



# 3RD INTERNATIONAL Cancer Control Congress

INTERNATIONAL COLLABORATIONS

8-11 NOVEMBER, 2009 / CERNOBBIO, COMO, ITALY

## **The Good and the Bad: Lessons From Screening Programs in Developed countries, and What Other Countries Can Learn From the Experience**

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# Questions

- Demonstration of efficacy and effectiveness (reduction of mortality, change of the natural history, impact on the population) versus test sensitivity only
- Early diagnosis versus public-health organised screening, and equity of access
- Screening as care process, not just a test. Implications for the health service.
- Information , communication and screening harms

# Evidence-based screening

- The most traditional screening, pap test for cervical cancer, never had evidence-based demonstration of efficacy, only observational
- Mammography screening had 8 RCTs performed in 70'-80', background of service screening implementation
- Colorectal cancer started to be widespread before the results of RCTs, which after several years showed the impact on mortality of FOBT, after 15 years since the introduction of the test.

# Evidence of Efficacy : history, controversies

Wald NJ, Chamberlain J,  
Hackshaw A.

European Society of Mastology.  
Consensus Conference on Breast  
Cancer Screening.

Paris, 4-5 February, 1993. Report  
of the Evaluation Committee. *Bull  
Cancer*. 1994 Oct;81(10):825-34.

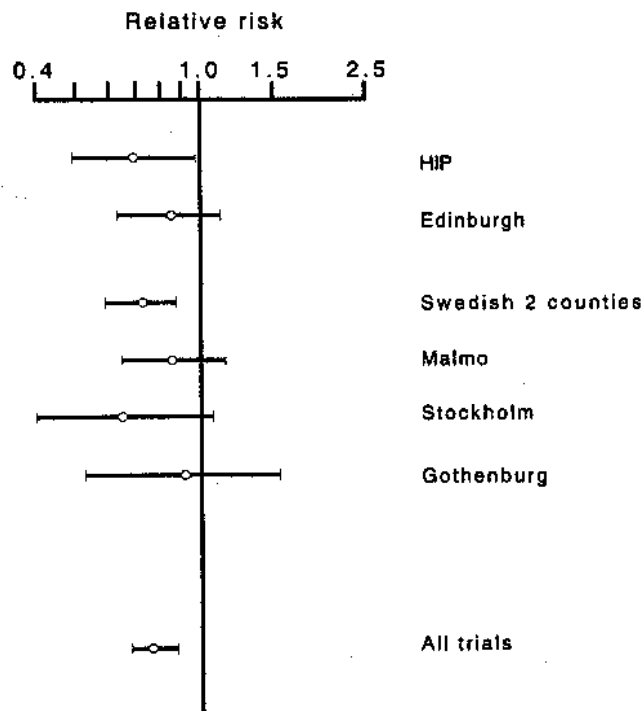


Fig. 2—The relative risk of breast cancer mortality in women aged 50-74 years invited for screening compared with those not invited is shown for each trial together with the 95% CI. The combined estimate is also shown for all trials.

**The Paris Consensus concluded the RCTs experience , while service screening was starting in Europe (Forest report UK , 1988)**

# Evidence of Efficacy : history, controversies

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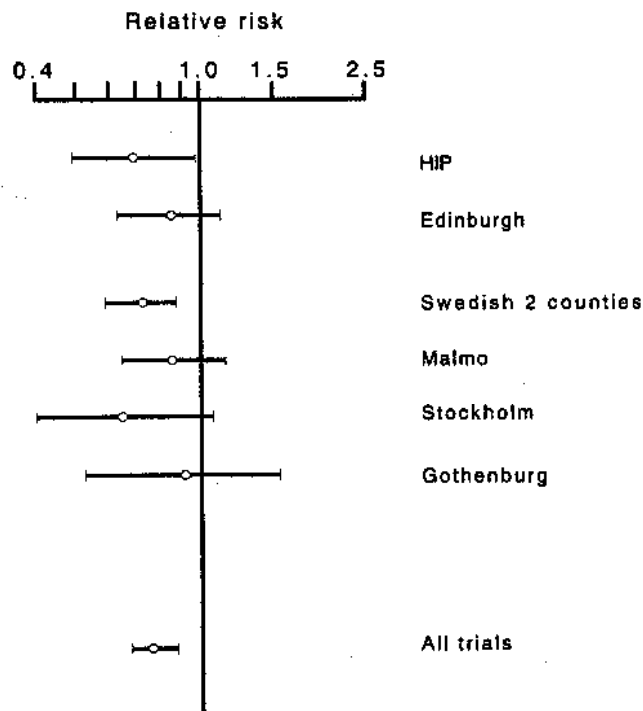


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**The Paris Consensus defined the  
age range of efficacy, discouraging  
screening in younger women. A  
choice with many controversies.**

