



Faculty of Health and Medical Sciences

5th Workshop in Breast Cancer Surgery
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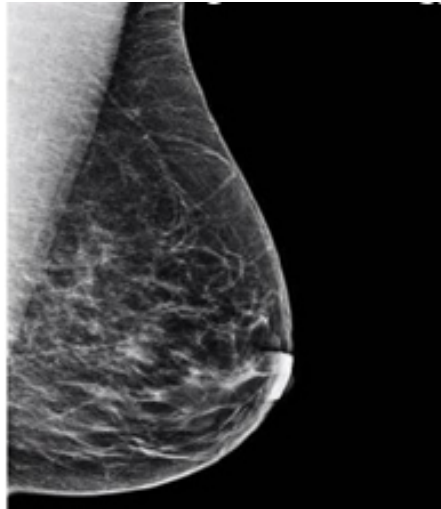
Mammography screening in the elderly age-group

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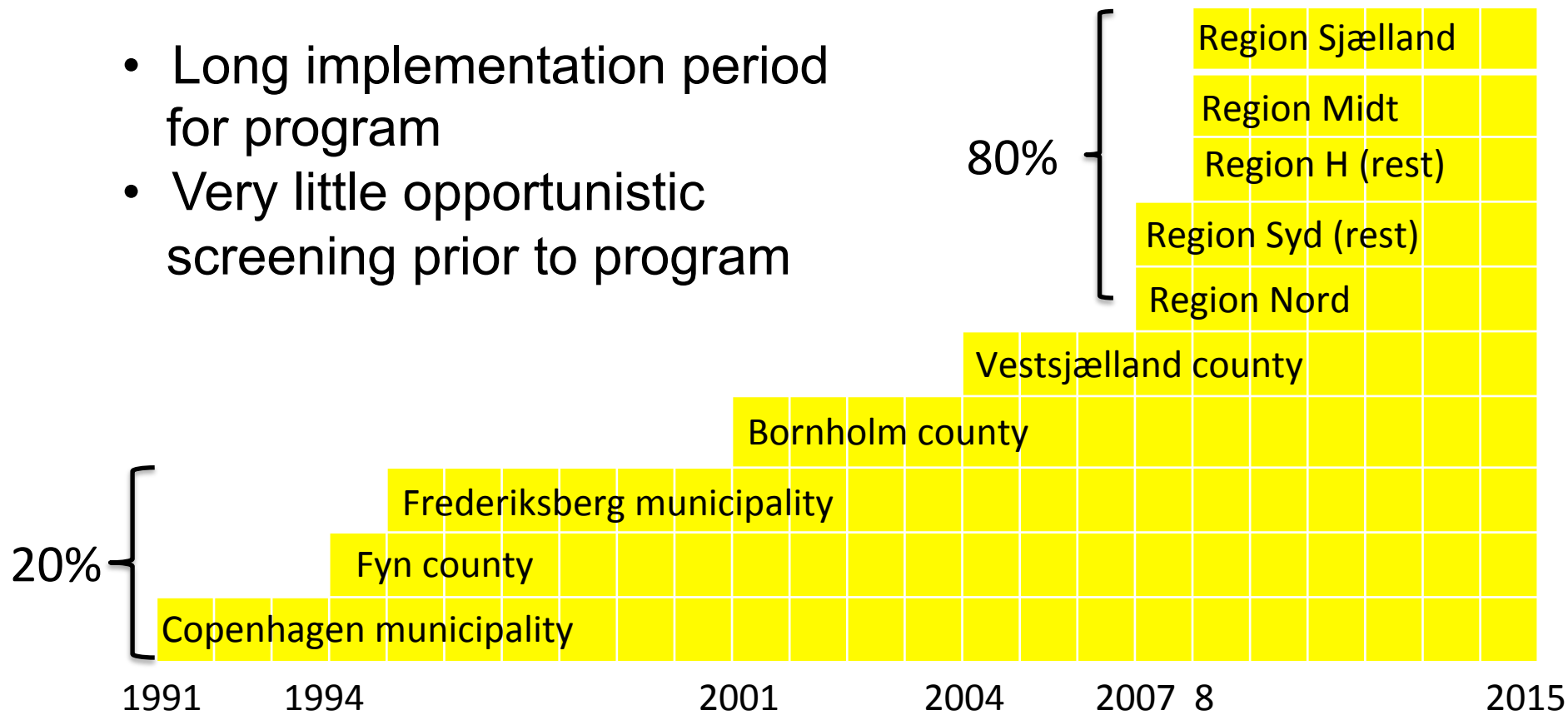
Mammography screening

- Purpose: To decrease mortality from breast cancer
- Method: Detect breast cancer before it gives rise to symptoms to ensure effective treatment
- In Denmark: women aged 50-69 years, 2-view mammography, personal invitation every 2nd year
- Both benefits and harms of screening should be known



Mammography screening in Denmark

- Long implementation period for program
- Very little opportunistic screening prior to program



Effect of mammography screening in Denmark

	Before screening	During screening	During/Before
Study area	Historical control group	Study group	Study area: During/before
Denmark without screening	Historical regional control group	Regional control group	Control area: During/before
Study area/ Control area	Historical: Study area/ Control area	During: Study area/ Control area	(Study area: During/before)/ (Control area: during/before)

