Centers of Excellence in Cancer

BREAST CANCER DIAGNOSIS AND STAGING:

A FRAMEWORK FOR PROGRESS

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DIAGNOSIS AND STAGING

➢ Early Detection

➢ Tissue Sampling

➢ Cancer Staging

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BREAST CANCER EPIDEMIOLOGY

STAGE AT DIAGNOSIS: UNITED STATES VS. INDIA

STAGE	EXTENT	5 year SURVIVAL	DISTRIBUTION	
			USA	INDIA
0	Noninvasive	100%	**16%**	----
I	Early stage disease	100%	**40%**	1%
II	Early stage disease	86%	**34%**	23%
III	Locally advanced	57%	6%	**52%**
IV	Metastatic disease	20%	4%	**24%**

USA:
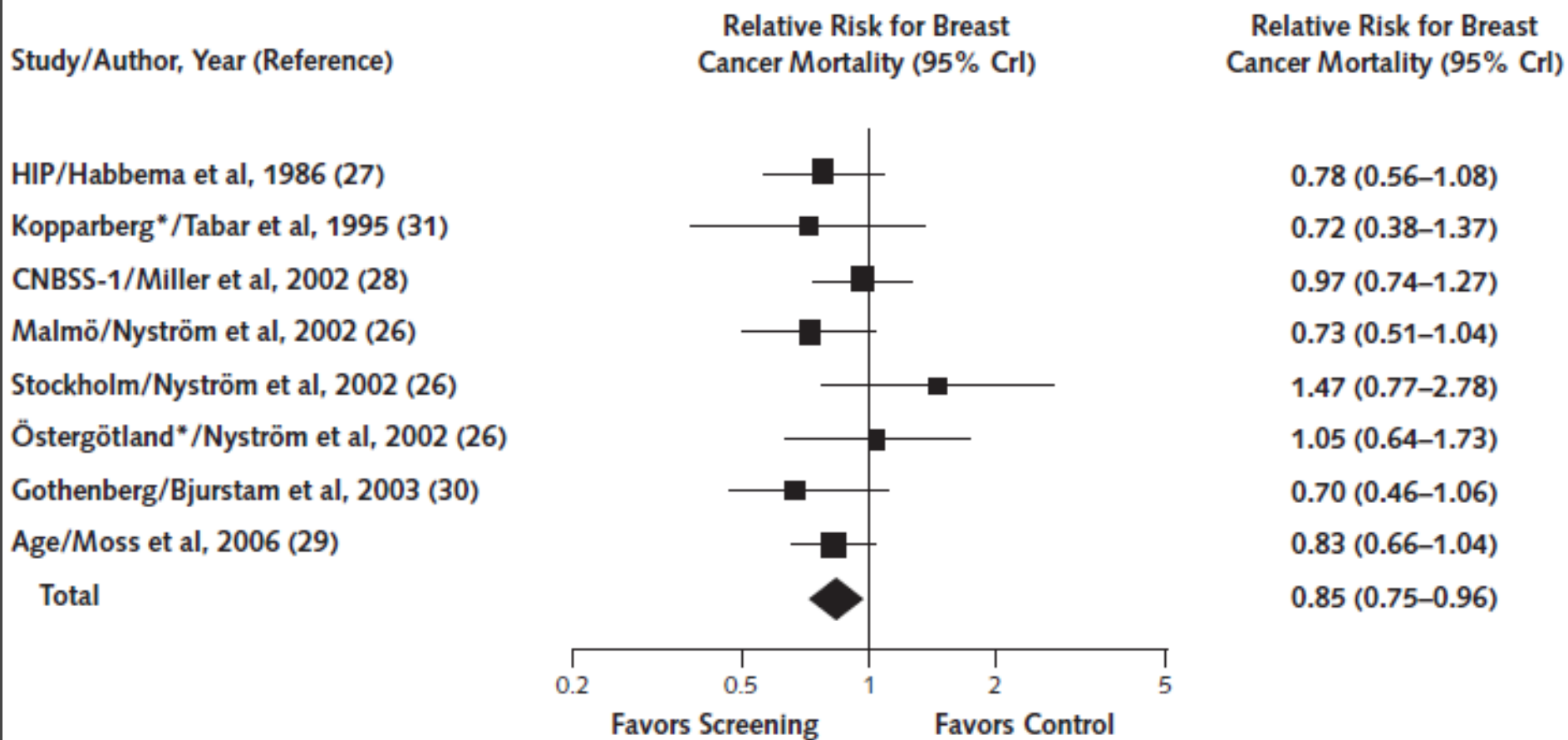90% DCIS or early staged invasive disease at diagnosis

