

# Prevalence, progression, survival and repair of AAA: results from three randomised controlled screening trials over three decades



**Jes S. Lindholt**

Professor and leading consultant of Vascular Surgery  
Department of Cardiothoracic and Vascular Surgery  
Odense University Hospital, Odense, Denmark

# Disclosures

## The 1990s



### Viborg study

RCT

N=12 658, 1:1

### Solitary AAA screening

No prevention

2% reduced overall mortality

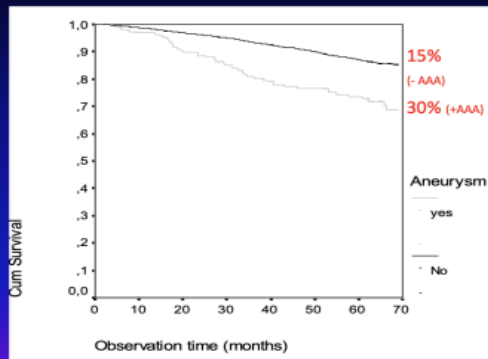
## The 2000s



### VIVA

RCT

### Need for general cardiovascular prevention Survival after having an AAA diagnosed by screening



Lindholt. Relatively high pulmonary and cardiovascular mortality rates in screening-detected aneurysmal patients without previous hospital admissions. Eur J Vasc Endovasc Surg. 2007;33:94-9

## The 2010s



### DANCAVAS

RCT

N=47 322, 1:2

Multiple CVD screening:  
Coronary artery calcification,  
aortic aneurysms and PAD

Statin, low dose aspirin, smoking cessation, + exercise

The jury is currently out for 5 year results

# The 1990s

# The 2000s

# The 2010s

Liisberg et al. BMC Medical Imaging (2017) 17:14  
DOI:10.1186/s12890-017-0186-8  
**N=544 paired obs.**  
**RESEARCH ARTICLE**  
 Abdominal ultrasound-scanning versus non-contrast computed tomography as screening method for abdominal aortic aneurysm – a validation study from the randomized DANCAVAS study  
Mads Liisberg<sup>1,2\*</sup>, Axel C. Diederichsen<sup>3,4</sup> and Jes S. Lindholt<sup>1,2,4</sup>

**Viborg study**  
 RCT  
 N=12 658, 1:1  
Solitary AAA screening  
  
 No prevention  
  
 AAA: 3.8%  
 46% current smokers

**Impact of Abdominal Aortic Aneurysm repair in European and non-European countries**  
  
 Matthew Joe Grima, VASCUNET, ESVS meeting 2018, Valencia  
 St George's Vascular Institute, London

**VIVA**  
 RCT  
 N=50 156, 1:1  
Triple vascular screening:  
 AAA, PAD & hypertension  
  
 Statin, low dose aspirin, smoking cessation, + exercise  
  
 AAA: 3.3%  
 21.1% smokers

Country	Intact AAA repair rate / 100,000
Sweden	37.5
England	33.5
Denmark	43.2

**DANCAVAS**  
 RCT  
 N=47 322, 1:2  
Multiple CVD screening:  
Coronary artery calcification, aortic aneurysms and PAD  
  
 Statin, low dose aspirin, smoking cessation, + exercise  
  
 AAA: 4.2%  
 15.2% smokers

**Screening**  
**Screening**  
**No screening**

## The 1990s



**Viborg study**  
RCT

N=12 658, 1:1

Solitary AAA screening

No prevention

AAA: 3.8%

- 62.4% were smokers  
2.90 +/- 2.57 mm per år

## The 2000s



**VIVA**  
RCT

N=50 156, 1:1

Triple vascular screening:  
AAA, PAD & hypertension

Statin, low dose aspirin, smoking  
cessation, + exercise

AAA: 3.3%

- 41.5% were smokers  
2.98 +/- 2.57 mm/year

## The 2010s



**DANCAVAS**  
RCT

N=47 322, 1:2

Multiple CVD screening:  
Coronary artery calcification,  
aortic aneurysms and PAD

