Endoscopic Diagnosis

Course

Endoscopy For Oesophageal Squamous Cell Carcinoma:
Diagnosis and Therapeutic Procedures

Speaker
Dr Michael Mwachiro MBChB, MPH, FACS, FCS

Moderators
Dr. Amos Mwasamwaja
Prof. Mário Dinis Ribeiro

IPOPORTO

AFROC ICF AFRICA PROJECT

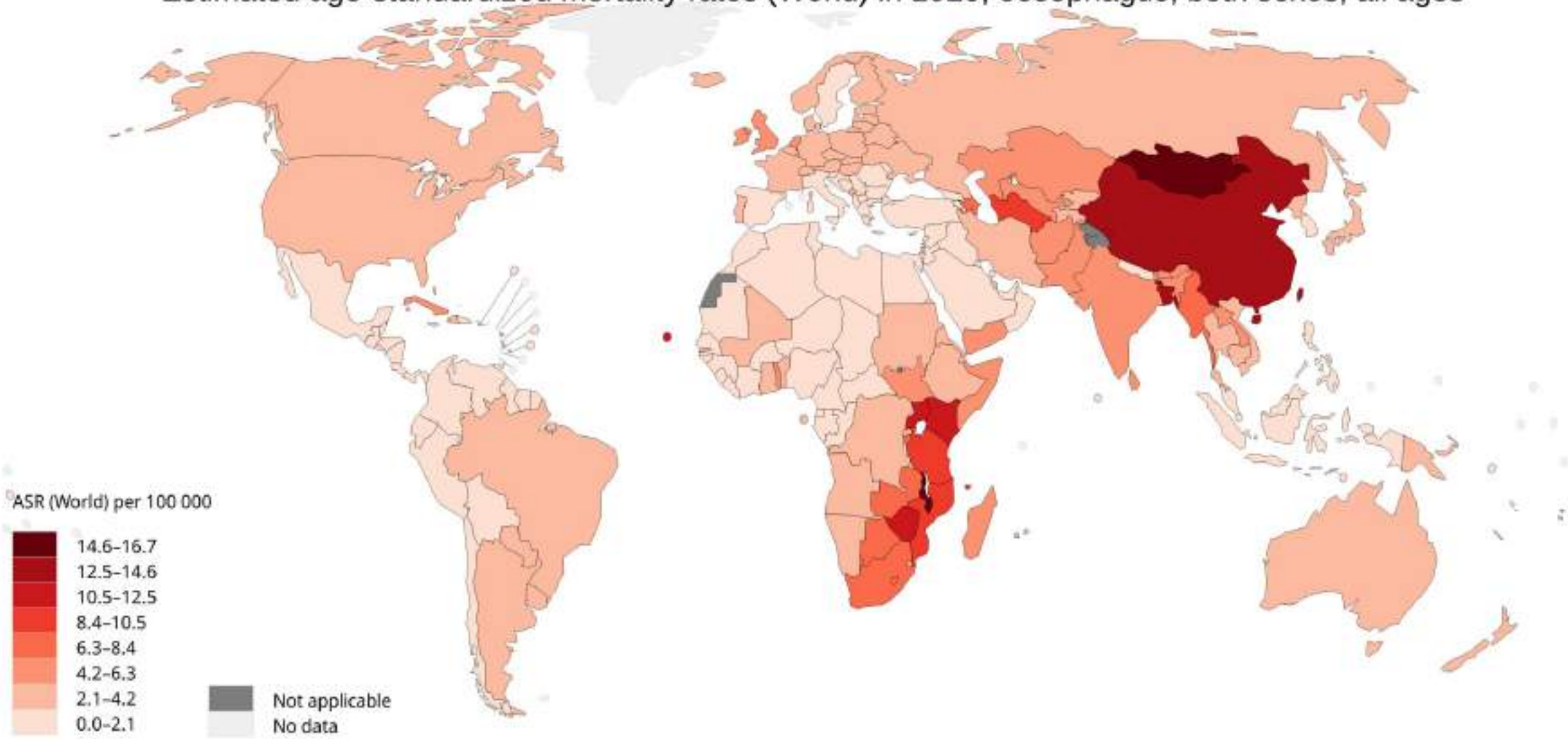
INTERNATIONAL CANCER FOUNDATION
Bridging the global divide in cancer care

KIJANI
LAPAROSCOPY & ENDOSCOPY FOR AFRICA
UP-SKILLING | RESEARCH | PATIENT CARE

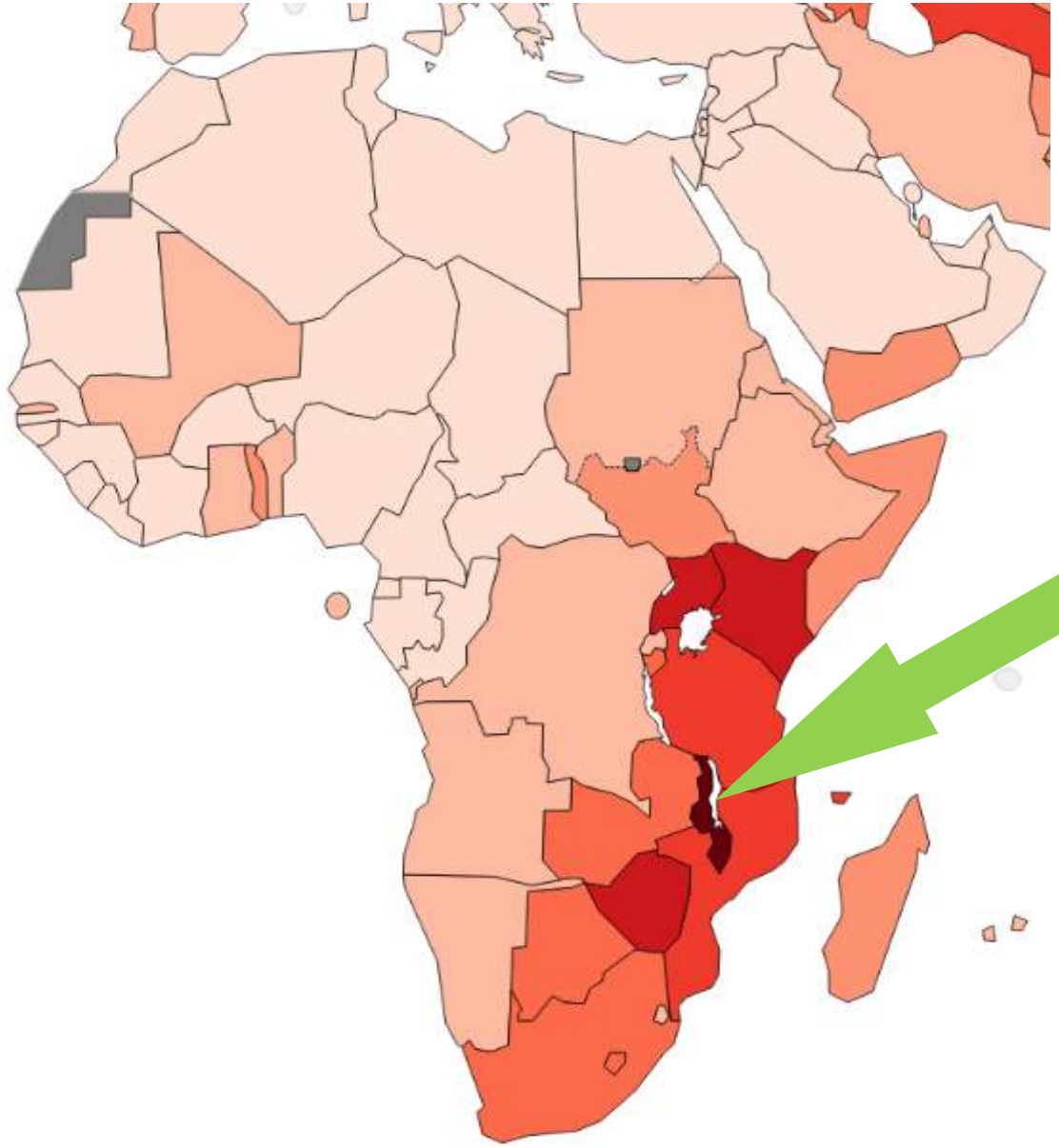
Avenue Healthcare

AfrECC

Estimated age-standardized mortality rates (World) in 2020, oesophagus, both sexes, all ages

