Breast cancer screening in resource limited settings

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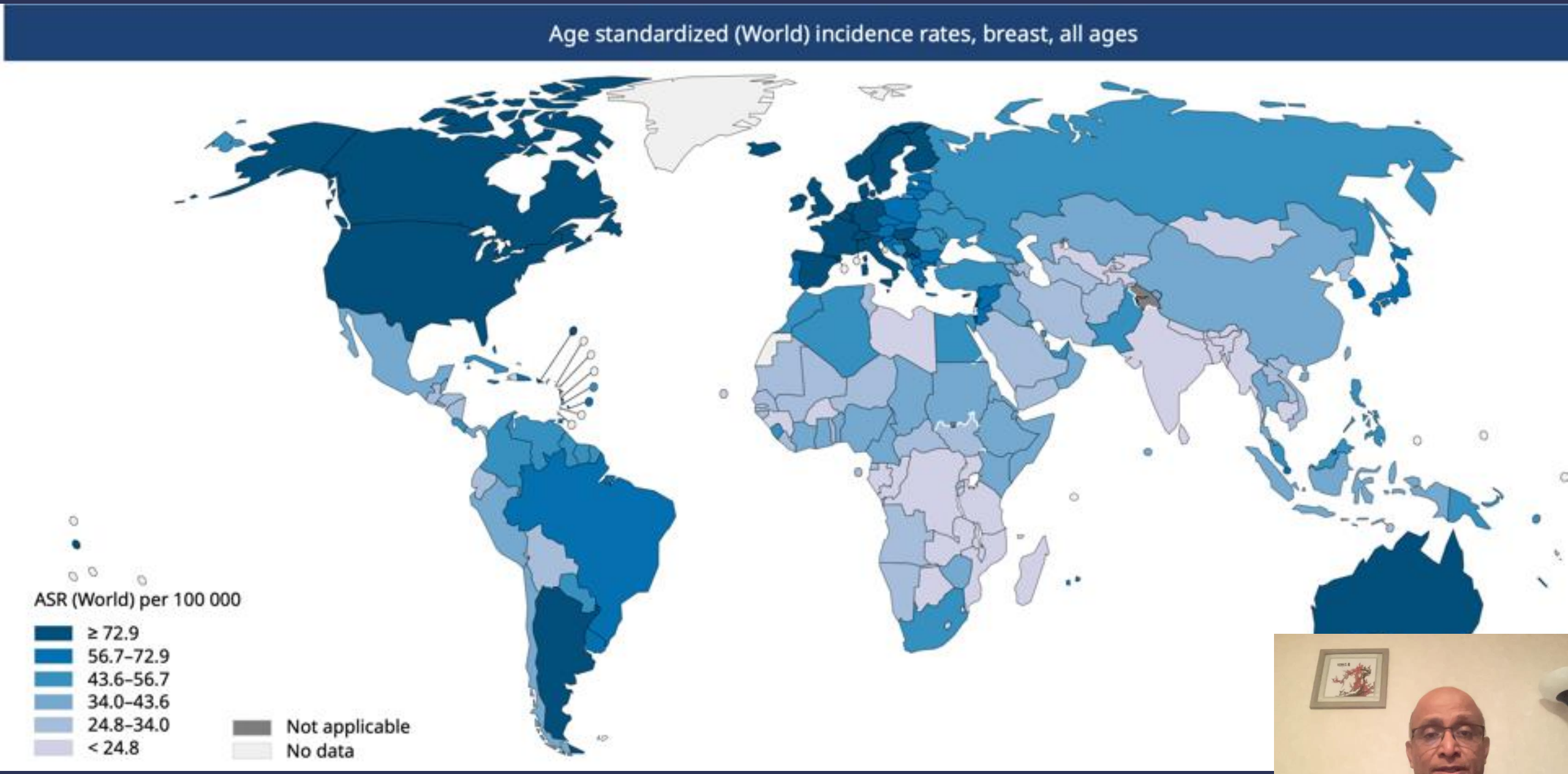
7th International Clinical Oncology Congress of Iran