INDIA:
76% locally advanced or metastatic at diagnosis

Sources: SEER Survival Monograph (NCI), 2007;
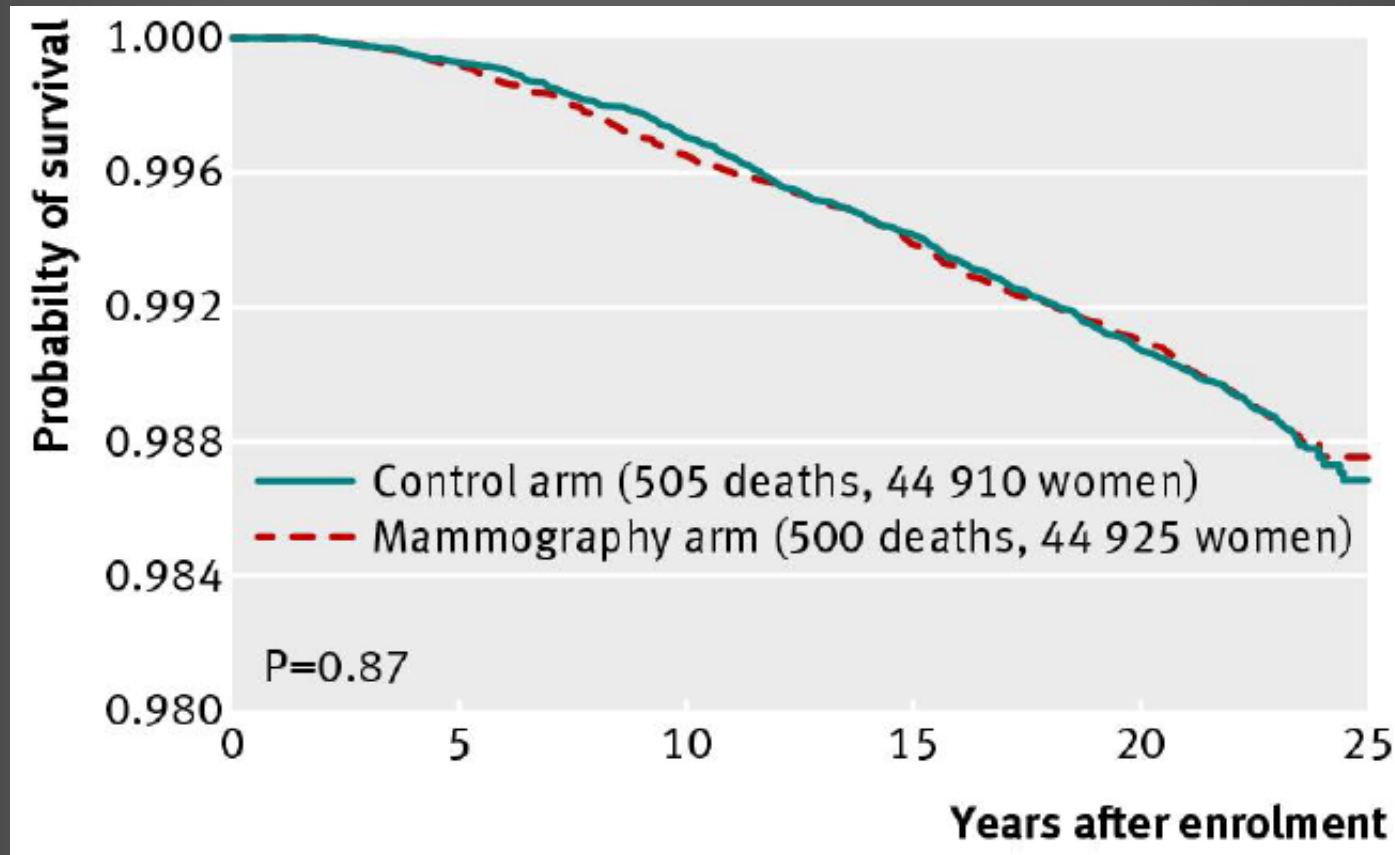Chopra, Cancer Institute Chennai, 2001

MAMMOGRAPHY SCREENING TRIALS
BREAST CANCER MORTALITY REDUCTION

Study/Author, Year (Reference)	Relative Risk for Breast Cancer Mortality (95% CrI)
HIP/Habbema et al, 1986 (27)	0.78 (0.56–1.08)
Kopparberg*/Tabar et al, 1995 (31)	0.72 (0.38–1.37)
CNBSS-1/Miller et al, 2002 (28)	0.97 (0.74–1.27)
Malmö/Nyström et al, 2002 (26)	0.73 (0.51–1.04)
Stockholm/Nyström et al, 2002 (26)	1.47 (0.77–2.78)
Östergötland*/Nyström et al, 2002 (26)	1.05 (0.64–1.73)
Gothenberg/Bjurstam et al, 2003 (30)	0.70 (0.46–1.06)
Age/Moss et al, 2006 (29)	0.83 (0.66–1.04)
Total	0.85 (0.75–0.96)

