

Early Detection Resource Allocation

Level of resources	Public Education and Awareness	Detection Methods	Evaluation Goal
Basic	Development of culturally sensitive, linguistically appropriate local education programs for target populations to teach value of early detection, breast cancer risk factors and breast health awareness (education + self-examination)	Clinical history and CBE	Breast health awareness regarding value of early detection in improving breast cancer outcome
Limited	Culturally and linguistically appropriate targeted outreach/education encouraging CBE for age groups at higher risk administered at district/provincial level using healthcare providers in the field	Diagnostic breast US +/- diagnostic mammography in women with positive CBE Mammographic screening of target group*	Downsizing of symptomatic disease
Enhanced	Regional awareness programs regarding breast health linked to general health and women's health programs	Mammographic screening every 2 years in women ages 50-69* Consider mammographic screening every 12-18 months in women ages 40-49*	Downsizing and/or downstaging of asymptomatic disease in women in highest yield target groups
Maximal	National awareness campaigns regarding breast health using media	Consider annual mammographic screening in women ages 40 and older Other imaging technologies as appropriate for high-risk groups†	Downsizing and/or downstaging of asymptomatic disease in women in all risk groups

Note: The table stratification scheme implies incrementally increasing resource allocation at the basic, limited, and enhanced levels. Maximal level resources should not be targeted for implementation in LMCs, even though they may be used in some higher income settings.

Early Detection Resource Allocation and Process Metrics

Level of resources	Public Education and Awareness	Detection Methods	Evaluation Goal	Process Metrics
Basic	Development of culturally sensitive, linguistically appropriate local education programs for target populations to teach value of early detection, breast cancer risk factors and breast health awareness (education + self-examination)	Clinical history and CBE	Breast health awareness regarding value of early detection in improving breast cancer outcome	# Pts with documented H&P / # Pts evaluated <i>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.</i>
Limited	Culturally and linguistically appropriate targeted outreach/ education encouraging CBE for age groups at higher risk administered at district/provincial level using healthcare providers in the field	Diagnostic breast US +/- diagnostic mammography in women with positive CBE Mammographic screening of target group*	Downsizing of symptomatic disease	% Pts with CBE-detected abnormalities who undergo breast imaging for work-up
Enhanced	Regional awareness programs regarding breast health linked to general health and women's health programs	Mammographic screening every 2 years in women ages 50-69* Consider mammographic screening every 12-18 months in women ages 40-49*	Downsizing and/or downstaging of asymptomatic disease in women in highest yield target groups	% Pts age 50-69 who had screening mammogram within past 24 months
Maximal	National awareness campaigns regarding breast health using media	Consider annual mammographic screening in women ages 40 and older Other imaging technologies as appropriate for high-risk groups†	Downsizing and/or downstaging of asymptomatic disease in women in all risk groups	Maximal category process metrics determined based upon standards of care in high-income countries

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Diagnosis Resource Allocation and Process Metrics

Level of resources	Clinical	Imaging and Lab Tests	Pathology	Process Metrics
Basic	History Physical examination Clinical breast examination (CBE) Tissue sampling for cancer diagnosis (cytologic or histologic) prior to initiation of treatment	*	Pathology diagnosis obtained for every breast lesion by any available sampling procedure Pathology report containing appropriate diagnostic and prognostic/predictive information to include tumor size, lymph node status, histologic type and tumor grade Process to establish hormone receptor status possibly including empiric assessment of response to therapy† Determination and reporting of TNM stage	# Pts with tissue dx / # Pts with suspic. mass
Limited	US-guided FNAB of sonographically suspicious axillary nodes Sentinel lymph node (SLN) biopsy with blue dye‡	Diagnostic breast ultrasound (US) Plain chest and skeletal radiography Liver US Blood chemistry profile* Complete blood count (CBC)*	Determination of ER status by IHC† Determination of margin status, DCIS content, presence of LVI Frozen section or touch prep SLN analysis §	% Pts with biopsy-proven cancer diagnosis who have documented TNM stage
Enhanced	Image guided breast sampling Preoperative needle localization under mammo and/or US guidance SLN biopsy using radiotracer‡	Diagnostic mammography Specimen radiography Bone scan, CT scan Cardiac function monitoring	Measurement of HER-2/neu overexpression or gene amplification§ Determination of PR status by IHC	% Pts with biopsy-proven cancer diagnosis who have documented HER-2/neu status
Maximal		PET scan, MIBI scan, breast MRI, BRCA1/2 testing Mammographic double reading	IHC staining of sentinel nodes for cytokeratin to detect micrometastases Pathology double reading Gene profiling tests	Maximal category process metrics determined based upon standards of care in high-income countries

