

Early Detection and Use of Mammography

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Early Detection and Mammography Panel Participants

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Yelena Wetherill	HGEI

Agreement

- Until breast cancer can be prevented, early detection is critical
 - to decrease pain, suffering, costs associated with treatment and to decrease deaths associated with breast cancer

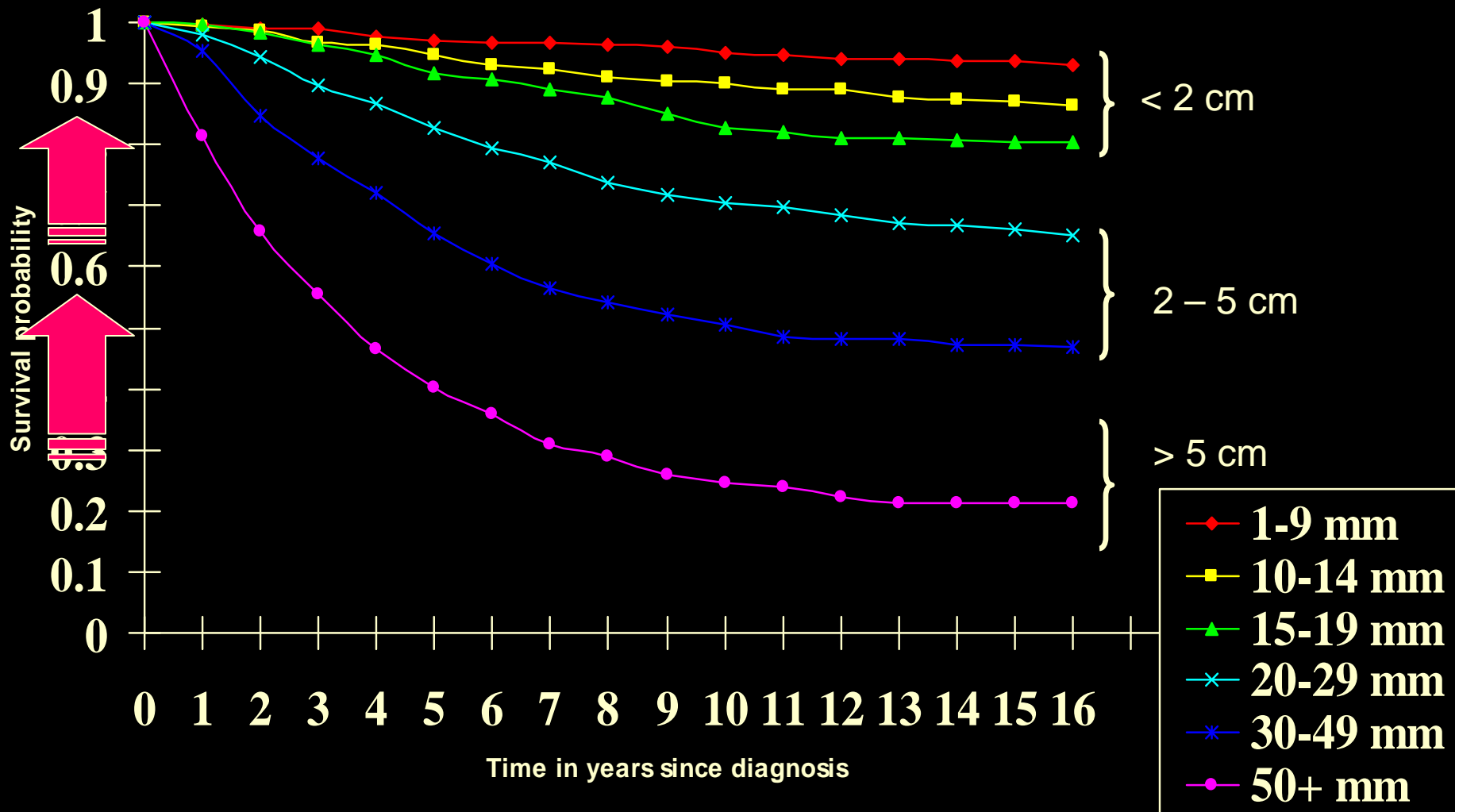
Agreement

- Historically, and in most parts of the world today,
 - the disease is commonly advanced at the time of diagnosis and mortality is high
- Nodal status, tumor size, stage predict survival
 - All can be used as surrogate markers for survival

Relative risk of death and relative risk of node positive breast cancer in the mammography screening trials