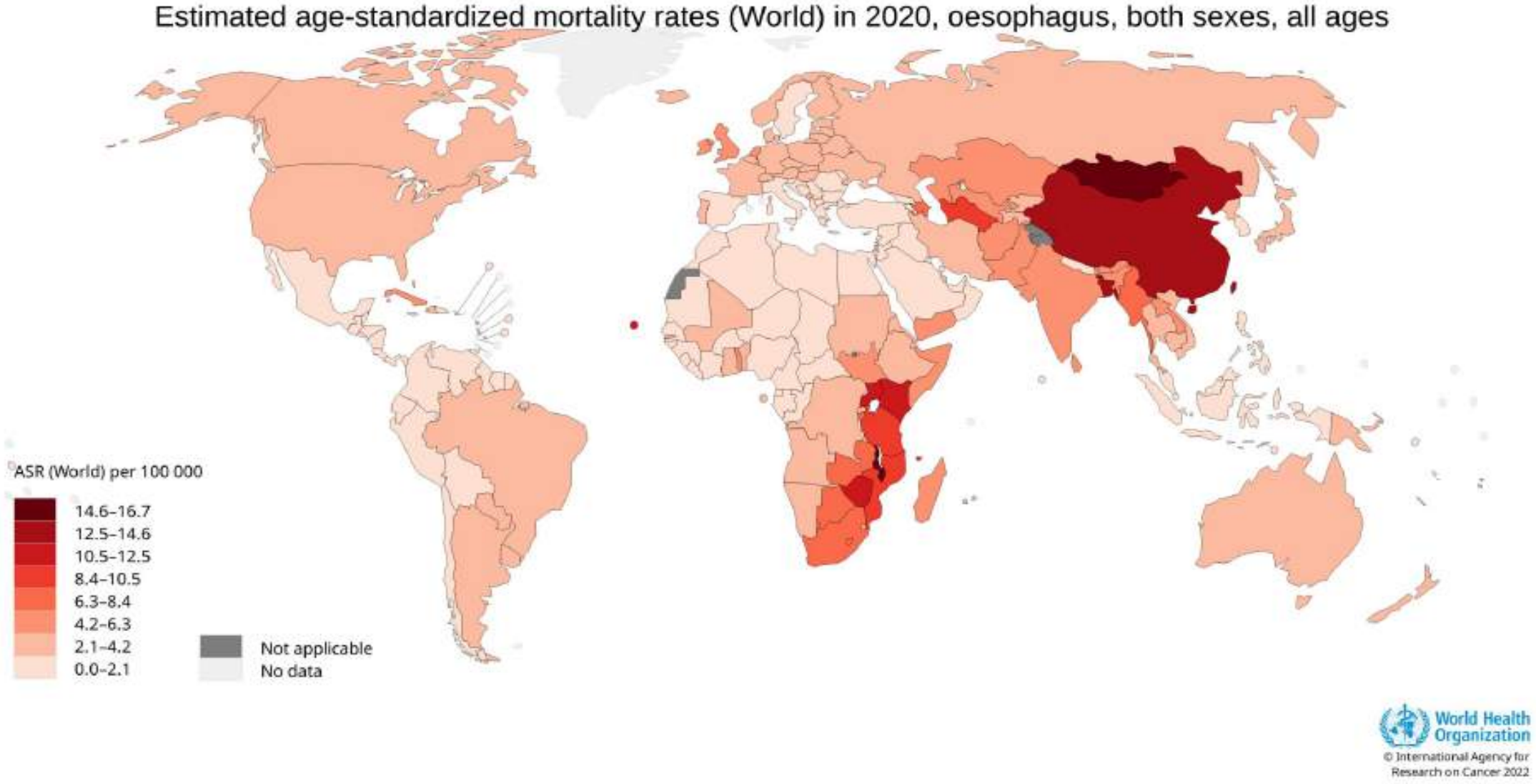


World Health Organization



Malawi

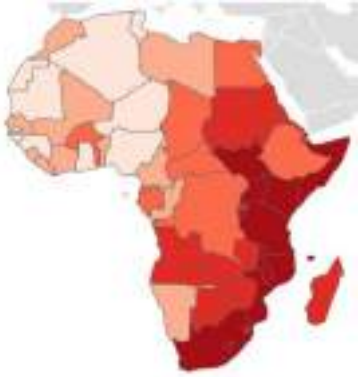
- 20,000,000 People
- Very low HDI
- The highest rates of EC at the country level
  - 17.5/100,000
  - 20.3 in men
  - 15.2 in women



Challenge #1: few reliable population-based cancer registries

Challenge #2: little etiologic or clinical research in the HR

The African Esophageal Cancer Consortium (AfrECC)



ESCC mortality

- Organized in 2017, to coordinate studies and increase capacity, to reduce the burden of EC in Africa
- 10 collaborating sites in 6 countries
- 7 case-control studies – total 2400 cases
  - Joint GWAS study (2K/2K scanned in 2022)
  - Endoscopic capacity surveys
  - Early detection studies
  - Partnering with Boston Scientific Corp. to provide affordable stents and stent insertion training for palliative care
  - Quality of life and survival studies