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Diagnosis Resource Allocation

Level of resources	Clinical	Imaging and Lab Tests	Pathology
Basic	<p style="text-align: center;">History Physical examination Clinical breast examination (CBE)</p> <p>Tissue sampling for cancer diagnosis (cytologic or histologic) prior to initiation of treatment</p>	*	<p>Pathology diagnosis obtained for every breast lesion by any available sampling procedure</p> <p>Pathology report containing appropriate diagnostic and prognostic/predictive information to include tumor size, lymph node status, histologic type and tumor grade</p> <p>Process to establish hormone receptor status possibly including empiric assessment of response to therapy[†]</p> <p>Determination and reporting of TNM stage</p>
Limited	<p>US-guided FNAB of sonographically suspicious axillary nodes</p> <p>Sentinel lymph node (SLN) biopsy with blue dye[‡]</p>	<p>Diagnostic breast ultrasound (US)</p> <p>Plain chest and skeletal radiography</p> <p>Liver US</p> <p>Blood chemistry profile*</p> <p>Complete blood count (CBC)*</p>	<p>Determination of ER status by IHC[†]</p> <p>Determination of margin status, DCIS content, presence of LVI</p> <p>Frozen section or touch prep SLN analysis</p> <p style="text-align: center;">§</p>
Enhanced	<p>Image guided breast sampling</p> <p>Preoperative needle localization under mammo and/or US guidance</p> <p>SLN biopsy using radiotracer[†]</p>	<p>Diagnostic mammography</p> <p>Specimen radiography</p> <p>Bone scan, CT scan</p> <p>Cardiac function monitoring</p>	<p>Measurement of HER-2/neu overexpression or gene amplification[§]</p> <p>Determination of PR status by IHC</p>
Maximal		<p>PET scan, MIBI scan, breast MRI, BRCA1/2 testing</p> <p>Mammographic double reading</p>	<p>IHC staining of sentinel nodes for cytokeratin to detect micrometastases</p> <p>Pathology double reading</p> <p>Gene profiling tests</p>

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**Treatment Resource Allocation and Process Metrics:
Stage I Breast Cancer**

Level of resources	Local-Regional Treatment		Systemic Treatment (Adjuvant)			Process Metrics
	Surgery	Radiation Therapy	Chemotherapy	Endocrine Therapy	Biological Therapy	
Basic	Modified radical mastectomy			Oophorectomy in premenopausal women Tamoxifen*		Pts diagnosed with cancer underwent MRM (min 75%, target 90%) Tamoxifen for postmeno pts w/ ER+ ca >1 cm (min 75%, target 90%) w/i 1 yr of diagnosis
Limited	Breast conserving surgery† Sentinel lymph node (SLN) biopsy with blue dye‡		Classical CMF§ AC, EC, or FAC§			Chemo for premeno pts with ER- ca >1 cm w/i 120d (min 75%, target 90%) Sentinel node identification (min 75%, target 90%)
Enhanced	SLN biopsy using radiotracer‡ Breast reconstruction surgery	Breast-conserving whole-breast irradiation as part of breast-conserving therapy†	Taxanes	Aromatase inhibitors LH-RH agonists	Trastuzumab for treating HER-2/ neu positive disease	Sentinel node identification (min 90%, target 95%) Chemo for premeno pts w/ ER- tumors >1 cm w/i 120d (min 90%, target 95%) Hormone tx for postmeno pts w/ ER+ ca >1 cm w/i 1yr (min 90%, target 95%) XRT post BCT for pts <70 yrs w/i 1 yr (min 90%, target 95%)
Maximal			Growth factors Dose-dense chemotherapy			Maximal category process metrics determined based upon standards of care in high-income countries

Note: The table stratification scheme implies incrementally increasing resource allocation at the basic, limited, and enhanced levels. An empty matrix box indicates that additional resource allocation is not mandated beyond those resources required at lower levels. Maximal level resources should not be targeted for implementation in LMCs, even though they may be used in some higher income settings.

