Access to Surgery in LMICs

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World Cancer Congres, Paris 2016
Overview

- Introduction and background
- Training in Surgery for cancer treatment
- Limitations and perspectives
Introduction

- Cancer is a real public health concern worldwide
- It even causes a more important burden in LMICs countries:
  - due to the challenges in all stages of the disease management
  - an the other competing public health problems
- Cancer is Under-reported:
  - Problem of tumor registry
For the current 2016 fiscal year:

- low-income economies are those with a GNI per capita of 1,045 USD or less in 2014;
- lower-middle-income economies are those with a GNI per capita between 1,046 USD and 4,125 USD;
- upper-middle-income economies are those with a GNI per capita between 4,126 USD and 12,735 USD;
- high-income economies are those with a GNI per capita of 12,736 USD or more
LMICs
Healthcare Expenditure per Capita

Health expenditure per capita, 2014 (OECD stat)

Diagram showing healthcare expenditure per capita in various countries.
Sub Saharan Africa

- All African countries excluding the 5 North African countries:
  - Morocco, Algeria, Tunisia, Libya, Egypt

- Based on WHO, in 2011:
  - Africa had the lowest Growth National Income (GNI) of 2513 USD
  - and the lowest Per capita government expenditure on health with 49.2 USD compared to 1695.7 USD in America and 1786.3 USD in Europe
The large majority of health spending are dedicated to prevent and treat tropical disease such as infections and malnutrition

Overview of Cancer burden in LMICs

- High incidence and high mortality rate
- Delayed diagnosis
  - Advanced disease
- Limited healthcare coverage
- Limited resources
- Inadequate training of surgeons
  - Non Surgeon staff members often not involved in training
- Cultural Factors (some procedures not accepted) :
  - Amputation, External diversion, castration, etc…
- Data management issues
- Lack of Maintenance
Estimated age-standardized rates (World) of incidence cases, males, all cancers excluding non-melanoma skin cancer, worldwide in 2012
Estimated age-standardized rates (World) of incidence cases, females, all cancers excluding non-melanoma skin cancer, worldwide in 2012
## Estimated incidence, mortality and prevalence (5 years) worldwide in 2012

<table>
<thead>
<tr>
<th>Estimated numbers</th>
<th>Males</th>
<th>Females</th>
<th>Both sexes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Deaths</td>
<td>5-year-prev</td>
</tr>
<tr>
<td>World</td>
<td>7,410,376</td>
<td>4,633,385</td>
<td>15,296,119</td>
</tr>
<tr>
<td>More developed regions</td>
<td>3,226,738</td>
<td>1,591,501</td>
<td>8,549,600</td>
</tr>
<tr>
<td>Less developed regions</td>
<td>4,183,637</td>
<td>3,081,884</td>
<td>6,746,519</td>
</tr>
<tr>
<td>WHO African Region</td>
<td>264,569</td>
<td>205,378</td>
<td>467,820</td>
</tr>
<tr>
<td>WHO Region of the Americas</td>
<td>1,453,679</td>
<td>676,645</td>
<td>3,843,203</td>
</tr>
<tr>
<td>WHO Eastern Mediterranean Region</td>
<td>262,941</td>
<td>191,302</td>
<td>461,190</td>
</tr>
<tr>
<td>WHO European Region</td>
<td>1,970,418</td>
<td>1,020,574</td>
<td>4,791,316</td>
</tr>
<tr>
<td>WHO South-East Asia Region</td>
<td>816,013</td>
<td>616,212</td>
<td>1,237,475</td>
</tr>
<tr>
<td>WHO Western Pacific Region</td>
<td>2,641,596</td>
<td>1,882,428</td>
<td>4,522,687</td>
</tr>
<tr>
<td>IARC Member State (24 countries)</td>
<td>3,089,369</td>
<td>1,900,220</td>
<td>9,192,617</td>
</tr>
<tr>
<td>United States of America</td>
<td>824,698</td>
<td>323,876</td>
<td>2,402,172</td>
</tr>
<tr>
<td>China</td>
<td>1,822,768</td>
<td>1,429,461</td>
<td>2,495,611</td>
</tr>
<tr>
<td>India</td>
<td>477,482</td>
<td>356,730</td>
<td>664,538</td>
</tr>
<tr>
<td>European Union (EU-28)</td>
<td>1,429,715</td>
<td>715,503</td>
<td>3,692,805</td>
</tr>
</tbody>
</table>
Six most common cancers in both sexes by continent (Incidence - ASR)