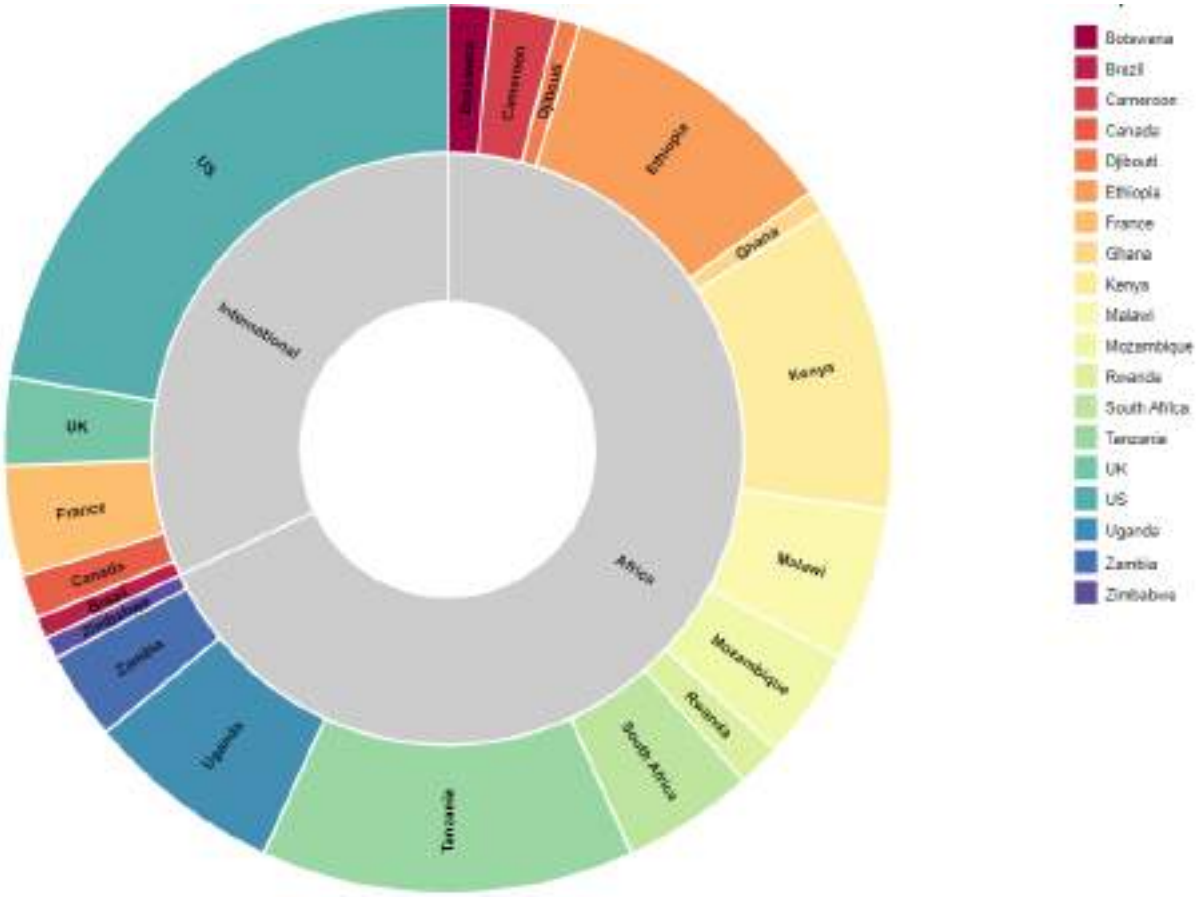
AfrECC sites

AfrECC Membership in 2024

130 individuals

19 countries
14 African
5 International

+10% increase in 2023 at the major biennial African Cancer Conference AORTIC



Expanding oesophageal cancer research and care in eastern Africa

*The African Esophageal Cancer Consortium**

The African Esophageal Cancer Consortium is a self-organized oesophageal cancer research consortium of more than 80 physicians and scientists working at ten sites in nine countries of eastern and southern Africa. We study the aetiology of this highly fatal cancer and are expanding the clinical capacity to improve cancer care.

The African Esophageal Cancer Consortium

Christian C. Abnet[1]✉, Geoffrey C. Buckle[2], Yingxi Chen[1], Sanford M. Dawsey[1], Violet Kayamba[3], Michael M. Mwachiro[4]✉, Charles Dzamalala[5], David E. Fleischer[6], Bongani Kaimila[7], Paul Kelly[3], Christopher Mathew[8,9], Valerie McCormack[10], Stephen J. Meltzer[11], Diana Menya[12], Daniel Middleton[13], Blandina T. Mmbaga[14], Elia Mmbaga[15], Gift Mulima[7], Beatrice Mushi[15], M. Iqbal Parker[16], Msiba Selekwa[15], Mark D. Topazian[17], Yona Ringo[18], Joachim Schüz[10], Katherine Van Loon[2] and Russell E. White[4]

Africa Connect Project: African Initiative against Oesophageal Cancer (AFROC)

INTERNATIONAL CANCER FOUNDATION

Michael Mwachiro
Kenya

Florian Lordick
Germany

Mahlet Tesfaye
Ethiopia

Mansoor Saleh
Kenya

Chite Asirwa
Kenya

Abebe Bekele
Rwanda

Deo Ruhangaza
Rwanda

Duvern Ramiah
South Africa

Amos Mwasamwaja
Tanzania

Blandina Mbaga
Tanzania

Israel Luutu
Uganda

Radka Obermannová
Czech Republic

Nicole van Grieken
Netherlands

Mario Dinis Ribeiero
Portugal

Magnus Nilsson
Sweden

Alex Adjei
USA

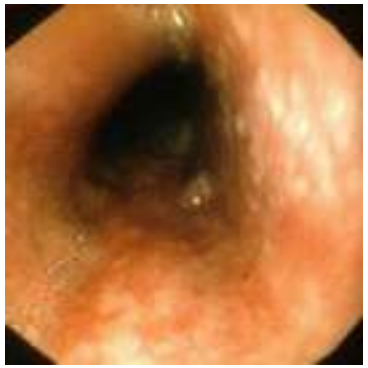
Pernilla Lagergren
Sweden

Lars Abakken
Norway

Reducing the clinical burden of EC

ESCC Survival

- Early detection



> 90% 5-year survival < 10%

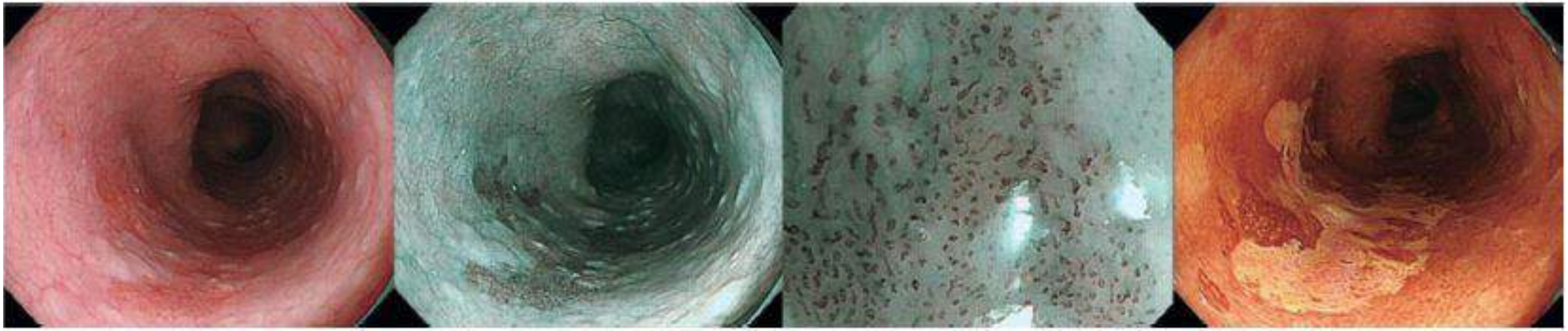
- Poor survival is due to late diagnosis, which is due to late symptoms
- Need early detection and treatment
- How do we screen asymptomatic persons?

