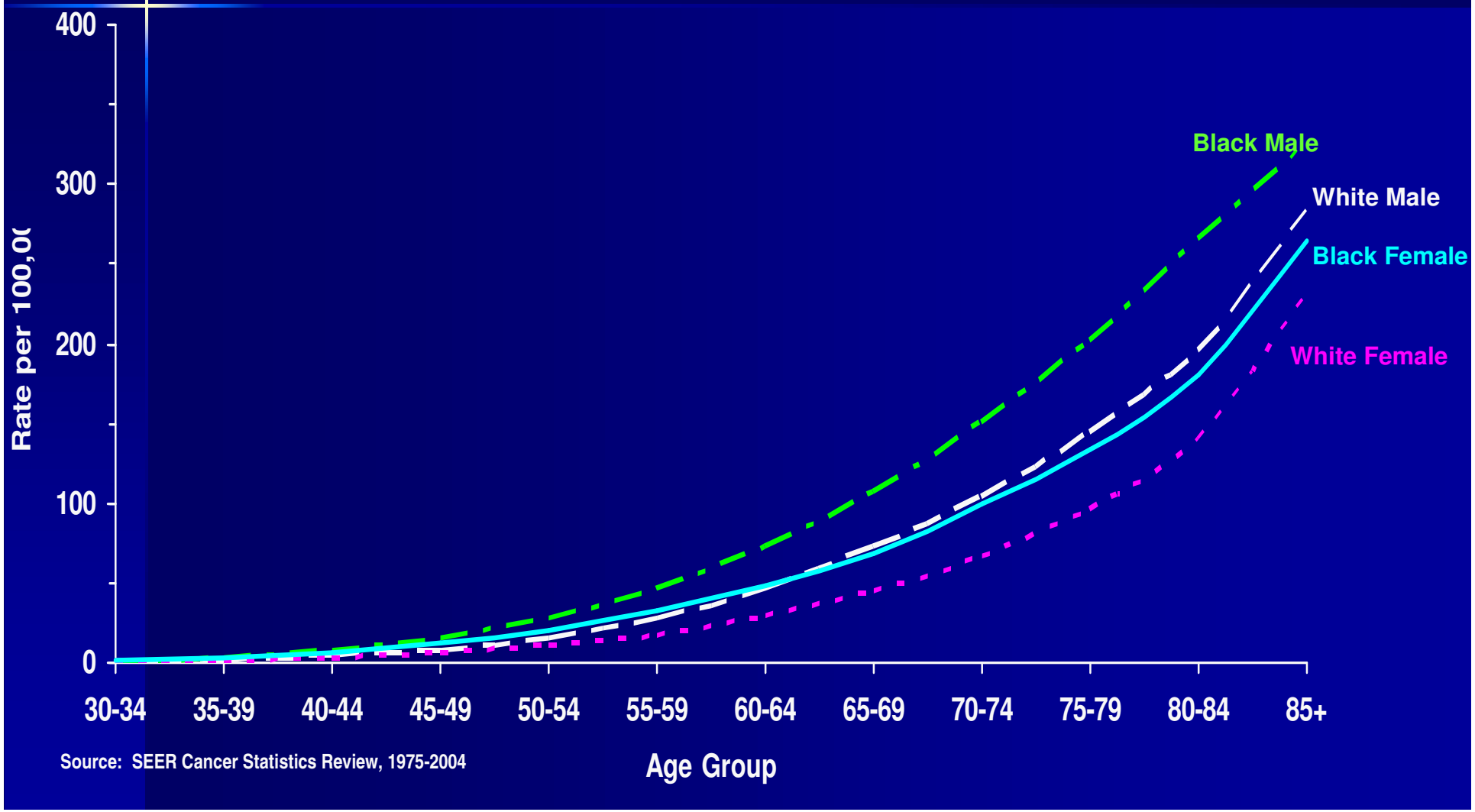