**Table 2.** North American Recommendations for Routine Mammographic Screening in Women at Average Risk Who Are 40 Years of Age or Older.\*

Group (Date)	Frequency of Screening  <i>yr</i>	Initiation of Screening		
		40–49 Yr of Age	50–69 Yr of Age	≥70 Yr of Age
<b>Government-sponsored and private groups</b>				
U.S. Preventive Services Task Force (2002) †	1–2	Yes	Yes	Yes ‡
Canadian Task Force on Preventive Health Care (1998, 1999, 2001)	1–2	No	Yes	No
National Institutes of Health consensus conference (1997)		No ‡	—	—
American Cancer Society (1997)	1	Yes	Yes	Yes
National Cancer Institute (2002)	1–2	Yes	Yes	Yes
<b>Medical societies</b>				
American College of Obstetricians and Gynecologists (2000)	1–2 if 40–49 yr old 1 yr if ≥50 yr old	Yes	Yes	Yes
American Medical Association (1999)	1	Yes	Yes	Yes
American College of Radiology (1998)	1	Yes	Yes	Yes
American College of Preventive Medicine (1996)	1–2	No ¶	Yes	Yes
American Academy of Family Physicians (2001)	1–2	No ‡ ¶	Yes	No
American Geriatrics Society (1999)	1–2	—	—	Yes ‡
<b>Advocacy groups</b>				
National Breast Cancer Coalition (2000)		No	— ‡	No
National Alliance of Breast Cancer Organizations (2002)	1	Yes	Yes	Yes
Susan B. Komen Foundation (2002)	1	Yes	Yes	Yes

\* Adapted from the U.S. Preventive Services Task Force.<sup>3</sup> A “no” recommendation may be a statement that there is insufficient evidence for a positive recommendation.

† Recommendations are for mammography with or without clinical breast examination.

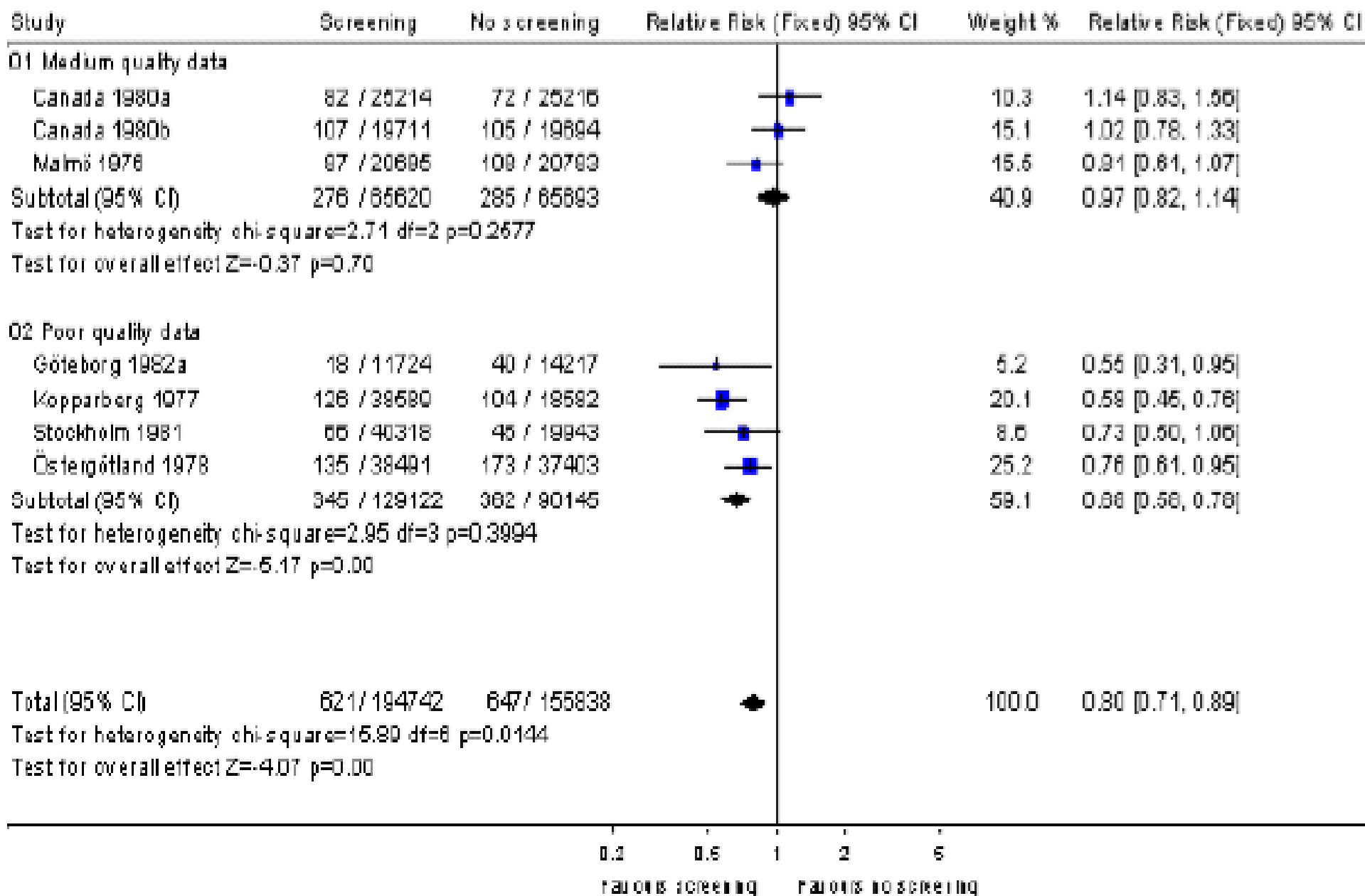
‡ There is an explicit recommendation to screen women older than 70 years of age.

