



# Overdiagnosticering

– da ikke i min klinik, eller?

John Brodersen

Speciallæge i almen medicin, ph.d., professor



Center for Forskning & Uddannelse i Almen Medicin, Institut for Folkesundhedsvidenskab  
Forskningsenheden for Almen Praksis, Region Sjælland

# Præsentation

- Kan vi gennemskue odx v. screening?
- Kan befolkningen?
- Videnskab og overdiagnostik
- Definition af overdiagnostik
- Typer af overdiagnostik
- Eksempler på overdiagnostik



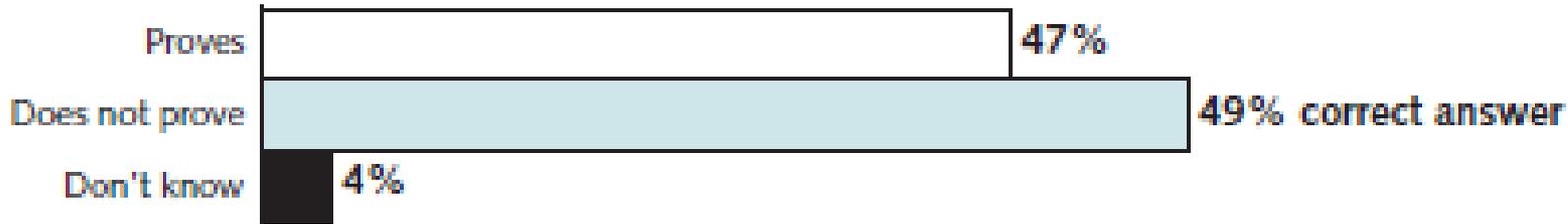
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# Der bliver diagnosticeret flere kræfttilfælde i den screenede gruppe end i den ikke-screenede gruppe

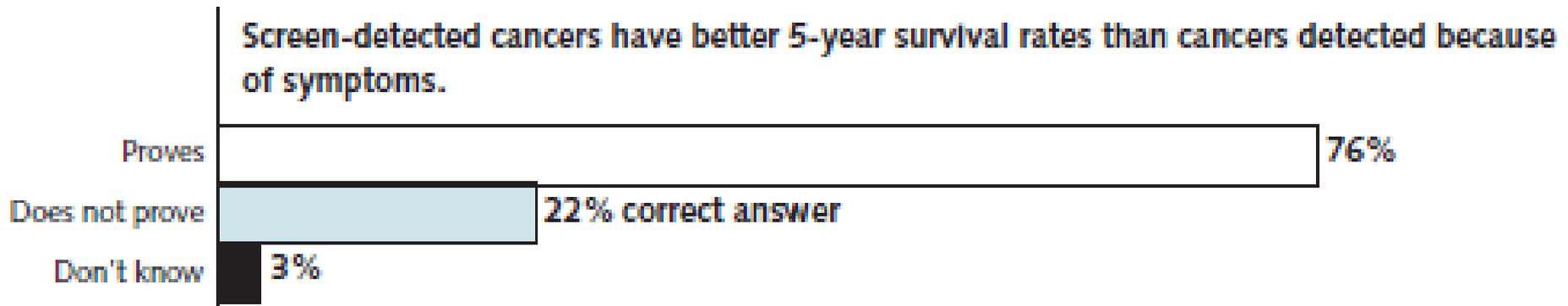
More cancers are detected in screened populations than in unscreened populations.



Wegwarth et al. Do Physicians Understand Cancer Screening Statistics? A National Survey of Primary Care Physicians in the United States. *Ann Intern Med* 156 (5):340-349, 2012.



# Kræfttilfælde fundet ved screening har en bedre 5-års overlevelse end kræfttilfælde diagnosticeret pga. symptomer



Wegwarth et al. Do Physicians Understand Cancer Screening Statistics? A National Survey of Primary Care Physicians in the United States. *Ann Intern Med* 156 (5):340-349, 2012.



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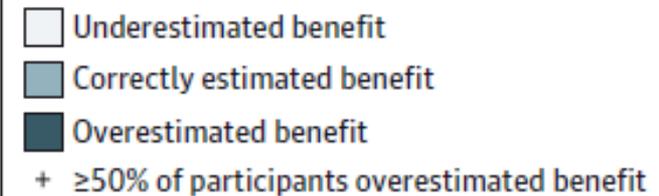
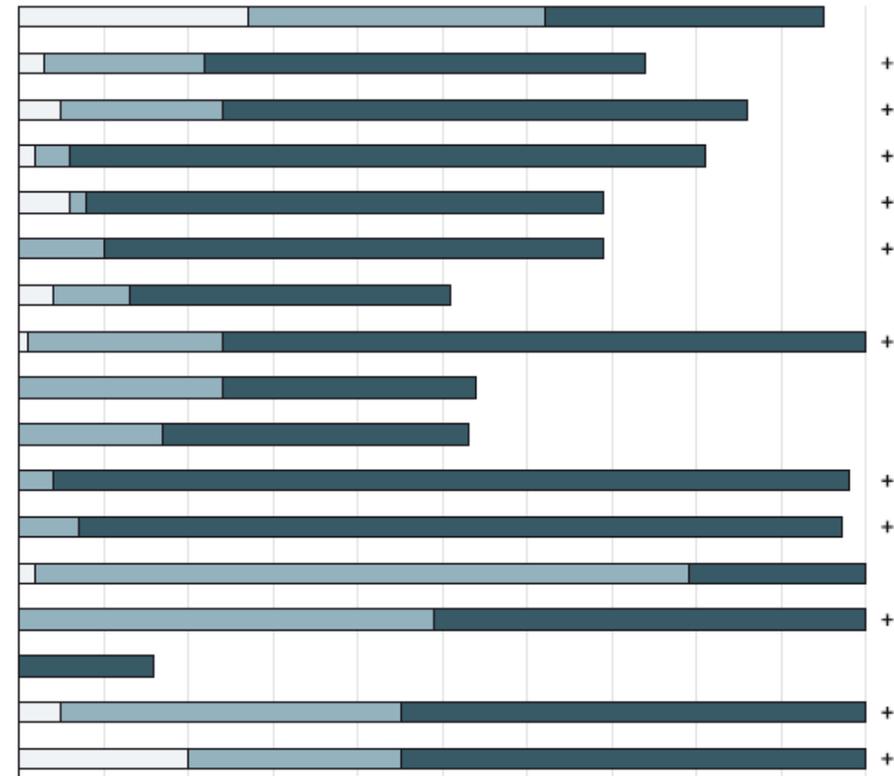
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# Befolkningens vurdering af screening for kræft – de gavnlige virkninger

## Cancer screening

Barratt et al,<sup>31</sup> 1999, mammography sensitivity  
 Chamot and Perneger,<sup>34</sup> 2001, decreased breast Ca death by mammography  
 Domenighetti et al,<sup>36</sup> 2003, decreased breast Ca death by mammography  
 Domenighetti et al,<sup>36</sup> 2003, deaths prevented by mammography screening  
 Gigerenzer et al,<sup>38</sup> 2009, decreased breast Ca death by mammography  
 Gigerenzer et al,<sup>38</sup> 2009, decreased prostate Ca death by PSA screening  
 Haakenson et al,<sup>40</sup> 2006, decreased breast Ca death by mammography  
 Haggstrom and Schapira,<sup>41</sup> 2006, decreased death risk from breast Ca by mammography  
 Hoffman et al,<sup>16</sup> 2010, Ca diagnosis from positive mammogram  
 Hoffman et al,<sup>16</sup> 2010, Ca diagnosis from high PSA  
 Hudson et al,<sup>18</sup> 2012, decreased bowel Ca death by screening  
 Hudson et al,<sup>18</sup> 2012, decreased breast Ca death by screening  
 Phillips et al,<sup>44</sup> 2003, accuracy of cervical smear test  
 Phillips et al,<sup>44</sup> 2003, cervical Ca prevented by screening  
 Phillips et al,<sup>45</sup> 2005, accuracy of cervical smear test  
 Phillips et al,<sup>45</sup> 2005, cervical Ca prevented by screening  
 Schwartz et al,<sup>46</sup> 2000, decreased breast Ca death by mammography



Hoffmann & Mar. Patients' expectations of the benefits and harms of treatments, screening, and tests: a systematic review. *JAMA Intern.Med* 175 (2):274-286, 2015.

# Befolkningens vurdering af screening for kræft – de skadelige virkninger

## Cancer screening

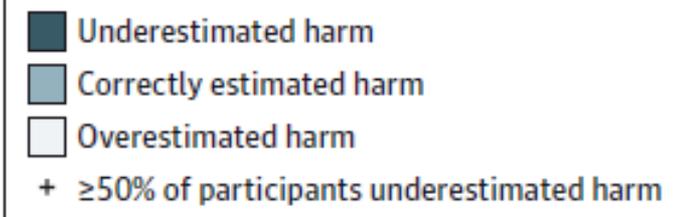
Lewis et al,<sup>42</sup> 2003, chance of false positive from mammography

Lewis et al,<sup>42</sup> 2003, upset by false positive from mammography

Haakenson et al,<sup>40</sup> 2006, need biopsies after extra mammogram

Haakenson et al,<sup>40</sup> 2006, need to return for additional mammogram

Haakenson et al,<sup>40</sup> 2006, noncancerous abnormalities after biopsy



Hoffmann & Mar. Patients' expectations of the benefits and harms of treatments, screening, and tests: a systematic review. *JAMA Intern.Med* 175 (2):274-286, 2015.

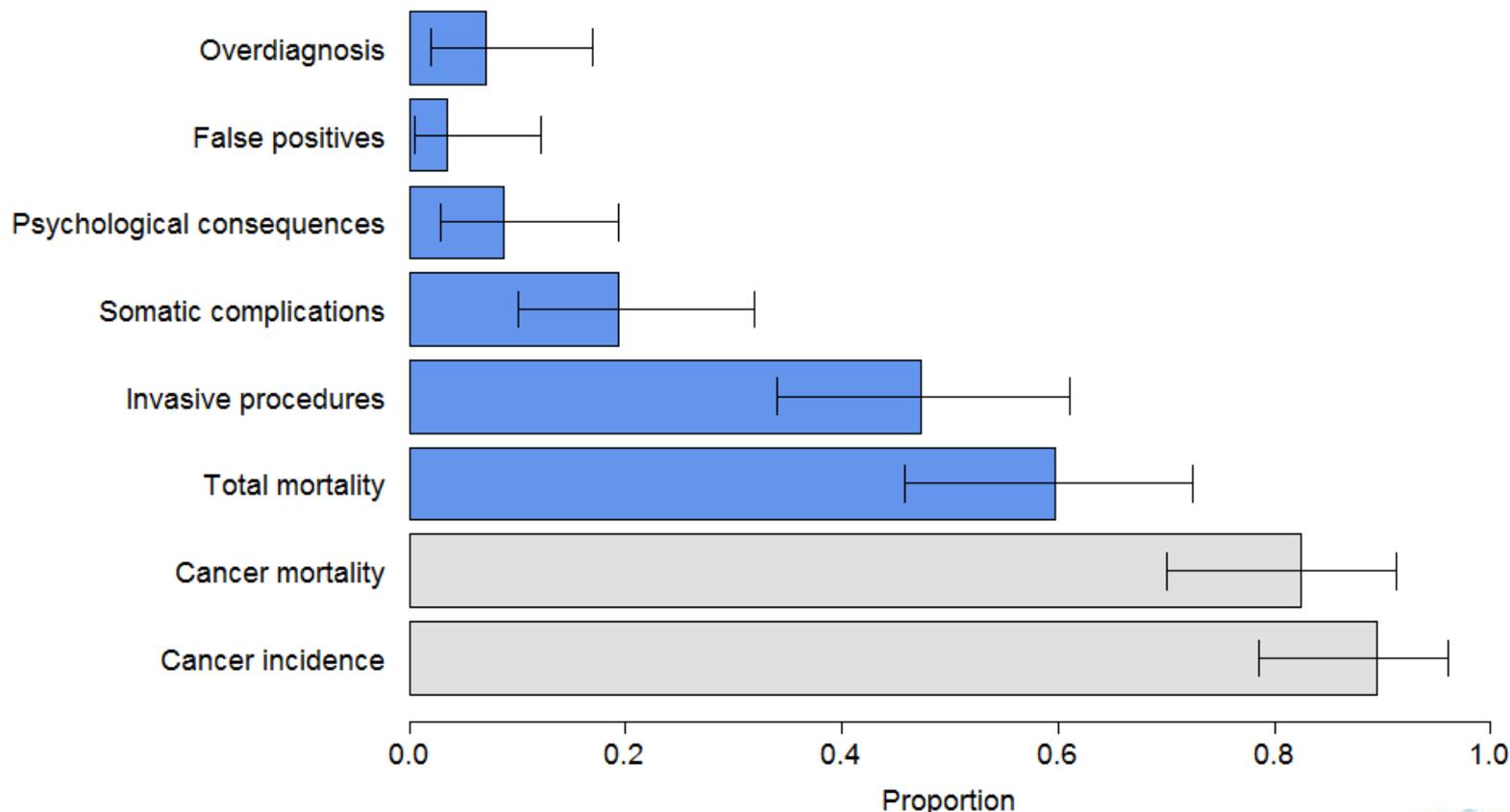


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# Er overdetektion ved screening for kræft dokumenteret i de videnskabelige artikler?



