

# Breast cancer under-treatment in older women increases risk of breast cancer death

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for

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# Older women

- ◆ Breast cancer disproportionately affects older women
  - 61 years is the median age of breast cancer diagnosis
- ◆ Gains in life expectancy have occurred at the end of life for all older women
  - Average life expectancy of a 75 year old woman ~12 years (17 if healthy)
  - 85 year old woman is ~5.9 years (9.6 if healthy)
  - Not until 95 does life expectancy approach <5 years
- ◆ Older women have longer periods at risk for recurrence and breast cancer mortality

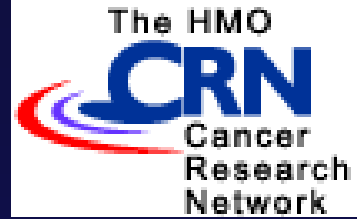
# Breast cancer treatment

- ◆ Clinical trials offer gold standards for clinical guidelines
- ◆ Older women are underrepresented in clinical trials
  - Less likely to receive standard primary therapy
    - Radiation therapy
    - Chemotherapy
    - Hormonal therapy
- ◆ Must rely on observational studies for clinical impact of less than definitive primary therapy in older women

# Breast cancer mortality

- ◆ Declines in breast cancer mortality in recent years
  - Limited to women <70 years
  - Stable for 70-79 years
  - Increasing for 80+ years