§ Recommendations note that women should be counseled about the risks and benefits of mammography.

¶ Recommendations note that women at high risk should be screened beginning at 40 years of age.

Review: Screening for breast cancer with mammography  
 Comparison: 01 Screening with mammography versus no screening  
 Outcome: 09 Deaths ascribed to breast cancer, 13 years follow-up

**GOTZSCHE&OLSEN 2001**  
**Cochrane systematic review**





**European guidelines for quality assurance  
in mammography screening** *Third Edition*



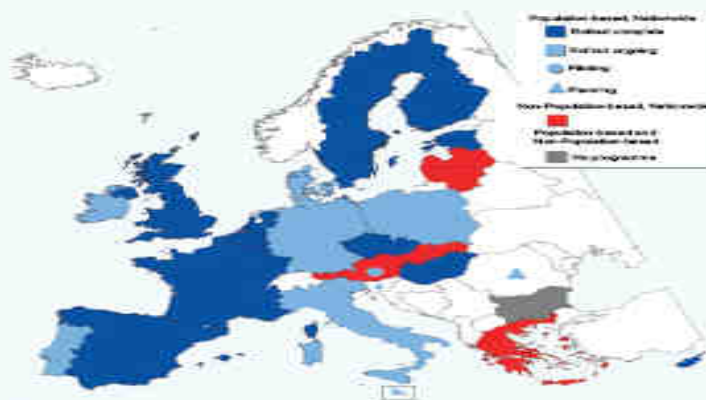
European Commission

**But service  
Screening  
progressed in EU.**

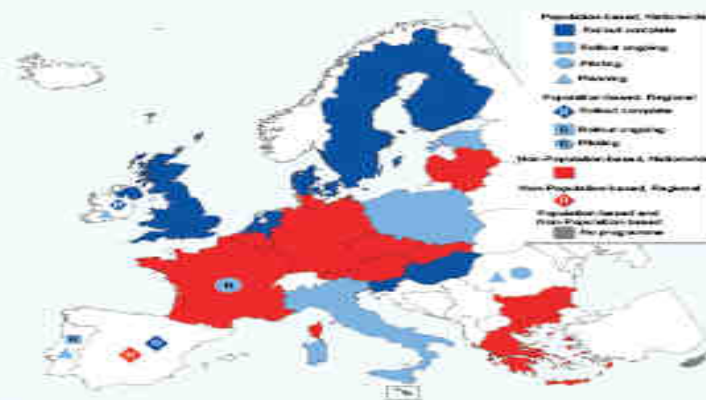
**European  
guideline were the  
result of strict  
cooperation  
Between  
countries.**



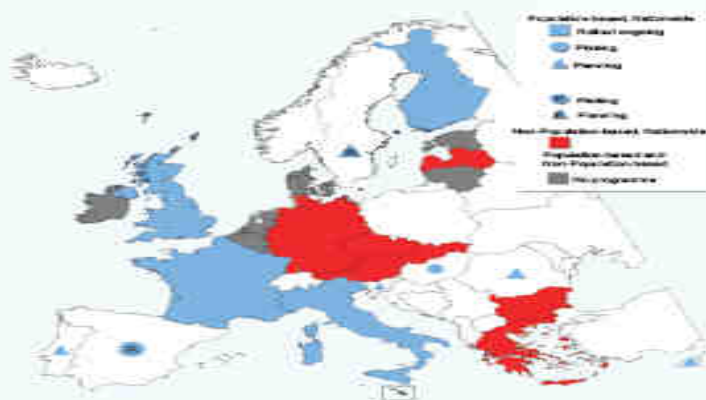
### Breast Cancer Screening Programmes in the EU in 2007



