Management of Prostate Cancer in Africa

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Clinical Oncologist
Groote Schuur Hospital
February 2017
No disclosures to present
Overview

• Challenges
Africa is not a country
Africa lacks data

Figure 2. (a) Map showing the availability of incidence data. (b) Map showing the availability of mortality data.

GLOBCAN, 2012
Overview

• Challenges
• The Problem
Africa population

![Graph 1: World Population and Projection to 2100 (Billions)]

![Graph 2: UN Regional Population Projections (Billions, 2015 - 2100)]
New cancers in LMIC: (low & middle income countries)

- 1970: 15%
- 2008: 56%
- 2030: 70%

Farmer et al. Lancet 2010

Expansion of cancer care and control in countries of low and middle income: a call to action


Substantial inequalities exist in cancer survival rates across countries. In addition to prevention of new cancers by reduction of risk factors, strategies are needed to close the gap between developed and developing countries in cancer survival and the effects of the disease on human suffering. We challenge the public health community’s assumption that cancers will remain untreated in poor countries, and note the analogy to similarly unfounded arguments from more than a decade ago against provision of HIV treatment. In resource-constrained countries without specialised services, experience has shown that much can be done to prevent and treat cancer by deployment of primary and secondary caregivers, use of off-patent drugs, and application of regional and global mechanisms for financing and procurement. Furthermore, several middle-income countries have included cancer treatment in national health insurance coverage with a focus on people living in poverty. These strategies can reduce costs, increase access to health services, and strengthen health systems to meet the challenge of cancer and other diseases. In 2009, we formed the Global Task Force on Expanded Access to Cancer Care and Control in Developing Countries, which is composed of leaders from the global health and cancer care communities, and is dedicated to proposal, implementation, and evaluation of strategies to advance this agenda.

Farmer et al. Lancet 2010
New cancers and expenditure in Africa
## Distribution & Costs of cancer

**Table:** Distribution & Costs of Cancer Cases by Geographic Group

<table>
<thead>
<tr>
<th>Geographic group</th>
<th>Total population ('000s)</th>
<th>% of world population</th>
<th>Estimated new cancer cases (all sites)</th>
<th>% of new cases</th>
<th>Estimated cost of new cancer cases (all sites, $m)</th>
<th>% of costs</th>
</tr>
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<tbody>
<tr>
<td>Africa</td>
<td>1,007,766</td>
<td>14.8</td>
<td>816,747</td>
<td>6.4</td>
<td>849</td>
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<td>Americas</td>
<td>889,640</td>
<td>13.1</td>
<td>2,772,681</td>
<td>21.8</td>
<td>153,941</td>
<td>53.9</td>
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<td>4,107,263</td>
<td>60.3</td>
<td>5,851,340</td>
<td>46.0</td>
<td>43,951</td>
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<td>Europe</td>
<td>730,365</td>
<td>10.7</td>
<td>3,062,704</td>
<td>24.1</td>
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<tr>
<td>Oceania</td>
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<td>1.1</td>
<td>210,640</td>
<td>1.7</td>
<td>4,379</td>
<td>1.5</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>6,808,967</strong></td>
<td><strong>100.0</strong></td>
<td><strong>12,714,112</strong></td>
<td><strong>100.0</strong></td>
<td><strong>285,804</strong></td>
<td><strong>100.0</strong></td>
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</table>

*The Economist, 2009*
Cost of prostate cancer (income grp)

