Metrics for Assessing Early Breast Cancer Detection Success – Moving Beyond Incidence and Mortality

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*International Agency for Research on Cancer (France)*
# Outline

## Metrics for Assessing Early Breast Cancer Detection Success in LMICs

- Background – global burden
- Current Recommendations
- The journey to diagnosis - examples
- How to measure early detection success
Background

Where? Africa (low/lower-middle)

Central America, Caribbean, most of South America (upper-middle)

Some of Eastern Europe (upper middle); Most of Asia, Melanasia
2018, All ages: 2.1 Million new breast cancer cases
2040, All ages: 3.1 Million

627,000 breast cancer deaths
1 Million breast cancer deaths

HIV/AIDS deaths BOTH sexes: 2M in 2004; 1M today

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Preventing Breast Cancer Deaths

- **Primary Prevention**
  - Curtail an inevitable increase in incidence rates due to
    - Declining age at menarche
    - Less and later childbearing
    - Sedentary lives
  - Promote healthy lifestyles
    - Increase physical activity
    - Healthy body weight
    - Reduce alcohol intake
    - Promote breastfeeding

- **Improving Survival**: Early detection, screening and treatment
Early diagnosis - How long is the time window of opportunity?

Screening:
Diagnosis of asymptomatic BC

Early detection:
Earlier diagnosis of symptomatic BC

7 months time from a 2 cm to 5 cm tumour
# Current recommendations

## Current methods and metrics

<table>
<thead>
<tr>
<th></th>
<th>Basic</th>
<th>Limited / Core</th>
<th>Enhanced</th>
<th>Maximal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public education</strong></td>
<td>Appropriate education program to teach value of early detection, BC risk factors, BH awareness, SBE</td>
<td>District-level appropriate outreach/education encouraging CBE in high risk age groups using field HCP</td>
<td>Regional awareness on breast health linked to general/woman’s healthcare</td>
<td>National awareness campaigns on breast health</td>
</tr>
<tr>
<td><strong>Detection methods</strong></td>
<td>Clinical history CBE</td>
<td>If CBE+, diagnostic US +/- mgm.</td>
<td>2-yr mgm sx 50-69 y; Consider mgm sx 12-18 mo at 40-49y</td>
<td>Annual sx mgm 40+; other imaging for high-risk</td>
</tr>
<tr>
<td><strong>Process Metric</strong></td>
<td>In an organized BH centre History + Phy exam Target Women</td>
<td>$Dx\ imaging\ CBE + \frac{CBE\ +\ women}{Target\ Women}$</td>
<td>Screen within 24 mo No. women 50 – 69 y</td>
<td>HIC</td>
</tr>
<tr>
<td><strong>Evaluation Goal</strong></td>
<td>Breast health awareness regarding value of early detection</td>
<td>Downsizing +/- of symptomatic BC</td>
<td>Downsizing +/- downstaging of asymptomatic BC in women in highest yield target groups</td>
<td>Downsizing +/- downstaging of asymptomatic disease in all groups</td>
</tr>
</tbody>
</table>

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Examples - Enhanced

Enhanced. Egypt

1. Mobile + fixed mammography for women over 45 years;
   6 units, 77,000 screenees
   16 of 27 governates covered with 4 vans

2. Awareness

3. Education and Training
### Gharbiah 1999-2008 Average Annual % Change in Breast Cancer Incidence, by Stage

<table>
<thead>
<tr>
<th>Stage</th>
<th>Age group</th>
<th>AAPCa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Localized</td>
<td>30–39</td>
<td>−1.3%</td>
</tr>
<tr>
<td></td>
<td>40–49</td>
<td>5.8%</td>
</tr>
<tr>
<td></td>
<td>50–59</td>
<td>3.1%</td>
</tr>
<tr>
<td></td>
<td>60–69</td>
<td>9.4%</td>
</tr>
<tr>
<td></td>
<td>70+</td>
<td>18.2%</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>5.5%</td>
</tr>
<tr>
<td>Regional</td>
<td>Overall</td>
<td>2.6%</td>
</tr>
<tr>
<td>Distant</td>
<td>30–39</td>
<td>−11.3%</td>
</tr>
<tr>
<td></td>
<td>40–49</td>
<td>−5.4%</td>
</tr>
<tr>
<td></td>
<td>50–59</td>
<td>−2.2%</td>
</tr>
<tr>
<td></td>
<td>60–69</td>
<td>−4.9%</td>
</tr>
<tr>
<td></td>
<td>70+</td>
<td>3.8%</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>−4.0%</td>
</tr>
</tbody>
</table>

Hirko, J Cancer Epidemiol. 2013
What does this mean in some African LMICs? Stage at diagnosis in Sub-Saharan African countries

Jedy Agba Lancet Global Health 2016
African Breast Cancer Disparities in Outcomes ABC-DO

1st signs/Symptoms noticed
Contacts with health care providers (incl. traditional ones)
Co-morbidities
BC diagnosis
Survival time
Time to diagnosis
Retrospective recall
Prospective
Death
Lost to follow-up
Still alive
Palliative care
Recovery

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Age distribution at diagnosis

Graphs by Text
No. of pregnancies

<table>
<thead>
<tr>
<th>Location</th>
<th>No. of Pregnancies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aba</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Kampala</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>Owerri</td>
<td>2</td>
<td>20%</td>
</tr>
<tr>
<td>Windhoek</td>
<td>3</td>
<td>30%</td>
</tr>
<tr>
<td>Zambia</td>
<td>4</td>
<td>40%</td>
</tr>
</tbody>
</table>

For ages:
- < 50 years: Aba, Kampala, Owerri, Windhoek, Zambia
- ≥50 years: Aba, Kampala, Owerri, Windhoek, Zambia
Geographically disparate populations - Namibia
What causes breast cancer?