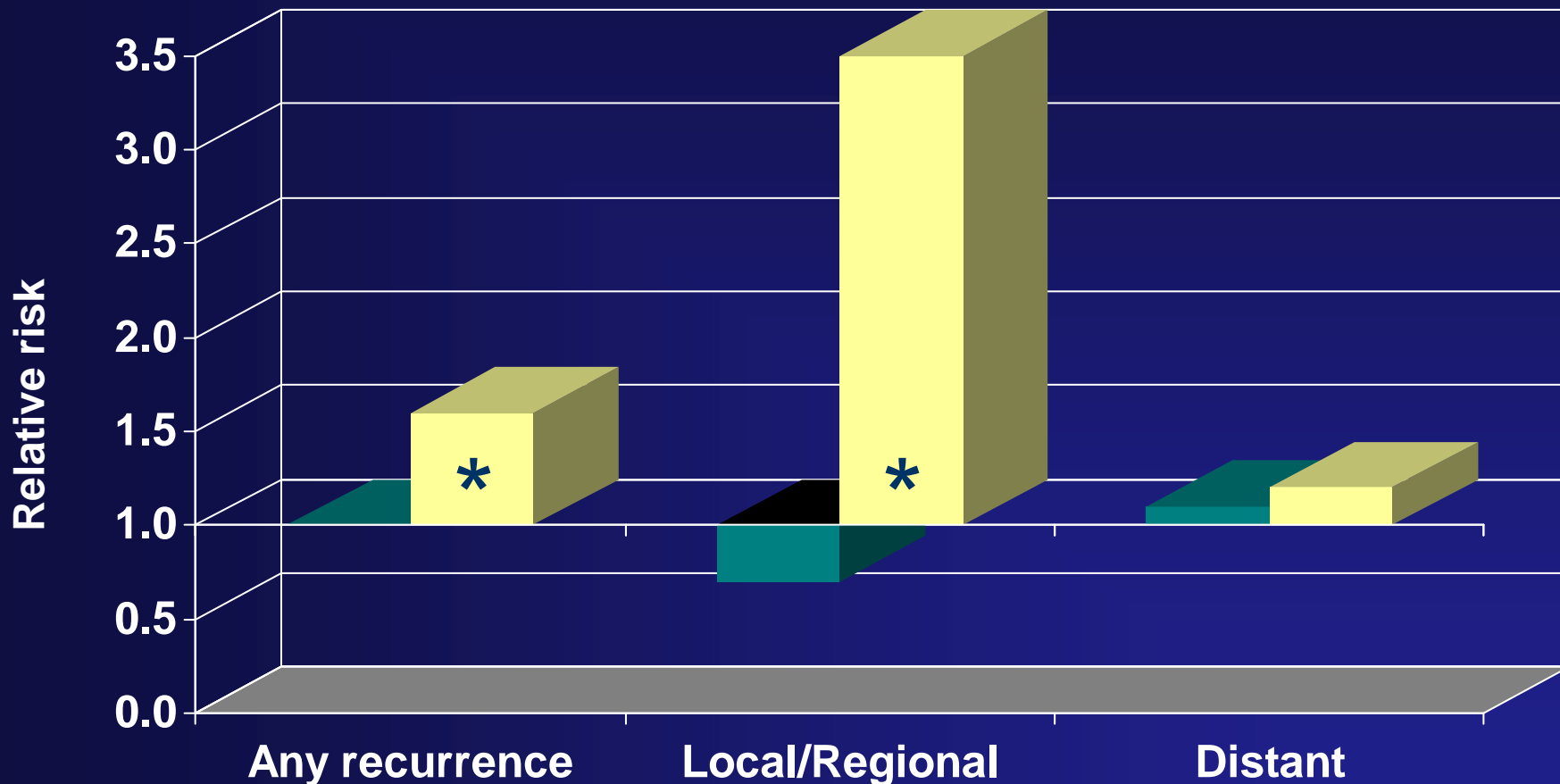
# Purpose



To determine whether primary breast cancer therapy impacts risk of dying from breast cancer among older women with access to health care

# Risk of recurrence relative to mastectomy

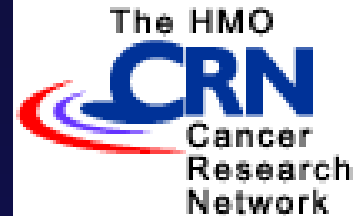
■ BCS + RT ■ BCS only



Adjusted for: age, race, Charlson comorbidity, tumor size, grade, nodal involvement, hormone receptor positivity. \* $p < 0.05$

Geiger et al. Cancer 2007;109:966–74

# BOW Study



- ◆ Breast Cancer Treatment Effectiveness in Older Women
  - PI: Rebecca Silliman, Boston University
- ◆ Prospective cohort study conducted within the NCI funded Cancer Research Network at 6 integrated healthcare delivery systems:
  - Group Health, WA