- Greatest disparity of all the cancers
- 4000 x

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<table>
<thead>
<tr>
<th>Cancer site</th>
<th>Low Income</th>
<th>Lower middle income</th>
<th>Upper middle income</th>
<th>High Income</th>
</tr>
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<tbody>
<tr>
<td>Total</td>
<td>647</td>
<td>8,209</td>
<td>8,945</td>
<td>268,002</td>
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<tr>
<td>Bladder</td>
<td>8</td>
<td>100</td>
<td>194</td>
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<tr>
<td>Brain Cancers</td>
<td>5</td>
<td>113</td>
<td>183</td>
<td>4,171</td>
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<tr>
<td>Breast</td>
<td>37</td>
<td>374</td>
<td>754</td>
<td>27,263</td>
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<tr>
<td>Cervix</td>
<td>49</td>
<td>245</td>
<td>436</td>
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<tr>
<td>Colorectal</td>
<td>23</td>
<td>398</td>
<td>705</td>
<td>32,264</td>
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<tr>
<td>Corpus</td>
<td>3</td>
<td>44</td>
<td>131</td>
<td>5,014</td>
</tr>
<tr>
<td>Hodgkin’s Lymphoma</td>
<td>4</td>
<td>24</td>
<td>67</td>
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<tr>
<td>Kaposi Sarcoma(^1)</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
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<td>52</td>
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<td>279</td>
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<tr>
<td>Lung</td>
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<td>1,264</td>
<td>1,468</td>
<td>50,074</td>
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<td>Melanoma</td>
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<td>12</td>
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<td>77</td>
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<td>Nasopharynx</td>
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<td>95</td>
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<tr>
<td>non-Hodgkin Lymphoma</td>
<td>20</td>
<td>111</td>
<td>205</td>
<td>10,178</td>
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<td>Oesophagus</td>
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<tr>
<td>Oral Cavity</td>
<td>23</td>
<td>108</td>
<td>144</td>
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<tr>
<td>Other Pharynx</td>
<td>16</td>
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<td>84</td>
<td>2,573</td>
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<tr>
<td>Other Sites</td>
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<td>372</td>
<td>821</td>
<td>15,848</td>
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<td>Ovary</td>
<td>12</td>
<td>80</td>
<td>187</td>
<td>4,650</td>
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<tr>
<td>Pancreas</td>
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<td>143</td>
<td>203</td>
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<tr>
<td><strong>Prostate</strong></td>
<td><strong>6</strong></td>
<td><strong>37</strong></td>
<td><strong>321</strong></td>
<td><strong>23,647</strong></td>
</tr>
</tbody>
</table>

The Economist, 2009
Cost of prostate cancer (Africa)

- 10th biggest spender in Africa
- USA - 2nd
- Europe - 4th
- Asia – 9th

The Economist, 2009
Incidence of prostate cancer in Africa

3rd overall
1st Breast
2nd Cervix

Table 3. Age-adjusted Incidence Rates* for the Most Common Cancers in Males and Females in Africa, 2008

<table>
<thead>
<tr>
<th></th>
<th>Africa</th>
<th>Sub-Saharan Africa</th>
<th>Southern Africa</th>
<th>Eastern Africa</th>
<th>Middle Africa</th>
<th>Northern Africa</th>
<th>Western Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All sites’</td>
<td>108.1</td>
<td>115.9</td>
<td>235.9</td>
<td>121.3</td>
<td>88.1</td>
<td>109.2</td>
<td>92.0</td>
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<tr>
<td>Prostate</td>
<td>1</td>
<td>17.5</td>
<td>1</td>
<td>53.9</td>
<td>3</td>
<td>14.5</td>
<td>2</td>
</tr>
<tr>
<td>Liver</td>
<td>2</td>
<td>11.6</td>
<td>2</td>
<td>13.1</td>
<td>5</td>
<td>13.9</td>
<td>4</td>
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<tr>
<td>Lung</td>
<td>3</td>
<td>8.4</td>
<td>6</td>
<td>5.9</td>
<td>2</td>
<td>29.0</td>
<td>9</td>
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<td>Esophagus</td>
<td>4</td>
<td>6.7</td>
<td>3</td>
<td>8.5</td>
<td>3</td>
<td>22.3</td>
<td>1</td>
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<tr>
<td>Colorectal</td>
<td>5</td>
<td>6.9</td>
<td>5</td>
<td>6.8</td>
<td>4</td>
<td>20.4</td>
<td>6</td>
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<tr>
<td>Non-Hodgkin lymphoma</td>
<td>6</td>
<td>6.3</td>
<td>7</td>
<td>5.5</td>
<td>9</td>
<td>5.7</td>
<td>5</td>
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<tr>
<td>Urinary bladder</td>
<td>7</td>
<td>6.7</td>
<td>9</td>
<td>3.7</td>
<td>8</td>
<td>7.3</td>
<td>10</td>
</tr>
<tr>
<td>Stomach</td>
<td>8</td>
<td>4.7</td>
<td>8</td>
<td>5.0</td>
<td>4</td>
<td>4.1</td>
<td>7</td>
</tr>
<tr>
<td>Leukemia</td>
<td>9</td>
<td>3.2</td>
<td>8</td>
<td>5.0</td>
<td>4</td>
<td>3.9</td>
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<td>2.6</td>
<td>10</td>
<td>5.5</td>
<td>2.6</td>
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<tr>
<td>Kaposi sarcoma</td>
<td>–</td>
<td>8.1</td>
<td>4</td>
<td>11.5</td>
<td>6</td>
<td>14.9</td>
<td>6</td>
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</tbody>
</table>

