# The Science and "Nonscience" About Breast Cancer Screening: Implications for the Development of Screening Guidelines

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# DISCLOSURES

Daniel B. Kopans, M.D.

1. 40 years in Radiology (Imaging)
2. 35 years defending access for women to breast cancer screening

# BREAST CANCER SCREENING

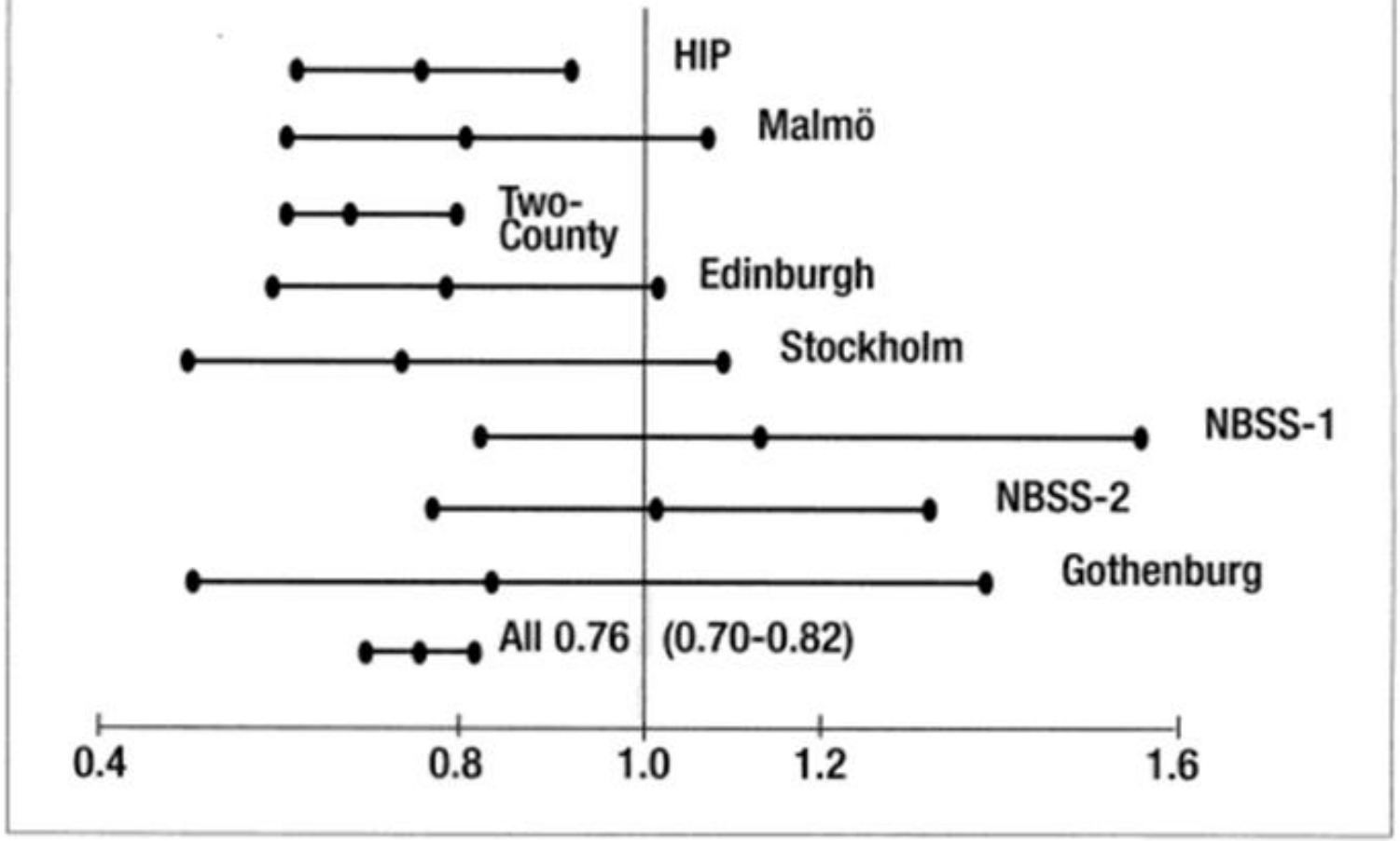
Despite the fact that:

1. Randomized, controlled trials have, unequivocally, shown a statistically significant mortality reduction for screening beginning at the age of 40
2. When screening is introduced into general populations the death rate from breast cancer declines –

efforts continue to try to limit access and discourage women from participating in screening

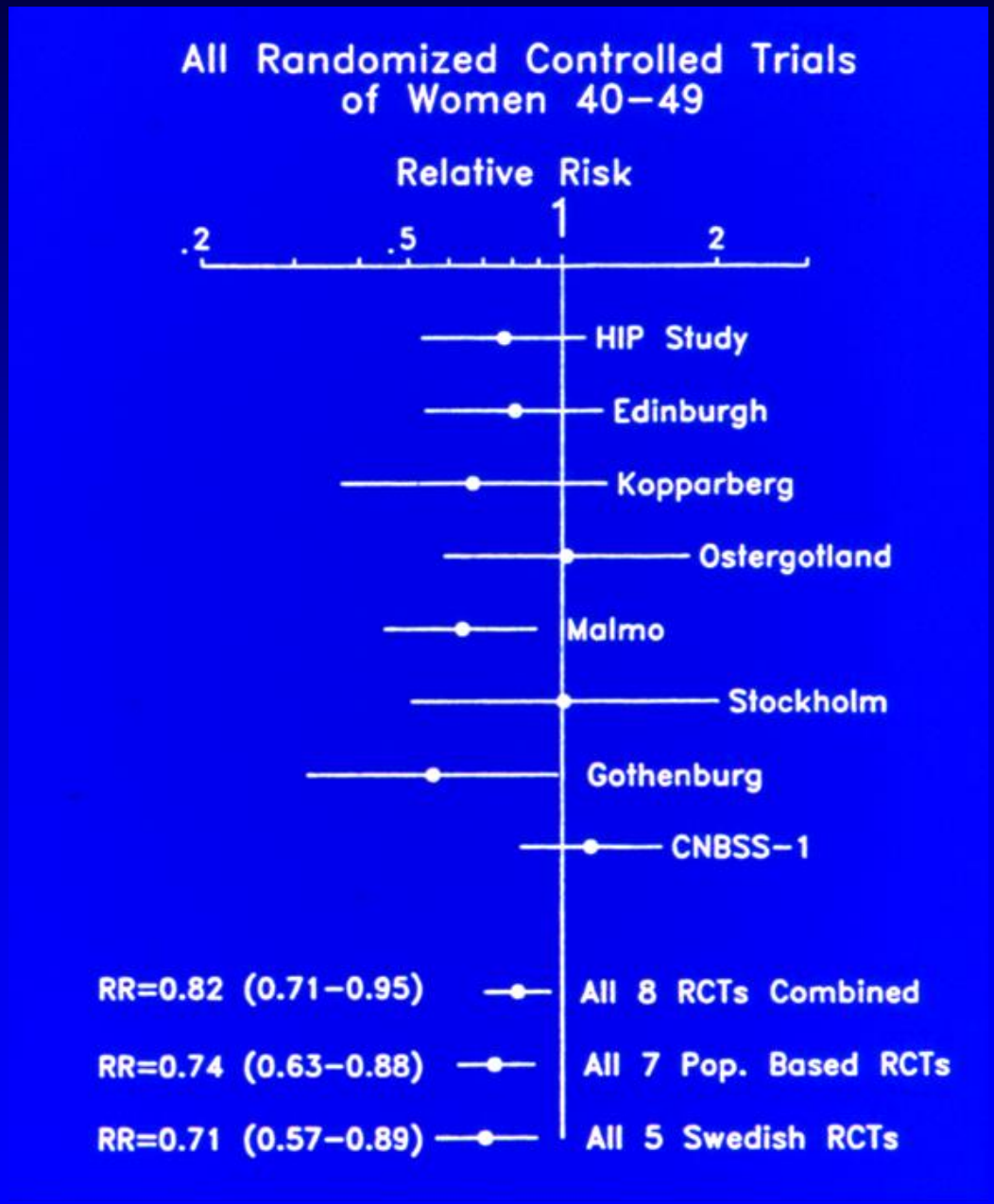
FIGURE **1**

Relative Rate of Breast Cancer Death in the Eight Randomized Trials of Breast Cancer Screening

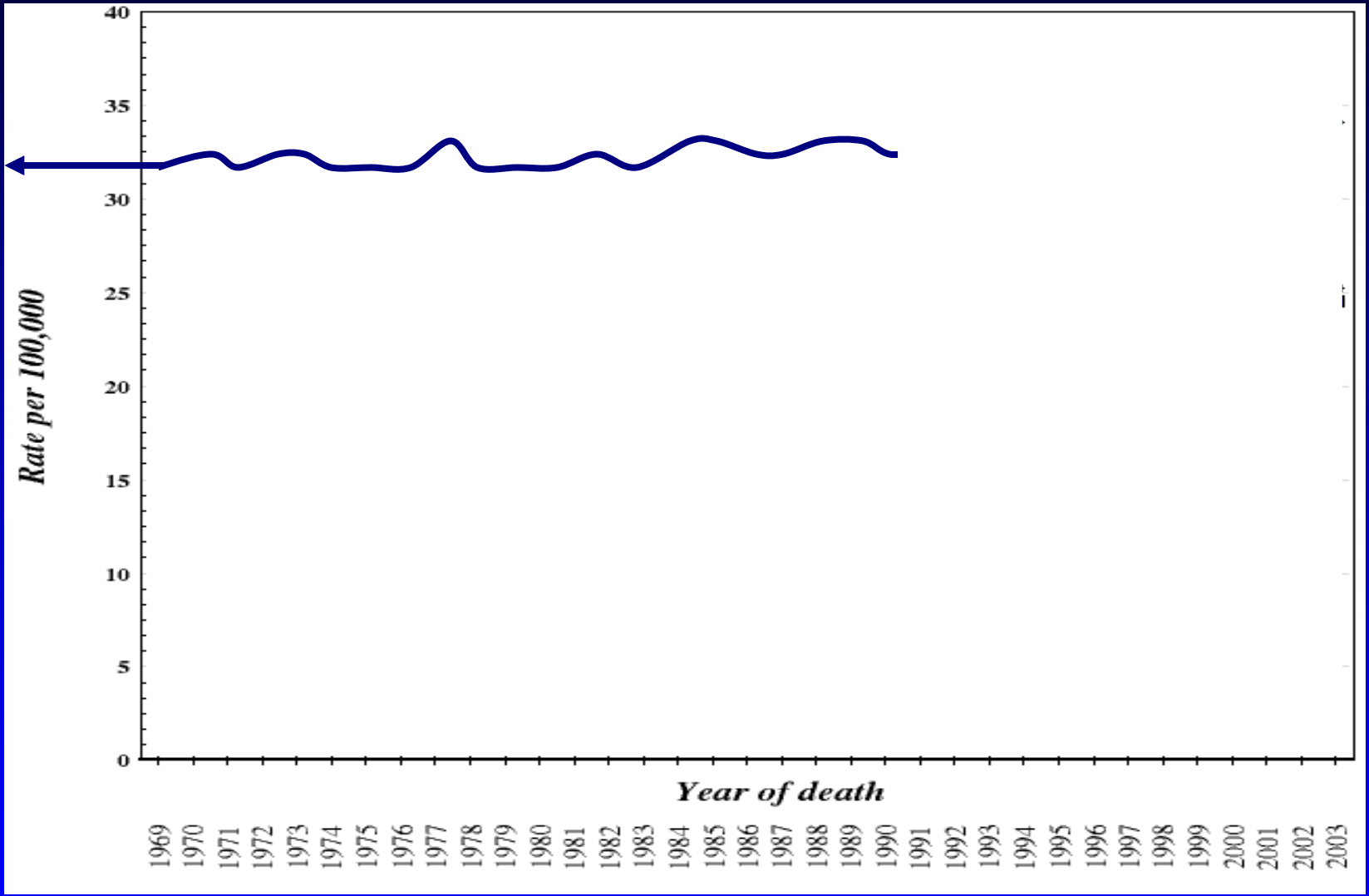


# SCREENING FOR WOMEN AGES 40-49

Although the RCT were never intended to be analyzed by age groups, the data show a benefit from screening women ages 40-49. This was provided to, and ignored by the Panel at the 1997 Consensus Development Conference



# Breast Cancer Death Rate 1940-1990




Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Public-Use With State, Total U.S. (1969-2003), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2006. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

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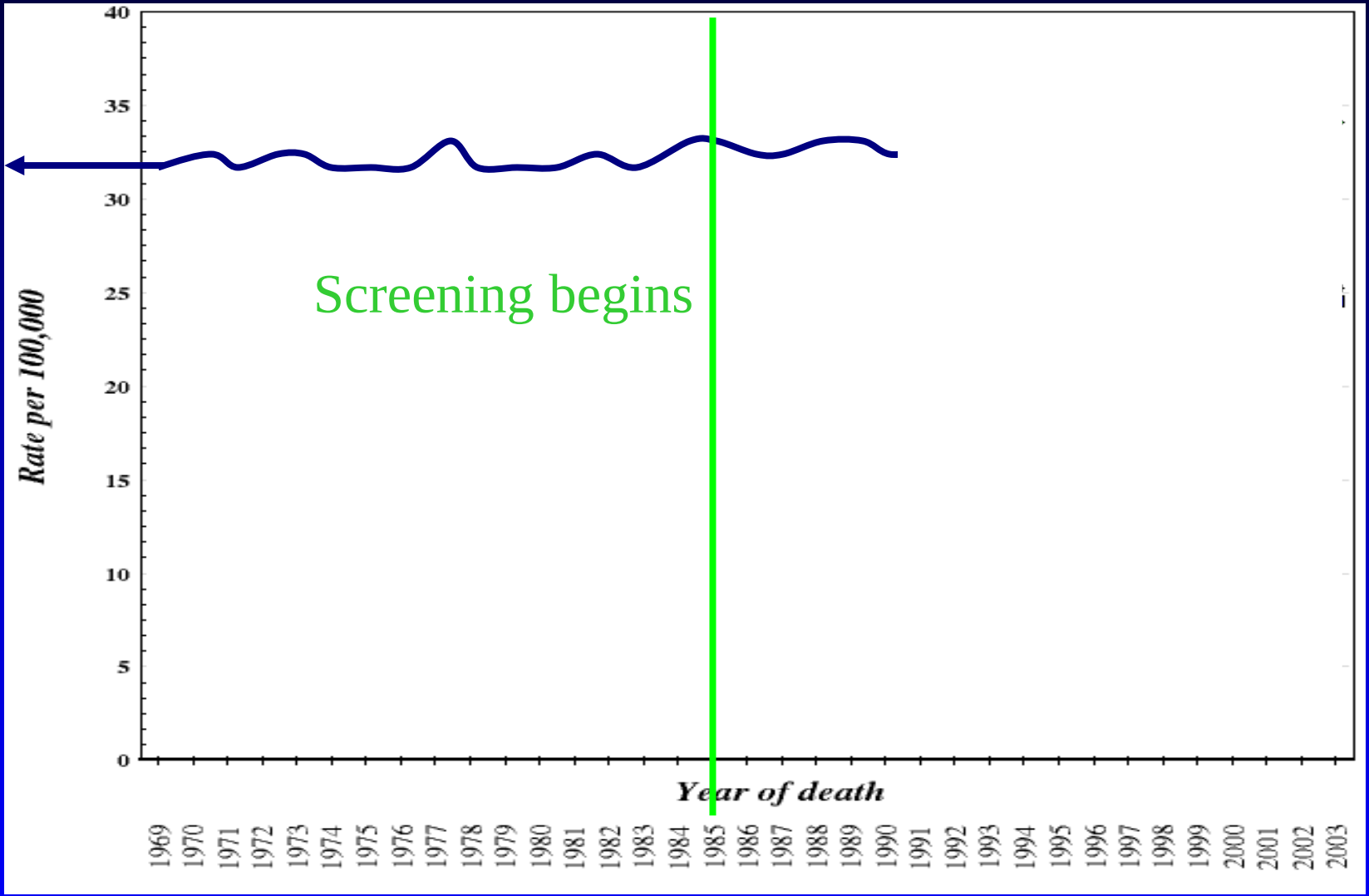


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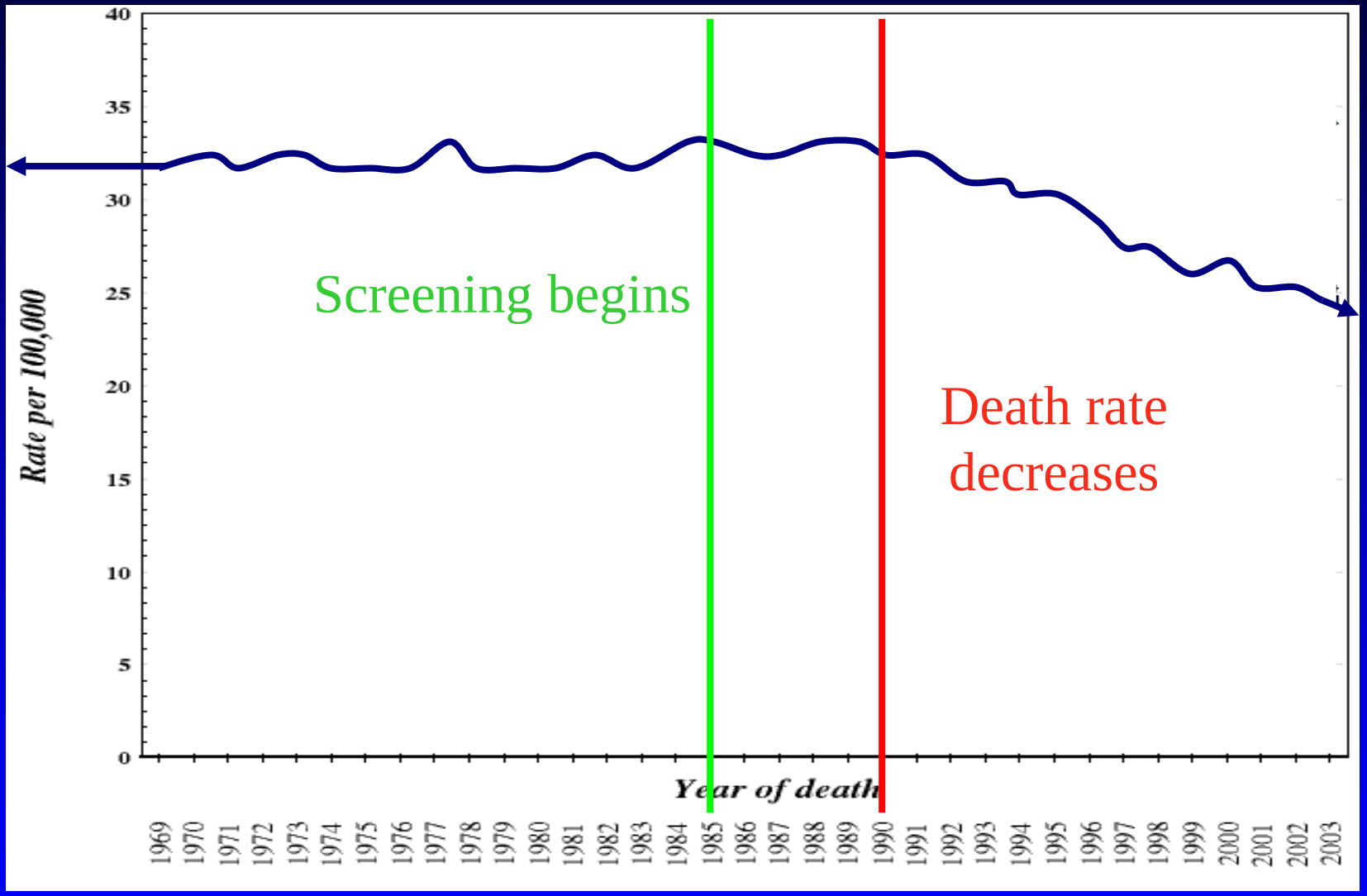
# Breast Cancer Death Rate 1940 -2010

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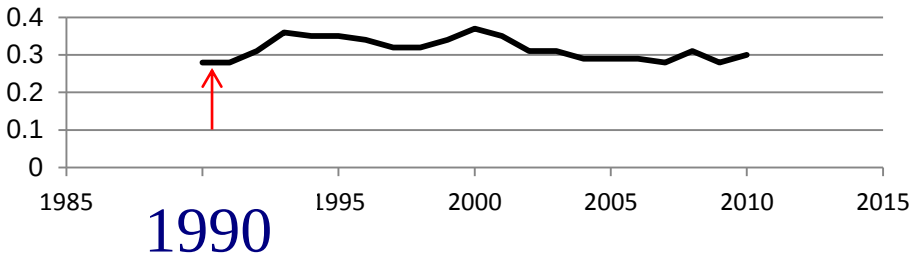
# FAILURE ANALYSIS

In the Harvard Medical School teaching hospitals 71% of the breast cancer deaths were among the 20% of women who were not participating in screening.

(Webb, et al. A Failure Analysis of Invasive Breast Cancer Most Deaths From Disease Occur in Women Not Regularly Screened Cancer 2013. )

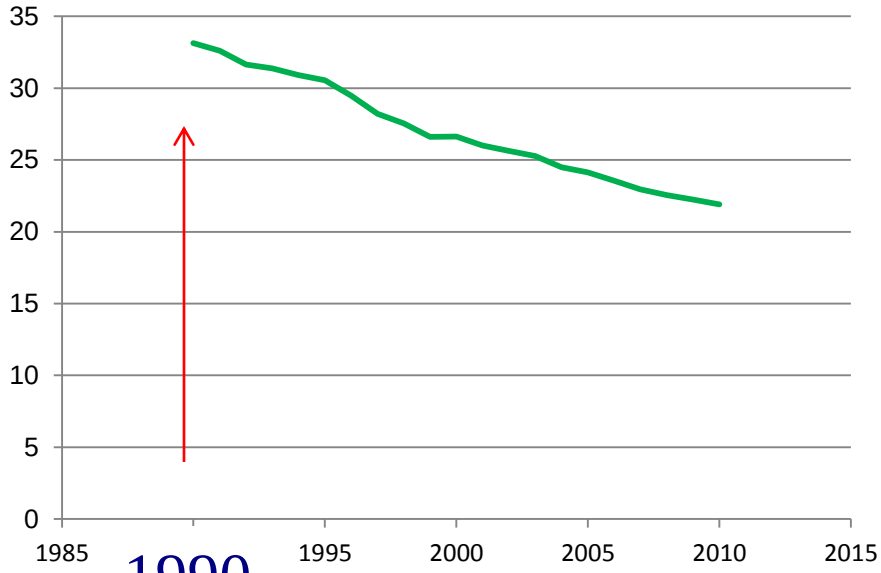
# UNITED STATES MALES VS FEMALE BREAST CANCER DEATH RATES 1990-2010

DEATH RATE PER 100,000 MALES




1990

DEATH RATE PER 100,000 FEMALES




1990

Mammography screening began in the mid 1980's and the death rate began to fall in 1990.

Over the same period, with access to the same therapy, the death rate for men increased, then returned to 1990 levels, and has not fallen since 1990.