B. Heleno, M. F. Thomsen, D. S. Rodrigues, K. J. Jørgensen, J. Brodersen. Quantification of harms in cancer screening trials: literature review. *BMJ*. 347:f5334, 2013.



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## Overdiagnosis: what it is and what it isn't

John Brodersen,<sup>1,2</sup> Lisa M Schwartz,<sup>3</sup> Carl Heneghan,<sup>4</sup>  
Jack William O'Sullivan,<sup>4</sup> Jeffrey K Aronson,<sup>4</sup>  
Steven Woloshin<sup>3</sup>

10.1136/ebmed-2017-110886

<sup>1</sup>Centre of Research & Education in General Practice, Department of Public Health, University of Copenhagen, Faculty of Health Sciences, Copenhagen, Denmark

<sup>2</sup>Region Zealand, Primary Health Care Research Unit

<sup>3</sup>Center for Medicine and the Media, The Dartmouth Institute for Health Policy and Clinical Practice, Dartmouth Medical School, Lebanon, New Hampshire, USA

<sup>4</sup>Centre for Evidence-Based Medicine, Nuffield Department of Primary Care

Why then, can one desire too much of a good thing?

William Shakespeare,  
*As You Like It* (1600)

Rosalind's question, as she is about to marry Orlando, is purely rhetorical—she thinks that one cannot desire too much of a good thing. Nevertheless, trite though it may be, it is true that one can sometimes have it. It is certainly true of healthcare and has been referred to as 'too much medicine',<sup>1</sup> although because of potential confusion with 'too much medication' a better term might be 'too much healthcare'. This includes too much screening of asymptomatic individuals, too much investigation of those with symptoms, too much reliance on biomarkers, too many quasi-diseases, too much

cases commercial incentives, has further propagated overdiagnosis. The more tests you order, the more likely you are to diagnose a 'disease'.<sup>5 6</sup> This is particularly problematic when there is little evidence that early detection improves patient outcomes. Consider the example of thyroid cancer in South Korea. From 1999 to 2008, the incidence of thyroid cancer increased 6.4-fold,<sup>7</sup> but 95% of these cancers were small (<20 mm), and they were detected mainly through screening.<sup>7</sup> The mortality from thyroid cancer remained essentially unchanged over the same period.<sup>7</sup> Use of advanced imaging also leads to overdiagnosis by finding incidentalomas—'surprise' abnormalities unrelated to the original reason for doing the test, for example, when a chest CT done to follow-up on a pulmonary nodule detects a small adrenal



# Definition af overdiagnostik

Broadly, overdiagnosis means making people patients unnecessarily, by identifying problems that were never going to cause harm or by medicalizing ordinary life experiences through expanded definitions of diseases.

Brodersen, J., et al. (2018). "Overdiagnosis: what it is and what it isn't." BMJ Evidence-Based Medicine **23**(1): 1-3.



# Definition af overdiagnostik

*Bredt forstået handler overdiagnostik om, at mennesker unødvendigt gøres til patienter, og at hverdagens lidelser, hændelser og problemer påføres en medicinsk diagnose.*

Brodersen, J., et al. (2018). "Overdiagnosis: what it is and what it isn't." *BMJ Evidence-Based Medicine* **23**(1): 1-3.



# Overdiagnostik: hvad det ikke er

- Falsk positiv
- Overbehandling
- Overtesting (overforbrug)
- Fejldiagnose
- Bifund (incidentalomas)
- Det modsatte af underdiagnostik
- Uberettiget variation

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# Typer af overdiagnostik

- Overdetection – screening
- Overdefinition: expanding disease definitions or changing disease boundaries

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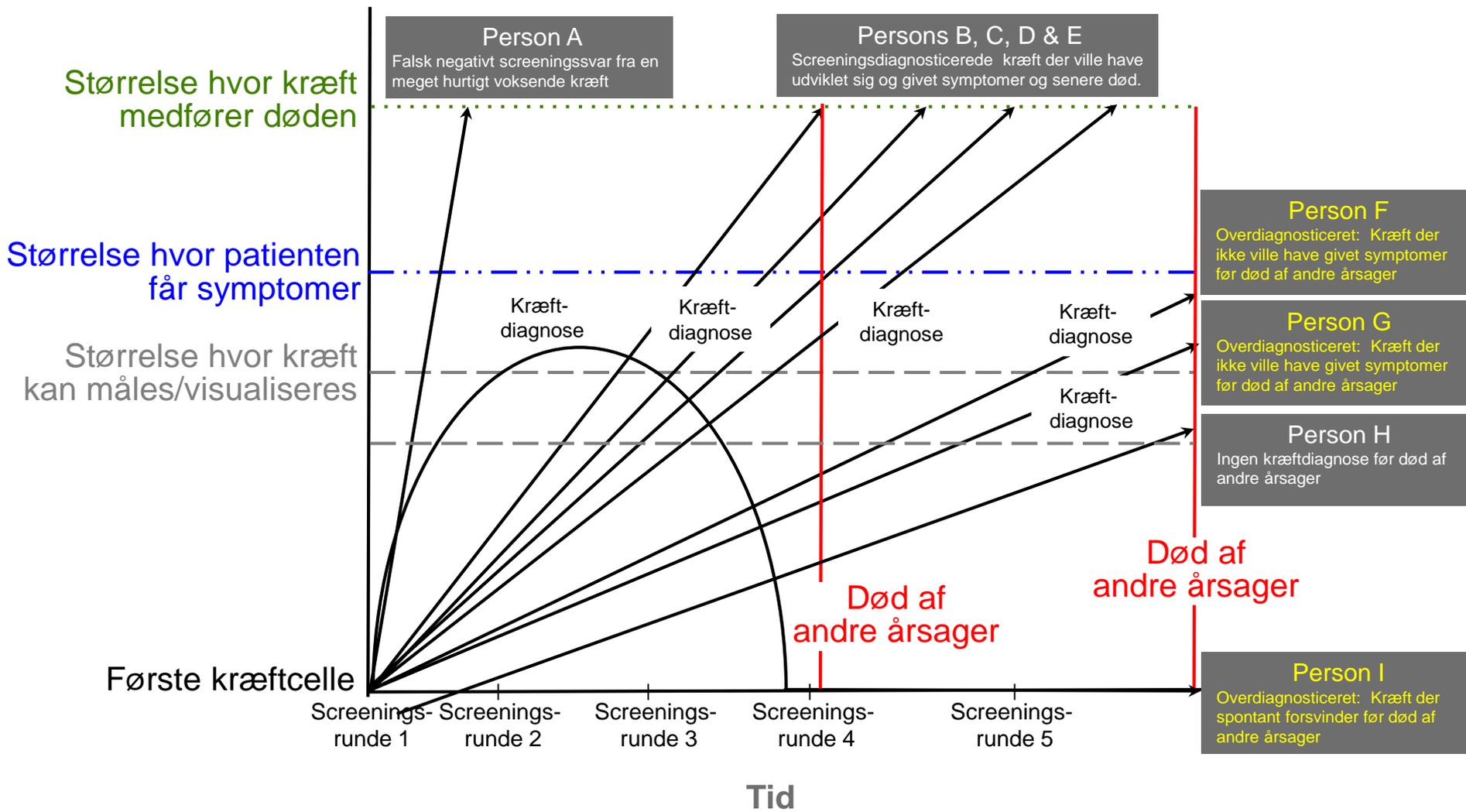
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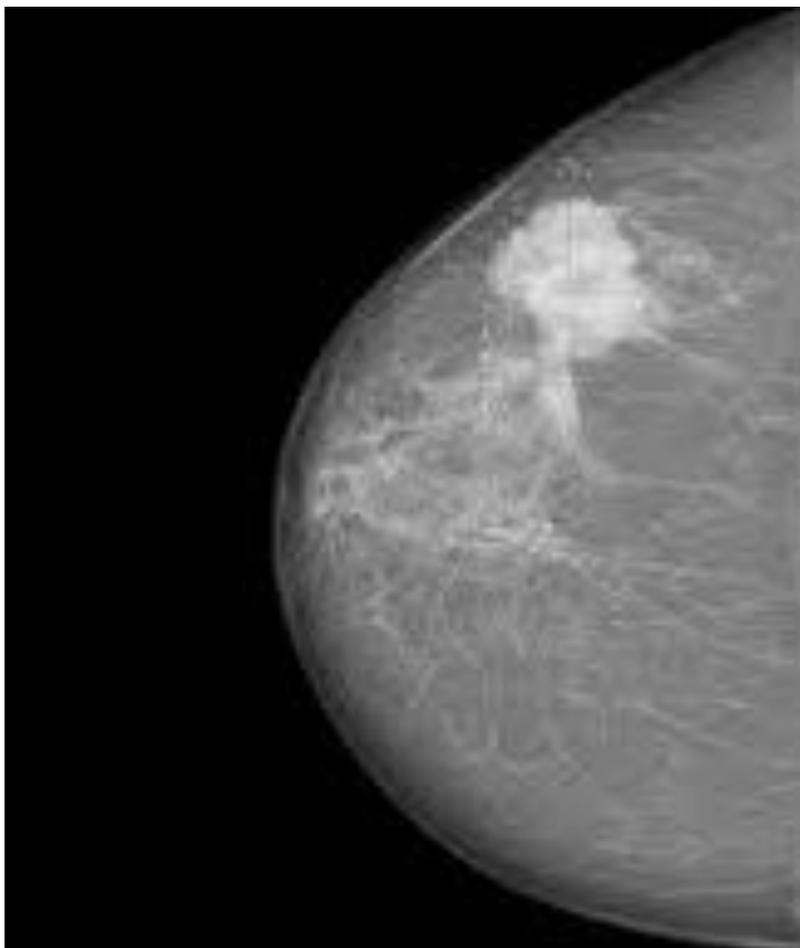