GLOBOCAN, 2008
Incidence of prostate cancer in Africa

GLOBOCAN, 2008
### Death Rate of prostate cancer in Africa

- 3rd overall
- 1st Breast
- 2nd Cervix

#### Table 4. Age-adjusted Death Rates* for the Most Common Cancers in Males and Females in Africa, 2008

<table>
<thead>
<tr>
<th>Cancers</th>
<th>All Africa</th>
<th>Sub-Saharan Africa</th>
<th>Southern Africa</th>
<th>Eastern Africa</th>
<th>Middle Africa</th>
<th>Northern Africa</th>
<th>Western Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All sites°</td>
<td>Rank 90.6</td>
<td>Rank 98.1</td>
<td>Rank 172.1</td>
<td>Rank 105.4</td>
<td>Rank 78.5</td>
<td>Rank 89.5</td>
<td>Rank 80.1</td>
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<td>Rank 1</td>
<td>Rank 15.0</td>
<td>Rank 19.3</td>
<td>Rank 11.7</td>
<td>Rank 13.4</td>
<td>Rank 6.2</td>
<td>Rank 18.3</td>
</tr>
<tr>
<td>Liver</td>
<td>Rank 2</td>
<td>Rank 13.2</td>
<td>Rank 14.0</td>
<td>Rank 7.3</td>
<td>Rank 19.2</td>
<td>Rank 7.4</td>
<td>Rank 16.5</td>
</tr>
<tr>
<td>Lung</td>
<td>Rank 3</td>
<td>Rank 7.9</td>
<td>Rank 27.4</td>
<td>Rank 4.0</td>
<td>Rank 2.7</td>
<td>Rank 14.0</td>
<td>Rank 7.2</td>
</tr>
<tr>
<td>Esophagus</td>
<td>Rank 4</td>
<td>Rank 6.5</td>
<td>Rank 21.4</td>
<td>Rank 14.3</td>
<td>Rank 9.1</td>
<td>Rank 14.0</td>
<td>Rank 2.0</td>
</tr>
<tr>
<td>Colorectal</td>
<td>Rank 5</td>
<td>Rank 5.5</td>
<td>Rank 15.8</td>
<td>Rank 4.7</td>
<td>Rank 3.5</td>
<td>Rank 5.5</td>
<td>Rank 3.4</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>Rank 6</td>
<td>Rank 5.3</td>
<td>Rank 4.6</td>
<td>Rank 5.1</td>
<td>Rank 4.6</td>
<td>Rank 6.9</td>
<td>Rank 4.1</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>Rank 7</td>
<td>Rank 4.8</td>
<td>Rank 4.9</td>
<td>Rank 10.2</td>
<td>Rank 1.2</td>
<td>Rank 9.9</td>
<td>Rank 6.3</td>
</tr>
<tr>
<td>Stomach</td>
<td>Rank 8</td>
<td>Rank 4.5</td>
<td>Rank 3.9</td>
<td>Rank 5.4</td>
<td>Rank 5.2</td>
<td>Rank 3.7</td>
<td>Rank 4.4</td>
</tr>
<tr>
<td>Leukemia</td>
<td>Rank 9</td>
<td>Rank 3.0</td>
<td>Rank 2.7</td>
<td>Rank 2.8</td>
<td>Rank 2.6</td>
<td>Rank 4.1</td>
<td>Rank 8.2</td>
</tr>
<tr>
<td>Larynx</td>
<td>Rank 10</td>
<td>Rank 1.9</td>
<td>Rank 1.7</td>
<td>Rank 1.7</td>
<td>Rank 1.2</td>
<td>Rank 2.4</td>
<td>Rank 10.1</td>
</tr>
<tr>
<td>Kaposi sarcoma</td>
<td></td>
<td>Rank 4</td>
<td>Rank 6.9</td>
<td>Rank 12.7</td>
<td>Rank 5</td>
<td>Rank 3.5</td>
<td>Rank 9.1</td>
</tr>
</tbody>
</table>