IARC GLOBOCAN

Global incidence (ASR): 48/100,000

Trend of Breast Ca Incidence in Iran: 2003-17

Breast cancers comprised one fourth of all cancers in women in 2017

ASR of breast cancer in Tehran: 57.4/100,000 women

8-fold increase in the number of new cases of breast cancer from 1990 to 2016

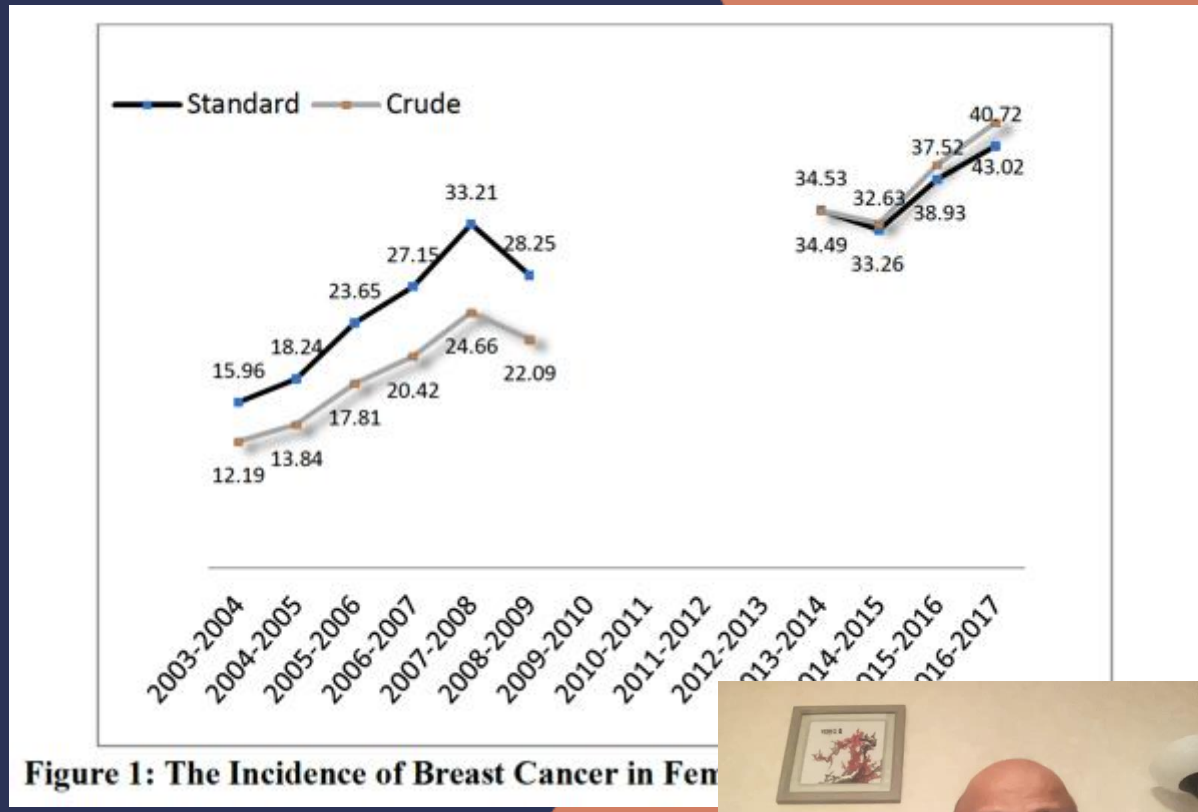
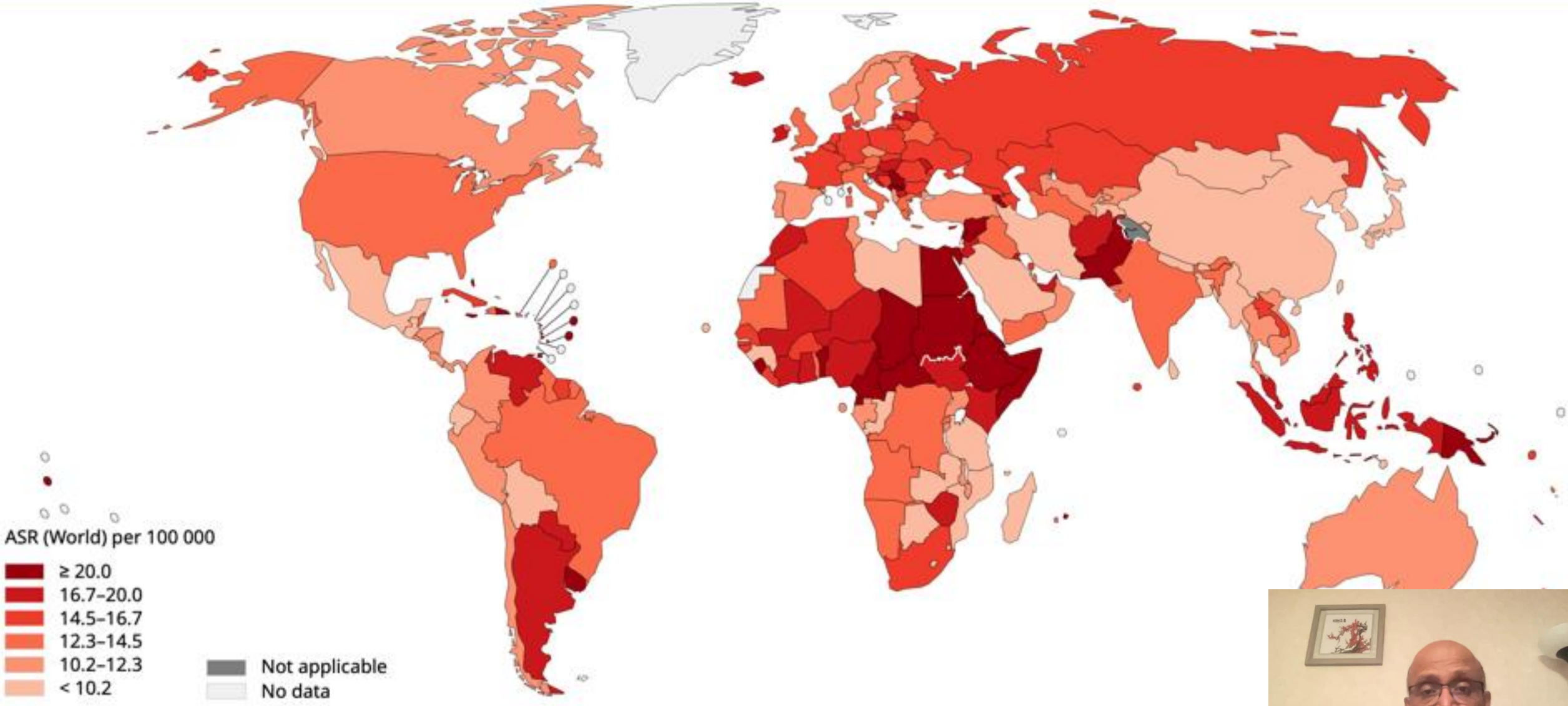


Figure 1: The Incidence of Breast Cancer in Fem

Iranian Quarterly Journal of Breast Disease. 2022; 15(2):4-17.

Age standardized (World) mortality rates, breast, all ages



IARC GLOBOCAN

Breast ca deaths globally: ~700,000 per y

Breast Cancer Survival in LMICs

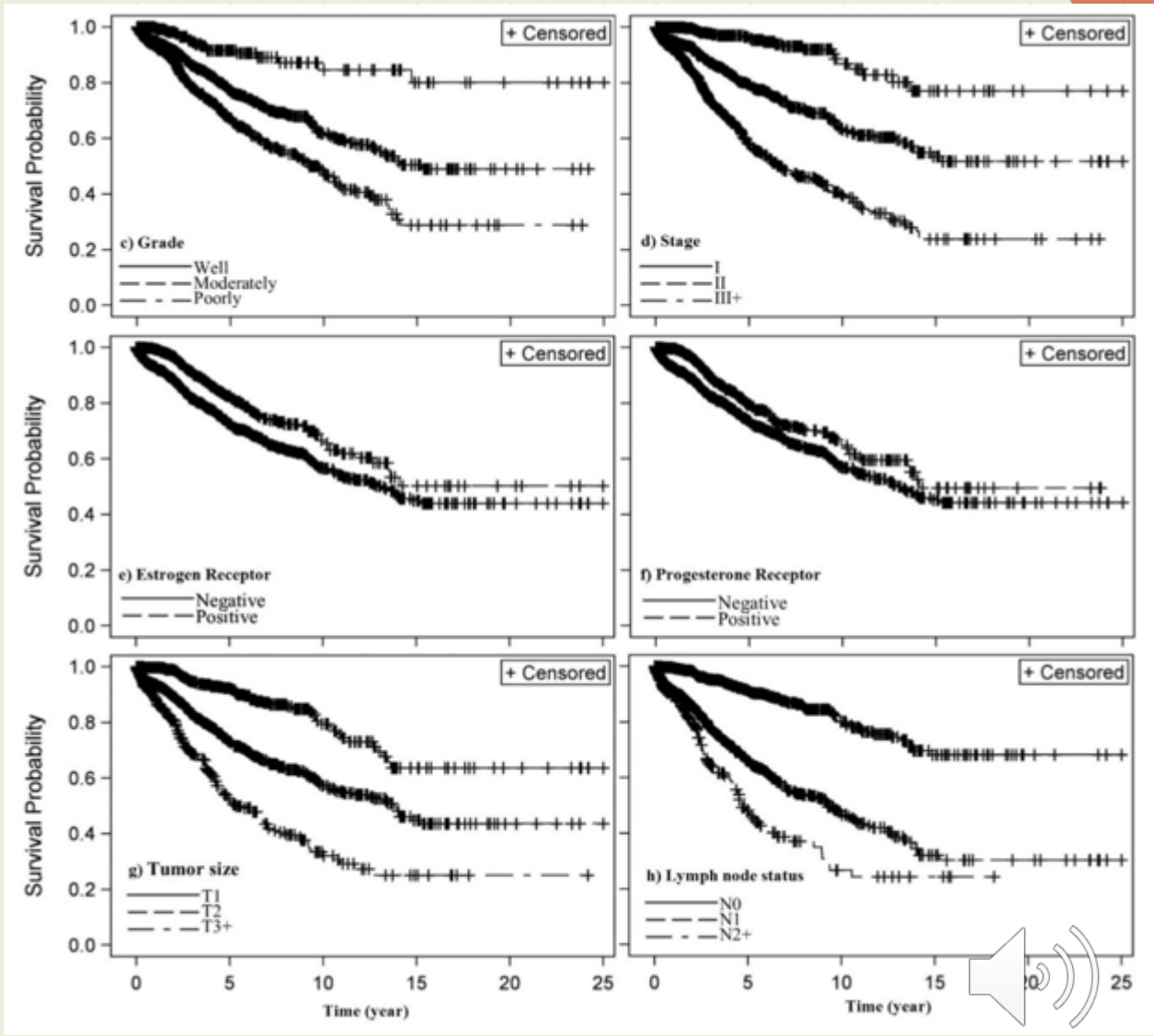
Five year overall survival rate of breast cancer in India ranged from 40%-62%