# Model: Hvad sker der ved screening for kræftsygdomme?

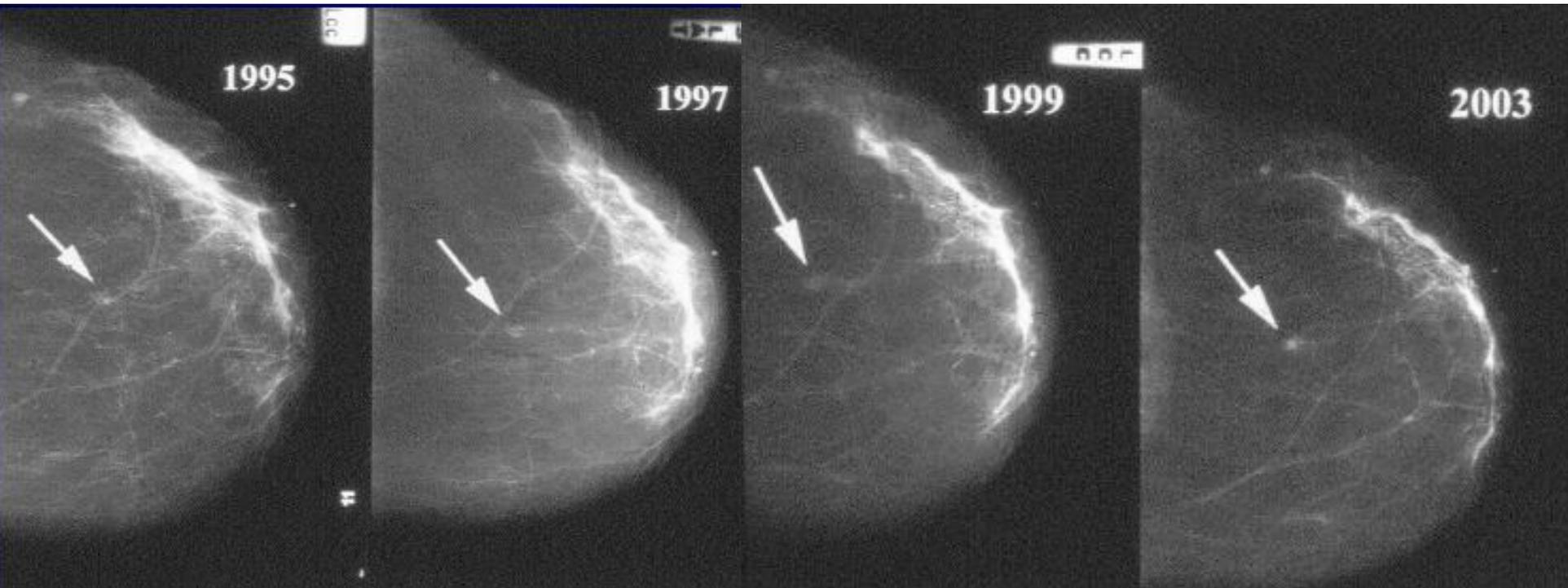
Størrelse af kræft

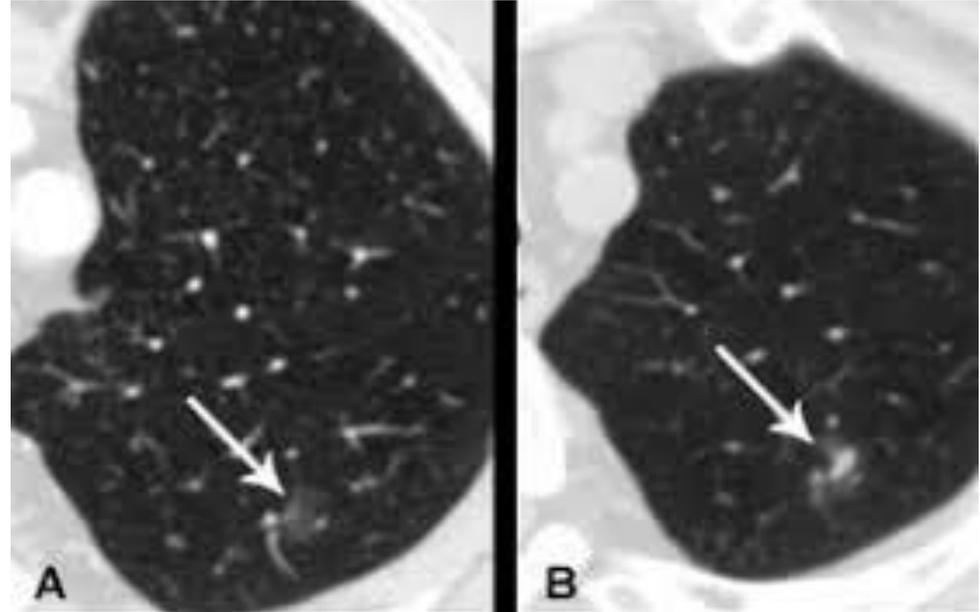
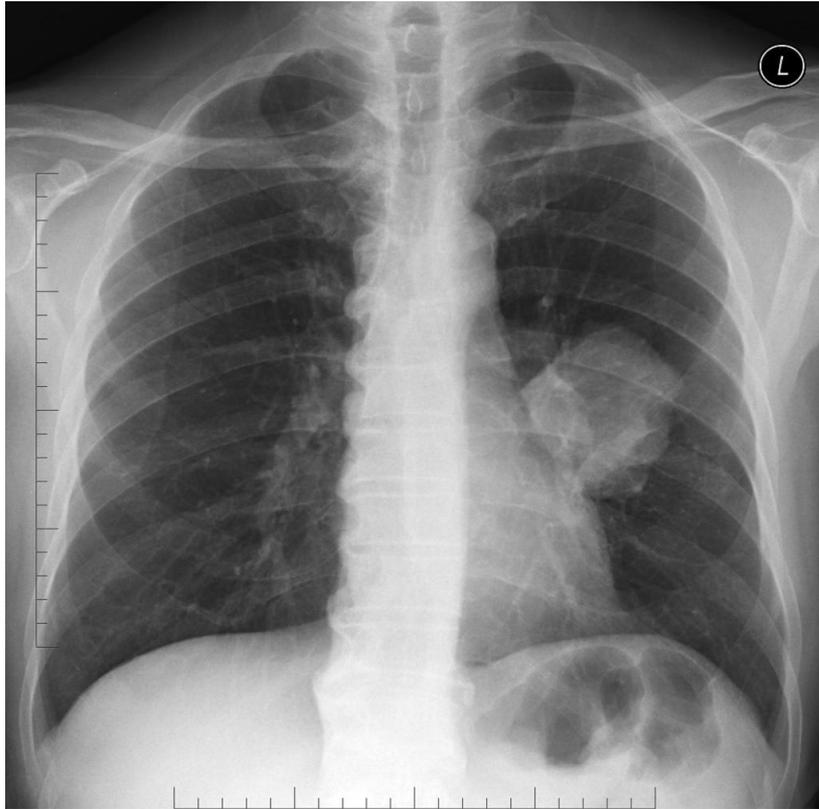


Modified version: Brodersen, Schwartz, Woloshin. Overdiagnosis: How cancer screening can turn indolent pathology into illness. *APMIS* 122 (8):683-689, 2014.



