



DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION



Projecting Test Need and Cost to Screen, Follow-Up and Provide Surveillance for Colorectal Cancer for the US Population

Laura Seeff MD

August 14, 2007

Division of Cancer Prevention and Control, CDC

Atlanta, GA USA

Projected test need and cost

In collaboration with:

◆ **CDC**

- **Laura Seeff**
- **Florence Tangka**

◆ **Battelle**

- **Diane Manninen**
- **Fred Dong**

◆ **Erasmus Medical Center, The Netherlands**

- **Marjolein van Ballegooijen**
- **Serdal Tunc**

◆ **Ann Zauber at Memorial Sloan –Kettering Cancer Center**

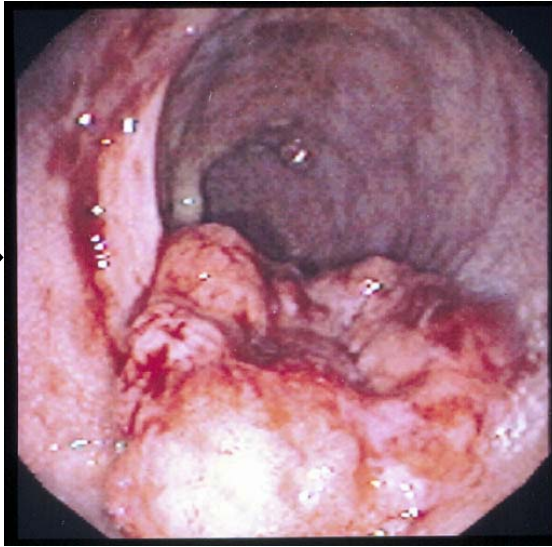
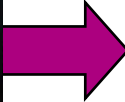
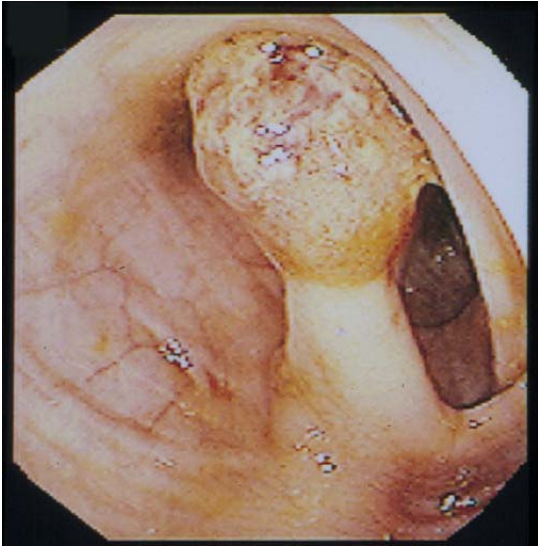
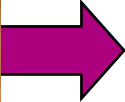
CAPACITY FOR SCREENING WITH ENDOSCOPY

Seeff LC, Manninen D, Dong F, Chattapodhyay, Nadel MR, Tangka F, Molinari N. Is there endoscopic capacity to provide colorectal cancer screening to the unscreened population in the United States? Gastroenterology 2004; 127: 1661-1669.

Seeff LC, Richards TB, Shapiro JA, et al. How many endoscopies are performed for colorectal cancer screening? Results from CDC's Survey of Endoscopic Capacity. Gastroenterology 2004; 127: 1670-1677.



Adenoma to Carcinoma Pathway



**Normal
Epithelium**

**Small
Adenoma**

**Advanced
Adenoma**

**Colorectal
Cancer**



Purpose

- ◆ What is current utilization of endoscopic tests for CRC screening?
- ◆ What is the size of the unscreened population?
- ◆ Are there enough available tests if screening rates increase?
- ◆ Who is performing endoscopic CRC screening exams?

