Imperial College London

School of Public Health
Athena SWAN Lecture 2013

What women can do to stay healthy

Professor Dame Valerie Beral DBE AC FRS,
Professor of Epidemiology, University of Oxford

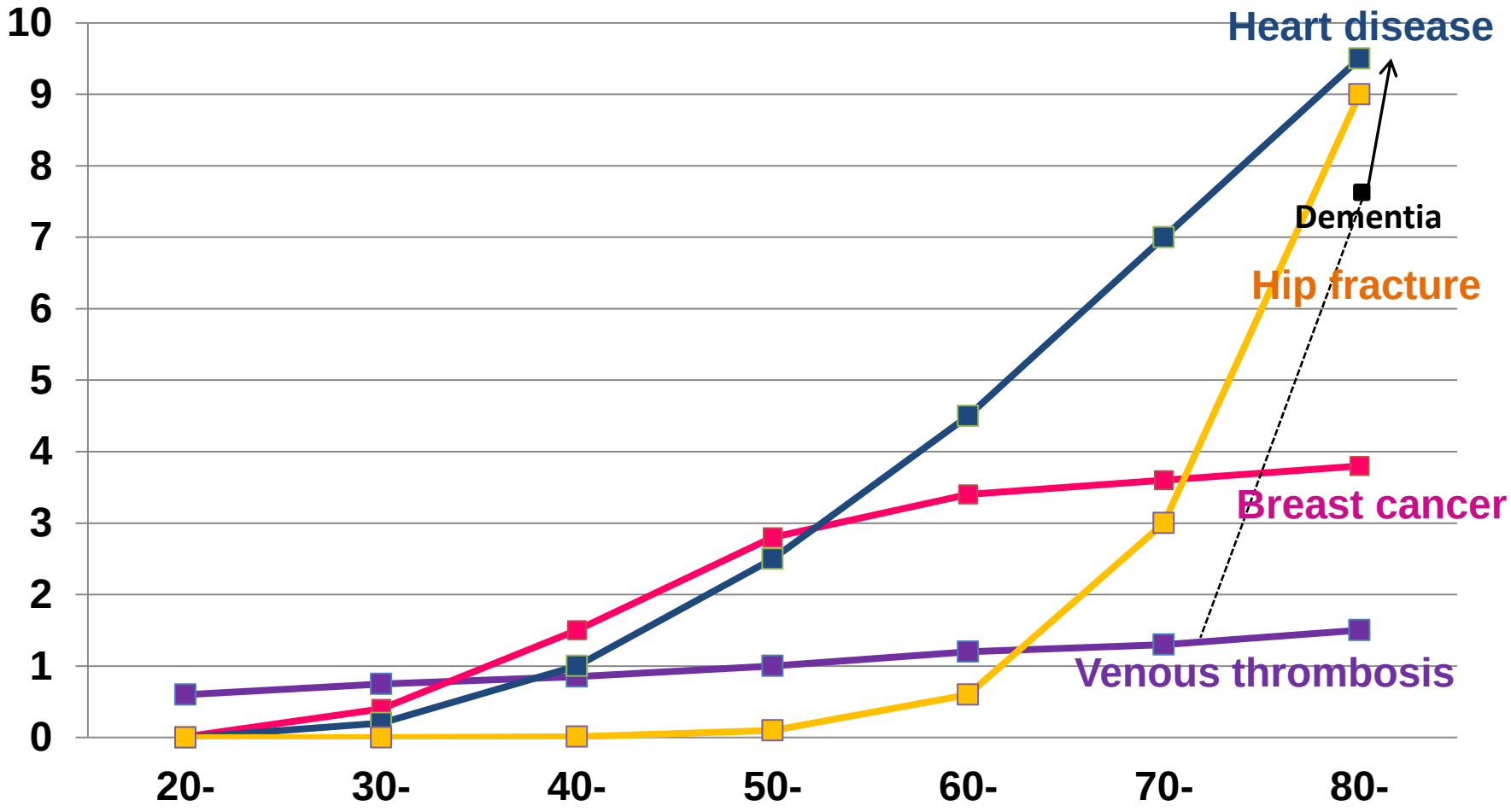
Athena SWAN

Charter for women in science
Recognising commitment to advancing women's careers in STEMM academia

What women can do to stay healthy

Valerie Beral
University of Oxford

Age-specific incidence of important conditions in women (rate/1000/year)



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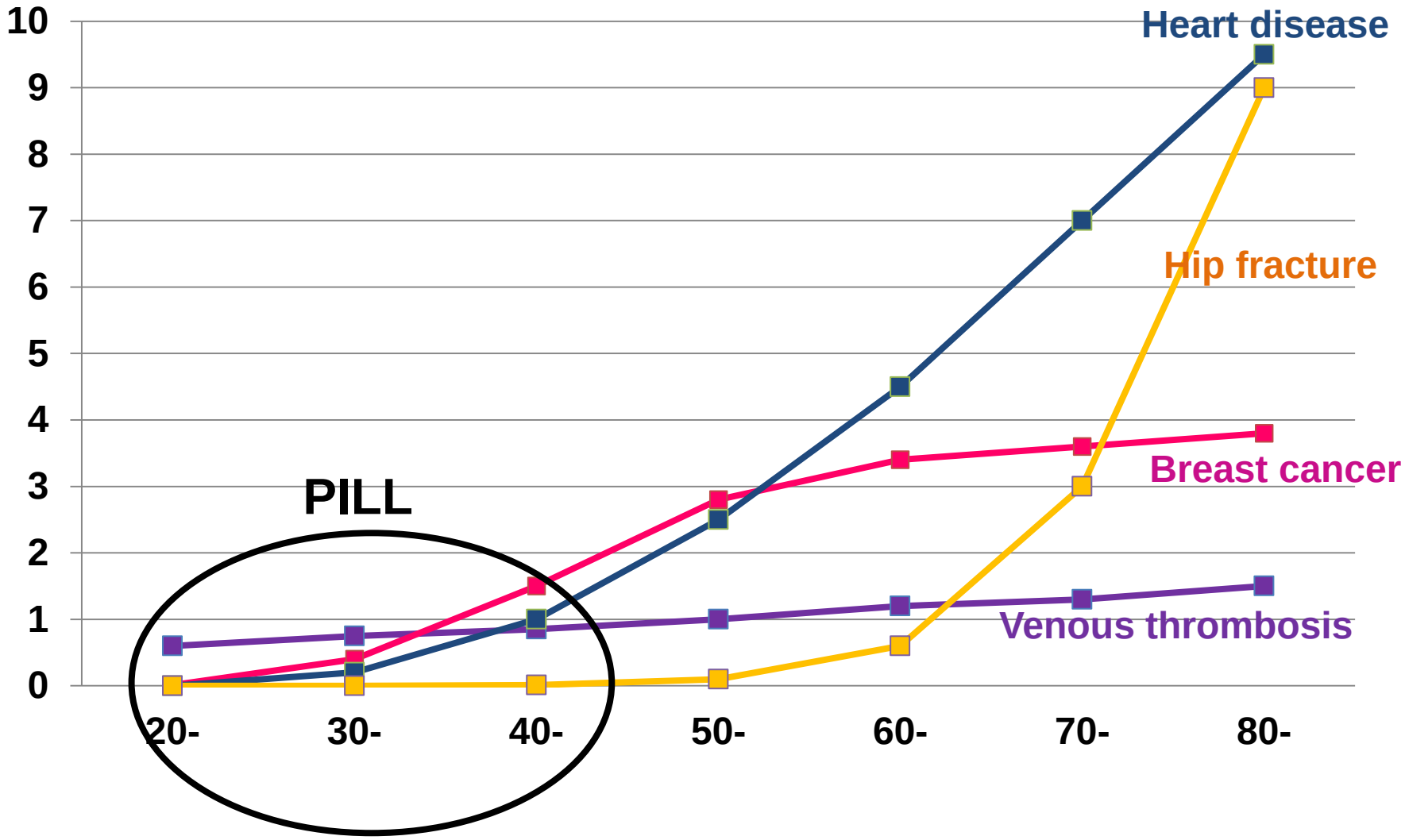

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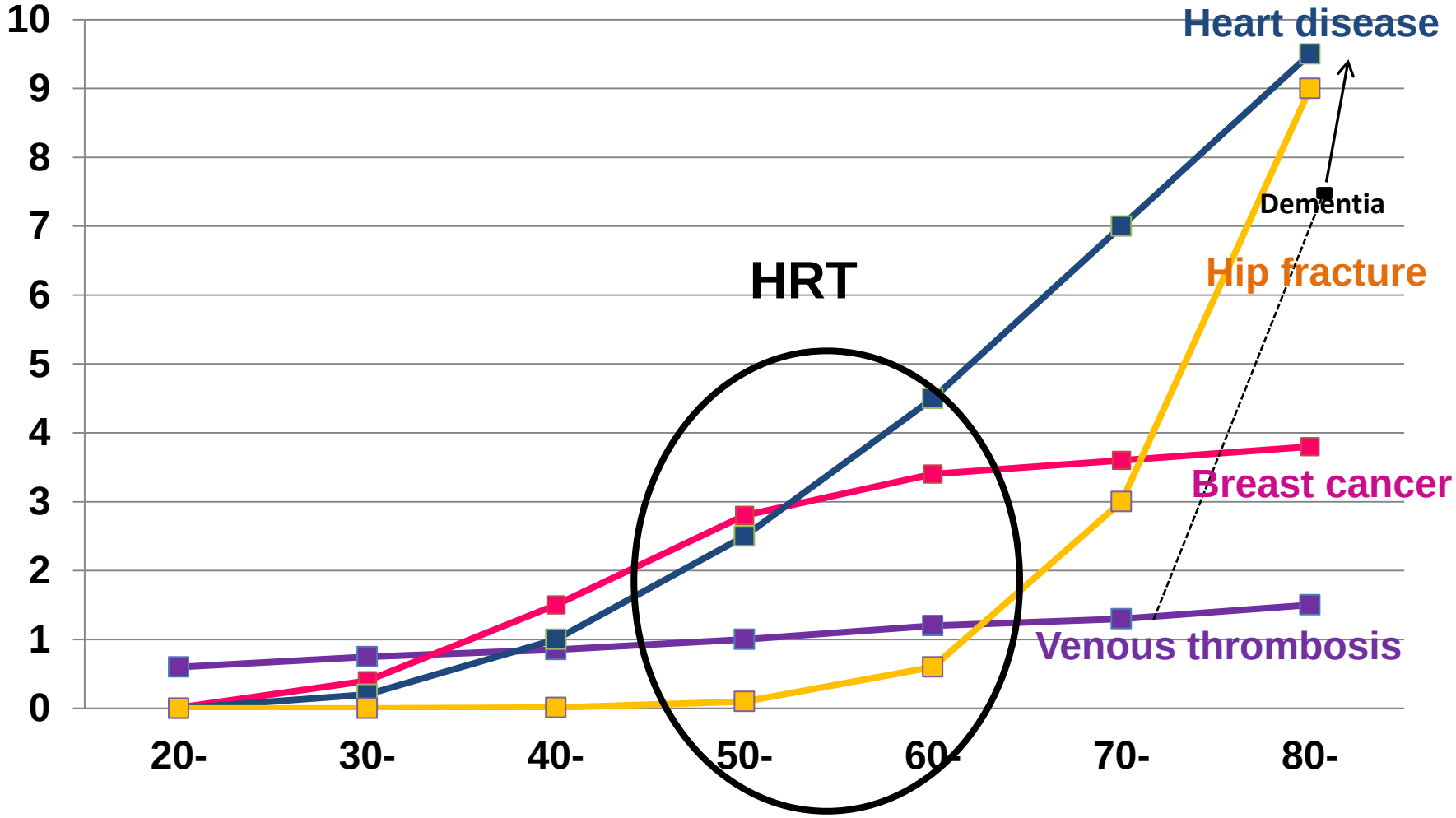


Disease rates vary by age; and exposures vary by age

Questions:

What are the effects of important potentially modifiable exposures?

Are the effects persistent?

Exposures:

The pill; HRT; adiposity; physical activity; alcohol and diet; smoking

THE PILL

- **First licensed in ~1960**
- **600 million women have used it**
- **120 million are currently using it**

In western countries today:

- women in their 60s, 80% ever-users (for 7 years)
- women in their 90s, 30% ever-users (for 5 years)

THE PILL

1960 and 1970s – adverse vascular effects

1961 – first report of venous thrombosis (VTE)
1962 – 26 cases of VTE reported to FDA
1962 – first report of stroke
1964 – first report of coronary heart disease