Challenges in resource limited settings

- Inadequate Reporting System
- Late Presentation
- Inconsistent Referral Patterns
- Traditional Healers/Treatment
- Difficulties accessing chemotherapy and Radiation
- Financial Constraints
- **Endoscopy access and expertise**

Endoscopic diagnosis for dyplasia

Endoscopic Screening Modalities



White Light Endoscopy

Narrow Band Imaging

Magnifying Narrow Band Imaging

Lugol's Chromoendoscopy

Codipilly DC, et al. Screening for esophageal squamous cell carcinoma: recent advances. Gastrointest Endosc. 2018 Sep;88(3):413-426

Identification of Precursor Lesions

13-year Follow-up of Biopsied Patients

Initial Diagnosis	Number of Subjects	Cumulative Incidence (%)	Relative Risk[1]
Normal	375	8.3	1.0 (ref)
Acanthosis	77	7.8	0.9
Esophagitis	33	6.1	0.8
Basal Cell Hyperplasia	40	15.0	1.9
Mild Dysplasia	76	23.7	2.9*
Mod Dysplasia	30	50.0	9.8*
Sev Dysplasia	23	73.9	28.3*
Carcinoma-in-situ	16	75.0	34.4*
Total	670	16.7	

[1]adjusted for age, sex, smoking, alcohol use, 1983 cytology dx and treatment group

* $p < 0.05$

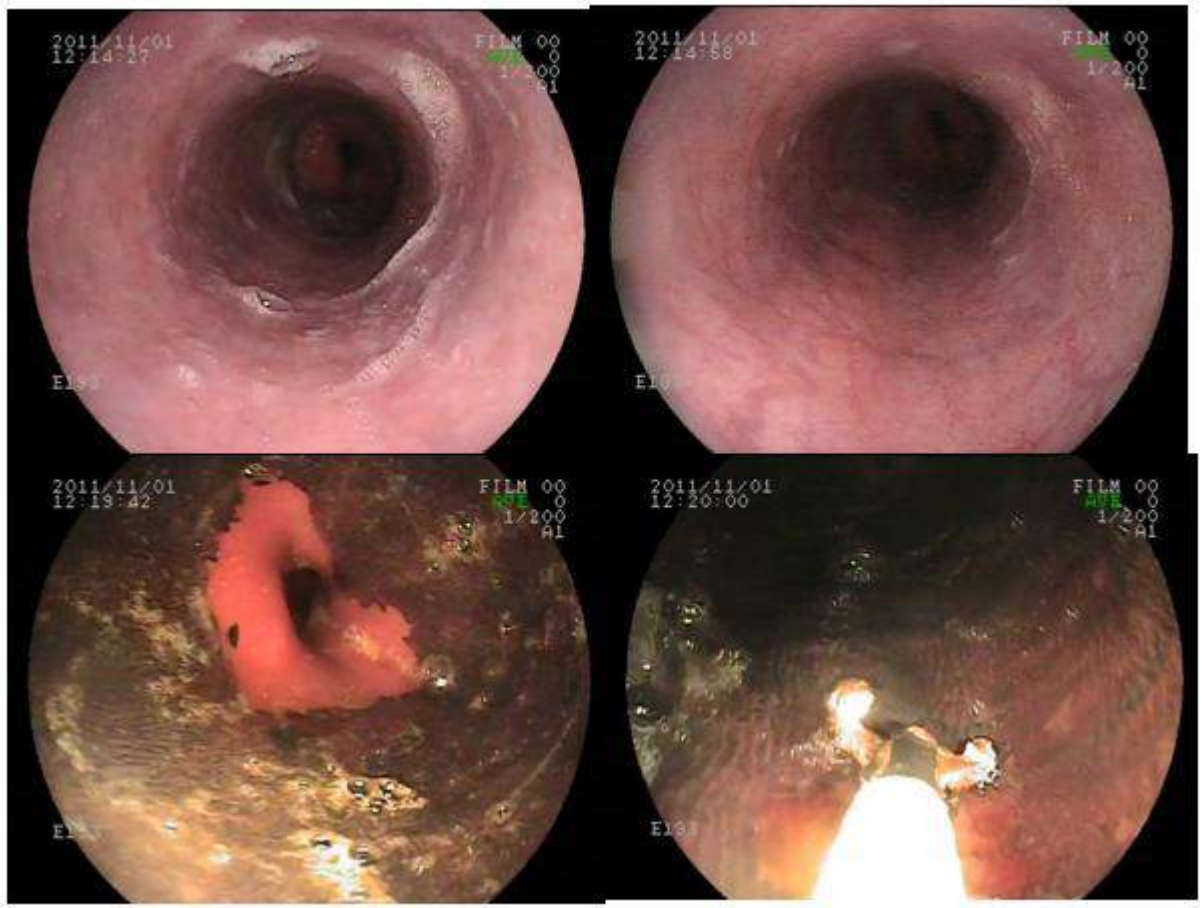
Wang et al Gut 2005

Early screening studies in asymptomatic subjects in Bomet

Kenya

Sensitivity	52%
Dysplasia	2.6%

White RE, et al. Gastroenterology , 2004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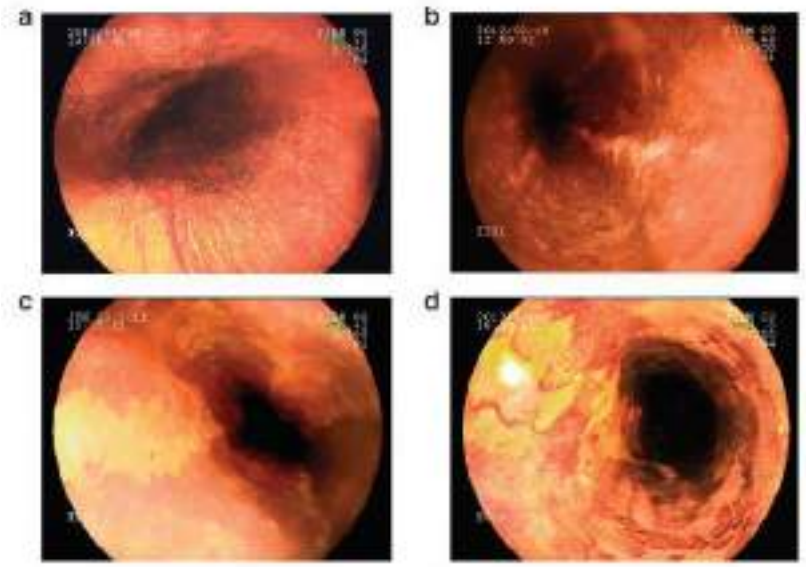
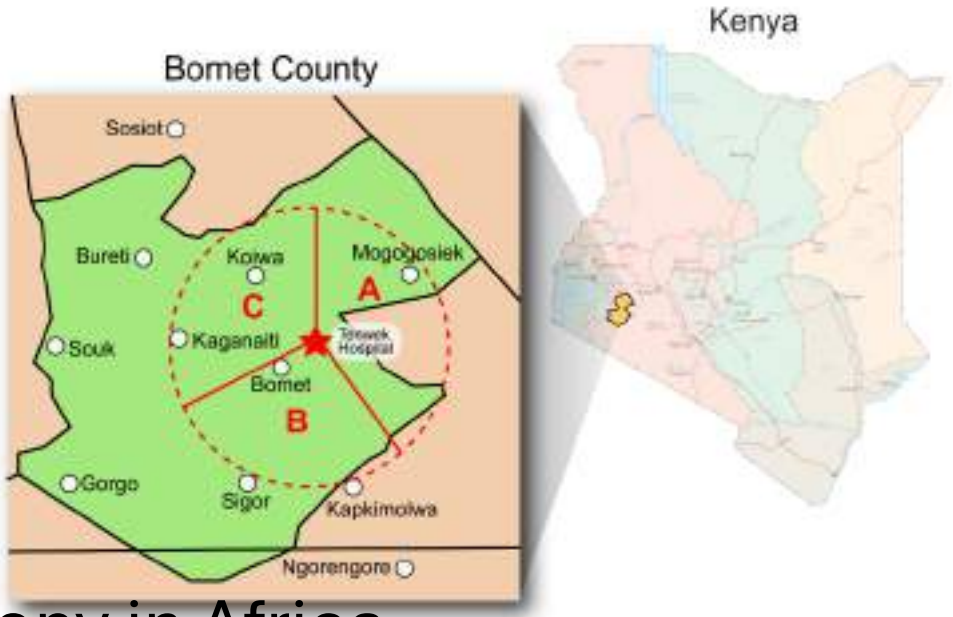
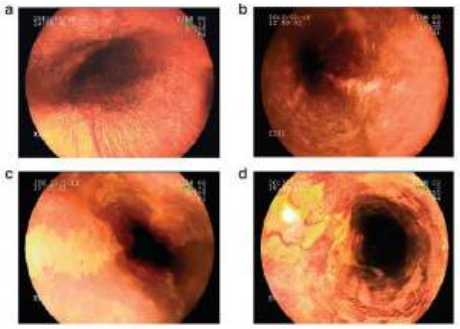