THE DIFFERENCE ?

**WOMEN ARE BEING SCREENED !**

# BREAST CANCER SCREENING

## "RISK BASED" SCREENING:

Screening Only High Risk Women ???

1. The randomized, controlled trials were not stratified by risk so there is no proof that screening only high risk women will save any lives.
2. If we only screen high risk women we will miss 75-90% of women who develop breast cancer each year.

# BREAST CANCER SCREENING

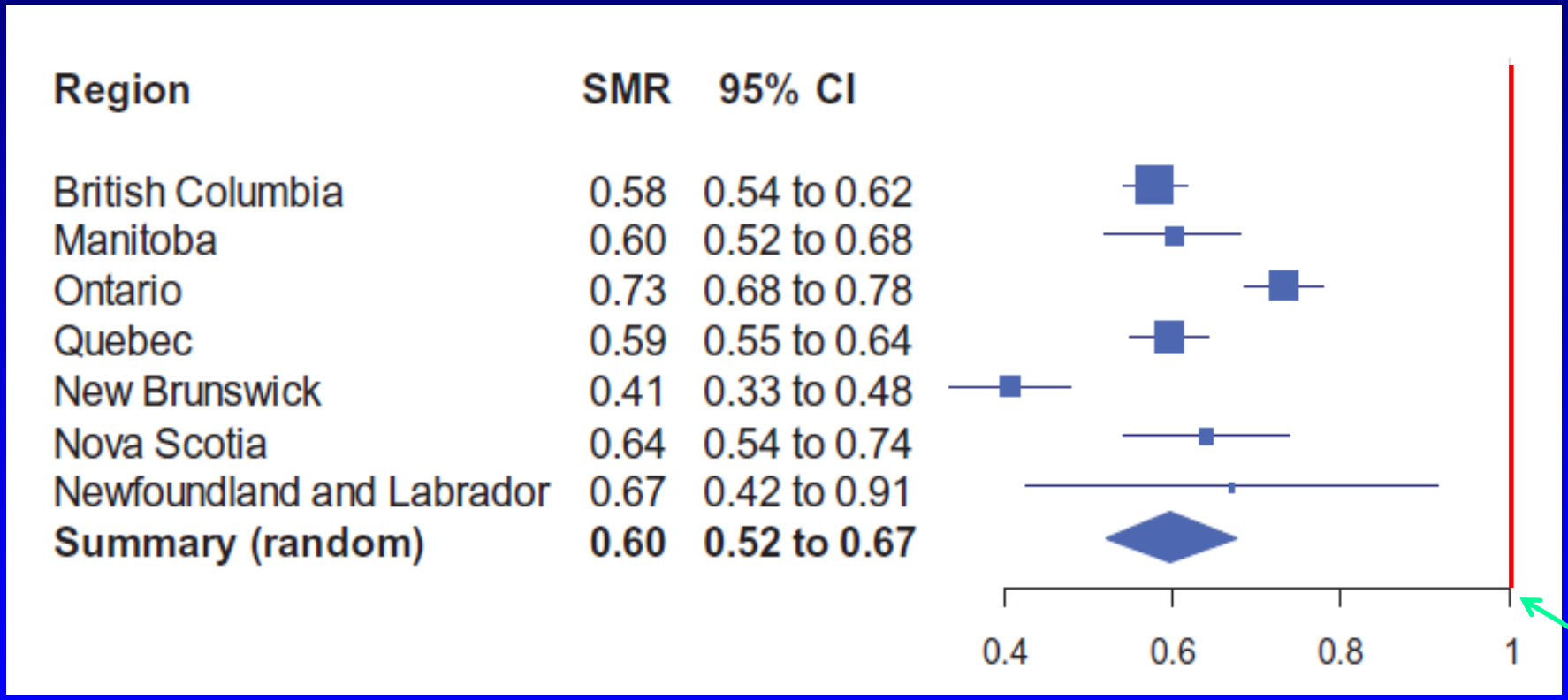
## The Bottom Line

Most women who develop breast cancer are not at increased risk.

All women are at risk and annual screening, beginning at the age of 40, should be encouraged for all women.

# SCREENING IN CANADA IS SAVING LIVES

Comparing women who participate in screening and those who do not, the death rate for the screened women is 40% (range 27%-50%) lower than expected.




Coldman A, Phillips N, Wilson C, Decker K, Chiarelli AM, Brisson J, Zhang B, Payne J, Doyle G, Ahmad R. Pan-canadian study of mammography screening and mortality from breast cancer. J Natl Cancer Inst. 2014 Oct 1;106(11).

# BREAST CANCER SCREENING

Mammography screening is not the ultimate answer to breast cancer. It does not find all cancers and does not result in a cure in all cases, but it is available today and is saving thousands of lives each year.

While we await a cure, or a safe way to prevent breast cancer (neither is on the horizon) it makes no sense to reduce access to screening.

# BREAST CANCER SCREENING

On Monday April 20, 2015, the United States Preventive Services Task Force (USPSTF) issued their draft guidelines for breast cancer screening.

# BREAST CANCER SCREENING

The USPSTF finally acknowledged what their own analysis had shown for years –

The most lives are saved by annual mammography beginning at the age of 40.

# BREAST CANCER SCREENING

Nevertheless, the Panel members' made a subjective value judgement. They advised that women wait until the age of 50 before participating in mammography screening, and then give cancer an extra year to grow and metastasize by screening every two years until the age of 74 after which they should stop being screened.

# BREAST CANCER SCREENING

Breast cancer has been trivialized as a problem for women ages 40-49.

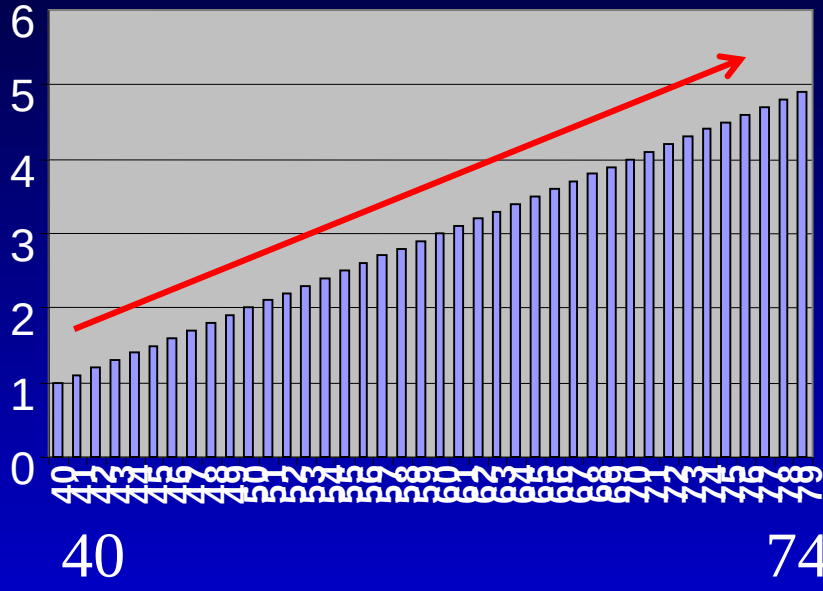
# BREAST CANCER SCREENING

The Chairman of the Panel stated that breast cancer was a disease of older women, clearly unaware that more than 30,000 women are diagnosed each year while in their forties, and more than 40% of the years of life lost to breast cancer are among women diagnosed in their forties.

# FACTS ABOUT BREAST CANCER SCREENING

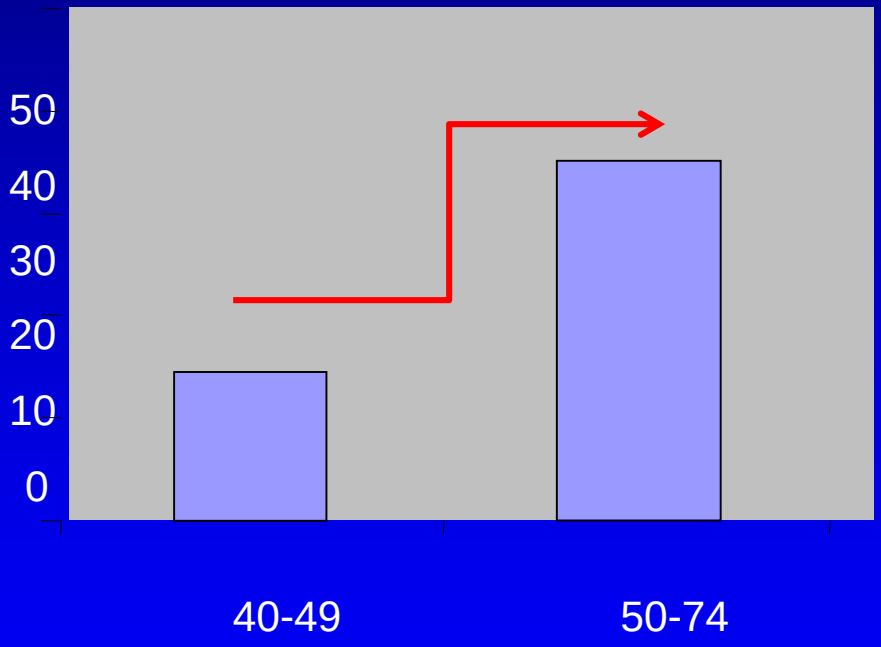
1. The age of 50 has no biological or scientific support as a threshold for screening. None of the parameters of screening change abruptly at the age of 50 or any other age.
2. Mammography screening does not lead to "overdiagnosis" of invasive breast cancers.
3. 75% of women diagnosed with breast cancer each year have no defined extra risk. Screening only high risk women will miss 75% of the cancers.

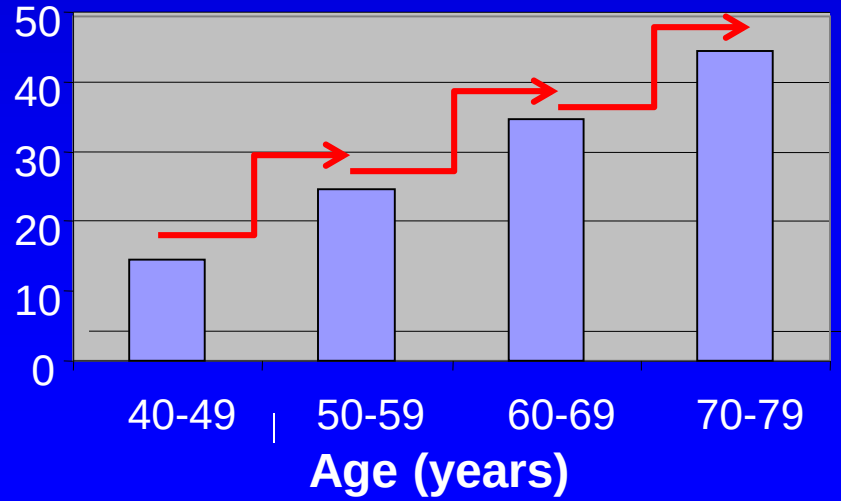
Age grouping has been used to make data that actually change gradually with increasing age appear to change suddenly at the age of 50.




Reality = continuous gradual change

Dichotomous grouping




USPTSF = group by decade

# BREAST CANCER SCREENING

The Panel claimed that women should decide for themselves, ignoring the fact that insurance coverage is based on their guidelines.

In effect the USPSTF will take away a woman's choice.

# THE 2015 USPSTF GUIDELINES

There was no one on the USPSTF Panel with expertise in breast cancer care.

There were no experts in breast cancer screening on the panel.

# THE 2015 USPSTF GUIDELINES

The USPSTF Panel stressed thhe "harms of screening".

1. "False positives'"
2. "Overdiagnosis"

# THE "HARMS" OF SCREENING

## "FALSE POSITIVES"

Most think these are women being told they have cancer when they do not have cancer.

In fact, they are, predominantly, recalls from screening for few extra pictures!

# THE "HARMS" OF SCREENING

## RECALLS FROM SCREENING

1000 women screened
900 are reassured by a negative report

100 (10%) recalled for additional evaluation (which is the same as for Pap testing)

56 have a few images or an ultrasound and nothing is found.
26 are asked to return in 6 months
19 (1.9% of women screened) have an image guided needle biopsy using local anesthesia
5-8 (20-40% of biopsies) have breast cancer

# THE 2015 USPSTF GUIDELINES

They “weighed” the anxiety of being recalled against the benefit of not dying from breast cancer. The USPSTF chose allowing women to die.

# THE 2015 USPSTF GUIDELINES

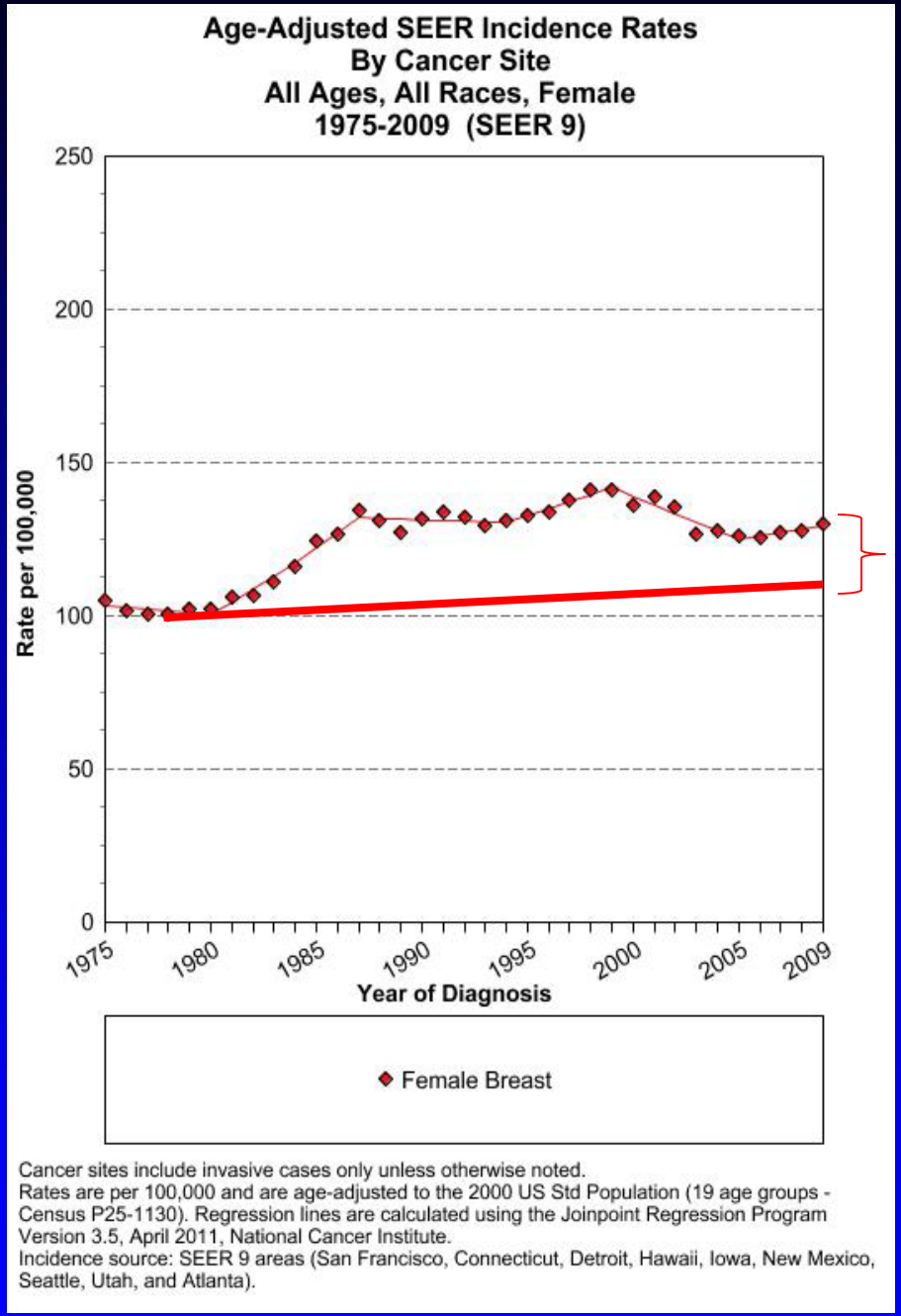
If women now in their thirties follow the USPSTF guidelines, and wait until age 50 to be screened every two years, as many as 100,000 women will die whose lives could have been saved by annual screening beginning at the age of 40.

(Hendrick RE, Helvie MA. USPSTF Guidelines on Screening Mammography Recommendations: Science Ignored. Am. J. Roentgenology 2011; 196: W112 - W116)

# THE 2015 USPSTF GUIDELINES

The Panel also claimed that there was massive “overdiagnosis” of breast cancers (cancers that would never become clinically evident), failing to understand that this is a MYTH. The data clearly show that there is actually little if any “overdiagnosis” of invasive breast cancers.

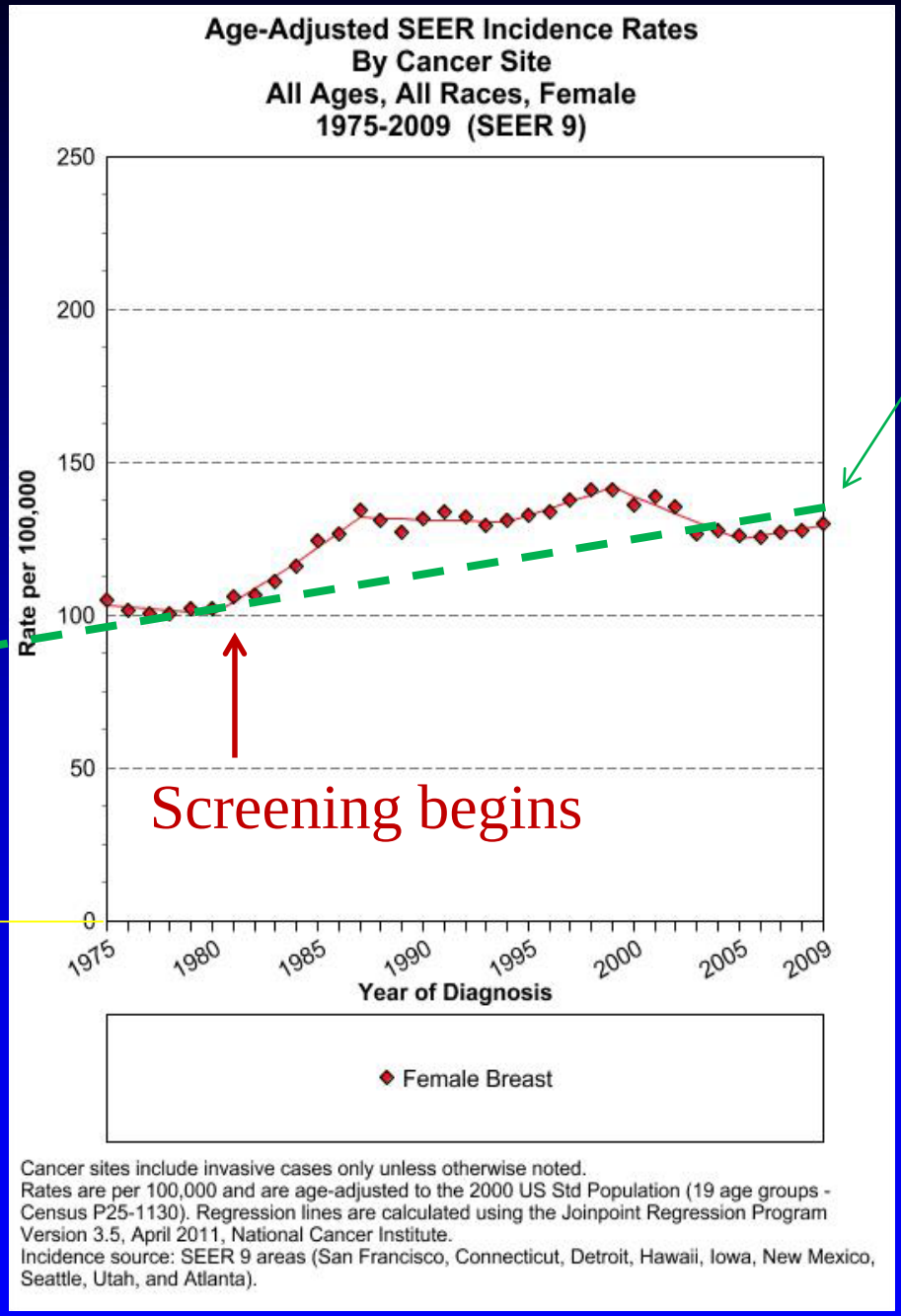
Bleyer and Welch claim that, since there were more cancers diagnosed in 2008 then they estimated should have occurred in the absence of screening, the excess must be “fake” cancers that would have never been clinically evident.




overdiagnosis

60/100,000

1940




40 year trend 1% per year increase in baseline for invasive cancers

The incidence is actually lower than expected showing that there is no overdiagnosis of invasive cancers !

# THE 2015 USPSTF GUIDELINES

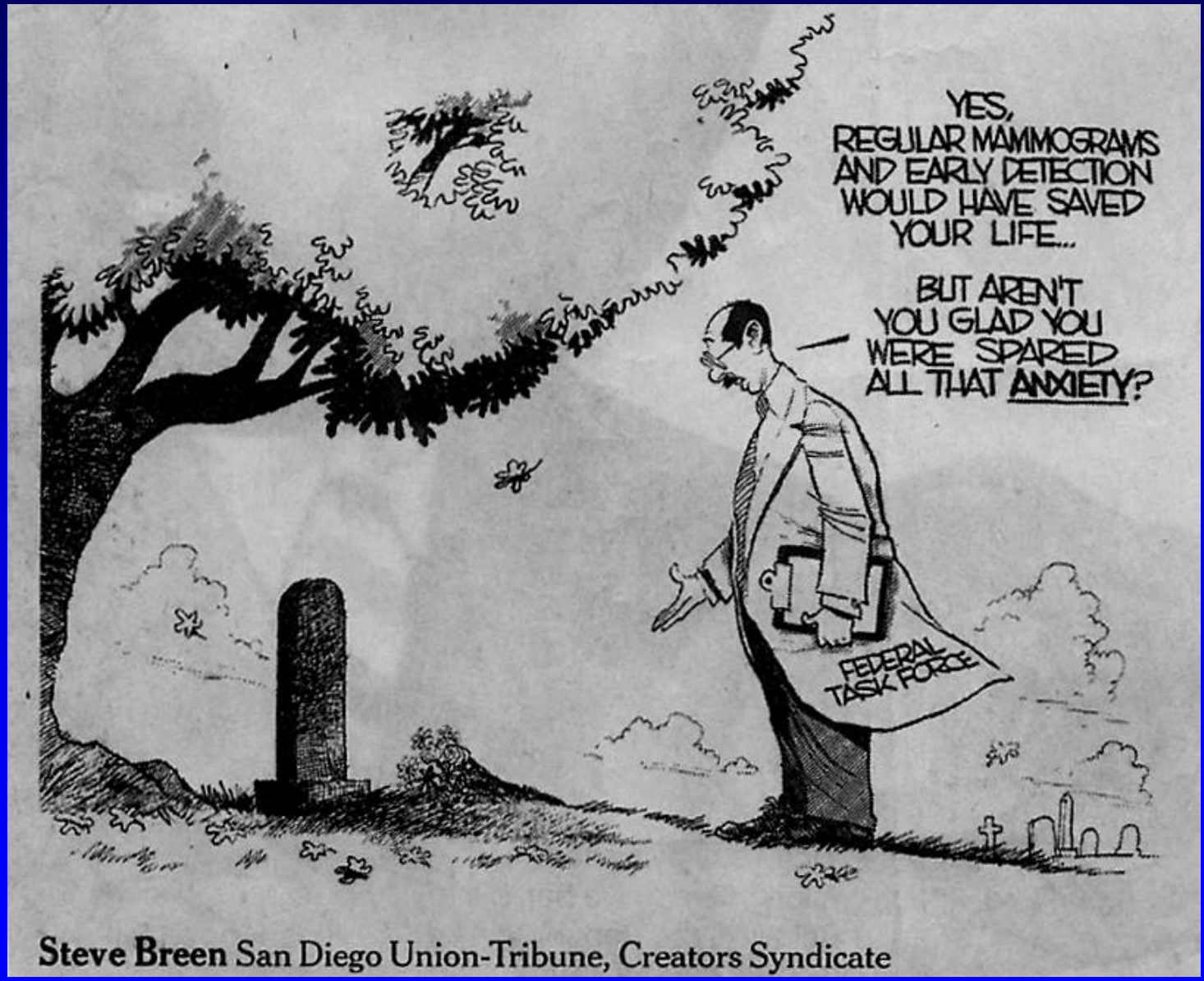
Lacking the expertise to actually know the data, and relying on outside reviews that were poor quality, the Panel made the subjective value judgement to restrict screening to every two years for women ages 50-74.