  - Kaiser Permanente Southern CA
  - Lovelace Health Systems, NM
  - Henry Ford, MI
  - HealthPartners, NM
  - Fallon Clinic, MA

# Study Design

- ◆ 1,837 Women aged  $\geq 65$  diagnosed with incident early stage (I/II) breast cancer between 1/1/1990 – 12/31/1994
- ◆ Data sources :
  - Automated administrative databases
  - Medical record review
    - Abstractors trained by 1 person
    - Automated data collection system
  - Tumor registries
- ◆ Data collected included:
  - Demographics
  - Tumor characteristics
  - Treatment
  - Comorbidity

## Exposure – Primary therapy

- ◆ Medical record review
  - Mastectomy
  - BCS + Radiation therapy
  - BCS only

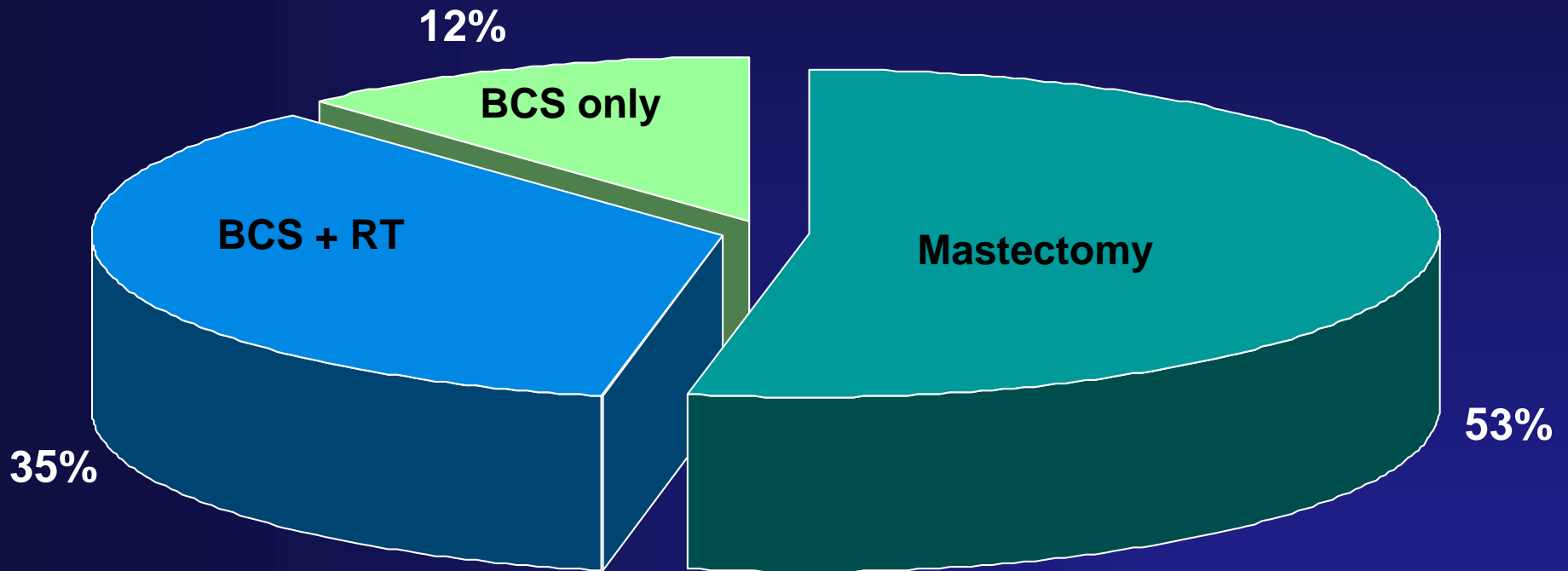
## Outcome: Breast cancer specific mortality