### Cervical Cancer Screening Programmes in the EU in 2007



### Colorectal Cancer Screening Programmes in the EU in 2007



L 327/34 Official Journal of the European Union 16.12.2003

#### COUNCIL RECOMMENDATION of 2 December 2003 on cancer screening (2003/878/EC)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 152(4), second subparagraph, thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Parliament,

Whereas:

- (1) Article 152 of the Treaty provides that Community action is to complement national policies and be directed towards improving public health, preventing human illness and diseases, and obviating sources of danger to human health. Such action shall cover the fight against the major health scourges, by promoting

**Cancer screening in the European Union**  
Report on the implementation of the Council Recommendation on cancer screening

*First Report*

## 2.3 Definitions

The Council of the European Union recommends implementation of cancer screening programmes with an organised, population-based approach, with quality assurance at all appropriate levels. The Council Recommendation describes those elements which are considered essential to fulfil this global standard, but it does not provide definitions of terminology which could be used to compare differences between Member States in the degree to which screening programmes are implemented.

### 2.3.1.1 "Programme" vs. "non-programme" screening

### 2.3.1.2 Organised screening

### 2.3.1.3 Population-based screening

# EU screening document

## 2.3.1.3 Population-based screening

Population-based screening means that in each round of screening the persons in the eligible target population in the area served by a programme are individually identified and personally invited to attend screening. Population-based screening programmes generally require a high degree of organisation in order to assure that the invitational activities are performed reliably and effectively and are adequately coordinated with the subsequent steps in the screening process.<sup>12</sup>

# Screening as process

- Population
- Information , awareness
- Invitation
- Test
- Assessment
- Treatment
- Follow up
- -----
- Periodic repetition

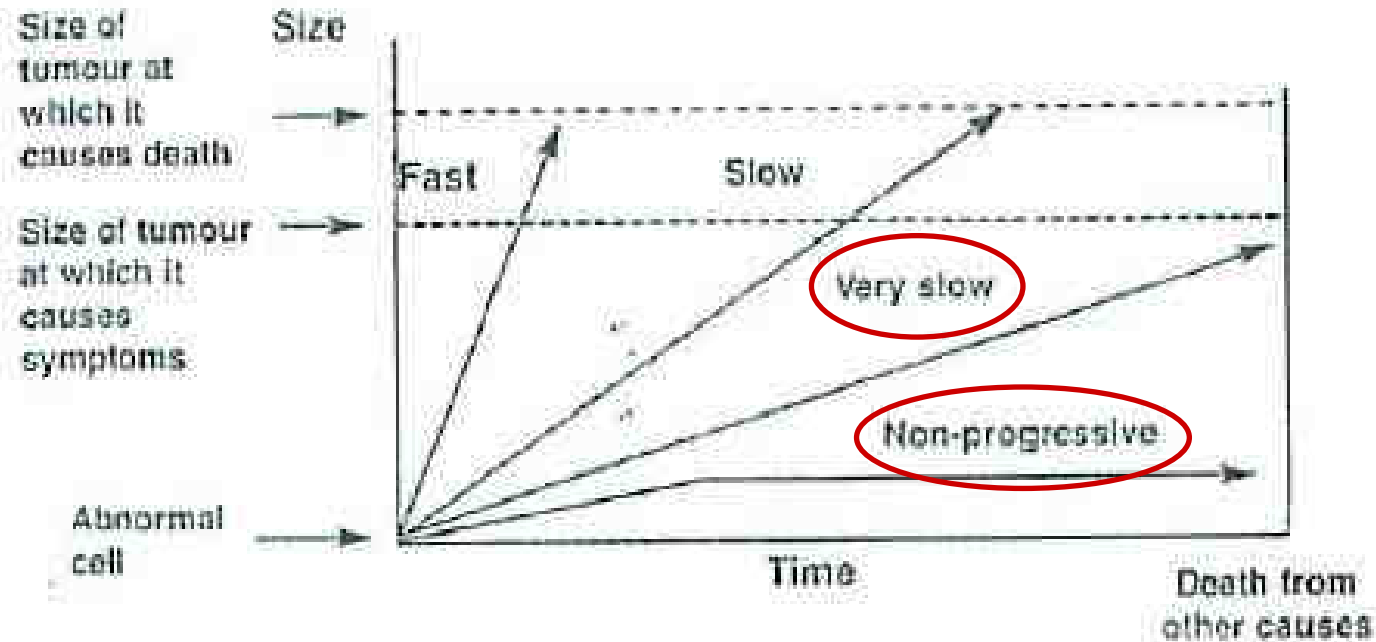
# The harms of screening

- False positive rates, separately for invasive and non invasive assessment.
- Psychological implication of screening, cultural aspects
- Overdiagnosis, as opposed to the excess of incidence which is inherent in screening process (breast, colorectal and prostate), and futile treatment