2-4 fold increase in venous thromboembolism, stroke and heart disease

All vascular effects are reversible

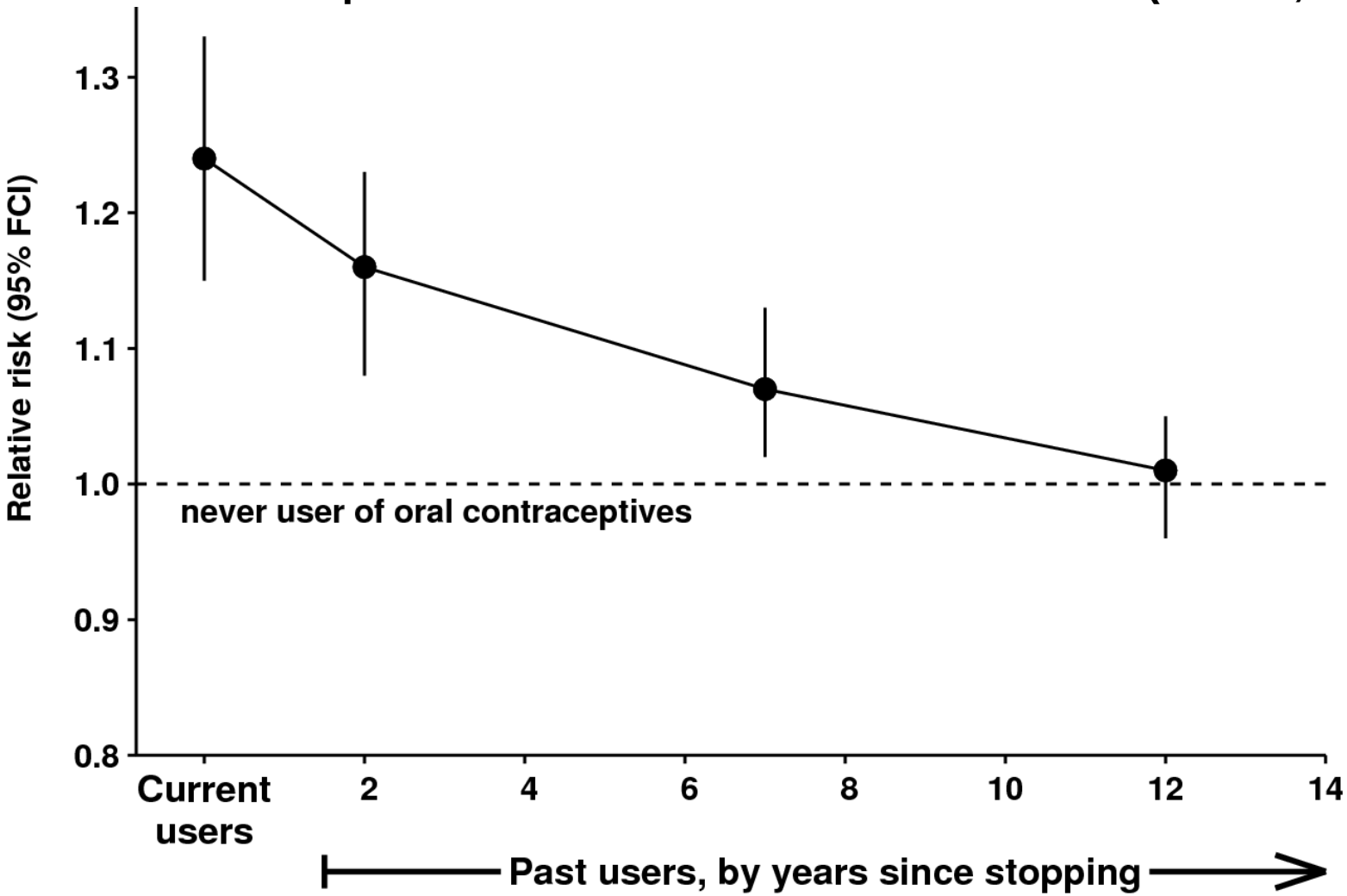
1980s and 1990s– emphasis on cancer

1980s - over 30 studies published results on breast cancer and the pill, with conflicting findings

1992 - Collaborative Group on Hormonal Factors in Breast Cancer set up in Oxford to bring together worldwide data; first results published in 1996

Oral contraceptives and breast cancer incidence

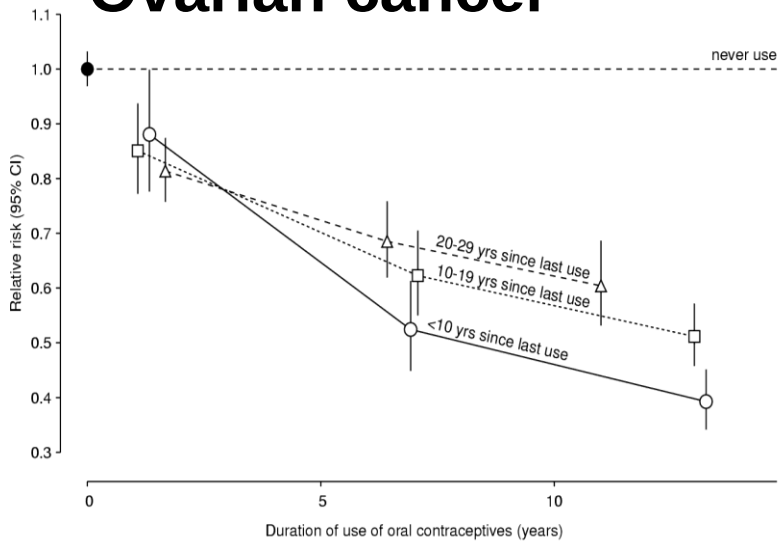
Collaborative Group on Hormonal Factors in Breast Cancer (Lancet, 1996)



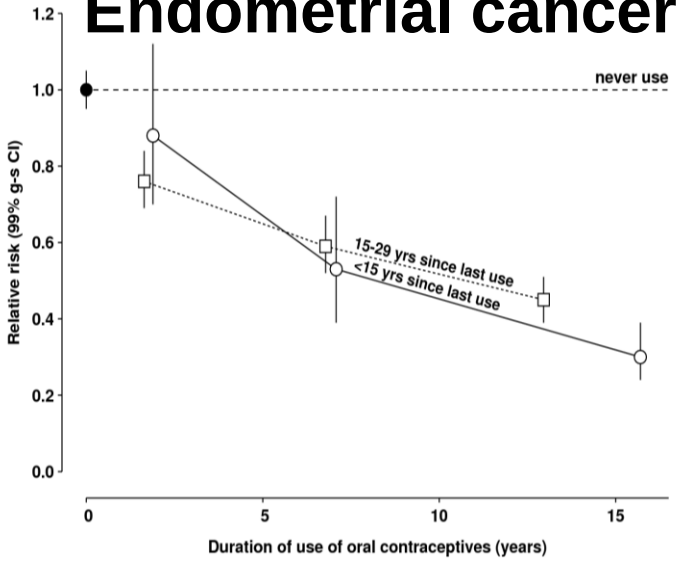
Excess breast cancer risk is reversible

Persistent reduction in ovarian and endometrial cancer risk – greater the longer the pill was used

Ovarian cancer



Endometrial cancer



Persistent reduction in ovarian and endometrial cancer risk – greater the longer the pill was used

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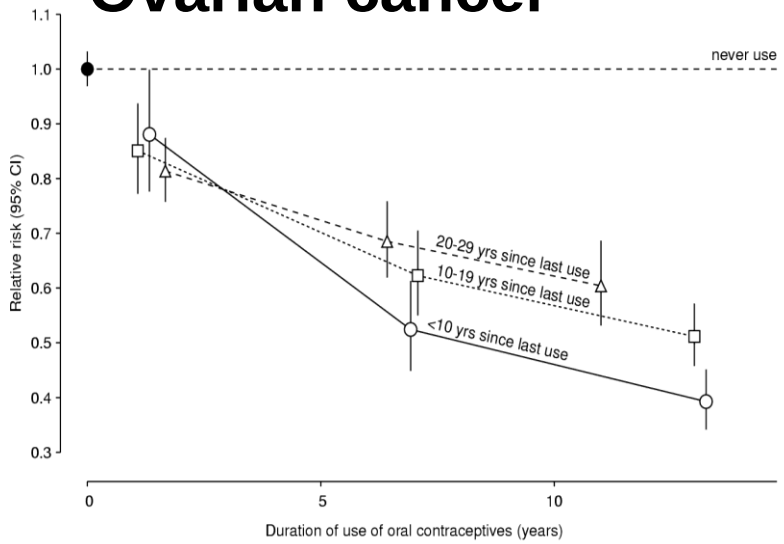
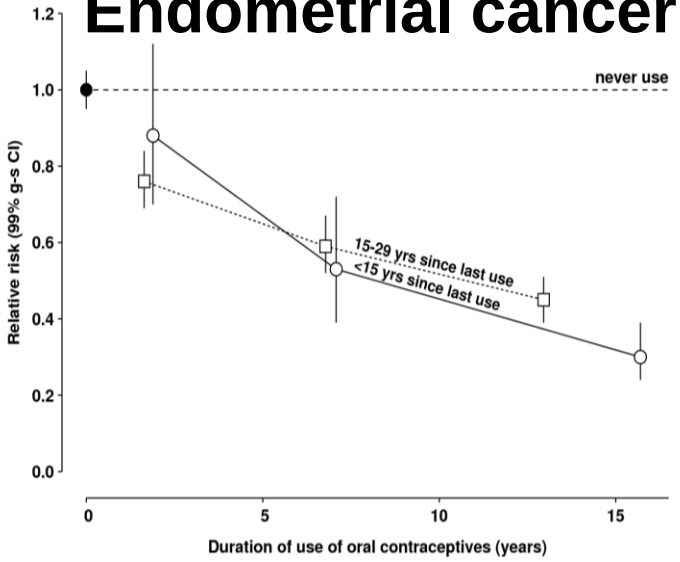
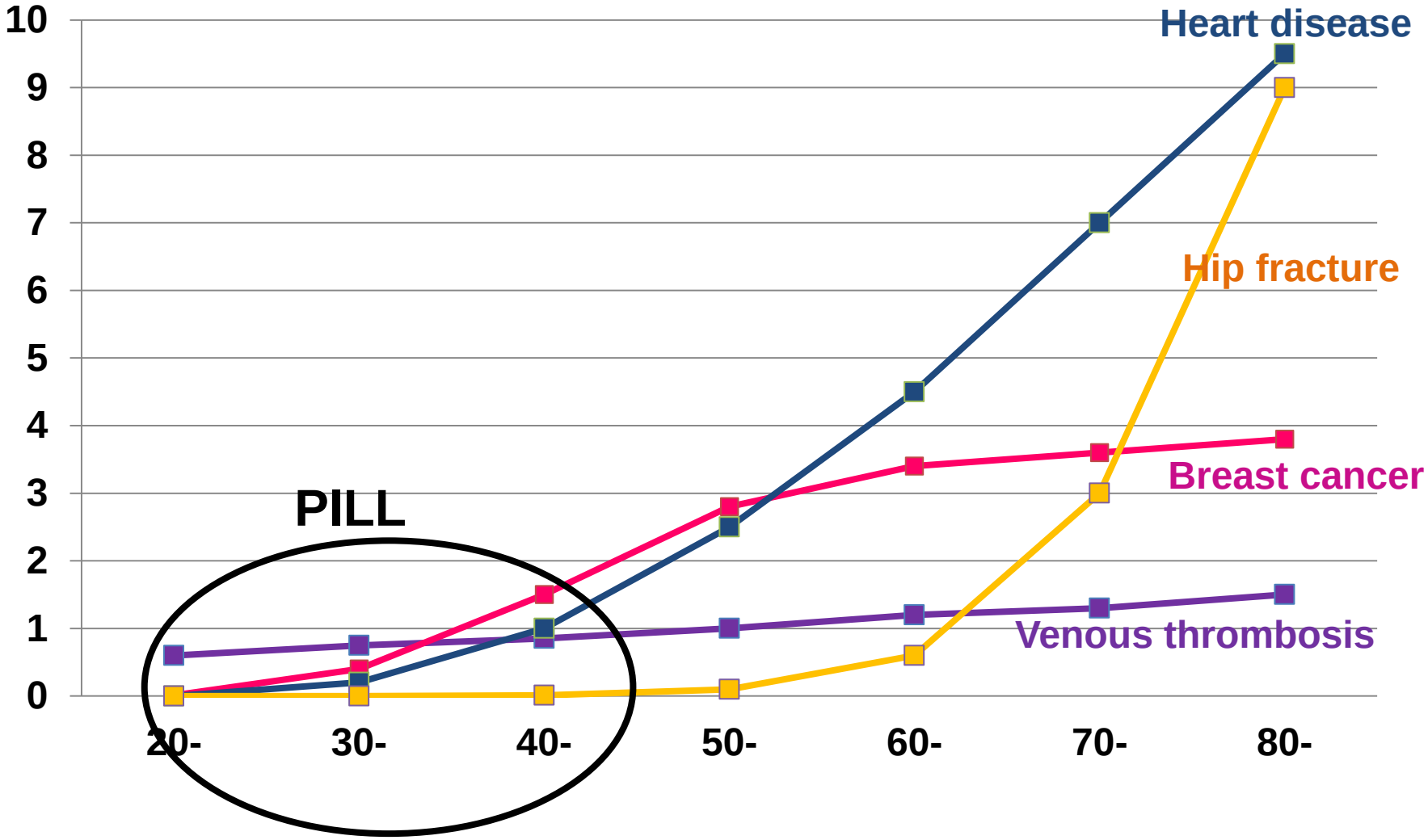


Endometrial cancer



A decade or so after stopping the pill the net effect is a reduction cancer incidence and mortality

Age-specific incidence of important conditions in women (rate/1000/year)



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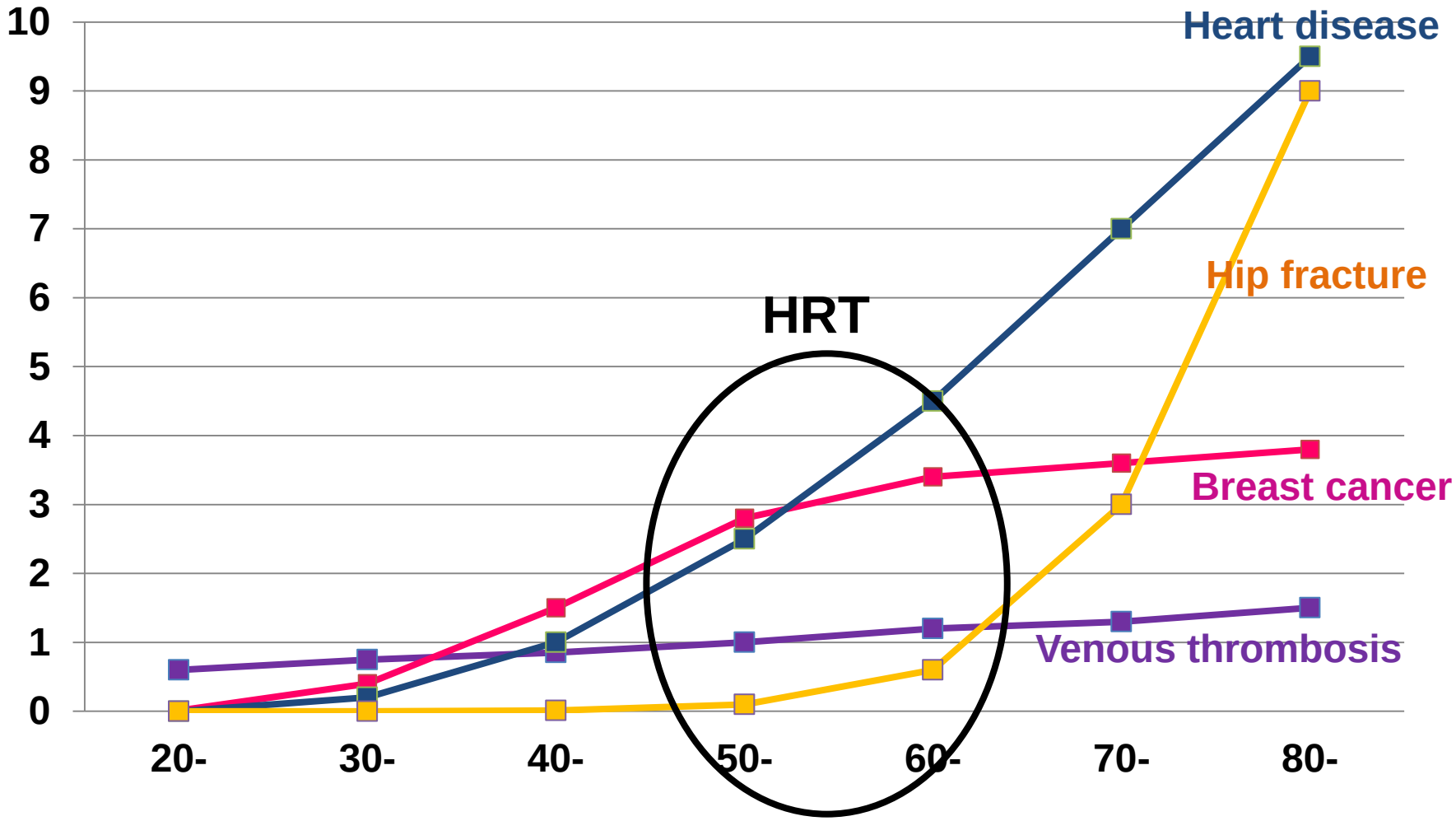