Colorectal Cancer Capacity Assessment

- ◆ Estimate current supply of lower endoscopies
 - Survey of Endoscopic Capacity (SECAP)
- ◆ Estimate demand for lower endoscopies
 - Unmet need forecasting model
- ◆ Capacity assessment
 - Comparison of supply to demand



SUPPLY

Survey of Endoscopic Capacity (SECAP)

SECAP Methods: Survey Variables

- ◆ Current weekly procedure volume
 - sigmoidoscopy and colonoscopy
- ◆ Potential maximum procedure volume
- ◆ Waiting time for procedure to be scheduled
- ◆ Room time
- ◆ Measures to increase supply if demand increases
- ◆ Action taken if polyp found
- ◆ Role of non-physician endoscopists

Annual Colonoscopies, All Specialties, United States, 2002 (in millions)

	Colonoscopy (95% CI)
Current Volume	14.2 (12.1-16.4)
Potential Volume	22.4 (20.1-24.8)
Available Capacity	8.2

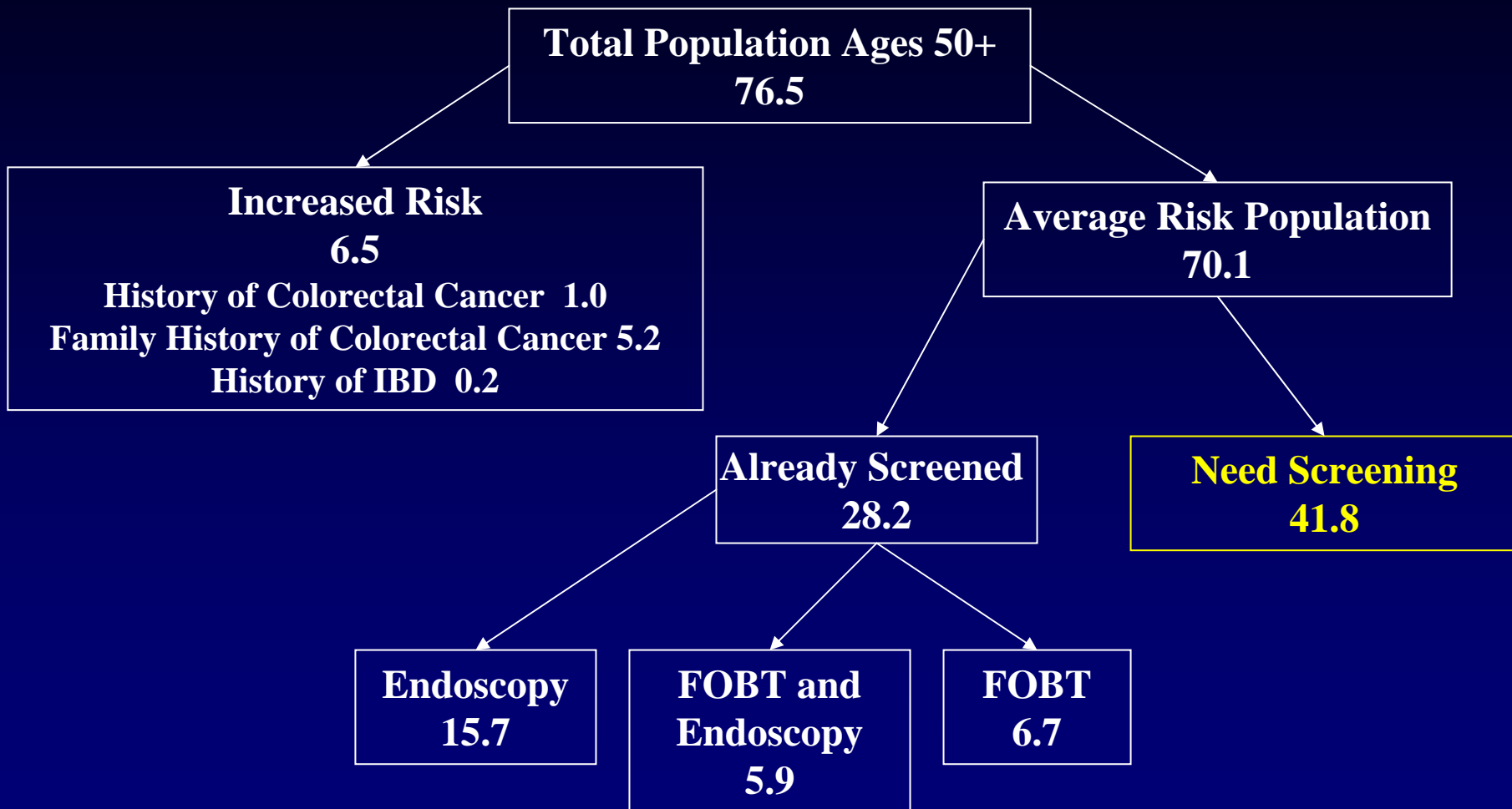
Assuming 46-week working year



DEMAND

Forecasting model

Number of People requiring CRC Screening and Follow-up Procedures (in millions)

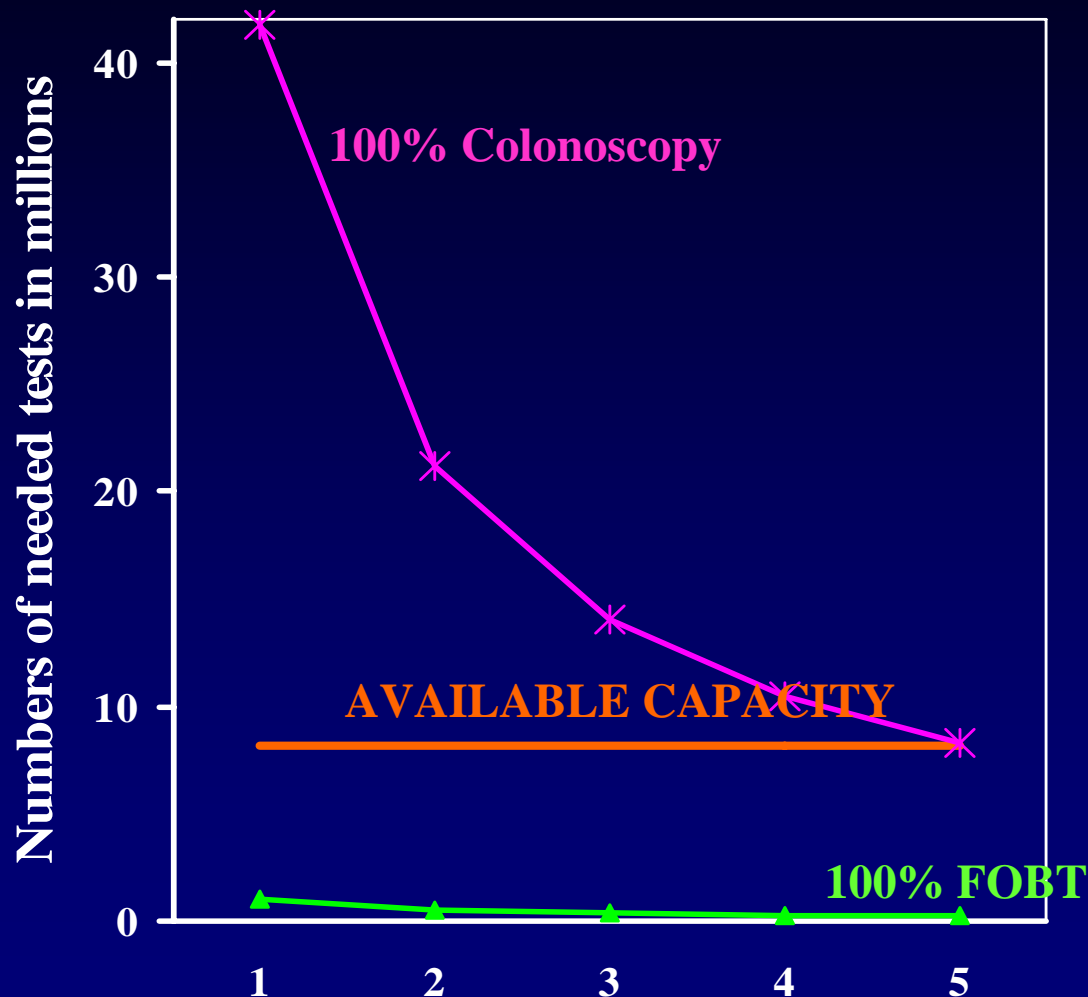


Number of Tests Needed in Various Screening Scenarios

◆ Screening Programs

- 100% FOBT, follow-up positive with colonoscopy
- 100% colonoscopy

Available colonoscopic capacity compared to number of tests needed over multiple years (in millions)