# Mammografiscreening





# CT-screening for lungekræftscreening

17.08.05



17.11.05



01.03.06



16.10.06



10.10.07



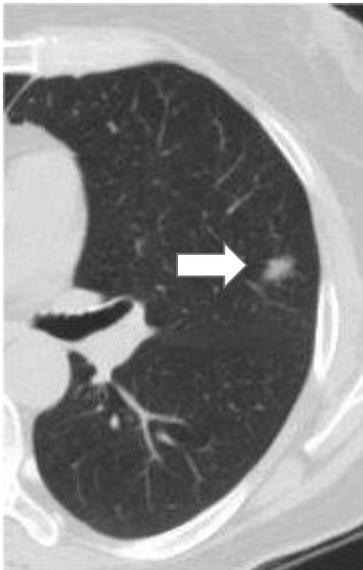
29.11.08



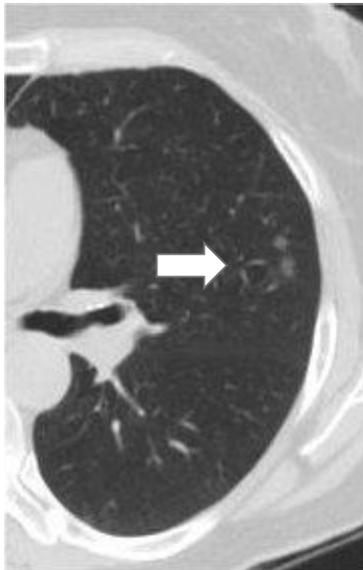
26.02.09



10.08.09



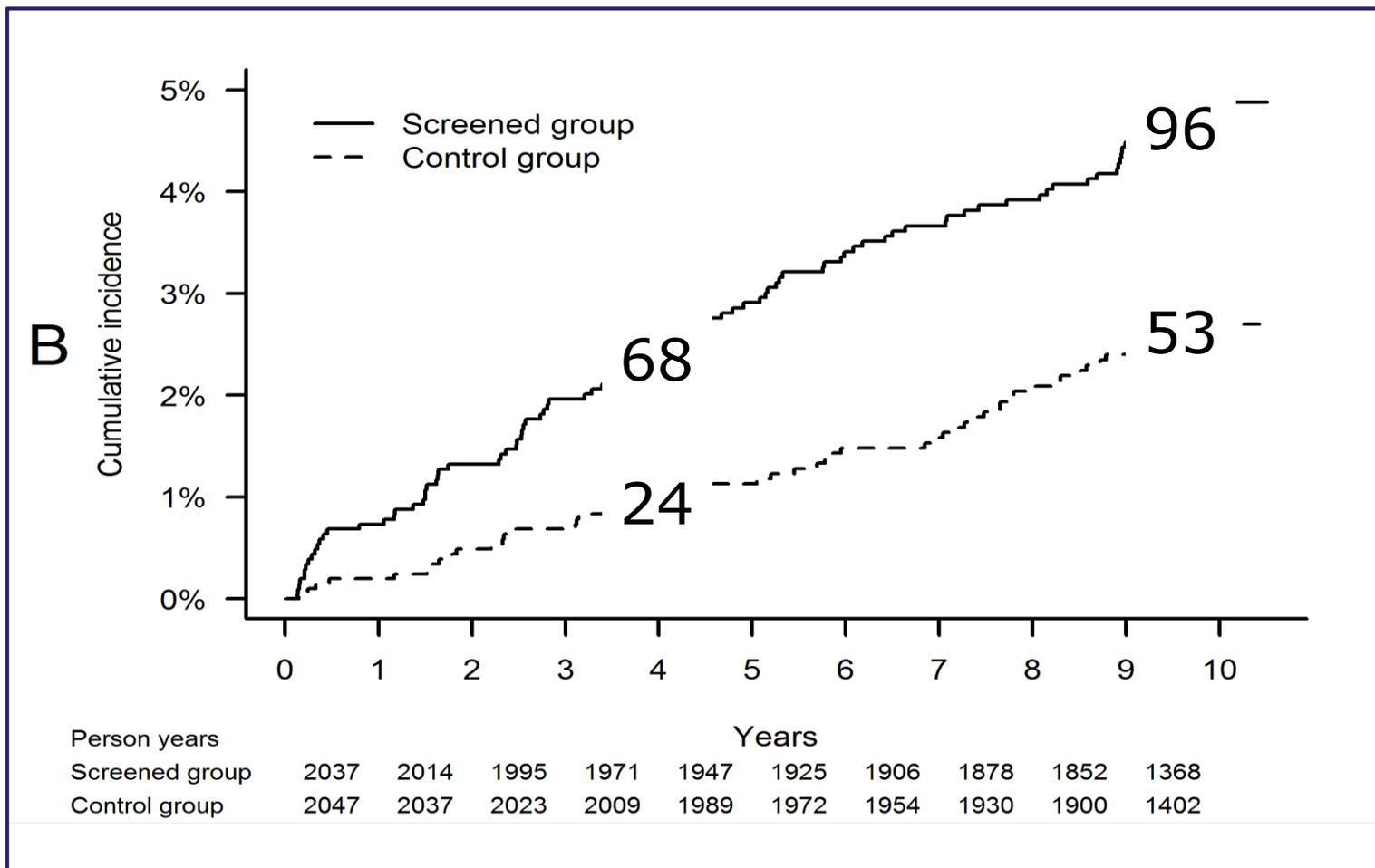
10.08.09



17.08.09



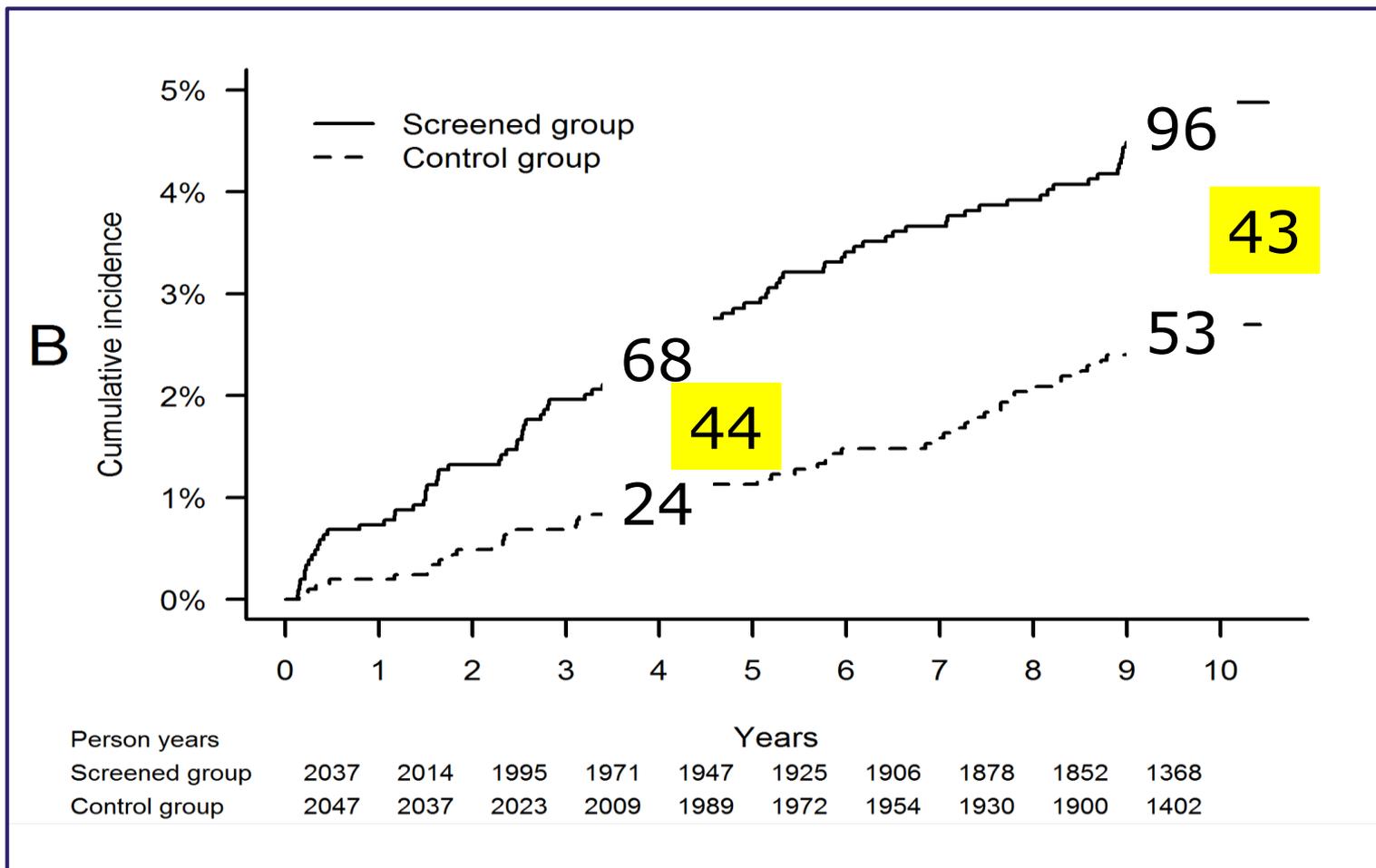
# Overdiagnostik i DLCST: 5 års opfølgning



Wille et al. Results of the Randomized Danish Lung Cancer Screening Trial with Focus on High-risk Profiling. *Am.J Respir.Crit Care Med.*, 2015.



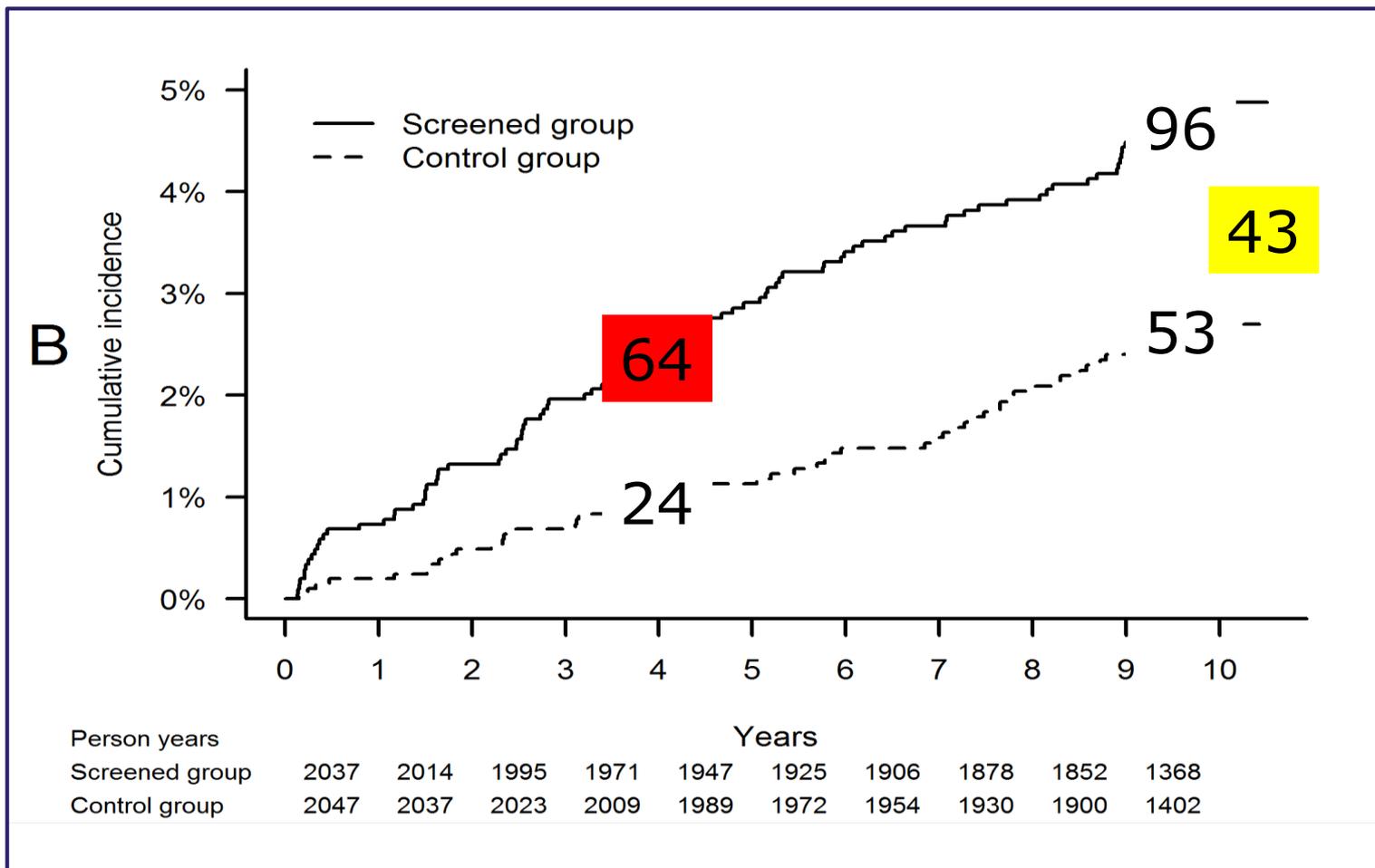
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Heleno, Siersma, Brodersen. Overdiagnosis of lung cancer with low-dose CT-screening: an analysis from the Danish Lung Cancer Screening Trial.

JAMA, accepted for publication 28.03.2018



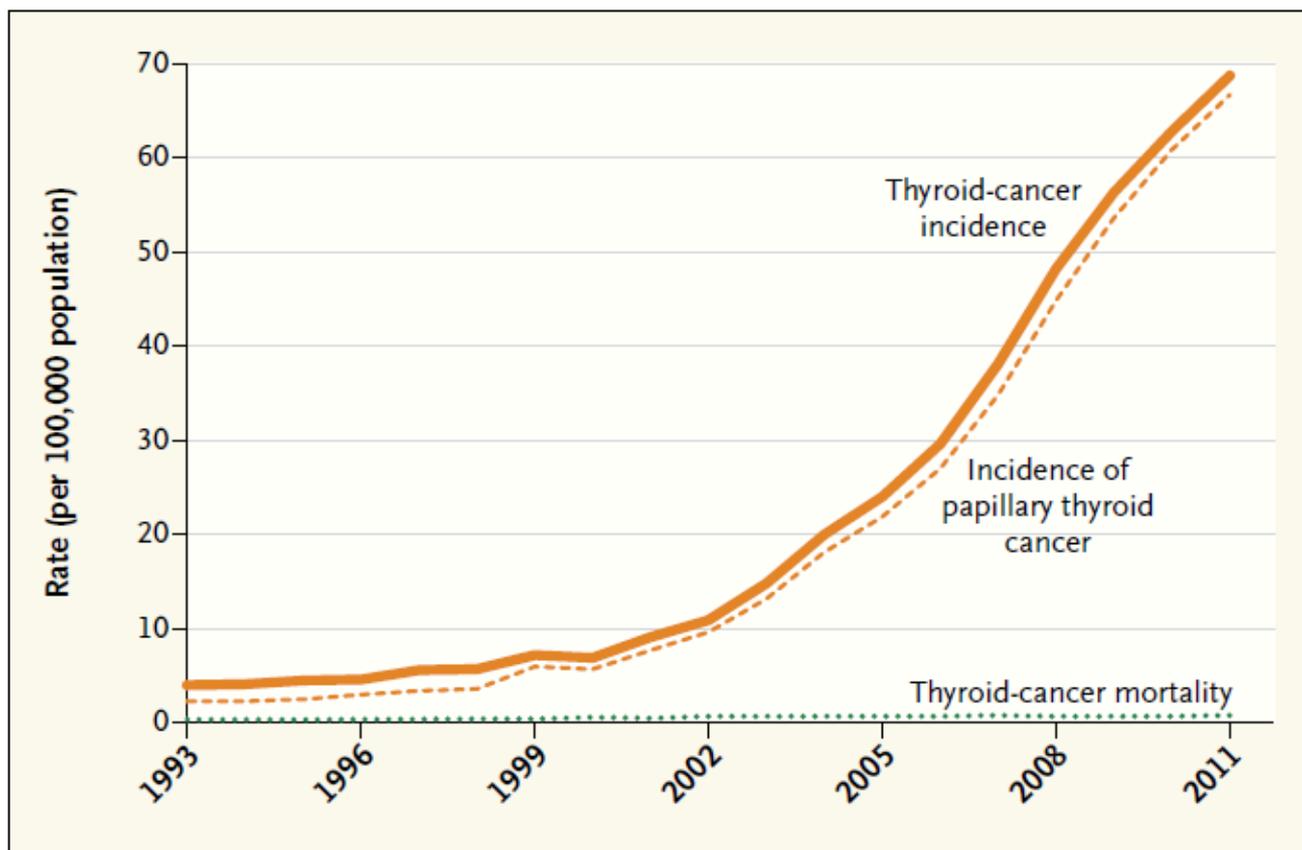
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$$43/64 = \mathbf{67.2\%}$$
$$[95\% \text{ CI}; 37.1\% - 95.4\%]$$

Heleno, Siersma, Brodersen. Overdiagnosis of lung cancer with low-dose CT-screening: an analysis from the Danish Lung Cancer Screening Trial.  
JAMA, accepted for publication 28.03.2018



# Thyreoidedækraft i Sydkorea

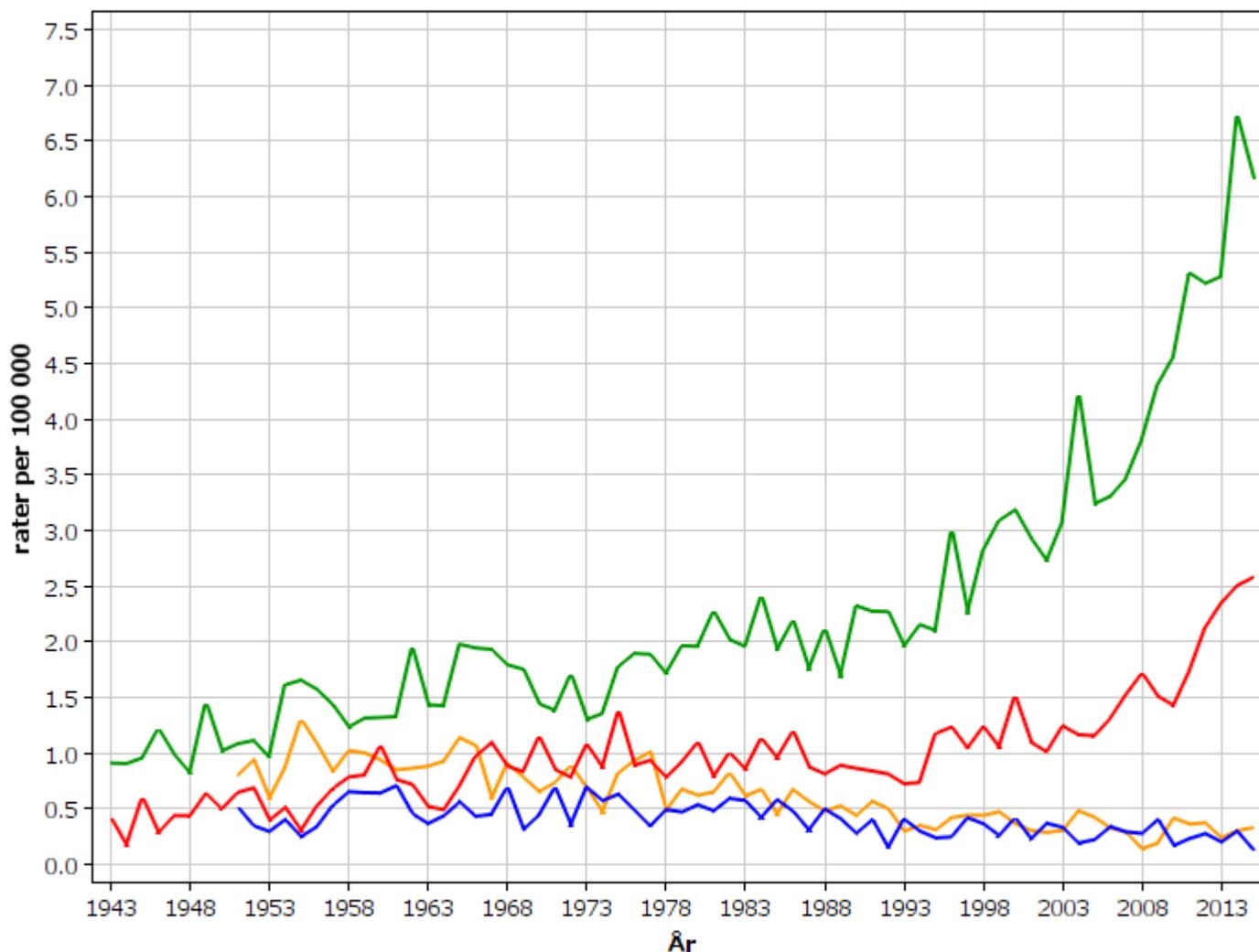


Thyroid-Cancer Incidence and Related Mortality in South Korea, 1993–2011.