Effect of mammography screening in Denmark

	Period	Intention to treat	Per protocol
Breast cancer mortality			
Copenhagen m.	1991-2001	0.75 (0.63-0.89)	0.63
Fyn c.	1993-2007/09	0.78 (0.68-0.89)	0.72 (0.59-0.89)
Breast cancer incidence			
Copenhagen m.	1991-2009	1.05 (0.88-1.24)	1.08
Fyn c.	1993-2009	1.01 (0.92-1.10)	1.02
Both	1991/93-2009	1.04 (0.99-1.09)	
Both, 8+ years after end of invitation	1991/93-2009	1.023 (0.97-1.08)	

Olsen et al, 2005; Njor et al, 2013; Njor et al, 2015

Effect of mammography screening in Denmark

Olsen et al, BMJ, 2005:

”Breast cancer mortality was reduced by 25% in the screening period compared with what would have been expected in the absence of screening.”

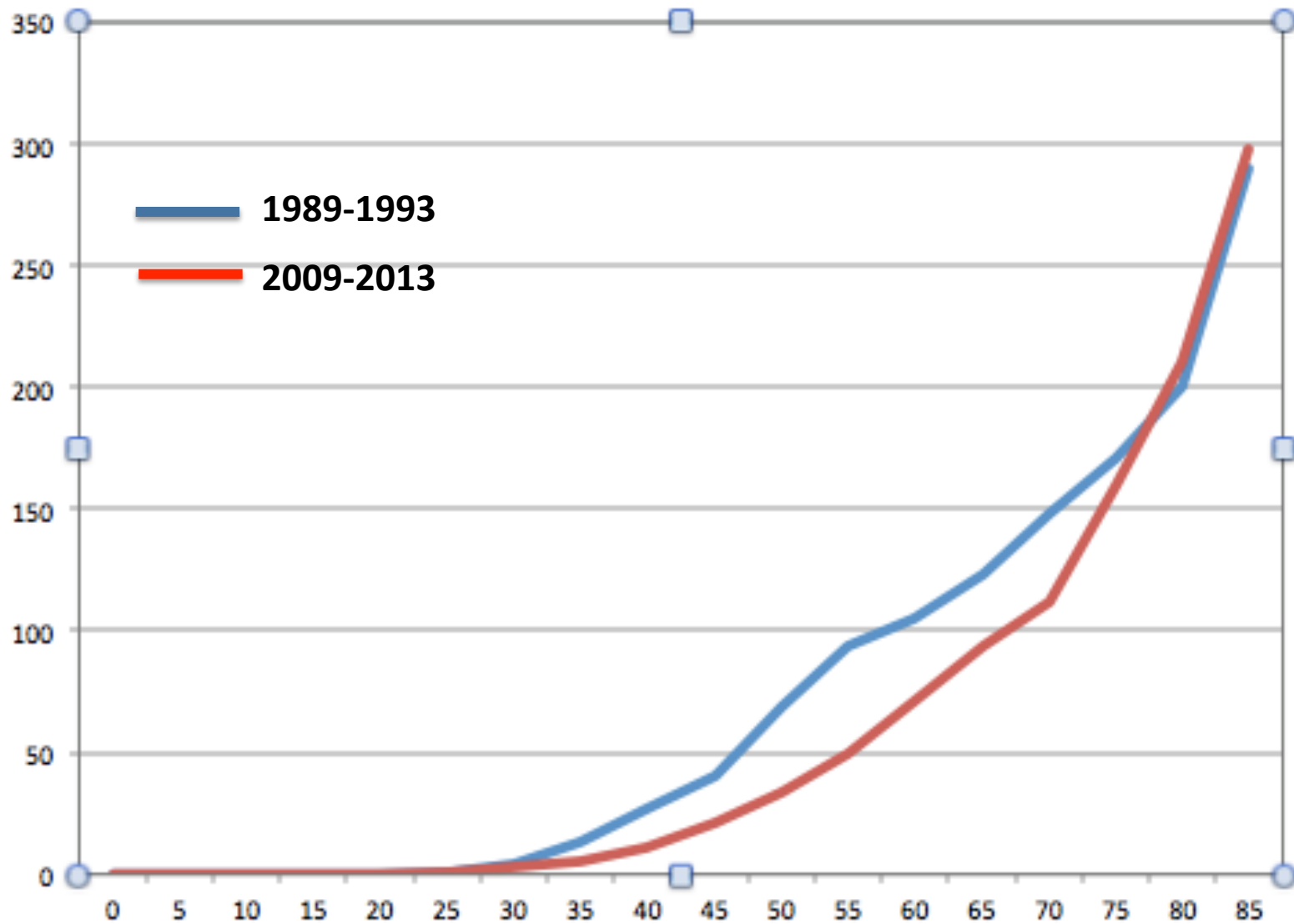
Jørgensen et al, BMJ, 2010:

”We were unable to detect any effect of the Danish screening programmes on breast cancer mortality”