# THE 2015 USPSTF GUIDELINES

They claimed to have "weighed" the "harms" against the benefits and made the decision FOR women ages 40-49 that the "harms" outweighed the benefits and decided to withhold screening from women ages 40-49.

# THE "HARMS" OF SCREENING

Opponents of screening seek to deny women access to screening to reduce inconvenience and some anxiety.



# WHAT THE 2015 USPSTF SHOULD SUPPORT

Annual screening mammography should be available to all women ages 40 and over (insurance should cover it). Women should be provided with accurate information about the benefits and "harms" of screening to that they can make informed decisions about whether or not to participate in screening.

# FACTS ABOUT BREAST CANCER SCREENING

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# BREAST CANCER SCREENING

Mammography screening is not the ultimate answer to breast cancer.

It does not find all cancers and does not find all cancers early enough to permit a cure.

# BREAST CANCER SCREENING

While we hope for  a cure r a safe way to prevent breast cancer, mammography screening is available today and women ages 40 and over should have access to annual screening.

# BREAST CANCER SCREENING

Despite continually mounting evidence of benefit, efforts to limit access to screening have persisted for over 40 years, based on poor peer review at some medical journals and the publication of flawed analyses and misinformation.

# BREAST CANCER SCREENING

Despite the fact that:

1. Randomized, controlled trials have, unequivocally, shown a statistically significant mortality reduction for screening beginning at the age of 40

2. When screening is introduced into general populations the death rate from breast cancer declines

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FIGURE **1**

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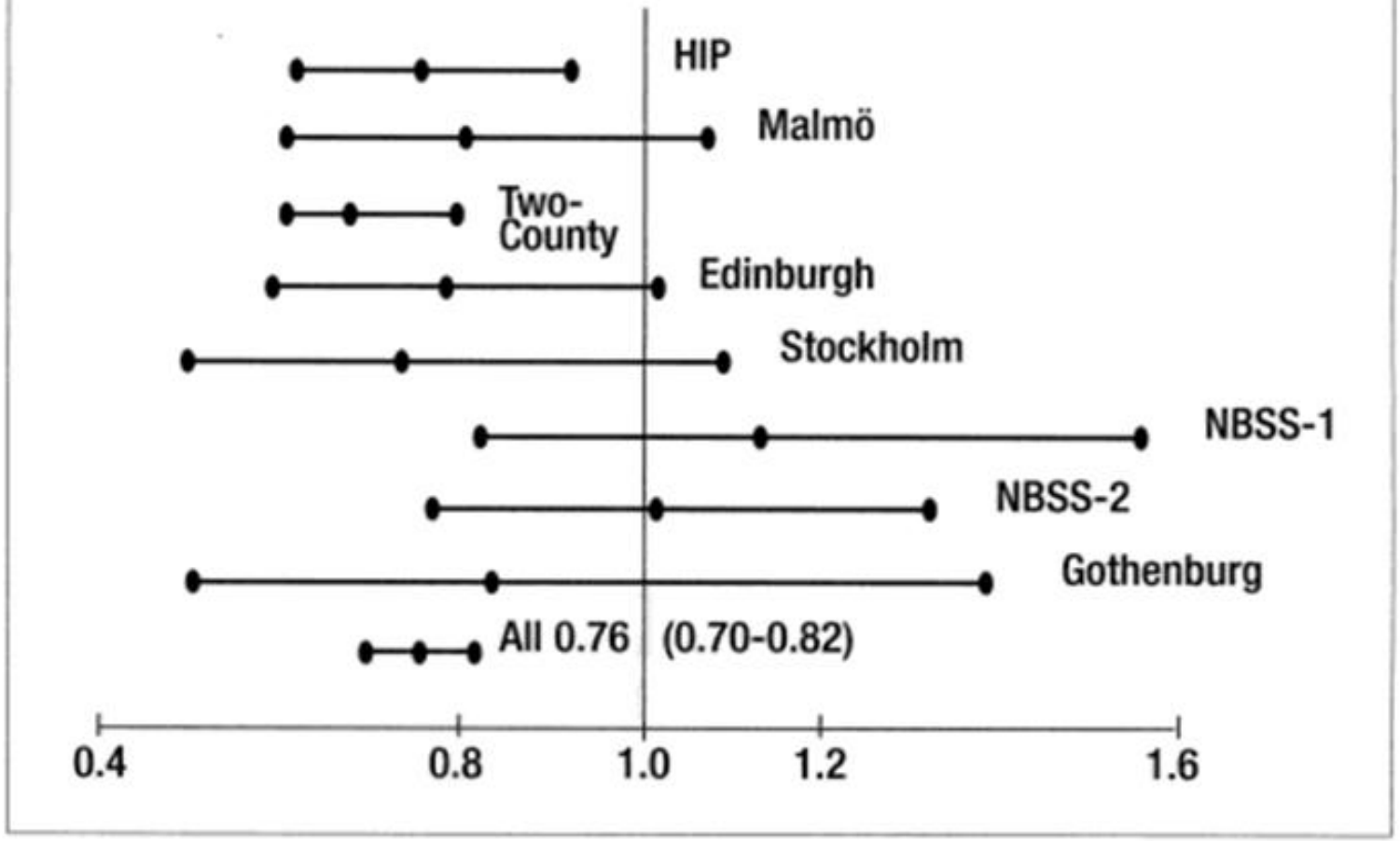
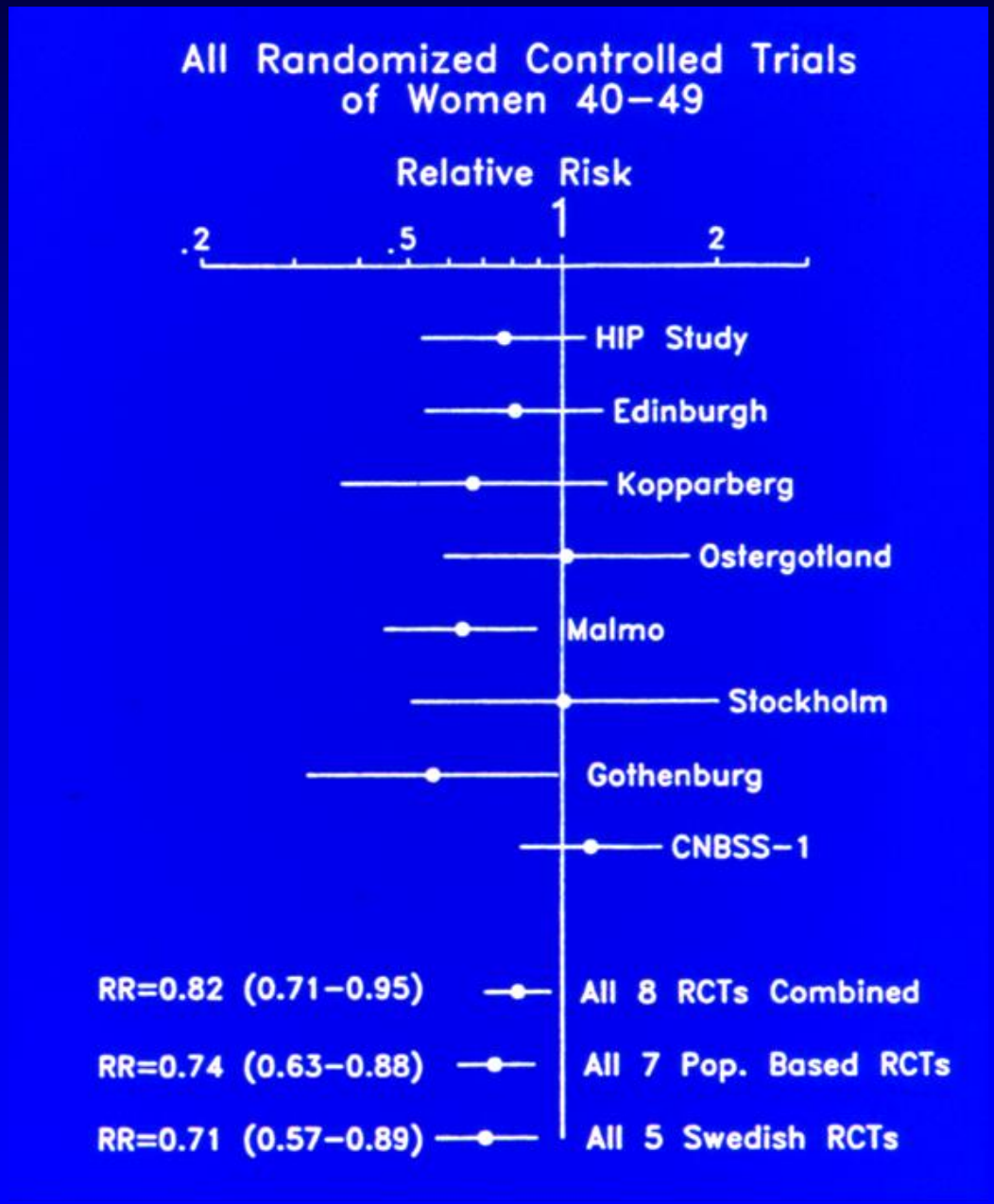


# SCREENING FOR WOMEN AGES 40-49

Although the RCT were never intended to be analyzed by age groups, the data show a benefit from screening women ages 40-49. This was provided to, and ignored by the Panel at the 1997 Consensus Development Conference



# LITTLE SUPPORT FOR THERAPY SAVING LIVES

## Numerous studies have shown that the decline in deaths for women who have access to modern therapy has little impact and that most decline in deaths is due to screening.


Jonsson H, et al. Mammography in Northern Sweden: effects on breast cancer mortality - an update. J Med Screen. 2007;14(2):87-93.

Hellquist et al.. Effectiveness of population-based service screening with mammography for women ages 40 to 49 years: evaluation of the Swedish Mammography Screening in Young Women (SCRY) cohort. Cancer. 2011 Feb 15;117(4):714-22.

Paap E et al. A remarkable reduction of breast cancer deaths in screened versus unscreened women: a case-referent study. Cancer Causes Control 2010; 21: 1569-1573

Hofvind S, et al Breast cancer mortality in participants of the Norwegian Breast Cancer Screening Program. Cancer. 2013 Sep 1;119(17):3106-12

Coldman A et al. Breast cancer mortality after screening mammography in British Columbia women. Int J Cancer. 2007 Mar 1;120(5):1076-80.

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# BREAST CANCER SCREENING

## FICTION

1. There is no benefit from screening – (1960-2009)
2. We can't possibly screen all women – (1970)
3. The radiation from the mammogram will cause more cancers than will be cured – (1976)
4. There is no benefit from screening women ages 40-49 – (1993)
5. The parameters of screening change abruptly at the age of 40 – (1994-1997)
6. Breast cancer is not a big issue for women ages 40-49 – (1994-1997)

# BREAST CANCER SCREENING

## FICTION

7. Mammography screening leads to false positive studies that lead to biopsies that permanently scar the breast so that when a lesion is palpable the mammogram is useless – (1994)
8. The benefit must appear within 5 years – (1993-1997).
9. The breast tissues are dense prior to the age of 50 hiding most cancers. At age 50 the breasts turn to fat and screening begins to save lives. (1993-1997)
10. There is so little breast cancer among women in their forties that we should concentrate on screening women ages 50 and over – (1994)

# BREAST CANCER SCREENING

## FICTION

11. Age Creep – Women reached the age of 50 and screening began to work.
12. 1997 Consensus Development Conference - There is no reason to encourage women in their forties to be screened – (1997)
13. Removing breast cancer early in women younger than age 50 leads to premature death – (1994-2000)
14. 2001 Gotzsche and Olsen Lancet – There is no benefit from screening for women at any age.
15. 2002 Gotzsche and Olsen, Lancet, and the New York Times - There is no benefit from screening for women at any age.

# BREAST CANCER SCREENING

## FICTION

16. The incidence of breast cancer has decreased because of reduced use of hormones - 2007
17. Screening women in their forties should be based on their risk of developing breast cancer (2008).
18. Cancers detected by mammography would “melt away if not detected by screening (2009).
19. Since mammography does not find the fastest most aggressive cancers it is not very useful (Esserman JAMA 2009)
20. Screening leads to massive overdiagnosis and overtreatment

# BREAST CANCER SCREENING

## FICTION

21. Money can be saved by allowing women to die from breast cancer by starting screening at age 50 and screening every two years.

# THE FICTION CONTINUES

The “debate” is not about the facts, but has been the result of data manipulation, and pseudoscience that has been permitted and perpetuated by bias and failed peer review at the medical journals, and disseminated by an uncritical media.

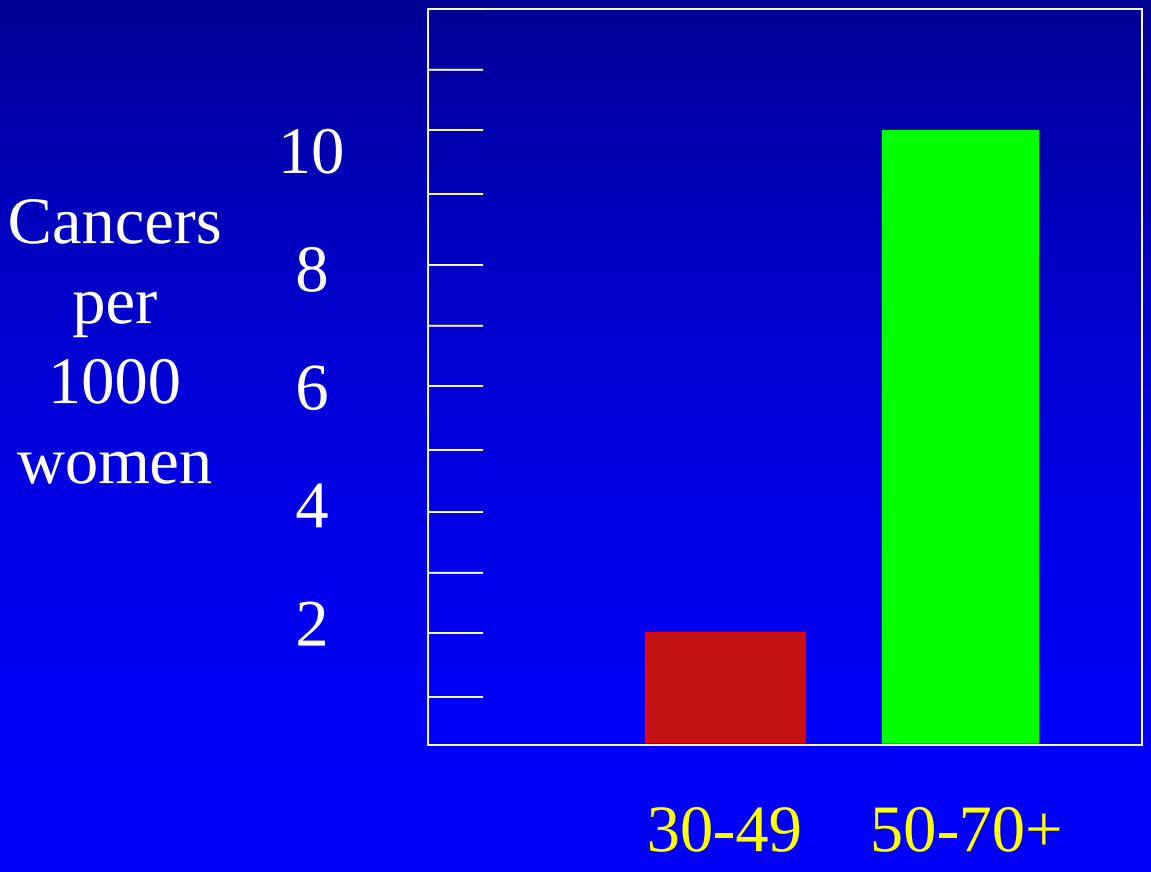
# BREAST CANCER SCREENING

How to make it appear as if the cancer detection rate changes suddenly at the age of 50.

# A SIMPLE WAY TO BIAS CONCLUSIONS

(Kerlikowske et al – UCSF-JAMA 1993)

Compared
women ages
30-49
to all women
ages
50-70+



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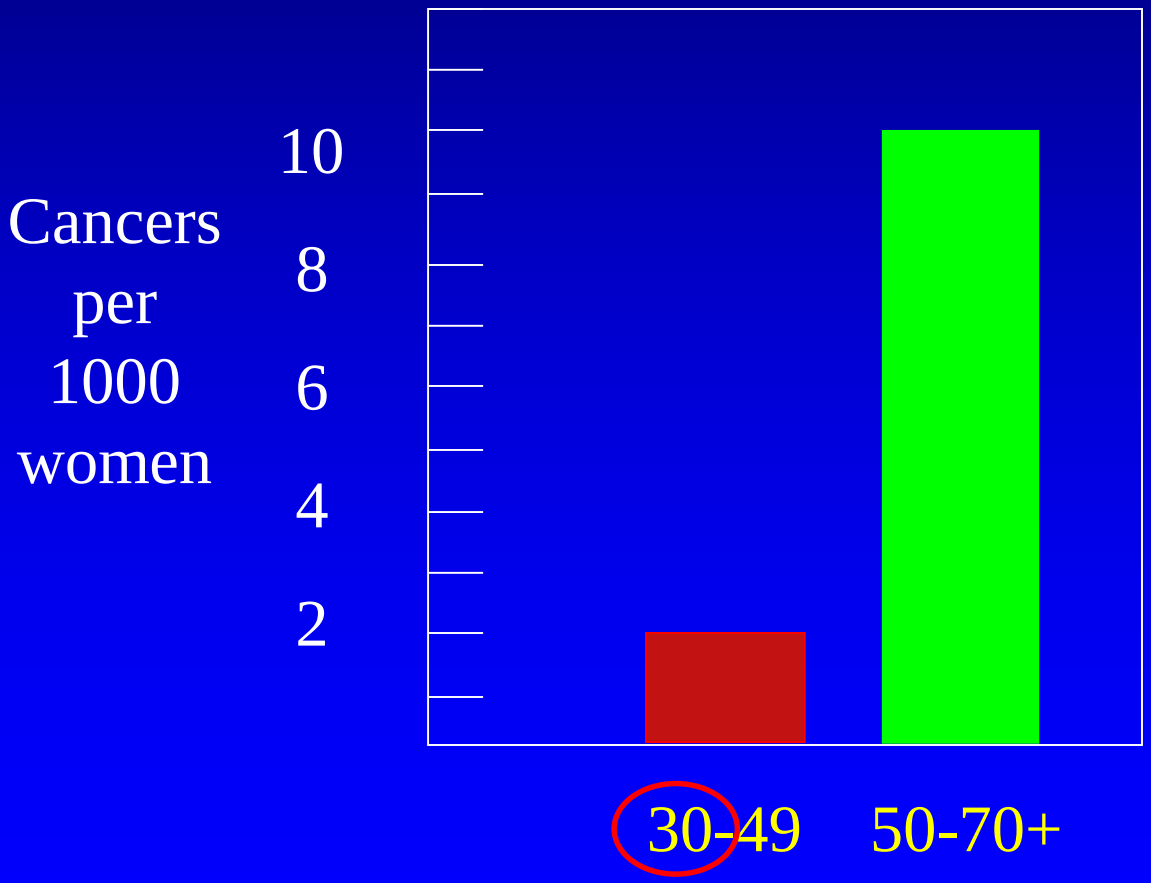
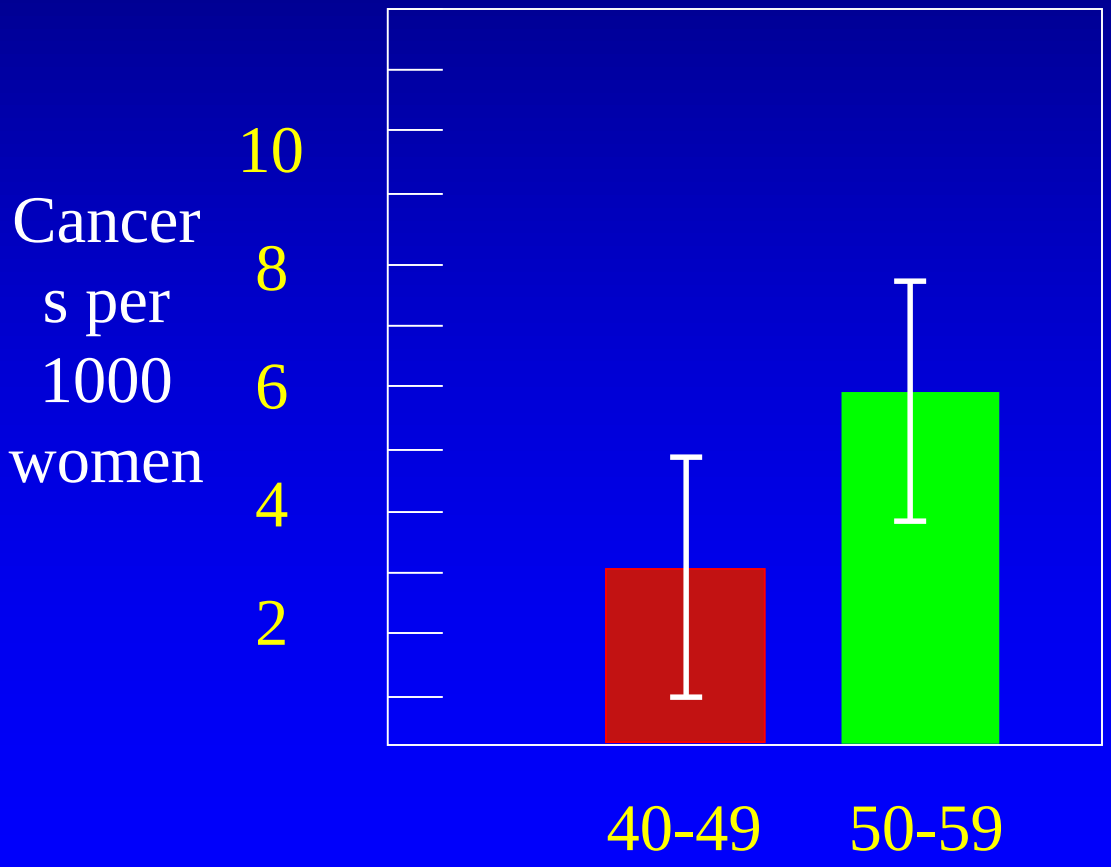