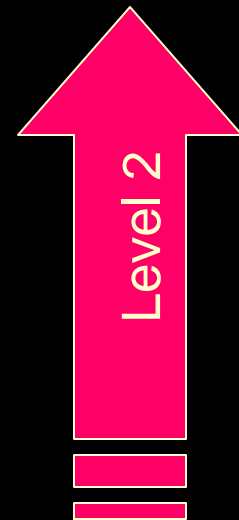
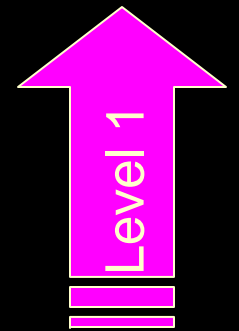
Study	RR (mortality)	RR (node positive)
HIP	0.78	0.85
Malmo	0.78	0.83
2-county	0.68	0.73
Edinburgh	0.78	0.81
Stockholm	0.90	0.82
Gothenburg	0.79	0.80
NBSS-1	0.97	1.20
NBSS-2	1.02	1.09

Survival of 2294 invasive breast cancer patients by size of tumor, Swedish Two-County Trial of breast cancer mammography screening



Five-Year Survival

- I 2 cm or less, no nodes 98%
- IIa ≤ 2 cm with nodes 88%
 - 2-5 cm, no nodes
- IIb 2-5 cm, axillary nodes 76%
 - > 5 cm, no nodes
- IIIa > 5 cm, ax nodes 56%
 - Any size, fixed or IM nodes
- IIIb Chest wall, skin 49%
- IV Distant metastases 16%



Level 2

- Breast cancer awareness programs
 - Comfort
 - with self exam, requesting assistance, cancer “label”
 - Hope for survival after diagnosis
- Clinical breast exam (CBE) programs
 - Needle biopsy, Cytology/pathology, Ultrasound
 - Adding mammography to US unlikely to be of significant added value *in diagnostic setting* compared to costs of mammography programs (dx mammography should be associated with screening mammography program development)

Breast Self Exam Evidence

ARTICLES

Randomized Trial of Breast Self-Examination in Shanghai: Final Results

David B. Thomas, Dao Li Gao, Roberta M. Ray, Wen Wan Wang, Charlene J. Allison, Fan Liang Chen, Peggy Porter, Yong Wei Hu, Guan Lin Zhao, Lei Dao Pan, Wenjin Li, Chunyuan Wu, Zokia Coriary, Ilonka Evans, Ming Gang Lin, Helge Stalsberg, Steven G. Self

Background: Among women who practice breast self-examination (BSE), breast cancers may be detected when they are at an earlier stage and are smaller than in women who do not practice BSE. However, the efficacy of breast self-examination for decreasing breast cancer mortality is unproven. This study was conducted to determine whether an intensive program of BSE instruction will reduce the number of women dying of breast cancer. **Methods:** From October 1989 through October 1991, 266 064 women associated with 519 factories in Shanghai were randomly assigned to a BSE instruction group (132 979 women) or a control group (133 085 women). Initial instruction in BSE was followed by reinforcement sessions 1 and 3 years later, by BSE practice under medical supervision at least every 6 months for 5 years, and by ongoing reminders to practice BSE monthly. The women were followed through December 2000 for mortality from breast cancer. Cumulative risk ratios of dying from breast cancer were estimated using Cox proportional hazards models. All statistical tests were two-sided. **Results:** There were 135 (0.10%) breast cancer deaths in the instruction group and 131 (0.10%) in the control group. The cumulative breast cancer mortality rates through 10 to 11 years of follow-up were similar (cumulative risk ratio for women in the instruction group relative to that in the control group = 1.04, 95% confidence interval = 0.82 to 1.33; $P = .72$). However, more benign breast lesions were diagnosed in the instruction group than in the control group. **Conclusions:** Intensive instruction in BSE did not reduce mortality from breast cancer. Programs to encourage BSE in the absence of mammography would be unlikely to reduce mortality from breast cancer. Women who choose to practice BSE should be informed that its efficacy is unproven and that it may increase their chances of having a benign breast biopsy. [J Natl Cancer Inst 2002;94:1445-57]

Whether practicing breast self-examination (BSE) ultimately reduces the number of women who die from breast cancer is unclear. Breast cancers detected while practicing breast self-examination tend to be diagnosed at an earlier stage (1-10) and to be smaller (2,5,6,9,10) than cancers diagnosed in the absence of any screening. Women who report practicing BSE tend to have their tumors diagnosed at an earlier stage than women who do not report practicing BSE (8,10-12). Tumor size has been inversely associated with the frequency of practicing BSE (10,11,13-18), and women who regularly and competently practice BSE are more likely to find their tumor themselves than

women who practice BSE less diligently (3,15,18). Improved survival has also been associated with BSE practice in some studies (16,19,20) but not in others (8,21,22). One study (10) showed better survival in women who detected their tumor while practicing BSE than in unscreened women who did not detect their tumors while practicing BSE, but two others (7,9) did not.