THE MILLION WOMEN STUDY

1.3 million women recruited in 1996-2001, from NHS Breast Screening Units

- to obtain reliable evidence about breast cancer and women's health in general

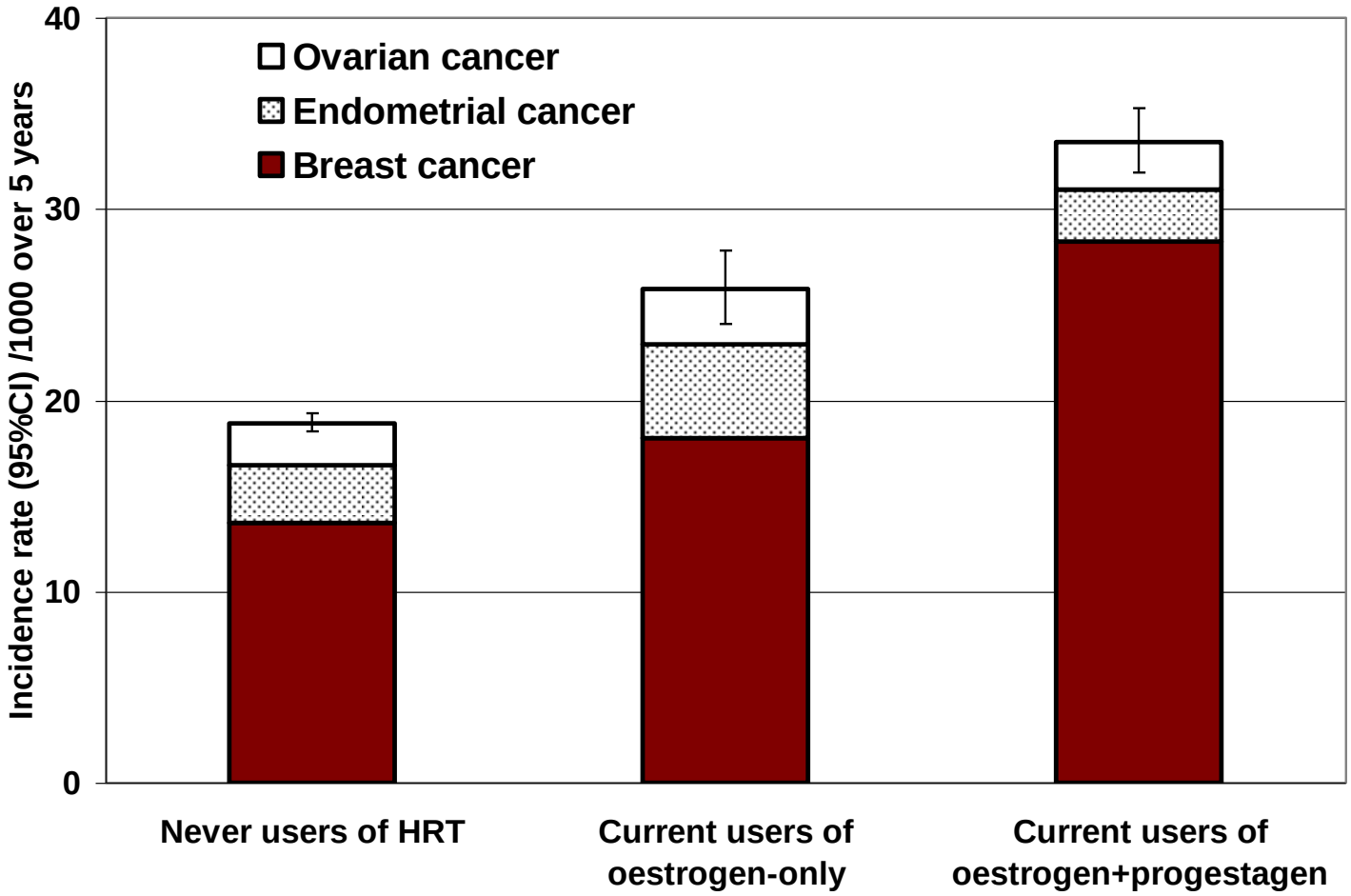
- 1 in 4 UK women aged 50-64 at the time of recruitment