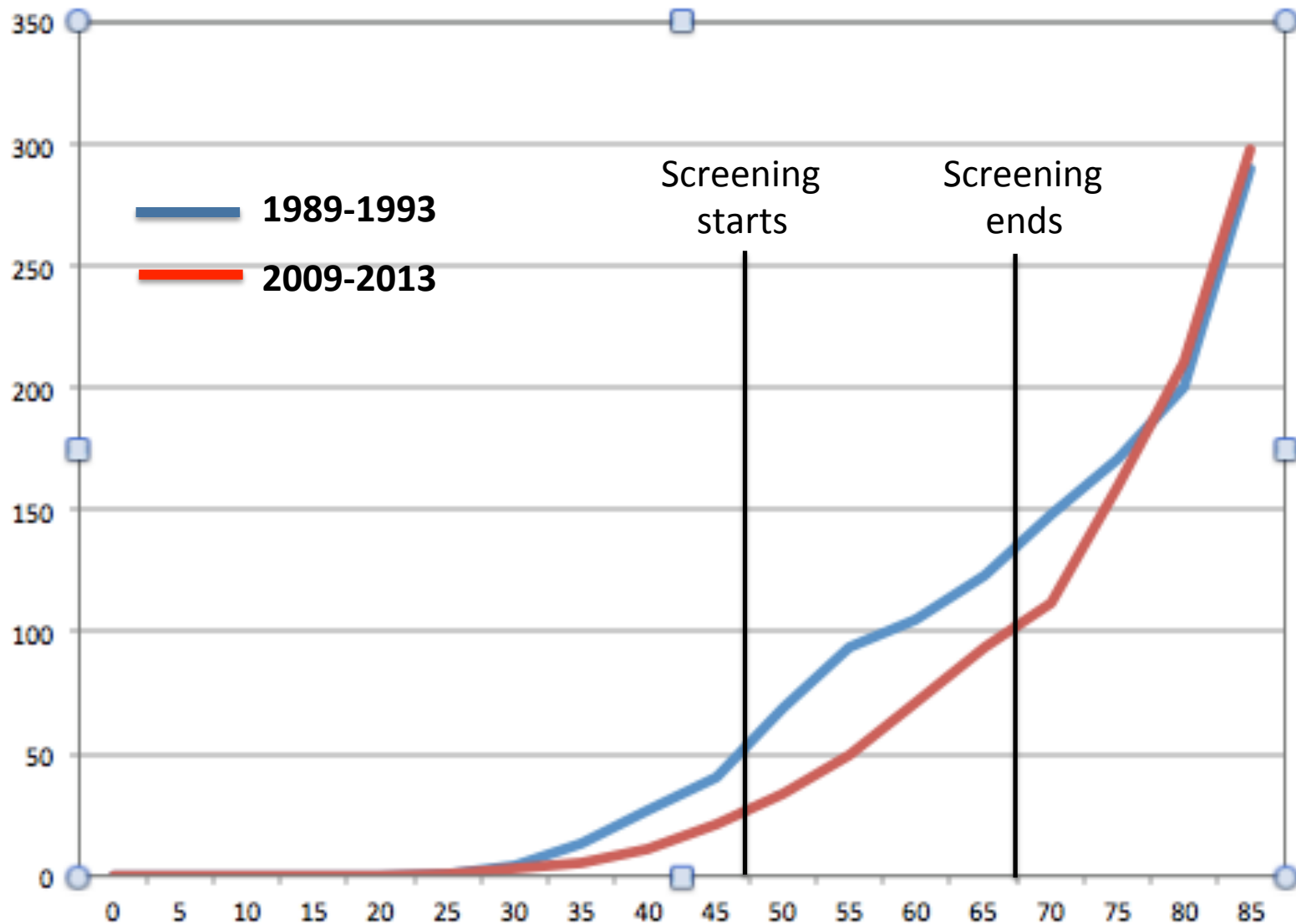
Effect of mammography screening on breast cancer mortality in Fyn 1993-2007/09

Age group years	RR (95% CI)	Screening
50-54	0.82 (0.45-1.51)	Yes
55-59	0.90 (0.64-1.27)	
60-64	0.75 (0.55-1.02)	
65-69	0.67 (0.49-0.91)	
70-74	0.85 (0.64-1.13)	No
75-79	0.72 (0.51-1.04)	
80-84	0.83 (0.46-1.49)	
All	0.78 (0.68-0.89)	Mixed