- ◆ National Death Index Plus
- ◆ Cause of death = Breast cancer if
  - listed in the underlying cause of death field or any line of Part I of the death certificate

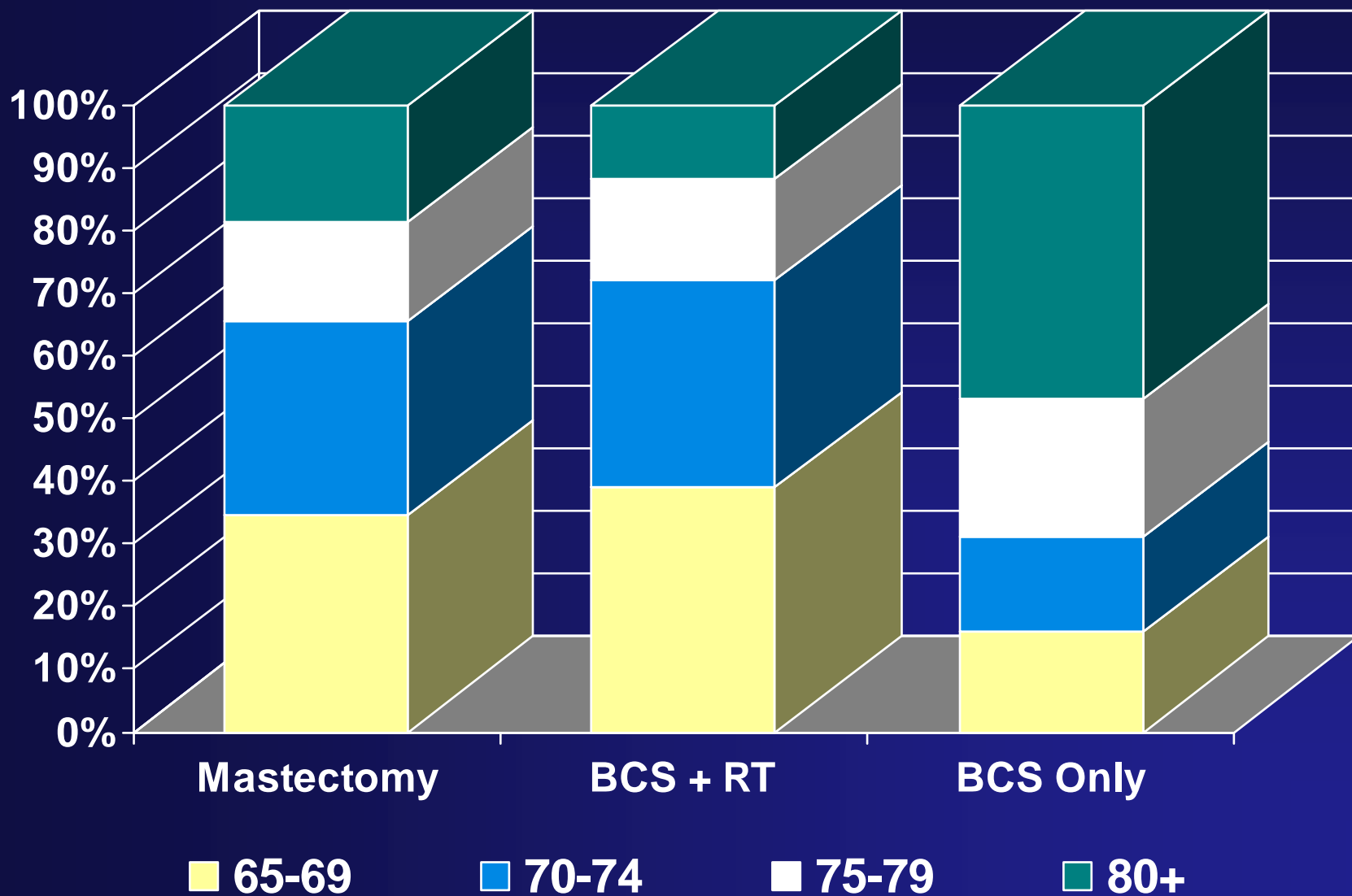
# Analyses

- ◆ Followed women from primary therapy to:
  - Death (all cause & breast cancer specific)
  - Disenrollment from health plan
  - 10 years
- ◆ Cox proportional hazards multivariable models adjusted for: study site, age, race, comorbidity, tumor size, number of positive nodes, receptor status, and histologic grade