*GLOBOCAN, 2008*
Estimated Prostate Cancer Mortality Worldwide in 2012

WHO, 2012
Summary

• Prostate cancer management is a major problem
Summary

• Prostate cancer management is a major problem
  • Population is increasing
  • Population will get older
  • Highest prostate cancer mortality in world
  • 3rd highest mortality within Africa
  • No data/registries
  • Under spending
Overview

• Challenges
• The Problem
• Resources
Radiation resources in Africa

Cancer Control in Africa 4

Status of radiotherapy resources in Africa: an International Atomic Energy Agency analysis

May Abdel-Wahab*, Jean-Marc Bourque*, Yaroslav Pyrya, Joanna Iżewska, Debbie Van der Merwe, Eduardo Zubizarreta, Eduard Rosenblatt

Radiation therapy is an important component of cancer control programmes. The scarcity of radiation oncology resources in Africa is becoming more severe as cancer incidence increases in the continent. We did a longitudinal assessment of the status of radiation oncology resources in Africa to measure the extent of the problem and the effects of programmes designed to enhance radiation services in the continent. Radiation oncology departments in Africa were surveyed through the Directory of Radiotherapy Centres, and this information was supplemented by that available from International Atomic Energy Agency Regional African and Interregional project reports for 2010. Of 52 African countries included, only 23 are known to have teletherapy. These facilities are concentrated in the southern and northern states of the continent. Brachytherapy resources (high-dose rate or low-dose rate) were only available in 20 of the 52 African countries. Although progress has been made in the establishment of radiation oncology services in some countries, a large need still exists for basic radiation services, and much resource mobilisation is needed for services to keep pace with the burgeoning populations of many countries.

Abdel-Wahab et al. Lancet 2013
Radiation resources in Africa

Figure 2: External beam radiotherapy machines in Africa in 2010. Dots represent radiotherapy centres. Comoros, Sao Tome and Principe, and Cape Verde (all of which have no machines) are not shown.
INTERVIEW: No cancer machine working in Nigerian hospitals – Health Minister

October 28, 2016 Agency Report

Health Minister, Prof. Isaac Adewole

Nigeria's minister of health, Isaac Adewole, speaks on various efforts by his ministry to improve health care delivery. He was interviewed by NAN editor-in-chief, Lawal Ado.
Radiation resources in Africa (DIRAC 2008)

- Africa
  - 54 countries
  - 23 offer Teletherapy
  - 200m people no RT
- 272 Teletherapy machines
  - 2 x LINACS: 1 x Co60
  - RSA(92) Egypt (76) = 60%
  - RSA + N.Africa = 90%

Brachytherapy

• 17 countries have HDR
• Published prostate brachytherapy information
  • South Africa
  • Egypt
  • Tunisia
  • Morocco
  • Ghana
  • Kenya
Summary

• Prostate cancer management is a major problem
• Only Southern and Northern Africa have adequate RT resources
## Survey