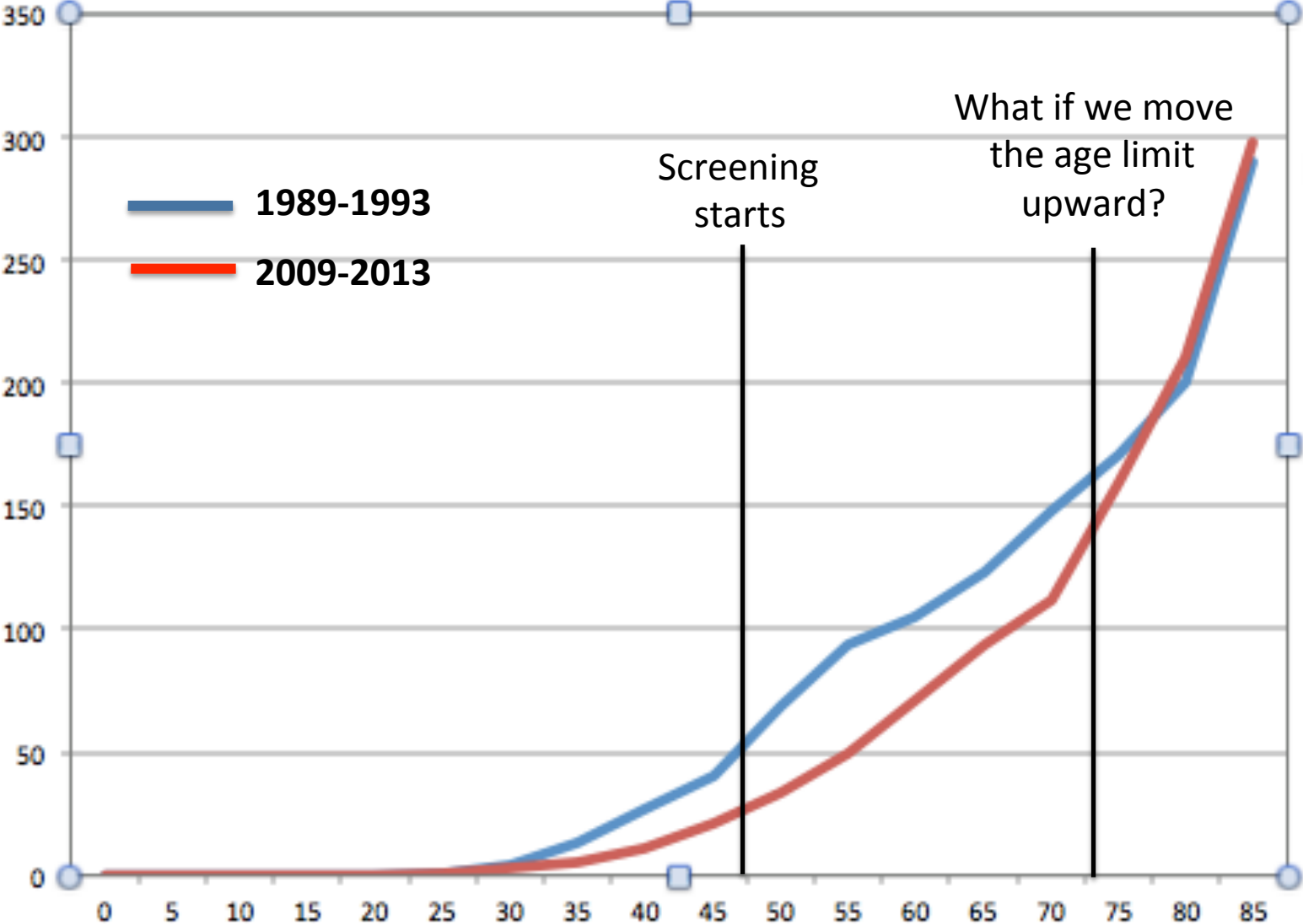
Breast cancer mortality in Denmark



Breast cancer mortality in Denmark



Breast cancer mortality in Denmark



Some countries have extended age-limit

- Sweden, started screening by county
1974-1997: age-group:
40-69, 40-70, 40-74, 45-69, 46-69, 50-69,
50-74
- Netherlands, started screening nationwide
1989-1998: 50-69
1999 - : 50-74

IARC evaluation of breast cancer screening from 2014

“A substantial reduction in the risk of death from breast cancer was also consistently observed in women 70 to 74 years of age who were invited to or who attended mammography screening in several incidence-based cohort mortality studies.¹⁷⁻¹⁹”

Lauby-Secretan et al, 2015



IARC evaluation of breast cancer screening from 2014, reference 17: Coleman et al, 2014

Reference	Study	Design	Age at entry	RR (95% CI)
Coleman, 2014	Canada prov	Part vs non-p*	40-49	0.56 (0.45-0.67)
			50-59	0.60 (0.49-0.70)
			60-69	0.58 (0.50-0.67)
			70-79	0.65 (0.56-0.74)

* Non-participant incidence and survival rates

IARC evaluation of breast cancer screening from 2014, reference 18: Review Van Dijck et al, 1997

Original reference	Study	Design	Age at invitation	RR (95% CI)
Chen, 1995	2-county, W+E	RCT	50-64	0.65 (0.50-0.83)
			65-74	0.68 (0.51-0.89)
Van Dijck, 1994	Nijmegen, 13 y	Case-control	65-74	0.34 (0.12-0.97)
			≥75	2.87 (0.62-13.2)
Van Dijck, 1996	Nijmegen, 18 y	Case-control	65-74	0.45 (0.20-1.02)
			≥75	1.05 (0.27-4.14)
Van Dijck, 1997	Nijmegen 13 y	Regional Control group	68-83 y	0.89 (0.59-1.36)*

* In original paper: 65/66-80/81 years: 0.80 (0.53-1.22)

IARC evaluation of breast cancer screening from 2014, reference 19: Jonsson et al, 2003

	Study	Design	Age at invitation	RR (95% CI)
Jonsson, 2003	Sweden, Regional and Historical control groups	Refined excess mortality*	70-74	0.82 (0.57-1.19)
	Same	Underlying cause of death	70-74	0.97 (0.73-1.28)

- (Observed – Expected deaths from all causes in breast cancer patients) /
Person-years in total group