Although no apparent breast cancer mortality benefit of BSE was observed in one prospective study (23), no information was available on the frequency or competency of BSE. Two prospective studies showed reduced breast cancer mortality in women who received detailed BSE instruction (12,24). However, one study (12) also showed a reduced risk of all-cause mortality, suggesting uncontrolled confounding, and results from the other study (24) may have been influenced by differences in treatment received by women in the BSE and comparison groups.

In two case-control studies (25,26), increasing trends in the risk of late stage or fatal breast cancer with frequency of BSE practice were observed, possibly because women in the case group reported self-examinations in response to symptoms of their disease. However, a small decrease in the risk of advanced or fatal breast cancer in women who practiced BSE with high proficiency was observed in one of these investigations (26). In two additional case-control studies nested within nonrandomized (20) and randomized (27) trials in which BSE practice was ascertained before any of the women developed breast cancer, one study showed a reduced risk of dying from breast cancer associated with attendance at BSE classes (20), and the other showed decreased trends in risk of advanced or fatal breast cancer in relation to the frequency and level of proficiency of BSE (27).

It has recently been suggested that BSE has been shown not to be efficacious (28). Although this conclusion seems unwarranted, the efficacy of BSE in reducing deaths from breast cancer is uncertain. The current position of the U.S. Preventive Health Services Task Force is that there is insufficient evidence

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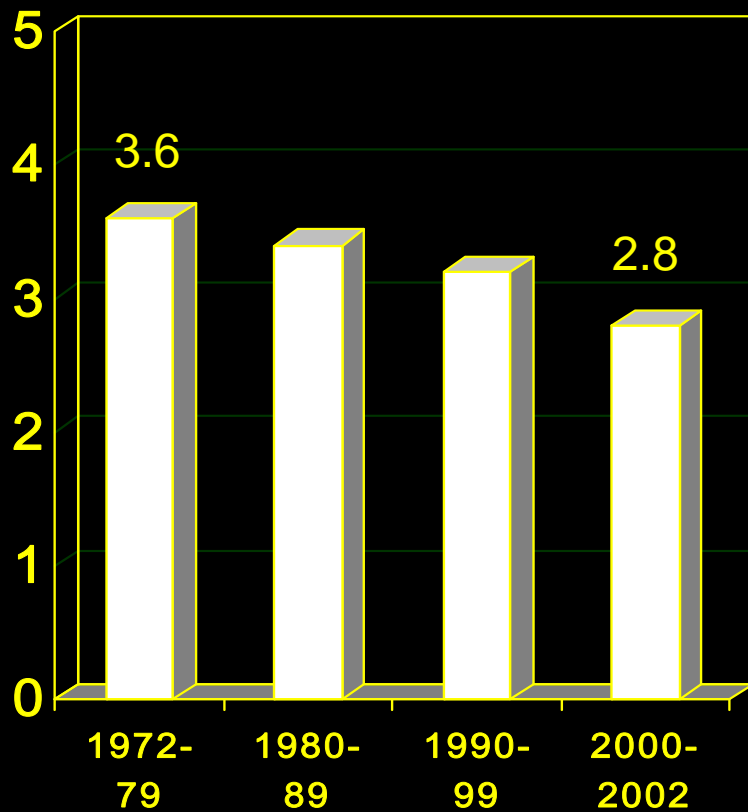
Correspondence to: David B. Thomas, MD, DrPH, Program in Epidemiology, Fred Hutchinson Cancer Research Center, 1100 Fairview Ave, North, Seattle, WA 98109-1024 (e-mail: dbthomas@fhcc.org).

See "Notes" following "References."

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- Based on results from 2 randomized trials, *the conventional thinking is that BSE has not been shown to reduce breast cancer mortality*
- However, interest in SBE as part of *increased breast cancer awareness programs*

Change in Mean Tumor Size in Southern Brazil, 1972-2002 with Increased Breast Cancer Awareness



- Mean tumor size decreased by 0.8 cm
- Mean tumor size still >> 2.5 cm

**Downstaging of Breast Cancer in Patients
Receiving Clinical Breast Exams
(1998 to August 2009):
Size shift from 7.5 to 3.5 cm**

Group	Stage (I + II)	Stage (III +IV)	Total
CBE Intervention	145 (64.7%)	79 (35.3%)	224
Control	80 (50%)	80 (50%)	160

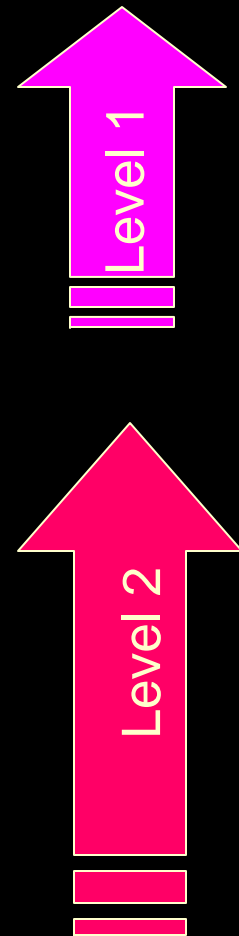
($\chi^2 = 8.3493$, $p = 0.004$)

Information regarding staging was not available for 31 cases from the screening arm and 29 cases from the control arm.