- Ghana, Ethiopia, Cameroon, Zimbabwe, Kenya

<table>
<thead>
<tr>
<th></th>
<th>Ghana</th>
<th>Ethiopia</th>
<th>Cameroon</th>
<th>Zimbabwe</th>
<th>Kenya</th>
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<td>2</td>
<td>2</td>
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<td>7</td>
<td>8</td>
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<td>Urologists</td>
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<td>20-30</td>
<td>20-30</td>
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<td>Uro</td>
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<td>Management</td>
<td>(Uro+Onc)</td>
<td>(Uro+Onc)</td>
<td>(Uro+Onc)</td>
<td>(Uro+Onc)</td>
<td>Uro+Onc</td>
</tr>
<tr>
<td>MDT</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
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</tbody>
</table>
Summary

• Prostate cancer management is a problem
• Only southern and northern Africa have adequate RT resources
• Prostate cancer is managed mostly by urologists
• Bulk of oncology input is palliative care
Overview

• Challenges
• The Problem
• Resources
• Prostate cancer in Africa: How does it present?
### Cancer fatality rates per cancer

#### Prostate cancer
- Greatest disparity
- 78% vs 22%

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#### Table: Case fatality rates (%) by cancer site, gender and country income group, 2002

<table>
<thead>
<tr>
<th>Cancer site</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
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<th>Male</th>
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<td>77.0</td>
<td>57.3</td>
<td>70.6</td>
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<td>79.9</td>
<td>71.6</td>
<td>56.4</td>
<td>61.9</td>
<td>48.0</td>
<td>45.3</td>
<td>31.3</td>
<td>25.3</td>
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<td>Brain Cancers</td>
<td>79.8</td>
<td>81.0</td>
<td>76.0</td>
<td>74.7</td>
<td>79.8</td>
<td>81.1</td>
<td>63.5</td>
<td>67.1</td>
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<td>Breast</td>
<td>56.3</td>
<td>-</td>
<td>44.0</td>
<td>-</td>
<td>38.7</td>
<td>-</td>
<td>23.9</td>
<td>-</td>
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<tr>
<td>Cervix</td>
<td>68.4</td>
<td>-</td>
<td>58.6</td>
<td>-</td>
<td>48.2</td>
<td>-</td>
<td>32.6</td>
<td>-</td>
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<tr>
<td>Colorectal</td>
<td>70.8</td>
<td>70.2</td>
<td>62.0</td>
<td>62.7</td>
<td>60.1</td>
<td>60.8</td>
<td>42.4</td>
<td>40.6</td>
</tr>
<tr>
<td>Corpus</td>
<td>39.3</td>
<td>-</td>
<td>32.4</td>
<td>-</td>
<td>32.3</td>
<td>-</td>
<td>15.4</td>
<td>-</td>
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<tr>
<td>Hodgkin’s Lymphoma</td>
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<td>52.9</td>
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<td>34.0</td>
<td>48.6</td>
<td>16.5</td>
<td>18.4</td>
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<td>88.9</td>
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*The Economist, 2009*
Worldwide Prostate mortality
Summary

• Prostate cancer management is a major problem
• Only southern and northern Africa have adequate RT resources
• Urologists manage prostate cancer
• Bulk of oncology input is palliative care
• Presents as metastatic disease
Overview

- Challenges
- The Problem
- Resources
- Prostate cancer in Africa: How does it present?
- Palliative care infrastructure
Palliative care

• 4 Pillars
  • Policy
  • Education
  • Drug access
  • Implementation

Cancer Control in Africa 6

Research into palliative care in sub-Saharan Africa


Roughly half a million people die of cancer in sub-Saharan Africa every year. Despite rapid expansion of palliative care for cancer, coverage remains woefully inadequate. The WHO public health strategy for palliative care aims to increase access to palliative care services through its integration into health-care systems. We present the available evidence for the four WHO strategy pillars of policy, education, drug availability, and implementation, and propose a fifth pillar of research activity to stimulate improvement of care. Increased attention to the generation of research evidence is essential to achieve quality and coverage of appropriate palliative care for patients with advanced cancer in sub-Saharan Africa. The use of locally validated, patient-reported outcome measures is an important advance in the measurement and improvement of care and patient wellbeing. Palliative care for patients with cancer in Africa currently receives far less research attention than does palliative care for patients with HIV/AIDS, but in view of projected increasing cancer incidence in the region, generation of local evidence to inform and allow assessment of palliative care for patients with cancer is urgently needed.