Years over which tests distributed
SAFER • HEALTHIER • PEOPLE™

Need compared to available capacity, New York City and Long Island, 2004

	Colonoscopy (95% CI)
Bronx	-65,879
Kings/Richmond	-40,618
Manhattan	+149,925
Queens	-44,157
Long Island	+70,202

Assuming 46-week working year

SAFER • HEALTHIER • PEOPLE™

Conclusions, Original Capacity Assessment

- ◆ **Currently not endoscopic capacity to screen US population but**
 - **Dynamic area which needs to be re-estimated**
 - **Capacity is uneven--local assessment helpful**

Limitations, Original Capacity Assessment

- ◆ **Projection of test availability did not take into account**
 - **Tests needed for repeat screening, diagnostic tests or surveillance**
 - **Primary colonoscopy screening in an FOBT program**
 - **Growth of older US population**
 - **Cost to screen US population**

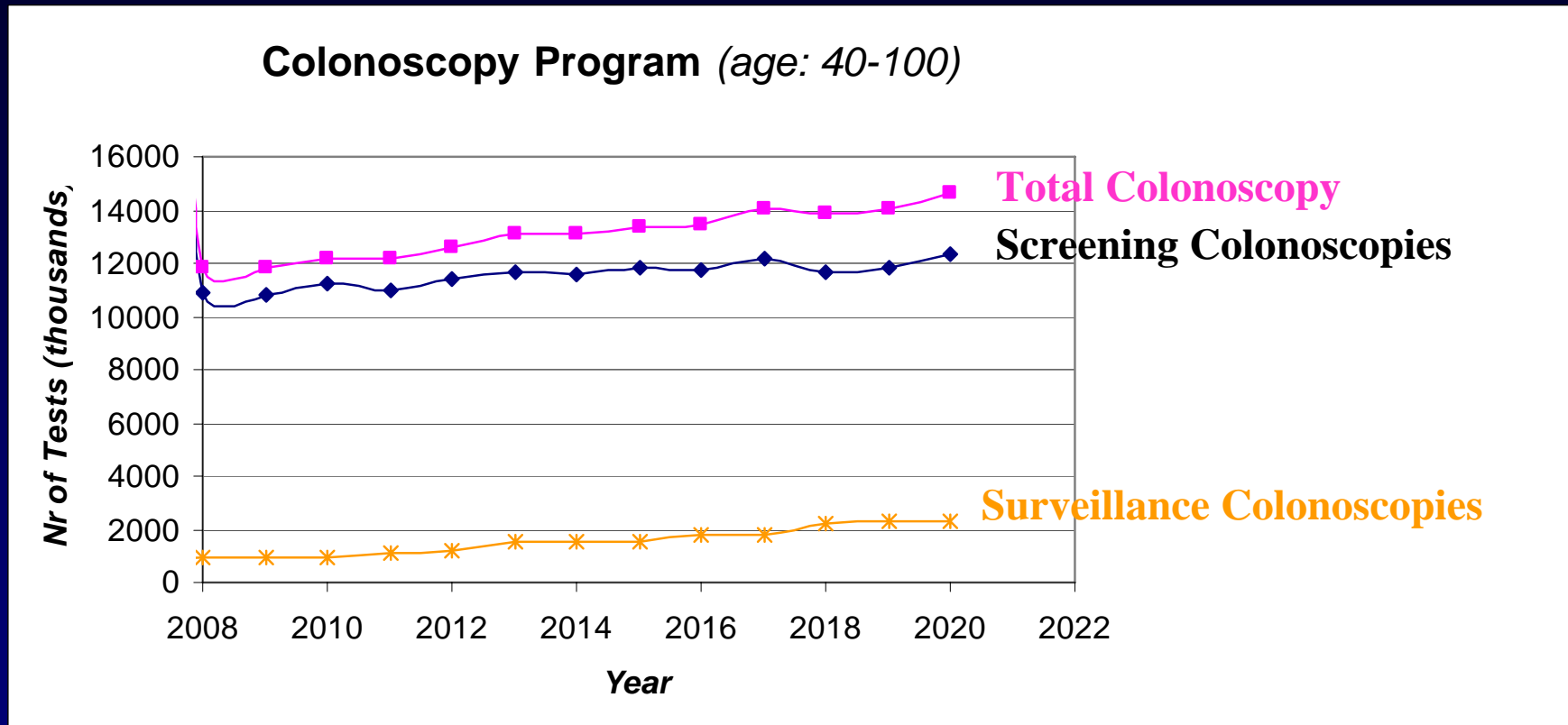
Updated Capacity Assessment

- ◆ **Original estimates are for “catch-up” screening, ie, how many tests are needed to screen the unscreened population once**