- Pioneer research on Lugol's chromoendoscopy in Africa
- Established a baseline dysplasia rate for ESD
- Screening study on 300 asymptomatic subjects in a high risk area
- Potential for scalability

Mwachiro et al, Am J Gastroentrol, 2016



Histologic Diagnoses

Diagnosis	Number	N (%)
Normal	115	37
Mild esophagitis	119	39
Moderate- severe esophagitis	27	9
Mild dysplasia	35	11.5
Moderate dysplasia	8	2.6
Severe dysplasia	1	0.3

14.4%

Mwachiro et al, Am J Gastroentrol, 2016

Cancer Epidemiology
Volume 78, June 2022, 102141

Prevalence of esophageal squamous dysplasia in relatives of patients with esophageal cancer in Southwestern Kenya

Justus O. Lando [a], Michael M. Mwachiro [a], Robert K. Parker [a, b], Paul S. Albert [c], Russell E. White [a, b], Stephen L. Burgert [a], Robert Chepkwony [a], Christian C. Abnet [d], Jessie Githanga [e], Mark D. Topazian [f], Sanford M. Dawsey [d]

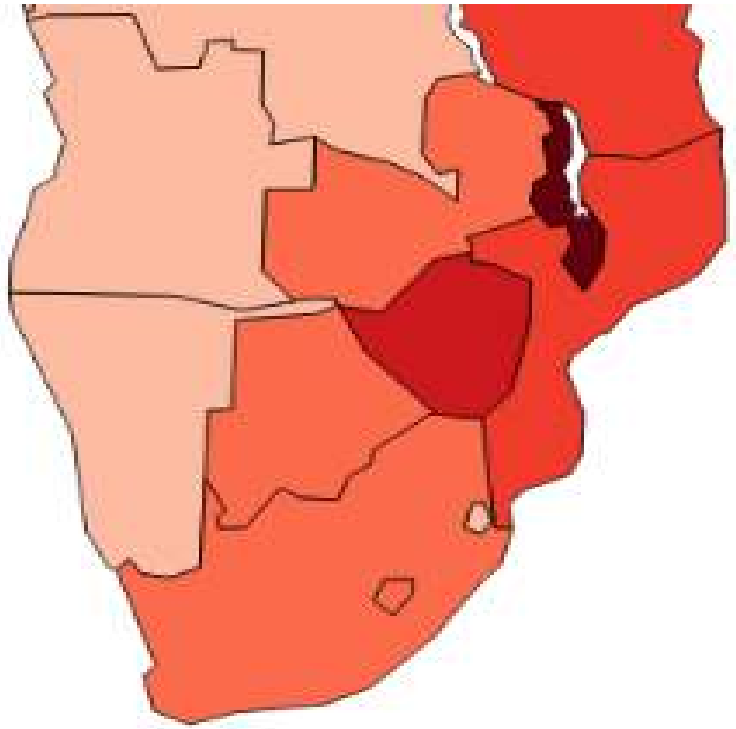
- There was heterogeneity in ESD prevalence between families, suggesting genetic or environmental factors may influence it.
- The overall prevalence of ESD among first-degree relatives was 14.7%, comparable to the background prevalence of 14.4%.

Lando et al, Cancer Epidemiology, 2022

Comparison of dysplasia studies

Year	Author	Location	Sample Size	Age (yrs	Prior Dysplasia	Mild	Moderate	Severe	All dysplasia
1994	Dawsey	Linxian, PRC	754	40 – 69	No	10.6%	4.6%	5.8%	23%
1997	Roth	Linxian, PRC	439	50 – 69	None	12.0%	10.0%	6.0%	28%
2004	Lu	Cixian, PRC	2013	40 – 69	NA	8.6%	7.8%	2.6%	22%
2008	Pan	Linxian, PRC	725	50 – 64	NA	14.0%	12.0%	5.0%	32%
2010	He	Anyang, PRC	7381	25– 65	NA	2.6%	0.2%	0.2%	3%
2012	Etemadi	Gonbad, Iran	724	NA	None	NA	NA	NA	4%
2016	**Mwachiro**	**Bomet, KE**	**294**	**18-79**	**None**	**11.5%**	**2.6%**	**0.3%**	**14.4%**
2022	**Lando**	**Bomet, KE**	**296**	**18-79**	**None**	**11.0%**	**2.5%**	**1.2%**	**14.7%**

MEZA (Swallow) ESCC Screening study in Lilongwe, Malawi



1. **Endoscopically screening 1000 asymptomatic adult Malawian volunteers**

2. **Conduct comprehensive oral health exams on the same subjects**

3. **Assess the consistency of risk factors for ESD and ESCC in Malawi and to build a risk stratification model**

4. **Bank biospecimens**
   Oral wash and subgingival samples
   Encapsulated esophageal sponge samples
   Esophageal and gastric biopsies
   Blood
   Urine