With permission, Dr. Rajendra Badwe Tata Memorial Centre India

Five-Year Survival

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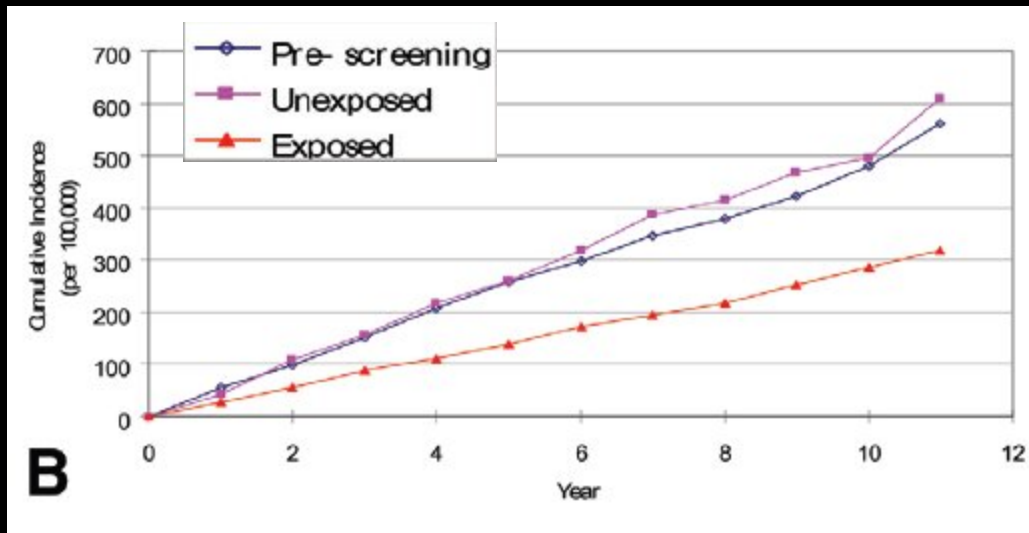


Level 1

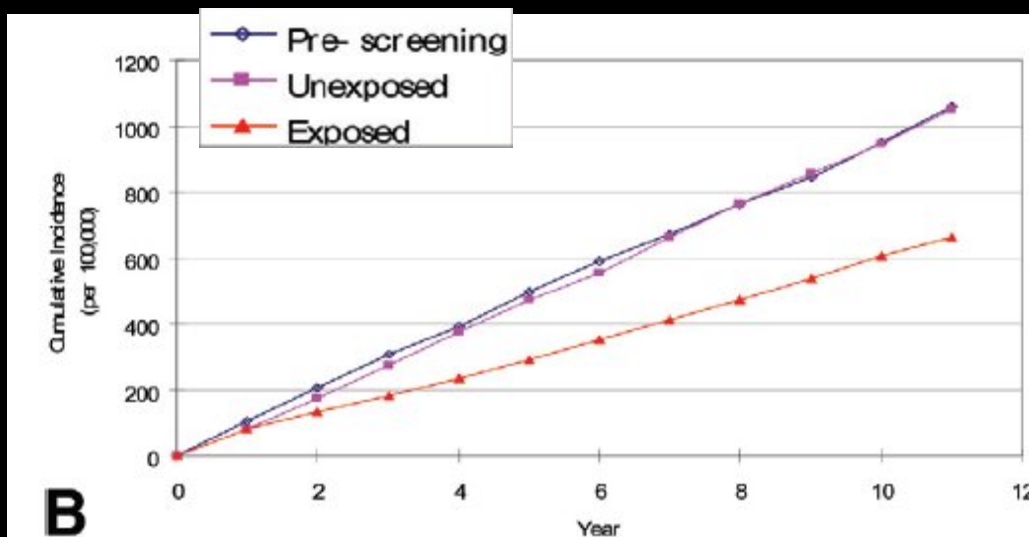
- Mammography needed to move significant portion of population to Stage I diagnosis



Cumulative incidence of tumors > 2 cm in 6 Swedish Counties by Age and Screening Mammography Exposure Status Comparing the Pre- and Post Mammography Screening Epoch