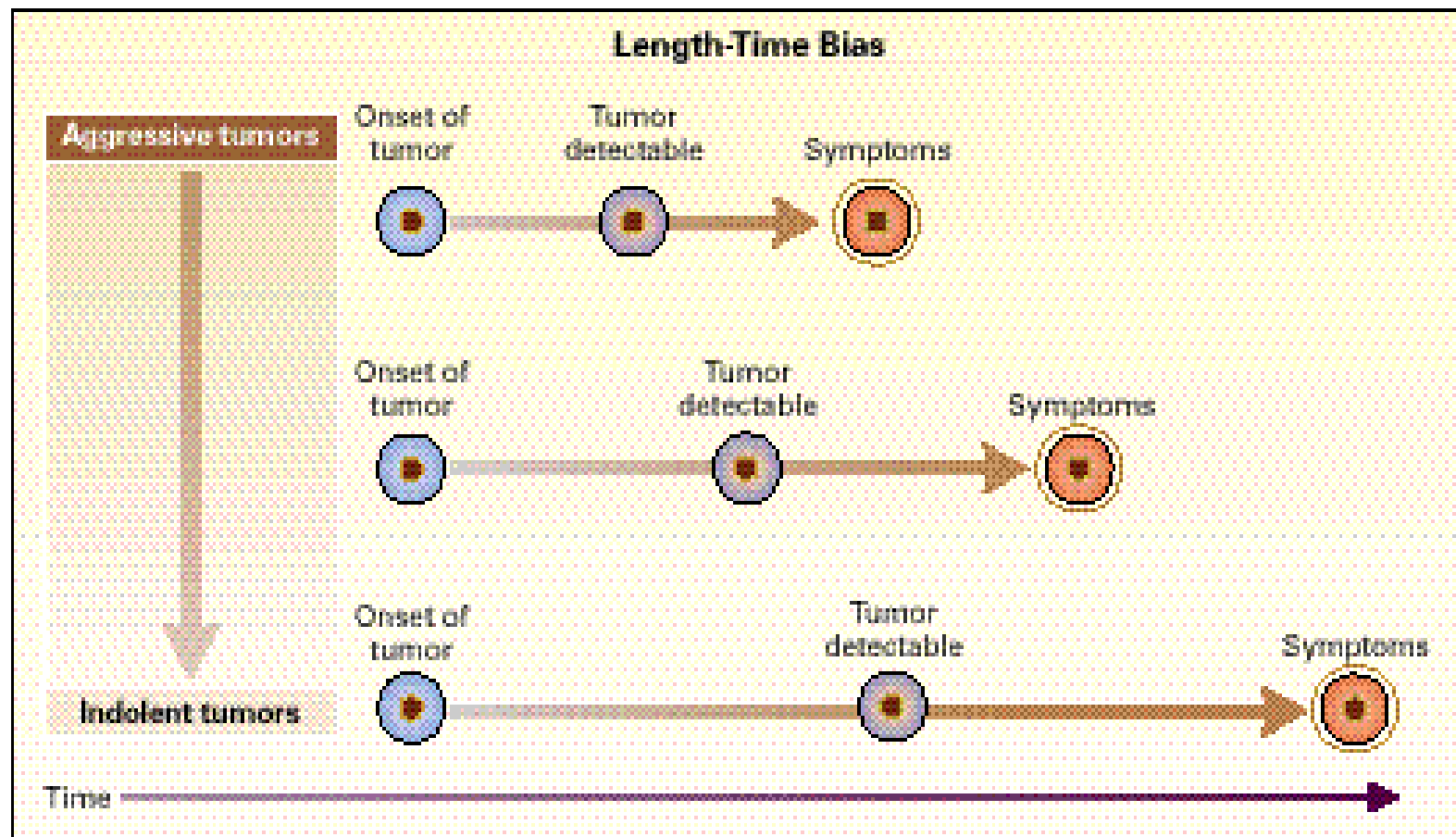
# Definition

- **Overdiagnosis is usually defined as the proportion of confirmed cancer cases diagnosed during a screening program that would not have come to clinical attention if screening had not taken place.**

## Growth rates of cancers (IARC, 2002)



The diagnosis of these cancers (very slow and non-progressive), that Morrison (1992) have called "pseudodisease", is overdiagnosis.



**Figure 2. Length-Time Bias.**

The probability of detecting disease is related to the growth rate of the tumor. Aggressive, rapidly growing tumors have a short potential screening period (the interval between possible detection and the occurrence of symptoms). Thus, unless the screening test is repeated frequently, patients with aggressive tumors are more likely to present with symptoms. More slowly growing tumors have a longer potential screening period and are more likely to be detected when they are asymptomatic. As a result, a higher proportion of indolent tumors is found in the screened group, causing an apparent improvement in survival.