- **Lifestyle**
  - Aba
  - Kampala
  - Owerri
  - Windhoek
  - Zambia

- **Breastfeeding**

- **Old age**

- **Family hx**

- **Curse**

- **Breast injury**

- **Contagious**

- **$ in bra**

- **Infection/bite**
**Breast Health Global Initiative – “Can BC be cured if diagnosed early?”**

- **Namibia-nonblack**
  - Yes it can be cured
  - No, there is no treatment
  - I don't know

- **Zambia**
  - Yes it can be cured
  - No, there is no treatment
  - I don't know

- **Namibia-black**
  - Yes it can be cured
  - No, there is no treatment
  - I don't know

- **Uganda**
  - Yes it can be cured
  - No, there is no treatment
  - I don't know

- **Nigeria**
  - Yes it can be cured
  - No, there is no treatment
  - I don't know

Graphs by onsite
“Can BC be cured if diagnosed early?” Awareness greater < 50 y

Graphs by over50 and ordsite

Yes it can be cured  No, there is no treatment  I don’t know

0, Namibia-nonblack  0, Zambia  0, Namibia-black  0, Uganda  0, Nigeria

<50y

1, Namibia-nonblack  1, Zambia  1, Namibia-black  1, Uganda  1, Nigeria

50+

Graphs by over50 and ordsite

International Agency for Research on Cancer
World Health Organization
Stage at diagnosis

Graphs by site

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Kaplan-Meier survival estimates

- Non-Black Namibian
- Black Namibian

survival time (years)
Overall survival by stage

Percentage reduction in deaths at 3-years if all patients had stage II survival as realized at that site

<table>
<thead>
<tr>
<th></th>
<th>Zambia</th>
<th>Namibian black</th>
<th>Uganda</th>
<th>Nigeria</th>
<th>Nigeria private</th>
<th>Namibian non-black</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namibian non black</td>
<td>1.00</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Namibian black</td>
<td></td>
<td></td>
<td>0.00</td>
<td>0.20</td>
<td>0.40</td>
<td>0.60</td>
<td>0.80</td>
</tr>
<tr>
<td>Namibian non-black</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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Birth Health Global Initiative – 2018 Global Summit
Seattle, Washington

October 15 – 17, 2018

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## Odds Ratios for late stage

- Lower stage with greater BrCa awareness: 0.8 (0.7, 0.9)
- Black v non-black: 4.0 (2.8, 5.7)
- No/primary education: 1.8 (1.4, 2.2)
- Not heard of BrCa: 1.6 (1.3, 2.1)
- Unskilled job: 1.8 (1.4, 2.2)
- Pregnancy in the past 3 y*: 1.6 (1.2, 2.3)
- 1+ yr symptom: 2.5 (1.9, 3.2)

*30% of ≤45 year olds
Advanced stage by symptom duration (months)
Symptom duration distribution (months)

McKenzie et al. Int J Cancer, 2017
Partition the pre-diagnostic journey

- Zambia: Patient = 1.1, System = 3.2, Symptom = 8.6
- Uganda: Patient = 3.4, System = 4.7, Symptom = 11.3
- Nigeria private: Patient = 0.3, System = 2.9, Symptom = 5.6
- Nigeria public: Patient = 0.3, System = 3.8, Symptom = 6.5
- Namibia non-black: Patient = 0.3, System = 0.7, Symptom = 2.6
- Namibia black: Patient = 1.3, System = 2.1, Symptom = 6.7
Pre-diagnostic journey: proportion pre and post-first health provider contact

<table>
<thead>
<tr>
<th>Country</th>
<th>Pre-first Health-care Contact</th>
<th>Post-first Health-care Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zambia</td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>Uganda</td>
<td>37%</td>
<td>63%</td>
</tr>
<tr>
<td>Nigeria public</td>
<td>95%</td>
<td>5%</td>
</tr>
<tr>
<td>Namibian non-black</td>
<td>30%</td>
<td>70%</td>
</tr>
<tr>
<td>Namibian black</td>
<td>37%</td>
<td>63%</td>
</tr>
</tbody>
</table>
Summary

• Late stage at diagnosis causing EXTREMELY low survival.
• Between-country between-women differences show downstaging is possible.
• Women know – retrospectively – symptoms were present and many acted.
• TIME is a major problem – delays by women and post-health care contact. Low SEP, lack of awareness, transport, rurality, finances causing delays.
• TIME is on our side.
Thanks

- F McKenzie, M Foerster, K Togawa, J Schuz, B Lauby-Secretan, IARC
- Isabel dos Santos Silva, LSHTM
- Groesbeck Parham, Zambia
- Charles Adisa, Angelica Anele, E Jedy Abga, C. Adebamowo, Nigeria
- Annelle Zietsman, Johanna Pontact, Namibia
- Herbert Cubasch, Maureen Joffe, South Africa
- Moses Galukande, Uganda
- Anna Cabanes, Komen Foundation
- Ben Anderson, BHGI
- Dorria Salem, Egypt
Goals and Metrics

• Monitor stage at diagnosis
  • Measurement tools available. How to collate data?
• Improve breast cancer awareness
  • Repeated surveys; DHS
  • Identify most vulnerable groups and feedback to awareness campaigns
• Provide standardized tools? BCAM (CRUK)
  • Is an international tool possible?
• Time? Symptom duration < x months? Seek help within x months? Referral times?
Thanks! Asante! Merci! Kea leboa hahoolo!