



NATIONAL INSTITUTE FOR HEALTH AND WELFARE

Cost-Effectiveness of Abdominal Aortic Aneurysm Screening in Finland

Mäklin Suvi, Laukontaus Sani, Salenius Juha-Pekka, Ronsi Pekka, Roth Wolf-Dieter, Laitinen Riikka, Isojärvi Jaana, Leipälä Jaana, Mäkelä Marjukka



Potential conflicts of interest

Affiliations:

FINOHTA (Finnish Office for HTA)
Universities of CPH & Helsinki

Other:

Editor-in-Chief for IJTAHC
(Honorarium to FINOHTA)

EUnetHTA partner (Funding for WP4)

Board member, HTAi and INAHTA
(Travel & accommodation for meetings)

Lectures and consultancies for scientific organisations and universities
(Travel and fees)

Author of HTA books & articles
(Royalties)



Background (1)

- Abdominal aortic aneurysm (AAA) is defined at aortic diameter $> 3\text{cm}$
- Elective surgery is indicated when the risk for aneurysm rupture is clearly higher than operative mortality
 - AAA $> 5,5\text{cm}$; growth rate 1cm/year or more; symptoms caused by AAA
- AAA is often asymptomatic unless and until it ruptures. A ruptured AAA (RAAA) is always a surgical emergency.
 - Risk factors for RAAA include age, smoking, male gender and family history of AAA, atherosclerosis
- Ultrasound can reliably visualise the aorta in 99% of people, thus providing the possibility of detection of an AAA at a size when rupture is unlikely to occur.



Background (2)

- According to RCTs, AAA screening
 - Increases number of elective surgeries
 - Reduces deaths and emergency surgeries due to RAAA
 - Reduces the overall AAA mortality
- The published literature on cost-effectiveness of AAA screening is controversial, eg.
 - Thompson et al. 2009: £7 600 / LYG
 - Lindholt et al. 2010: €157 / LYG; €179 / QALY
 - Ehlers et al. 2009: €54 852 / QALY
- The Screening Committee at the Ministry of Social Affairs and Health requested for an evaluation of AAA from Finohta



Aim of the study

- to evaluate the cost-effectiveness of abdominal aortic aneurysm (AAA) screening
 - 65-year old men and women in Finland
 - One time screening using ultrasound
 - Compared to current practice = no systematic screening
 - Effectiveness was measured in life-years gained (LYG)

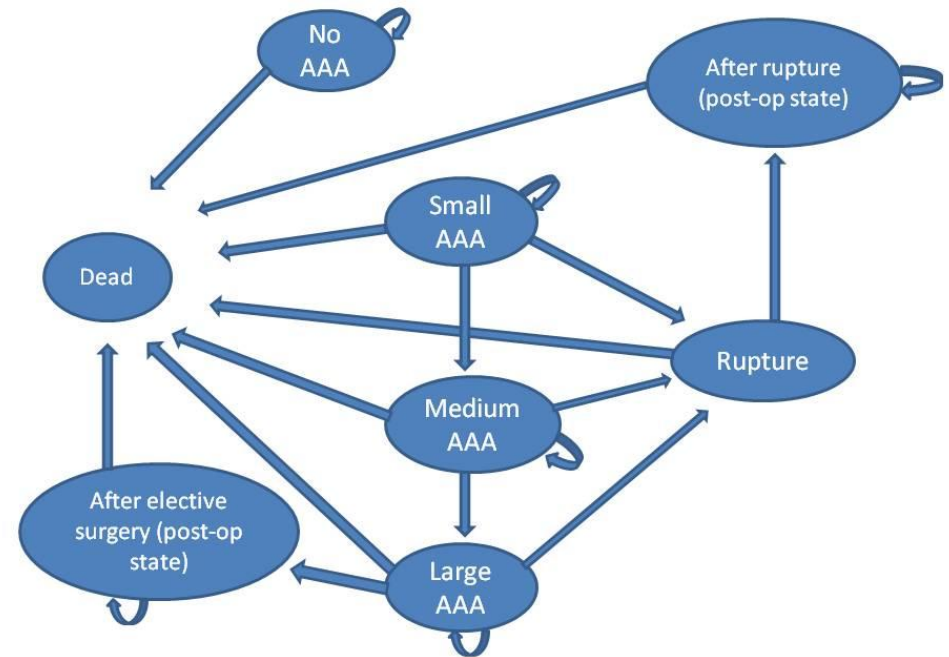
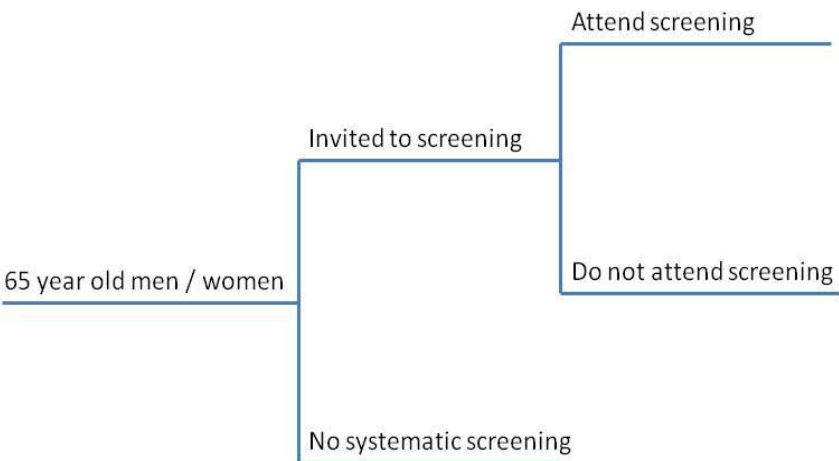