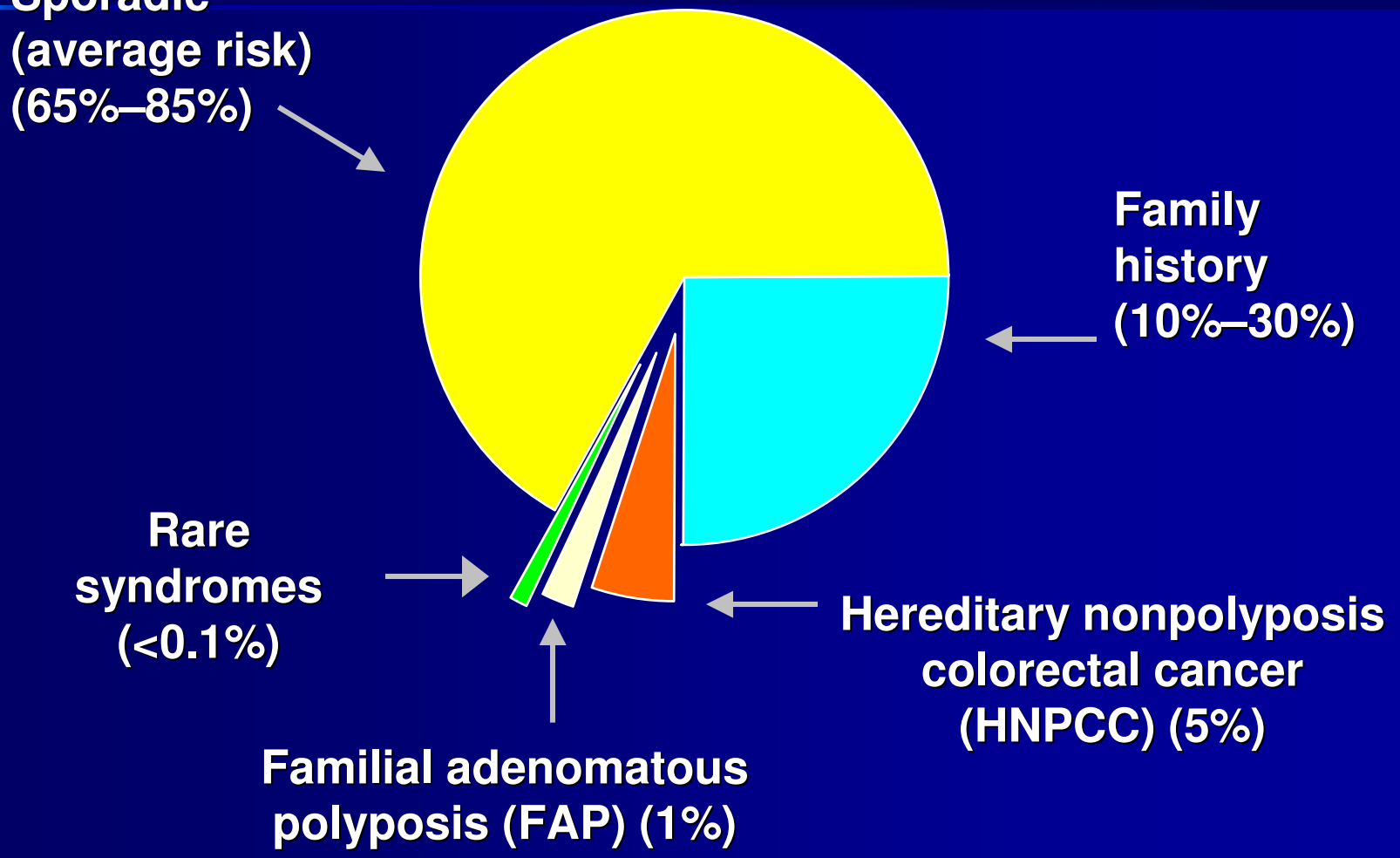