Harding et al.
Lancet 2013
Summary

• Prostate cancer management is a major problem
• Only southern and northern Africa have adequate RT resources
• Urologists manage prostate cancer
• Bulk of oncology input is palliative care
• Presents as metastatic disease
• Lack of palliative resources
Conclusions

• The problem is dire
• Only long term solution is political
  • National cancer control programs
  • Registries
  • Early detection
  • Resource acquisition & allocation
  • Training
  • Education
  • Primary health care
Short term solution
Short term solution

• Low Income Guidelines
  • Clinical
  • Radiation
• Publish “low income” articles
Short term solution

• Low Income Guidelines
  • Clinical
  • Radiation
• Publish “low income” articles
• Collaborations
• Training
Short term solution

• Low Income Guidelines
  • Clinical
  • Radiation
• Publish “low income” articles
• Collaborations
• Training
• Palliative Care
Short term solution #1

• Low-Income Guidelines

Kerr et al; NEJM, 2010
“Low-income” management decisions

• **Diagnosis**
  • PSA
    • Screening
    • Early detection
    • Can be diagnostic
  • PSA: R220/R120
  • Free/total: R420/R280
  • Cut off for radical treatment
“Low-income” management decisions

• Active surveillance
  • Repeat Biopsy
  • Serial PSA
  • Multiple clinic visits

• Benefits
  • Avoid treatment
## Survey

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“Low-income” management decisions

Radical Prostatectomy or Watchful Waiting in Early Prostate Cancer

Anna Bill-Axelson, M.D., Ph.D., Lars Holmberg, M.D., Ph.D., Hans Garmo, Ph.D., Jennifer R. Rider, Sc.D., Kimmo Taari, M.D., Ph.D., Christer Busch, M.D., Ph.D., Stig Nordling, M.D., Ph.D., Michael Häggman, M.D., Ph.D., Swen-Olof Andersson, M.D., Ph.D., Anders Spångberg, M.D., Ph.D., Ove Andrén, M.D., Ph.D., Juni Palmgren, Ph.D., Gunnar Steineck, M.D., Ph.D., Hans-Olov Adami, M.D., Ph.D., and Jan-Erik Johansson, M.D., Ph.D.

ABSTRACT

Bill-Axelson et al.
NEJM, 2014
“Low-income” management decisions

- Positive trial
  - OS (18y): 56% vs 68%
  - CSM (18y): 17% vs 28%
“Low-income” management decisions
PIVOT results

- OS or PCSM
  - No difference
  - PSA>10 or Intermediate risk
## Survey: watchful waiting

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Radiotherapy

- Split course RT
- 1796 patients; EBRT
- Biochemical free survival worse in patients with “non treatment delay”

Ambrosio et al.
IJORBP, 2008
“Low-income” management decisions

Palliative RT

- Cost effective comparison
  - Single fraction RT
  - Fractionated RT
  - Pain killers
  - Chemo

Konski et al
IJROBP, 2004
“Low-income” management decisions

Metastatic disease

- BO
- Ketoconazole
- Diethy stilbestrol
- CHAARTED
  - OS 57m vs 44m
  - 6 cycles Docetaxel
  - High volume ds

The leuprolide study group. NEJM 1984
“Low-income” management decisions

**CRPC**
- Complete androgen deprivation
  - PSA response
- Docetaxel
  - OS (3m)
- Mitoxantrone
  - PSA response
- Navelbine
  - PFS, symptoms, PSA response

- Corticosteriods
- Low dose ketoconazole + hydrocortisone
- Diethystilbestrol + aspirin
Conclusions

• **Achievable low cost solutions**
  • Low Income Guidelines
  • Publish “low income” articles
  • Collaborations
  • Training
  • Palliative Care