# Primary therapy



# Age distribution by type of primary therapy

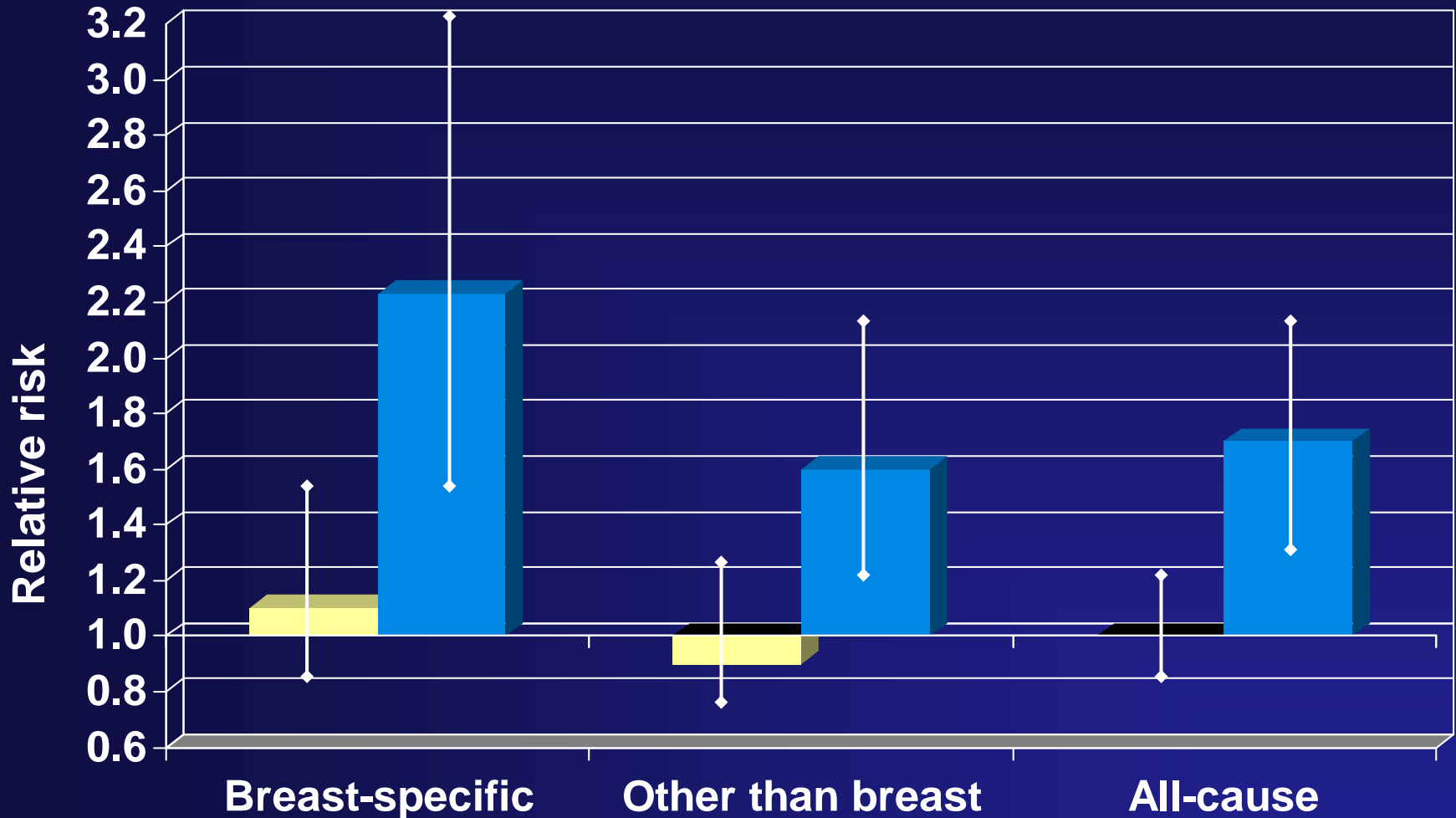


# Crude death rates

	Patients (N)	Person years	Breast Cancer Mortality		Other Than Breast Cancer Mortality		All-cause Mortality	
			Deaths (N)	Events per 1000 person years	Deaths (N)	Events per 1000 person years	Deaths (N)	Events per 1000 person years
<b>TOTAL</b>	1837	14,001	288	21	442	32	730	52
<b>Mastectomy</b>	977	7,313	175	24	223	30	398	54
<b>BCS + RT</b>	639	5,276	67	<b>13</b>	129	24	196	<b>37</b>
<b>BCS only</b>	221	1,413	46	33	90	<b>64</b>	136	<b>96</b>

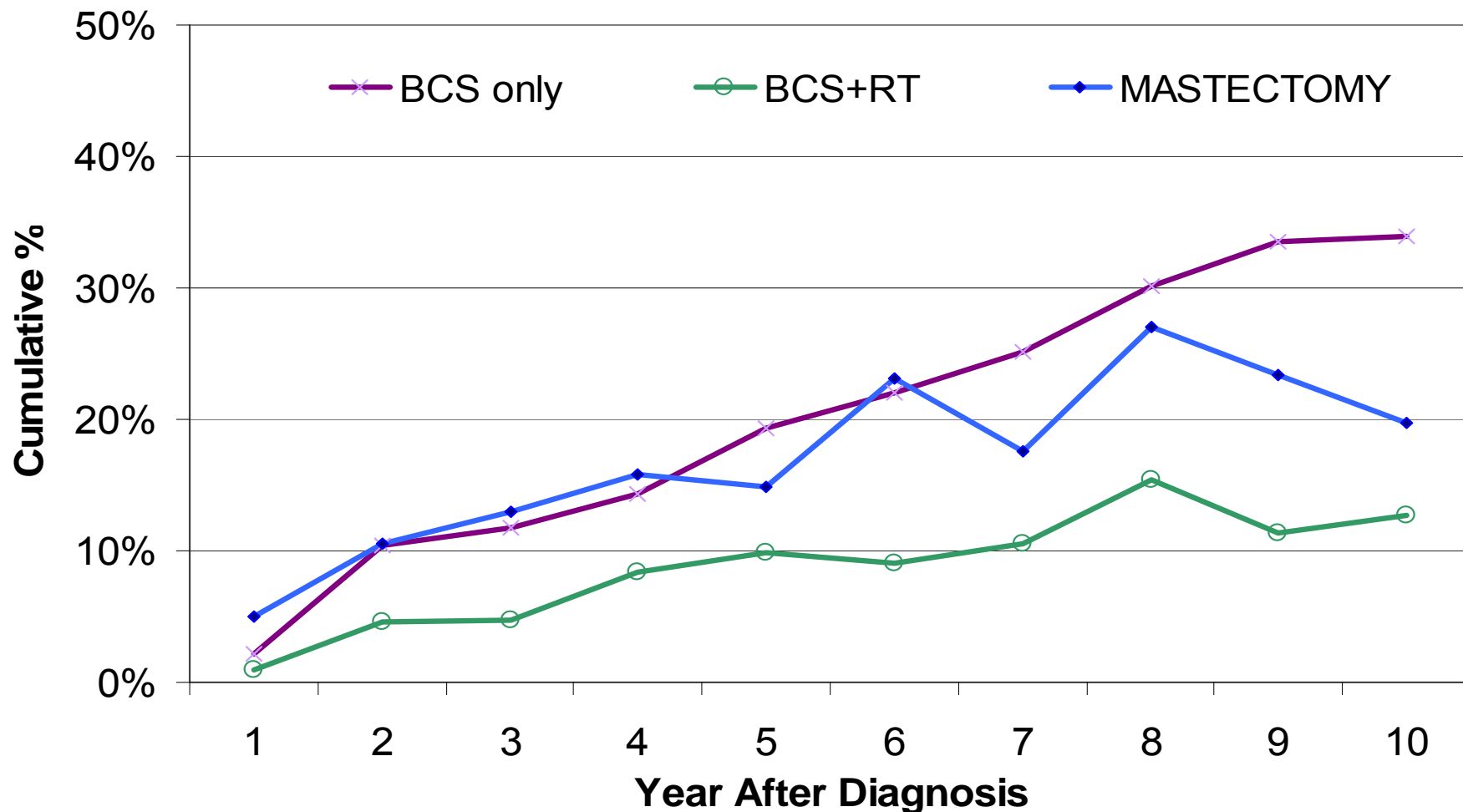
# Adjusted\* risk of death relative to mastectomy