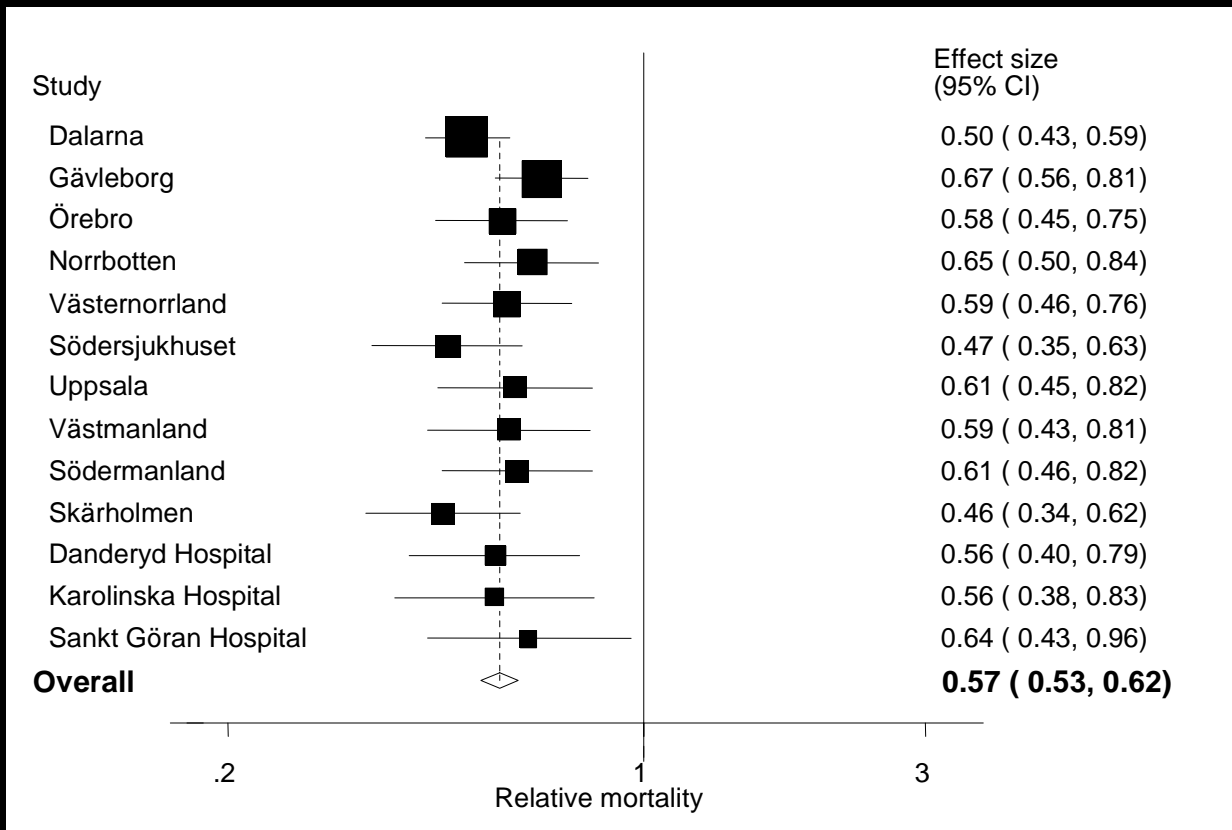


Age 40-49



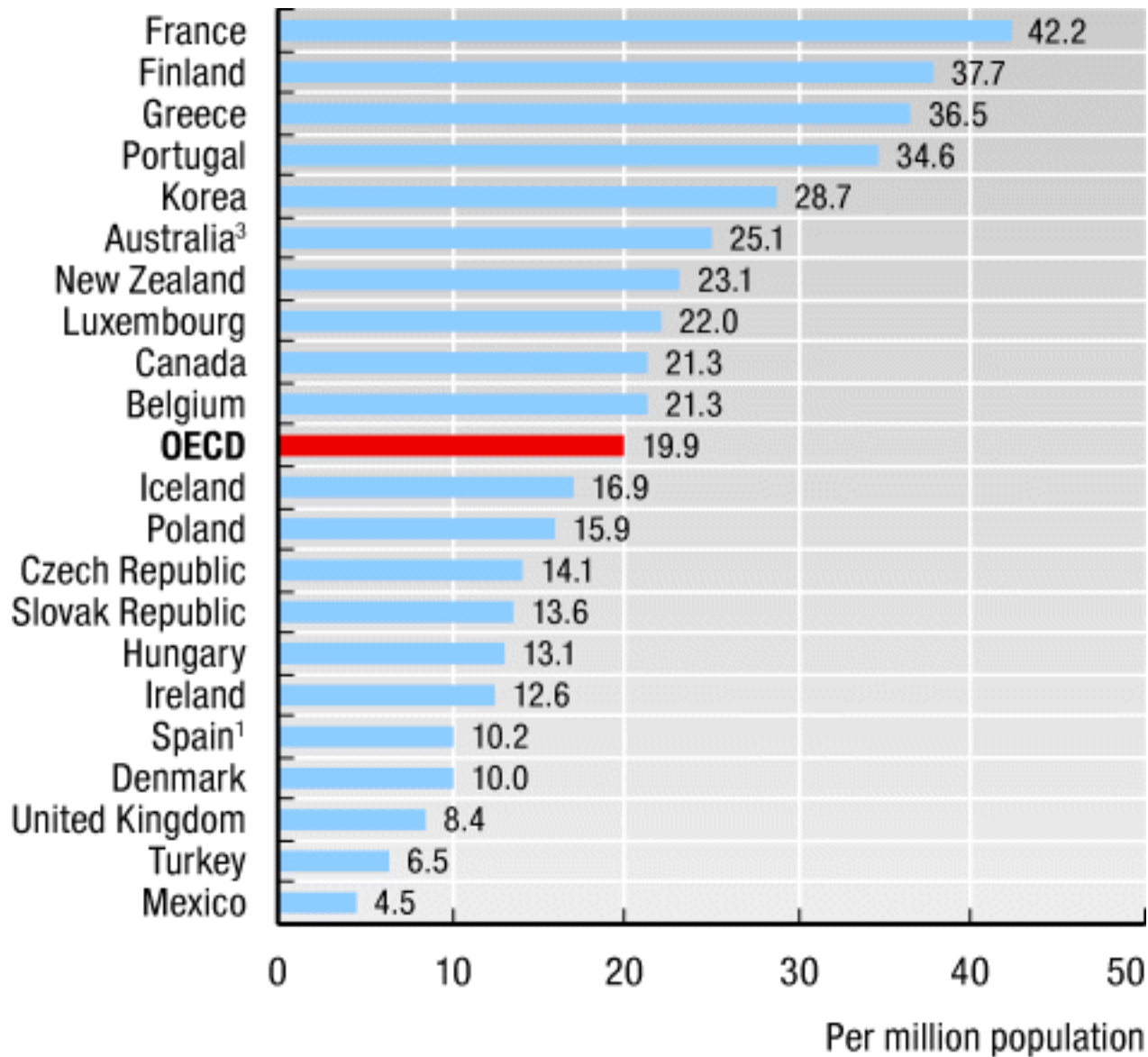
Age 50-69

Relative Risk of Incidence Based Breast Cancer Mortality in Screened women in the Screening Epoch vs. the Pre-Screening Epoch, 13 Swedish Counties, 1958-2001* Swedish Organised Service Screening Evaluation Group (SOSSEG)



- Overall effect size = **43% fewer deaths.**
- Effect size ranges from **33% to 54%** lower mortality in women exposed to screening

LIMITED NUMBER OF MAMMOGRAPHY MACHINES IN THE WORLD



Source: Health at a Glance 2007: OECD Indicators. Health Care Resources and Utilisation. 4-7. Medical technologies (<http://bit.ly/ioQzL>)

**ESTIMATES OF COVERAGE FOR BREAST CANCER
WITH MAMMOGRAPHY, MINISTRY OF HEALTH, 2007**
MEXICO: Less than 10% of women covered

YEAR	MAMMOGRAMS, NUMBER, COVERAGE (%)						SUMMARY	
	≥40		45 – 64		50 – 69		45 – 64	50 – 69
	Núm	(%)	Núm	(%)	Núm	(%)	(%)	(%)
2003	99,978	1.7%	72,514	2.2%	57,917	2.3%	3.1%	3.9%
2004	136,709	2.2%	94,042	2.8%	71,102	2.7%	4.1%	5.1%
2005	172,397	2.6%	112,558	3.2%	78,165	2.8%	4.9%	6.2%
2006	206,602	3.1%	122,970	3.4%	84,147	2.9%	5.7%	7.1%
2007	223,573	3.2%	133,473	3.5%	91,330	3.0%	5.9%	7.4%

