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25 Years of Breast Cancer Screening Experience: A Dutch Story to Tell

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Key message

The 25-year old Dutch Breast Cancer Screening Program continues to satisfy expectations. Success is due to high quality and efficient organization[1], combined with a solid screening data recording system.[2] The numbers of false-positives and overdiagnosis are less common than in some other countries, while the number of false-negatives is low.[3] Full transparency and confidence about the results and (cost)effectiveness feed the lively effectiveness debate among researchers and in the lay press.

Introduction

- The Dutch Breast Screening Program started in 1990 for all women aged 50-75 years.
- The Program is based on the criteria formulated by Wilson and Jungner (1968)[3].
- The Program is secured by the Dutch constitutional law.
- The implementation is based on 3 important public values: quality, affordability and accessibility.
- Goal of the screening program is to detect breast cancer in an early stage to improve prognosis, decrease invasive treatment and decrease breast cancer mortality.
- Controversy remains about the effectiveness and efficacy. Some believe that the efficacy is not as great as had been anticipated, while there are considerable harms. Others argue that breast cancer screening is in fact very effective with harms being minimized.
- The Health Council of the Netherlands has re-evaluated the Program in 2014.

Factors for Success in the Netherlands

- Favorable geography (small flat country)
- National management by the Centre for Population Screening
- National Independent Reference Centre (LRCB-Nijmegen)
- National Independent Evaluator (NETB-Rotterdam/Nijmegen)
- Regional implementation by five screening organizations
- Social incentive: mobile units in communities
- Organized separate from health care (women are not (yet) patients but clients)
- Dutch system is a system of balancing public and private interests
- National advisory committees, consisting of the involved public and private organizations, advise the Centre for Population Screening on a regular basis

Benefits and harms

Advantages
- Life-years gained
- Risk reduction
- Less invasive treatment
- More treatment options
- Reassurance

Disadvantages
- False-positive results
- False-negative results
- Overdiagnosis and overtreatment
- No guarantees
- Radiation / tests in healthy woman
- Mammography is a painfull method

Table 1: True positives, False positives, False Negatives, True Negatives

Per 1000 women		The truth	
		+	-
The test	+	True positives: 7	False positives: 18*
	-	False negatives: 2	True negatives: 973

*6 of 18 needed invasive assessment

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Organization

The Program is organized in a logistical chain of public and private organizations (Figure 1).

Dutch Breast Cancer Screening Program: turning the wheels together for 25 years

Figure 1: Public and private organizations

The Health Council of the Netherlands provides scientific advice for the Minister of Health, who decides on introduction of and innovations in screening programs. The Centre for Population Screening-RIVM, coordinates and directs the program, with stakeholders and partners. It is responsible for e.g. financial management, quality control, monitoring and evaluation, uniform communication and development and improvement. The Health Inspection is overlooking the whole chain of integrated care. The regional screening organizations are responsible for the practical performance of the program and are among others owner of the mobile units, have contracts with radiologists and are in contact with clients, municipalities, regional hospitals and GP's.

Facts and Figures[2,4]		
Total female population (50-75 yrs)	2.6 million	
Invitations per year	1.3 million	
Participation per year	1.0 million	~80% participation rate
Incidence of invasive breast cancer (n)	8.400	
Screen-detected breast cancer (n)	6.600	20% DCIS
Program sensitivity (%)	73	
Program specificity (%)	98.7	
Lives saved per year (n)	775	
Overdiagnosed per year (n)	375	
Risk reduction in breast cancer mortality (%)	50	due to regular participation
Total cost per year	€ 64 million	0.07% of total health care costs*
Total cost per examination	€ 64	1.2% of yearly health care costs per person**
Cost-effectiveness	€ 3300 per LifeYearGained	

* € 89 billion per year for total health care
**€ 5.354 per year for health care costs per person

References

1 Health Council of the Netherlands: Population screening for breast cancer: expectations and developments (2014)
2 National Evaluation Team for Breast Cancer Screening in the Netherlands (NETB): National evaluation of breast cancer screening in the Netherlands 1990 - 2011/2012 (2014)
3 Wilson, JMG and Jungner, G: Principles and Practice of Screening for Disease WHO (1968)
4 National Evaluation Team for Breast cancer screening in the Netherlands (NETB): Monitor 2012 Breast Cancer Screening Program