<table>
<thead>
<tr>
<th>Africa</th>
<th>Asia</th>
<th>South America</th>
<th>North America</th>
<th>Europe</th>
<th>Oceania</th>
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</thead>
<tbody>
<tr>
<td>Breast</td>
<td>Breast</td>
<td>Prostate</td>
<td>Prostate</td>
<td>Breast</td>
<td>Prostate</td>
</tr>
<tr>
<td>Cervix</td>
<td>Lung</td>
<td>Breast</td>
<td>Breast</td>
<td>Prostate</td>
<td>Breast</td>
</tr>
<tr>
<td>Prostate</td>
<td>Stomach</td>
<td>Cervix</td>
<td>Lung</td>
<td>Colorectum</td>
<td>Colorectum</td>
</tr>
<tr>
<td>Liver</td>
<td>Cervix</td>
<td>Lung</td>
<td>Colorectum</td>
<td>Lung</td>
<td>Melanoma</td>
</tr>
<tr>
<td>Colorectum</td>
<td>Liver</td>
<td>Colorectum</td>
<td>Uterus</td>
<td>Uterus</td>
<td>Lung</td>
</tr>
<tr>
<td>NHL</td>
<td>Colorectum</td>
<td>Stomach</td>
<td>NHL</td>
<td>Cervix</td>
<td>NHL</td>
</tr>
</tbody>
</table>

(NHL = Non-Hodgkin’s lymphoma)

- Cancers that have a predominantly infectious etiology
- Cancers for which a component of their etiology is associated with an infection

Wild CP. The role of cancer research in noncommunicable disease control. JNCI 2012;104:1051-1058
**Clinical characteristics of prostate cancer in Sub Saharan Africa**

- Diagnosis at an advanced stage with no possibility of treatment with intent to cure:

- High proportion of prostatic related symptoms and high PSA level:
### Clinical characteristics: Gueye et al. J Urol 2003

<table>
<thead>
<tr>
<th></th>
<th>Senegalese</th>
<th>AA</th>
<th>US Whites</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean age at diagnosis</strong></td>
<td>69</td>
<td>61</td>
<td>62</td>
</tr>
<tr>
<td><strong>Mean PSA</strong></td>
<td>73</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td><strong>Primary tumor</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>2%</td>
<td>43%</td>
<td>35%</td>
</tr>
<tr>
<td>T2</td>
<td>42</td>
<td>35</td>
<td>42</td>
</tr>
<tr>
<td>T3</td>
<td>25</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>T4</td>
<td>17</td>
<td>2</td>
<td>0.1</td>
</tr>
<tr>
<td>Unknown</td>
<td>15</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td><strong>Distant metastasis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>6%</td>
<td>95%</td>
<td>97%</td>
</tr>
<tr>
<td>Yes</td>
<td>16</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Unknown</td>
<td>79</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>
Causes of delayed diagnosis

- Lack of awareness
  - Practionners
  - Populations
- Lack of screening/early detection
- Scarcity of specialist practitioner:
  - Medical and Surgical oncologists
  - Pathologists
  - Pathology labs
Shortage of healthcare professionals

- WHO estimates that 57 countries globally face a critical shortage of health professionals
  - Surgeons and anesthesiologists are particularly scarce

- Thirty-six of these countries are in SSA
  - Surgeon density maybe as low as 0.5 per 100,000 people
Number of People Per Pathologist:
UK*: 15,108
US**: 19,232

*Royal College of Pathologists, 2012,
**Anatomic and Clinical Pathologists, AAMC, 2007
In Ghana the estimated number of new cases is 20,000/year. Korle Bu Hospital is the biggest treatment center but is cannot accommodate more than 1000 patients per year.
Limited access to Radiotherapy in LMICs

Access to radiotherapy is related to income (note log-log scale).

Over 30 African and Asian countries have no access to radiotherapy.

There is a shortfall of over 5000 radiotherapy machines in the developing world.

IAEA has initiated PACT to comprehensively address this urgent problem.
Low access to anti-cancer drugs

Anti-Cancer Drug Sales
- USA: 61%
- Japan: 19%
- Rest of World: 18%
- Other: 5%

Cancer
- USA: 16%
- Europe: 18%
- Japan: 5%
- Rest of World: 61%
Shortage of operating theatres

Estimated number of operating theatres:
- Less than 2/100,000 people in LMICs
- Above 14/100,000 people in high income countries

Data from 54 countries suggested that around 77,700 theatres worldwide were not equipped with pulse oximeters.

- Funk et al. Global operating theatre distribution and pulse oximetry supply: an estimation from reported data. Lancet 2010
Surgical Training in LMICs

- Training on site during residency programme

- Fellowship:
  - Different countries and organizations offer Fellowship programme:
    - Hands-on
    - Observership

- International Missions
Surgical Training in LMICs

- **Training within Residency programme:**
  - Requires competent specialists trainers
  - and close monitoring of trainees
  - Can train many surgeons on the long term while ensuring skill acquisition at all stages of the management:
    - Diagnosis, peri operative requirements, follow-up...