# Spontaneous versus population based Impact on incidence (and more)

- Prostate cancer screening was changing prostate cancer incidence in the absence of an assessment of efficacy. RCTs have presented controversial results
- There is different performance of spontaneous versus population-based breast screening, documented in several papers comparing the performance in US with the service screening measures of recall rates, biopsy rates and interval cancer rates.
- There is a deep difference in the epidemiology of breast cancer because of different policies (and risk pattern)

# EPIDEMIOLOGIA & PREVENZIONE

Rivista dell'Associazione Italiana di epidemiologia ANNO 33 (1) GENNAIO-APRILE 2009 SUPPLEMENTO 2

AIRTUM Working Group

DOCUMENTO ANNUALE 2009

I nuovi dati di incidenza e mortalità

PERIODO 2003-2005

New incidence and mortality data

2003-2005

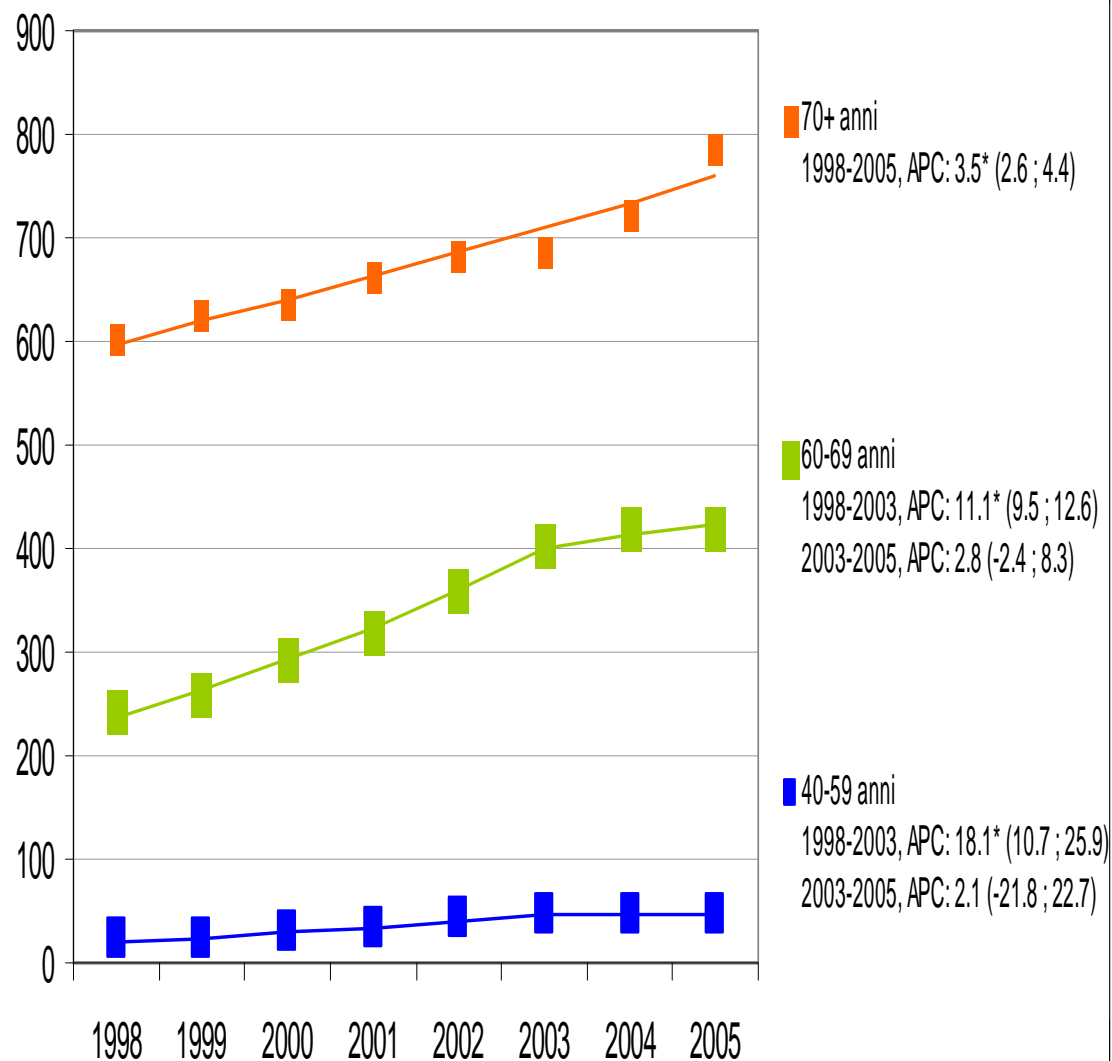
AGGIORNAMENTO  
APPROFONDIMENTO



Associazione Italiana registri tumori

inferenze

## POOL AIRTUM 1998-2005, Tumore della prostata. Tassi di incidenza standardizzati sulla popolazione europea



ORIGINAL ARTICLE

## Screening and Prostate-Cancer Mortality in a Randomized European Study

Fritz H. Schröder, M.D., Jonas Hugosson, M.D., Monique J. Roobol, Ph.D.,  