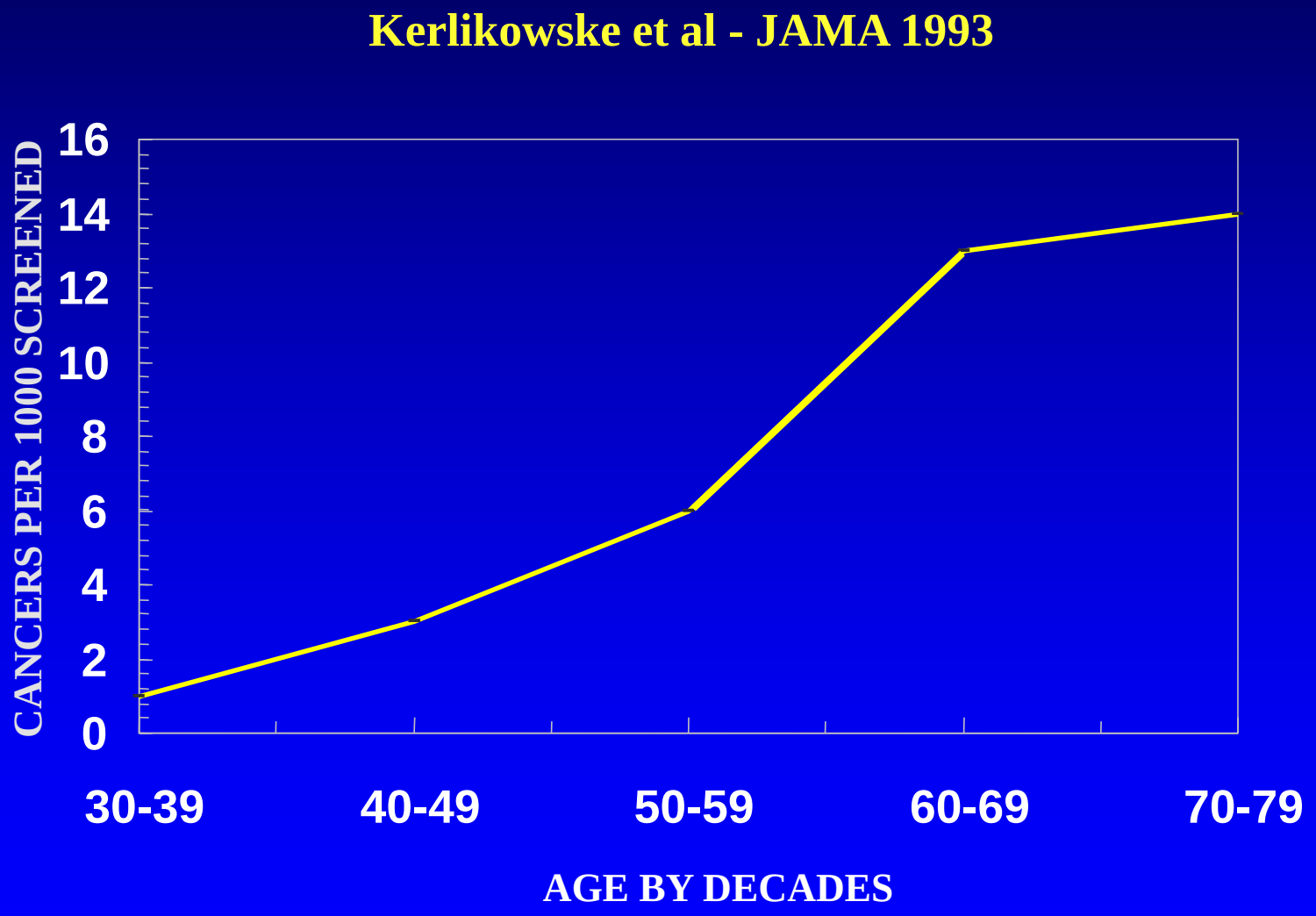
# USING A MORE APPROPRIATE COMPARISON (40-49 VS. 50-59) THERE IS LITTLE DIFFERENCE

3 per 1000 for women ages 40-49 and 6 per 1000 for women ages 50-59 .

With overlapping confidence intervals there is no significant difference

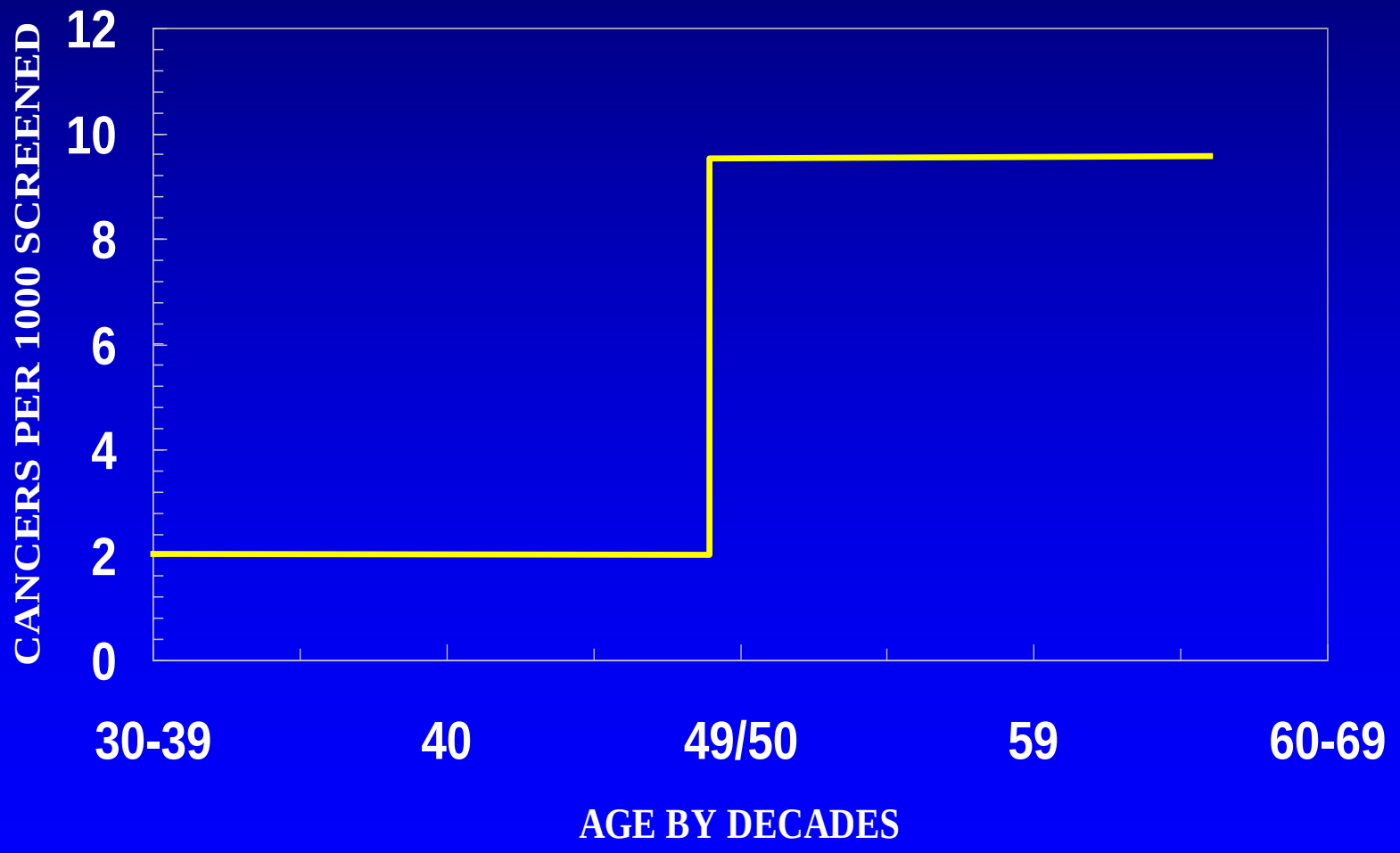


# MORE APPROPRIATE AGE GROUPING BY DECADE



# BIASING DATA BY INAPPROPRIATE AGE GROUPING

Kerlikowske et al - JAMA 1993



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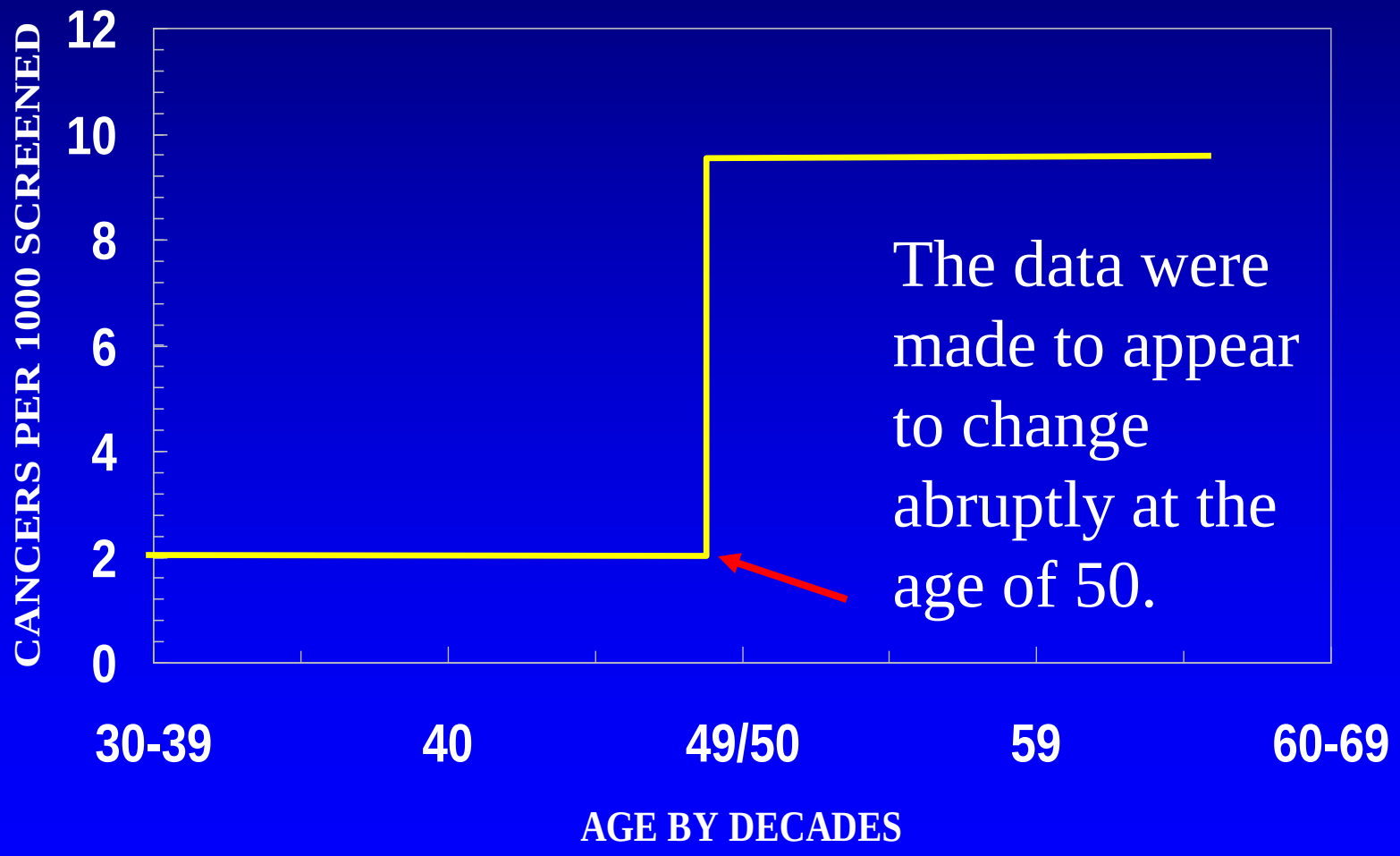
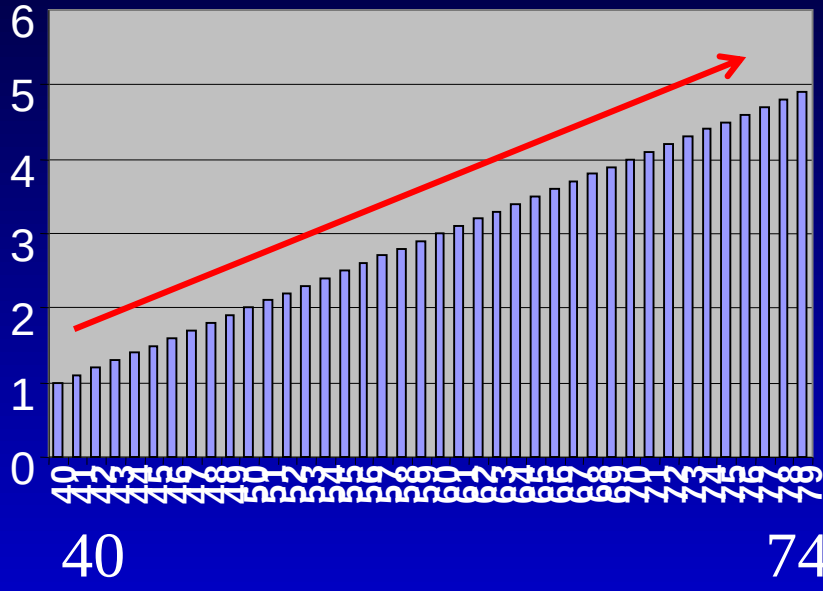


# HOW YOU WERE MISLED

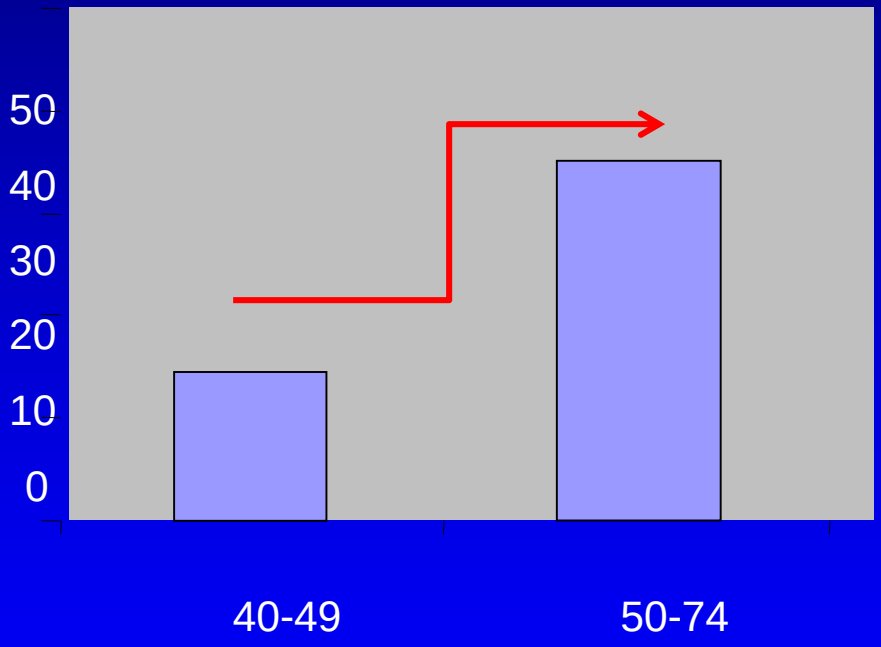
FACT: Opponents of screening women ages 40-49 have repeatedly grouped them together as if they are a uniform group and compared them to the group of all women ages 50 and over as if they are a uniform group. This also takes factors that change gradually with increasing age and makes them appear to change suddenly at the age of 50.

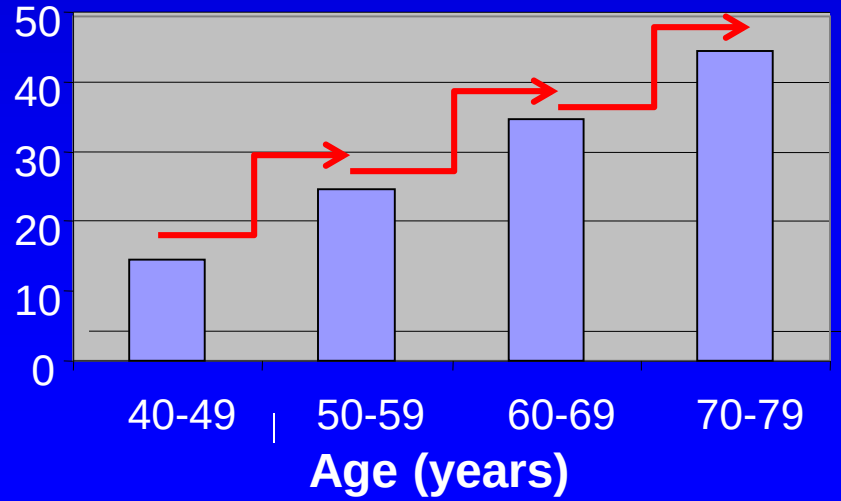
Age grouping has been used to make data that actually change gradually with increasing age appear to change suddenly at the age of 50.




Reality = continuous gradual change

Dichotomous grouping




USPTSF = group by decade

# THE USPSTF GUIDELINES ARE SCIENTIFICALLY UNSUPPORTABLE

By grouping the data by decades, the USPSTF misled the public –

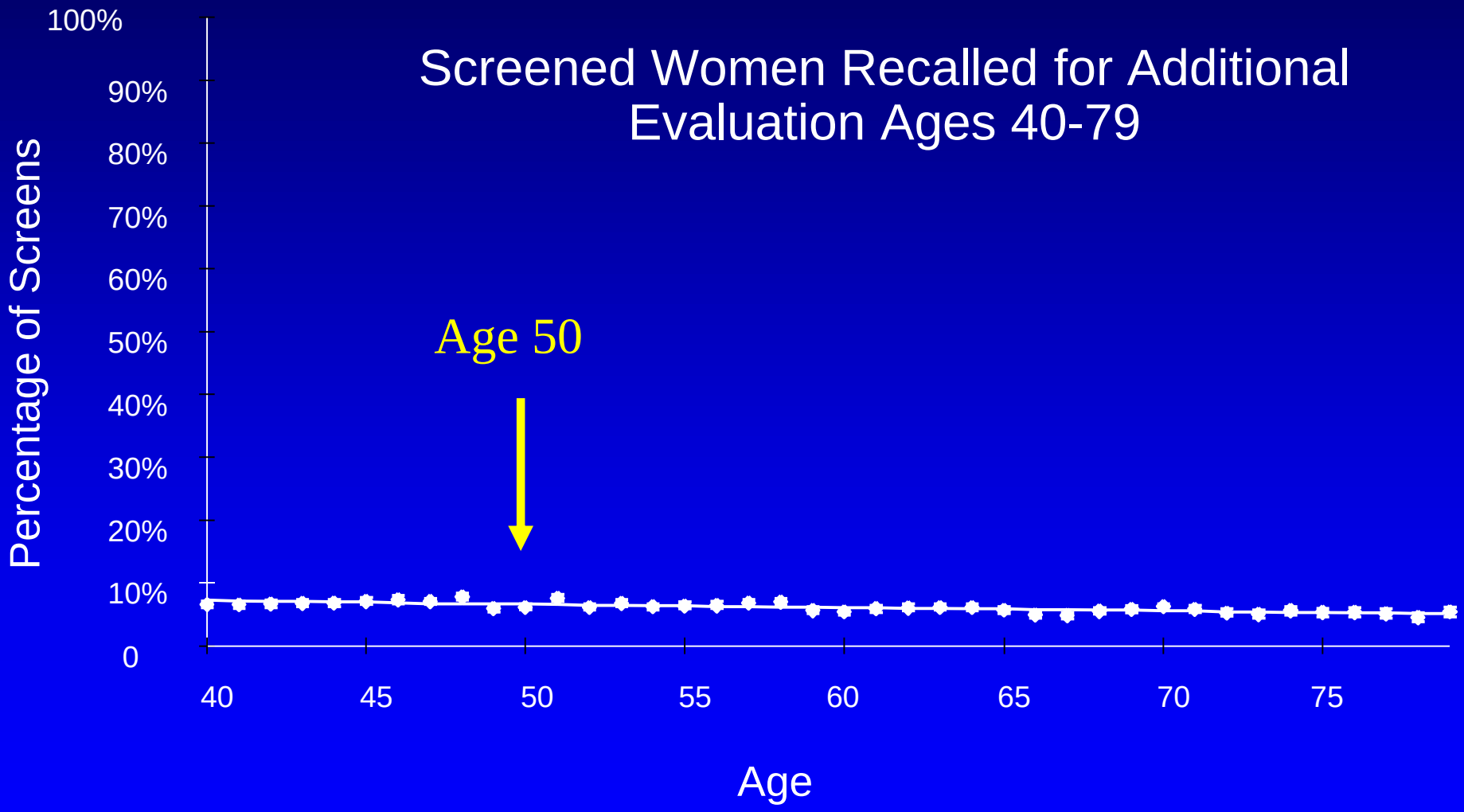
A woman age 48 is much more like a woman age 52 than she is like a woman age 42.