- ◆ **Updated estimate to assess test need and cost to sustain screening, follow-up and re-screening over 10-15 years**
- ◆ **Will link historical with projected future screening**
- ◆ **Will address limitations of original capacity assessment**
 - **Will account for re-screening, diagnostic testing and surveillance**
 - **Will measure primary colonoscopy screening in an FOBT program**
 - **Can account for growth of US population**
 - **Will measure cost to screen**

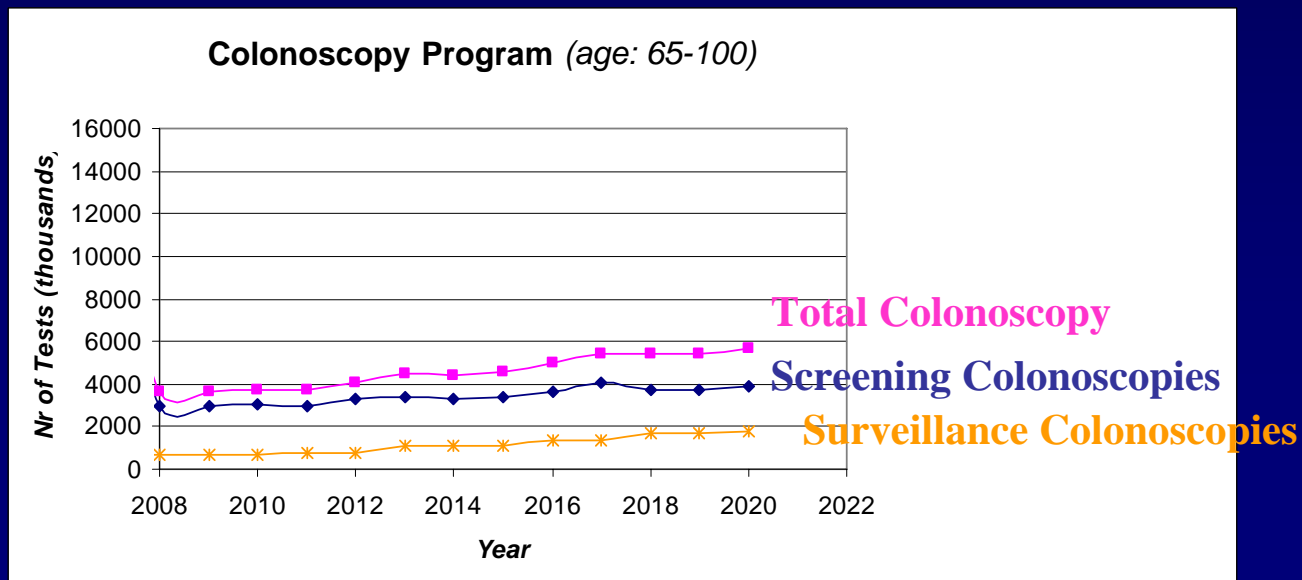
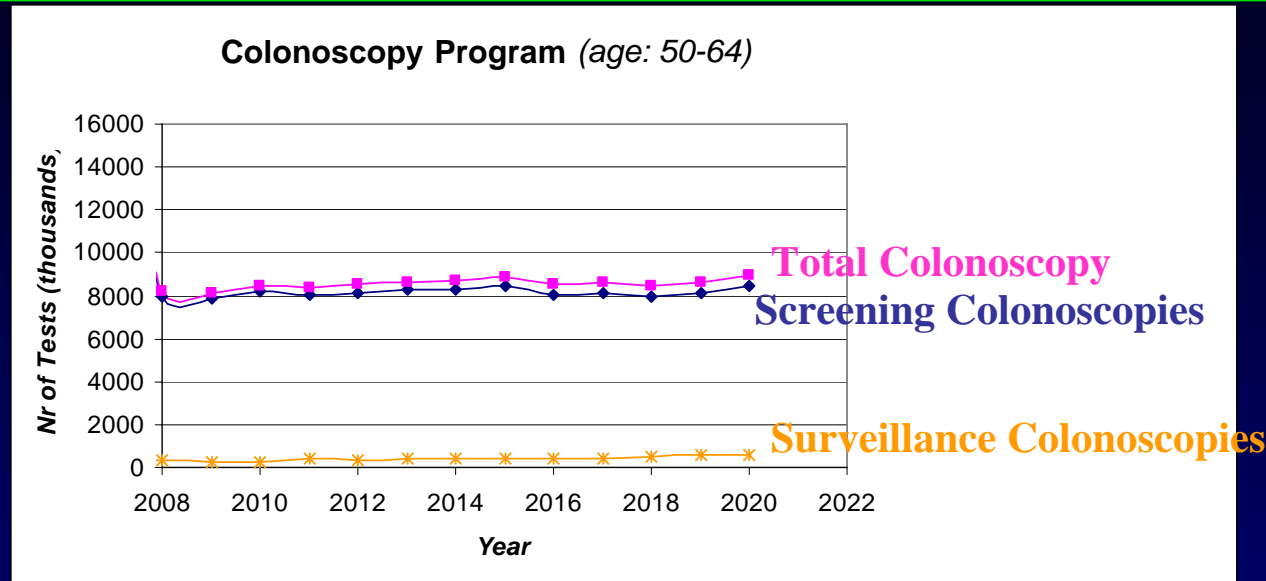
MISCAN-Colon Model