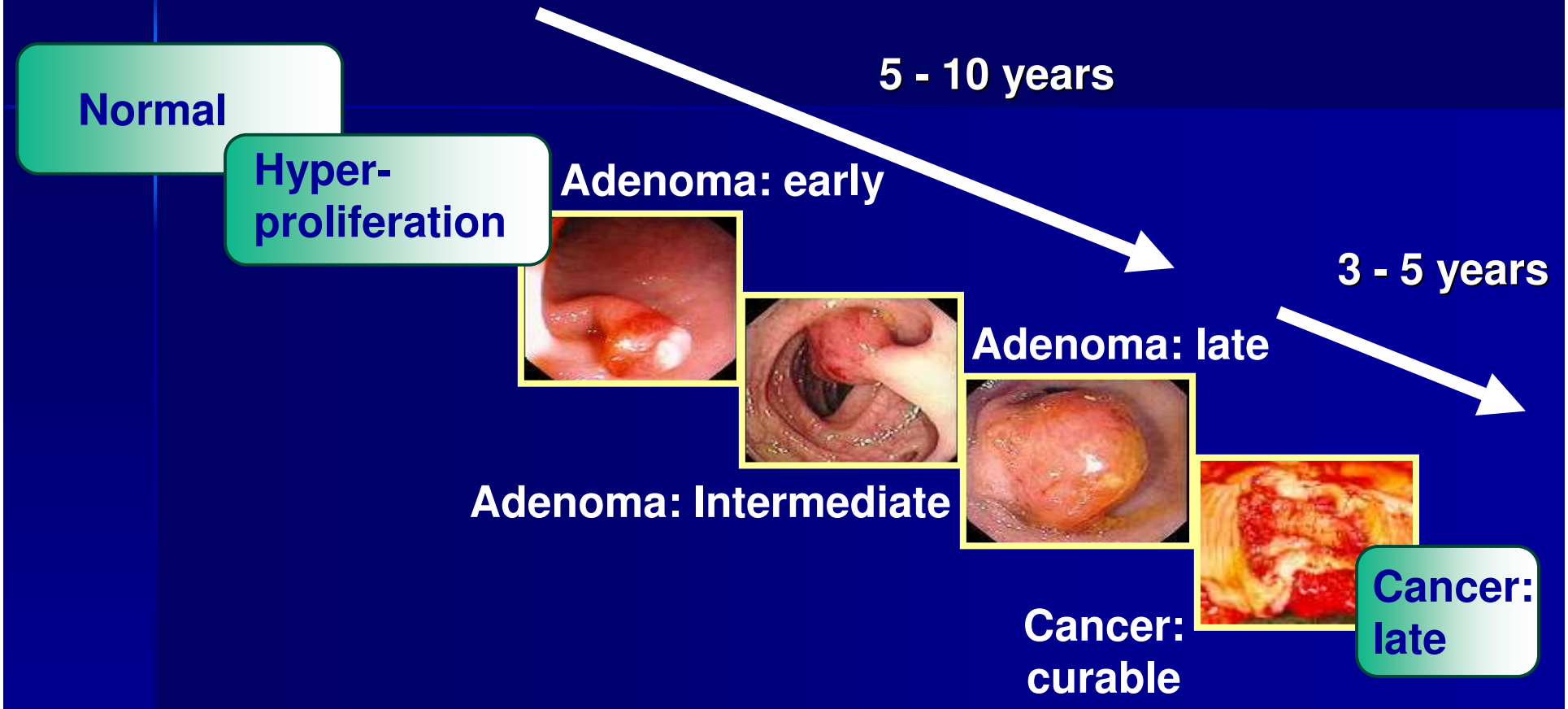