Ahn HS, Kim HJ, Welch HG. Korea's thyroid-cancer "epidemic"-- screening and overdiagnosis. *N Engl J Med*. 2014;371(19):1765-7.



# Thyreoideakræft i Danmark



■ Incidens, Mænd

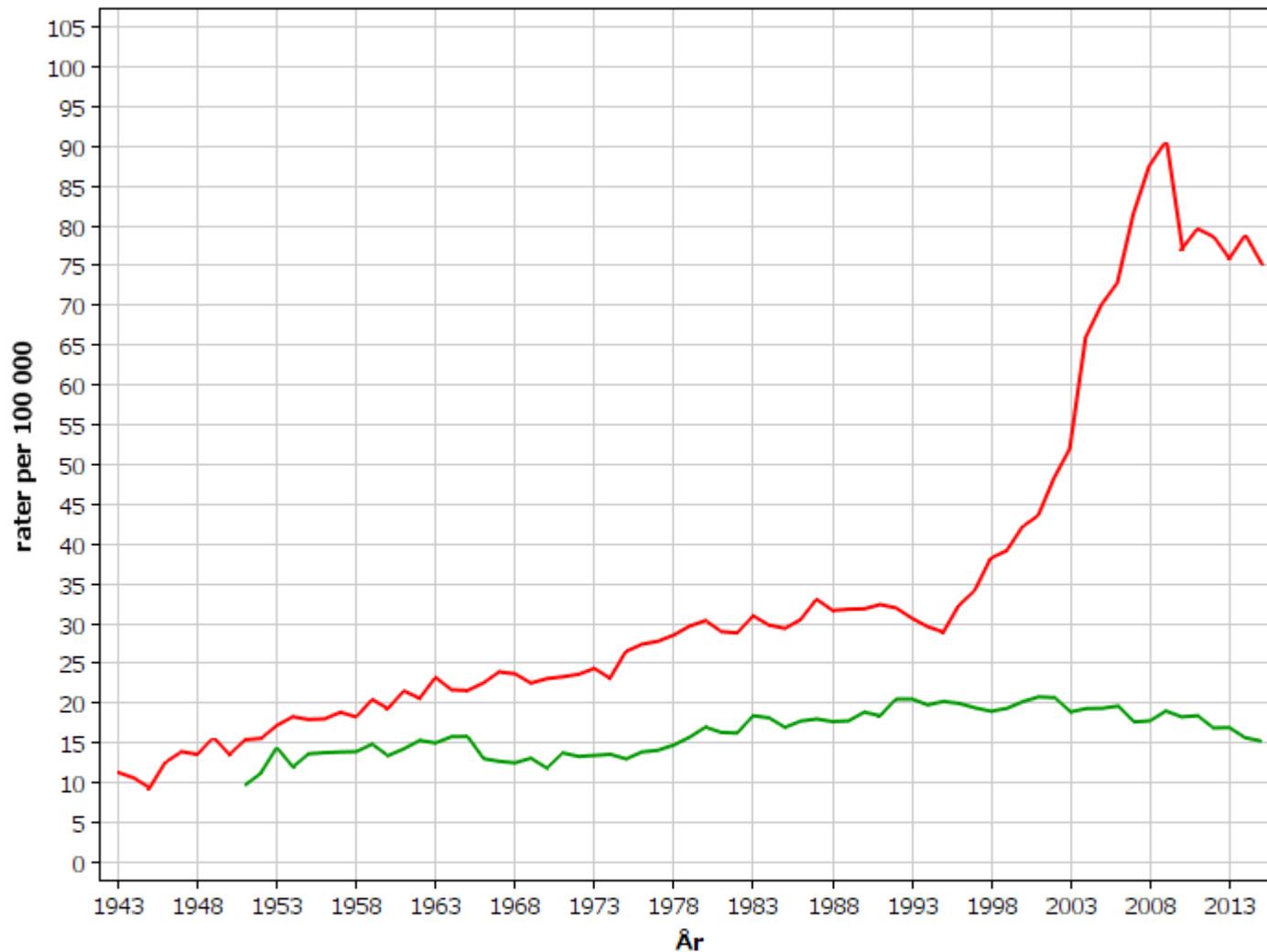
■ Incidens, Kvinder

■ Dødelighed, Mænd

■ Dødelighed, Kvinder

Danmark  
Prostata  
ASR (W) alder 0-85+

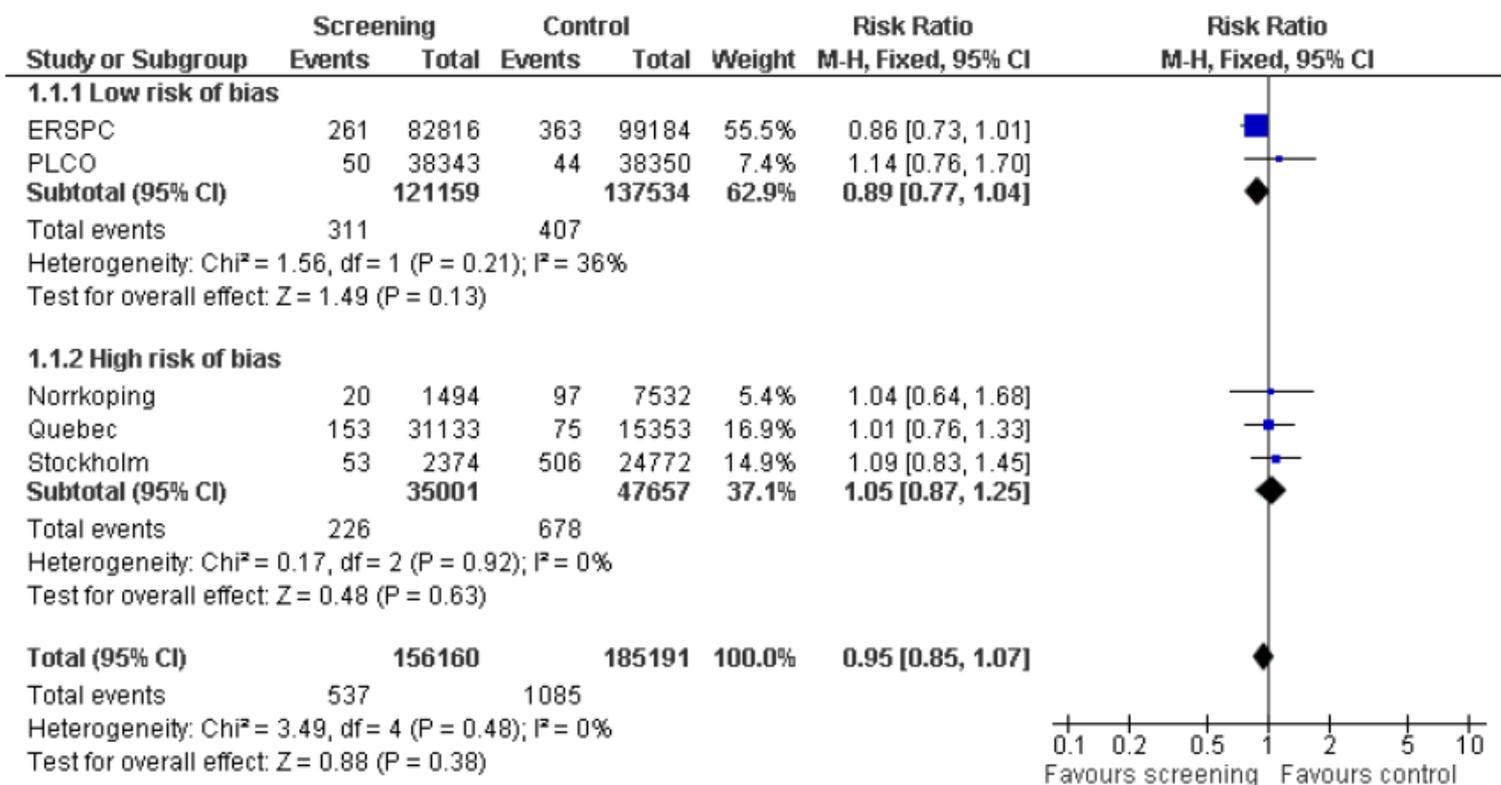
# Prostatakræft i Danmark



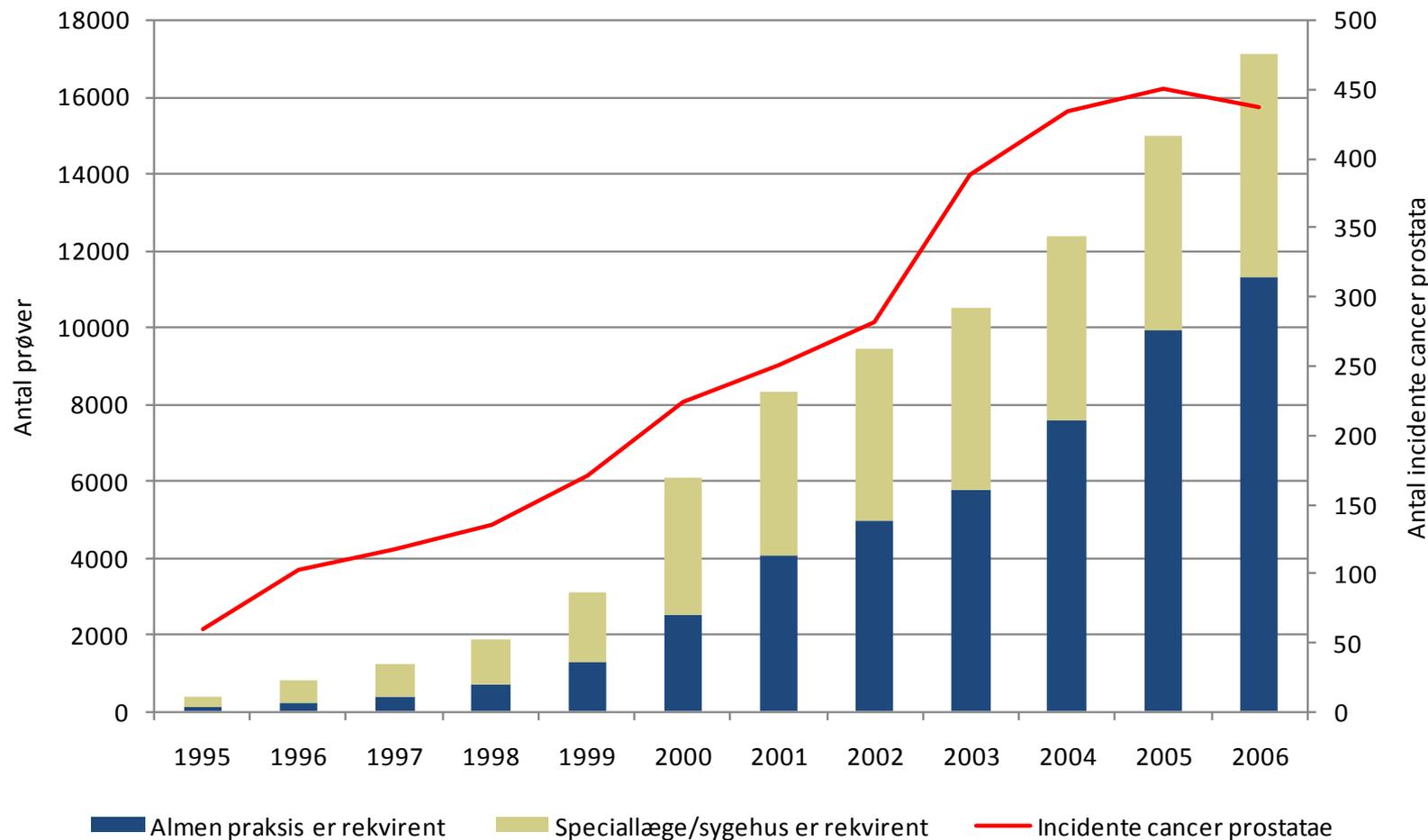
■ Incidens: ■ Dødelighed:

# PSA-screening

Figure 2. Forest plot of comparison: 1 Screening vs control, outcome: 1.1 Prostate cancer-specific mortality (sub-group analysis risk of bias).