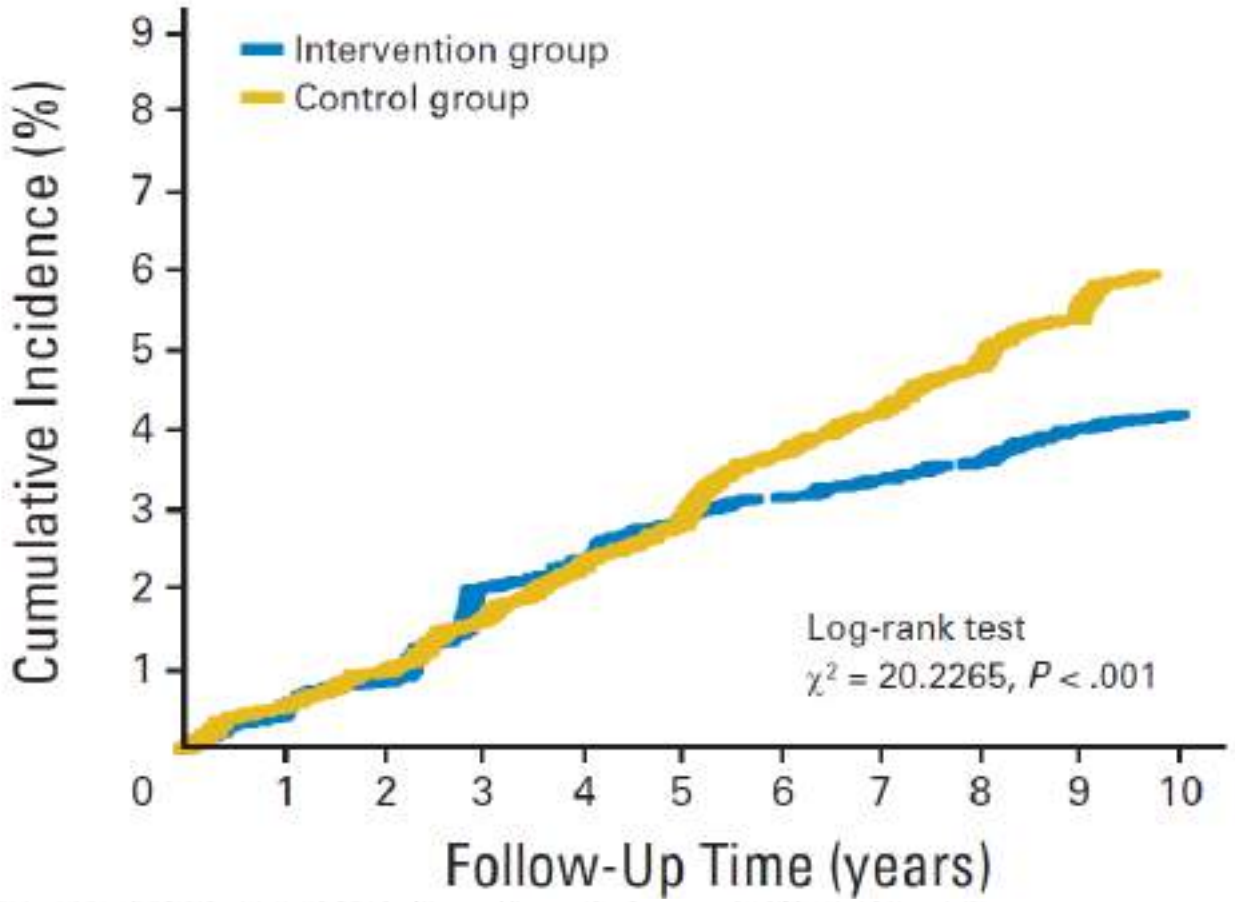
MEZA (Swallow) ESCC Screening study in Lilongwe, Malawi

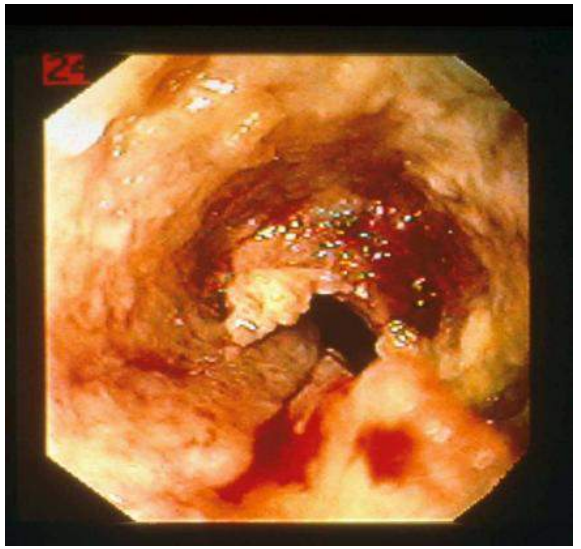
Screening In Africa- Tanzania dysplasia studies

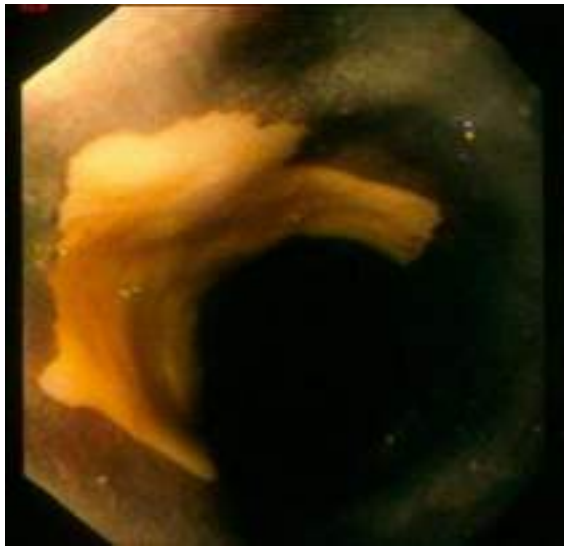
Long-Term Follow-Up of a Community Assignment, One-Time Endoscopic Screening Study of Esophageal Cancer in China

Wen-Qiang Wei, Zhi-Feng Chen, Yu-Tong He, Hao Feng, Jun Hou, Dong-Mei Lin, Xin-Qing Li, Cui-Lan Guo, Shao-Sen Li, Guo-Qing Wang, Zhi-Wei Dong, Christian C. Abnet, and You-Lin Qiao

A







J Clin Oncol 33:1951-1957.

Endoscopic diagnosis for locally advanced disease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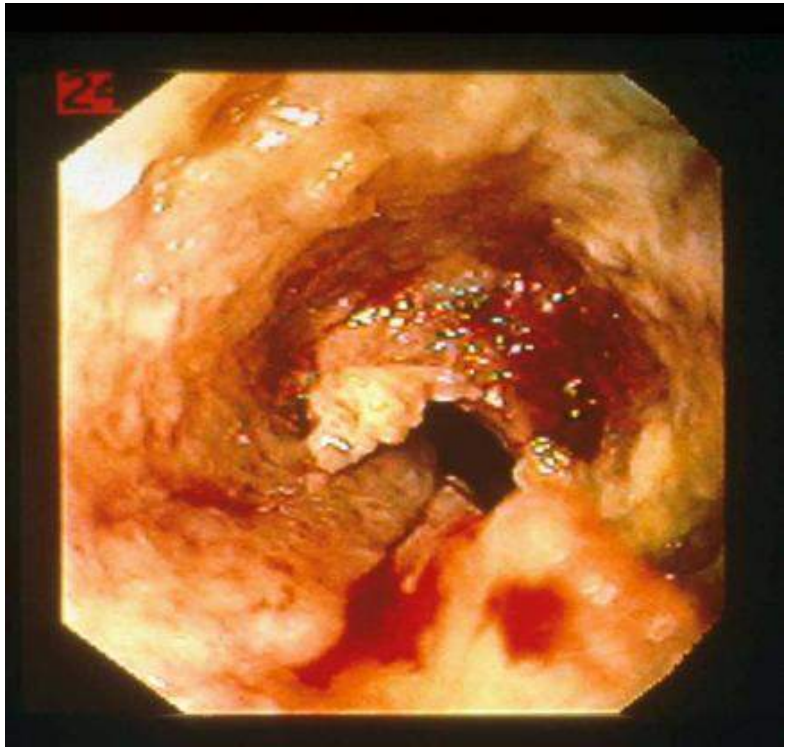
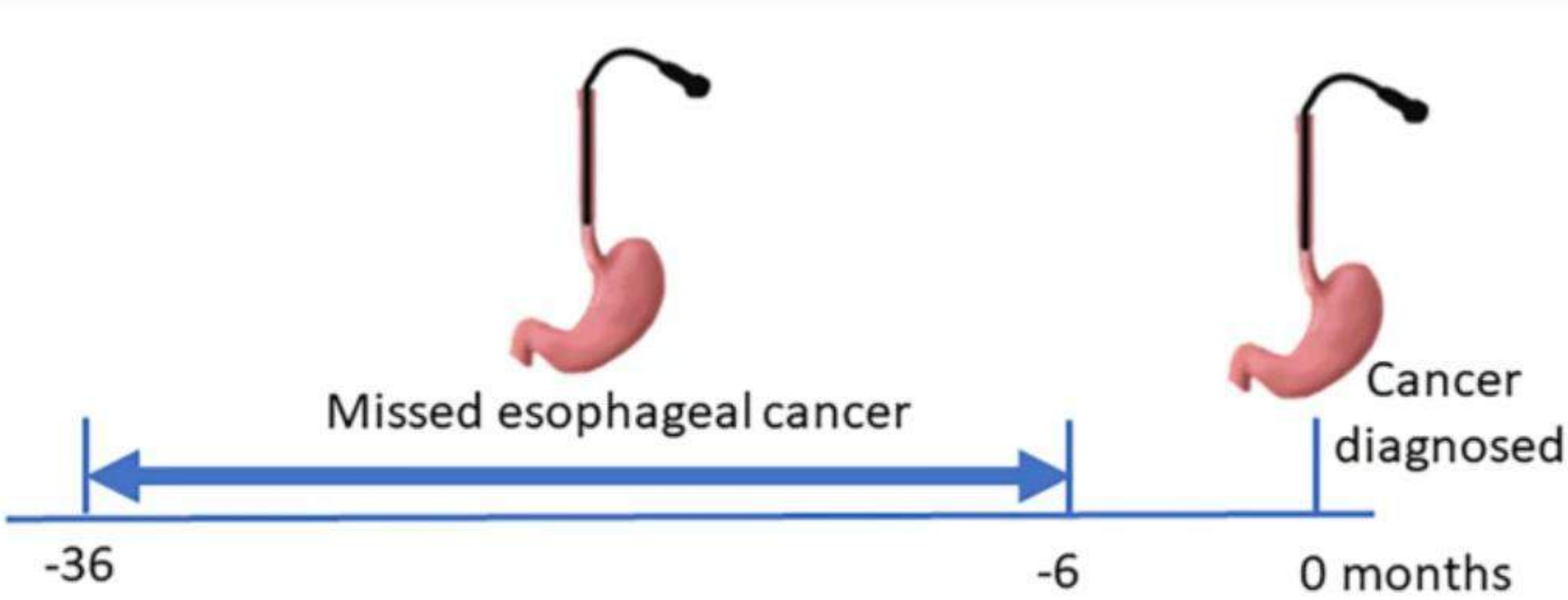