Source: SEER Cancer Statistics Review, 1975-2004

Colorectal Cancer (CRC)



Natural History of Colorectal Neoplasia



From: Rozen, Young, Levin, Spann (2002)

Colon cancer staging

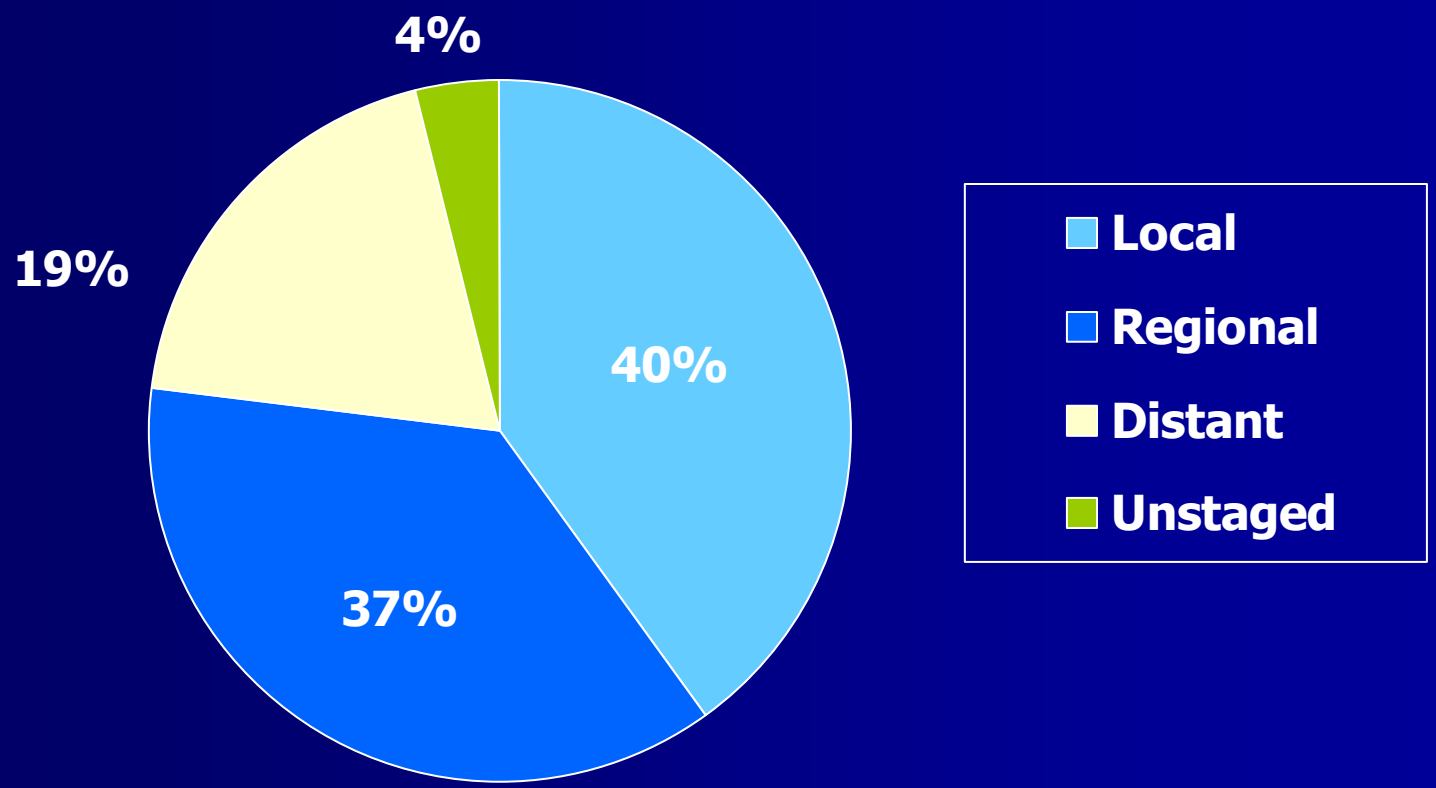
- **Stage 0: carcinoma in situ**
- **Stage I: T1-2, N0, M0 The cancer has grown through the muscularis mucosa into submucosa *or* it may also have grown into the muscularis propria, but hasn't spread to lymph nodes or distant sites.**
- **Stage II: T3-4, N0, M0: The cancer has grown through the wall of the colon or rectum into the outermost layers (A) or nearby tissues (B). It has not yet spread to the nearby lymph nodes or distant sites.**
- **Stage IIIA-B: T1-4, N1, M0: The cancer has grown through the mucosa into the submucosa *or* it may also have grown into the muscularis propria (A), or through the wall of the colon or rectum *or* into other nearby tissues or organs (B) and it has spread to 1-3 nearby lymph nodes but not distant sites.**
- **Stage IIIC: Any T, N2, M0: The cancer can be any T but has spread to 4 or more nearby lymph nodes but not distant sites.**
- **Stage IV: Any T, Any N, M1: The cancer can be any T, any N, but has spread to distant sites such as the liver, lung, peritoneum (the membrane lining the abdominal cavity), or ovary.**

5 year survival by stage

Stage I	93%
Stage IIa	85%
Stage IIb	72%
Stage IIIa	83%
Stage IIIb	64%
Stage IIIc	44%
Stage IV	8%