**Treatment Resource Allocation:
Stage I Breast Cancer**

Level of resources	Local-Regional Treatment		Systemic Treatment (Adjuvant)		
	Surgery	Radiation Therapy	Chemotherapy	Endocrine Therapy	Biological Therapy
Basic	Modified radical mastectomy			Oophorectomy in premenopausal women Tamoxifen*	
Limited	Breast conserving surgery [†] Sentinel lymph node (SLN) biopsy with blue dye [‡]		Classical CMF [§] AC, EC, or FAC [§]		
Enhanced	SLN biopsy using radiotracer [‡] Breast reconstruction surgery	Breast-conserving whole-breast irradiation as part of breast-conserving therapy [§]	Taxanes	Aromatase inhibitors LH-RH agonists	Trastuzumab for treating HER-2/neu positive disease
Maximal			Growth factors Dose-dense chemotherapy		

Note: The table stratification scheme implies incrementally increasing resource allocation at the basic, limited, and enhanced levels. An empty matrix box indicates that additional resource allocation is not mandated beyond those resources required at lower levels. Maximal level resources should not be targeted for implementation in LMCs, even though they may be used in some higher income settings.

**Treatment Resource Allocation and Process Metrics:
Stage II Breast Cancer**

Level of resources	Local-Regional Treatment		Systemic Treatment (Adjuvant)			Process Metrics
	Surgery	Radiation Therapy	Chemotherapy	Endocrine Therapy	Biological Therapy	
Basic	Modified radical mastectomy	*	Classical CMF [†] AC, EC, or FAC [†]	Oophorectomy in premenopausal women Tamoxifen [‡]		Pts diagnosed with cancer underwent MRM (min 75%, target 90%) Chemo for premeno pts w/ ER- ca w/i 120d (min 75%, target 90%) Tamoxifen for postmeno pts w/ ER+ ca >1 cm (min 75%, target 90%) w/i 1 yr of diagnosis
Limited	Breast conserving surgery [§] Sentinel lymph node (SLN) biopsy with blue dye	Postmastectomy irradiation of chest wall and regional nodes for high-risk cases*			¶	Post mastectomy chest wall radiation therapy for high risk women <70 yrs w/i 1 yr of mastectomy (min 75%, target 90%) Sentinel node identification (min 75%, target 90%)
Enhanced	SLN biopsy using radiotracer Breast reconstruction surgery	Breast-conserving whole-breast irradiation as part of breast-conserving therapy [§]	Taxanes	Aromatase inhibitors LH-RH agonists	Trastuzumab for treating HER-2/neu positive disease [¶]	Sentinel node identification (min 90%, target 95%) Chemo for premeno pts w/ ER- ca w/i 120d (min 90%, target 95%) Hormone tx for pts with ER+ ca w/i 1 yr (min 90%, target 95%) XRT post BCT for pts <70 yrs w/i 1 yr (min 75%, target 90%)
Maximal			Growth factors Dose-dense chemotherapy			Maximal category process metrics determined based upon standards of care in high-income countries

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**Treatment Resource Allocation:
Stage II Breast Cancer**

Level of resources	Local-Regional Treatment		Systemic Treatment (Adjuvant)		
	Surgery	Radiation Therapy	Chemotherapy	Endocrine Therapy	Biological Therapy
Basic	Modified radical mastectomy	*	Classical CMF [†] AC, EC, or FAC [†]	Oophorectomy in premenopausal women Tamoxifen [‡]	
Limited	Breast conserving surgery [§] Sentinel lymph node (SLN) biopsy with blue dye	Postmastectomy irradiation of chest wall and regional nodes for high-risk cases*			¶
Enhanced	SLN biopsy using radiotracer Breast reconstruction surgery	Breast-conserving whole-breast irradiation as part of breast-conserving therapy [§]	Taxanes	Aromatase inhibitors LH-RH agonists	Trastuzumab for treating HER-2/neu positive disease [¶]
Maximal			Growth factors Dose-dense chemotherapy		