M:I ratio is 0.16 in North America but 0.55 in middle, eastern & western Africa

North America has 1 pathologist per 17,500 population

Sub-Saharan African countries may have 1 pathologist per 9 million population or no pathologist

Turnaround time for pathology ranges from 6 to 15 wks in SSA

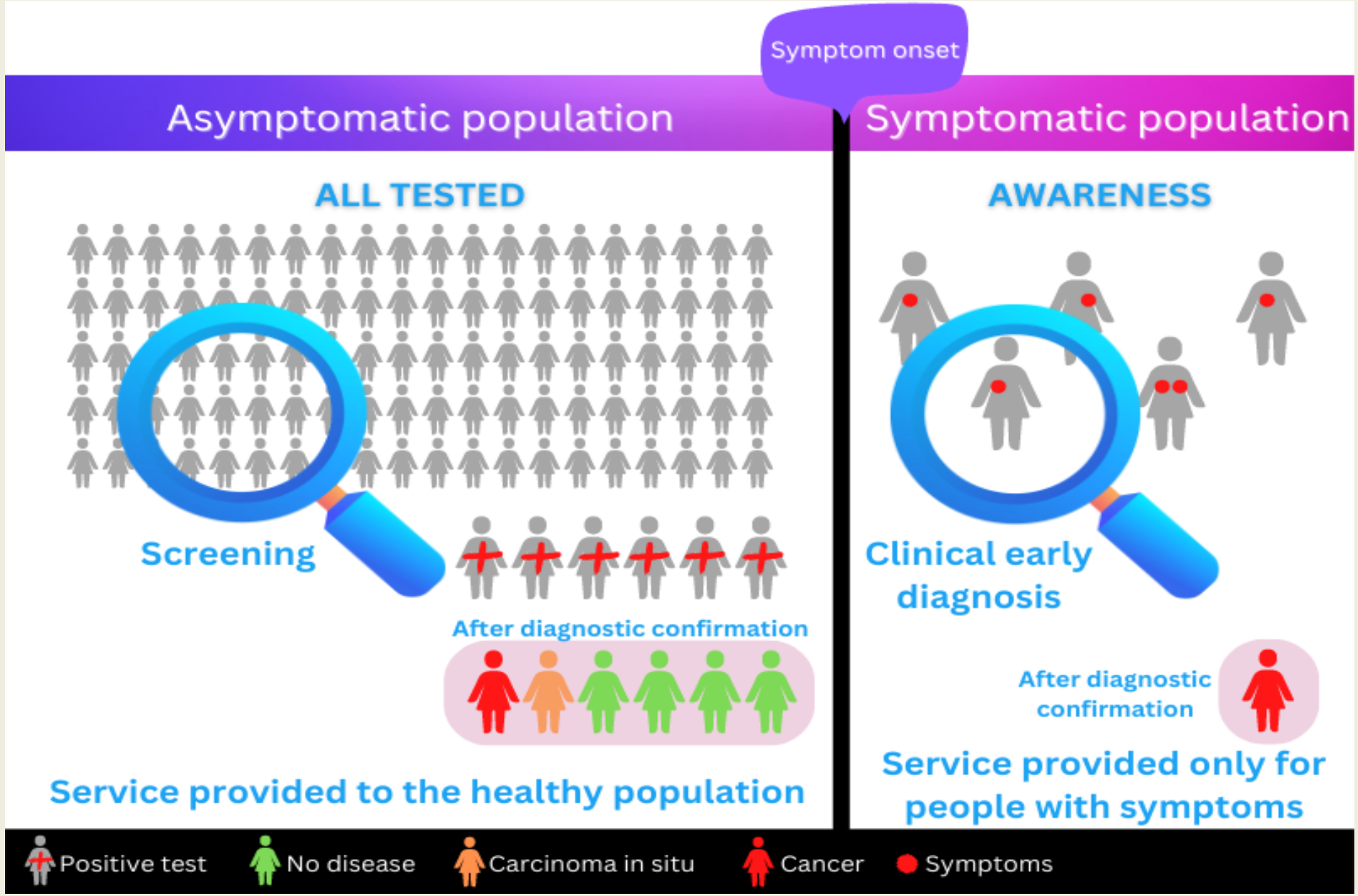


Iran J Public Health, Vol. 49, No.2, Feb 2020, pp.341-350

International Journal of Research in Medical Sciences 4(8):3102-3108

Clin Lab Med. 2018 March ; 38(1): 161–173.