Methods

- The analysis was done using a health care providers' perspective and expected life time as a time horizon
- Both future costs and effects were discounted by 3%
- The analysis was based on a modification of a model constructed in Denmark by Ehlers et al (2009)
 - Combination of a decision tree and a Markov model
 - We added a branch for endovascular surgery (Ehlers et al evaluated only open surgery for elective treatment)
 - We also modified the structure of the tree for RAAA in order to take better into account the



Methods – Structure of the model



Methods

- Input parameter values:
 - Mostly taken from literature (published RCTs)
 - National registry data for AAA-mortality and number of performed operations
 - Actual costs of patients at the Helsinki and Uusimaa Hospital District
 - Expert opinion
- The uncertainty in the model was examined in various one-way sensitivity analyses, and in a probabilistic sensitivity analysis



Results - Base case analysis

		<u>Costs</u> (€)	<u>Additional costs</u> (€)	<u>Life-years</u>	<u>Additional life-years gained</u> (LYG)	<u>Incremental cost-effectiveness ratio (ICER)</u>
Men	No screening	352		11,524		
	Screening	522	170	11,551	0,027	6 237 € / LYG
Women	No screening	103		15,677		
	Screening	140	37	15,688	0,011	3 329 € / LYG



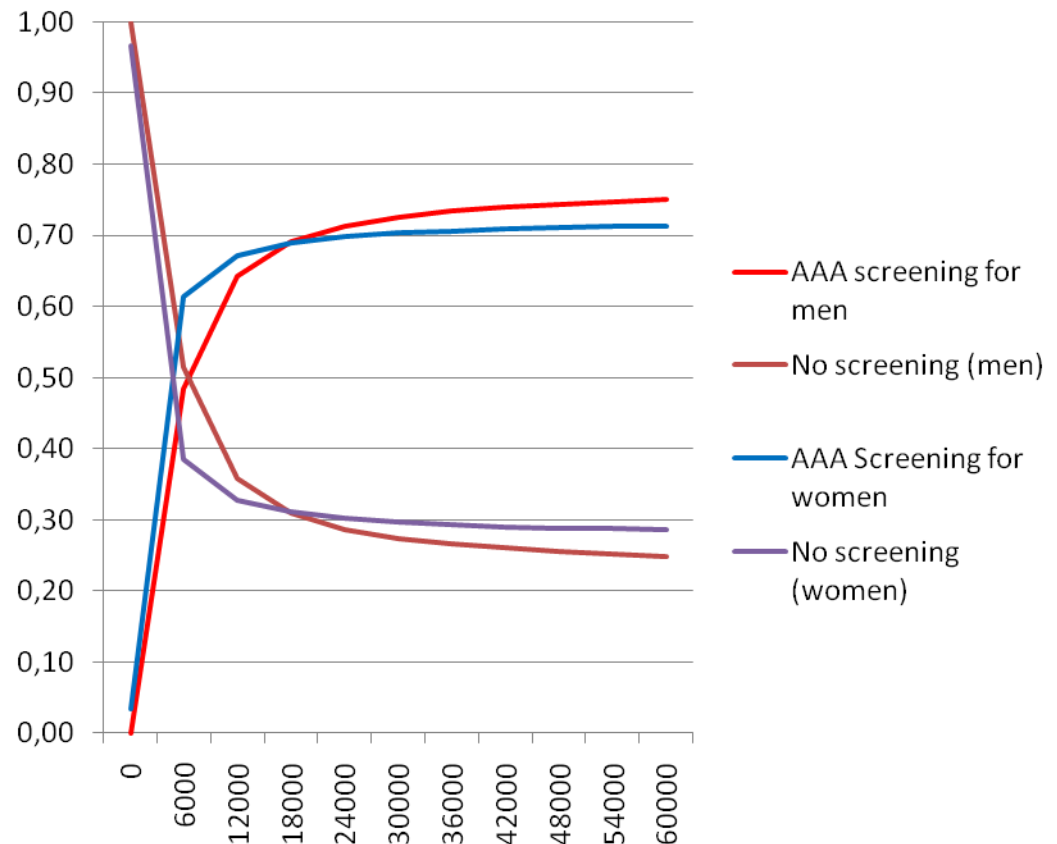
Results – One-way sensitivity analysis

- According to one way sensitivity analyses, the results were most sensitive to
 - Risk of rupture of a large AAA
 - The higher the risk of rupture, the smaller the ICER of screening
 - Price of surgery (both emergency and elective)
 - Low cost of elective surgery in favor of screening
 - Low cost of emergency surgery in favor of no-screening
 - Discount rate
 - Due to long time horizon
- Surprisingly, the prevalence of AAA had a minor effect on ICER



Results - CEAC

- The probability that AAA screening is cost-effective at 50 000€ / LYG
 - 75 % for men
 - 73 % for women
- According to our analysis, some **uncertainty exists** even with higher threshold values
 - The CEAC does not reach 100% within conventional threshold values



Conclusions (1)

- AAA screening seems to have an attractive cost-effectiveness ratio in Finland
 - For both, men and women
 - More data on AAA on women is needed
- According to our model, screening resulted in an increase of elective procedures and reduction of RAAA deaths
 - similar finding to RCTs of screening
- The model did not include
 - Initial investments on screening
 - Sensitivity (98%) and specificity (99%) of ultrasound screening
 - Possible costs for patients, care-givers or other costs to society than those of health care



Conclusions (2)

- AAA screening is of interest in many European countries, and it has been selected for a topic at the EUnetHTA collaboration
 - European collaborative work, results expected at the end of 2012



Thank you for your attention!

Any further comments, questions? Please contact:

Suvi Mäklin

suvi.maklin@thl.fi

+358 20 610 7058

Jaana Leipälä

jaana.leipala@thl.fi

+358 20 610 7284