- average age 56 at recruitment, now 70

www.millionwomenstudy.org

THE MILLION WOMEN STUDY

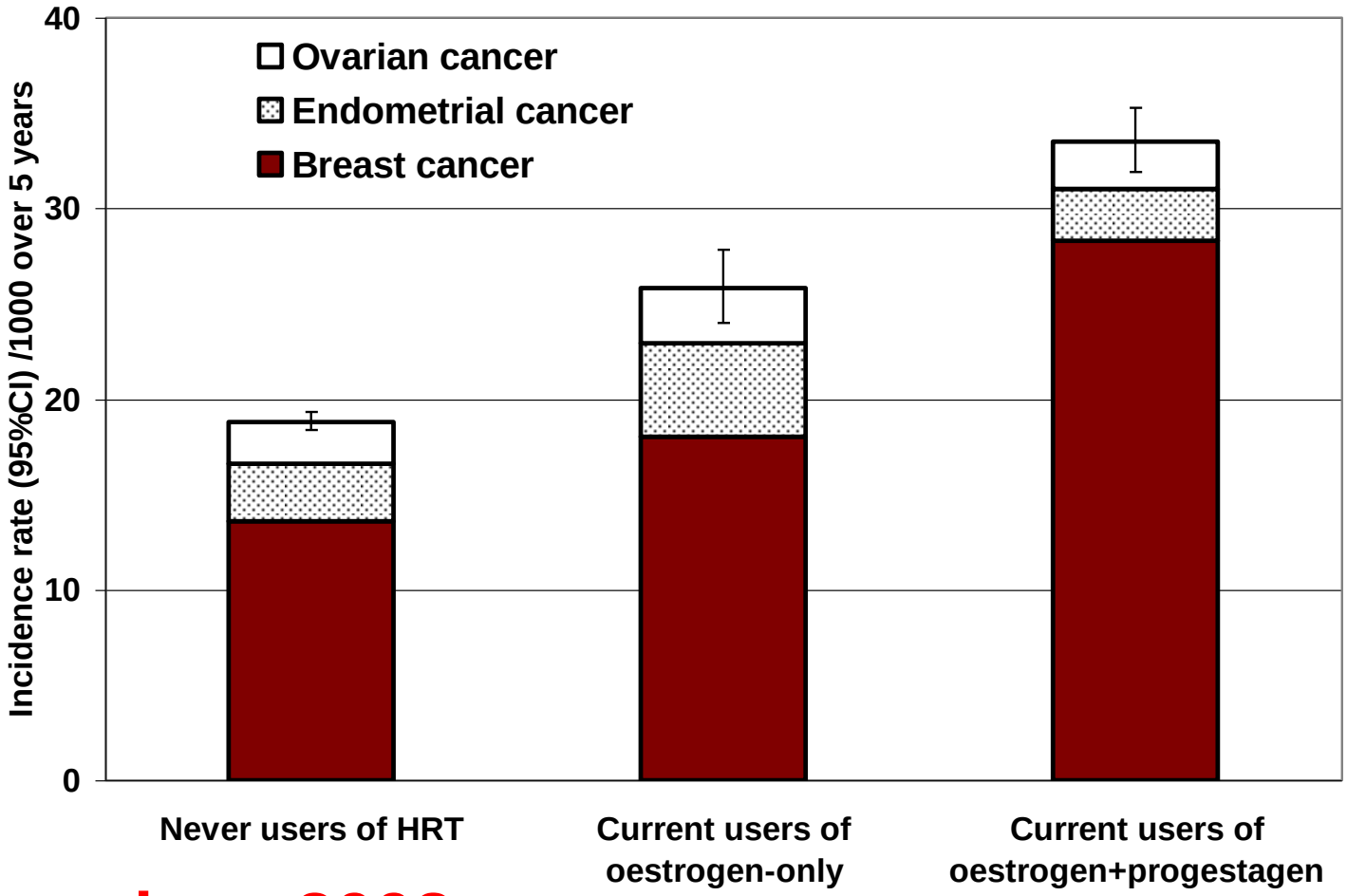
HRT and cancer incidence



Lancet, 2007

THE MILLION WOMEN STUDY

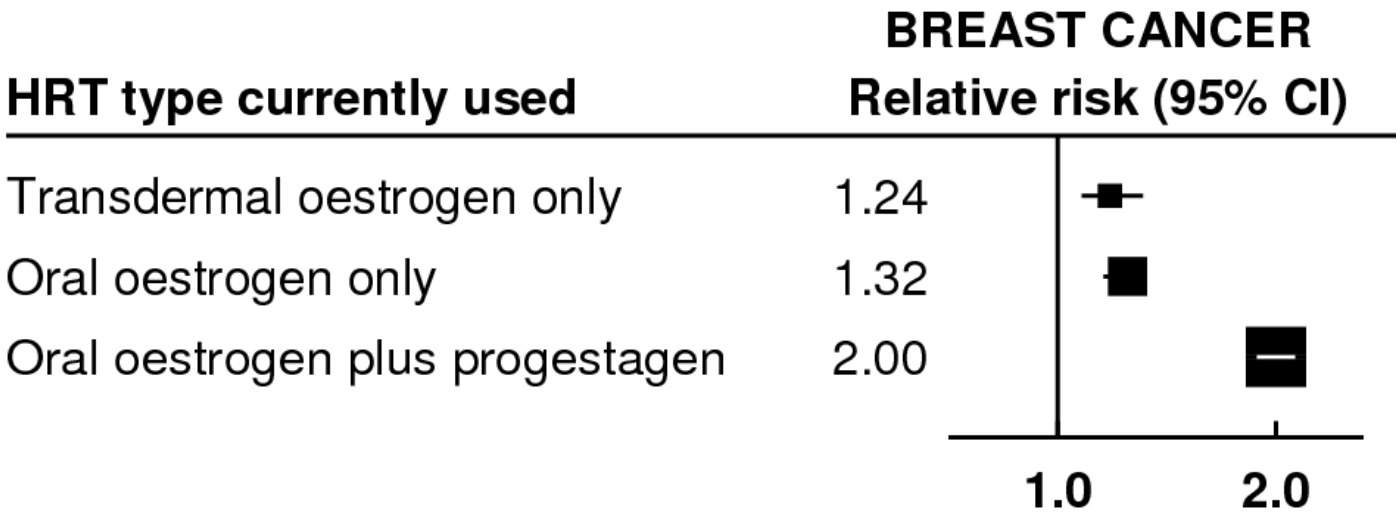
HRT and cancer incidence



MHRA, advice since 2002:
use HRT for as short a time as possible

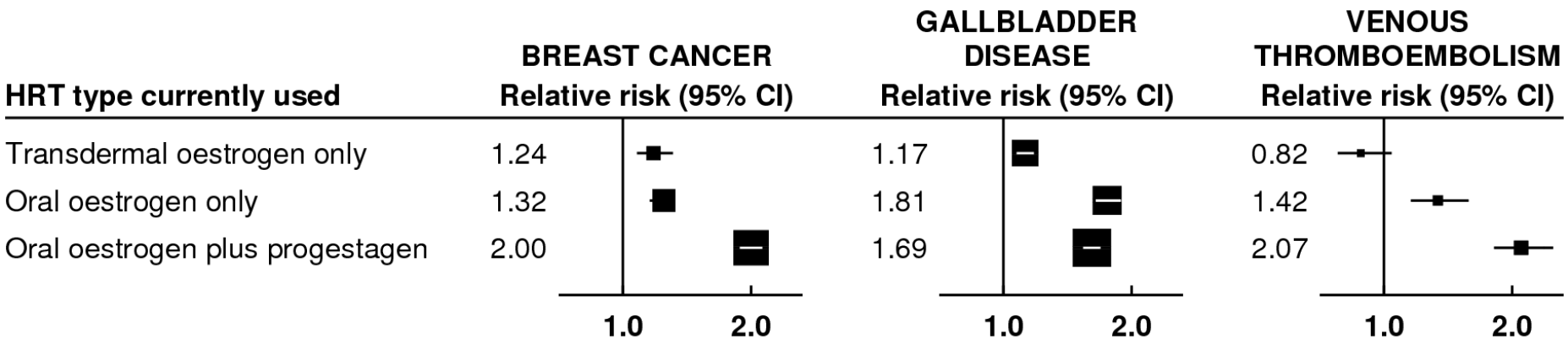
THE MILLION WOMEN STUDY

Type of HRT and risk of breast cancer



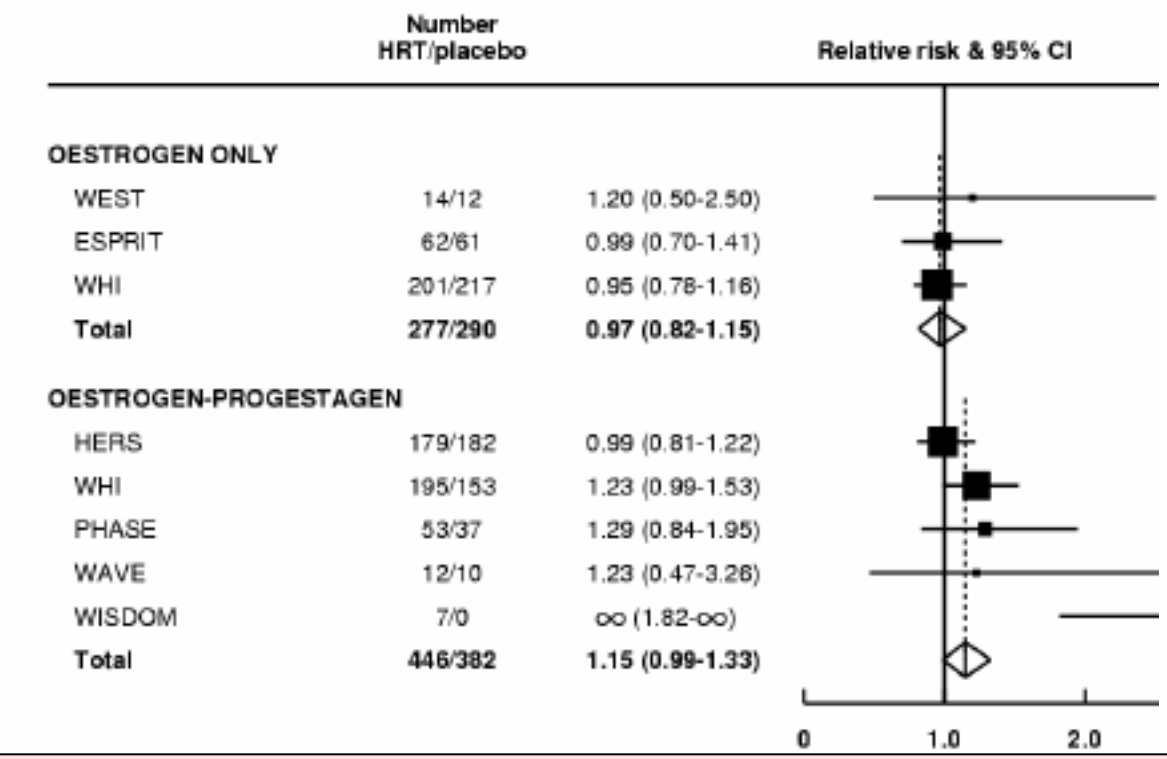
THE MILLION WOMEN STUDY

HRT type and risk of various conditions



Coronary heart disease: results from randomized trials*

little or no increase or difference by type of HRT

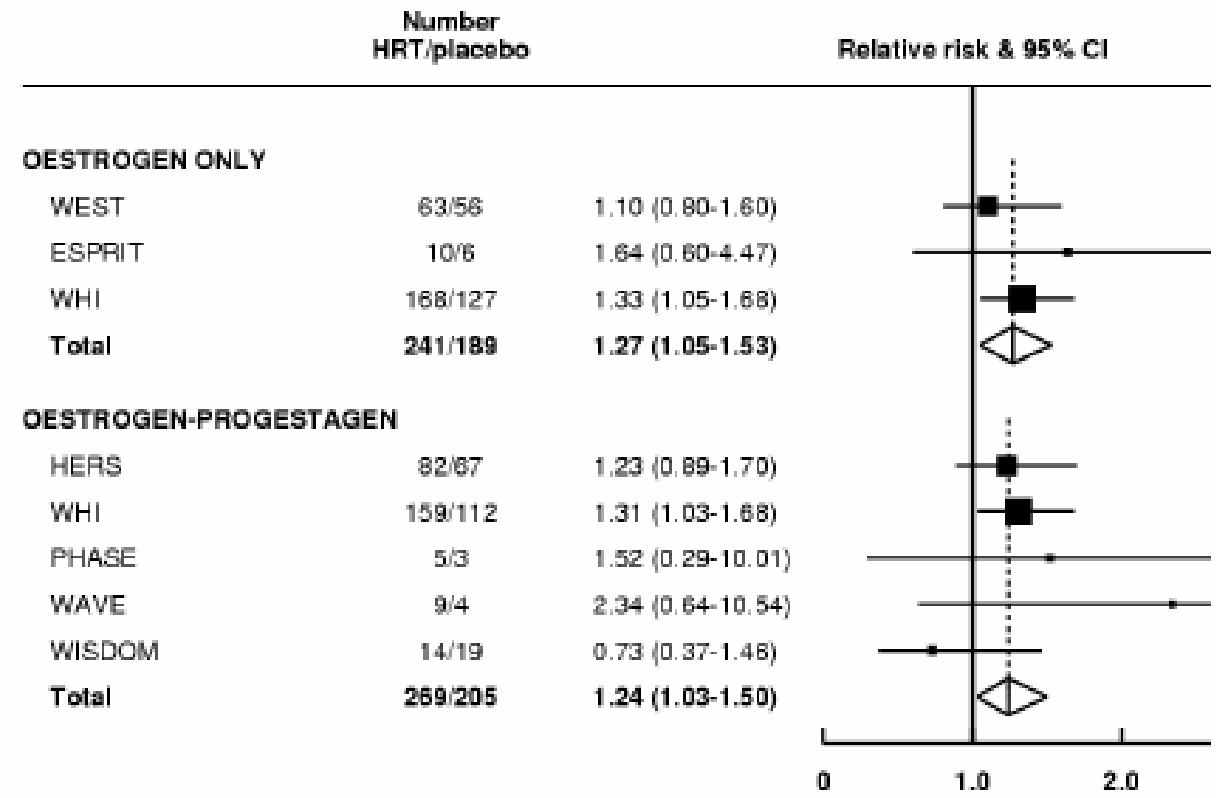


***MHRA Public Assessment Report, 2007 (www.mhra.gov.uk)**

However, as yet there is no evidence to support a cardioprotective effect of HRT, and further research is needed before any firm conclusions can be drawn about the effect of HRT on CHD r in younger women.

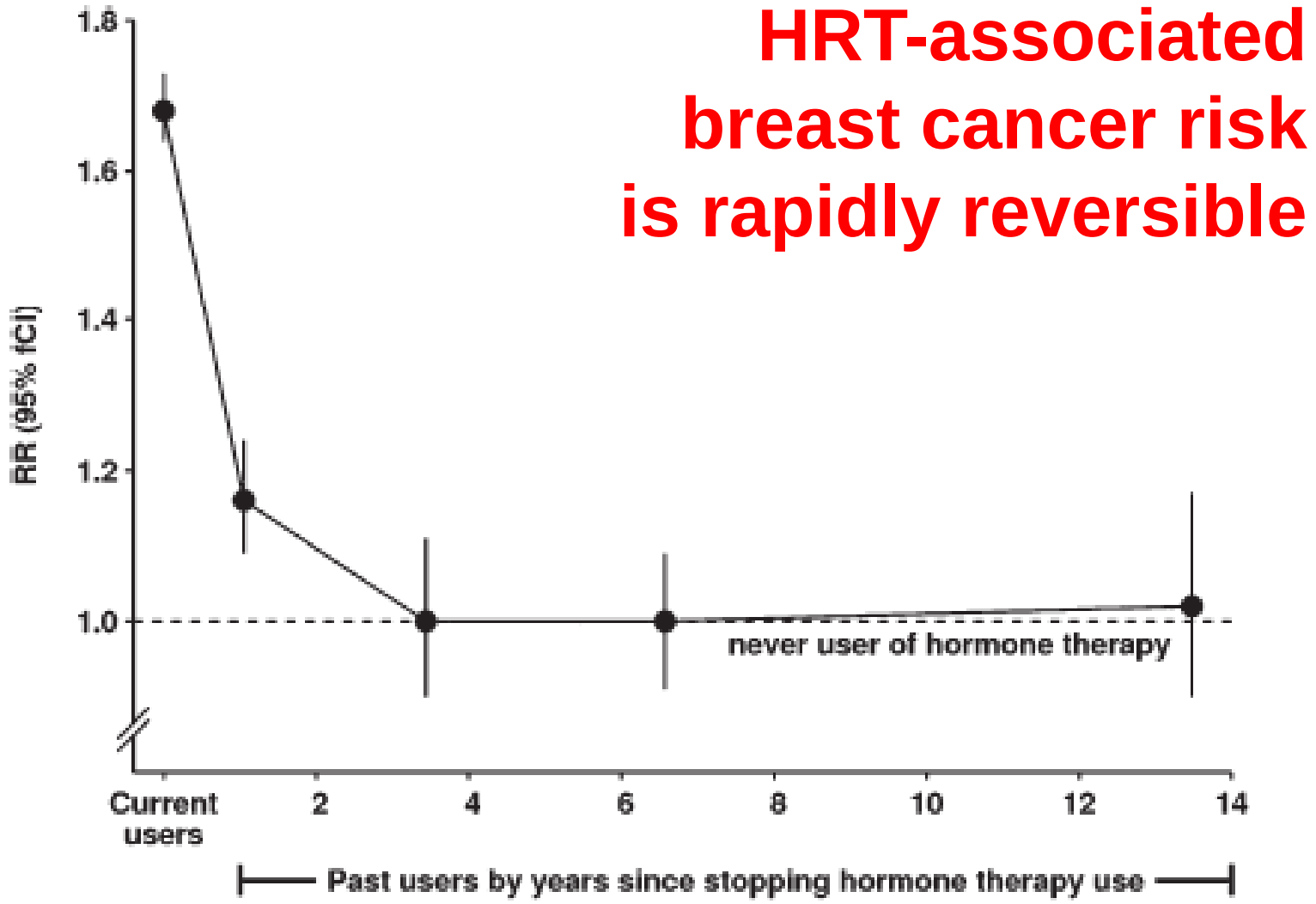
Stroke: results from randomised trials*

increased incidence with HRT use



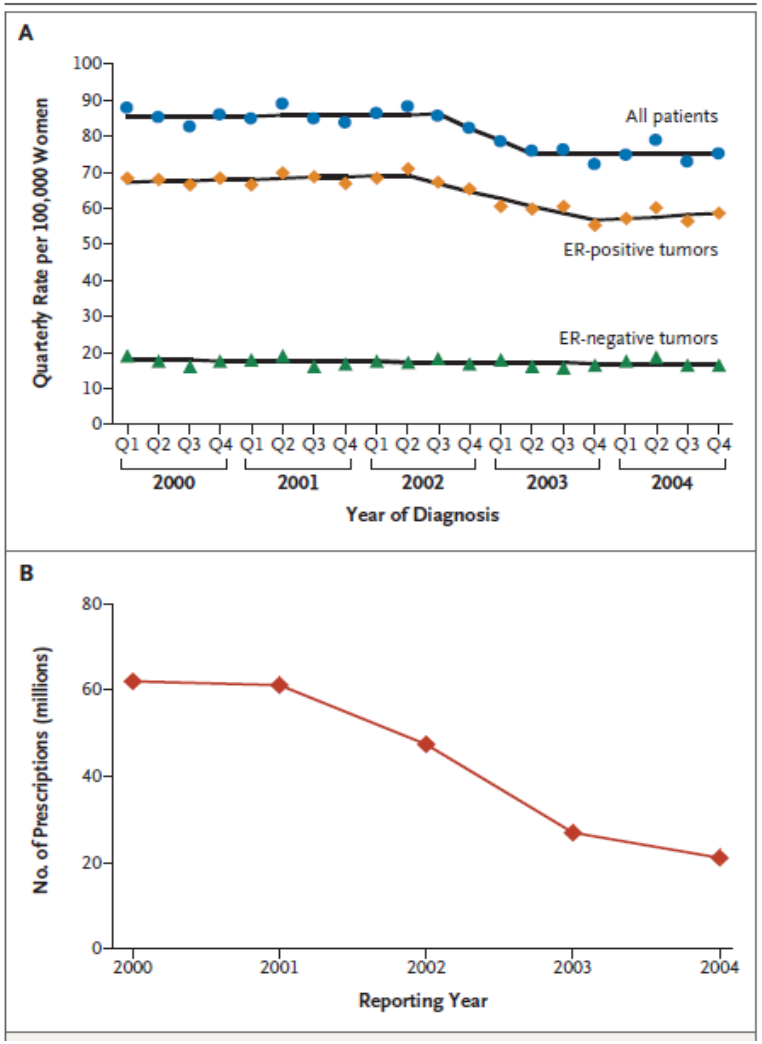
*MHRA Public Assessment Report, 2007 (www.mhra.gov.uk)