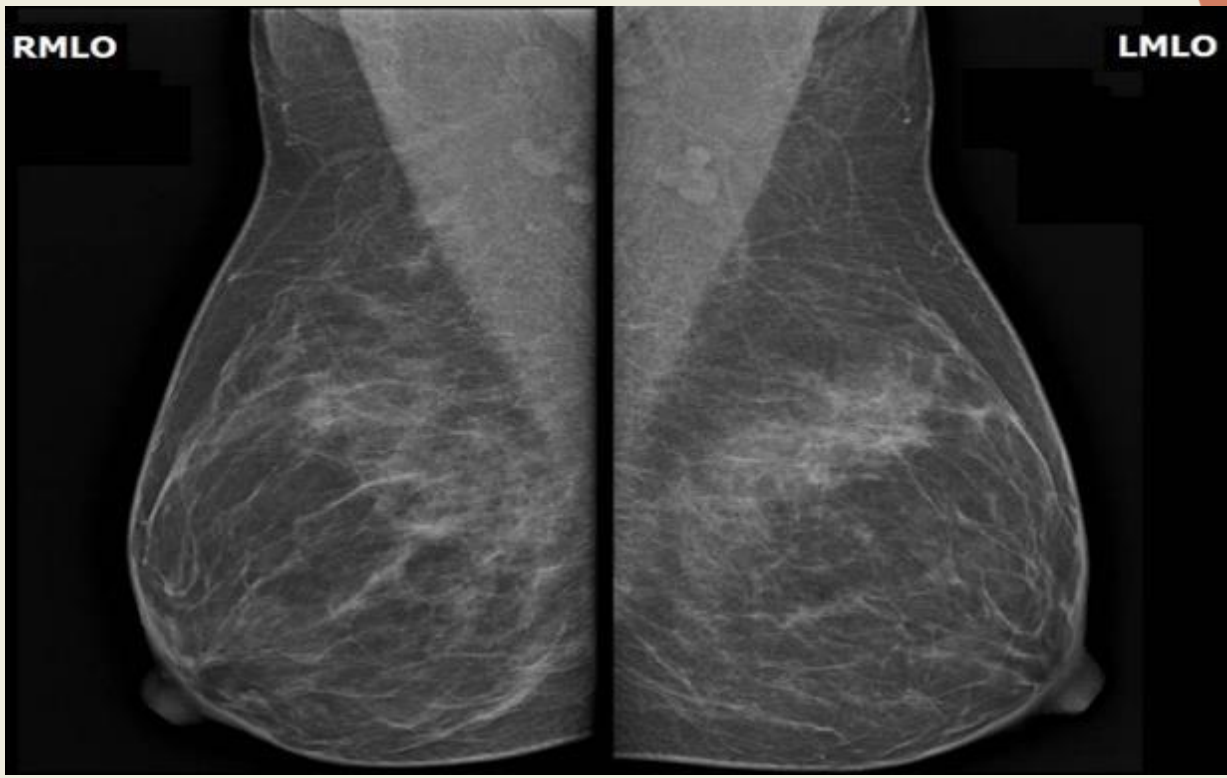
Early detection pathways



Mammography screening: IARC working group evaluation *(2015)*

RCTs demonstrate a 20% reduction in mortality in the intervention arm

Women aged 50-69 year undergoing mammography screening have 40% reduced risk of death from breast cancer



IARC handbook on Breast Cancer 2015

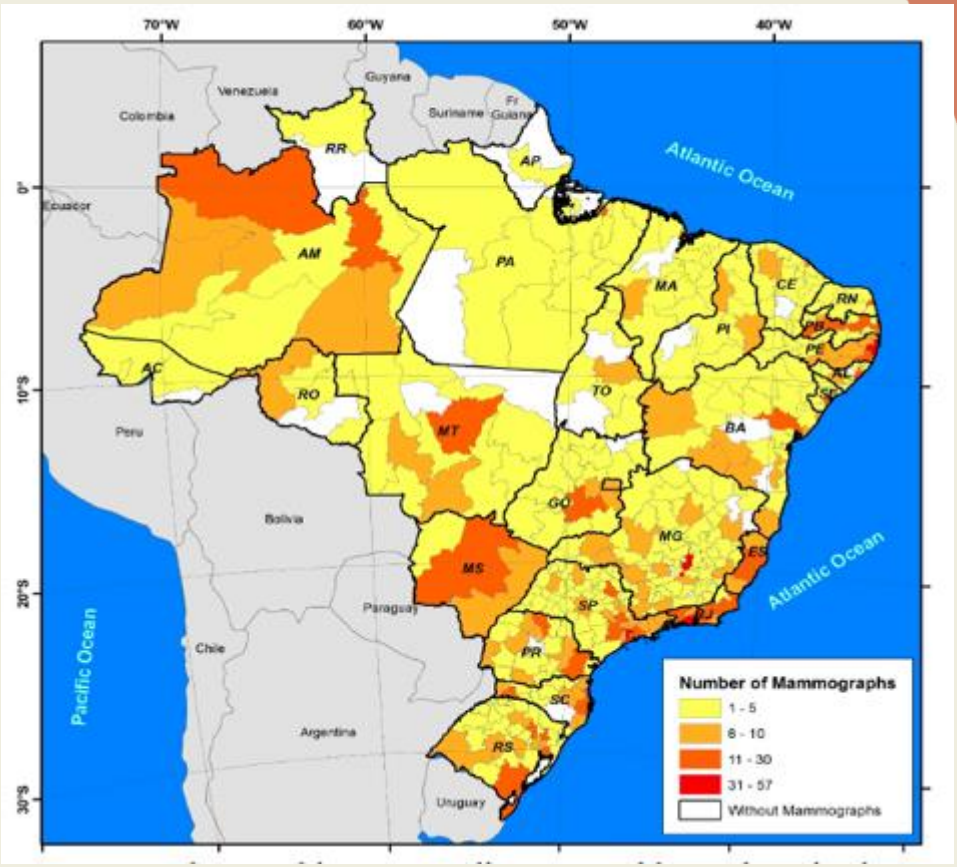
European guidelines on breast cancer screening & diagnosis

- Recommends using an organised mammography screening programme for early detection of breast cancer in asymptomatic women
- Suggests not implementing mammography screening in women <45 yrs of age
- Recommends 2-3 yrly mammography screening in women 44 to 74 yrs of age
- Recommends using either DBT or digital mammography

https://healthcare-quality.jrc.ec.europa.eu/european-breast-cancer-guidelines/dense-breast

Mammography screening in Brazil

- Free mammography screening is offered under Brazilian National Health Service (SUS)
- A National consensus document recommends 2 yrly screening of 50-69 yr old women
- Opportunistic screening is decentralized into different administrative regions
- Brazil has more machines (2113) than needed (2068) in the health services



Distribution of Mammographs by Health Regions in the States (2016)

*Asian Pac J Cancer Prev, **20 (6)**, 1857-1864*
Cad. Saúde Pública 2018; 34(6):e00046317