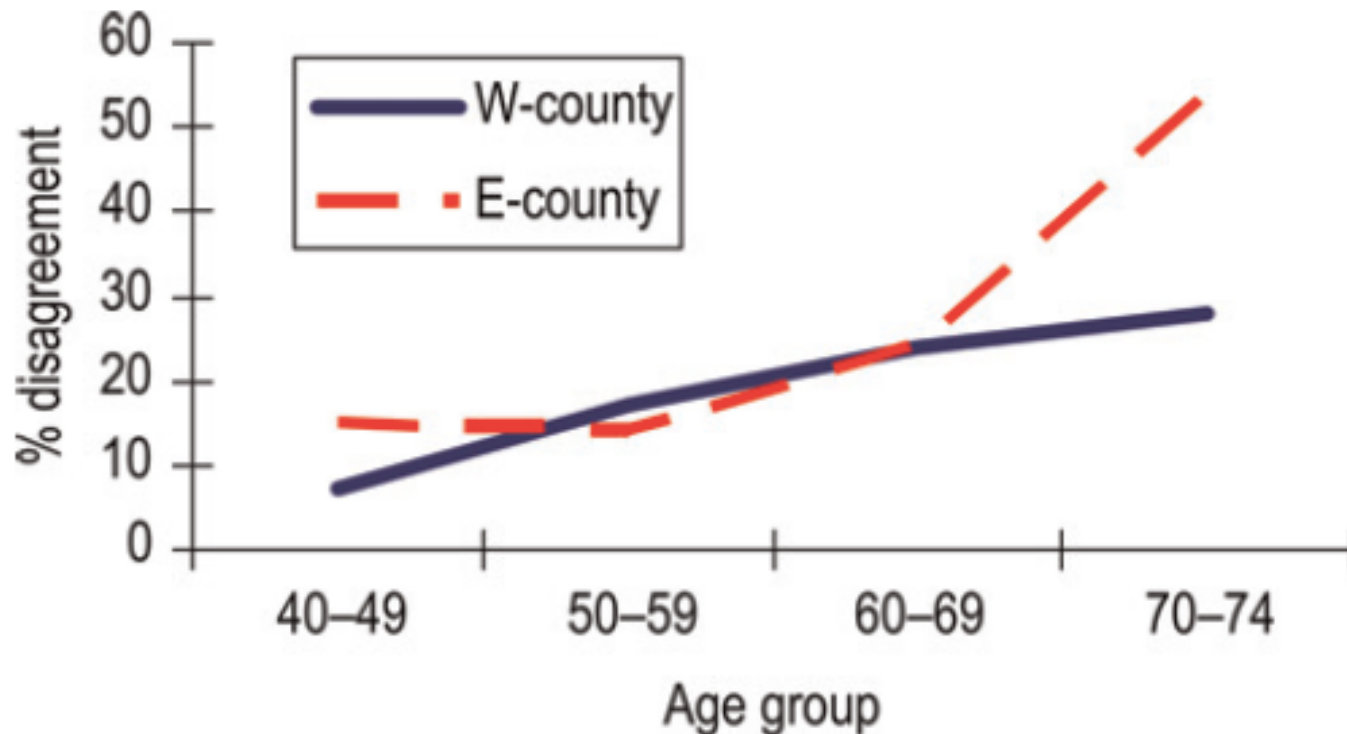
2-county W+E study Sweden breast cancer mortality women 70-74 years at entry

Reference	FU	W Kopparberg	E Östergötland	W + E
Chen et al, 1995	13y	NA	NA	0.78 (0.53-1.20)
Tabar et al, 2000	20y	0.76 (0.44-1.33)	0.73 (0.45-1.19)	NA
Nyström, 1993	11y	NA	NA	0.94 (0.60-1.46)
Nyström, 2002	17y	NA	1.18 (0.71-1.97)	NA

Cause of death:

- Chen + Tabar: local end point committee (LEPC)
- Nyström: Statistics Sweden underlying cause of death (UCD) and national end point committee (NEPD)
- For all regions and all ages Nyström, 1993 found RR 0.77 (0.67-0.88) using UCD and RR 0.78 (0.68-0.89) using NEPC

Disagreement between W+E cause of death (LEPC) and overview committee cause of death (NEPC)