THE MILLION WOMEN STUDY

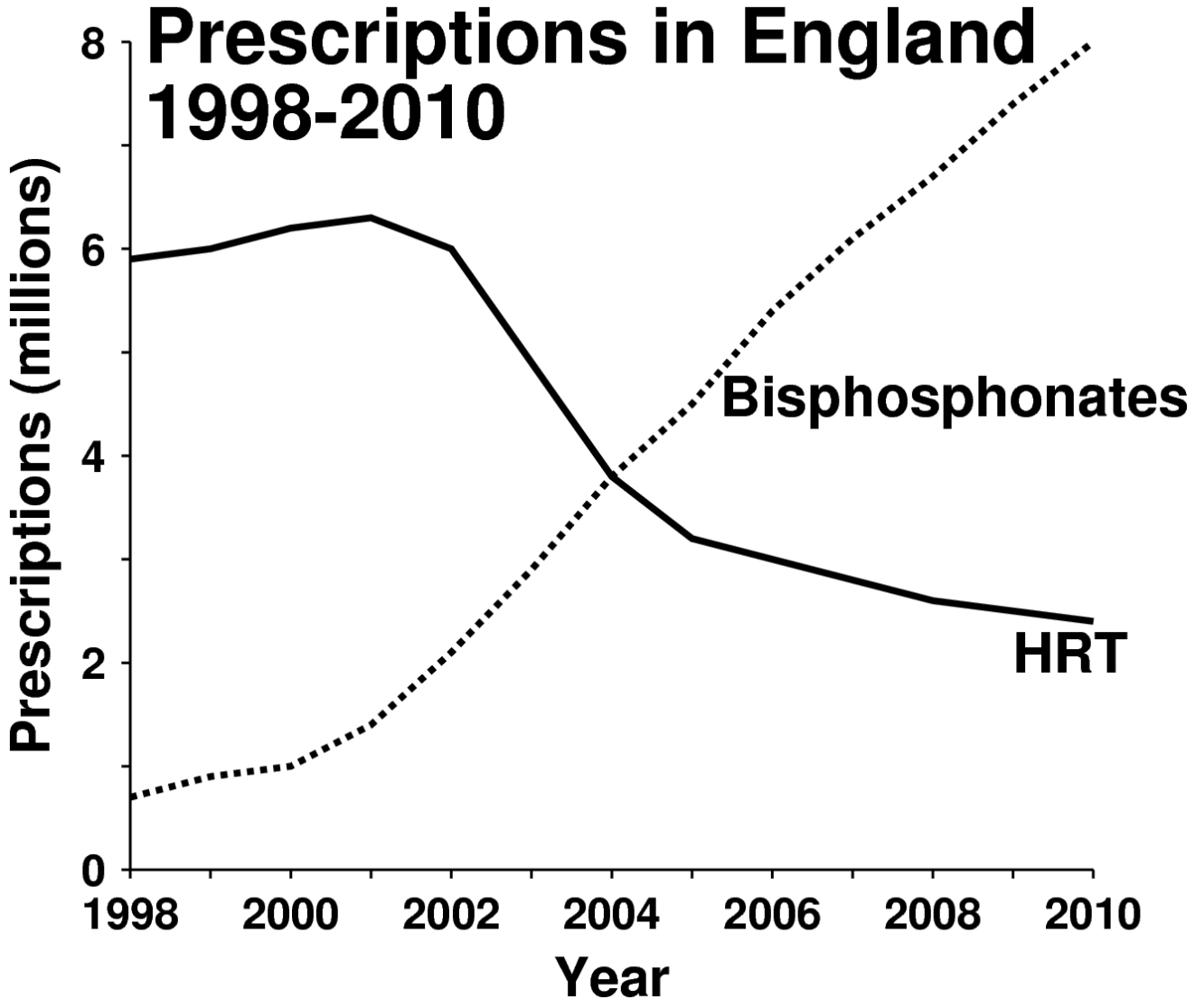


HRT-associated breast cancer risk is rapidly reversible

Drop in HRT use has been followed by a fall in breast cancer incidence in a dozen countries



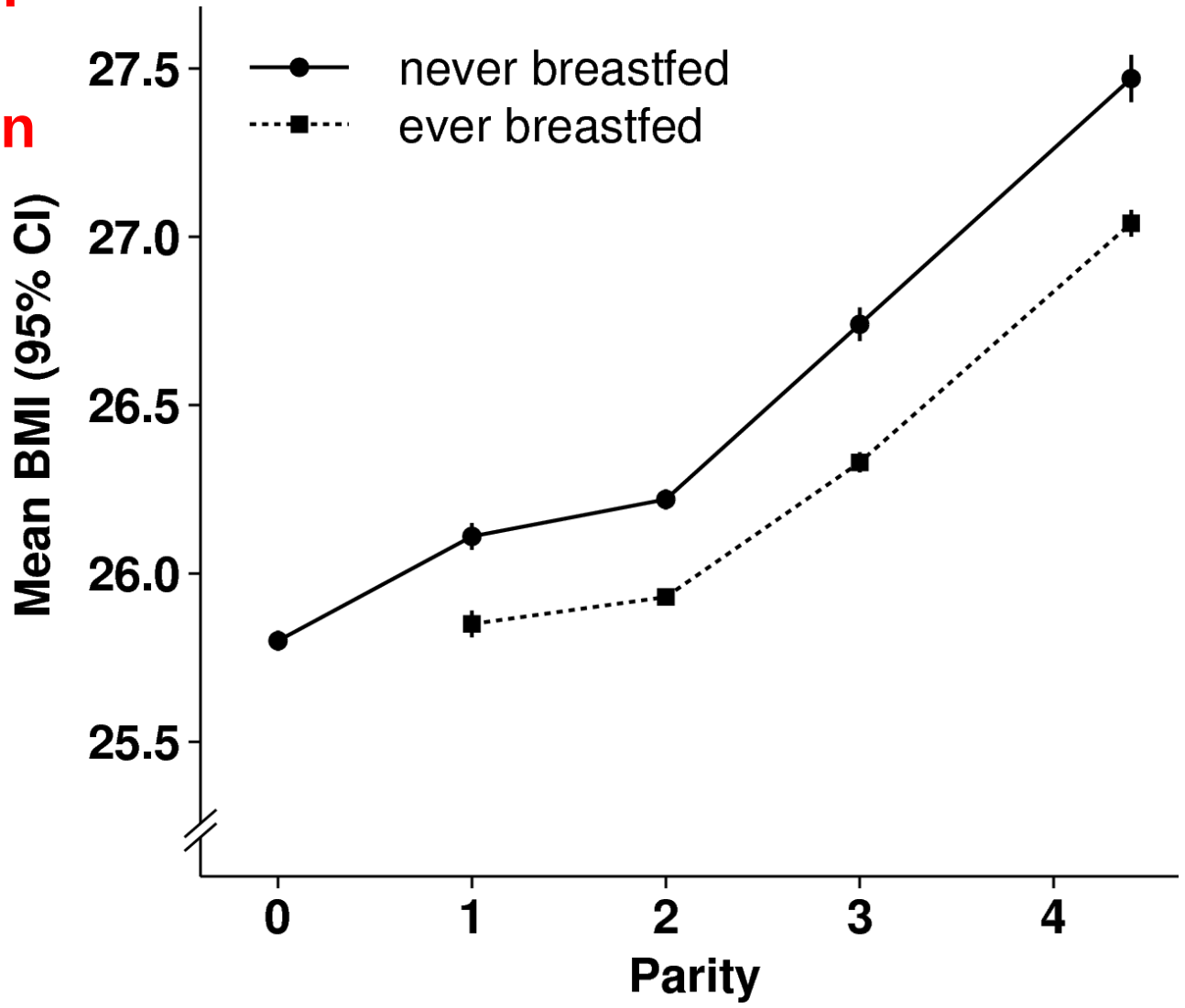
Ravdin, NEJM, 2007


Prescriptions in England
1998-2010
Prescriptions (millions)
8
6
4
2
0
1998
2000
2002
2004
2006
2008
2010
Year
Bisphosphonates
HRT