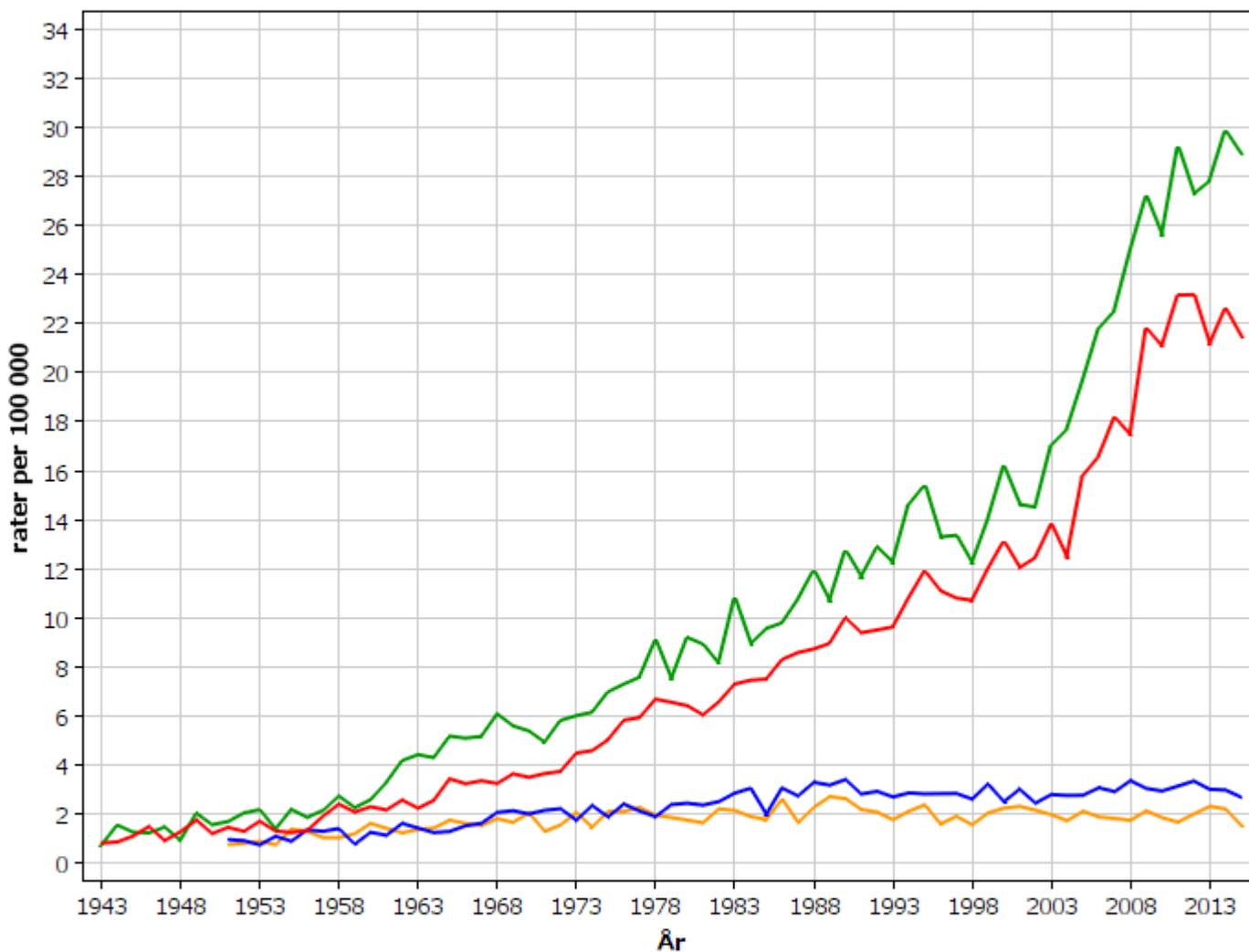
# PSA-test & Pca i Danmark



Mukai et al. Brug af undersøgelse for prostataspecifikt antigen .  
Ugeskr.Laeger 172 (9):696-700, 2010.



# Malignt melanom i Danmark



■ Incidens, Mænd   ■ Incidens, Kvinder   ■ Dødelighed, Mænd   ■ Dødelighed, Kvinder

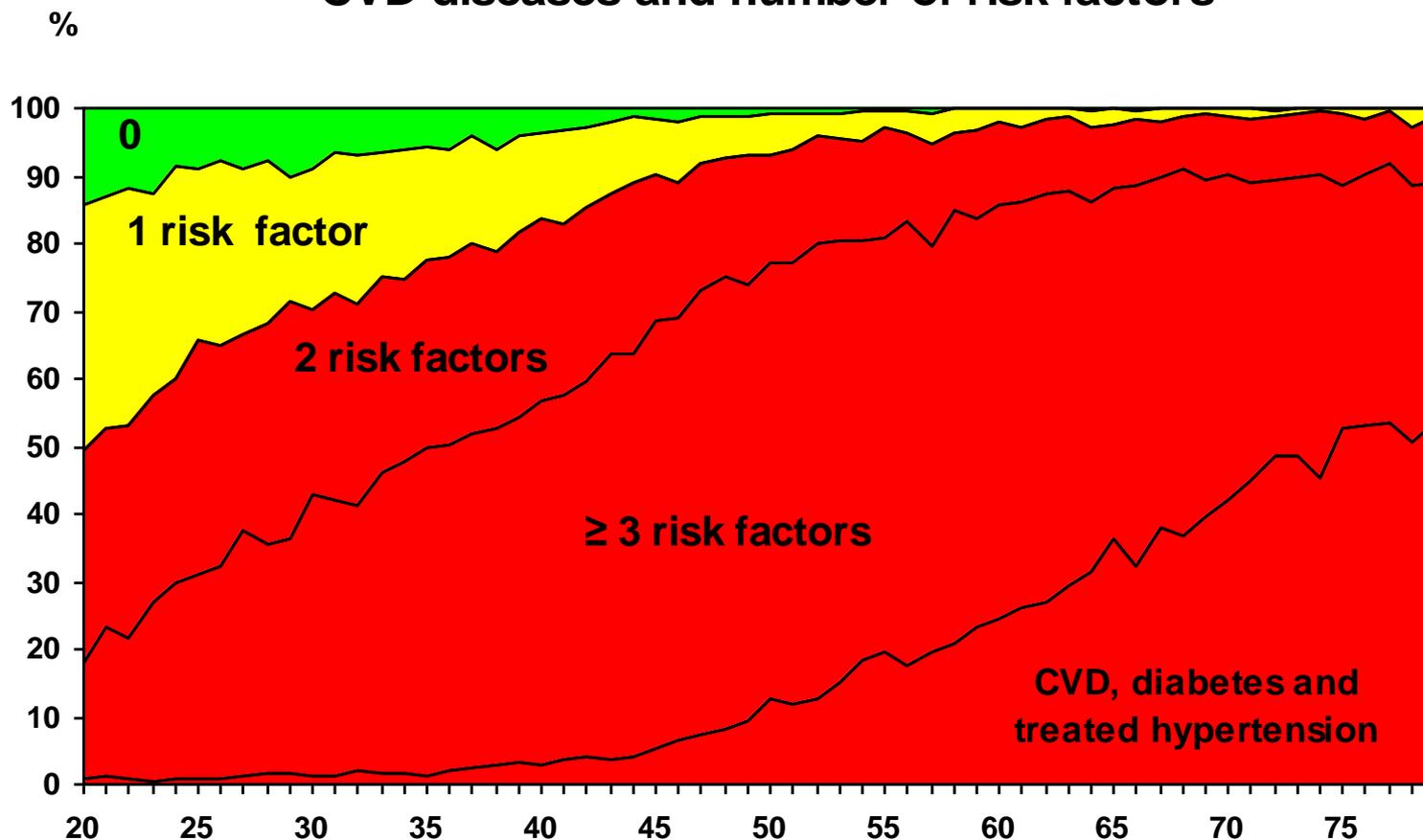
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- Overdefinition: expanding disease definitions or changing disease boundaries
  - Overselling
  - Disease mongering



# Cardio-vascular Overdiagnosis

## CVD diseases and number of risk factors

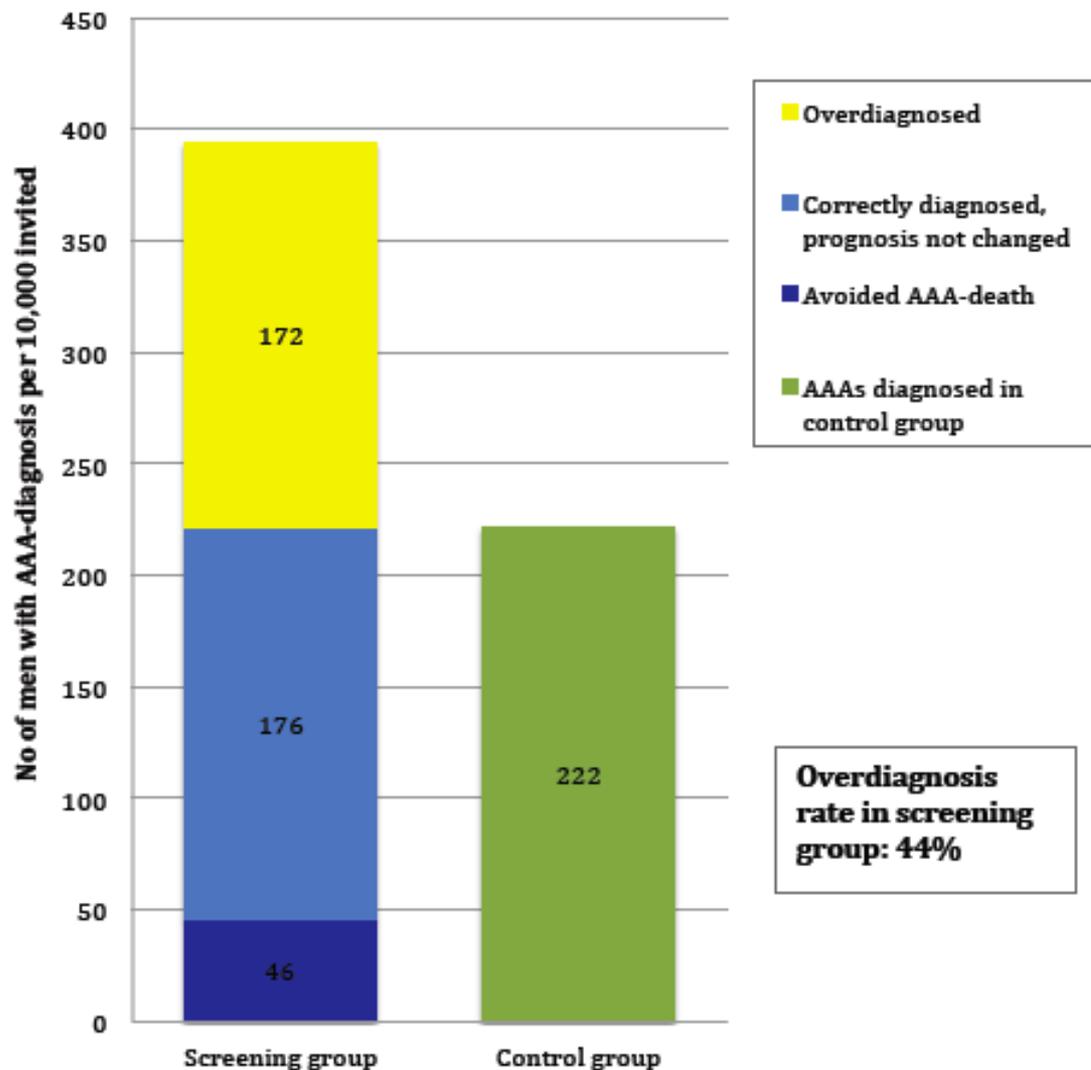


H. Petursson et al. Can individuals with a significant risk for cardiovascular disease be adequately identified by combination of several risk factors? *J.Eval.Clin.Pract.* 15 (1):103-109, 2009.