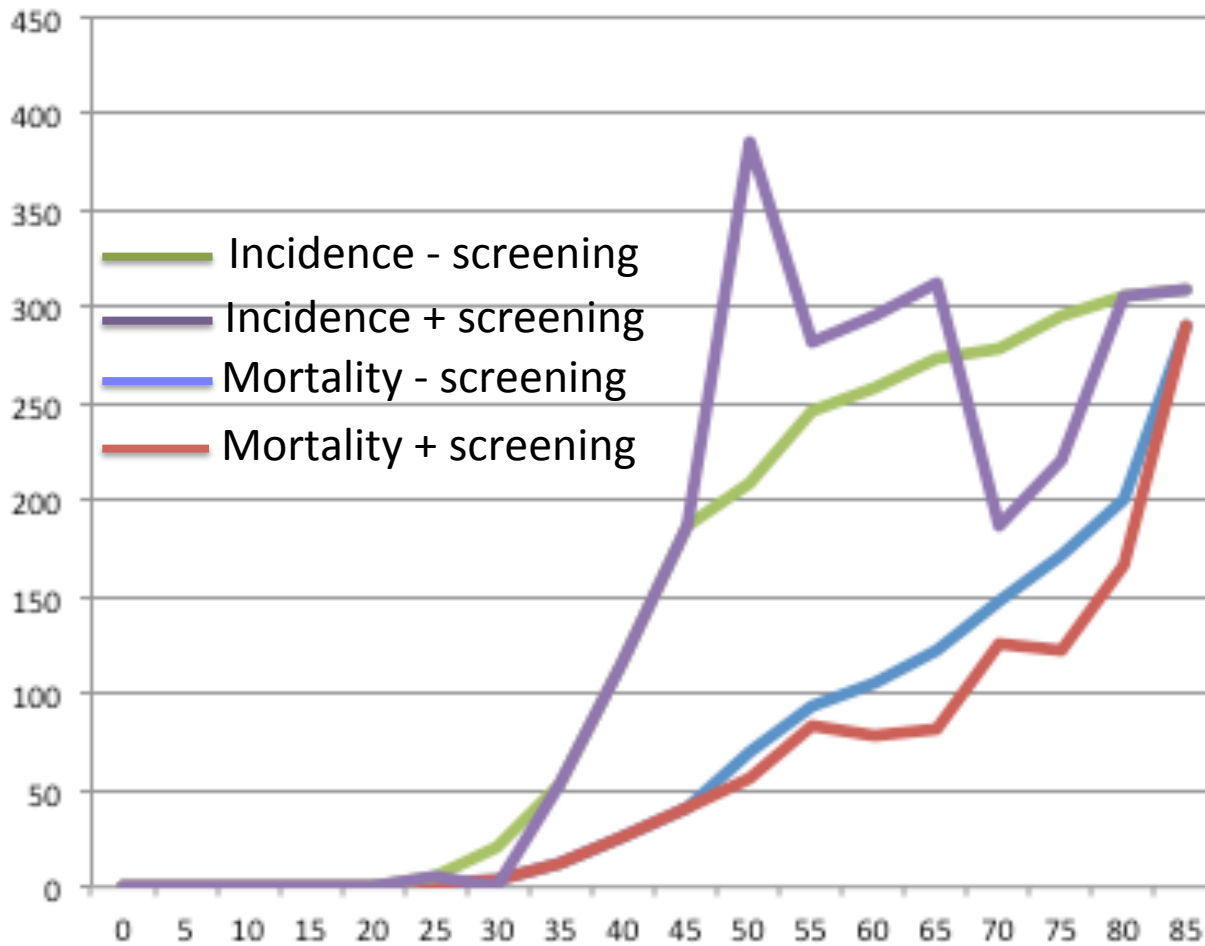


Holmberg et al, 2009

Tabar et al, 2011: W+E, all ages: LEPC 0.69 (0.56-0.85); NEPC 0.73 (0.59-0.89);

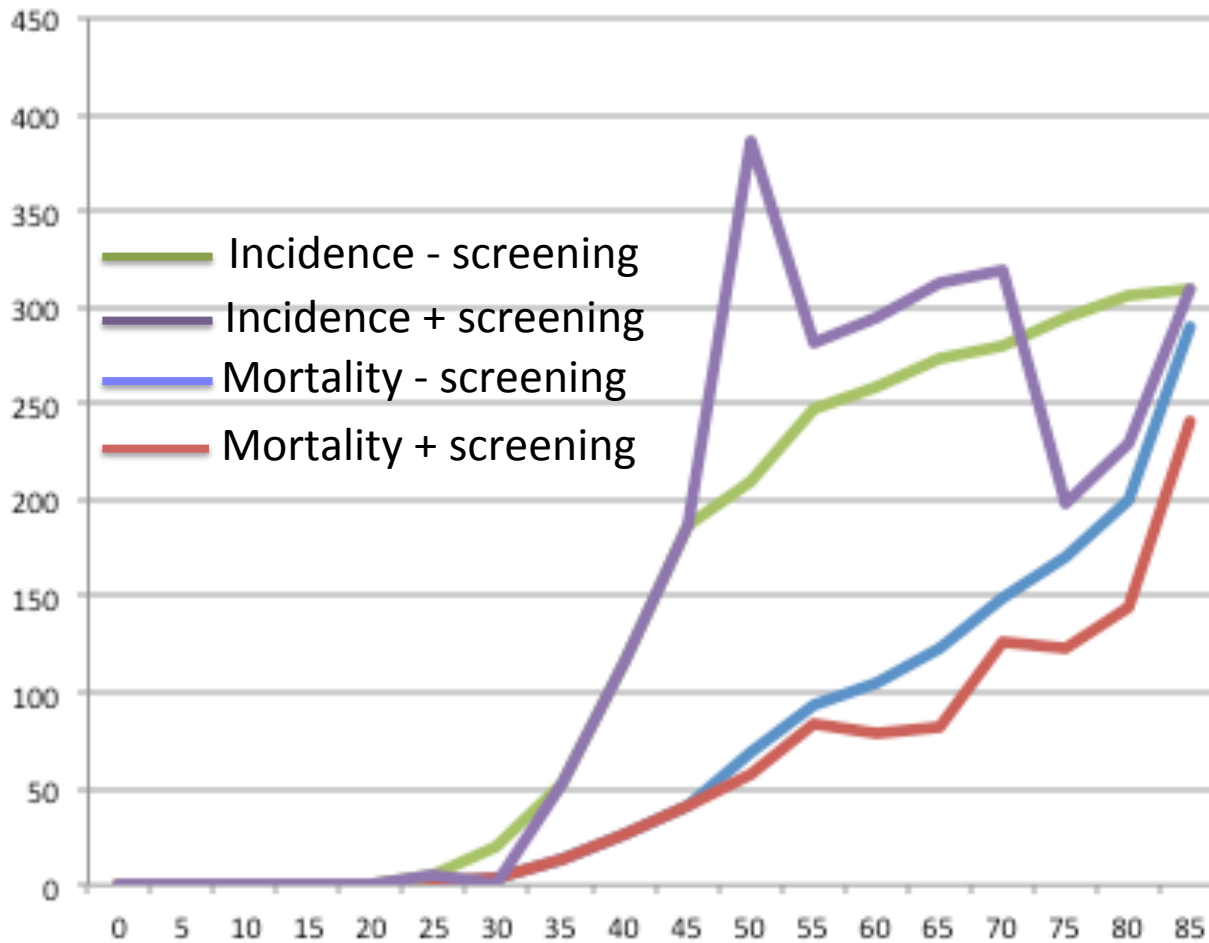
Data for women aged 70-74 years at entry NOT reported separately