- ◆ **MISCAN microsimulation model was developed at Erasmus Medical Center, The Netherlands**
- ◆ **Used to evaluate breast, cervical, colorectal, and prostate cancer screening programs**
- ◆ **MISCAN-Colon was developed in collaboration with NCI and CRC experts to assess the effect of different interventions on CRC**
- ◆ **Model simulates behavior of CRC in a population, first without and then with an intervention**

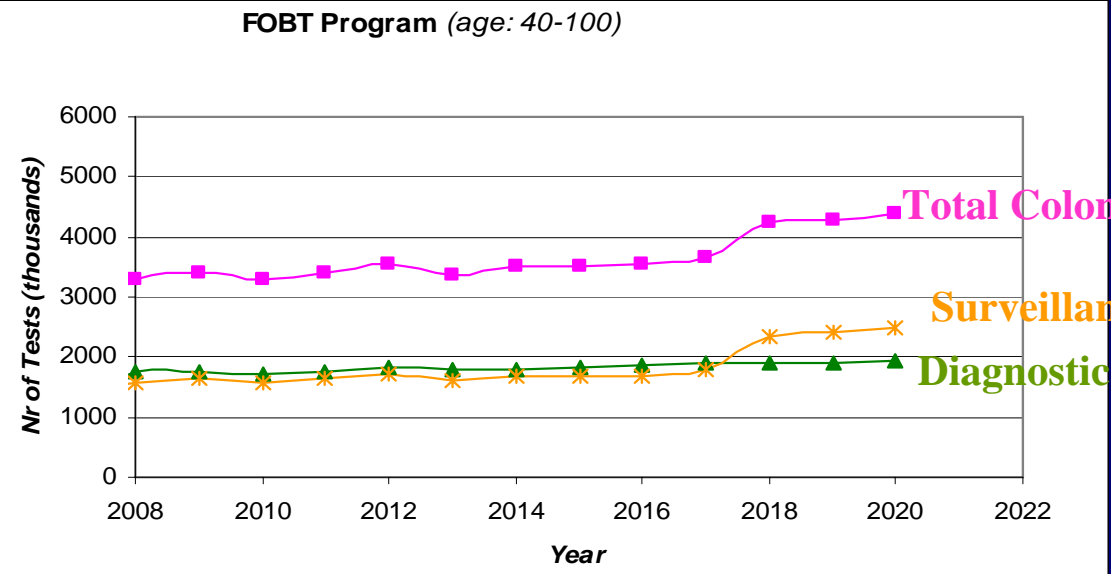
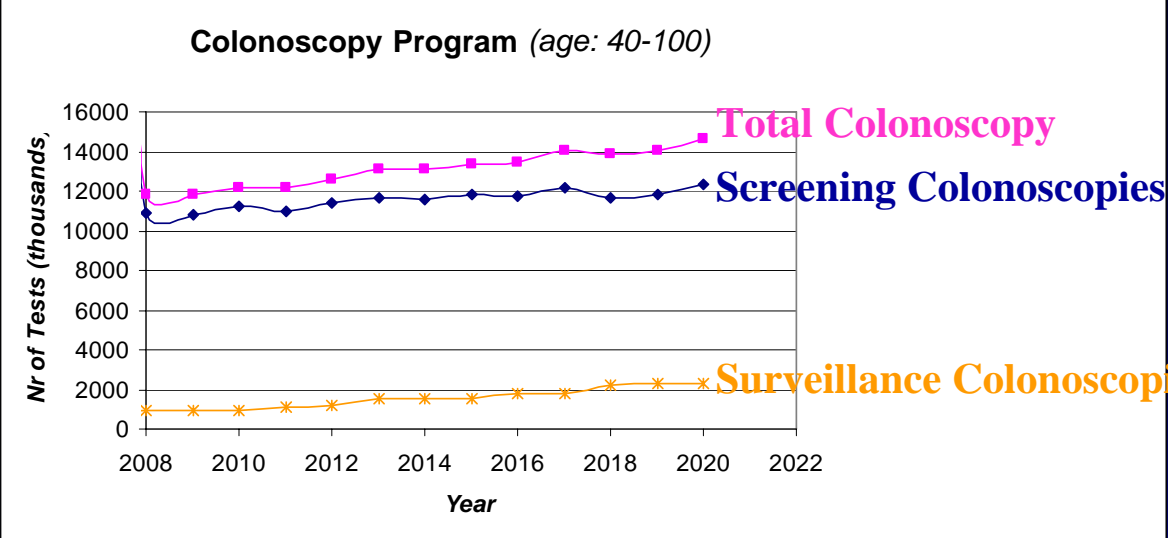
Preliminary Estimates of Colonoscopies Needed in a Colonoscopy Screening Program, ages 40-100



Preliminary Estimates of Colonoscopies Needed in a Colonoscopy Screening Program, ages 50-64 vs 65-100



Preliminary Estimates of Colonoscopies Needed in a Colonoscopy vs FOBT Screening Program, ages 40-100



Summary

- ◆ **Final study results will be used for planning purposes**
 - **Compare test need by indication**
 - **Compare test need by age groups**
 - **Compare test need by program type**
 - **Assign cost parameters to each of the above**