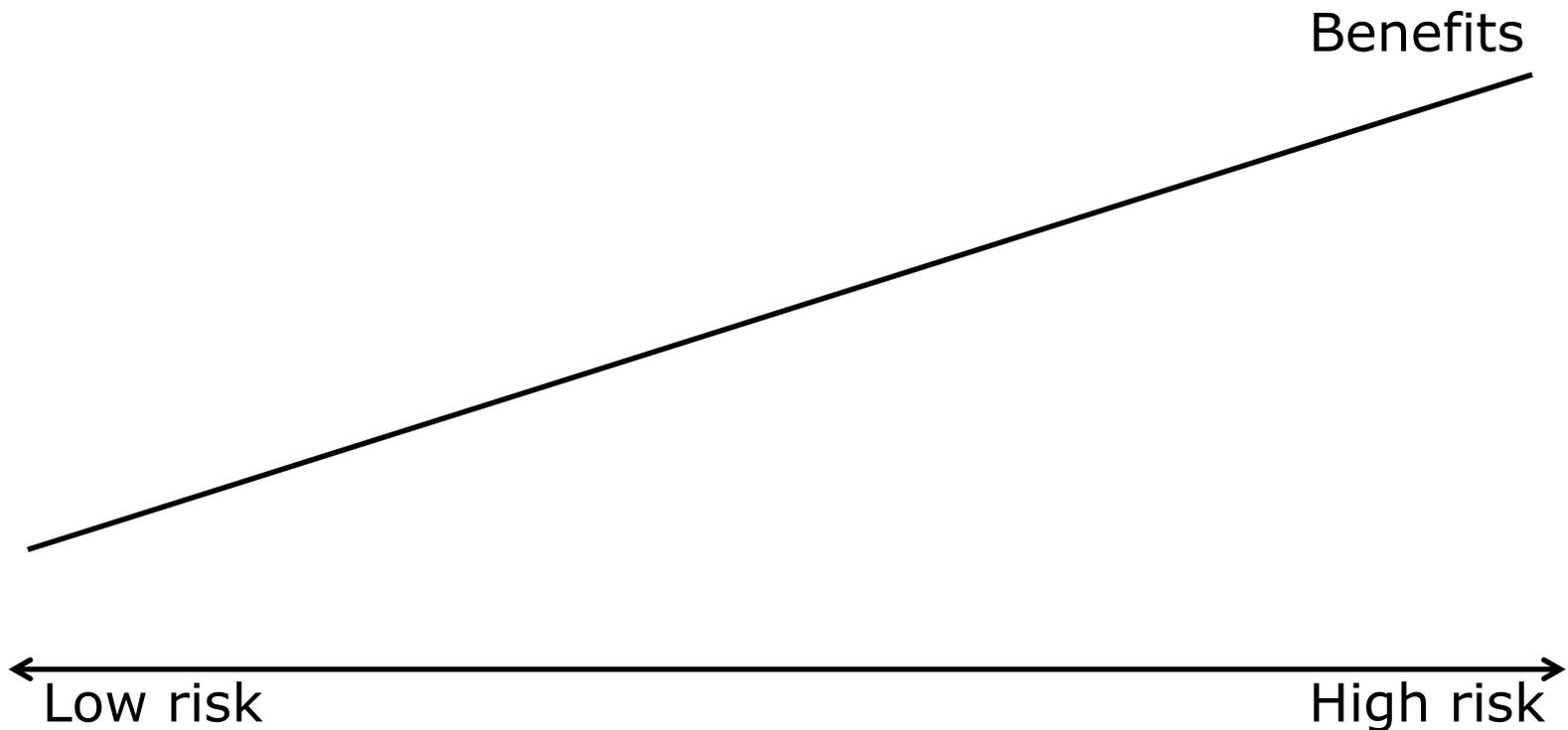
# AAA screening: 44% overdiagnostik

Overdiagnosis calculated from a randomised controlled trial with 13-year follow-up<sup>3</sup>



M. Johansson, A. Hansson, and J. Brodersen. Estimating overdiagnosis in screening for abdominal aortic aneurysm: could a change in smoking habits and lowered aortic diameter tip the balance of screening towards harm? *BMJ* 350:h825, 2015.

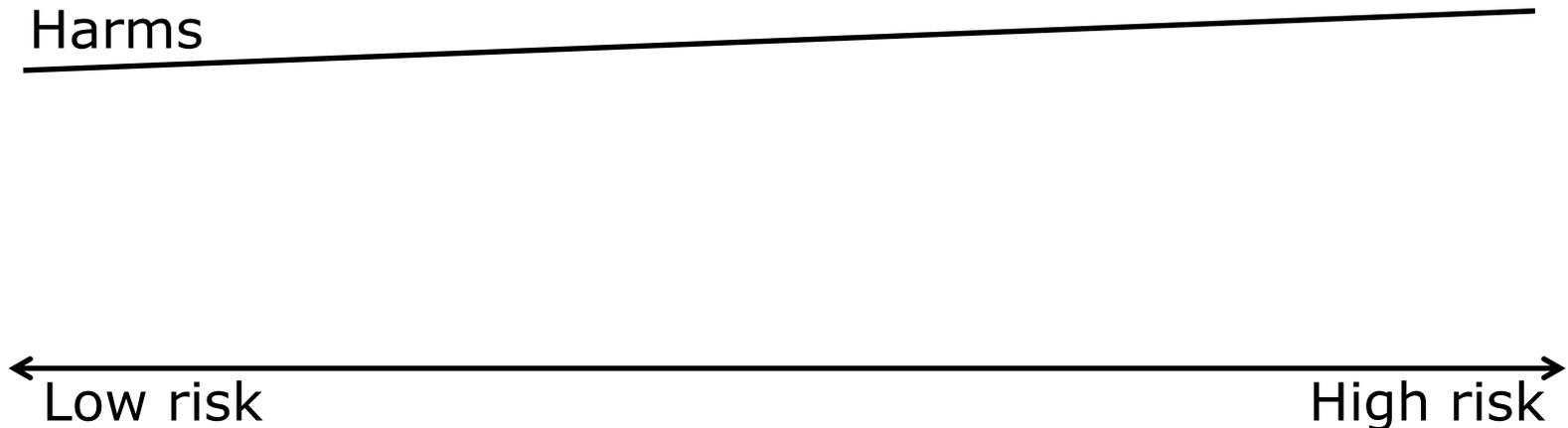
# AI medicinsk intervention: Balance mellem gavn & skade



Glasziou & Irwig (1995). "An evidence based approach to individualising treatment." *BMJ* **311**(7016): 1356-1359.