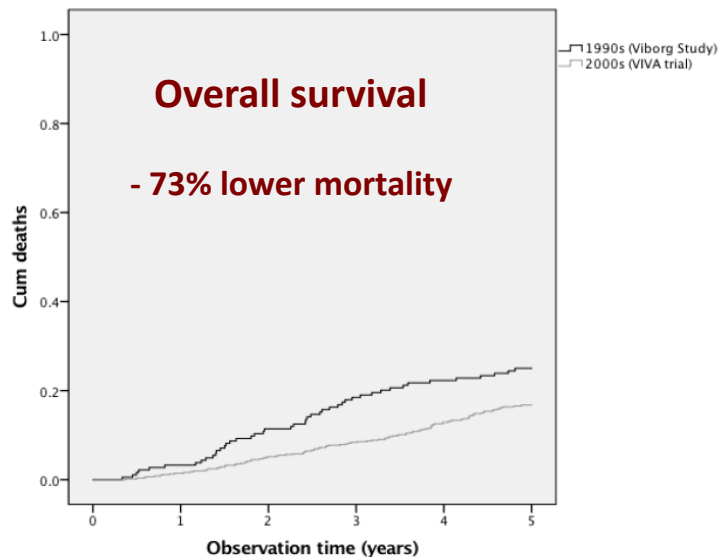
Statin, low dose aspirin, smoking  
cessation, + exercise

AAA: 4.2%

AAA: 34.1% smokers

# Overall survival: Viborg vs VIVA

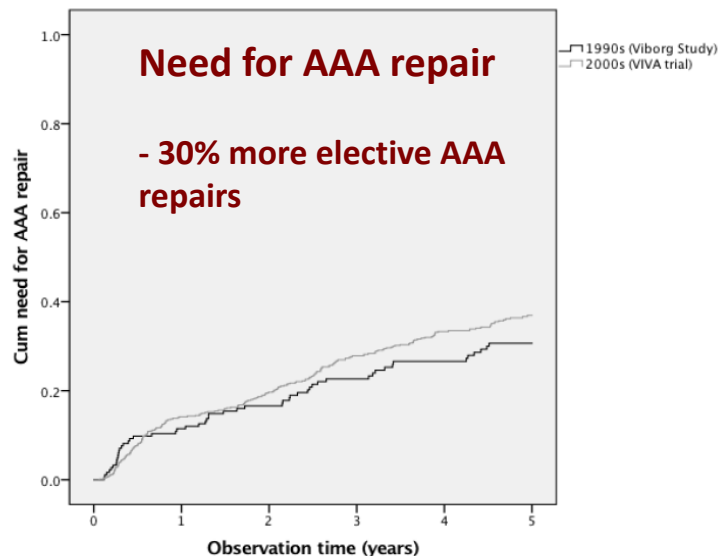
– the benefit of cardiovascular prevention and influence on need for AAA repair



N in risk						
1990s	184	178	163	150	143	138
2000s	618	609	589	569	541	373

Five-year overall mortality curves for positive findings with AAA in the 1990s versus the 2000s.

(Age-adjusted HR= 0.277 (0.215; 0.356, p<0.001))



N in risk						
1990s	184	158	139	121	109	98
2000s	618	523	471	406	354	223

Five-year cumulative aneurysmal repair for men with screen-detected abdominal aortic aneurysm in the 1990s versus the 2000s.

(Age adj. HR = 1.29, 95% C.I.: 0.95; 1.71, p=0.10)

# Conclusions – the odd and the good

- The prevalence of AAA in DK is strange
- The influence of smoking in AAA is unsolved
- BUT general cardiovascular prevention is strong medicine for these patients..
  - likely to double the survival benefit of screening
  - but without any impact on progression
  - increasing the need for repair