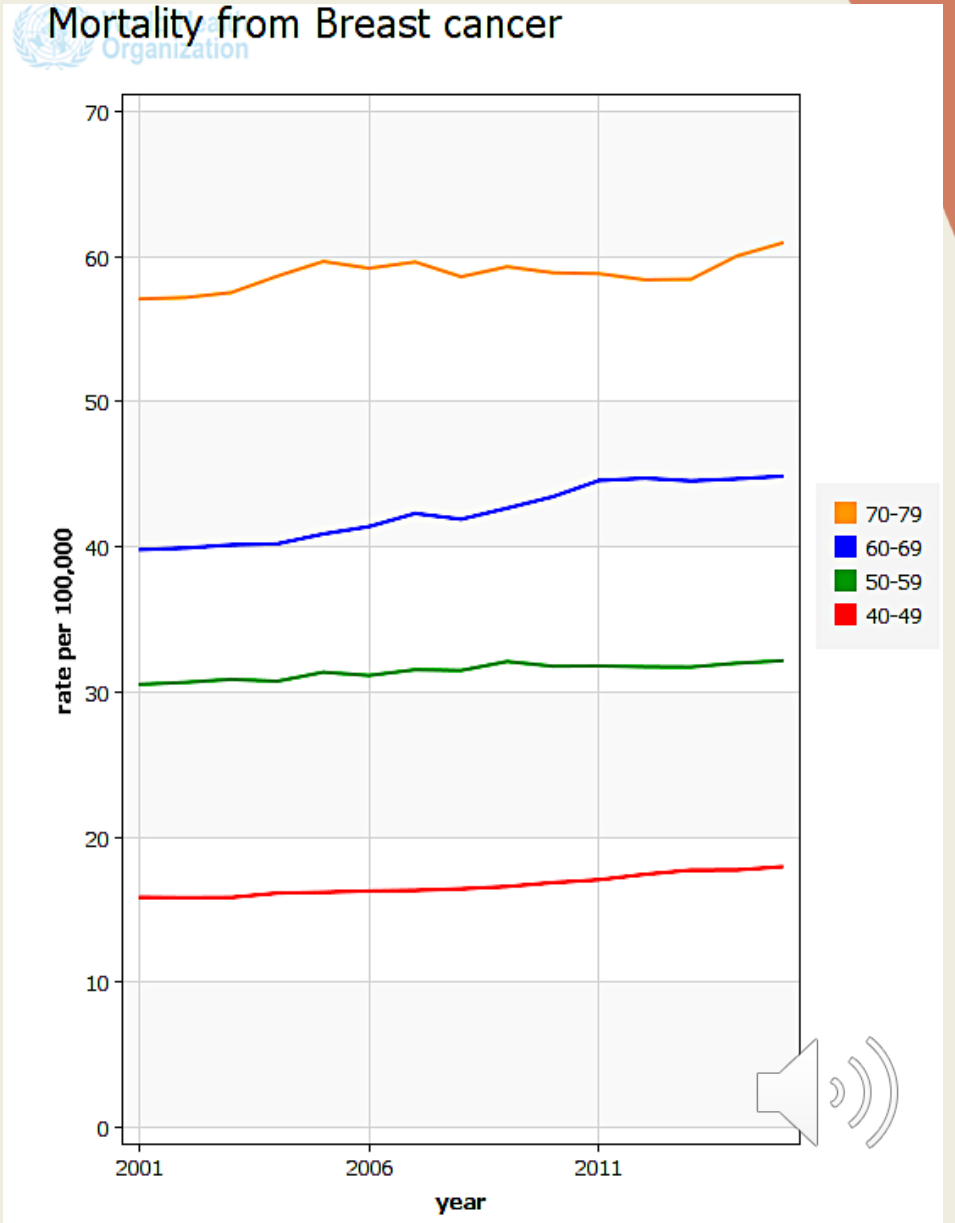
Mammography screening in Brazil

Coverage of target population <25%

Capacity utilization of mammography machines is only 29% due to lack of manpower and irregular supplies

Half of the mammograms are performed for women outside target age; mostly young

45% mammograms are performed at interval of 1 yr or less



Asian Pac J Cancer Prev, **20 (6)**, 1857-1864
Cad. Saúde Pública 2018; 34(6):e00046317

Building blocks	Elements of organized cancer screening
Leadership, governance, finance	• Policy framework • Evidence-based protocol/guideline that is universally complied with • Team for programme implementation and coordination
Health workforce	• Training of service providers
Access to essential services	• Adequate infrastructure, workforce and supplies for delivery of screening, diagnosis and treatment • Equity of access to screening, diagnosis and treatment services
Service delivery provisions	For improved awareness For informed choice  to identify the target population to invite eligible individuals for screening to notify the result and inform about FU to send recall to non-compliant individuals
Information system & quality assurance	Information system with appropriate linkages Legal framework • System to identify cancer occurrence • Quality improvement framework with a responsible team • Programme evaluation with indicators and reference standards on a regular basis; auditing and publication of report

Overdiagnosis with mammography screening

Defined as cancers detected at screening that would not have otherwise become clinically apparent in the woman's lifetime

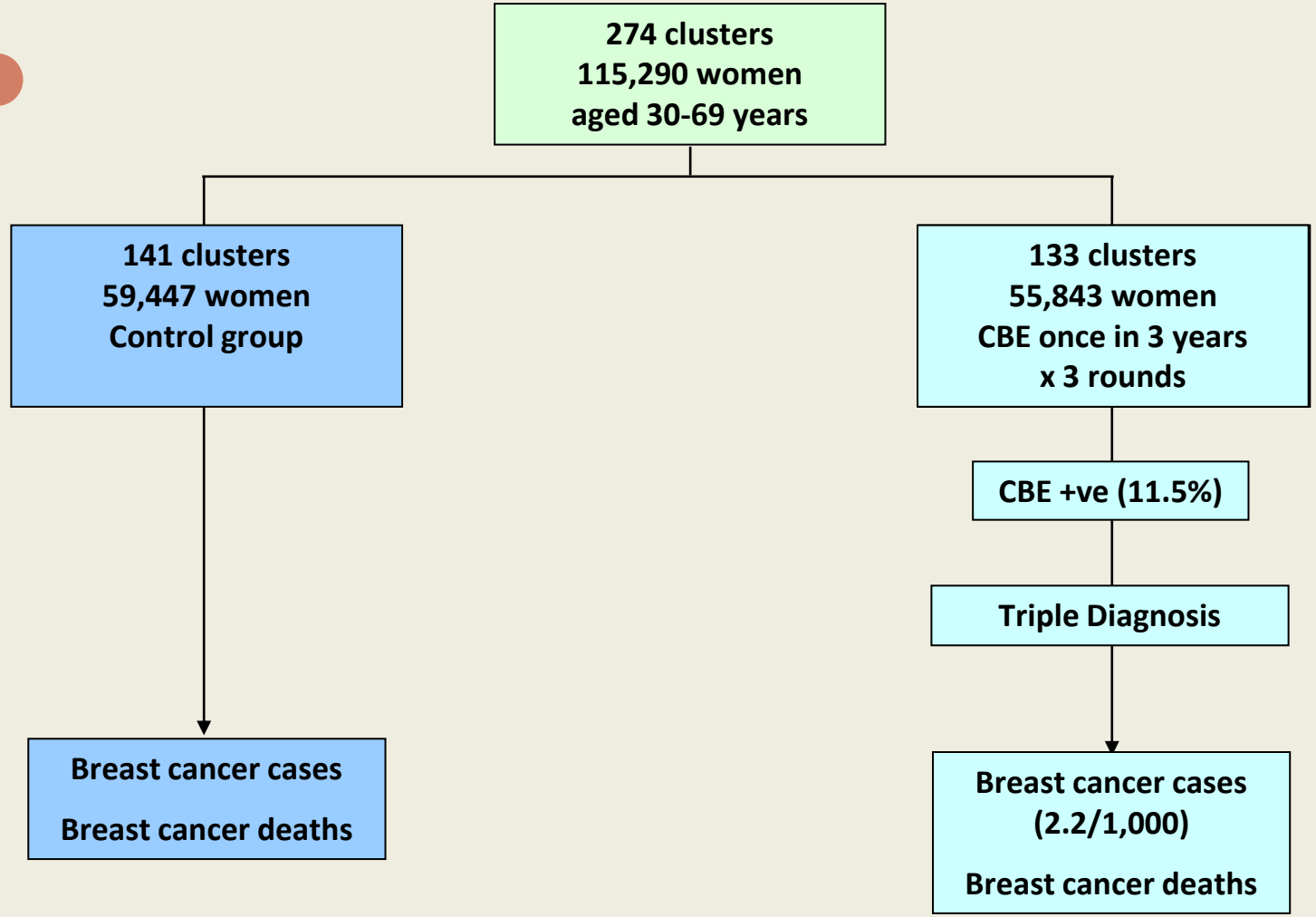
Assessment by an independent panel of experts (UK)-