- **Limitations:**
  - Number and capacity of training programs
Surgical Training in LMICs

**Fellowship:**
- Requires the travel of a single person
- Training conducted in an environment different from the setting of the country of origin:
  - Readjustment is often difficult back home
  - Lack of accompaniement and support
- **Risk of brain drain**
Surgical Training in LMICs

**International Missions**

- Allow the training of a whole team from the institution as well as external visitors
- Adapted to the local environment and needs
- Respect the slogan: *TEACH ONE, REACH MANY* of IVUmED (International Volunteers in Urology)
- Requires flexibility and quick adjustment of international trainers
- Renewed Sessions to strengthen the achievements
- Possibility of expanding the training to other visitors
Collaboration between HOGGY and Doylestown Hospital Philadelphia

Instructor: Dr Albert Ruenes
Hands-on

Dr Ruenes Supervising
Laparoscopy workshop
with Dr B Djinou in Dakar (HOGGY) 2016
Laparoscopy workshop with Dr B Djinou in Dakar (HOGGY) 2016
STATE-OF-THE-ART REVIEW

IVUmed: A Nonprofit Model for Surgical Training in Low-Resource Countries

Mohamed Jalloh, MD, Joshua P. Wood, Mary Fredley, Catherine R. deVries, MD

Dakar, Senegal; and Salt Lake City, UT

Abstract

BACKGROUND Low- and middle-income countries (LMICs) face both training and infrastructural challenges for surgical care, particularly for specialty care, such as for urology. Practitioners charged with caring for these patients have few options for basic or advanced training.

OBJECTIVES IVUmed, a nonprofit organization, has for 20 years supported urological educational programs in 30 LMICs by coordinating a network of US and international academic and private providers, institutions, industry partners, and professional societies.

METHODS IVUmed’s motto, “Teach One, Reach Many” has emphasized a teach-the-teacher approach.
IVUmed’s Mission

• IVUmed’s mission is to make quality urological care available worldwide by providing medical and surgical education in low-resource areas.

• IVUmed now works with a broad network of partner organizations:
  ◦ To implement a strategic plan for building a network of educational programs oriented toward providing regional training services in selected geographic areas.
IVUmed Principles

- A model of teaching programs capable of meeting the need for local surgical care and training

- IVUmed’s principle platform is onsite surgical workshops
IVUmed’s Principles (2)

The process involves:

- Connecting physicians/nurses in low resource settings with experienced colleagues for peer-to-peer interaction;
- Hands-on education through onsite surgical workshops;
- Building self-reliant surgical teaching programs capable of providing local and regional education;
- Serving as the chosen provider of care and education in partnership with global urological organizations;
- Identifying, supporting, and developing future generations of IVUmed volunteers and host colleagues.
Dr Jalloh (left) and Dr Ndoye (right) with Dr Schneck
Dean School of medicine, Director of the hospital with Dr Schneck and some participants
Tips for the success of International mission

1. Go for the right reasons
2. Leave the community in better shape than you found it.
3. Work with the local officials, community leaders, NGOs, and local physicians
4. Teach
5. Bring your own supplies, but bring the right supplies.
6. Remember, you’re a guest
7. Maintain communication with local officials
8. Go back and go often
9. Bring knowledge back home
Surgical missions: **Dos and Don’ts**

**Do:**
- Why you’re volunteering:
  - Understand that the trip’s rewards come from the sacrifice
- When you depart:
  - Leave the community in good shape
- How to be collaborative:
  - Work closely with local officials/physicians
- How to empower others:
  - Teach local surgeons, and include them in the efforts
- What do about surgical supplies:
  - Bring your own supplies
- How to gain acceptance in the community:
  - Remember that you’re a guest

**Don’t:**
- Expect a break or vacation
- Leave the community with spent resources, complications, and complex follow-up
- Participate in competitive humanitarianism
- Perform all the surgery yourself
- Bring equipment/supplies that will go unused when you depart
- Ignore the fact that these trips can be disruptive to locals
How to measure your trip’s success

Seek successes outside of the operating room

Judge a mission’s success simply by the number of operations performed

How to follow up

Maintain communication with local physicians/officials after you leave

Consider your physical departure the end of your volunteer work

How to make a lasting impact

Return often to places you’ve been

Explore new medical frontiers just for the sake of personal exploration

How to make the most of your knowledge

Share knowledge/experience with residents/colleagues

Forget that these trips are medical, cultural, and personal learning experiences

Source: Bradley A. Erickson, MD, MS
Maintenance issues

- Healthcare institutions are crowded with devices and instruments out of service

- Poses the problem of hospital maintenance
  - Can be the result of unbalanced public market contract that does not include enough guarantees from the provider
  - Lack of well trained technicians
A conducive environment for surgery

- Team work:
  - Collaboration within the unit:
    - surgeons, nurses, stoma specialists...
  - Collaboration outside the unit:
    - medical oncologist, radiotherapist, psychologists...
- Continuing medical education for all team members
  - Favoring onsite training
- Adequate Facilities
- Good supply chain:
  - Equipment
The key to sucess: a comprehensive and sustainable national anti cancer plan

- Addresses the issues at the global and local level
- Efforts focused on the well identified needs:
  - Appropriate training strategies
  - Adequate diagnostic and therapeutic resources
  - Support from all stakeholders
- Multidisciplinary approach
Governments endorsing a national anti cancer plan
Conclusion

- Cancer is an important public health concern in LMICs
- The limited resources are worsened by other competing public health issues
- All the stages of cancer management require a lot of efforts with a great emphasis on training
- The solutions rely on a multi-disciplinary approach in the framework of a national plan
Thank you for your attention