Biopsy for ESCC

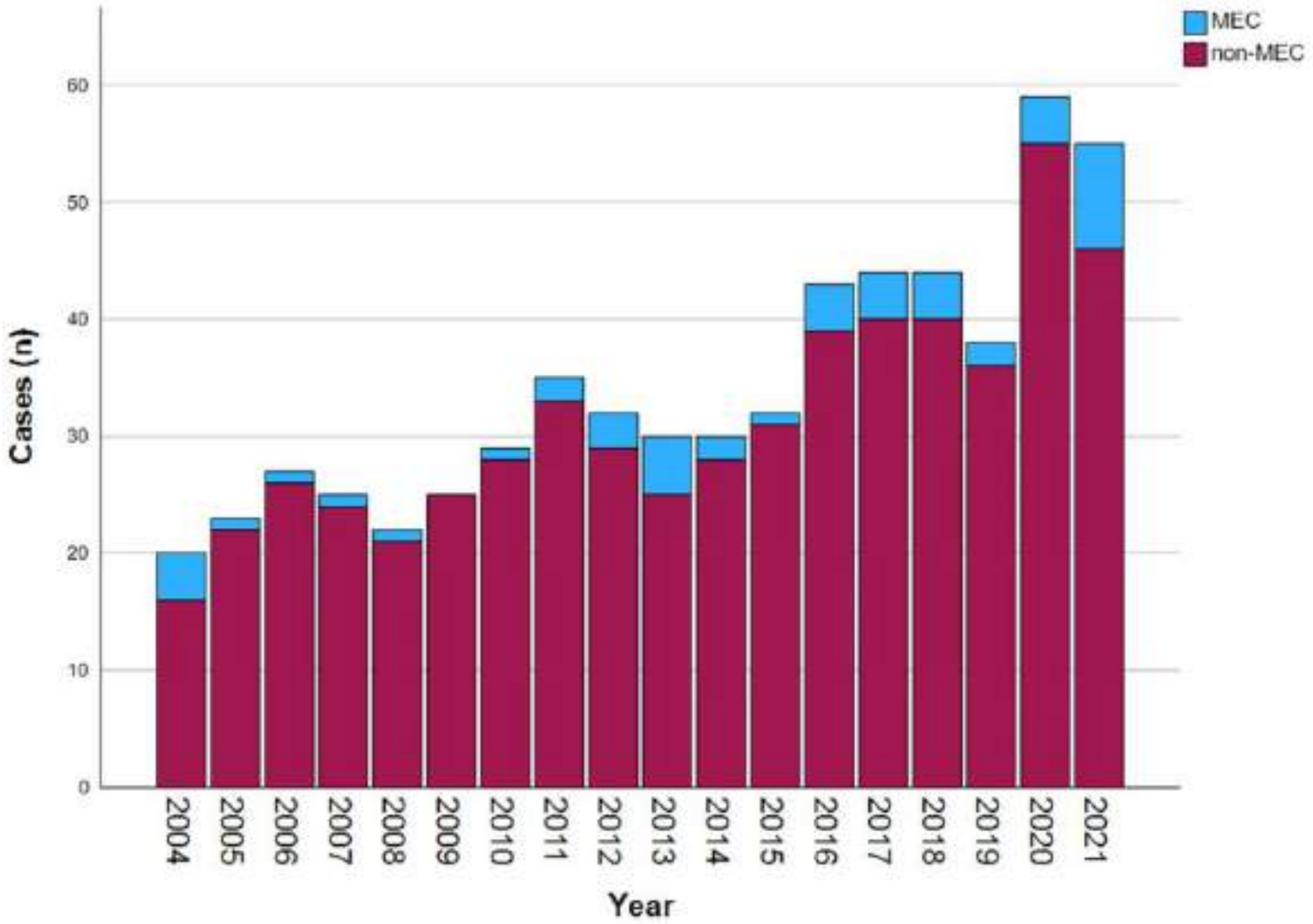
- The sensitivity for mucosal biopsies to detect esophageal carcinoma reaches 96% when multiple samples are obtained
- The use of large-capacity biopsy forceps does not improve the sensitivity.
- Strictures may prevent complete visualization and sampling of the obstructing malignancy.
- Dilation may be needed when the scope cannot advance

Missed Esophageal cancer diagnosis



Missed esophageal cancer was defined as cancer diagnosed 6 to 36 months after an upper endoscopy where cancer was not diagnosed