- ***for every 10 000 UK women aged 50 years invited to screening for the next 20 years, 43 deaths from breast cancer would be prevented and 129 cases of breast cancer would be overdiagnosed;***
- ***one breast cancer death prevented for about every three over-diagnosed cases identified and treated***

Lancet Volume 380, Issue 9855, 17–23 November 2012, Pages 1778-1786

Clinical Breast Examination

Trivandrum breast cancer RCT design



Intervention group:

Received 3 rounds of CBE by trained health workers once in three years

Control group:

Received existing usual health care and health education on early detection and prevention of cervical cancer.

- Women in either arm received awareness about breast cancer & self-exam
- Trial was initiated in 2006
- Follow-up was done actively through home visits & passively through cancer & deaths registries

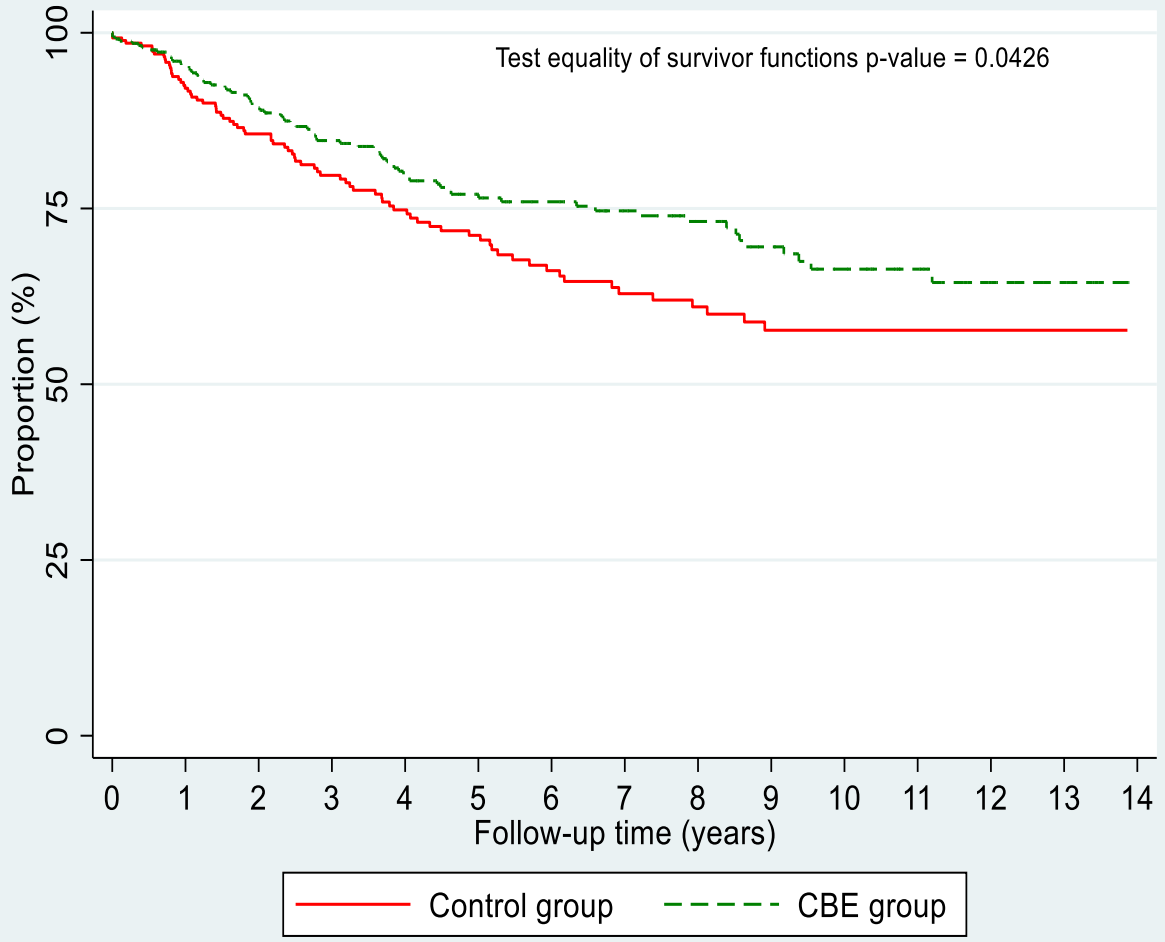
Ramdas et al. Cancer 2022

Stage, tumour size and node status distribution by study groups

	Control (N=59,447)		Intervention (N=55,843)		
	No.	Proportion (95% CI)	No.	Proportion (95% CI)	p-value
CBE +ve				11.5%	
Breast cancers cases		273		337	
Breast cancer detection rate				2.2/100,00	
Size of tumor <=2cm	36	**13.2 (9.2 - 17.2)**	**65**	**19.3 (15.1 - 23.5)**	**0.044**
Early composite stage breast cancers (I-II)	157	57.5 (51.6 - 63.4)	204	60.5 (55.3 - 65.8)	0.450
Advanced composite stage breast cancers (III-IV)	114	**41.8 (35.9 - 47.6)**	**127**	**37.7 (32.5 - 42.9)**	0.306
Breast cancer deaths	72	**26.4 (21.1 - 31.6)**	**71**	**21.1 (16.7 - 25.4)**	**0.124**