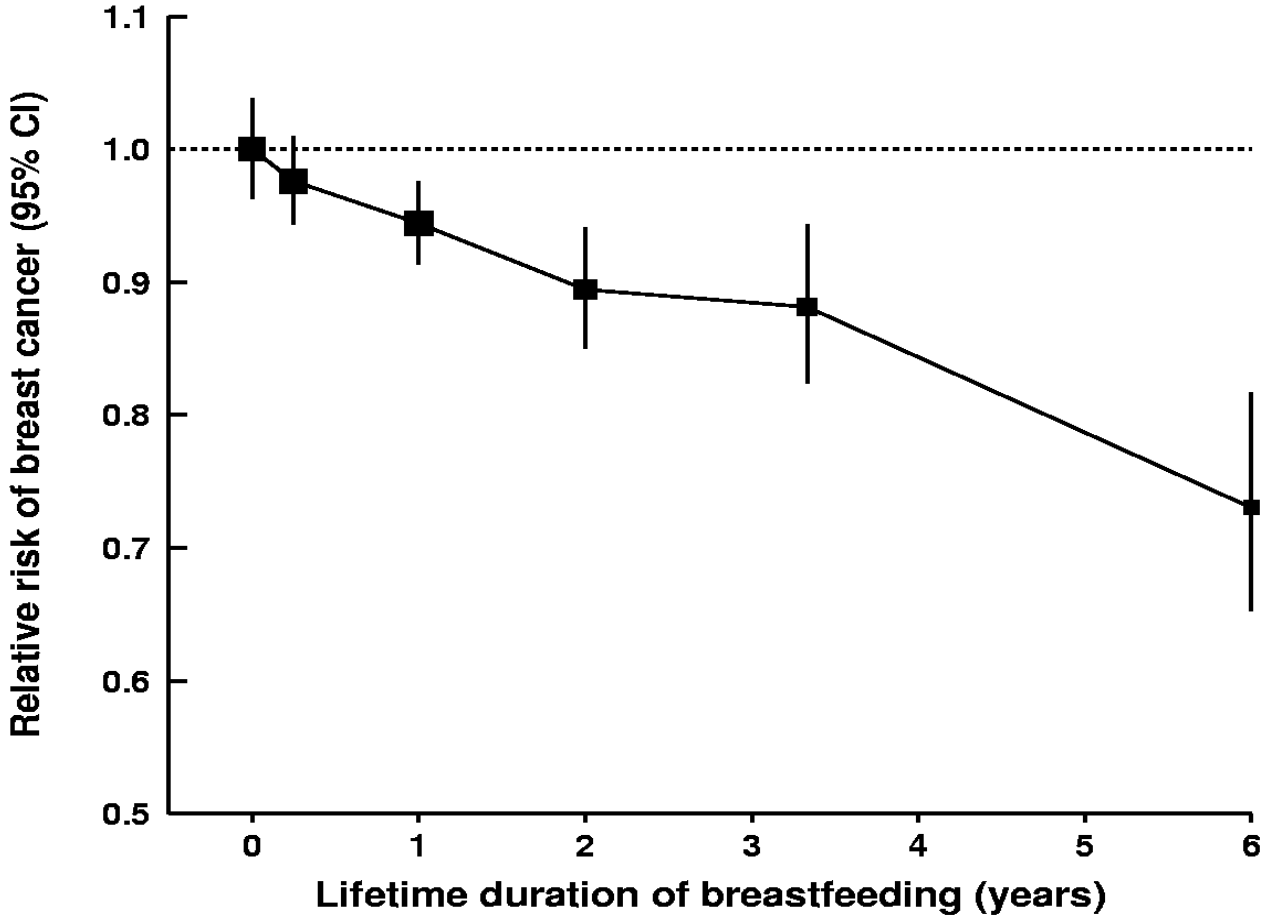
OBESITY

THE MILLION WOMEN STUDY

Persistent effect of childbearing on body mass index in postmenopausal women

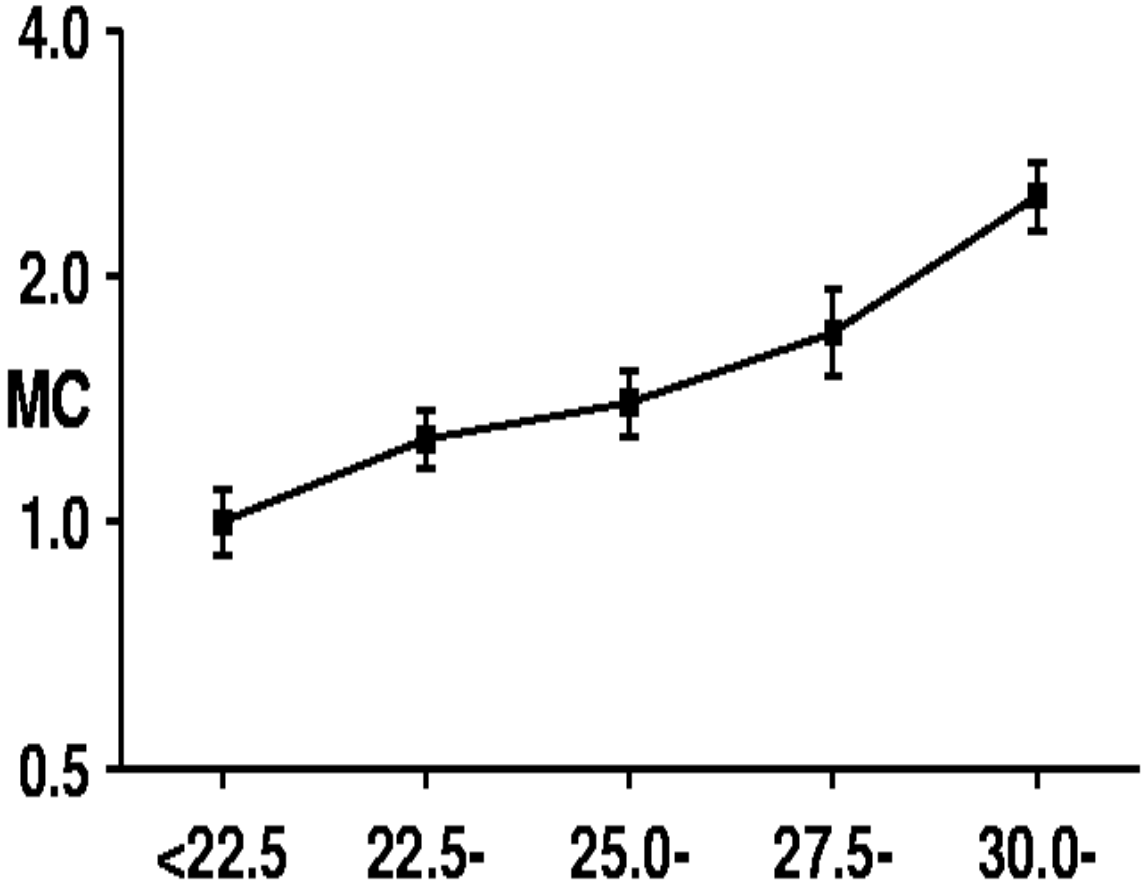


Breastfeeding and breast cancer risk: persistent protection throughout life



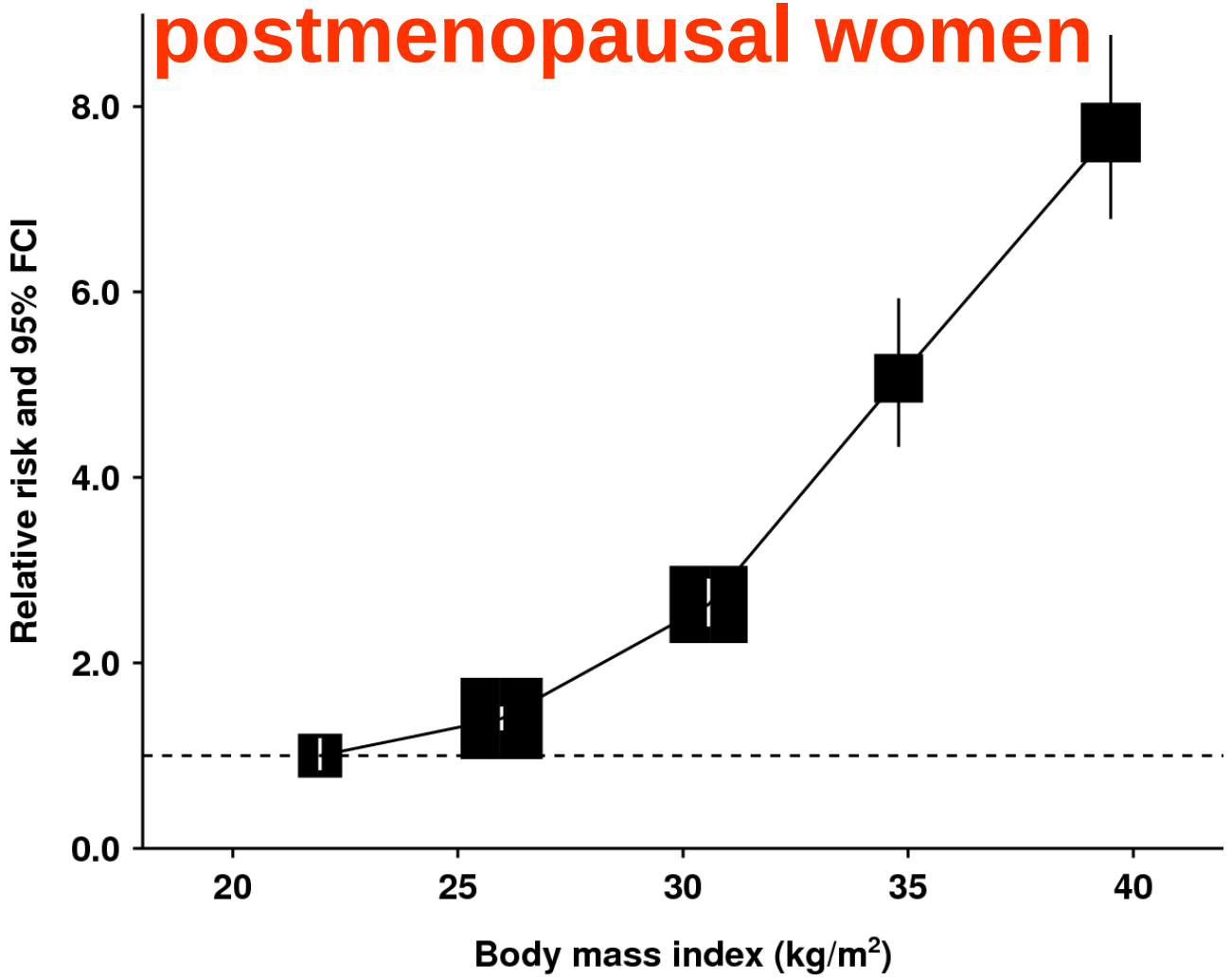
Collaborative Group on Hormonal Factors in Breast Cancer, Lancet 2002

Circulating levels of oestrogen by body mass index in postmenopausal women



THE MILLION WOMEN STUDY

Obesity and endometrial cancer risk in postmenopausal women



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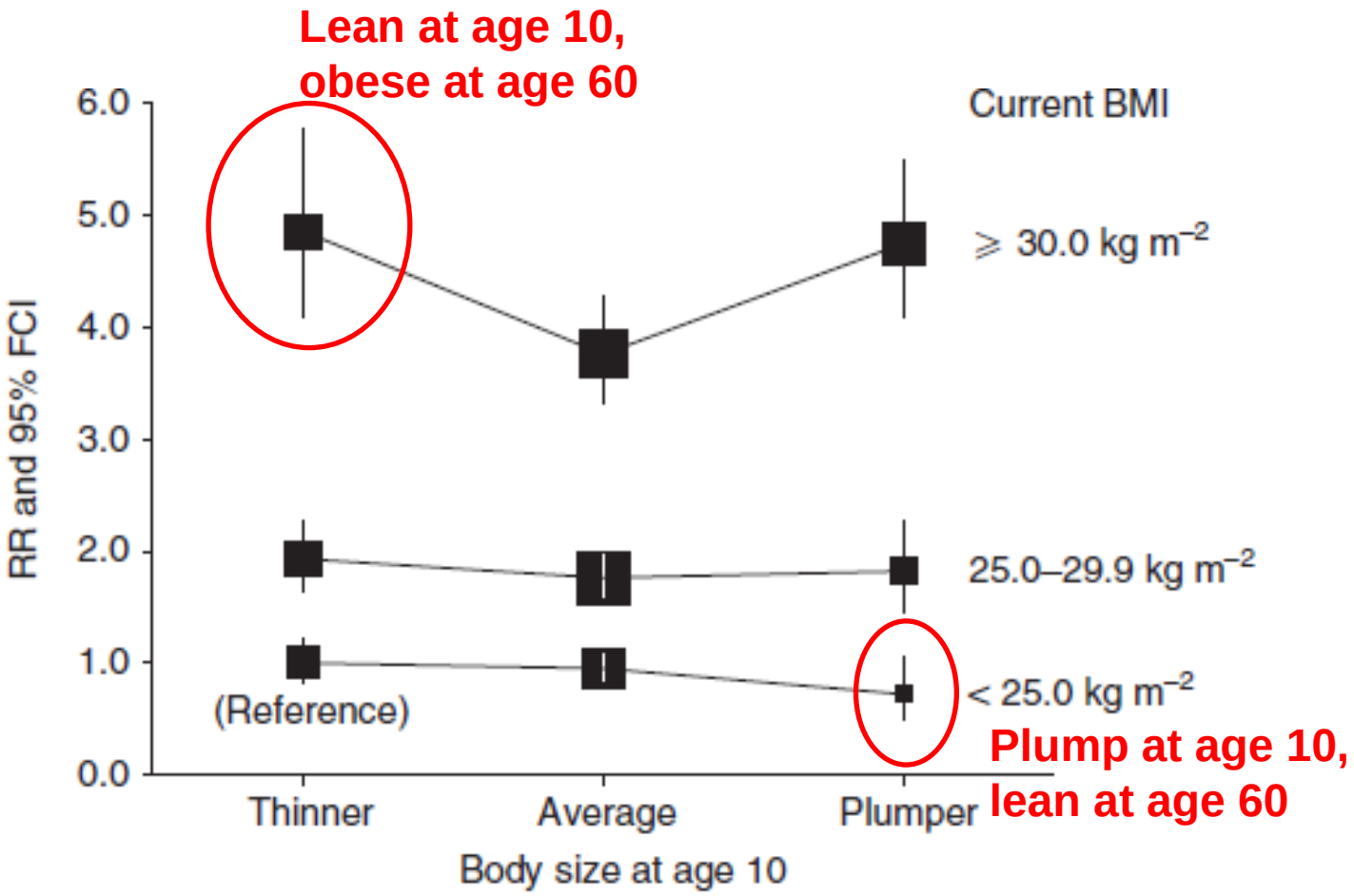
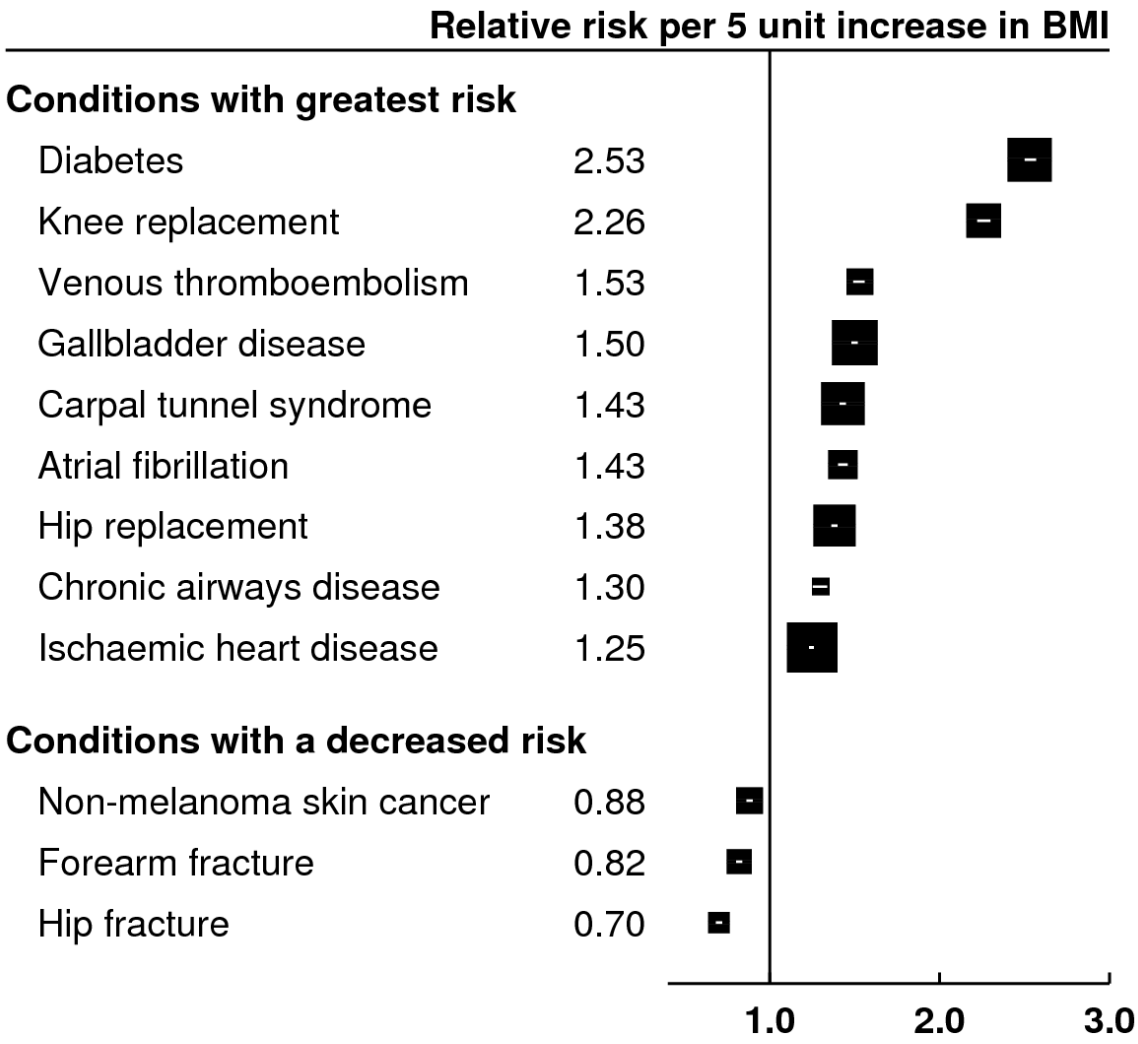