# THE USPSTF GUIDELINES ARE SCIENTIFICALLY UNSUPPORTABLE

Fact:

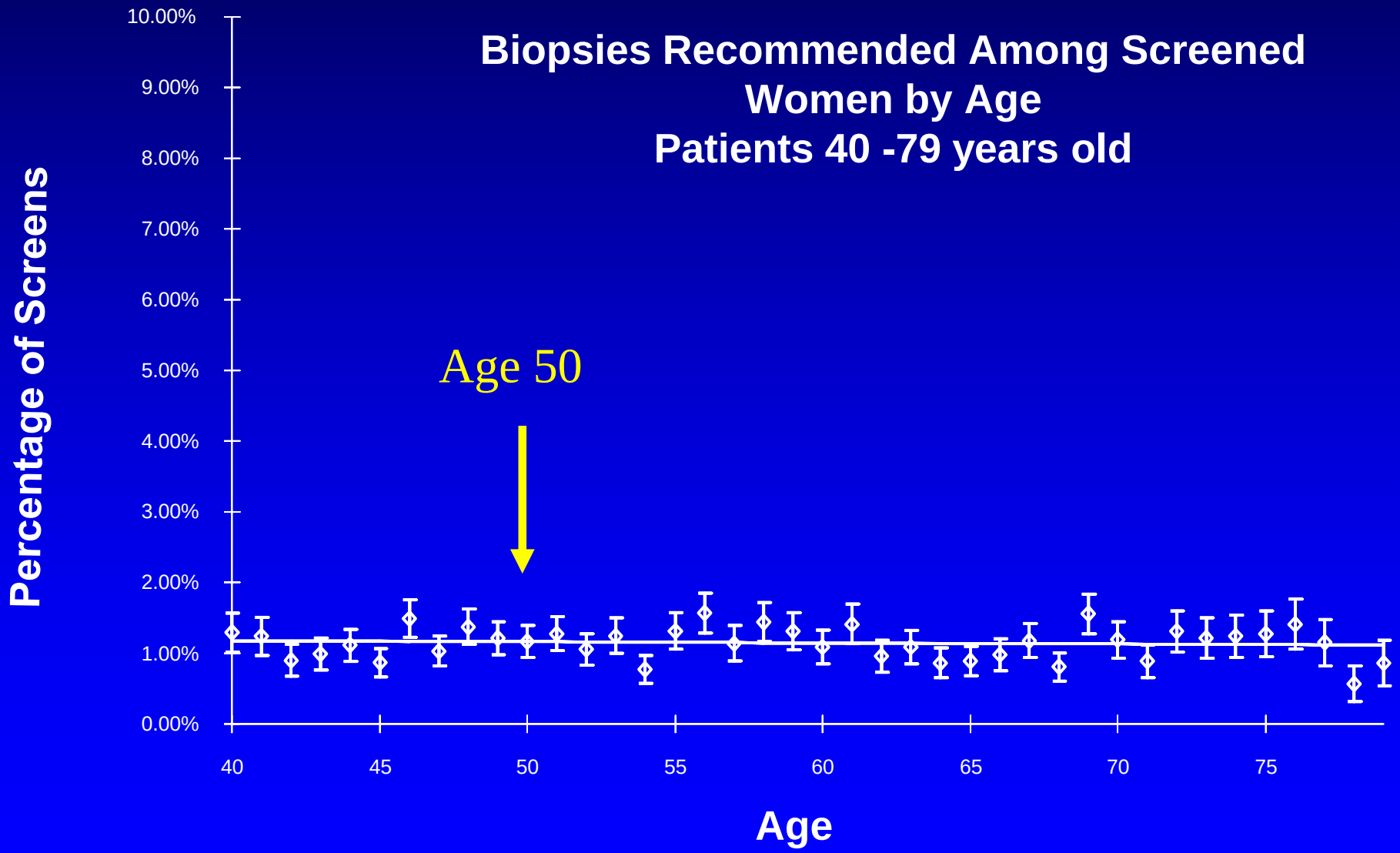
There are no data (NONE !!!!) that support the use of the age of 50 as a threshold for screening. ***None*** of the parameters of screening change abruptly at the age of 50 or any other age. Even menopause has no demonstrated effect.

# The recall rate from screening decreases gradually with increasing age from 8% to 6% with no abrupt change at age 50 or any other age



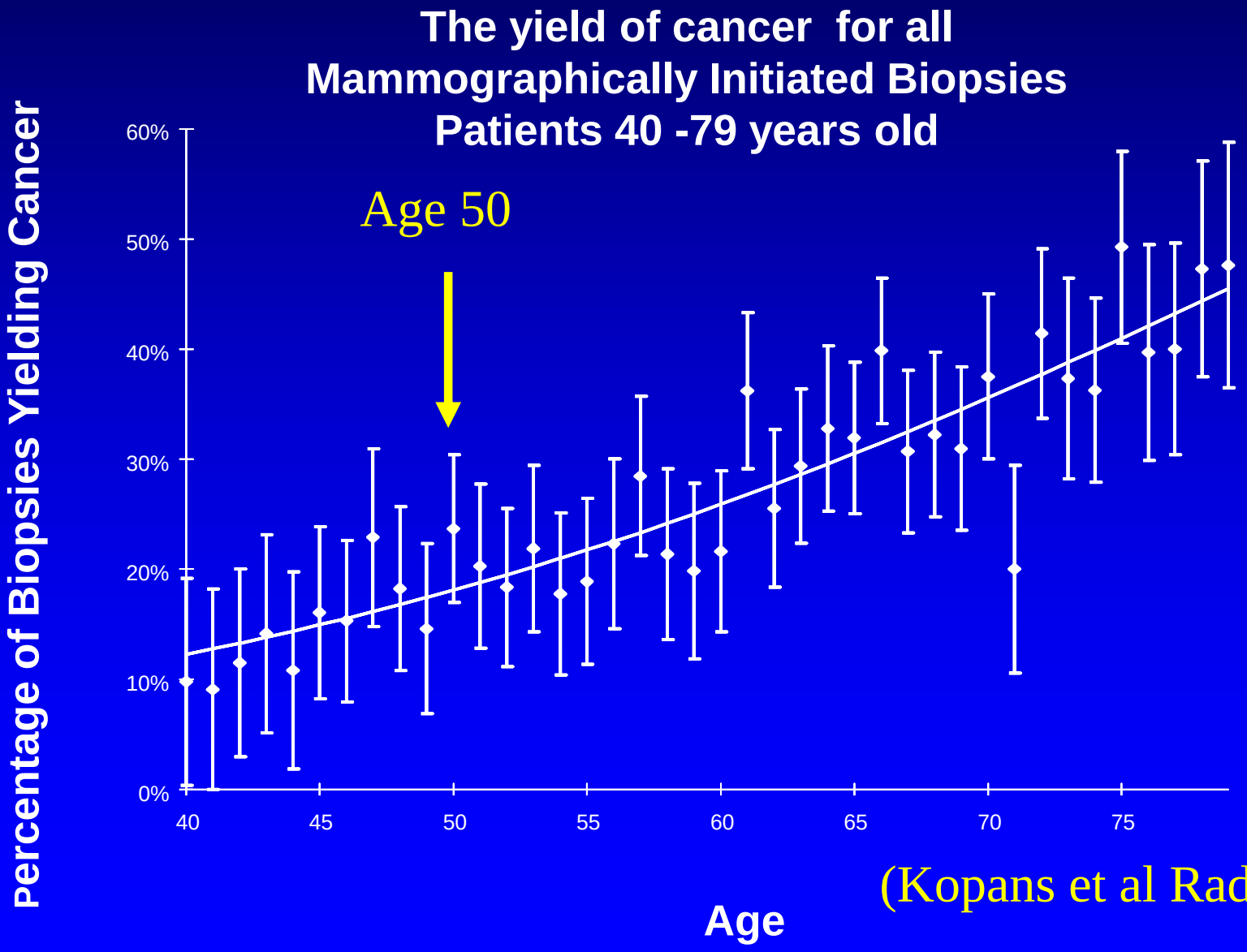

(Kopans et al The Breast Journal 1998;4)

# The percentage of women who are recommended for biopsy is fairly constant with no abrupt change at age 50 or any other age.



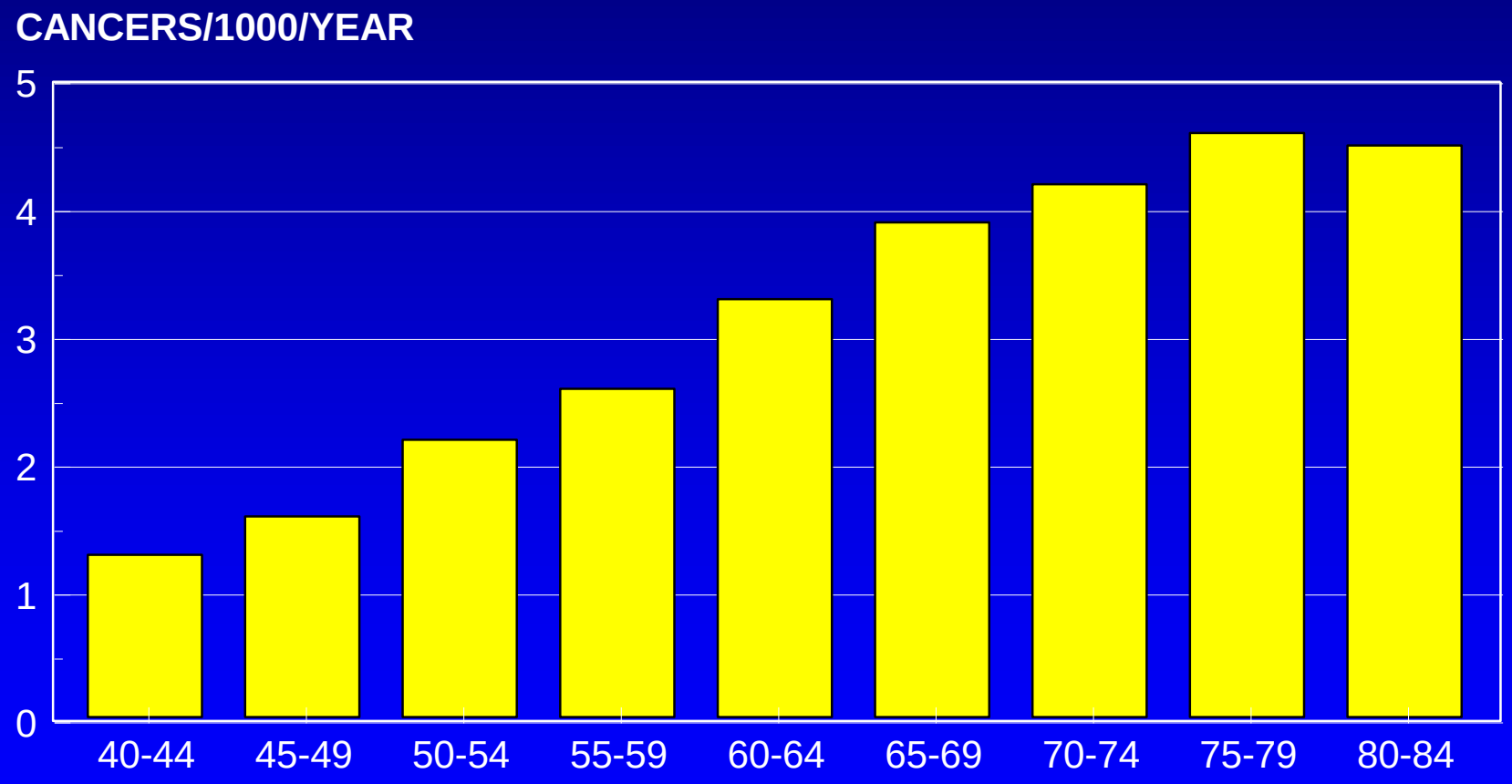

(Kopans et al The Breast Journal 1998;4)

The positive predictive value of a biopsy instigated by mammography goes up with the prior probability of cancer in the population with no abrupt change at any age.




(Kopans et al Rad 1996:200)

# ANNUAL BREAST CANCER INCIDENCE (per 1000) BY AGE



# AGE 50 AND MAMMOGRAPHY SCREENING

Fact:

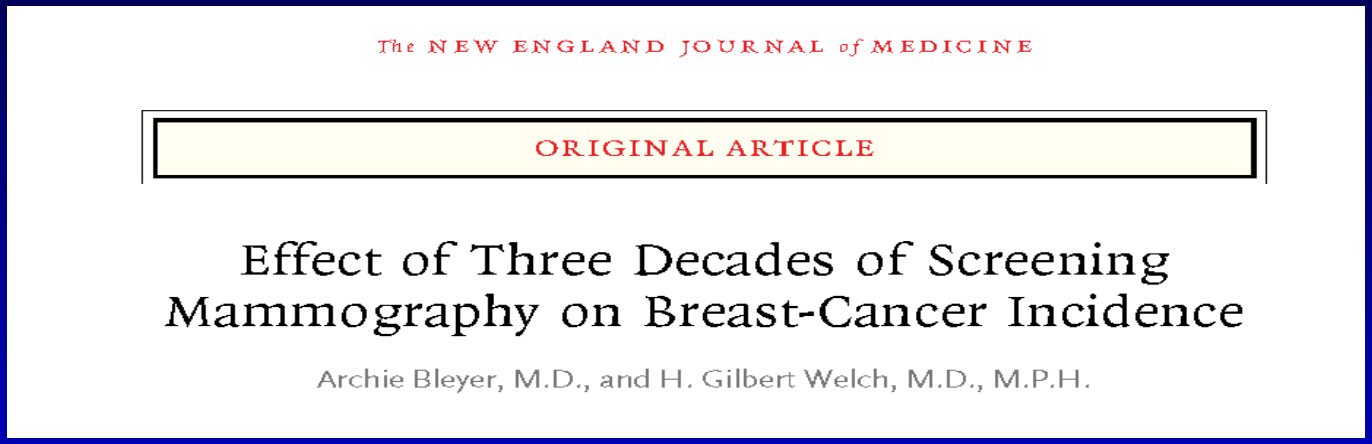
The cancer detection rate increases steadily with increasing age along with the steady increase in breast cancer incidence, reflecting the prior probability of breast cancer that increases with age.

***There is no abrupt change at age 50 or any other age.***

# THE MYTH OF "OVERDIAGNOSIS"

The idea that screening leads to massive overdiagnosis has been manufactured by making guesses and extrapolations about what the incidence of breast cancer would have been in the absence of screening and comparing it to the actual incidence of cancer.

# THE LATEST MISINFORMATION FROM THE DARTMOUTH INSTITUTE ON HEALTH POLICY



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Effect of Three Decades of Screening Mammography on Breast-Cancer Incidence

Archie Bleyer, M.D., and H. Gilbert Welch, M.D., M.P.H.

N Engl J Med 2012;367:1999-2005

Claimed that due to screening in 2008 alone:
" breast cancer was overdiagnosed in more than 70,000 women; this accounted for 31% of all breast cancers diagnosed"

# BIAS IN THE MEDIA

The next day the New York Times, which has a long history of bias against mammography screening, published an Op Ed piece by Dr. Welch with no rebuttal.


OP-ED CONTRIBUTOR

## Cancer Survivor or Victim of Overdiagnosis?

By H. GILBERT WELCH

Published: November 21, 2012

Hanover, N.H.

# THE LATEST MISINFORMATION FROM THE DARTMOUTH INSTITUTE ON HEALTH POLICY

The paper had no scientific merit and should not have been published.

1. They did not have direct patient information, but relied on registry summaries.
2. They faulted mammography even though they had no idea which women had mammograms and which women had their cancers detected by mammography.
3. They, inappropriately, combined DCIS and small invasive cancers calling them “early breast cancer” to dilute the results for invasive cancers

# THE LATEST MISINFORMATION FROM THE DARTMOUTH INSTITUTE ON HEALTH POLICY

In addition to not having direct patient data, the paper was based on assumptions, estimates, and extrapolations which were simply incorrect.

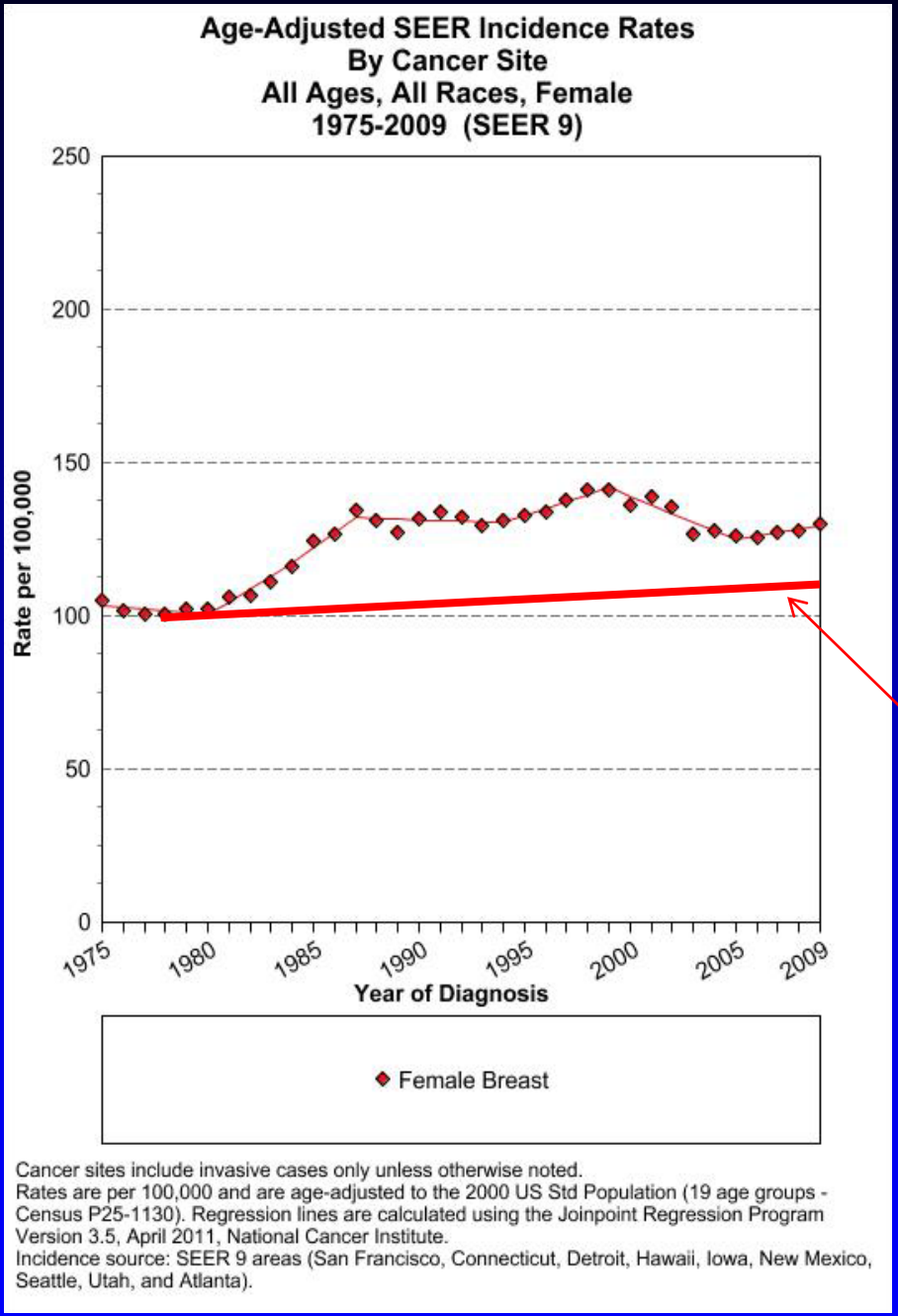
# THE LATEST MISINFORMATION FROM THE DARTMOUTH INSTITUTE ON HEALTH POLICY

Bleyer and Welch used data from 1976-1978 to estimate what the incidence of breast cancer would have been in 2008 had screening not been initiated in the 1980's.

They ignored the fact that many women were screened over this period after Happy Rockefeller and Betty Ford had breast cancers diagnosed in 1974.

They also ignored 40 years of data.

SEER began in 1973. Bleyer and Welch used data from ‘76-’78 to estimate that the baseline breast cancer incidence would have increased by 0.25% per year if screening had not been initiated




Bleyer and Welch estimate 0.25% per year baseline increase

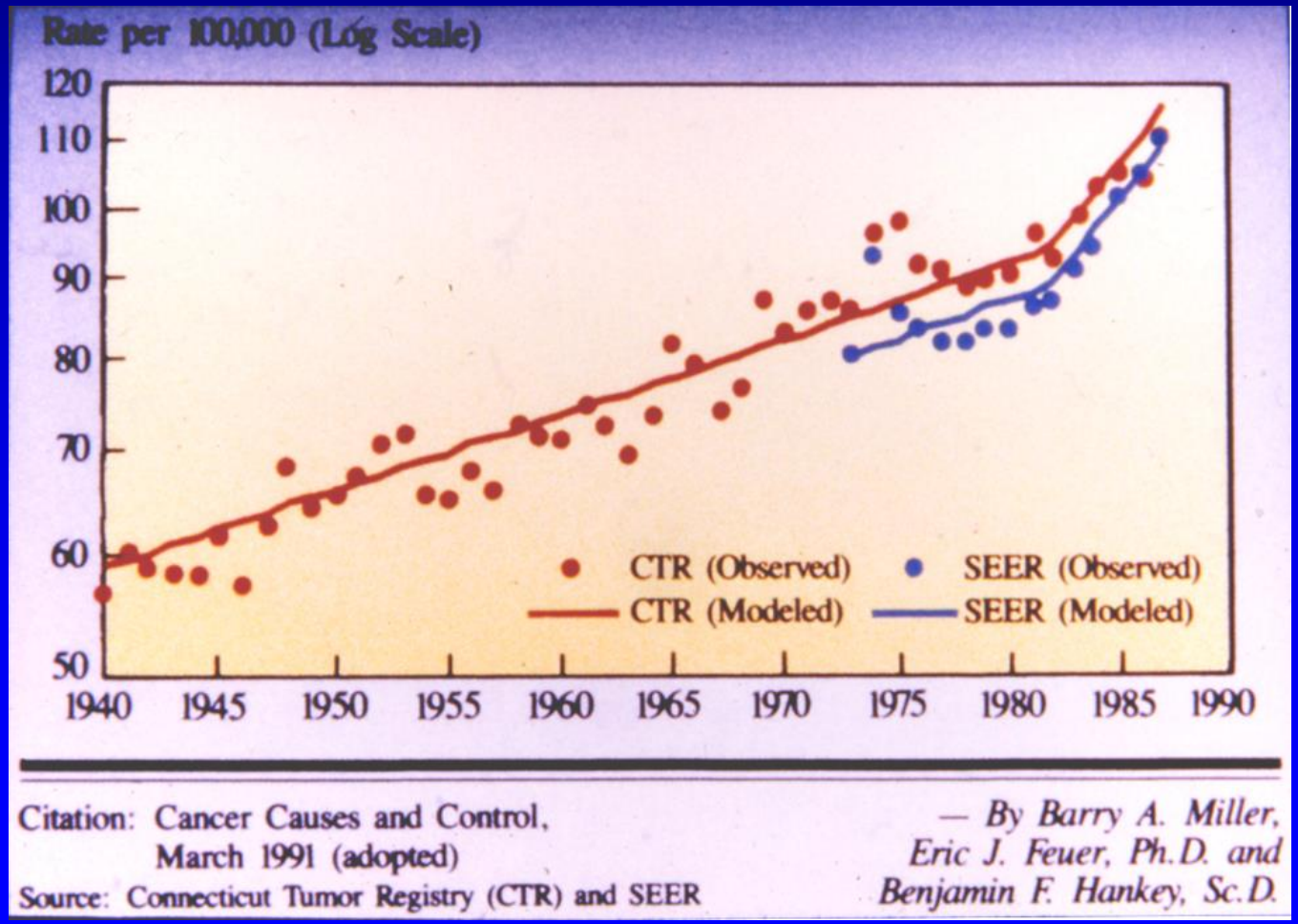
# THE LATEST MISINFORMATION FROM THE DARTMOUTH INSTITUTE ON HEALTH POLICY

Bleyer and Welch failed to acknowledge that the incidence of invasive breast cancer had been increasing steadily not by 0.25%, but by 1% per year since at least 1940.

(Garfinkel et al Changing trends. An overview of breast cancer incidence and mortality. Cancer. 1994 Jul 1;74 (1 Suppl):222-7).

