

MAMMOGRAPHIC SCREENING: IN FAVOUR

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HYPOTHESIS PRIOR TO THE IMPLEMENTATION OF SCREENING MAMMOGRAPHY

- The beneficial effect of screening on the health of the population is because cancer is detected earlier, which favours less aggressive treatments and can achieve a higher cure rate.
- This hypothesis sounds compelling and is attractive.
- However, has this hypothesis been confirmed as true, and if so, are the negative consequences outweighed by the benefits?

BENEFITS AND RISKS OF SCREENING MAMMOGRAPHY

- **Reduced risk of dying from breast cancer**
- Less aggressive treatments
- Overdiagnosis and overtreatment
- False positives (false alarms)
- Pain
- False tranquillity
- Radiation

WHY HAVE A BREAST CANCER SCREENING?

- **Screening programs** are preventive strategies applied to a selected population to detect a disease early, before signs or symptoms related to it appear.
- Breast cancer is the most frequently diagnosed malignant tumour in females. In Europe, it represents 30% of all tumours diagnosed and is the leading cause of death from cancer in women.
- The incidence and mortality rates in Spain are similar to those in Europe.
- More than 26,000 cases were diagnosed in 2014.

WHY HAVE BREAST CANCER SCREENING?

- The classic recognised risk factors are not modifiable, and they explain fewer than half of all detected cases.
- However, controlling the modifiable risk factors would not produce a significant decrease in incidence, so there is no clear possibility of deterring their appearance.
- Thus, we can conclude that we do not have effective primary prevention strategies; in contrast, secondary prevention through mammographic screening currently constitutes our fundamental instrument for controlling the disease.
- Currently, the Andalusian Health Service includes population screening for breast cancer as a basic benefit that, in general, is carried out through a biennial mammogram in women between 50 and 69 years old.

CAN THE RISK OF DYING FROM BREAST CANCER REALLY BE REDUCED?

- There have been 9 randomised clinical trials comparing a group of women who had not undergone mammography with a group that had. Some 600,000 women were included.
- Four systematic reviews were carried out:
 - Cochrane Collaboration
 - American
 - Canadian
 - British
- The American and British reviews regarded all trials as being acceptable in quality. The Cochrane and Canadian reviews considered 4 trials as having ensured adequate randomisation (i.e., achieved reliable results) and 5 as having not (i.e., achieved less reliable results).

CAN THE RISK OF DYING FROM BREAST CANCER REALLY BE REDUCED?

- Overall, the systematic reviews agreed that undergoing mammography reduces breast cancer mortality by **20%**, with a risk ratio (RR) of approximately **0.80**.
- Many experts do not agree with differentiating clinical trials according to their methodological quality.
- The fundamental parameter to be measured is the reduction of mortality from breast cancer instead of overall mortality, and this has been accomplished.

CAN THE RISK OF DYING FROM BREAST CANCER REALLY BE REDUCED?

- Despite analysing the same clinical trials, the estimates of the NNT (number needed to treat: number of women aged 50–69 years who would need to have a biennial mammogram to avoid one death from breast cancer) ranged from **235** in the British review (over 20 years) to **1000** in the Cochrane review (over 20 years).

Diagram illustrating NNT: 1/235. A box containing 235 green circles, with the 235th circle highlighted in red.

NNT: 1/235

Diagram illustrating NNT: 1/1000. A box containing 1000 green circles, with the 1000th circle highlighted in red.

NNT: 1/1000

DO WOMEN WHO PARTICIPATE IN SCREENINGS REALLY RECEIVE LESS AGGRESSIVE TREATMENTS?

- Reduced risk of dying from breast cancer
- **Less aggressive treatments**
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DO WOMEN WHO PARTICIPATE IN SCREENINGS REALLY RECEIVE LESS AGGRESSIVE TREATMENTS?

- According to the Cochrane review, although there was a greater use of surgery (RR 1.31) and radiotherapy (RR 1.24), the need for treatment with **chemotherapy (RR 0.63)** and **hormone therapy (RR 0.81)** was reduced.