■ BCS + RT      ■ BCS



\*Adjusted for: study site, age, race, comorbidity, tumor size, number of positive nodes, receptor status, and histologic grade

# Adjusted\* Risk of Death from Breast Cancer by Primary Therapy



\*Adjusted for: study site, age, race, comorbidity, tumor size, number of positive nodes, receptor status, and histologic grade

# Methods for tamoxifen sub-analysis

- ◆ Limited to chemotherapy naïve women with ER+ or PR+ tumors

## Exposure – Tamoxifen

- ◆ Medical record review\*
  - Tamoxifen 1<sup>st</sup> fill (initiation)
  - 1<sup>st</sup> mention of tamoxifen discontinuation (cessation)

\*93% concordance with electronic pharmacy fill data

## Outcome: Breast cancer specific mortality

- ◆ National Death Index Plus
- ◆ Cause of death = Breast cancer if
  - listed in the underlying cause of death field or any line of Part I of the death certificate

# Tamoxifen exposure

- ◆ Time dependent to account for differing lengths of follow-up and eliminate confounding by duration of enrollment/follow-up categorized:
  - < 1 year
  - 1-1.9 years
  - 2-4.9 years
  - 5+ years

# Adjusted\* risk of death among women with hormone receptor positive tumors relative to tamoxifen therapy for 5+ years

Tamoxifen	Breast Cancer Mortality		Other Than Breast Cancer Mortality		All-cause Mortality	
	HR	95% CI	HR	95% CI	HR	95% CI
< 1 year	6.7	3.3, 13.7	2.0	1.2, 3.2	2.6	1.8, 3.8
1–2 years	4.3	2.0, 9.5	1.9	1.1, 3.5	2.3	1.4, 3.5
2–5 years	1.3	0.7, 2.4	0.9	0.6, 1.4	1.1	0.8, 1.5
≥ 5 years	Ref		Ref		Ref	

\*Adjusted for: study site, age, race, comorbidity, tumor size, number positive nodes, receptor status, histologic grade and patient-level differences in follow-up time

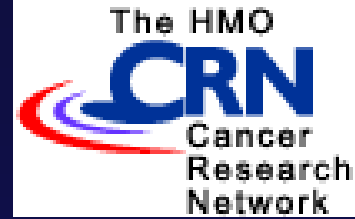
# Conclusions

- ◆ Older women receiving BCS alone have higher rates of breast cancer death than those receiving BCS +RT or mastectomy
- ◆ Survival benefits from tamoxifen increase with increasing duration of treatment

# Clinical implications

- ◆ Undertreating older women with breast cancer leads to more breast-cancer mortality
- ◆ Multi-dimensional factors contribute to undertreatment of breast cancer in older women:
  - Physician
  - Health system
  - Patient factors
- ◆ Work to increase participation of older women in clinical trials

# The BOW Study Team



## ◆ Boston University

- Rebecca Silliman, PI
- Timothy Lash
- Soe Soe Thwinn
- Marianne Prout

## ◆ Fallon Clinic

- Terry Field

## ◆ Group Health

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