Favors Screening   Favors Control

Nelson et al, Ann Intern Med 151:727, 2009

RANDOMIZED SCREENING TRIALS
CANADIAN NATIONAL BREAST SCREENING STUDY

BREAST CANCER SPECIFIC MORTALITY

Miller et al, BMJ 348:g366, 2014

RANDOMIZED SCREENING TRIALS
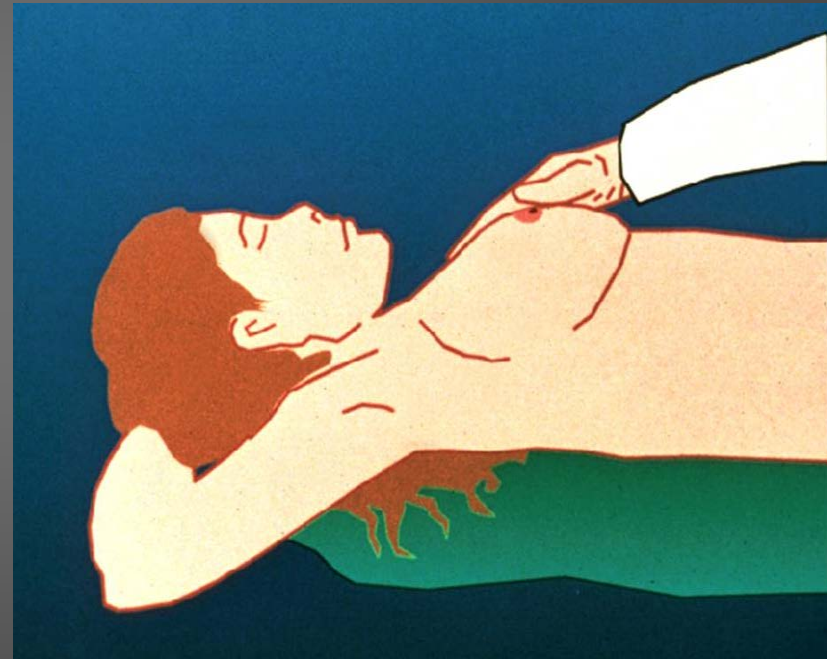## CANADIAN NATIONAL BREAST SCREENING STUDY

Table 1| Number of breast cancers diagnosed in mammography arm and control arm, by study year

Year of study	Mammography arm (n=44 925)		Control arm (n=44 910)	
	No of cancers detected	Mean size (cm)	No of cancers detected	Mean size (cm)
1	253	1.87	170	2.03
2	109	2.05	89	2.19
3	101	1.64	89	2.11
4	111	2.01	86	2.08
5	92	1.98	90	2.13
Subtotal years 1-5	666	1.91	524	2.10
6	83	2.15	83	2.42
7	82	1.99	93	2.24
8	107	2.01	133	2.04
9	115	1.86	119	1.90
10	127	1.69	128	1.71
Subtotal years 6-10	514	1.93	556	2.05
Subtotal years 11-25	2070	—	2053	—
Subtotal years 6-25	2584	—	2609	—
Total years 1-25	3250	—	3133	—

Miller et al, BMJ 348:g366, 2014

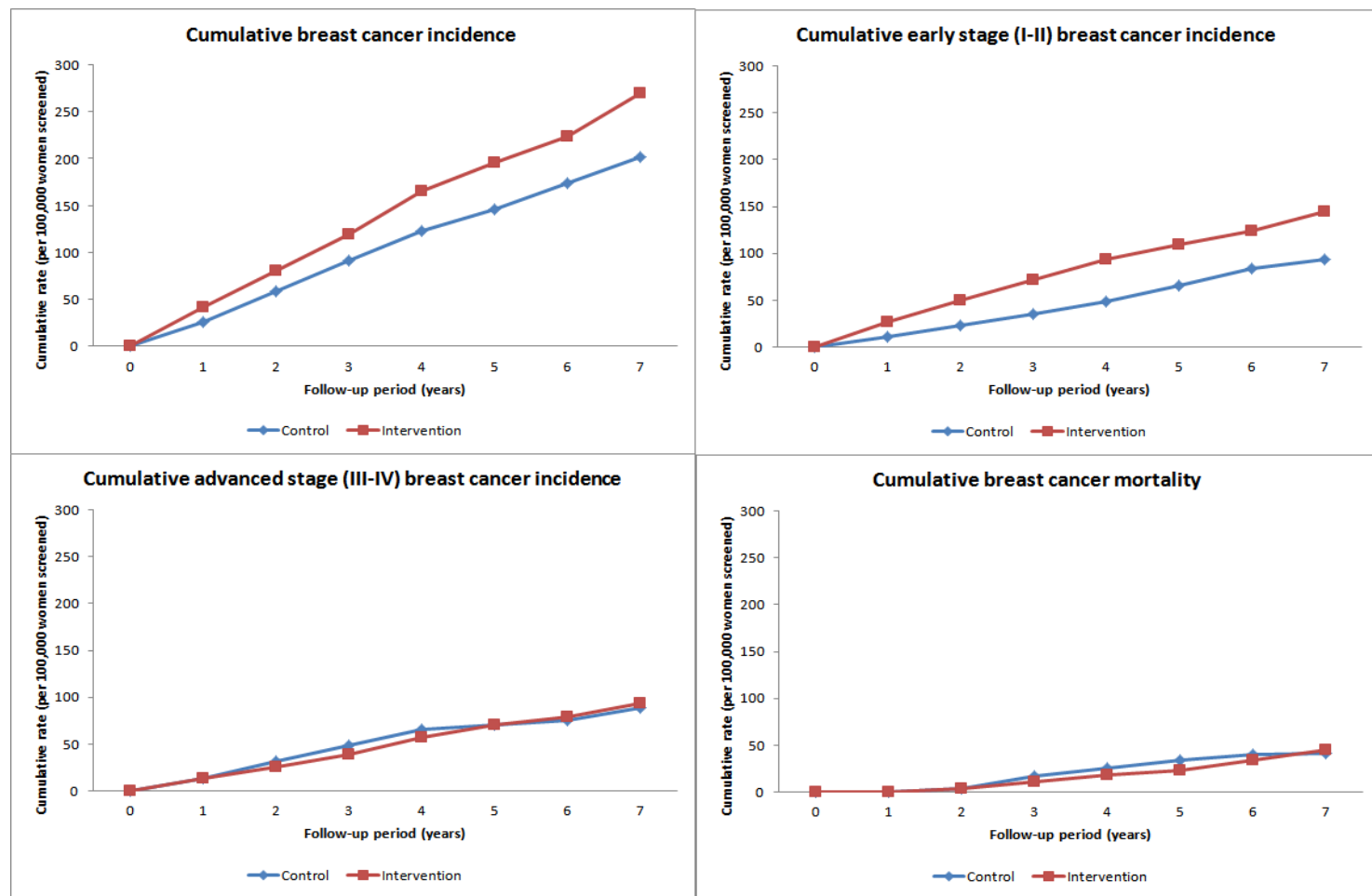# CLINICAL BREAST EXAMINATION: WHAT DO WE KNOW?