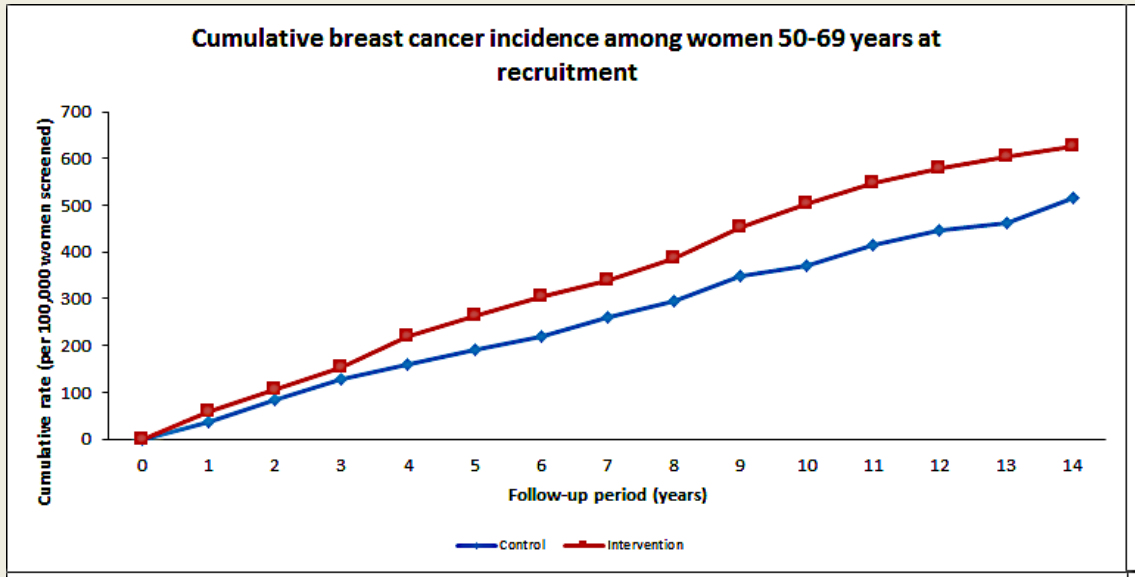
Impact of CBE on survival

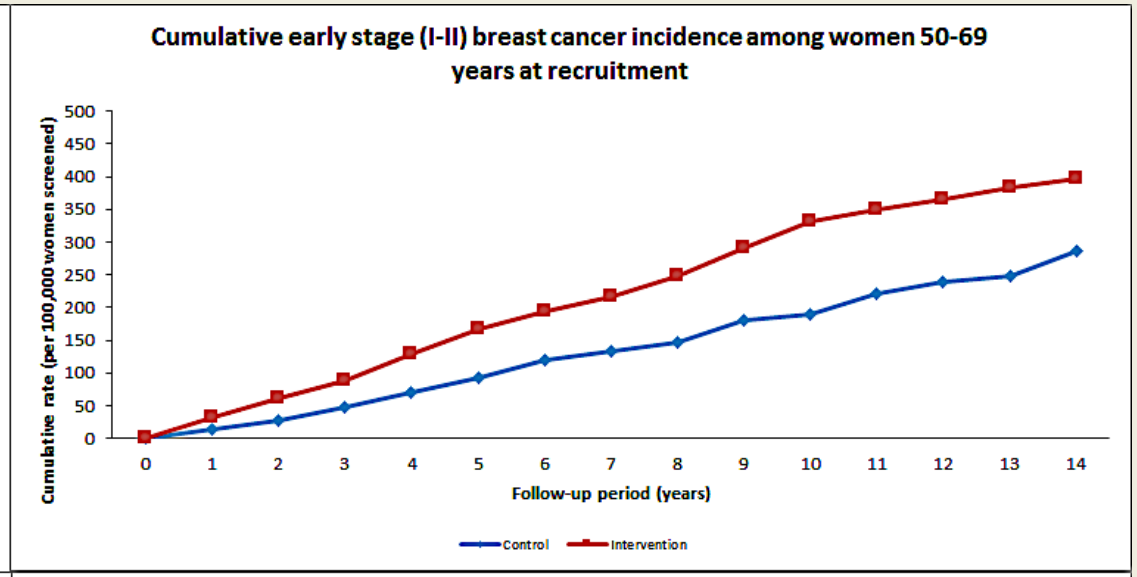
- 10- year breast cancer survival rates in intervention and control groups were **66.4% and 57.7%, respectively**
- Among breast cancer patients, a **significant 26% reduction in death** in intervention group compared to control group (Adjusted HR=0.74; 95%CI=0.56-0.99)