# THE LATEST MISINFORMATION FROM THE DARTMOUTH INSTITUTE ON HEALTH POLICY

In fact, the incidence of invasive breast cancer had been increasing by 1% each year from 1940 to 1980 prior to any national screening.



# BLEYER AND WELCH "GUESSED" INCORRECTLY

Every published estimate of the incidence of breast cancer prior to the start of the SEER registry has relied on the data from the Connecticut Tumor Registry.


Shulman LN, Willett W, Sievers A, Knaul FM. Breast cancer in developing countries: opportunities for improved survival. J Oncol. 2010;2010

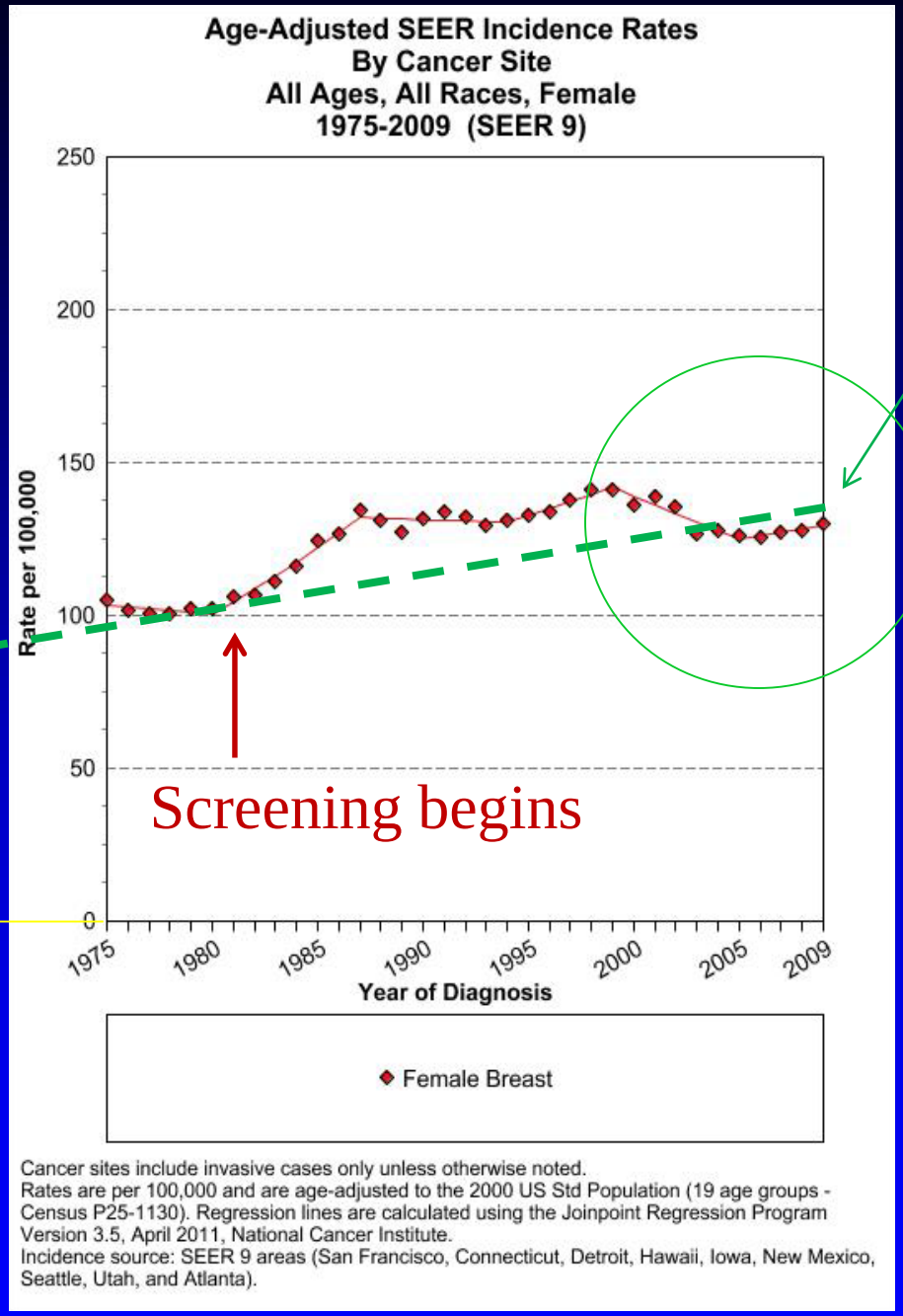
Kessler LG, Feuer EJ, Brown ML. Projections of the breast cancer burden to U.S. women: 1990-2000. Prev Med. 1991 Jan;20(1):170-82.

Garfinkel L, Boring CC, Heath CW Jr. Changing trends. An overview of breast cancer incidence and mortality. Cancer. 1994 Jul 1;74(1Suppl):222-7.

Miller BA, Feuer EJ, Hankey BF. Recent incidence trends for breast cancer in women and the relevance of early detection: an update. CA Cancer J Clin. 1993 Jan-Feb;43(1):27-41

60/100,000

1940




NOTE !!!: The latest SEER data show that the rate of invasive breast cancers has returned to 1% per year as expected

# THE LATEST MISINFORMATION FROM THE DARTMOUTH INSTITUTE ON HEALTH POLICY

Bleyer and Welch claimed that there had been little if any reduction in advanced breast cancers over the time period (hence little benefit).

Actually, had they used the Connecticut Tumor Registry data
"At an APC [Annual Percentage Change] of 1.3%, late-stage breast cancer incidence decreased by 37%."

(Helvie MA, et al Reduction in late-stage breast cancer incidence in the mammography era: Implications for overdiagnosis of invasive cancer. Cancer. 2014)

# THE LATEST MISINFORMATION FROM THE DARTMOUTH INSTITUTE ON HEALTH POLICY

Bleyer has admitted that:

1. Since they had no data on who had mammograms and which cancers were detected by mammography they could not say that mammography was leading to overdiagnosis.
2. Their analysis was based on “guesses”.

**Health care advice should not be based on guesses. The paper should be withdrawn.**

# THE CANADIAN NATIONAL BREAST SCREENING STUDIES (CNBSS)

## COMPROMISED TRIALS WITH UNRELIABLE RESULTS

# THE CANADIAN NATIONAL BREAST SCREENING STUDIES (CNBSS)

Despite having been discredited years ago as compromised trials, the CNBSS reported a 25 year follow-up and concluded that there was no benefit from mammography screening for anyone ages 40-59.

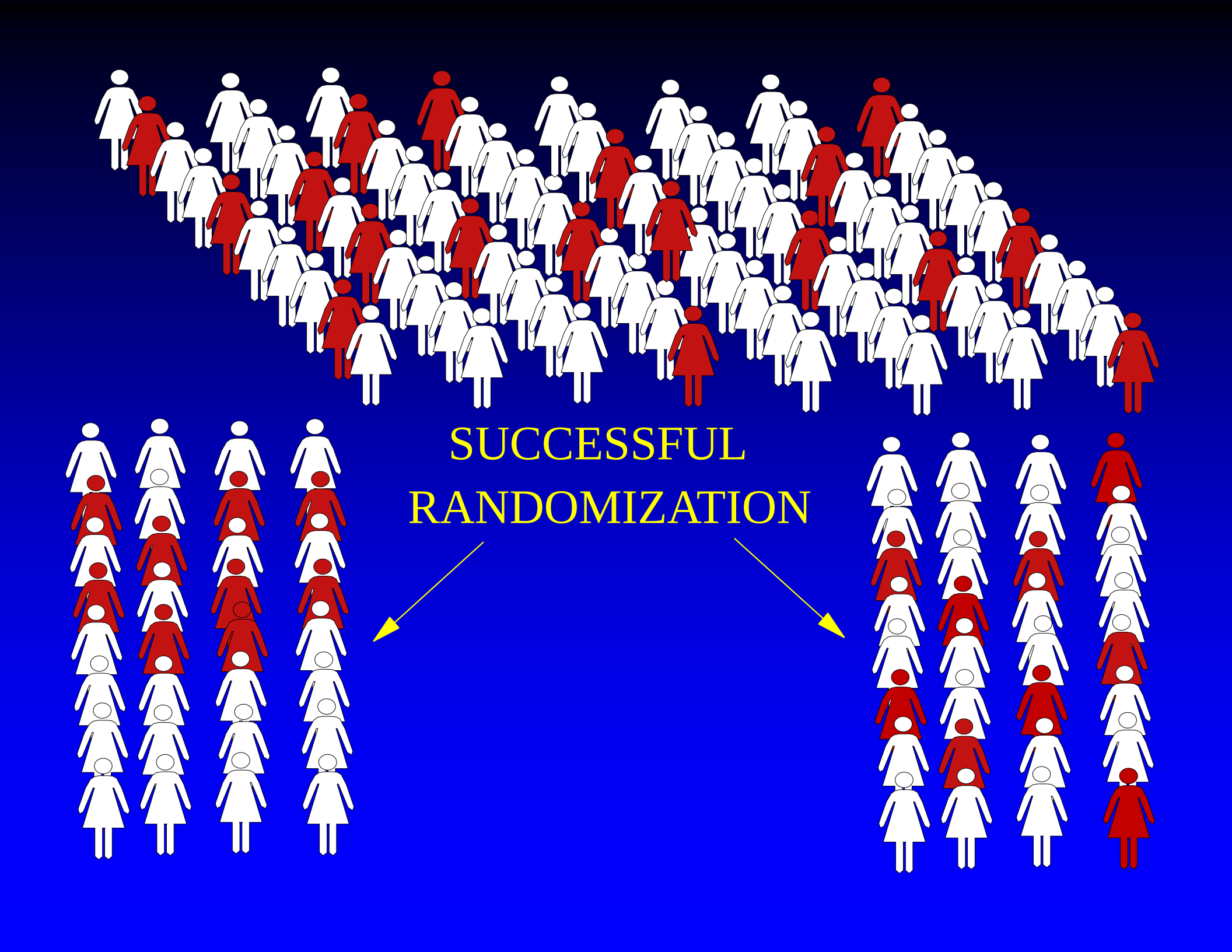
(Miller AB, Wall C, Baines CJ, Sun P, To T, Narod SA. Twenty five year follow-up for breast cancer incidence and mortality of the Canadian National Breast Screening Study: randomised screening trial. BMJ 2014;348:g366 doi: 10.1136/bmj.g366)

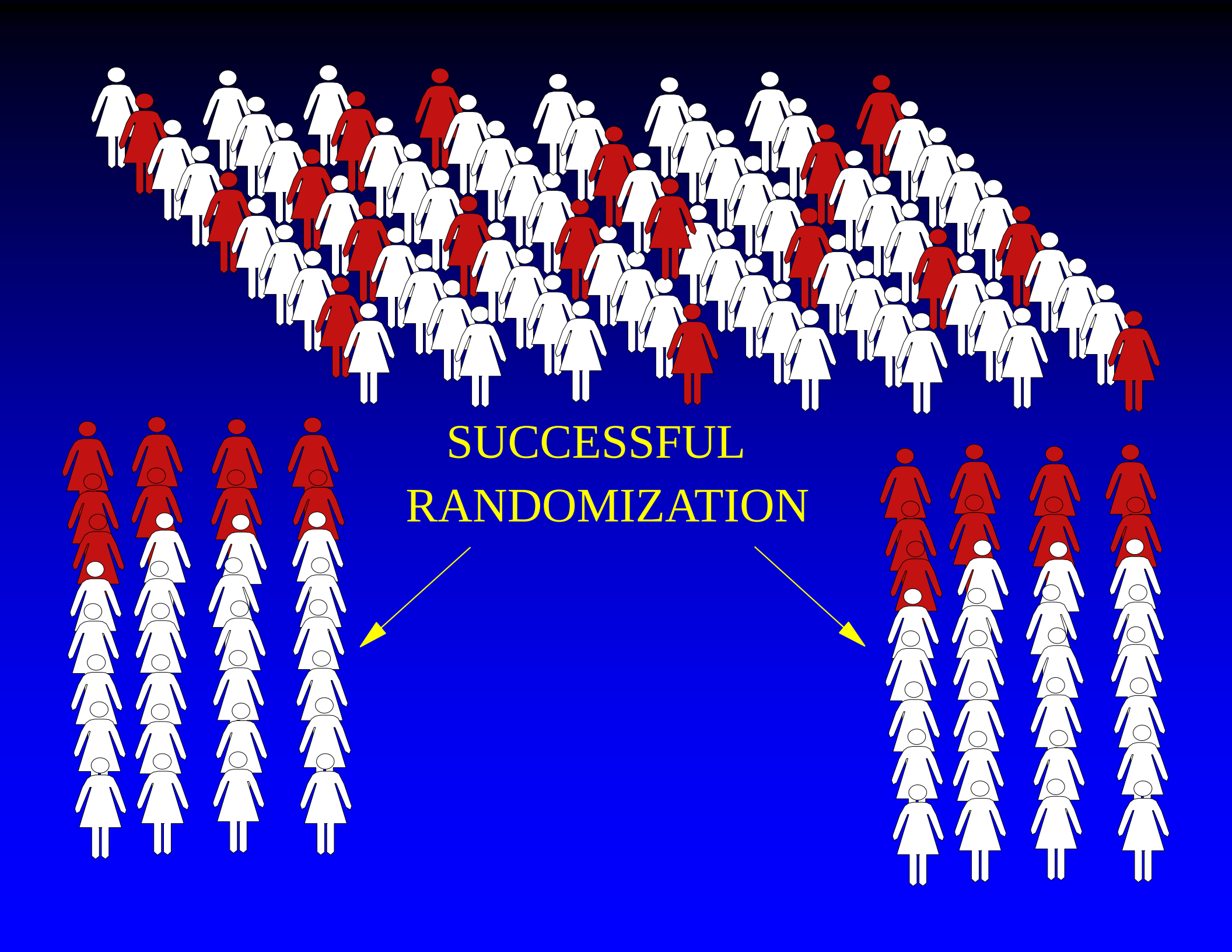
# RANDOMIZED/CONTROLLED TRIALS

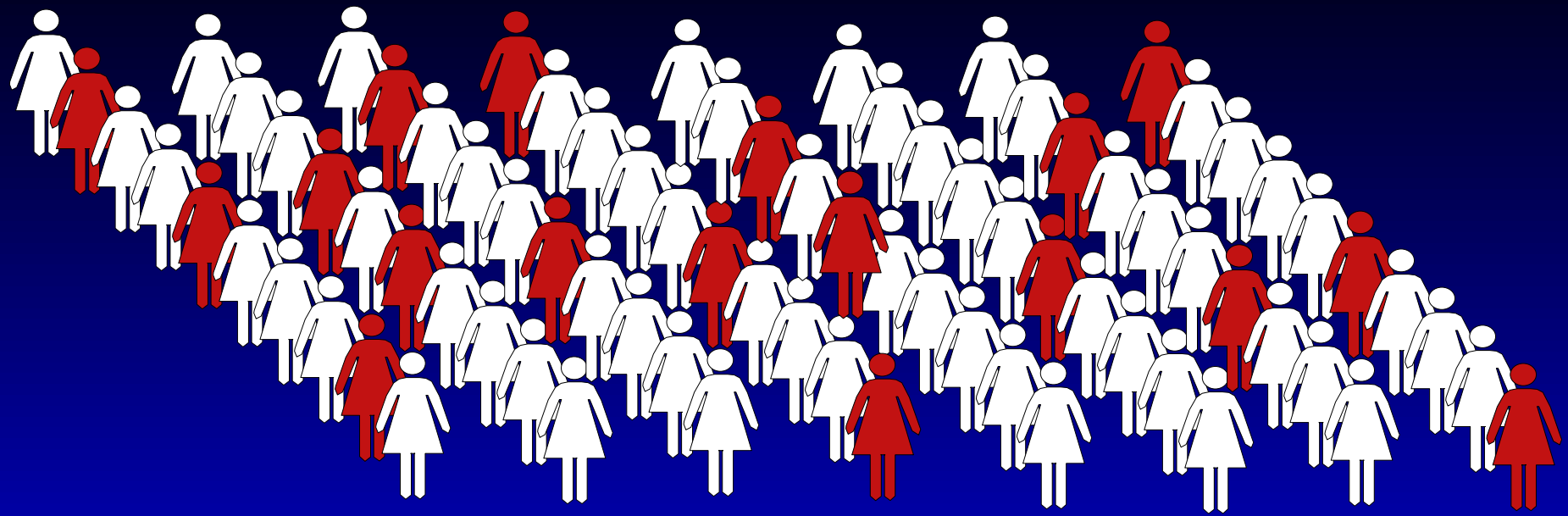
Proper design and execution of RCT is critical

# RANDOMIZED/CONTROLLED TRIALS

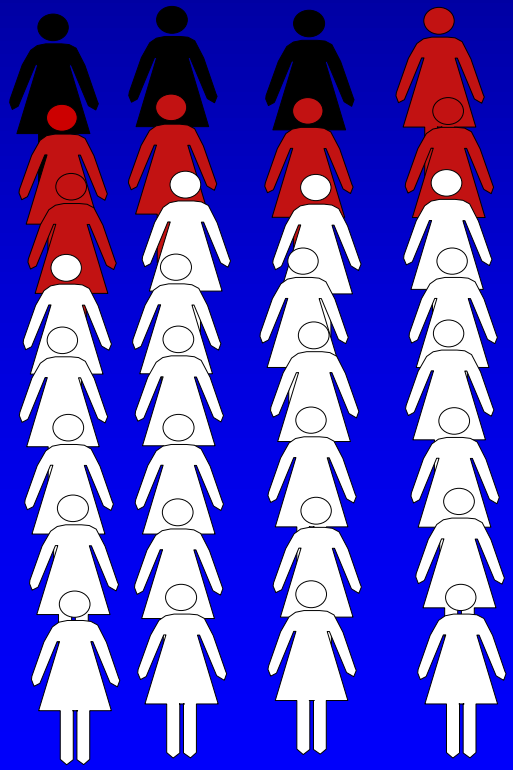
Randomization must be blinded

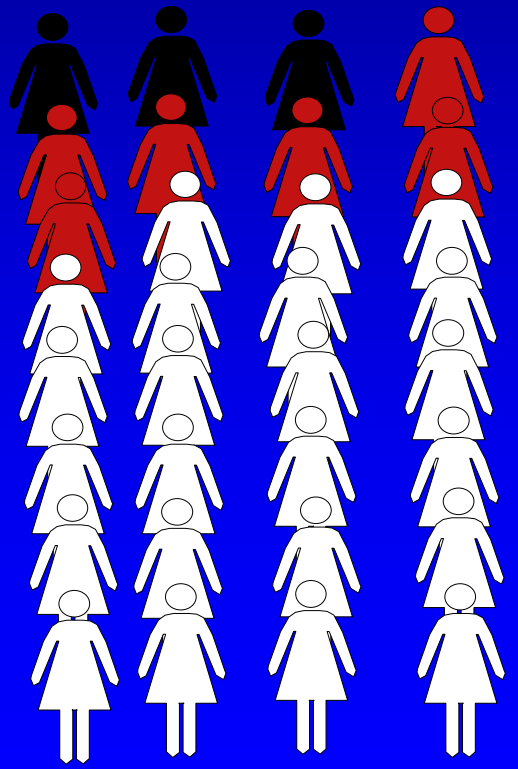

SUCCESSFUL
RANDOMIZATION


SUCCESSFUL
RANDOMIZATION

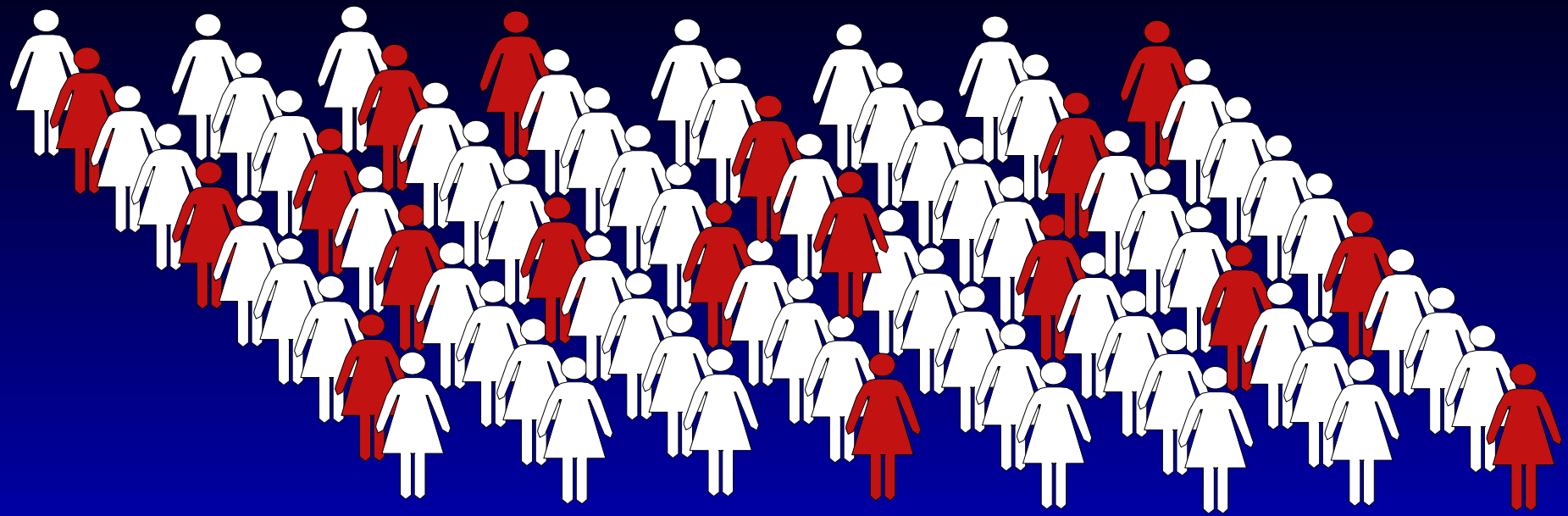


SUCCESSFUL
RANDOMIZATION

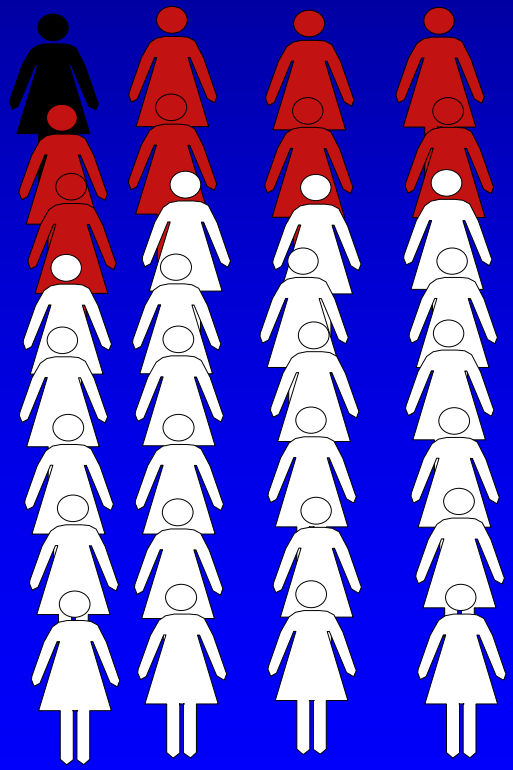




Them same number
will die of cancer
over time.