Screening 50-69 years



Based on rates 1989-1993, Njor et al, 2013; Njor et al, 2015

Screening 50-74 years



Based on rates 1989-1993, Njor et al, 2013; Njor et al, 2015

Comorbidity increases with age

Age group	Inpatient contacts for women 2012	Self-reported long-term illness for women 2013
45-54 years	9%	39%
55-64 years	11%	44%
65-74 years	16%	43%
75+ years	25%	51%

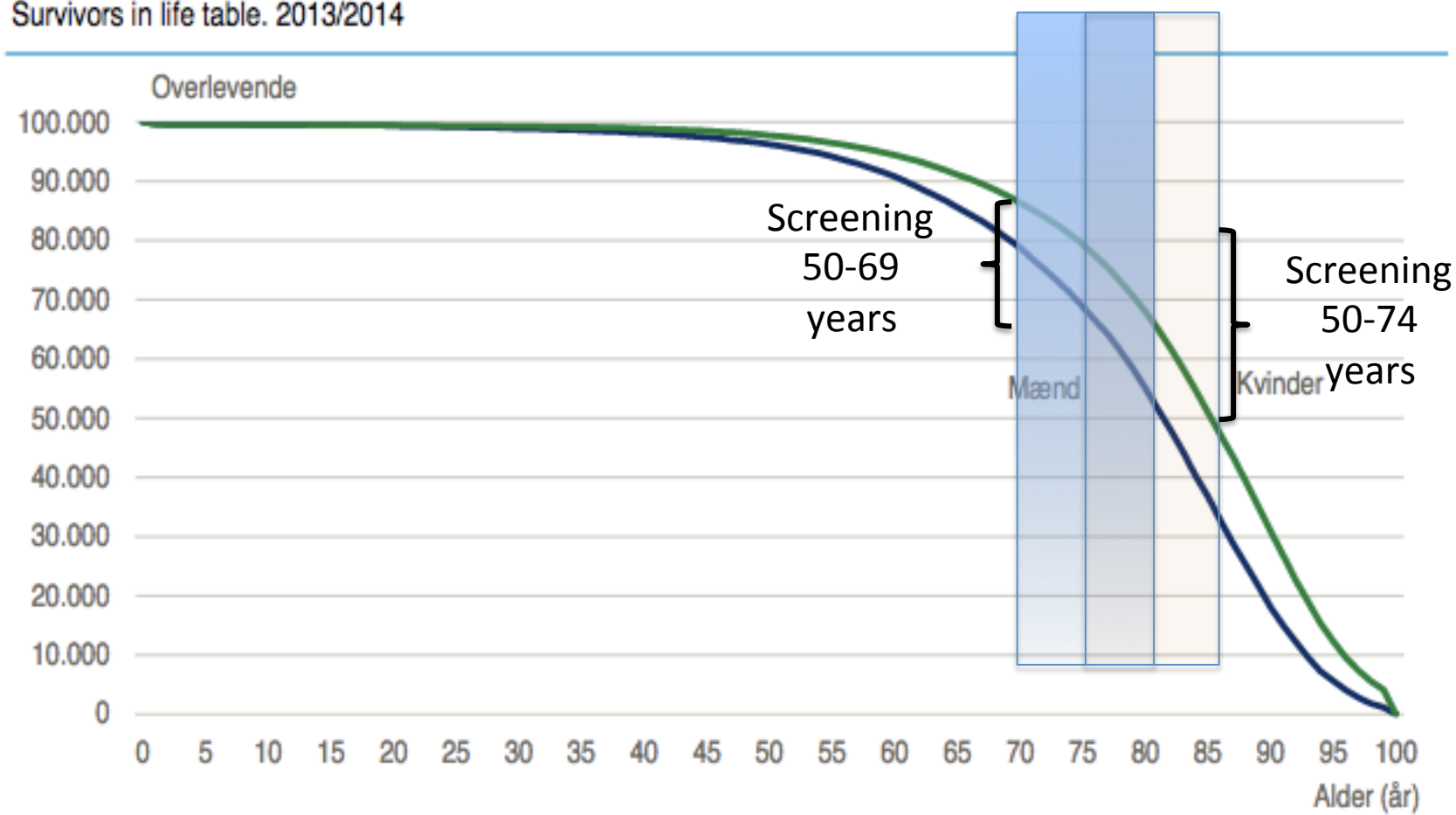
<https://www.dst.dk/pukora/epub/Nyt/2013/NR617.pdf>

http://proxy.danskernessundhed.dk/SASVisualAnalyticsViewer/VisualAnalyticsViewer_guest.jsp?reportName=Langvarig%20sygdom&reportPath=/Danskernes_sundhed/