- CBE detects about 60% of mammo detected cancers

- CBE finds some cancers not seen on mammography

- CBE necessary for any breast program, especially when ts present with advanced disease

Trivandrum Breast Cancer Screening Study (TBCS)

Study design

275 clusters
115,652 women
aged 30-69 years

142 clusters
59,808 women
Control group

133 clusters
55,844 women
CBE once in 3 years
x 3 rounds

CBE +ve

Triple Assessment

Breast cancer cases

Breast cancer deaths

Breast cancer cases

Breast cancer deaths

International Agency for Research on Cancer

World Health Organization

In collaboration with Regional Cancer Centre (RCC), Trivandrum, India

Trivandrum Breast Cancer Screening Study (TBCS)

Cumulative breast cancer incidence and mortality

DIAGNOSIS AND STAGING

➢ Early Detection

➢ Tissue Sampling

➢ Cancer Staging

LMC IMPLEMENTATION RESEARCH
LOWER-MIDDLE INCOME COUNTRY

Peru

Early Detection and Patient Triage

Breast cancer care model

Regional Cancer Institute
(Trujillo)

- Mammography
- Pathology
- Surgery
- Chemotherapy
- Radiotherapy

La Fora Reference Hospital

- FNA

Health Centers

- Community education
- CBE

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PATH

TISSUE SAMPLING OPTIONS
FINE-NEEDLE ASPIRATION (FNA) VS. CORE BIOPSY

FNA

- Low cost (<$5 per patient)
- Immediate result (20 minutes)
- Can be integrated into health system
- Requires expert cytologist for reading

Core Needle Biopsy

- Histology services are mandatory in system
- High cost ($30 - 60 per single use needle)
- Delayed result (1 day to <1 month)

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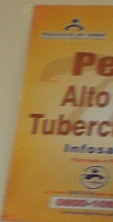
Peru Site Visit 2012

Public education about breast cancer and breast health

PLAN DE SUPERVISIÓN HOSPITAL REGIONAL DE LORETO

• Capacitación de proveedores clínicos (obstetrices y médicos) en ECM.

• El 1 y 2 de julio de 2011, un grupo de médicos y enfermeras de INEN, IREN Norte y PATH, asistió a un curso conjunto en ECM y BAAF celebrado en IREN-Norte. Donde ocho obstetrices de la Red de Salud de Pacasmayo y tres médicos del Hospital La Fora recibieron la formación en teoría científica, aplicación práctica y orientación de pacientes con respecto al ECM.

1 Hinchazón, calor, oscurecimiento o enrojecimiento de la mama.

2 Cambio en el tamaño y/o forma de la mama.
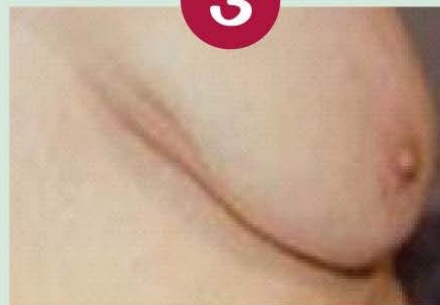
3 Hoyuelos o arrugas en la piel.

4 Picazón, úlceras o llaga escamosa en la piel o sarpullido en el pezón.
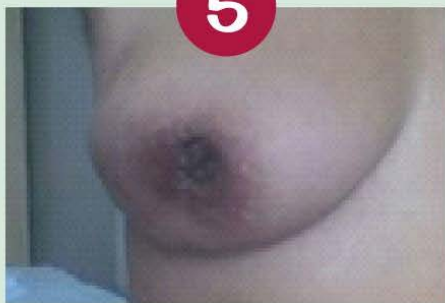
5 Hundimiento del pezón o de otras partes de la mama.
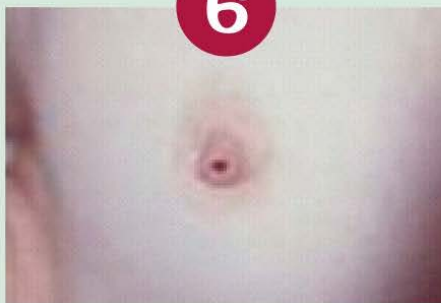
6 Secreción repentina del pezón.
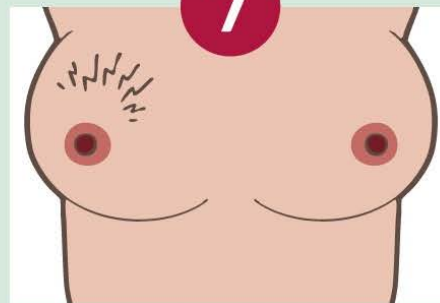
7 Dolor reciente y persistente en alguna parte de la mama.
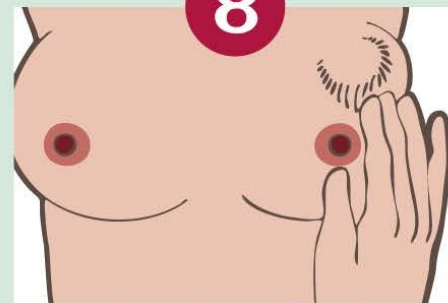
8 Aparición de alguna masa, bolita dura, o la piel más gruesa dentro de la mama.