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**Treatment Resource Allocation and Process Metrics:
Locally Advanced Breast Cancer**

Level of resources	Local-Regional Treatment		Systemic Treatment (Adjuvant or Neoadjuvant)			Process Metrics
	Surgery	Radiation Therapy	Chemotherapy	Endocrine Therapy	Biological Therapy	
Basic	Modified radical mastectomy	*	Preoperative chemotherapy with AC, EC, FAC or CMF [†]	Oophorectomy in premenopausal women Tamoxifen [‡]		Neoadjuvant systemic therapy for all pts (min 75%, target 90%) Hormone tx for all pts w/ ER+ ca w/i 1 yr (min 75%, target 90%) Pts that received neoadjuvant therapy underwent MRM (min 75%, target 90%)
Limited		Postmastectomy irradiation of chest wall and regional nodes*			§	Post mastectomy chest wall radiation therapy for women <70 yrs w/i 1 yr of mastectomy (min 75%, target 90%)
Enhanced	Breast-conserving surgery Breast reconstruction surgery	Breast-conserving whole-breast irradiation as part of breast-conserving therapy	Taxanes	Aromatase inhibitors LH-RH agonists	Trastuzumab for treating HER-2/ neu positive disease [§]	Neoadjuvant systemic therapy for pts <70 yrs (min 90%, target 95%) Post-mastectomy chest wall XRT for pts <70 yrs w/i 1 yr of mastectomy (min 90%, target 95%) Hormone tx for all pts w/ ER+ ca w/i 1 yr (min 90%, target 95%)
Maximal			Growth factors Dose-dense chemotherapy			Maximal category process metrics determined based upon standards of care in high-income countries

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**Treatment Resource Allocation:
Locally Advanced Breast Cancer**

Level of resources	Local-Regional Treatment		Systemic Treatment (Adjuvant or Neoadjuvant)		
	Surgery	Radiation Therapy	Chemotherapy	Endocrine Therapy	Biological Therapy
Basic	Modified radical mastectomy	*	Preoperative chemotherapy with AC, EC, FAC or CMF [†]	Oophorectomy in premenopausal women Tamoxifen [‡]	
Limited		Postmastectomy irradiation of chest wall and regional nodes*			§
Enhanced	Breast-conserving surgery Breast reconstruction surgery	Breast-conserving whole-breast irradiation as part of breast-conserving therapy	Taxanes	Aromatase inhibitors LH-RH agonists	Trastuzumab for treating HER-2/neu positive disease [§]
Maximal			Growth factors Dose-dense chemotherapy		

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**Treatment Resource Allocation and Process Metrics:
Metastatic (Stage IV) and Recurrent Breast Cancer**

Level of resources	Local-Regional Treatment		Systemic Treatment (Palliative)			Process Metrics
	Surgery	Radiation Therapy	Chemotherapy	Endocrine Therapy	Supportive Therapy	
Basic	Total mastectomy for ipsilateral breast tumor recurrence after breast conserving surgery			Oophorectomy in premenopausal women Tamoxifen*	Nonopioid and opioid analgesics and symptom management	Pain control provided (min 80%, target 95%) Hormone tx for all patients with ER+ ca 120d of diagnosis (min 80%, target 90%)
Limited		Palliative radiation therapy	Classical CMF† Anthracycline monotherapy or in combination†			Palliative XRT for CNS mets (min 70%, target 80%) First line palliative chemo if ER- ca (min 80%, target 90%)
Enhanced			Sequential single agent or combination chemotherapy Trastuzumab Lapatinib	Aromatase inhibitors	Bisphosphonates	Second line chemo, if visceral metastasis and good performance status (min 90%, target 95%) Bisphosphonates for lytic/symptomatic bone disease (min 90%, target 95%)
Maximal			Bevacizumab	Fulvestrant	Growth factors	Maximal category process metrics determined based upon standards of care in high-income countries

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**Treatment Resource Allocation:
Metastatic (Stage IV) and Recurrent Breast Cancer**