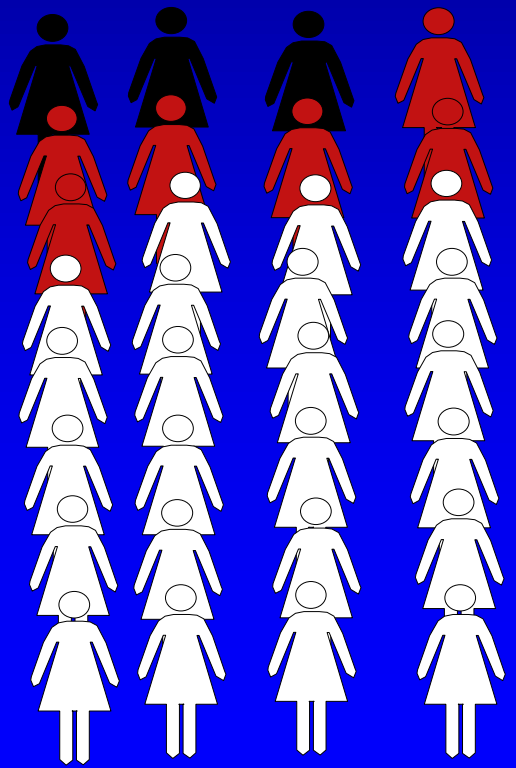


SUCCESSFUL RANDOMIZATION

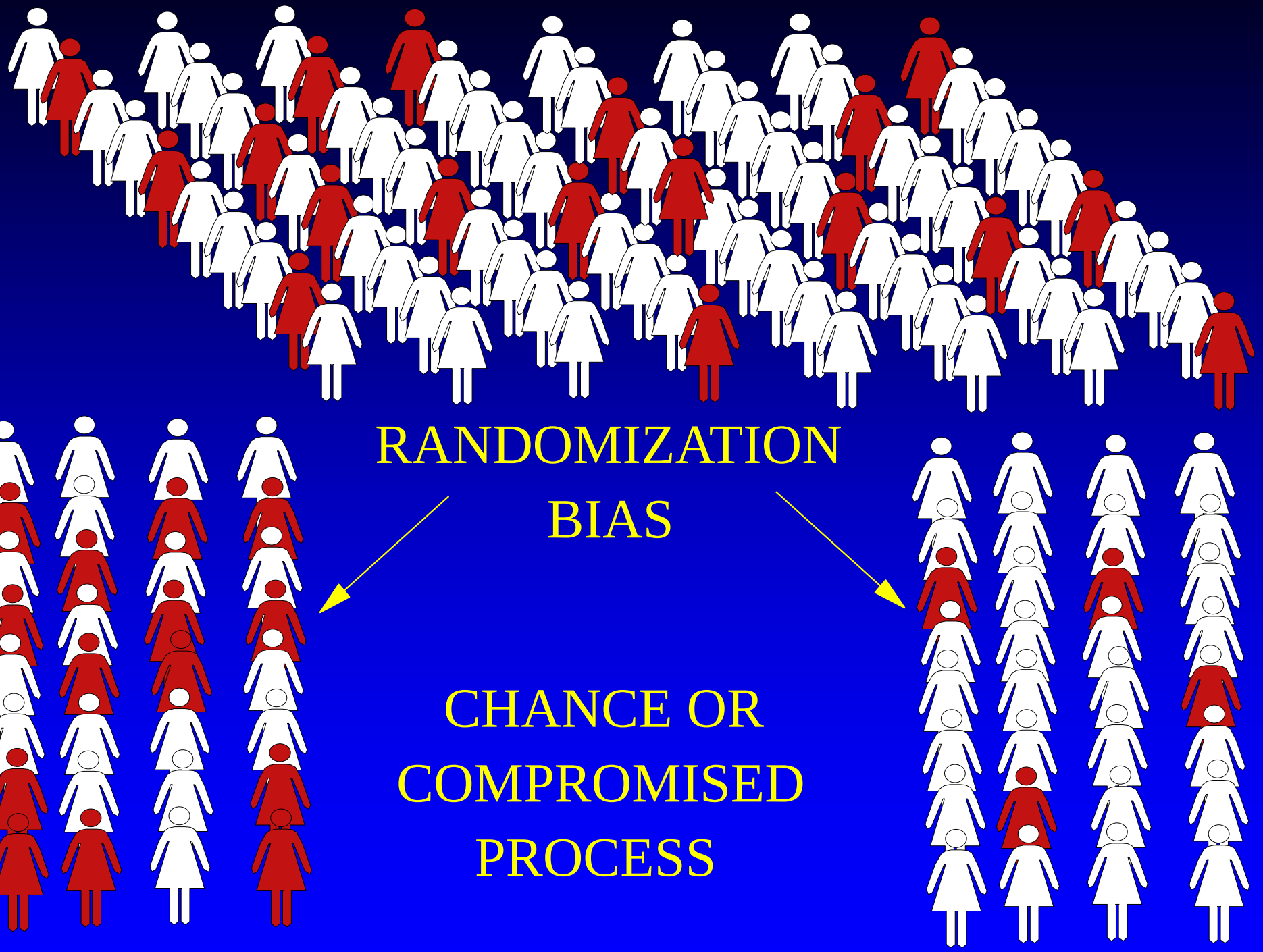


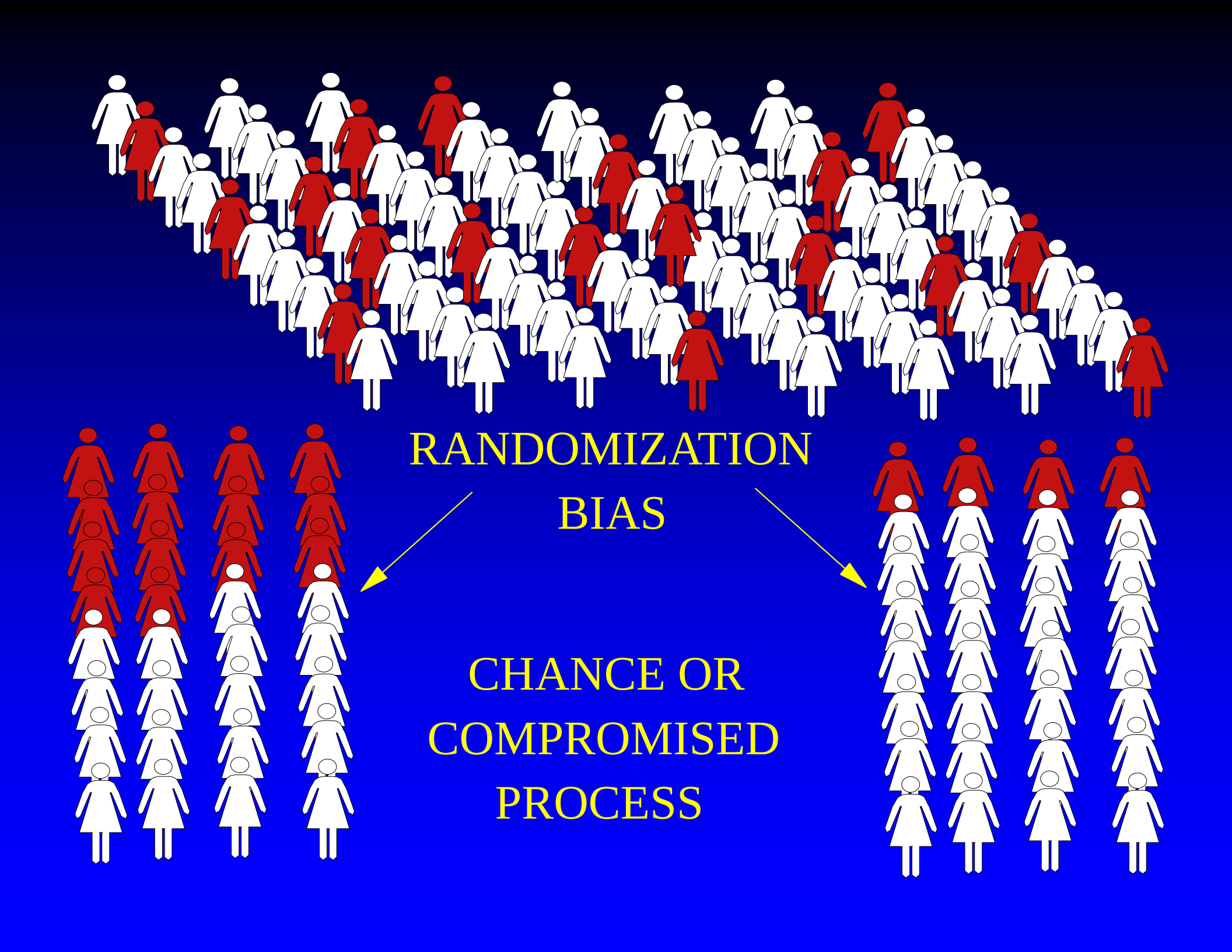
Screens

If fewer women die in the screened group over time, then efficacy can be shown.



Unscreened controls


RANDOMIZATION
BIAS
CHANCE OR
COMPROMISED
PROCESS


RANDOMIZATION
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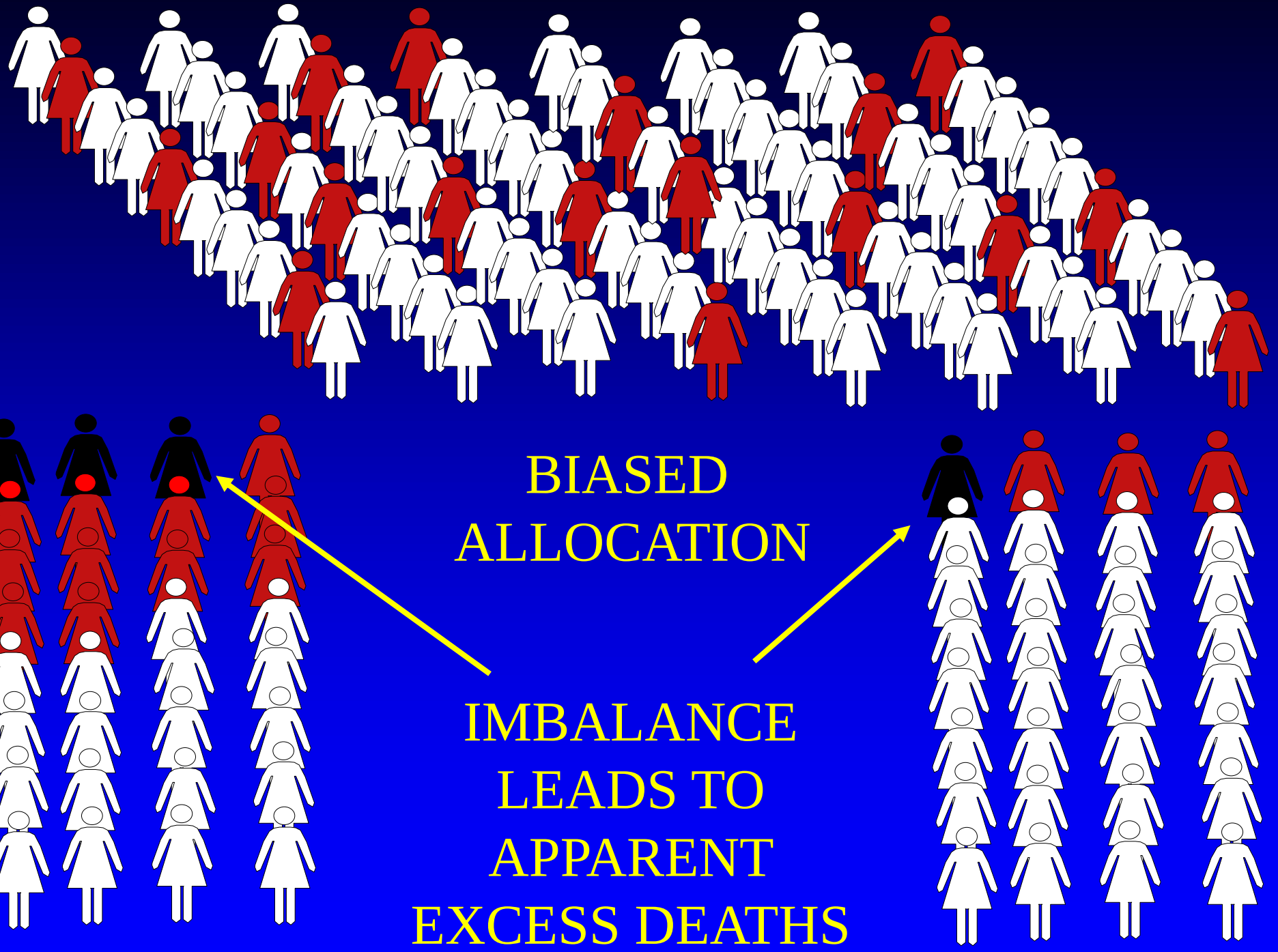

BIASED
ALLOCATION
IMBALANCE
LEADS TO
APPARENT
EXCESS DEATHS

# THE CANADIAN NATIONAL BREAST SCREENING STUDY (CNBSS)

Documented poor quality mammography.

1. Old devices (10 years old in Vancouver) at least 1 second hand.
2. No grids
3. No training for techs – used straight lateral not MLO
4. No training for the radiologists
5. Mammo size cancers = 1.9 cm
   Controls = 2.1 cm

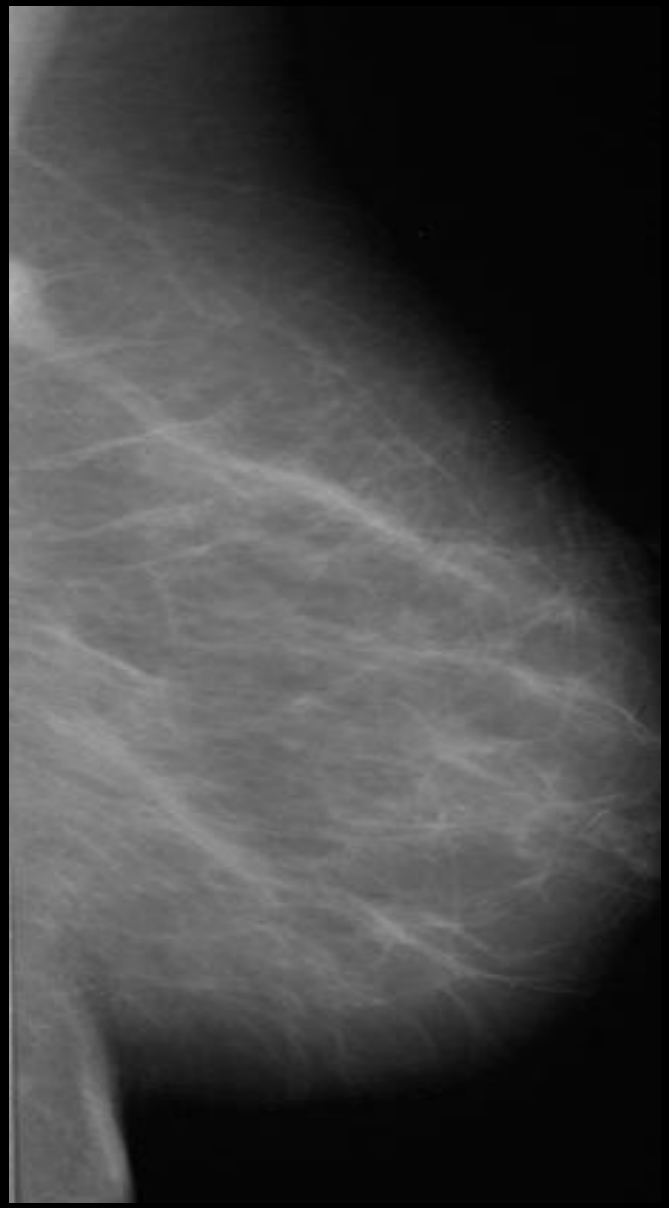
# THE CANADIAN NATIONAL BREAST SCREENING STUDY (CNBSS)

## Documented poor quality mammography.

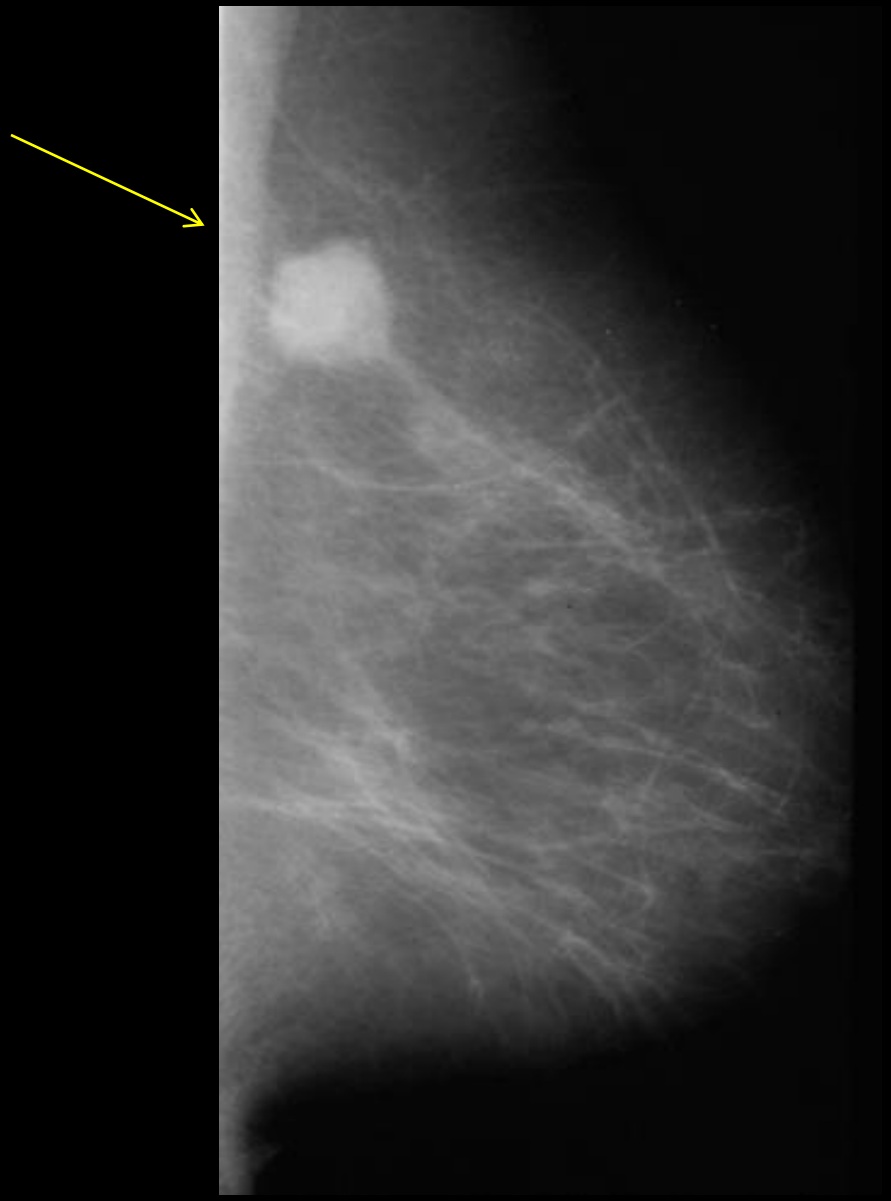
"..in my work as reference physicist to the NBSS, [I] identified many concerns regarding the quality of mammography carried out in some of the NBSS screening centers. That quality [in the NBSS] was far below state of the art, even for that time (early 1980's). “

(Yaffe MJ. Correction: Canada Study. Letter to the Editor JNCI 1993;85:94).