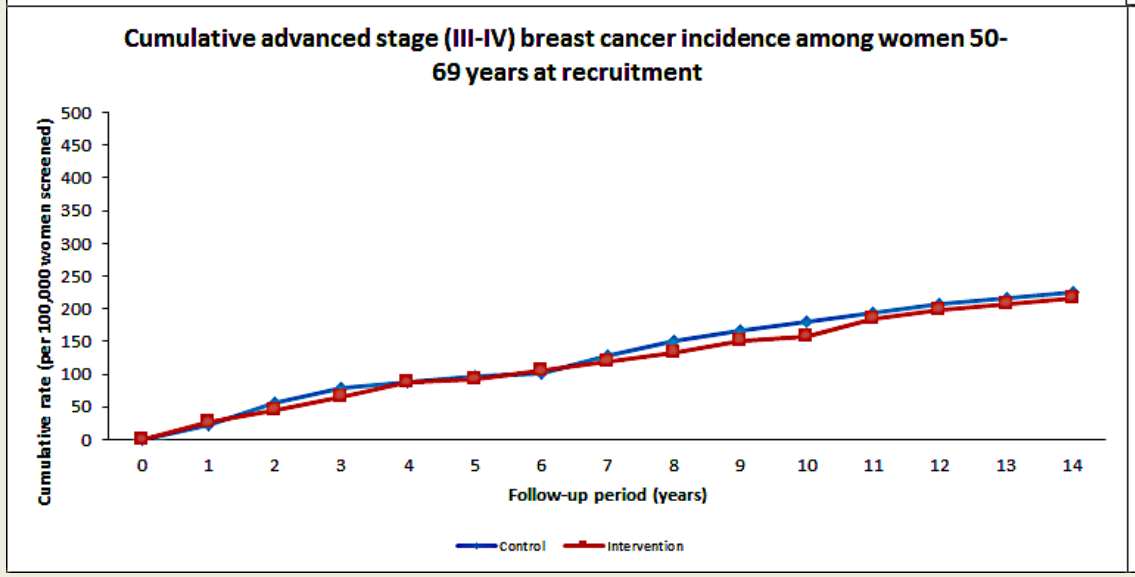


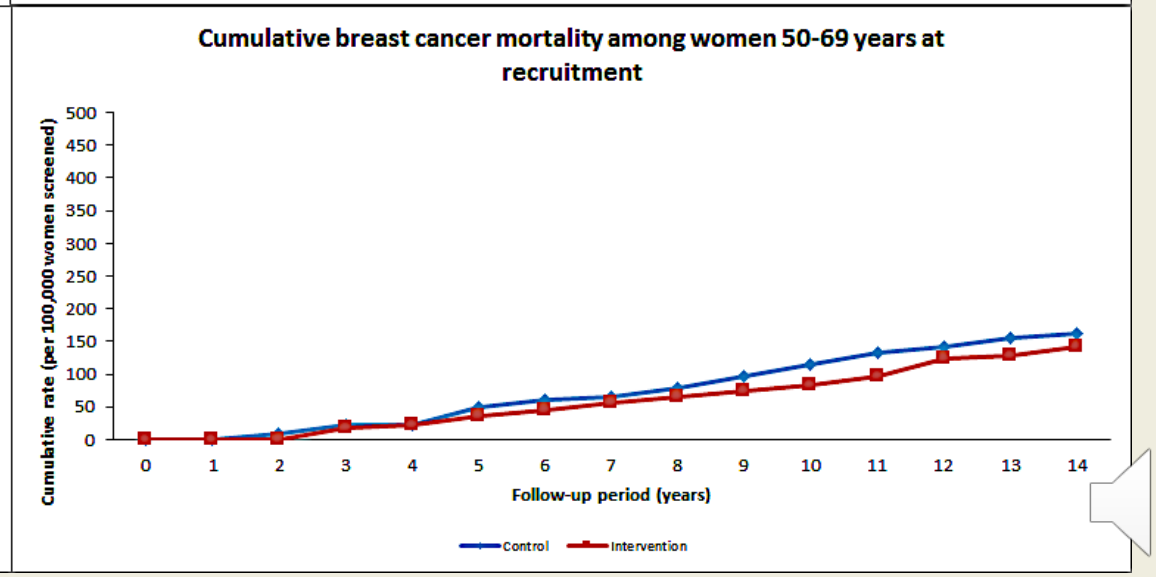
Ramdas et al. Cancer 2022

Cumulative breast cancer incidence and mortality among women aged 50-69 at recruitment









Ramdas et al. Cancer 2022

RCTs in Trivandrum (2006-19) and Mumbai (1998-2019)

75 360 women
(intervention group)

76 178 women
(control group – cancer awareness education)

Mumbai (Age 35-64 yrs)

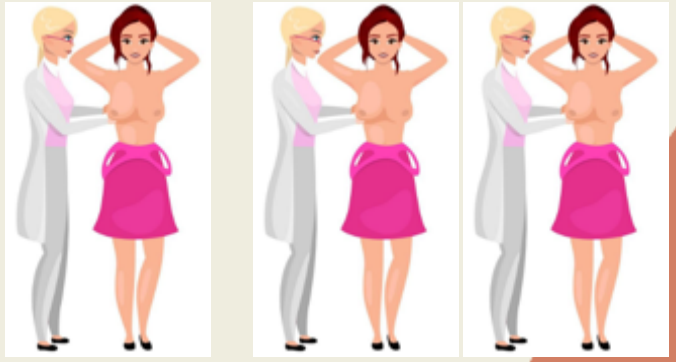
55 844 women
(intervention group)

59 808 women
(control group – cervical cancer prevention education)

Trivandrum (age 30 – 69 yrs)

4 rounds biennial screen

3 rounds triennial screen



Effect of CBE screening on breast cancer incidence & mortality after 20 years: RCT in Mumbai

Table 3 | Breast cancer incidence, breast cancer mortality, and all cause mortality after 20 years since commencement of study

	Screening arm				Control arm					
	Total No of women	No of diagnoses or deaths	No of person years	Crude rate per 100 000 person years (95% CI)	Total No of women	No of diagnoses or deaths	No of person years	Crude rate per 100 000 person year (95% CI)	Rate ratio (95% CI)†	P value
Breast cancer incidence										
Completion of active screening	75 360	198	326 891.2	60.57 (49.87 to 74.62)	76 178	151	333 346.7	45.30 (38.51 to 53.64)	1.34 (1.05 to 1.71)	0.02
Completion of 20 years of study	75 360	640	1 019 761	62.76 (57.02 to 69.35)	76 178	655	1 016 616	64.43 (60.43 to 68.90)	0.97 (0.87 to 1.09)	0.66
Breast cancer mortality										
All ages*	75 360	213	1 023 097	20.82 (18.25 to 23.97)	76 178	251	1 019 500	24.62 (21.71 to 28.04)	0.85 (0.71 to 1.01)	0.07
Age <50	54 212	149	763 141.8	19.53 (17.24 to 22.29)	54 188	158	751 367.0	21.03 (18.97 to 23.44)	0.93 (0.79 to 1.09)	0.37
Age ≥50	20 965	64	259 955.2	24.62 (20.62 to 29.76)	21 909	93	268 133.1	34.68 (27.54 to 44.37)	0.71 (0.54 to 0.94)	0.02

CBE is a critical component of triple assessment

Primary care

Secondary care

GLOBAL BREAST CANCER INITIATIVE

Objective and Pillars

OBJECTIVE: To reduce global breast cancer mortality by 2.5% per year, thereby averting 2.5 million breast cancer deaths globally between 2020 and 2040.

PILLAR 1: Health promotion for early detection

PILLAR 2: Timely breast diagnostics

PILLAR 3: Comprehensive breast cancer management

Targets

65% of invasive cancers are diagnosed at stage I/II

Evaluation, imaging and tissue diagnosis completed in 60 days

80% patients are treated comprehensively without abandonment

GBCI Pillar 1: Health promotion for early detection

Target: 60% of invasive cancers are stage I or II at diagnosis

Strategy I: Breast health education to women

Strategy II: Primary & secondary care provider education to perform clinical breast assessment (obtaining medical history; performing CBE & managing women appropriately)

To conclude..

Implementing mammography screening is logistically & financially challenging for LMICs

CBE screening every 2-3 years may be considered with appropriate programme organization

GBCI provides a framework for health system strengthening

The present dysfunctional referral pathways need to be reviewed & navigation to be introduced

Universal health coverage approach is required to reduce the inequalities and avoid financial toxicity

Systems need to be in place to monitor the GBCI targets

Thank You!