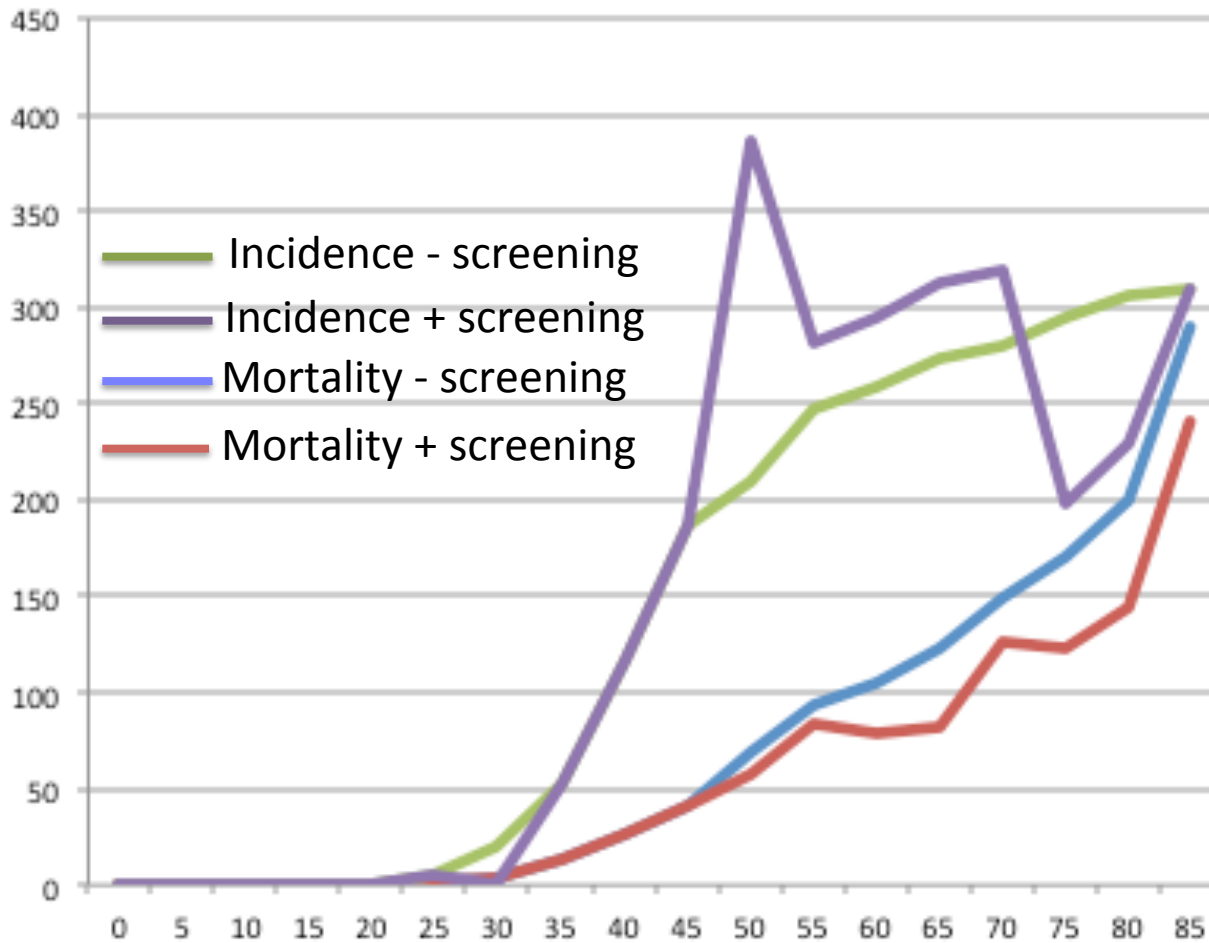
Age for compensatory dip

Overlevelseskurve for mænd og kvinder. 2013/2014

Survivors in life table. 2013/2014



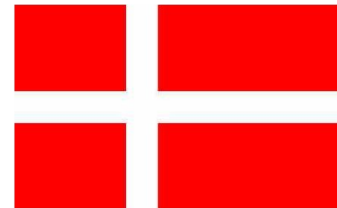
Screening 50-74 years



Based on rates 1989-1993, Njor et al, 2013; Njor et al, 2015

Before decision on change of age group

- 2-county data for women aged 70-74 years at entry by all methods for assessment of cause of death
- Simulate effect of higher age-limit on both breast cancer mortality and incidence
- Investigate effect of mammography screening for women with different degrees of comorbidity



Thank you for your attention



Copenhagen Old Municipality Hospital, now part of University of Copenhagen