JNCI 2004;96:1420

Stage at diagnosis: 1996-2003 SEER data



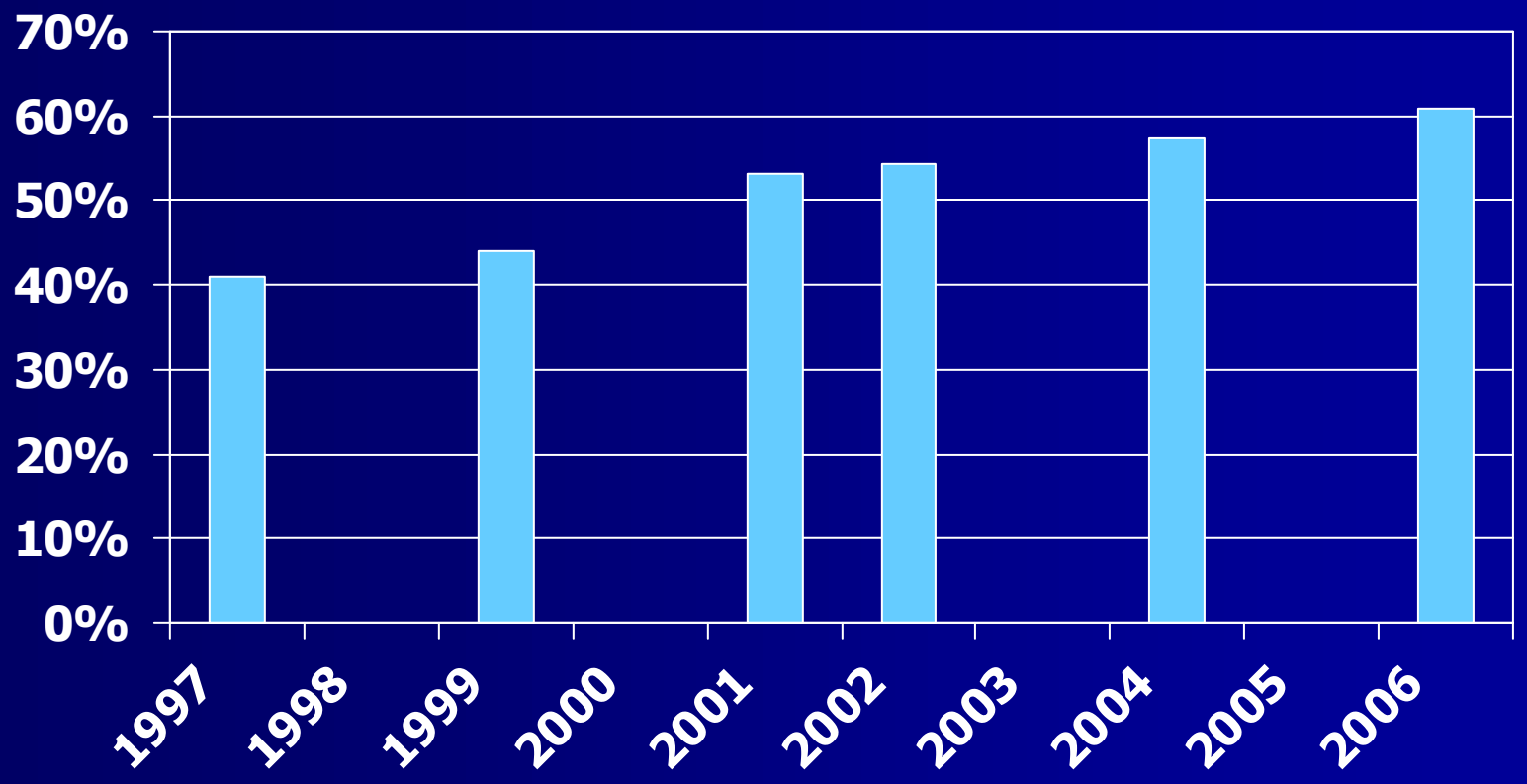
Stage at diagnosis improving over time

	1975-1979			1985-1989			1996-2003		
	All	White	Black	All	White	Black	All	White	Black
Percent localized	33%	33%	30%	38%	38%	33%	40%	40%	35%
Percent regional	37%	37%	35%	37%	37%	36%	37%	37%	35%
Percent distant	22%	22%	26%	19%	19%	24%	19%	18%	24%
Percent unstaged	8%	8%	9%	6%	6%	7%	4%	4%	6%