THE MILLION WOMEN STUDY

BODY MASS INDEX and hospital admissions

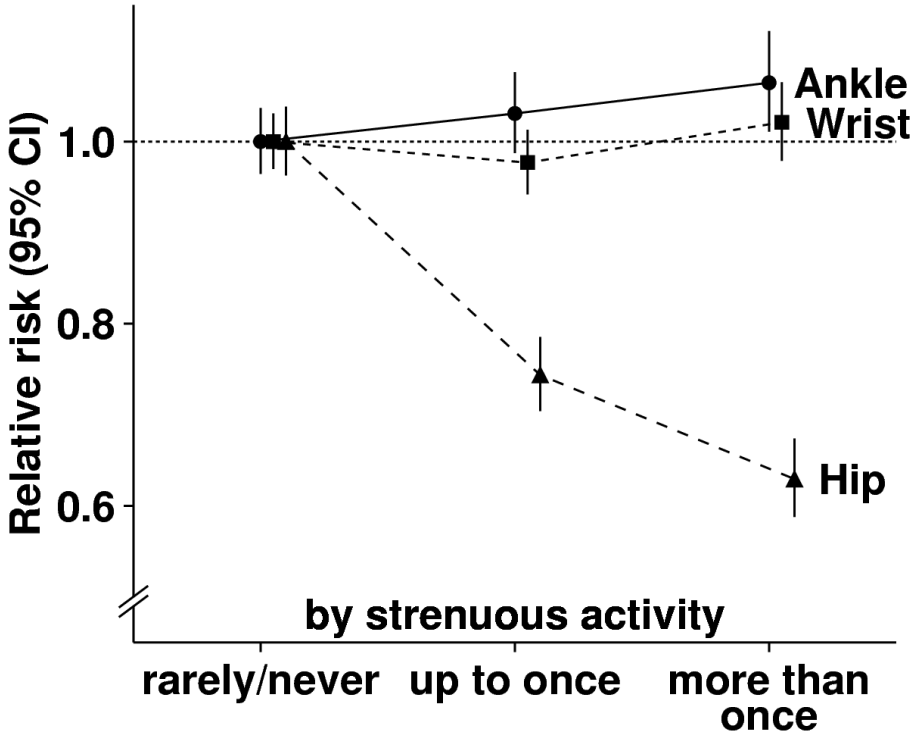


Reeves et al

Physical activity

THE MILLION WOMEN STUDY

PHYSICAL ACTIVITY and fracture risk



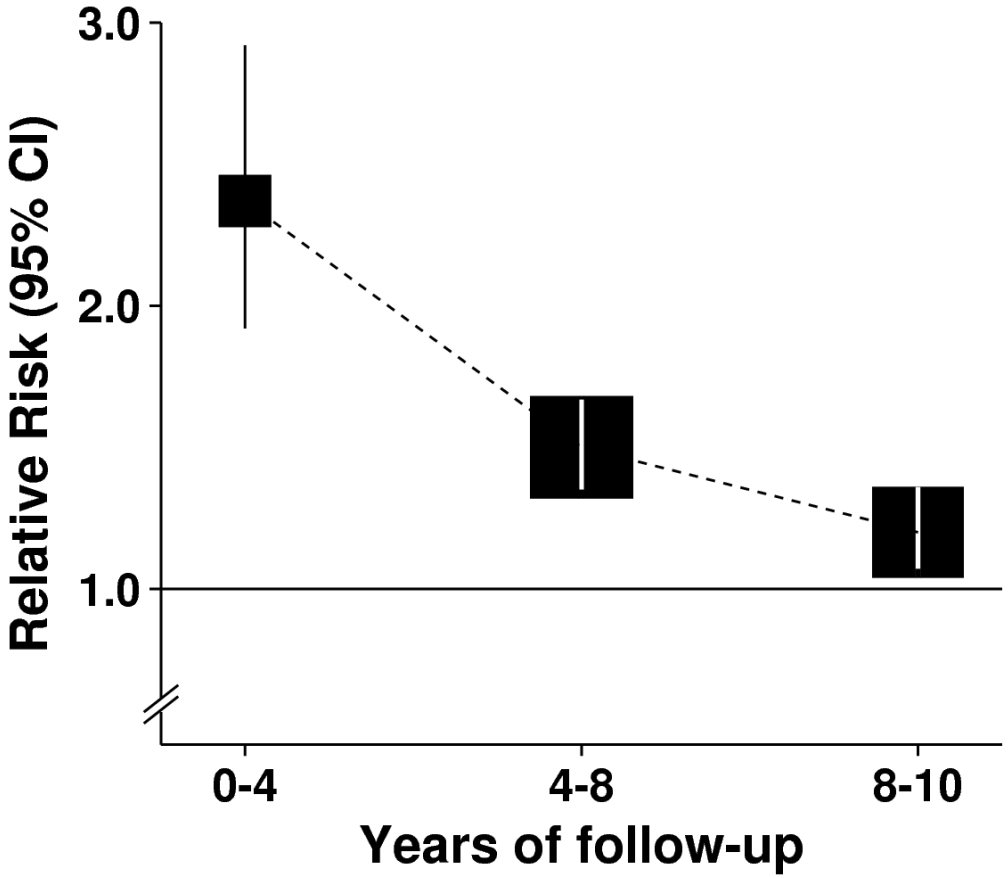
Armstrong et al, 2013

THE MILLION WOMEN STUDY

PHYSICAL ACTIVITY

Dementia risk in inactive versus active

"Reverse causation" - early dementia causes inactivity

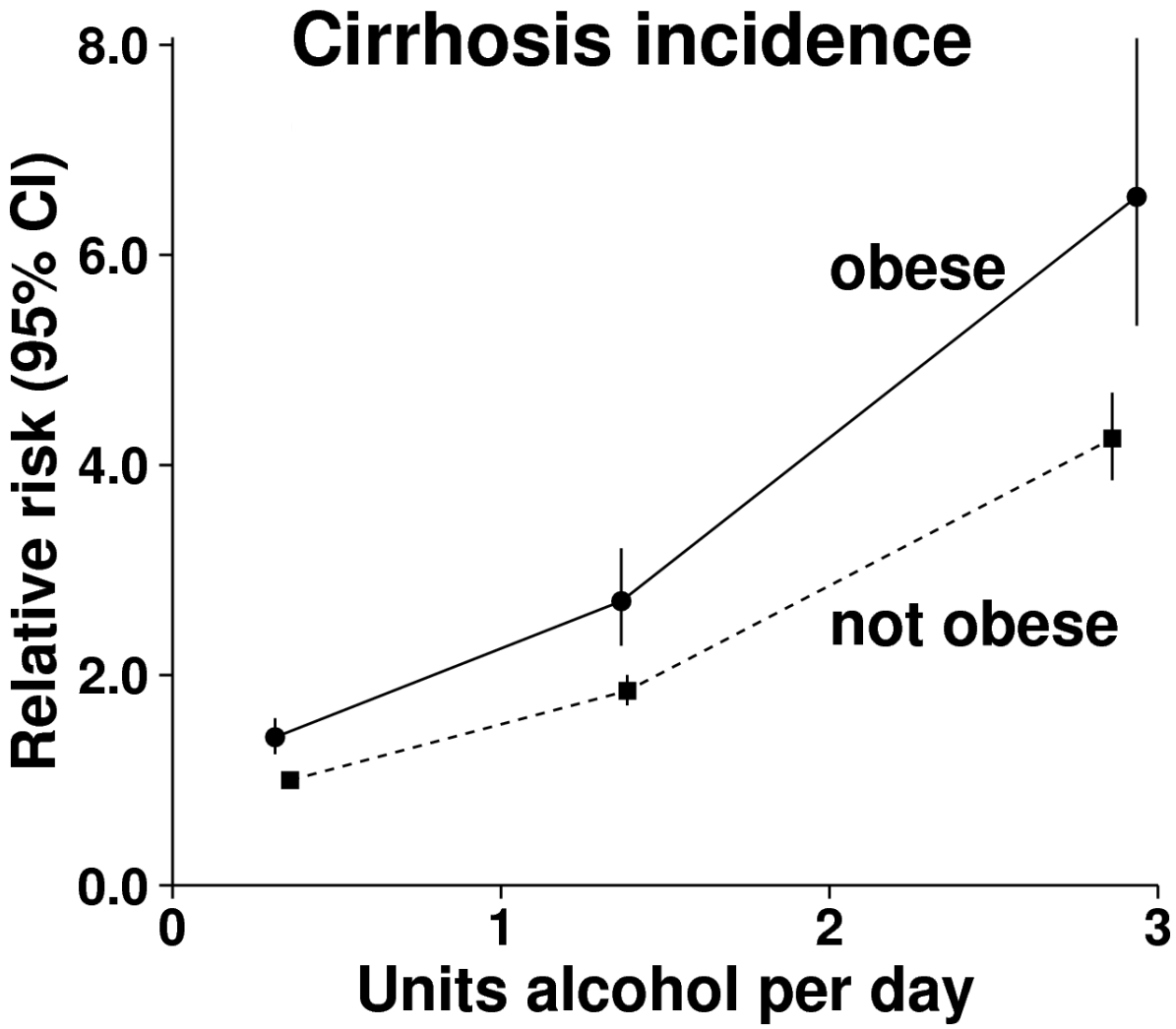


ALCOHOL and DIET

THE MILLION WOMEN STUDY

CIRRHOSIS:

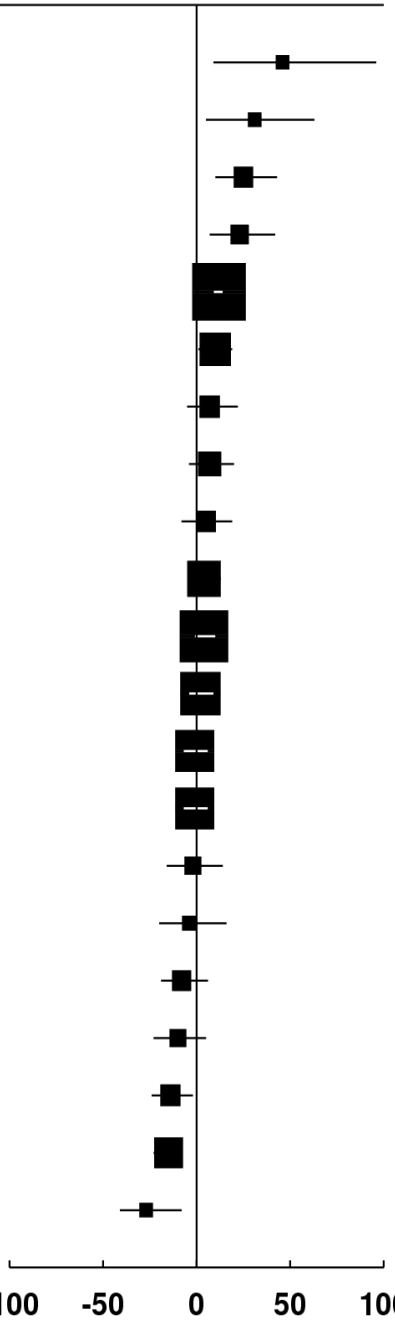
ALCOHOL & OBESITY



Liu et al, 2010

ALCOHOL
and cancer incidence

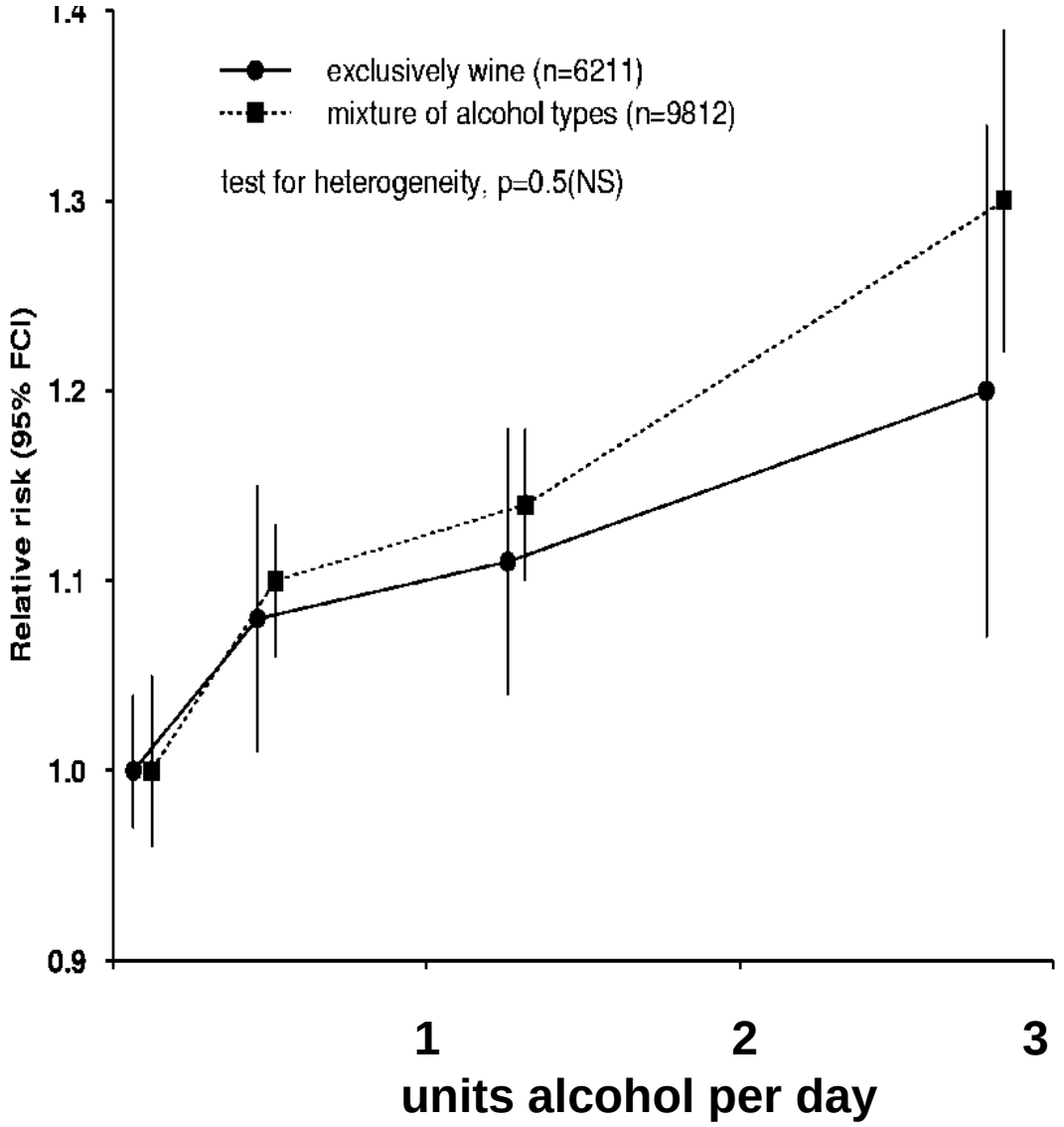
Cancer site or type	Number of cases in drinkers	% increase in relative risk (95% CI) per 10 g/day increase in alcohol*
Larynx	89	46 (9 to 96)
Liver	190	31 (5 to 63)
Oral cavity and pharynx	506	25 (10 to 43)
Esophagus	464	23 (7 to 42)
Breast	19123	12 (9 to 14)
Rectum	1402	10 (1 to 19)
Leukaemia	638	7 (-5 to 22)
Pancreas	828	7 (-4 to 20)
Brain	607	5 (-8 to 19)
Malignant melanoma	1771	4 (-3 to 13)
Lung	3087	4 (-1 to 10)
Colon	2682	2 (-4 to 9)
Endometrium	2447	-1 (-7 to 6)
Ovary	2298	-1 (-7 to 6)
Multiple myeloma	480	-2 (-16 to 14)
Cervix	286	-4 (-20 to 16)
Bladder	573	-8 (-19 to 6)
Stomach	475	-10 (-23 to 5)
Renal cell carcinoma	683	-14 (-24 to -2)
Non-Hodgkin lymphoma	1453	-15 (-23 to -8)
Thyroid	255	-27 (-41 to -8)