DATOS GENERALES

Nombre del establecimiento _____ N° Historia Clinica _____

Primer Apellido _____ Segundo Apellido _____ Nombres _____ DNI _____

Dirección _____ Distrito _____ Teléfono _____

____/____/____ Fecha de nacimiento | Edad (años) _____ | Establecimiento que refiere _____ | ____/____/____ Fecha de consulta

¿Has escuchado acerca de salud mamaria de un promotor(a) de salud?

No ☐   Si, en una sesión educativa en el establecimiento de salud ☐   Si, en una sesión educativa en mi comunidad ☐   Si, a través del contacto individual con el promotor ☐

ANAMNESIS

Motivo de consulta: Por tamizaje ☐   Por sintomas mamarios ☐   Por referencia ☐

Sintomas _____

_____

_____ D / M / A_____ Duración_____

Relación con ciclo menstrual: SI ☐   NO ☐   Peso: _____ Kg.   Talla: _____ mt.

ANTECEDENTES MAMARIOS:

Exámenes previos: Biopsia ☐   Mamografia ☐   Ecografia ☐   Fecha: ___/___/___   Resultado:_____

Mastitis ☐   Otros: _____

Edad menarquia:_____ A   Edad menopausia: _____ A   G ☐   P ☐☐☐☐

Uso de anticonceptivos: SI ☐   NO ☐   Tipo: Oral ☐   Inyectable ☐   Duración: _____ M / A

Terapia de reemplazo hormonal: SI ☐   NO ☐   Edad primer embarazo: _____ Años   Lactancia Materna: SI ☐   NO ☐
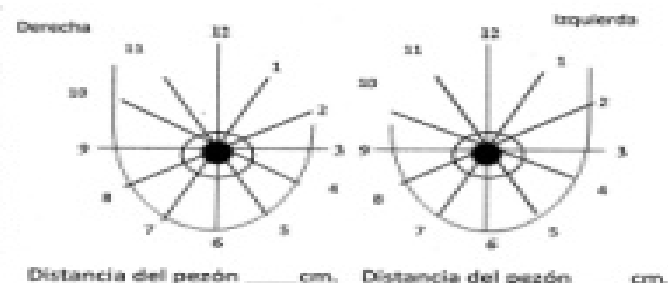
Antecedentes personales y familiares:

Historia personal de: Cáncer de mama: SI ☐ NO ☐   Cáncer de ovario: SI ☐ NO ☐   Otro cáncer:_____

Historia de familiar directo de: Cáncer de mama: SI ☐ NO ☐   Cáncer de ovario: SI ☐ NO ☐   Otro cáncer:_____

Hábitos: Tabaco: SI ☐   NO ☐   Alcohol: SI ☐   NO ☐

EXAMEN CLINICO DE MAMA:

CARACTERISTICAS DEL TUMOR		Mama Derecha	Mama Izquierda
Tumor palpable	Tamaño Tumor 1	cm	cm
	Tamaño Tumor 2	cm	cm
Consistencia del tumor (blando, duro, pétreo, fluctuante)			
Forma del tumor (redondo, oval, dismórfico)			
Bordes del tumor (regular, irregular)			
Ganglio (axilar, supraclavicular)			
Secreción por pezón (color)			
Retracción (pezón, piel)			
Eczema (pezón, areola)			
Ulceración (pezón, piel)			
Eritema o edema (pezón, piel)			
"Piel de naranja"			

Derecha / Izquierda

Distancia del pezón _____ cm.   Distancia del pezón _____ cm.

BREAST CANCER ASSESSMENT

LOW INCOME COUNTRY

Rwanda

Early Detection Capacity Analysis

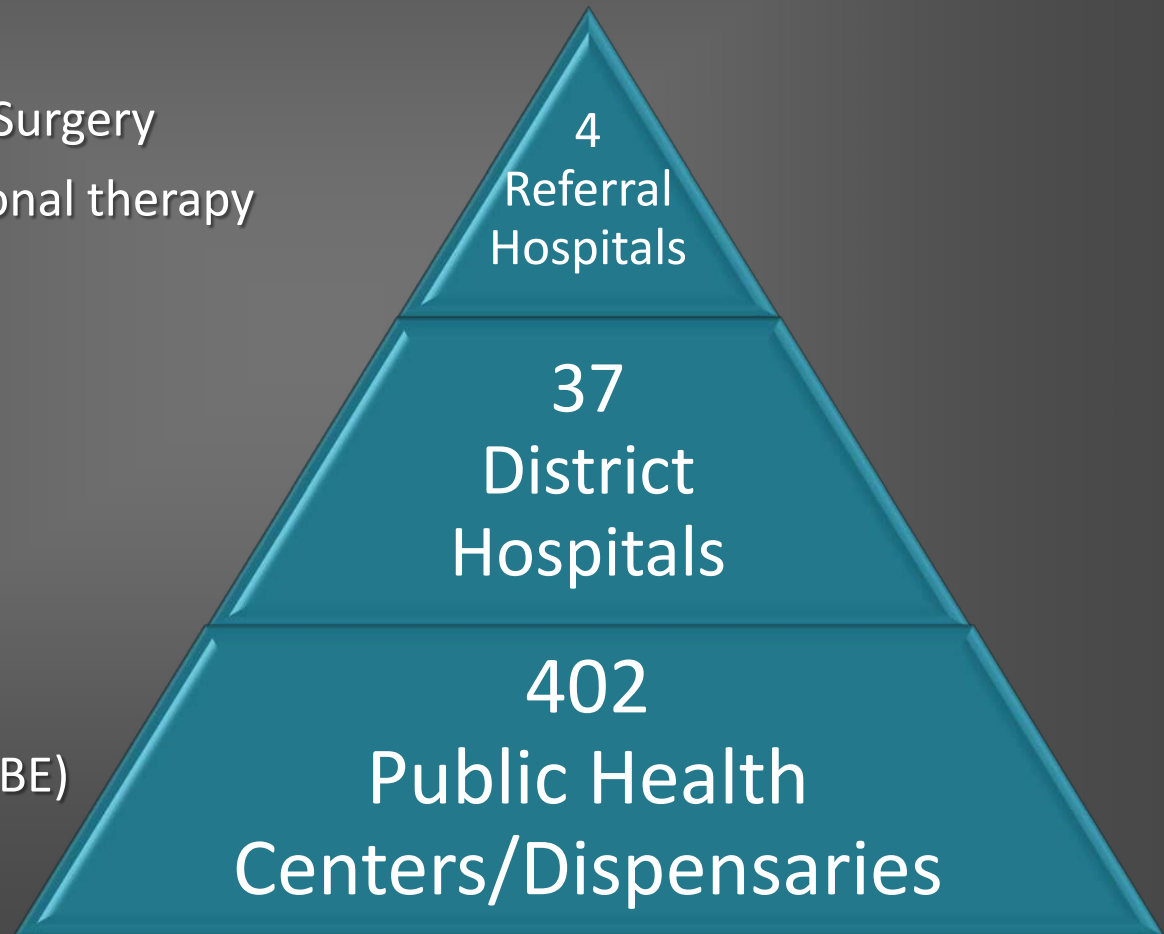# HEALTH FACILITY OVERVIEW
RWANDA, EAST AFRICA