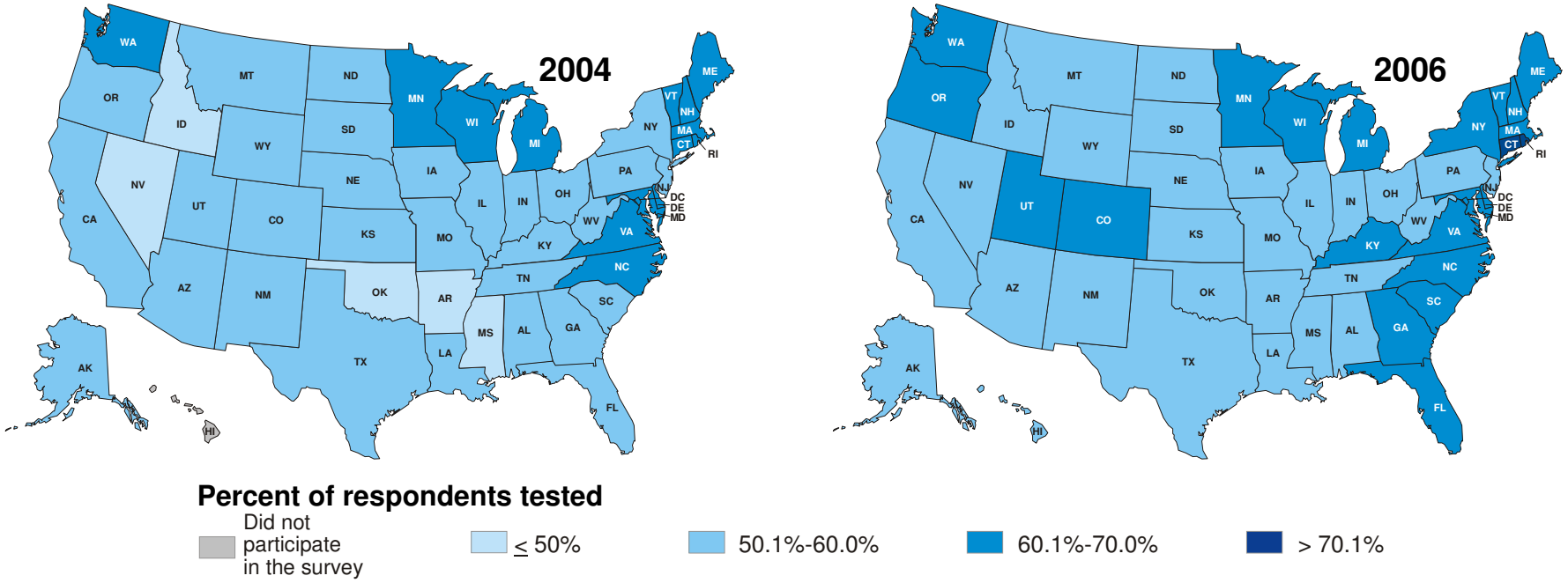
Colon cancer screening

- Several methods available:
  - Stool tests (guaiac, immunochemical, DNA)
  - Sigmoidoscopy
  - Colonoscopy
  - Radiological (barium enema, CT)
- Recent increase in screening rates mainly attributable to colonoscopy