Allen et al, JNCI, 2009

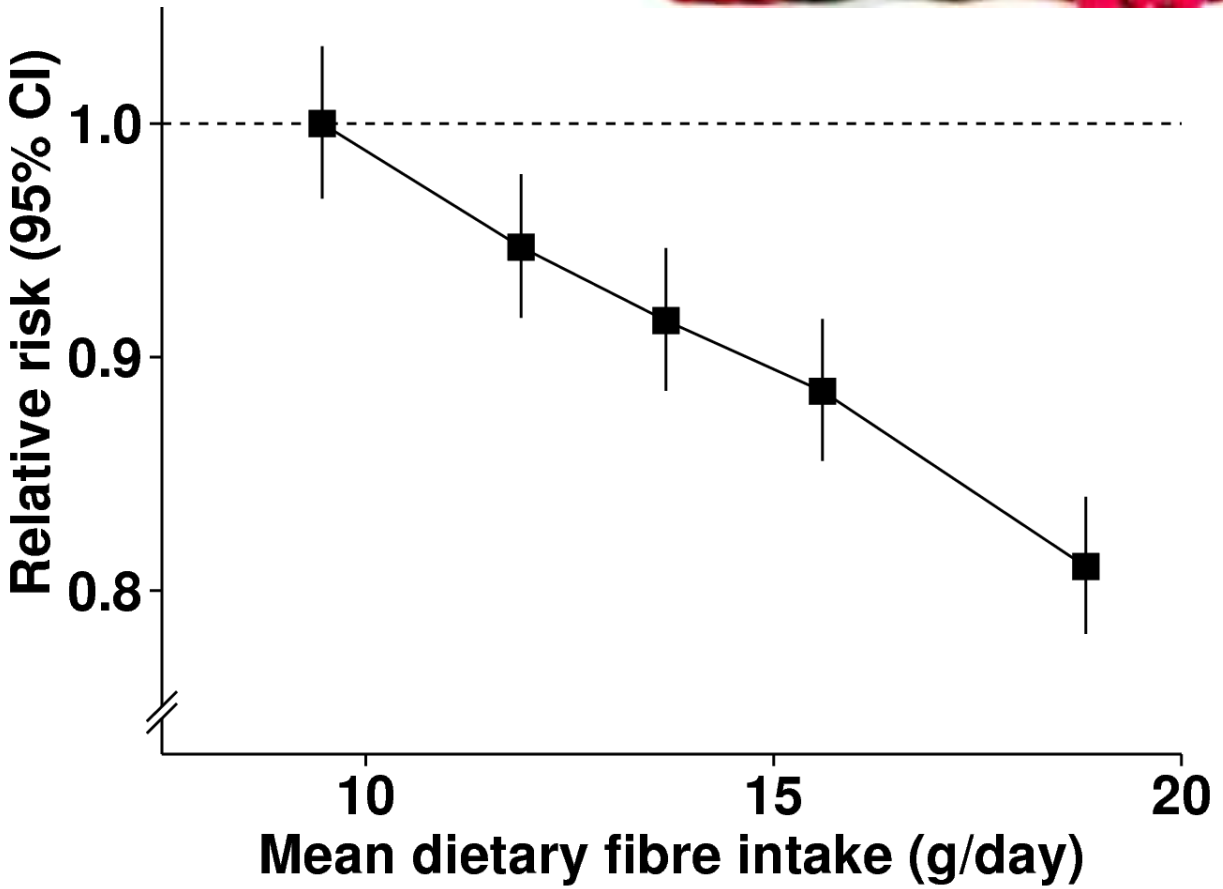
THE MILLION WOMEN STUDY

Type of alcohol and breast cancer risk



THE MILLION WOMEN STUDY

FIBRE INTAKE &
diverticular disease

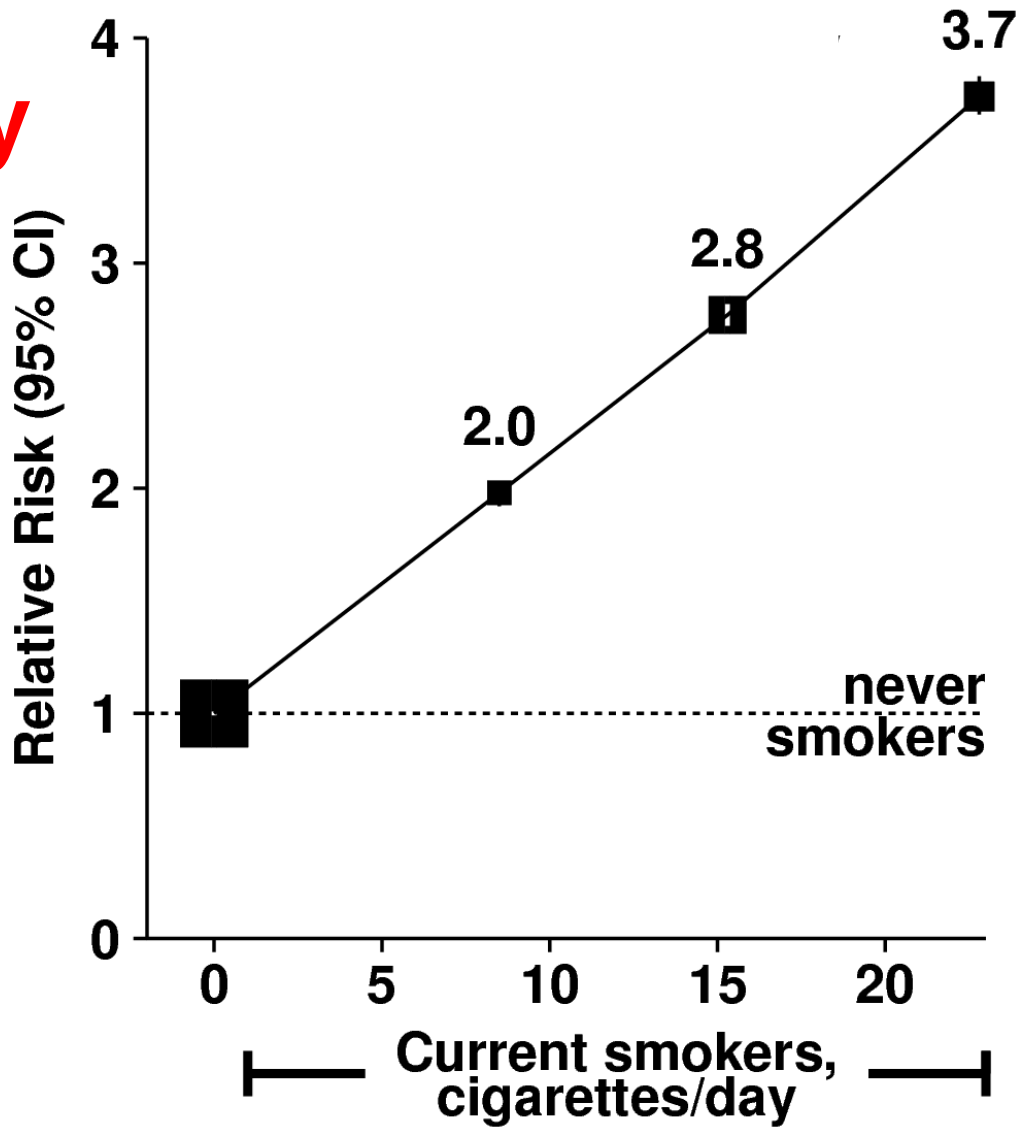


Crowe et al

SMOKING

THE MILLION WOMEN STUDY

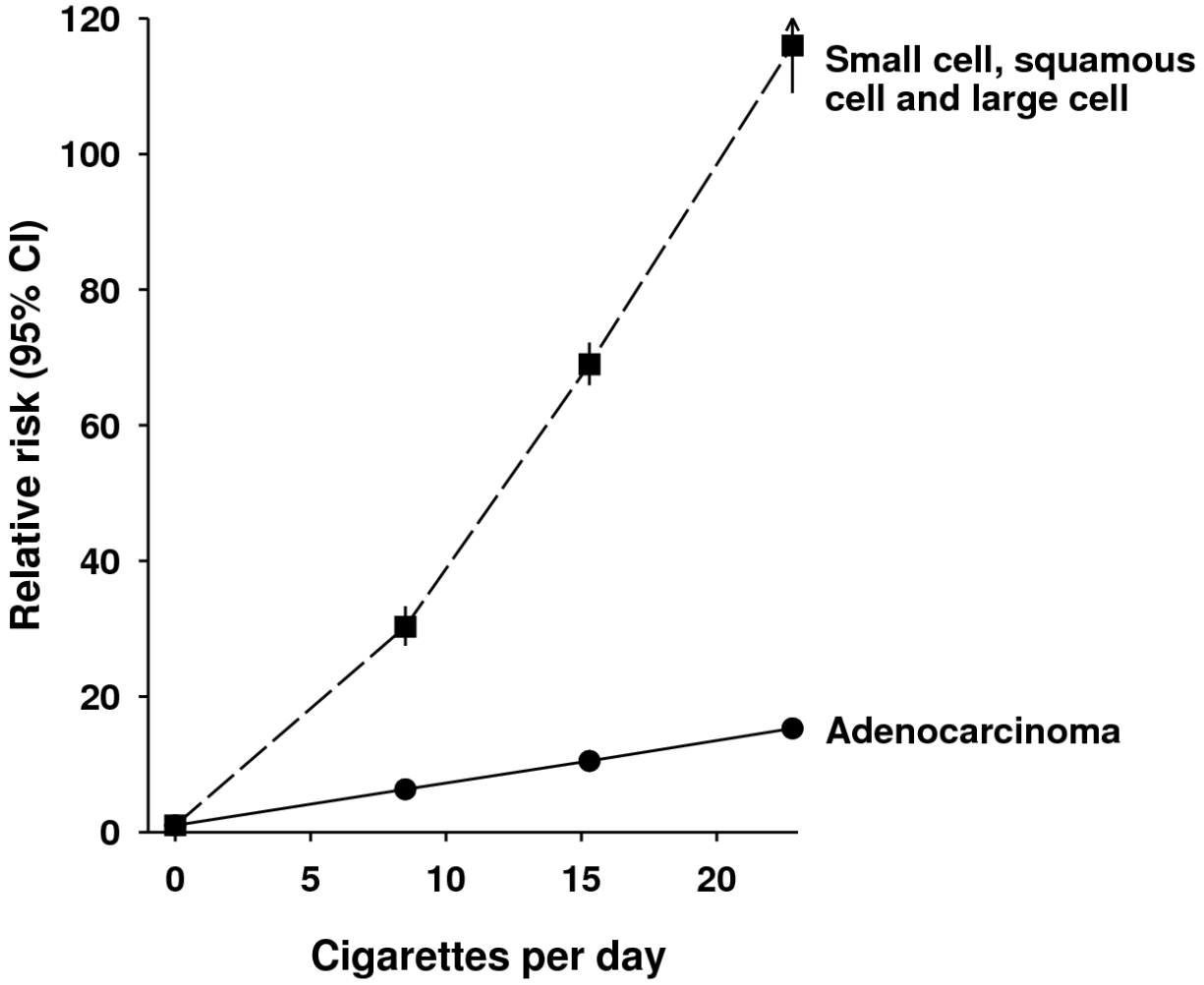
All cause mortality in smokers



Pirie, Peto, et al, 2013

THE MILLION WOMEN STUDY

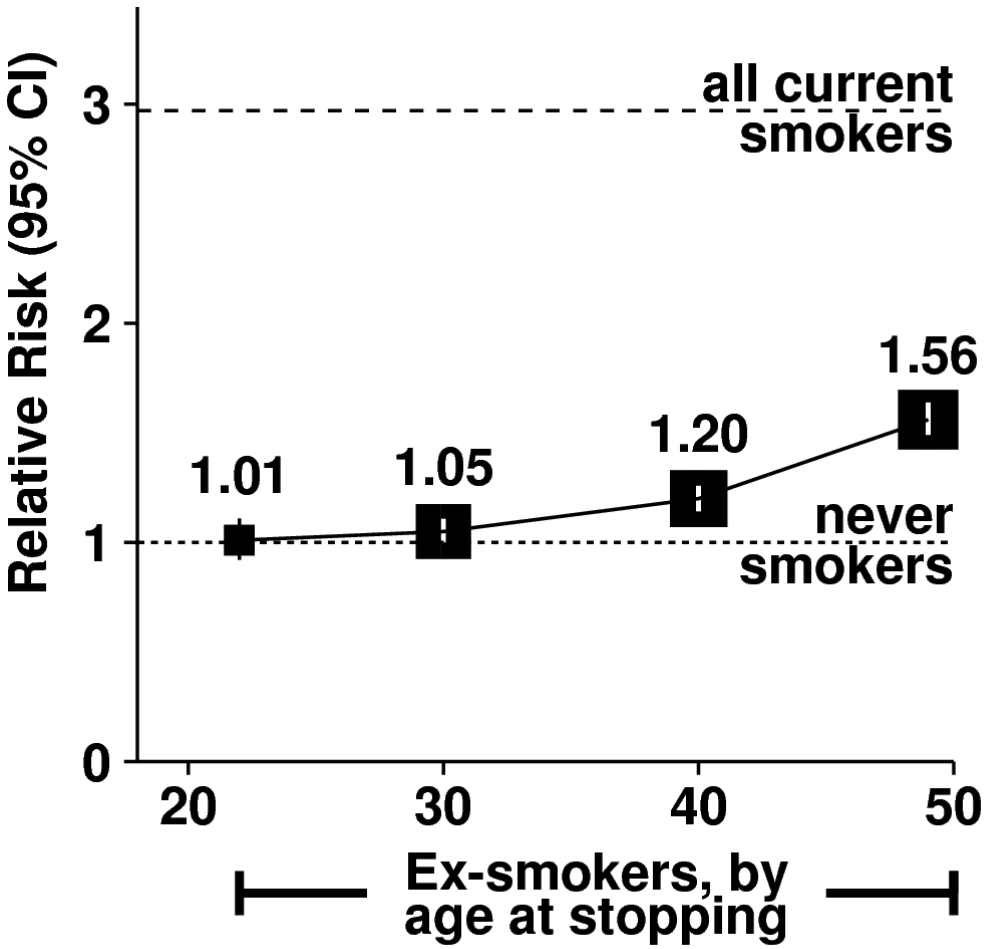
Lung cancer histology in smokers



Pirie, Peto, et al

THE MILLION WOMEN STUDY

All cause mortality in ex-smokers



Pirie, Peto, et al, 2013

What will definitely improve health:

- **Don’t smoke; give up if you do**
- Keep your weight down
- Breastfeed, if you have children
- Exercise, but possibly not too much
- Drink as little alcohol as possible (until old age)
- Eat fruits and vegetables
- Take the pill, but stop before ~age 40 years
- Take menopausal hormones as little as possible

MANY EFFECTS ARE REVERSIBLE
so it is rarely too late to benefit from a change

Benefits from each can be small,
BUT TOGETHER CAN BE LARGE


THANK YOU
1,383,110