After 5 complete rounds of screening	Group with mammography	Group without mammography
Non-invasive cancer (stage 0)	93 (16%)	53 (11%)
Stage I	296 (51%)	162 (37%)
Stage II	142 (25%)	172 (39%)
Stage III	26 (4%)	27 (6%)
Stage IV	22 (4%)	32 (7%)
Received chemotherapy	26 (5%)	41 (9%)

Characteristics of cancers diagnosed in the Malmö trial

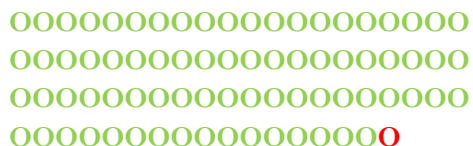
ARE WOMEN WHO PARTICIPATE IN SCREENINGS REALLY DIAGNOSED AND TREATED UNNECESSARILY FOR BREAST CANCER?

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ARE WOMEN WHO PARTICIPATE IN SCREENINGS REALLY DIAGNOSED AND TREATED UNNECESSARILY FOR BREAST CANCER?

- Two reviews (British and Cochrane) evaluated the degree of overdiagnosis based on 3 trials of contrasting quality that did not offer mammography to the control group at the end of the study.
 - According to the British review: if a woman was diagnosed with cancer in the screening, the probability that it was an overdiagnosis was **19%**. There was **1** case of overdiagnosis for every **77** women screened.
 - According to the Cochrane review: there was overdiagnosis in **30%** of the cancers diagnosed in the screening. There was **1** case of overdiagnosis for every **200** women screened.

ARE SCREENED WOMEN REALLY DIAGNOSED AND TREATED UNNECESSARILY FOR BREAST CANCER?



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NND: 77



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NNT: 200

**NND: NUMBER OF WOMEN NEEDING TO SUBMIT TO A PROGRAM OF
SCREENING WITH MAMMOGRAPHY FOR DAMAGE TO OCCUR (I.E., 1
CASE OF OVERDIAGNOSIS).**

CAN MAMMOGRAPHY REALLY SAY THAT THERE IS CANCER WHEN, IN REALITY, THERE IS NONE?

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CAN MAMMOGRAPHY REALLY SAY THAT THERE IS CANCER WHEN, IN REALITY, THERE IS NONE?

- False positives: **3.36%** (British review)
- False positives: **10%** (Cochrane review)
- Consequences:
 - Carrying out other diagnostic tests:
 - **70%** were administered other imaging tests
 - **30%** required a biopsy
 - The expected benefit in reducing mortality outweighs the damages that may result from participation in the screening program.

CAN MAMMOGRAPHY REALLY CAUSE OTHER SECONDARY EFFECTS?

- Reduced risk of dying from breast cancer
- Less aggressive treatments
- Overdiagnosis and overtreatment
- False positives (false alarms)
- **Pain**
- **False tranquillity**
- **Radiation**

CAN MAMMOGRAPHY REALLY CAUSE OTHER SECONDARY EFFECTS?

- Some women suffer **pain** due to mammography, but in the vast majority of cases, this pain is mild.
- **Exposure to radiation** from mammograms may cause breast cancer. One study estimates a rate of 3–6 cancers per 10,000 women screened every 3 years between 47 and 73 years of age. The current digital mammography exposes women to lower doses of radiation.

THE CONTROVERSY OVER THE SCREENING PROGRAM

- There are discrepancies in the methodological aspects when estimating the benefits and risks:
 - Differential importance is given to the quality of the original clinical trials (randomisation, other biases).
 - Differential importance is given to the role played by studies that are not clinical trials (observational studies).
- There are discrepancies in the validity assigned to clinical trials conducted in the 1960s, 1970s, and 1980s that used outdated radiological technology. The current digital techniques are associated with less exposure to radiation.
- Although the RR estimates often coincide, different estimates of the NNT are given to avoid one death or to yield one overdiagnosis, although the estimates do not reach an unacceptable magnitude.
- Assessing the balance between benefits and damages differs according to the review; therefore, the recommendations also differ.

RECOMMENDATIONS FOR DELIBERATION

- The key measurement of benefit:
 - Mortality from breast cancer: reduction of 20%, according to the studies carried out.
 - Reduction in the need to administer aggressive treatments, such as chemotherapy.
- Balance between mortality reduction and overdiagnosis:
 - There is no definitive evidence that the amount of overdiagnosis is significant, and we can argue that it does not exceed the mortality benefit.
- Even with these positive data for mammography, there may be women who do not want to undergo it because they prioritise its adverse aspects.
- It is advisable to improve the information that women receive so they can make informed decisions.

SHOULD THE PUBLIC HEALTH SYSTEM OF ANDALUSIA OFFER
MAMMOGRAPHY TO WOMEN FROM 50 TO 69 YEARS OF AGE?

YES