Tertiary
- Anatomic pathology / Surgery
- Chemotherapy /hormonal therapy
- Radiotherapy(?)

Secondary
- Clinical Diagnosis
- Tissue Sampling

Primary
- Clinical Breast Exam (CBE)
- Awareness Education

4 Referral Hospitals

37 District Hospitals

402 Public Health Centers/Dispensaries

Source: MOH, 2009

Ultrasound: Kibagabaga Hospital

Dr. Ssendi Bwogi, Cytopathologist: CHUB

The *The* Breast Health Global Initiative

DIAGNOSIS AND STAGING

➤ Early Detection

➤ Tissue Sampling

➤ Cancer Staging

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METRICS & QUALITY IMPROVEMENT

Patient Factors

PROCESS
- Diagnosis and staging
- Cancer treatment
- Symptom management
- Surveillance

OUTCOME
- Survival
- QOL
- Satisfaction

STRUCTURE
- Resources (e.g. radiation)
- Coverage and reimbursement

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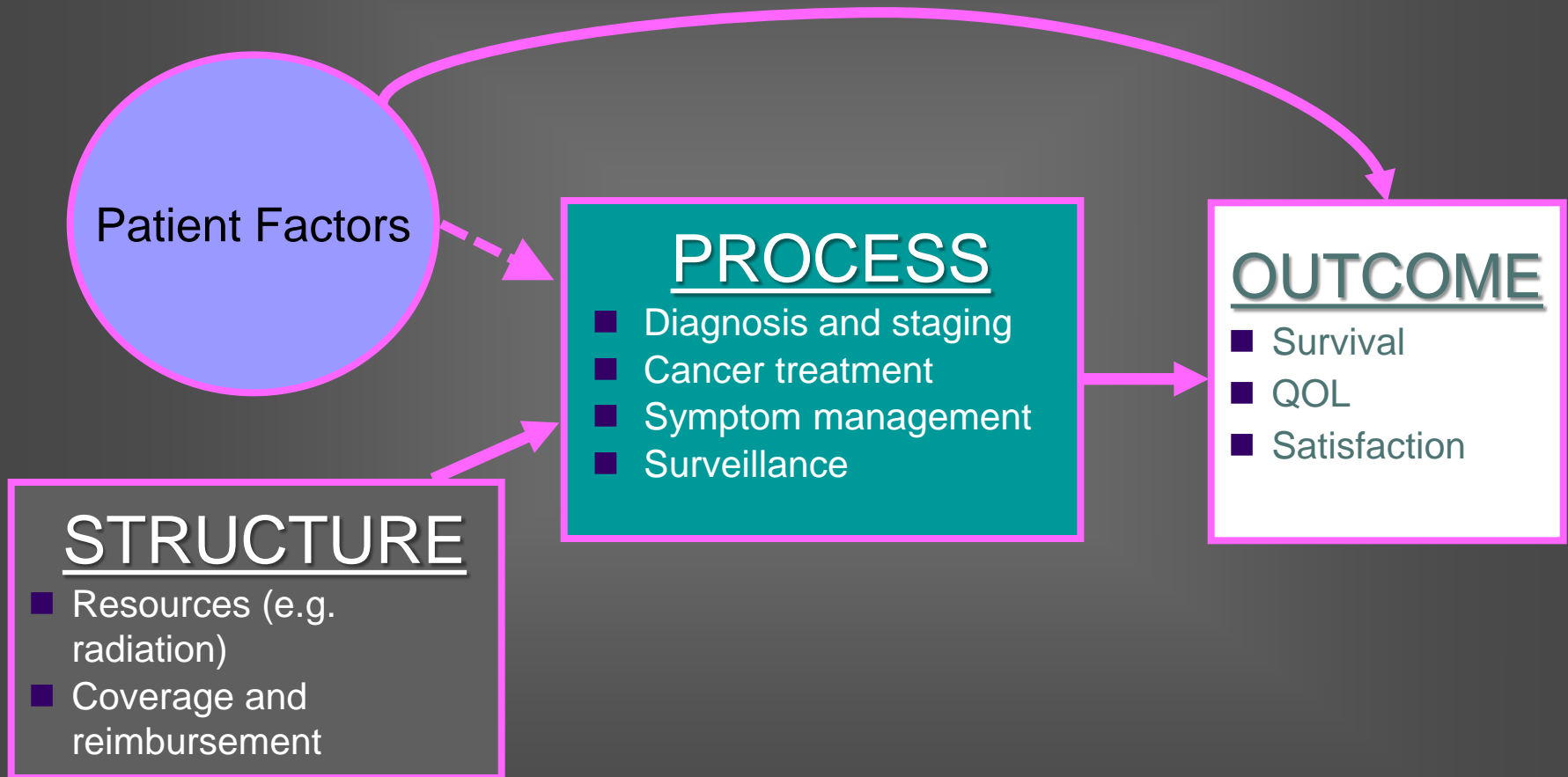
BHGI SYSTEMS METRICS