Level of resources	Local-Regional Treatment		Systemic Treatment (Palliative)		
	Surgery	Radiation Therapy	Chemotherapy	Endocrine Therapy	Supportive Therapy
Basic	Total mastectomy for ipsilateral breast tumor recurrence after breast conserving surgery			Oophorectomy in premenopausal women Tamoxifen*	Nonopioid and opioid analgesics and symptom management
Limited		Palliative radiation therapy	Classical CMF† Anthracycline monotherapy or in combination†		
Enhanced			Sequential single agent or combination chemotherapy Trastuzumab Lapatinib	Aromatase inhibitors	Bisphosphonates
Maximal			Bevacizumab	Fulvestrant	Growth factors

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**Breast Care Programs:
Human Resource Allocation**

Level of resources	Patient and Family Education	Human Resource Capacity Building	Patient Navigation
Basic	<p>General education regarding primary prevention of cancer, early detection and self examination</p> <p>Development of culturally adapted patient and family education services</p>	<p>Primary care provider education re breast cancer detection, diagnosis and treatment</p> <p>Nursing education re cancer patient management and emotional support</p> <p>Pathology technician education re tissue handling and specimen preparation</p> <p>Trained community worker</p>	<p>Field nurse, midwife or healthcare provider triages patients to central facility for diagnosis and treatment</p>
Limited	<p>Group or one-on-one counseling involving family and peer support</p> <p>Education regarding nutrition and complementary therapies</p>	<p>Nursing education re breast cancer diagnosis, treatment and patient management</p> <p>Imaging technician education re imaging technique and quality control</p> <p>Volunteer recruitment corp to support care</p>	<p>On site patient navigator (staff member or nurse) facilitates patient triage through diagnosis and treatment</p>
Enhanced	<p>Education regarding survivorship</p> <p>Lymphedema education</p> <p>Education regarding home care</p>	<p>Organization of national volunteer network</p> <p>Specialized nursing oncology training</p> <p>Home care nursing</p> <p>Physiotherapist & lymphedema therapist</p> <p>On-site cytopathologist</p>	<p>Patient navigation team from each discipline supports patient "handoff" during key transitions from specialist to specialist to ensure completion of therapy</p>
Maximal		<p>Organization of national medical breast health groups</p>	

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**Breast Care Programs:
Support Systems Resource Allocation**

Level of resources	Services	Record Keeping	Cancer Care Facility	Breast Care Center
Basic	Diagnostic/Pathology services Nursing services Oncology services Palliative services Psychosocial services Primary care services Surgical services	Individual medical records and service-based patient registration	Health facility Operating facility Outpatient care facility Pharmacy Home hospice support External consultation pathology laboratory	Breast healthcare access integrated into existing healthcare infrastructure
Limited	Imaging services Peer support services Radiation oncology services	Facility-based medical records and centralized patient registration Hospital level cancer registry	Clinical information systems Health system network Imaging facility Internal pathology laboratory Radiation therapy	"Breast Center" with clinician, staff and breast imaging access Breast prostheses for mastectomy pts
Enhanced	Cancer follow-up Group support Screening programs Rehabilitation services Survivorship services	Resource Room(s) for education/outreach Facility based follow-up Regional cancer registry	Centralized referral cancer center(s) Radiation therapy: low energy linear accelerator, electrons, brachytherapy, treatment planning system	Multidisciplinary breast programs Oncology nurse specialists Physician assistants
Maximal	Universal access to screening Individual psychosocial care	Representative national cancer registry	Satellite (non-centralized or regional) cancer centers	

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Process Metrics for LMC Breast Healthcare Programs

Level of resources	Early Detection	Diagnosis	Treatment	Programmatic
Basic	<p># Pts with documented H&P / # Pts evaluated</p> <p>.....</p> <p><i>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.</i></p>	<p># Pts with tissue dx / # Pts with suspic. mass</p> <p>.....</p> <p><i>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).</i></p>	<p># Pts treated for ca / # Pts with tissue dx ca</p> <p>.....</p> <p><i>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.</i></p>	<p>Median pathologic tumor size</p> <p>.....</p> <p><i>Description: The median pathologically determined size of invasive breast primary tumors within the target group for a center or program providing organized breast healthcare.</i></p>
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

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