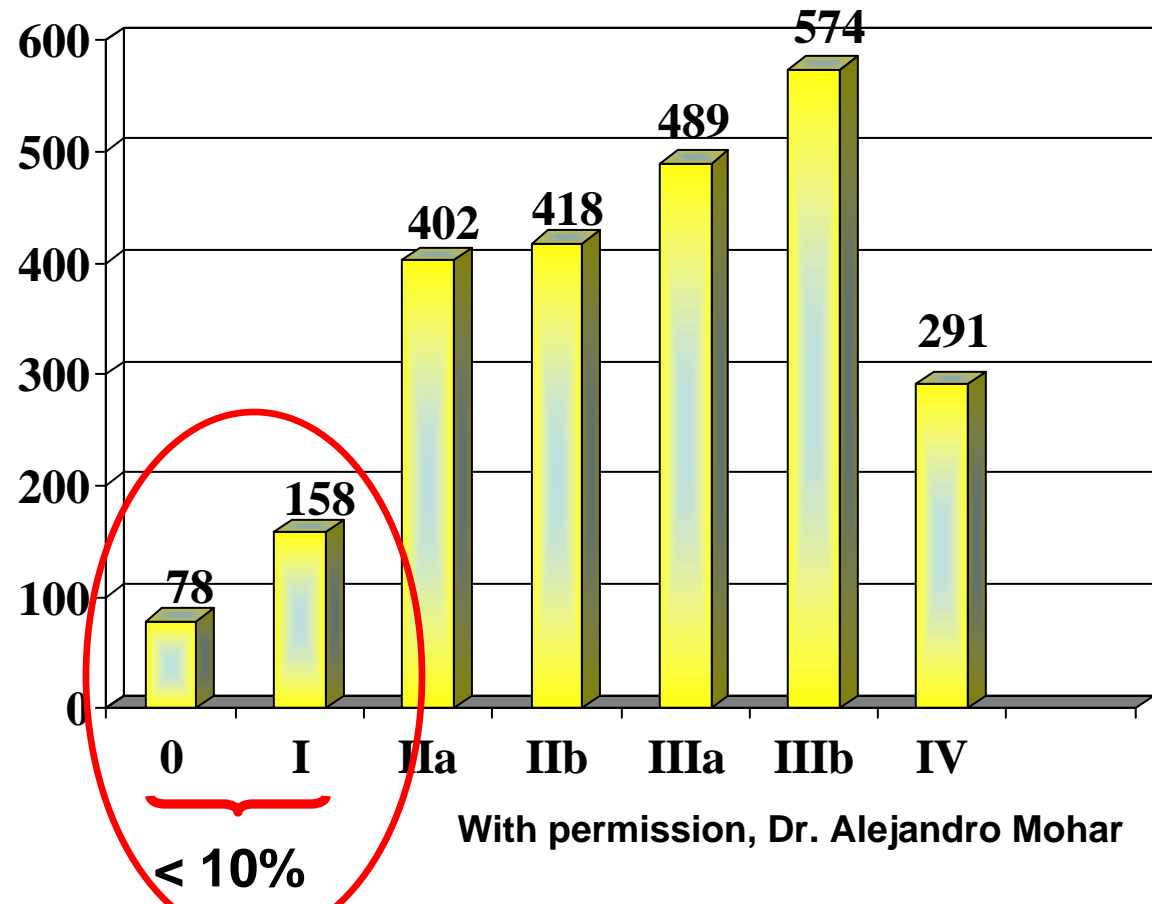
SOURCE: SICAM e Informe de Entidades Federativas, with permission, Dr. Alejandro Mohar

CLINICAL STAGE DISTRIBUTION, 2008

**FULL TREATMENT BY SEGURO POPULAR
N=2,410**



SOURCE: CNEGySR





UNEMES FOR EARLY DETECTION AND DIAGNOSIS OF BREAST CANCER

SALUD

	UNEMES DACMA
Ags	1
Baja California	1
Sur	1
Campeche	1
Coahuila	1
Colima	1
Chiapas	2
Chihuahua	1
Distrito Federal	2
Durango	1
Guanajuato	2
Guerrero	2
Hidalgo	1
Jalisco	2
México	4
Michoacán	2
Morelos	1
Nayarit	1
Nuevo León	1
Oaxaca	2
Puebla	2
Querétaro	1
Quintana Roo	1
San Luis Potosí	1
Sinaloa	1
Sonora	1
Tabasco	1
Tamaulipas	1
Tlaxcala	1
Veracruz	3
Yucatán	1
Zacatecas	1
TOTAL	45

Need for “Best Practices” for most effective and efficient use of mammography units and radiologists interpreting exams



Targeted Screening: Tailor screening approaches to the specific population

- Breast cancer is not the same in all countries
- Specifically, age of diagnosis is significantly younger
 - Worldwide > 50% of breast cancer cases are reported in women who are pre-menopausal

Targeted Screening: Population Specific Approaches

- Avoid temptation to transfer recommendations for other countries to developing countries
 - Draw insights from past research, but local investigations are essential
 - Support needed for organized programs to assess impact of interventions in local setting

Effective Screening Programs **Require Knowledge of:**

- Disease burden and impact of disease in the local setting
 - *Incidence and mortality by age, stage at presentation, biology of tumors*
- Resources in the local setting
 - *for screening, diagnosis and treatment*