Level of resources	Early Detection	Diagnosis	Treatment	Programmatic
Basic	# Pts with documented H&P / # Pts evaluated Description: The ratio of the number of patients who have a recorded history and physical examination within the target group to the number of patients who were clinically evaluated within the target group for a center or program providing organized breast healthcare.	# Pts with tissue dx / # Pts with suspic. mass Description: The ratio of the number of patients who receive a tissue diagnosis (benign or malignant) to the number of patients who had a "suspicious mass" (finding on CBE that the clinical examiner considers abnormal and therefore warranting further evaluation).	# Pts treated for ca / # Pts with tissue dx ca Description: The ratio of the number of patients who receive cancer treatment of some fashion (surgery beyond surgical biopsy, radiation tx and/or systemic tx) to the number of patients who had a tissue diagnosis of cancer.	Median pathologic tumor size Description: The median pathologically determined size of invasive breast primary tumors within the target group for a center or program providing organized breast healthcare.
Limited	% Pts with CBE-detected abnormalities who undergo breast imaging for work-up	% Pts with biopsy-proven cancer diagnosis who have documented TNM stage	% Pts with ca diagnosis who start treatment within 120d of tissue diagnosis	% cancer Pts who have TNM stage I or II disease at initial biopsy-proven diagnosis
Enhanced	% Pts age 50-69 who had screening mammogram within past 24 months	% Pts with biopsy-proven cancer diagnosis who have documented HER-2/neu status	% Pts treated by lumpectomy starting XRT within 120d of last surgical procedure	% cancer Pts who have TNM stage I or II disease who at 5 yrs have no evidence of disease recurrence
Maximal	Maximal category process metrics determined based upon standards of care in high-income countries	Maximal category process metrics determined based upon standards of care in high-income countries	Maximal category process metrics determined based upon standards of care in high-income countries	Maximal category process metrics determined based upon standards of care in high-income countries

Cancer: 113 (8 suppl), 2008

The Breast Health Global Initiative

BHGI SYSTEMS METRICS (2008)
MEDIAN TUMOR SIZE (MTS)

- ➤ "T" is most fundamental element in TNM staging and is measured on clinical breast exam (CBE)

- ➤ MTS is surrogate measure of early detection success in healthcare delivery system

- ➤ MTS suggests early detection strategy:

  - ➤ > 4 – 5cm: Awareness + CBE (no mammography)

  - ➤ < 2cm: Image screening needed for down-staging

26 Harford, Cancer: 113 (8 suppl):2282, 2008

HOW DO WE DETERMINE "STAGE" ?

- Staging is the process of determining how much cancer is in the body

- Staging is done both before and after a patient goes to operating room

CLINICAL staging is **pre-**operative

PATHOLOGIC staging is **post-** operative
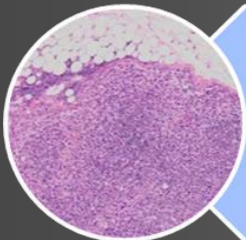
SLIDE CREDIT: Gilles Erb, PhD

STAGING FOR BREAST CANCER = TNM
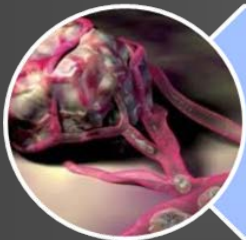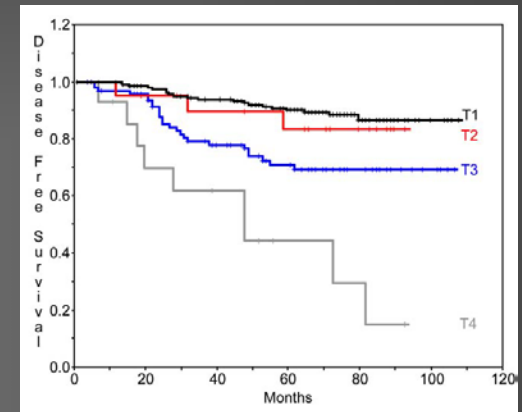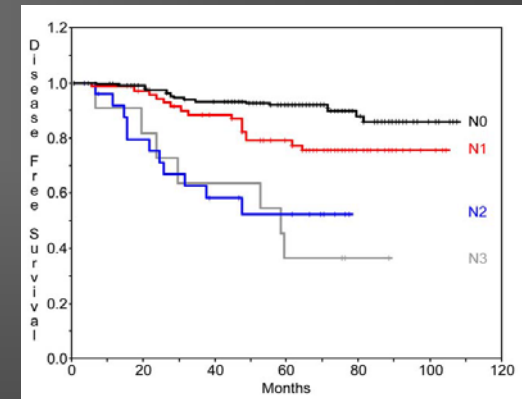## AJCC-UICC