SAFER • HEALTHIER • PEOPLE™



Planned MISCAN model output: Number of Tests Needed Over 10-15 years

◆ Screening Programs

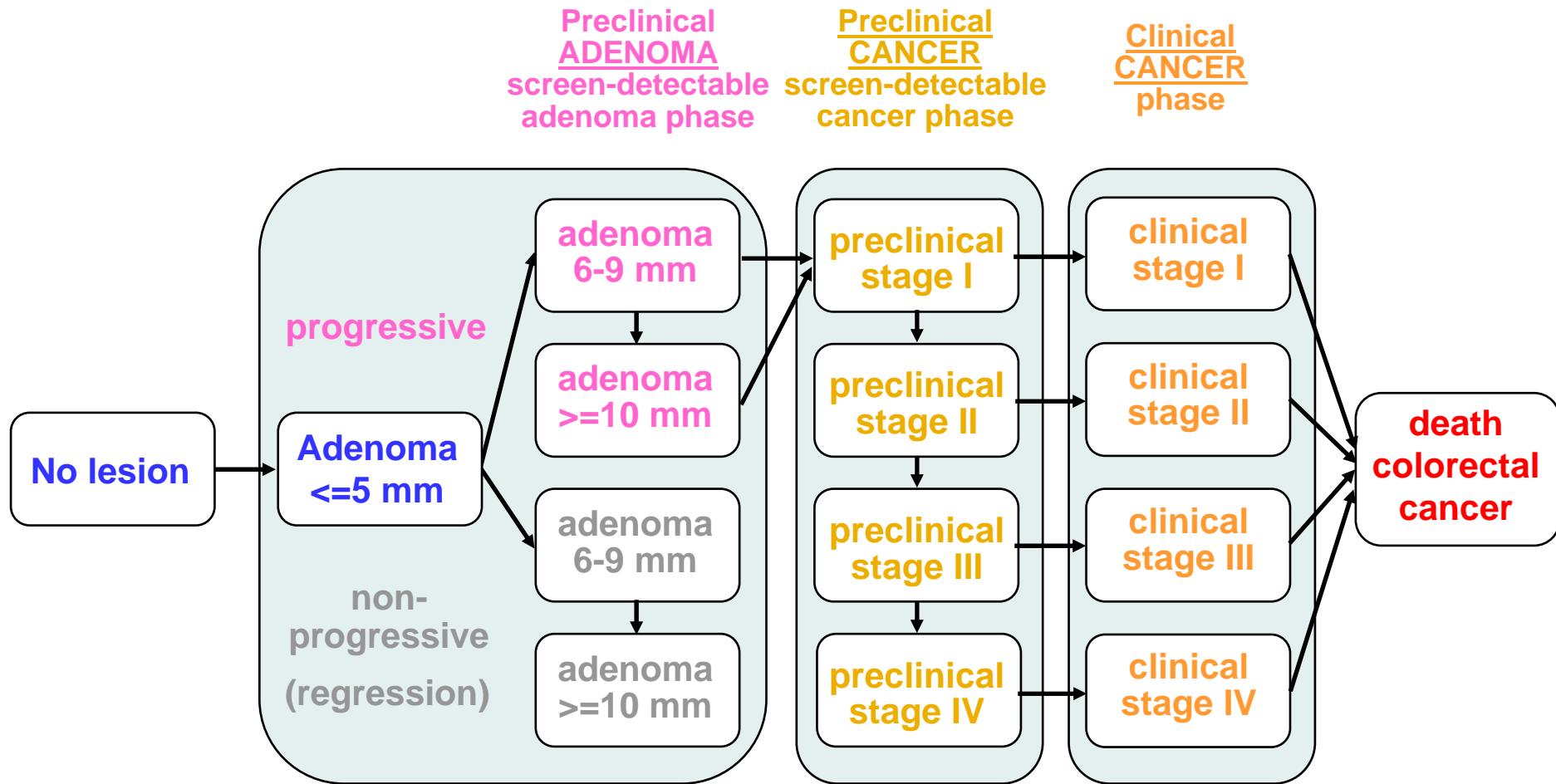
- 100% FOBT, follow-up positive with colonoscopy
 - ◆ Guaiac-based and immunochemical
- 100% colonoscopy

◆ Tests needed for follow-up to positives, re-screens and surveillance, in different program scenarios

◆ Costs to screen

- Clinical costs
- Program costs

Natural History of Colorectal Cancer



Datasources:

Adenoma
Autopsy studies
Colonoscopy studies

Preclinical Cancer
Dwell time

Clinical Cancer
SEER Incidence

Death
US Mortality