Teuvo L.J. Tammela, M.D., Stefano Ciatto, M.D., Vera Nelen, M.D.,  
Maciej Kwiatkowski, M.D., Marcos Lujan, M.D., Hans Lilja, M.D.,  
Marco Zappa, Ph.D., Louis J. Denis, M.D., Franz Recker, M.D.,  
Antonio Berenguer, M.D., Liisa Määtänen, Ph.D., Chris H. Bangma, M.D.,  
Gunnar Aus, M.D., Arnaud Villers, M.D., Xavier Rebillard, M.D.,  
Theodorus van der Kwast, M.D., Bert G. Blijenberg, Ph.D., Sue M. Moss, Ph.D.,  
Harry J. de Koning, M.D., and Anssi Auvinen, M.D., for the ERSPC Investigators\*

ORIGINAL ARTICLE

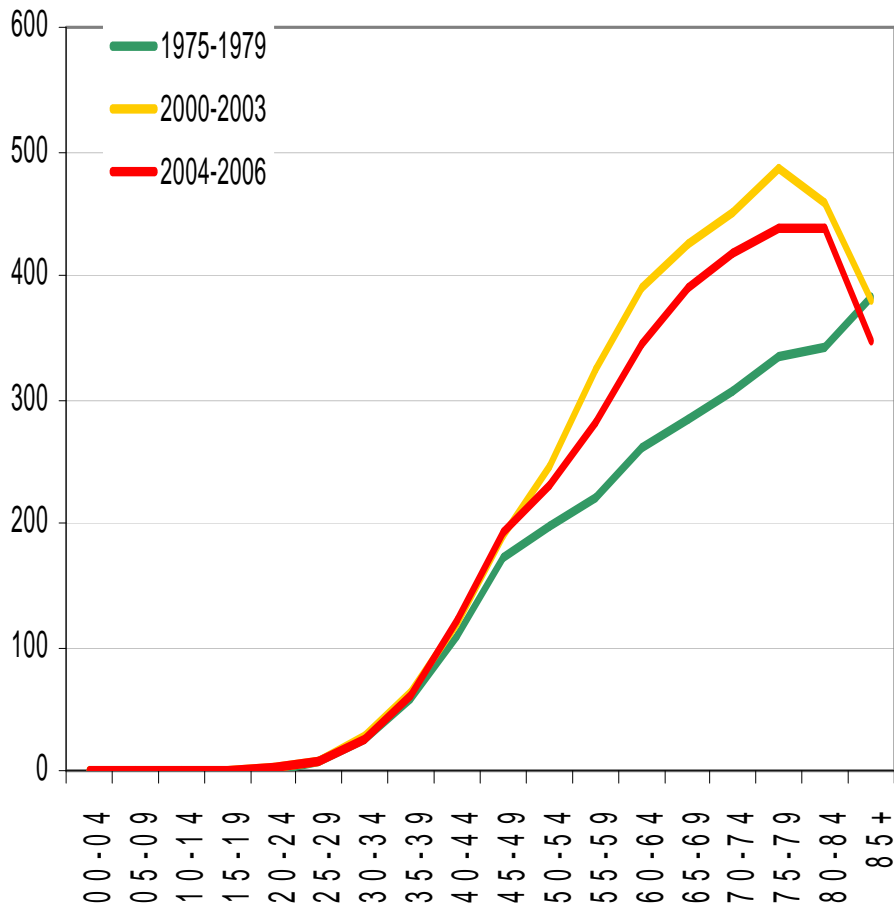
## Mortality Results from a Randomized Prostate-Cancer Screening Trial

Gerald L. Andriole, M.D., E. David Crawford, M.D., Robert L. Grubb III, M.D.,  
Saundra S. Buys, M.D., David Chia, Ph.D., Timothy R. Church, Ph.D.,  
Mona N. Fouad, M.D., Edward P. Gelmann, M.D., Paul A. Kvale, M.D.,  
Douglas J. Reding, M.D., Joel L. Weissfeld, M.D., Lance A. Yokochi, M.D.,  
Barbara O'Brien, M.P.H., Jonathan D. Clapp, B.S., Joshua M. Rathmell, M.S.,  
Thomas L. Riley, B.S., Richard B. Hayes, Ph.D., Barnett S. Kramer, M.D.,  
Grant Izmirlian, Ph.D., Anthony B. Miller, M.B., Paul F. Pinsky, Ph.D.,  
Philip C. Prorok, Ph.D., John K. Gohagan, Ph.D., and Christine D. Berg, M.D.,  
for the PLCO Project Team\*