Tumor Size (T)

Nodal Stage (N)

Metastasis (M)

Cancer 1989;63:181–187

Cancer 1983;52:1551–1557

AJCC= American Joint Committee on Cancer   UICC= Union for International Cancer Control
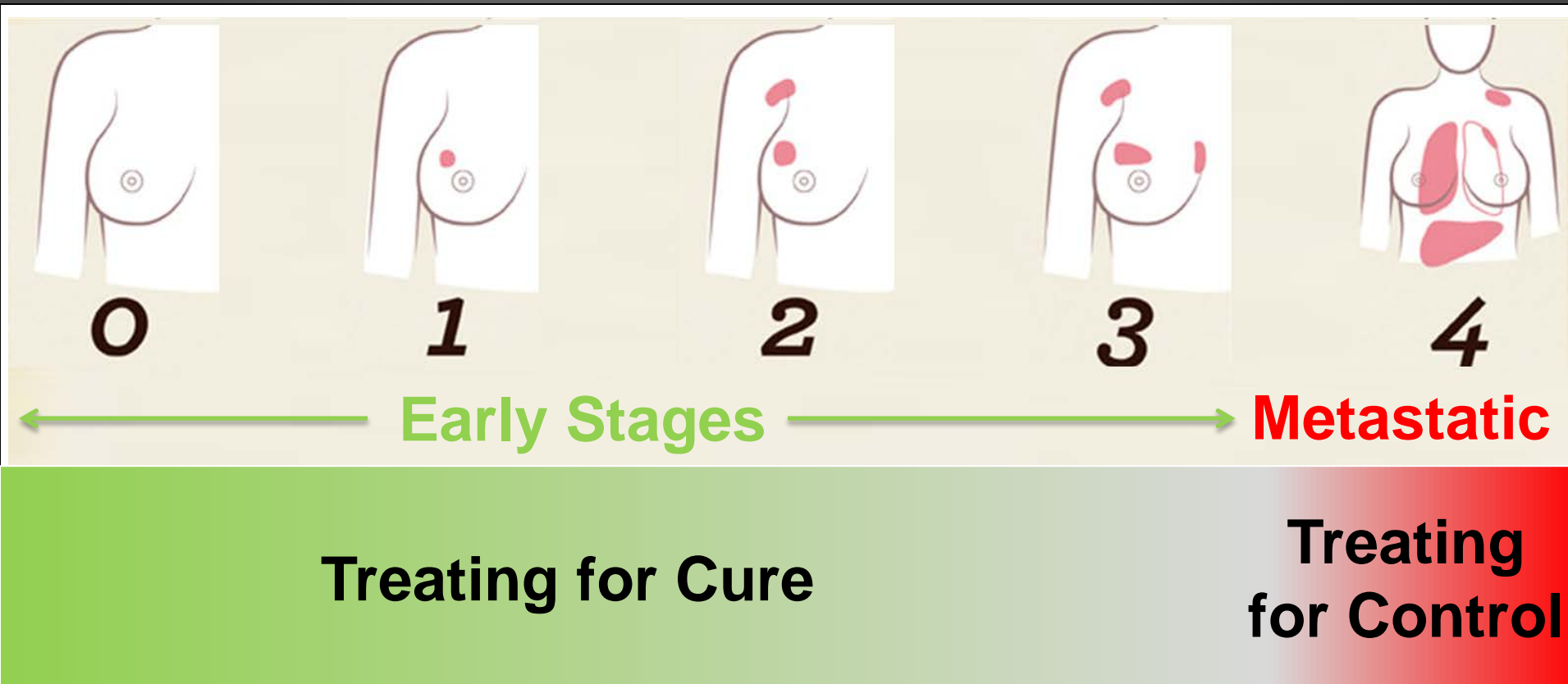
SLIDE CREDIT: Gilles Erb, PhD

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BREAST CANCER FOUNDATION
TNM STAGING

	T0	T1	T2	T3	T4
N0	Stage I				
N1	Stage II				
N2	Stage IIIa				
N3	Stage IIIb				
M1	Stage IV				

AJCC= American Joint Committee on Cancer   UICC= Union for International Cancer Control

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SLIDE CREDIT: Gilles Erb, PhD

BREAST CANCER FOUNDATION
TNM STAGING

Early Stages → **Metastatic**

Treating for Cure

Treating for Control

AJCC= American Joint Committee on Cancer   UICC= Union for International Cancer Control

SLIDE CREDIT: Gilles Erb, PhD

DIAGNOSIS AND STAGING
SUMMARY

➤ Late-stage presentation is a fundamental obstacle to improving global breast cancer outcomes.

➤ Systematic approaches to make prompt, accurate cancer diagnoses is essential for cancer systems to work.

➤ Tissue sampling approaches with FNA and cytology can facilitate cancer patient triage.

➤ Cancer staging provides the necessary framework for determining cancer treatment as well as building cancer registration.

The Breast Health Global Initiative

www.bhgi.info

BCI2.5

Making breast cancer a global priority

www.BCI25.org