Diagnostics are Essential for Healthcare: Challenges in LMICs and How to Overcome Them

Pathological Diagnosis: The Center of Cancer Management No Matter Where You Are!

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Cervical cancer – disparities in mortality from a preventable disease

(Map shows countries sized by number of cervical cancer deaths. Numbers represent age-standardized mortality rates.)

- United States: 2.4 per 100,000
- Uganda: 44.4 per 100,000
- Tanzania: 54 per 100,000
- Malawi: 75.9 per 100,000
- Swaziland: 53.1 per 100,000

Cervical cancer mortality rates:

- Eastern Africa
- Middle Africa
- USA
- Western Europe

Age-standardized mortality per 100,000
NCDs in LMICs
2015-2035
$21.3 Trillion
Sources of Delay & (Solutions) In Pathology Value Chain

- **Patient presentation**
  ① Not aware of cancer as a disease (Education, public awareness)
  ② Fear of death, loss of body image (CHW outreach, Survivor Stories)
  ③ Lack of resources for accessing system (Insurance schemes and donor programs)

- **Clinical acumen**
  ① Not aware of cancer as a disease (National Cancer Control Plans)
  ② No guiding documentation (Tiered Training across health sector)
  ③ Lack of resources for diagnosis (Clinical network procurement plans)
Sources of Delay & (Solutions) In Pathology Value Chain

• Biopsy tools
  10 No simple tools (FNA) available (Training in FNA/FNB + essential tools)
  10 No biopsy tools (surgical) available (Training in Biopsy + essential tools)

• Specimen Transportation
  10 No formalin available (Defined specimen transport network)
  10 No specimen containers/requisitions (Supplies exchange program)
  10 Unclear referral network (Public-private partnerships)
Sources of Delay & (Solutions) In Pathology Value Chain

• Personnel
  
  10 No pathologist
  10 No trained or poorly trained technical staff (On site and remedial training with support)
  10 Management issues (Laboratory management training)

• Reagents and Supplies
  10 No reliable supply of standard reagents (Defined role of laboratory in network)
  10 No supply of special reagents (Central support for recurring procurement)
  10 Delays in procurement (Public-private partnerships)
Sources of Delay & (Solutions) In Pathology Value Chain

• Reporting Process
  - On paper reporting (APLIS with networking across system)
  - No laboratory information system (APLIS with networking across system)
  - No standardize reporting (Synoptic reporting to international standards)
  - No electronic reporting systems (APLIS with networking across system)

• Communications
  - Difficult channels between pathology and clinicians
    - (Synoptic reporting)
    - (Interdisciplinary teams)
Number of People Per Pathologist in Sub-Saharan Africa

- No Active Pathologist
- >5.0 million
- 2.5-5.0 million
- 1.0-2.5 million
- 500,000-1 million
- 200,000-500,000
- Data Not Available

Number of People Per Pathologist:

*Royal College of Pathologists, 2012,
**Anatomic and Clinical Pathologists, AAMC, 2007
Site Assessment for Pathology Preparedness

Site has…
Nothing

Site has…
Pathologist(s) but no lab
- Build a lab

Site has…
Lab but no pathologist(s)
- Transport specimens
- Visiting pathologists
- Telepathology

Site has…
Lab, pathologist but understaffed
- Visiting pathologists
- Telepathology

Site has…
Lab, sufficient staff, but not meeting standard of care
- Visiting pathologists
- Telepathology

Site has…
Lab, sufficient staff, and meets standard of care
- Model for other labs

Note:
1. “Site” could be any geographical area
2. Presence/absence of Oncologist/Surgeons
Telepathology as a solution…

**Static image**
Transfer of still images from MD to MD

**Dynamic image**
Transfer of live images from slide to MD

**Whole Slide image**
Transfer of whole image from server to MD

**Automated Histology**
Computer-assisted/directed slide review
Leapfrog Histopathology / Telepathology Process
Leveraging our 8,000 anatomic pathologist members to provide diagnostic services.

Pathologists are recruited via meetings, email and social media as well as focused searches for collaborating academic centers already in country

- Duke/UCSF – Tanzania
- UW/MGH – Uganda
- UNC - Malawi

Intake via a special web site that captures screening and subspecialty data.

Assigned based on anticipated work demand by country.

Volunteers can read as many or as few slides as they choose.
Planned Telepathology Deployments

- 7 Countries (Malawi, Rwanda, Tanzania, Haiti, Ghana, Liberia, DRC)
- 10 Sites (Blantyre, Butaro, Moshi, Dar es Salaam, Mirebalais, Tamale, Kumasi, Accra, Monrovia, Kinshasa)
- Whole slide imaging system with server
- US-based collaboration software (any scanner)
- Teams of 15 ASCP member volunteers per country (virtual consultants)
- As teams come online, additional interventions including onsite training in grossing, histotechnology, special stains, and IHC as needed (gap analysis)
Planned Anatomic Pathology Laboratory Information System

• Web-based program for accessioning, processing, and reporting tissue samples
• Provided to all Partners sites free of charge
• Include hardware for maximum utility
  ▪ barcode readers, barcode printers, etc.
• Allows remote anonymous monitoring of data for measuring impact
Our Partners
Thank You!