# Spontaneous versus population based Impact on incidence (and more)

FIGURE 1A. Breast cancer. Incidence rates by age and period

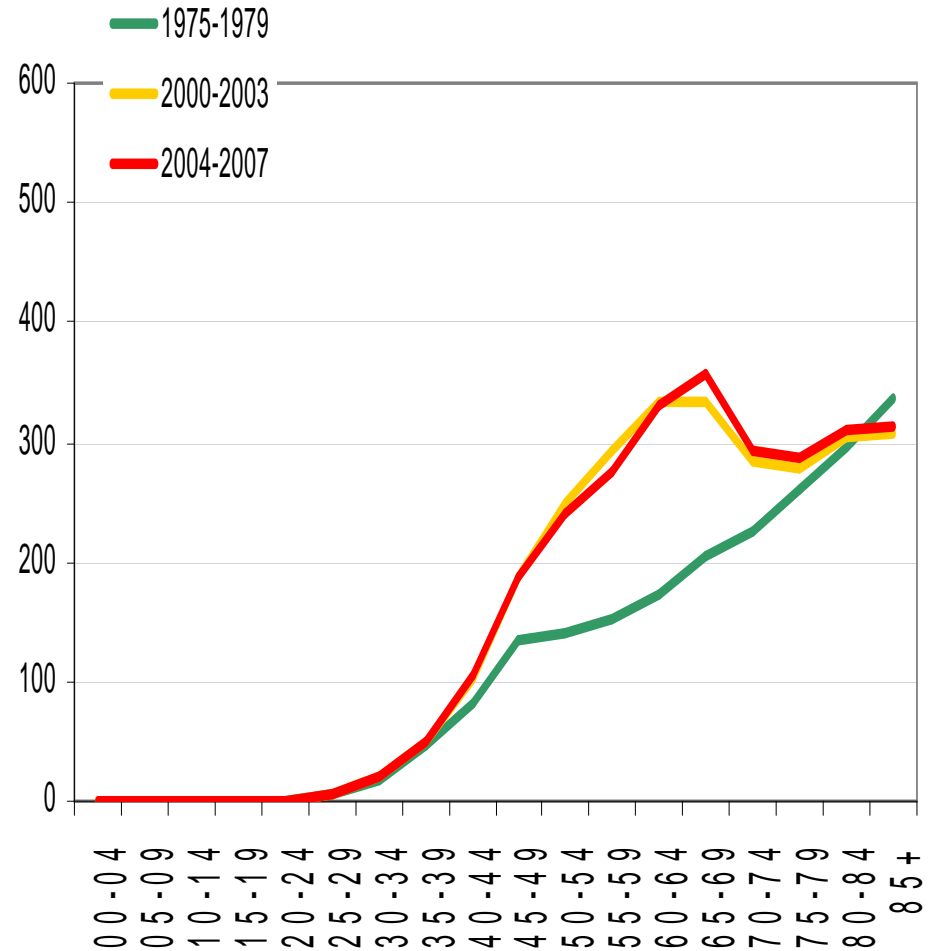
## SEER-US (9 Cancer Registries)



<http://seer.cancer.gov/index.html>

FIGURE 1B. Breast cancer. Incidence rates by age and period

## NORDCAN-Nordic countries (EU)



<http://www-dep.iarc.fr/nordcan.htm>

# Breast screening: the facts— or maybe not

**Peter Gøtzsche and colleagues** argue that women are still not given enough, or correct, information about the harms of screening

## Summary from evidence based leaflet

- It may be reasonable to attend for breast cancer screening with mammography, but it may also be reasonable not to attend because screening has both benefits and harms
- If 2000 women are screened regularly for 10 years, one will benefit from the screening, as she will avoid dying from breast cancer
- At the same time, 10 healthy women will, as a consequence, become cancer patients and will be treated unnecessarily. These women will have either a part of their breast or the whole breast removed, and they will often receive radiotherapy and sometimes chemotherapy
- Furthermore, about 200 healthy women will experience a false alarm. The psychological strain until one knows whether it was cancer, and even afterwards, can be severe

# BUT.., in my opinion , wrong

1. Information and communication is essential and it should be aimed to increase awareness and freedom of choice
2. How is the evidence relevant for a quantitative communication of benefit and risk decided? Is it only true because published in the BMJ?
3. There are many sources of communication in the modern world; to understand what to believe is often extremely difficult.