BRFSS self-reported CRC screening: up-to-date any method

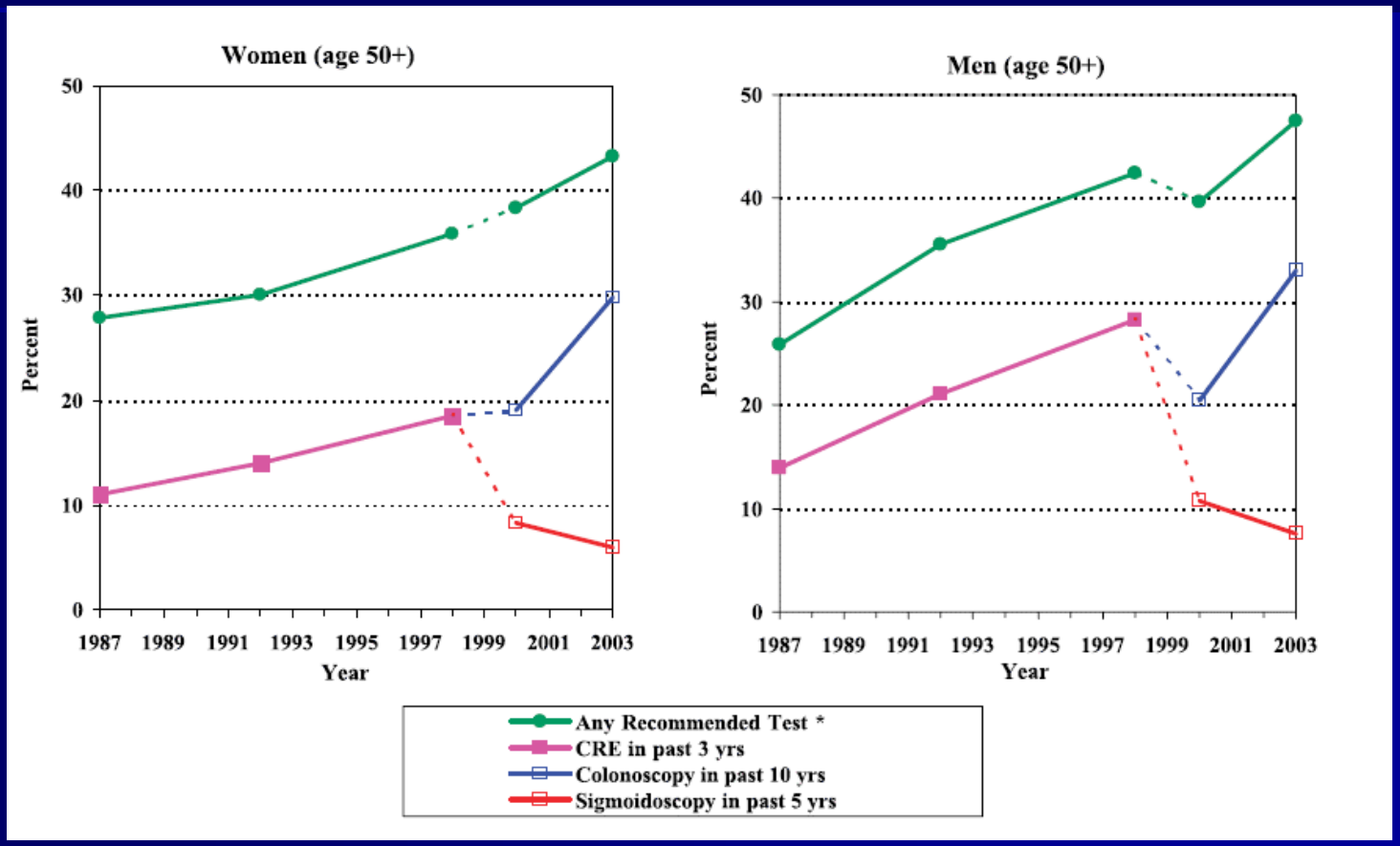


Percentage of adults aged ≥50 years who reported receiving a fecal occult blood test within past year and/or lower endoscopy within past 10 years by state -- Behavioral Risk Factor Surveillance System (BRFSS), United States, 2004 and 2006



Source: CDC, U.S., Behavioral Risk Factor Surveillance System

NHIS CRC screening data



Meissner et al Cancer Epidemiol Biomarkers Prev. 2006; 15:389-94

Factors associated with colon cancer screening (through 2002)

- Age > 65 and <85
- Educational attainment
- HMO membership
- Belief that cancer is preventable
- Absence of strong fear or fatalism
- Physician recommendation
- Having usual source of care
- Number of physician visits

Subramanian Preventive Medicine 2004;38: 536

Factors not consistently associated with screening

- Sex
- Race
- Marital status
- Income

Subramanian Preventive Medicine 2004;38: 536

Patient Factors Associated with Being Up-to-date: NHIS 2003

Risk factor	% Men	% Women
Age 50-64	41	39
Age > 65	56	48
Education < HS	32	37
College grad	55	48
Income < 20K	39	37
Income > 75K	52	48
Married	50	44
Unmarried	38	41

Meissner et al CEBP 2006; 15: 389

Patient Factors Associated with being up-to-date: NHIS 2003

Risk factor	% Men	% Women
Insurance	49	47
No insurance	17	17
Usual source of care	49	45
No usual source	12	15
Physician visits in last year		
0	16	10
1	32	30
2-5	53	44
6 or more	58	54

Meissner et al CEBP 2006; 15: 389

Conclusions

- Colorectal cancer remains a leading cause of cancer deaths in the US and world-wide
- Despite favorable biology for prevention and early detection, more than half of cases in US are detected beyond local stage
- Screening is an effective means of reducing incidence and mortality, but is underutilized
- Several factors contribute to under-utilization and can be targeted for interventions