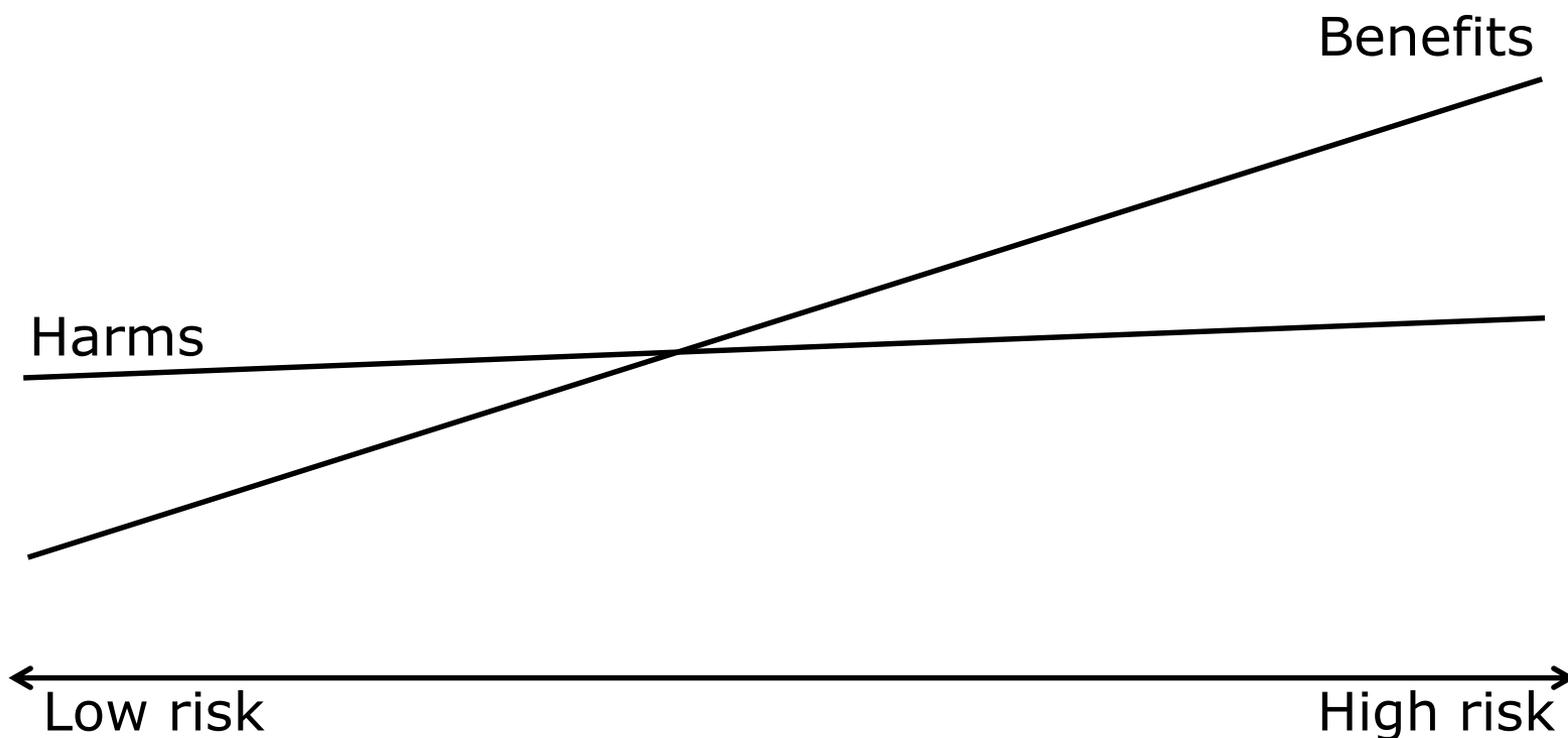
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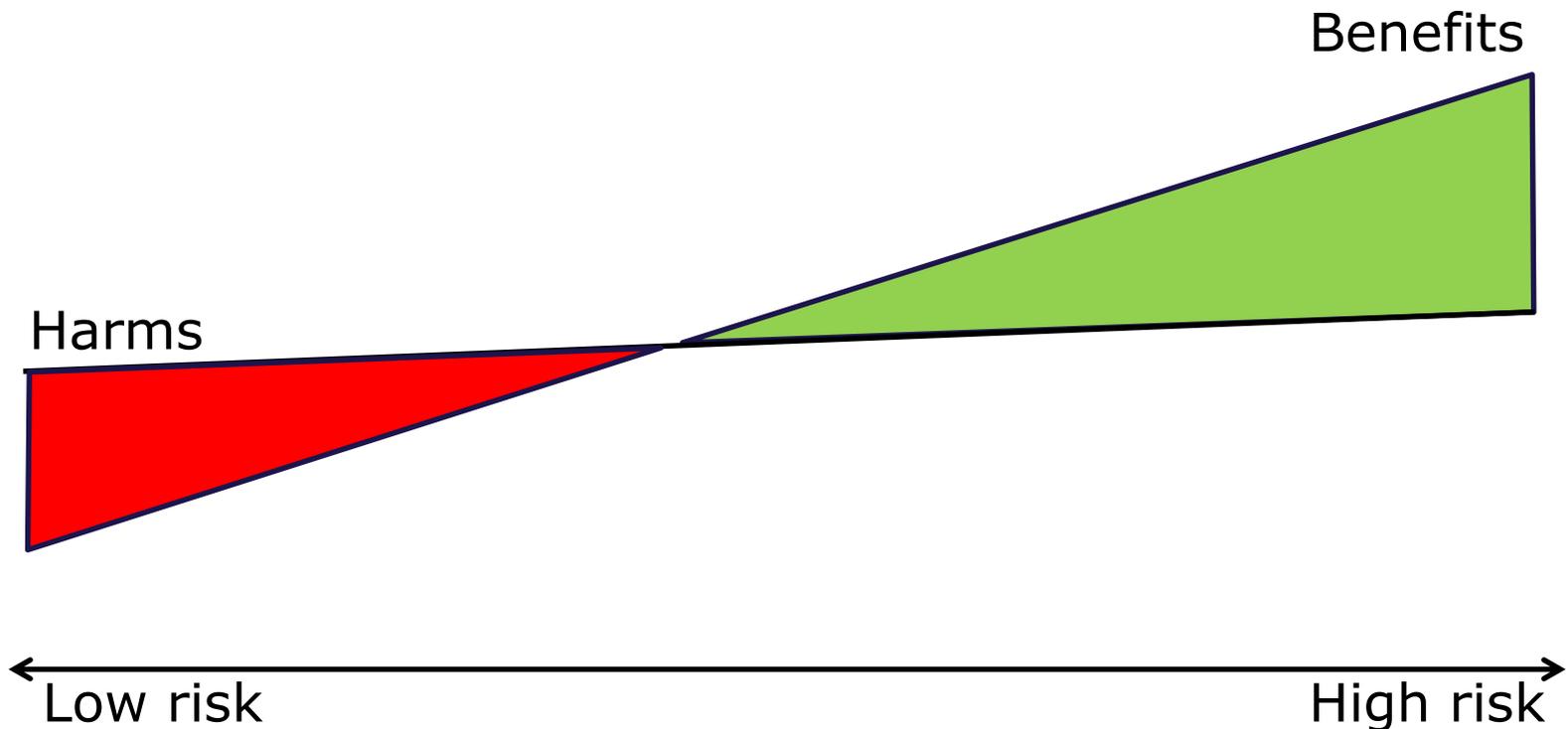
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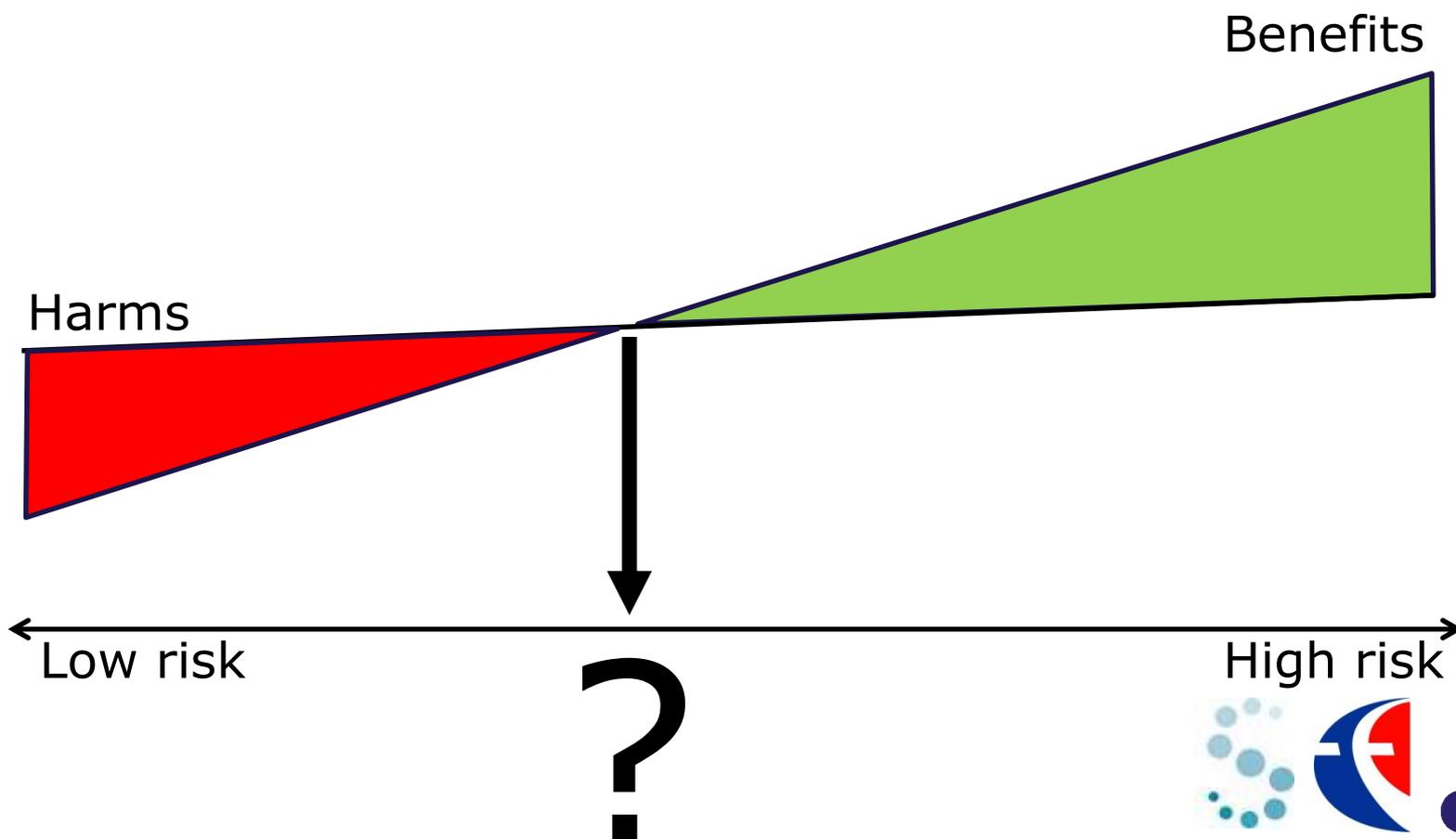


# AAA screening: 44% overdiagnostik

<http://www.bmj.com/content/350/bmj.h825/infographic>



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# Overfølsomhed

- En kolonisering af livets milde symptomer og lidelse – illusionen om nul risiko:
  - Bange – angst
  - Trist – depression
  - Mistrivsel i skolen – ADHD
  - Søvnproblemer – insomni
  - Generthed – social fobi
  - Vanlig sorg – svær sorg



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# Disease mongering

- Uro i benene (restless leg syndrom)
- Vejvrede (road rage disorder)
- For korte øjenvipper
- Skaldethed



# Disease mongering – Low T



**Low T Center**

It is time to get back in the game.  
Take control of your quality of life. You can recapture your youth and vitality!

**Symptoms of Low T**

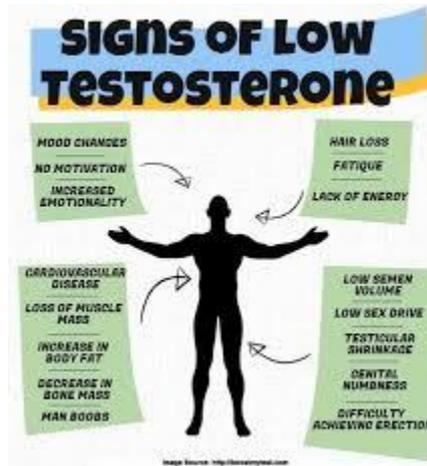
- ✓ Tired
- ✓ Decreased motivation
- ✓ Decreased energy levels
- ✓ Increased body fat
- ✓ Decreased libido

**Causes of Low T**

- ✓ Natural process of aging
- ✓ Chronic stress
- ✓ Use of certain medications
- ✓ Poor diet
- ✓ Other low testosterone conditions

**Cost of Treatment**

Most insurance accepted. \$1500 treatment costs \$300 per month (without insurance). \$1000 cash price (with insurance).



**BOOST YOUR TESTOSTERONE**

**BE A MAN!**

**ENHANCE!**

**GET JACKED UP!**

**SEXUAL ENERGY**

It's not you. It could be Low T.



### SYMPTOMS OF LOW TESTOSTERONE

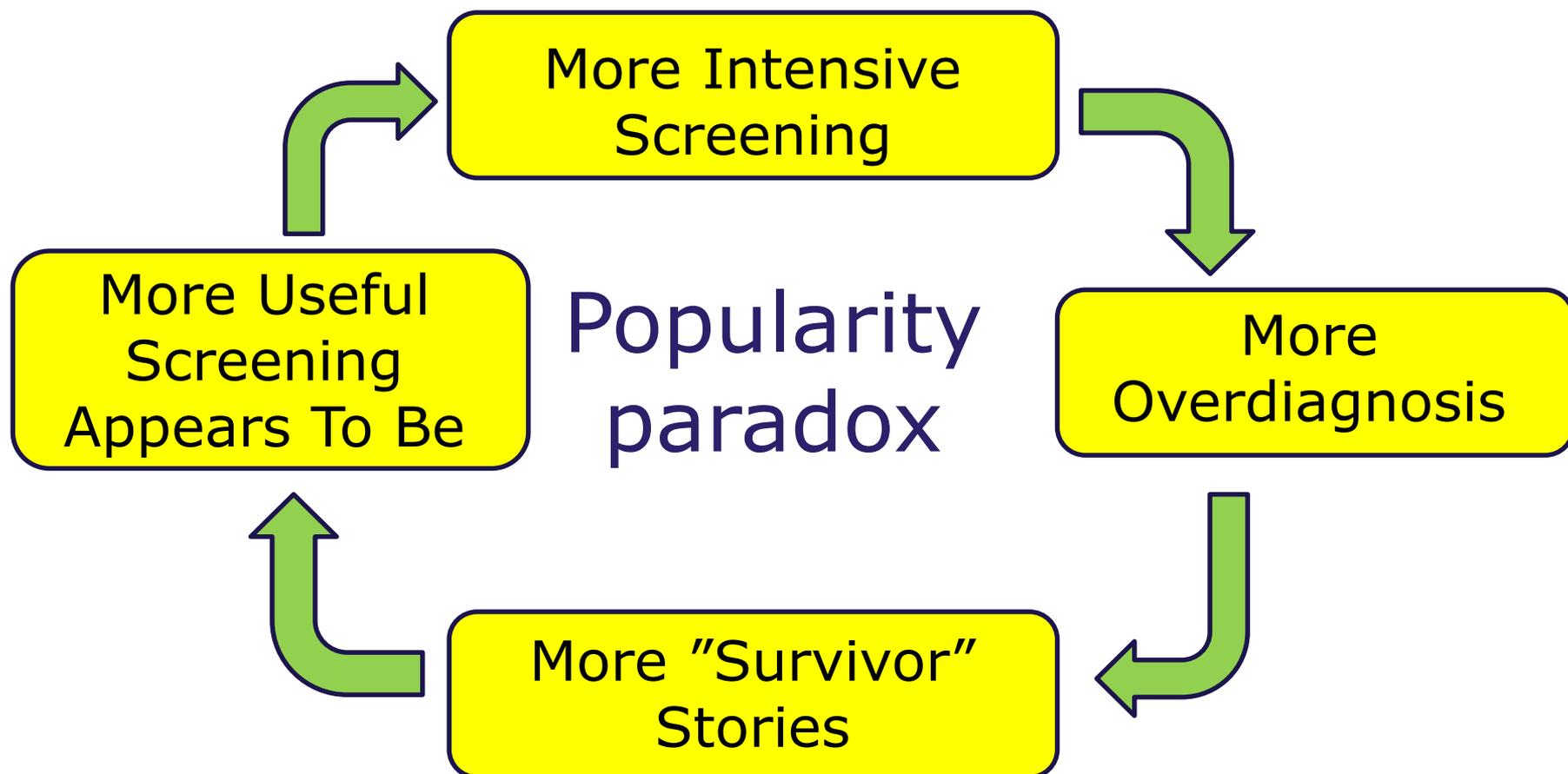
**Muscle Changes**

Low Testosterone can lead to a change in your Physique. Testosterone helps build & keep muscle mass & strength.

A decrease in testosterone can lead to decrease in muscle mass or watching what used to be muscle turn into fat.



# Survivors stories drive screening towards more overdiagnosis





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# See you in Copenhagen 2018!

The 2018 international Preventing Overdiagnosis conference will be held in Copenhagen, Denmark from August 20 to 22, 2018.  
Venue is the Panum Building in Copenhagen.

**Save the dates!**

[www.preventingoverdiagnosis.net](http://www.preventingoverdiagnosis.net)

The picture shows one of the beautiful canals in Copenhagen.



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Tak for opmærksomheden!

**See you in  
Copenhagen 2018!**

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