Key Issues

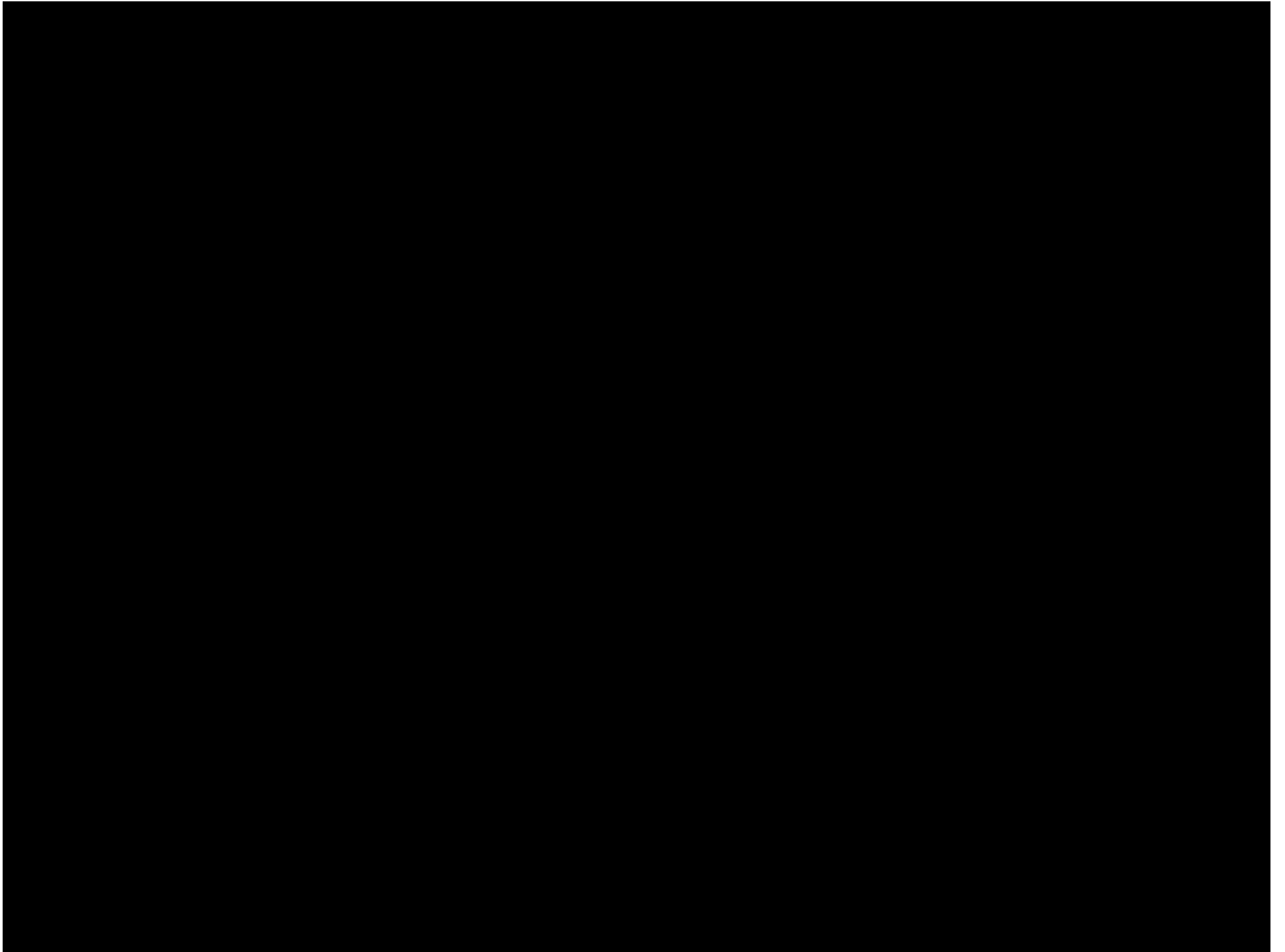
- Increasing “breast awareness” is a key element of a quality breast cancer screening program
 - Programs that are culturally sensitive and effective support complete system from detection through treatment
- Systems approach
 - Screening programs can only have an impact if linked to effective diagnostic and treatment programs
 - “Effective” includes assessing patient acceptance of treatment

Key Issues

- Identify, share and implement “best practices” for programs specific to characteristics of local population
 - Level II
 - Breast cancer awareness
 - Clinical breast exam
 - Level I
 - Mammography
- Global issues, local solutions
- Adjust, apply, appraise

Many Thanks to the Early Detection and Mammography Panel Participants

Selma Morris	Princess Nikky Foundation – Africa; HERA rep of Georgia
Sam Thenya	Nairobi Women’s Hospital, Kenya
Gladys Boateg	Reaching for Recovery, Ghana
Maria Palacios	MACHA, Argentina
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- IARC presentation.....find out the name of this person and email. Invite to participate on paper