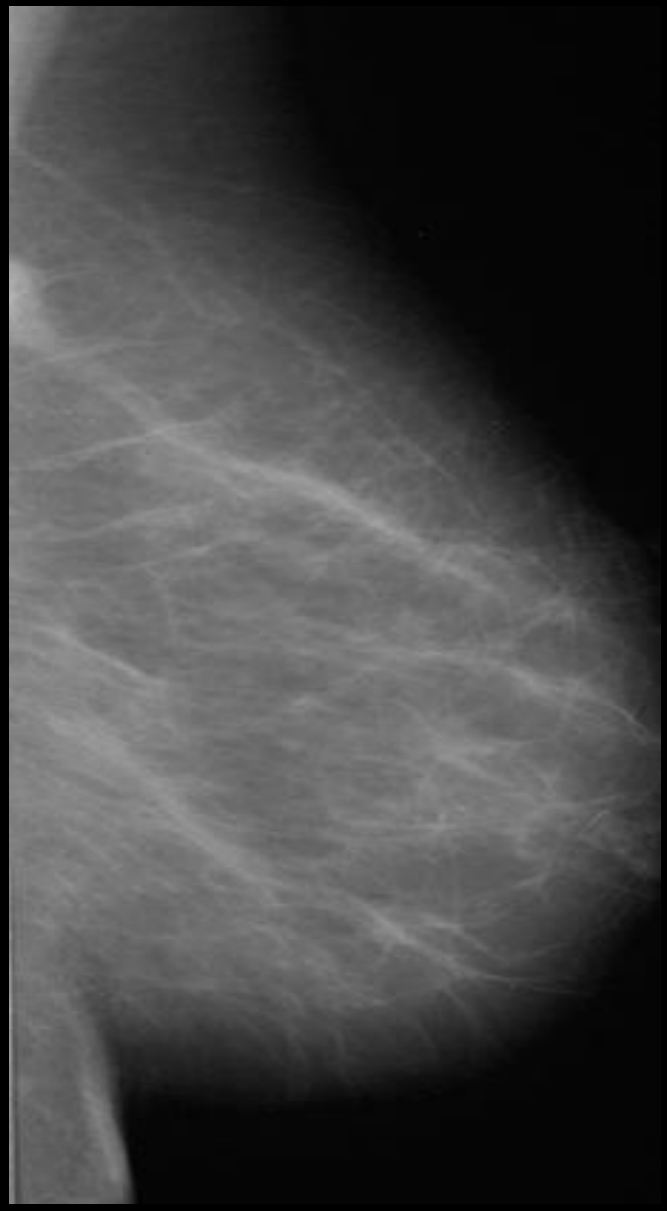
# Poorly Positioned Mammogram



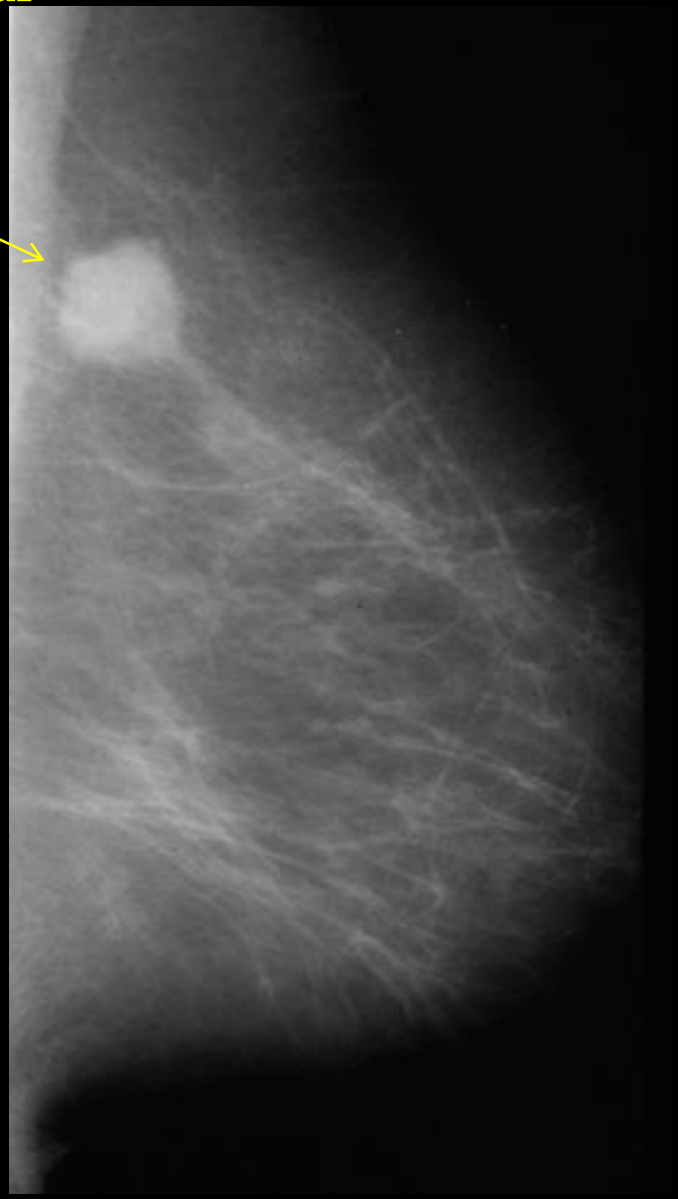
# Cancer Is Now Much Larger And Visible A Year Later



Cancer missed due to poor positioning

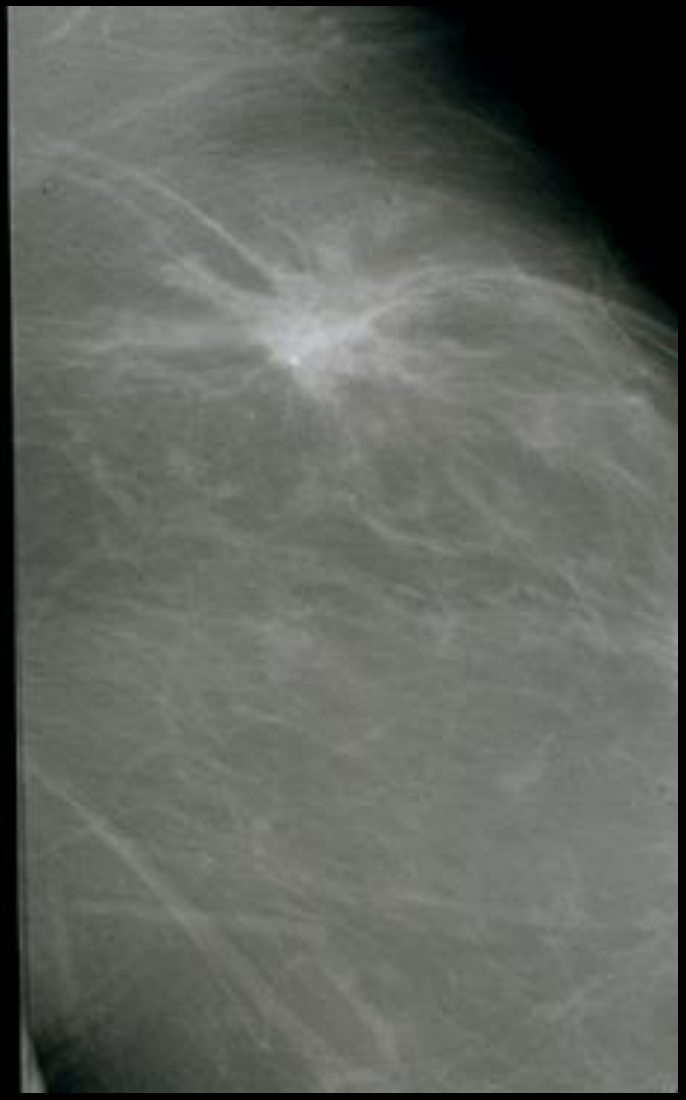


Cancer is now much larger and visible a year later



# No Grid

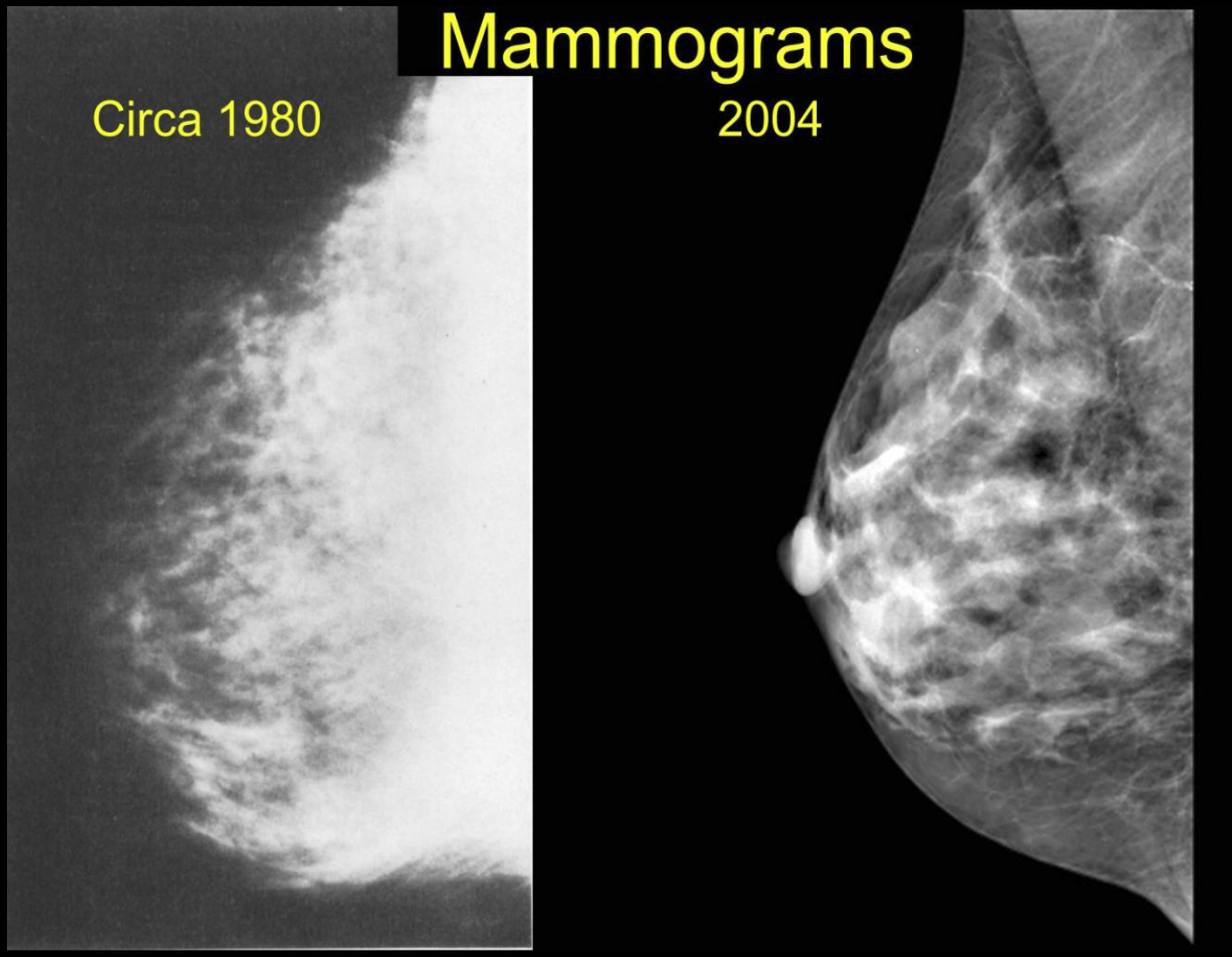
# Same Day Same Patient With A Grid – The Cancer Is Obvious



No grid – even a large cancer is hard to see

Same patient, same day with a grid – the cancer is obvious

Images provided by Martin Yaffe, PhD.
Reference Physicist Canadian National Breast Screening Study



# THE CANADIAN NATIONAL BREAST SCREENING STUDY (CNBSS)

RCT'S require blinded allocation which was totally violated in the CNBSS:

1. All women had a CBE first so they knew who had palpable lesions (cancers) and positive axillary nodes
2. Women were allocated on open lists so that lines could be skipped to insure a woman was placed in the mammography group.

(Bailar JC, MacMahon B, Randomization in the Canadian National Breast Screening Study: A Review for Evidence of Subversion. Can Med Assoc J 1997;156:193-199. ).

# THE CANADIAN NATIONAL BREAST SCREENING STUDY (CNBSS)

## The Data Clearly Show Compromise of Random Allocation:

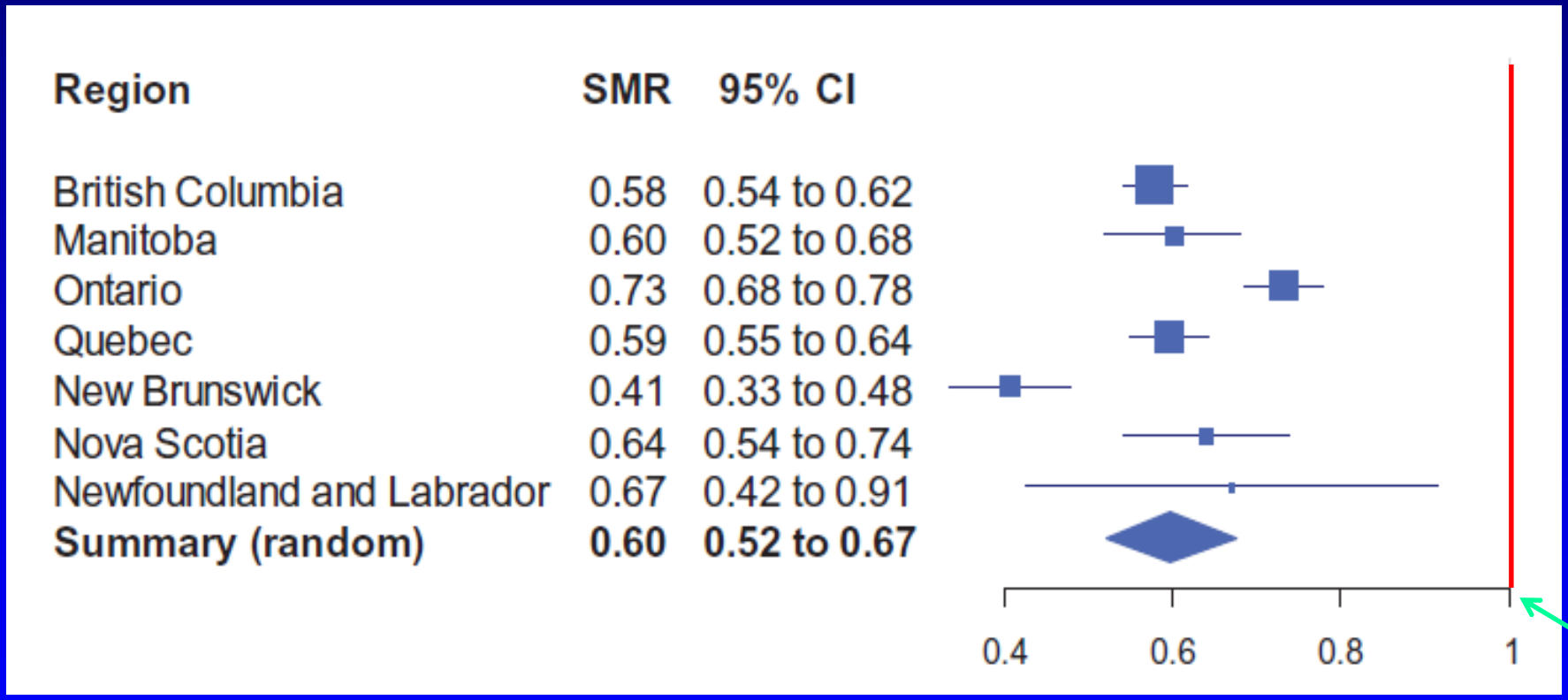
1. Significant excess of women with advanced cancers in the screening arm
2. More deaths in the screening group in first 10 years
3. Greater than 90% 5 year survival in the control women while background in Canada was only 75%. Impossible without moving cancers from control to screening arm.

# THE CANADIAN NATIONAL BREAST SCREENING STUDY (CNBSS)

The CNBSS results have been ignored in Canada. The provinces have continued to support breast cancer screening and just reported there has been a major decline in breast cancer deaths as a result.

# SCREENING IN CANADA IS SAVING LIVES

Comparing women who participate in screening and those who do not, the death rate for the screened women is 40% (range 27%-50%) lower than expected.




Coldman A, Phillips N, Wilson C, Decker K, Chiarelli AM, Brisson J, Zhang B, Payne J, Doyle G, Ahmad R. Pan-canadian study of mammography screening and mortality from breast cancer. J Natl Cancer Inst. 2014 Oct 1;106(11).

# BREAST CANCER SCREENING

## "RISK BASED" SCREENING:

It is "pie in the sky" to suggest that screening can be tailored based on risk.

1. The randomized, controlled trials were not stratified by risk so there is no proof that screening only high risk women will save any lives.
2. If we only screen high risk women we will miss 75-90% of women who develop breast cancer each year.

# FACT:

Screening has, consistently, shown a decrease in breast cancer deaths for all women of approximately 30%.

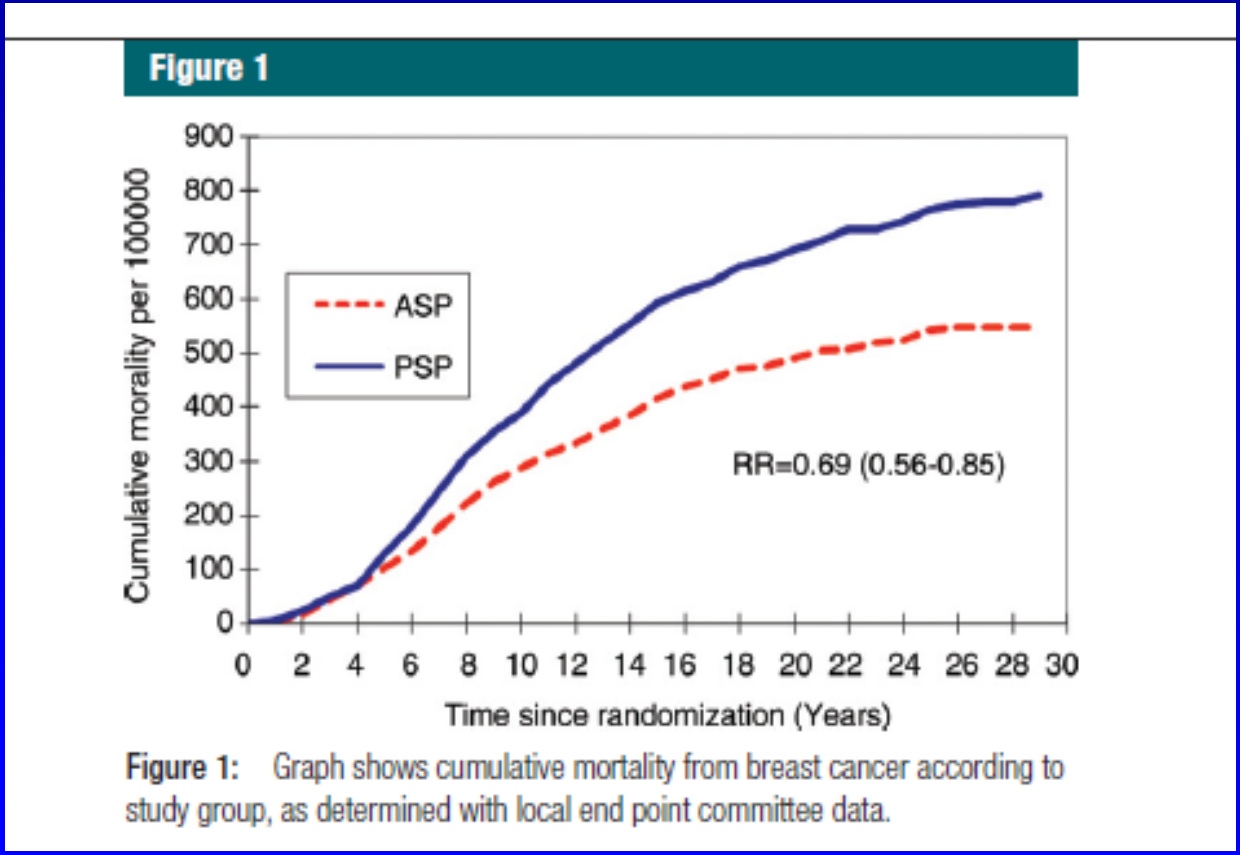
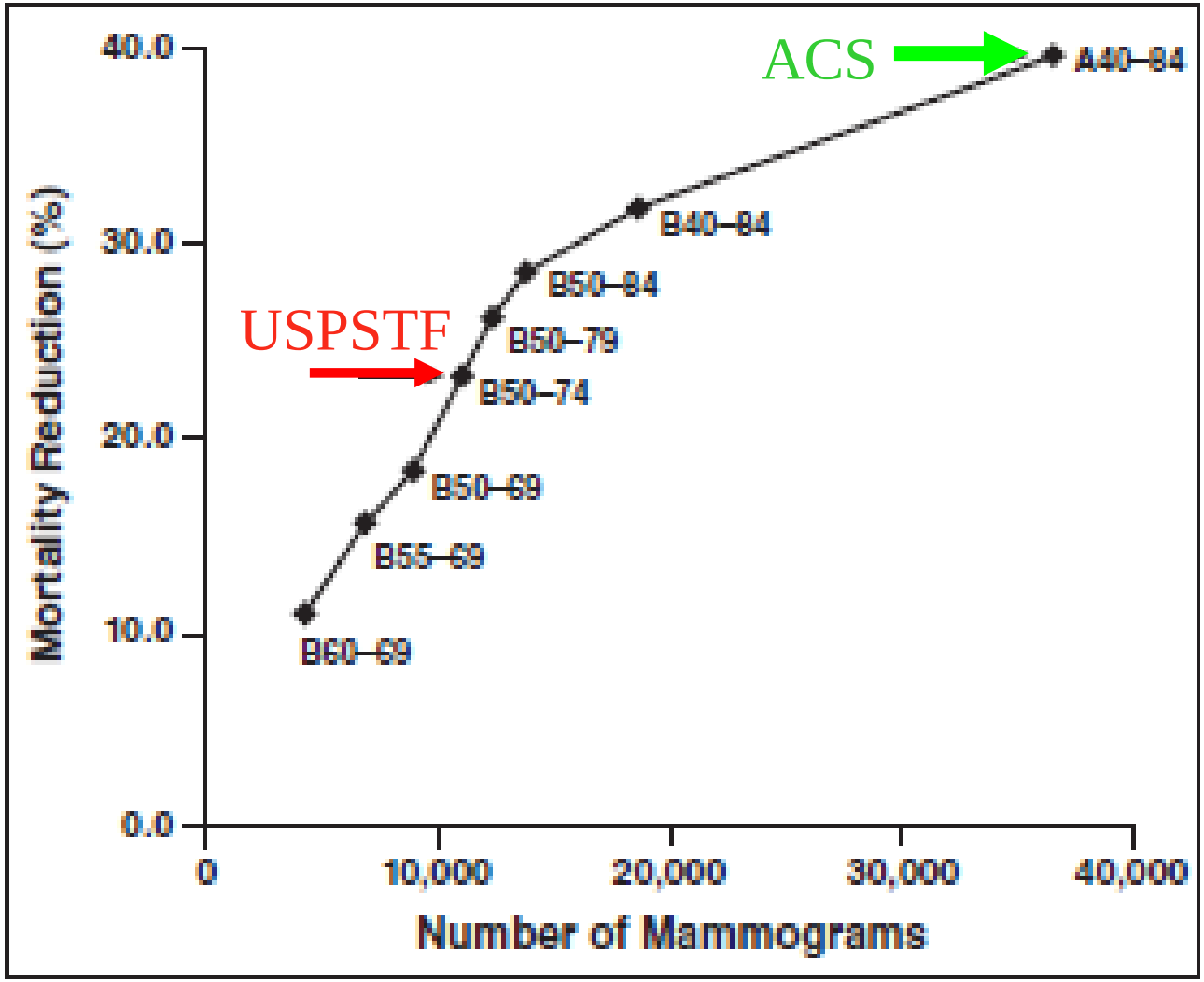



**Figure 1:** Graph shows cumulative mortality from breast cancer according to study group, as determined with local end point committee data.

Tabár L, Vitak B, Chen TH, Yen AM, Cohen A, Tot T, Chiu SY, Chen SL, Fann JC, Rosell J, Fohlin H, Smith RA, Duffy SW. Swedish two-county trial: impact of mammographic screening on breast cancer mortality during 3 decades. Radiology. 2011 Sep;260(3):658-63.

# USPSTF SHOWS THAT MOST LIVES ARE SAVED BY ANNUAL SCREENING BEGINNING AT 40

**Fig. 1**—Percentage mortality reduction from various screening strategies. Note that annual (A) screening from ages 40–84 years (A40–84, *solid arrow*) is estimated to have 71% greater mortality benefit than biennial (B) screening from ages 50–74 years (B50–74, *dashed arrow*). Number of mammograms shown on horizontal axis is per 1,000 women screened. Data shown are mean values of six models from [6].



# BREAST CANCER SCREENING

## The Bottom Line

Most women who develop breast cancer are not at increased risk.

All women are at risk and annual screening, beginning at the age of 40, should be encouraged for all women.

# THE USPSTF GUIDELINES ARE SCIENTIFICALLY UNSUPPORTABLE

Direct studies from the Netherlands and Sweden show that most of the decrease in deaths is due to screening and not therapy. In Sweden, where women are more likely to attend screening, the death rate is down by 30%.

# FAILURE ANALYSIS

71% of the breast cancer deaths were among the 20% of women who were not participating in screening.

(Webb, et al. A Failure Analysis of Invasive Breast Cancer Most Deaths From Disease Occur in Women Not Regularly Screened Cancer 2013. )

# BREAST CANCER SCREENING

The effort to reduce access to mammography screening is a major medical disgrace that has gone on unchecked. Several of the high profile medical journals have promoted their undeclared biases by censoring the publication of legitimate science while publishing scientifically unsupportable material that has misled physicians and the public.

THIS NEEDS TO STOP !

# BREAST CANCER SCREENING

Mammography screening is not the ultimate answer to breast cancer. It does not find all cancers and does not result in a cure in all cases, but it is available today and is saving thousands of lives each year.

While we await a cure, or a safe way to prevent breast cancer (neither is on the horizon) it makes no sense to reduce access to screening.