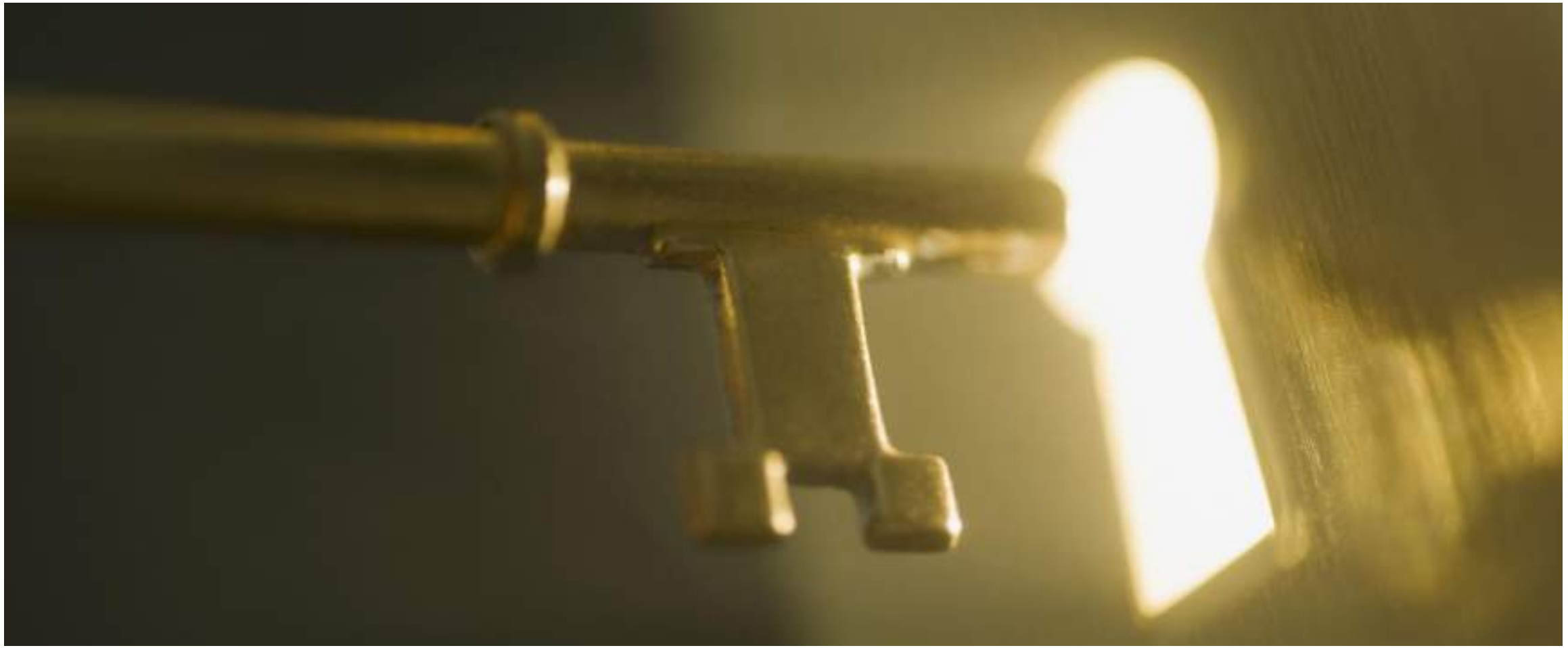
- Straum, S., Wollan, K., Rekstad, L.C. *et al.* Esophageal cancers missed at upper endoscopy in Central Norway 2004 to 2021 – A population-based study. *BMC Gastroenterol* **24**, 279 (2024). https://doi.org/10.1186/s12876-024-03371-z



Annual number of missed esophageal cancers (MEC) in comparison to the total number from 2004 to 2021

- Straum, S., Wollan, K., Rekstad, L.C. *et al.* Esophageal cancers missed at upper endoscopy in Central Norway 2004 to 2021 – A population-based study. *BMC Gastroenterol* **24**, 279 (2024). https://doi.org/10.1186/s12876-024-03371-z

Access to endoscopy is key



Gastrointestinal endoscopy capacity in the region

CC BY-NC-ND 4.0 · Endosc Int Open 2021; 09(11): E1827-E1836
DOI: 10.1055/a-1551-3343

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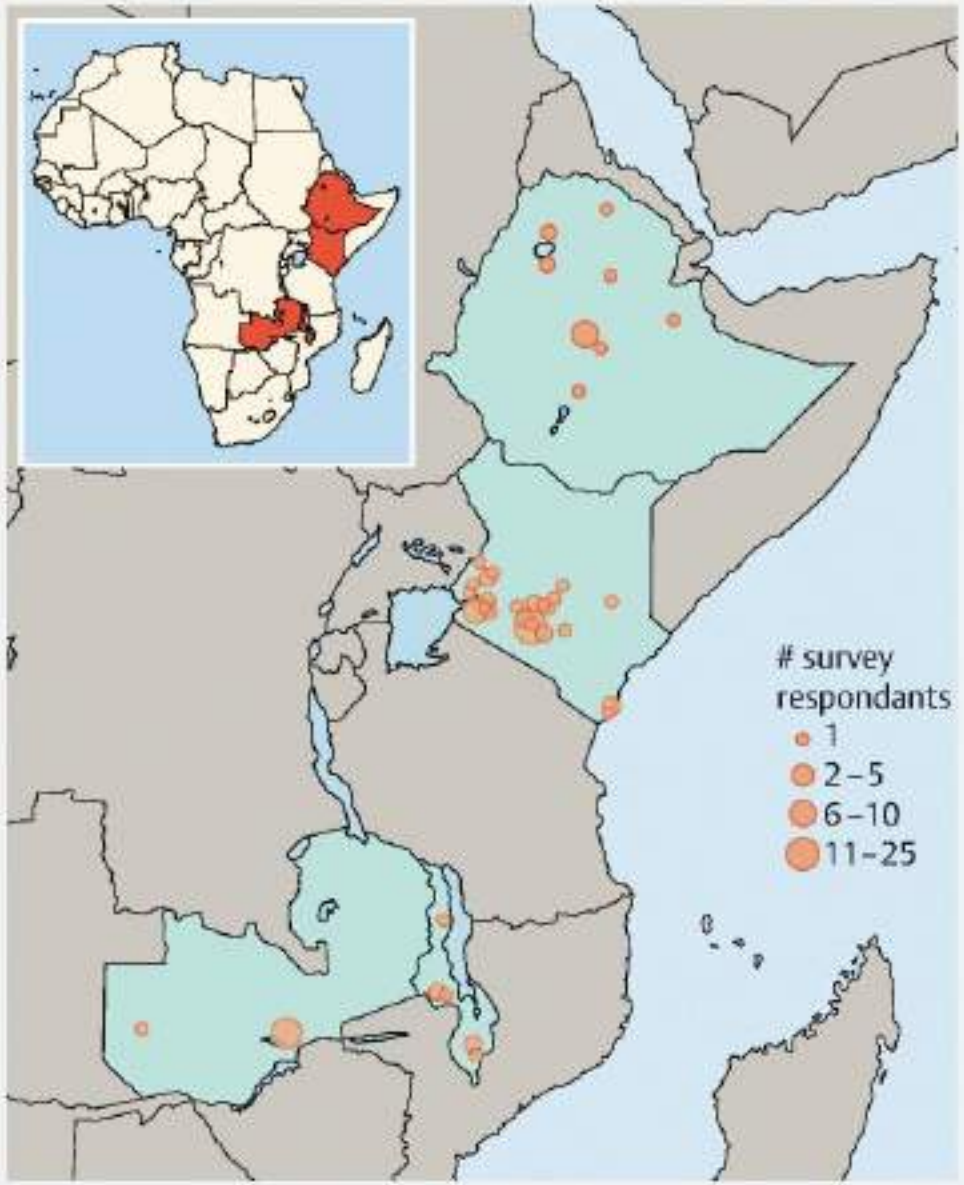
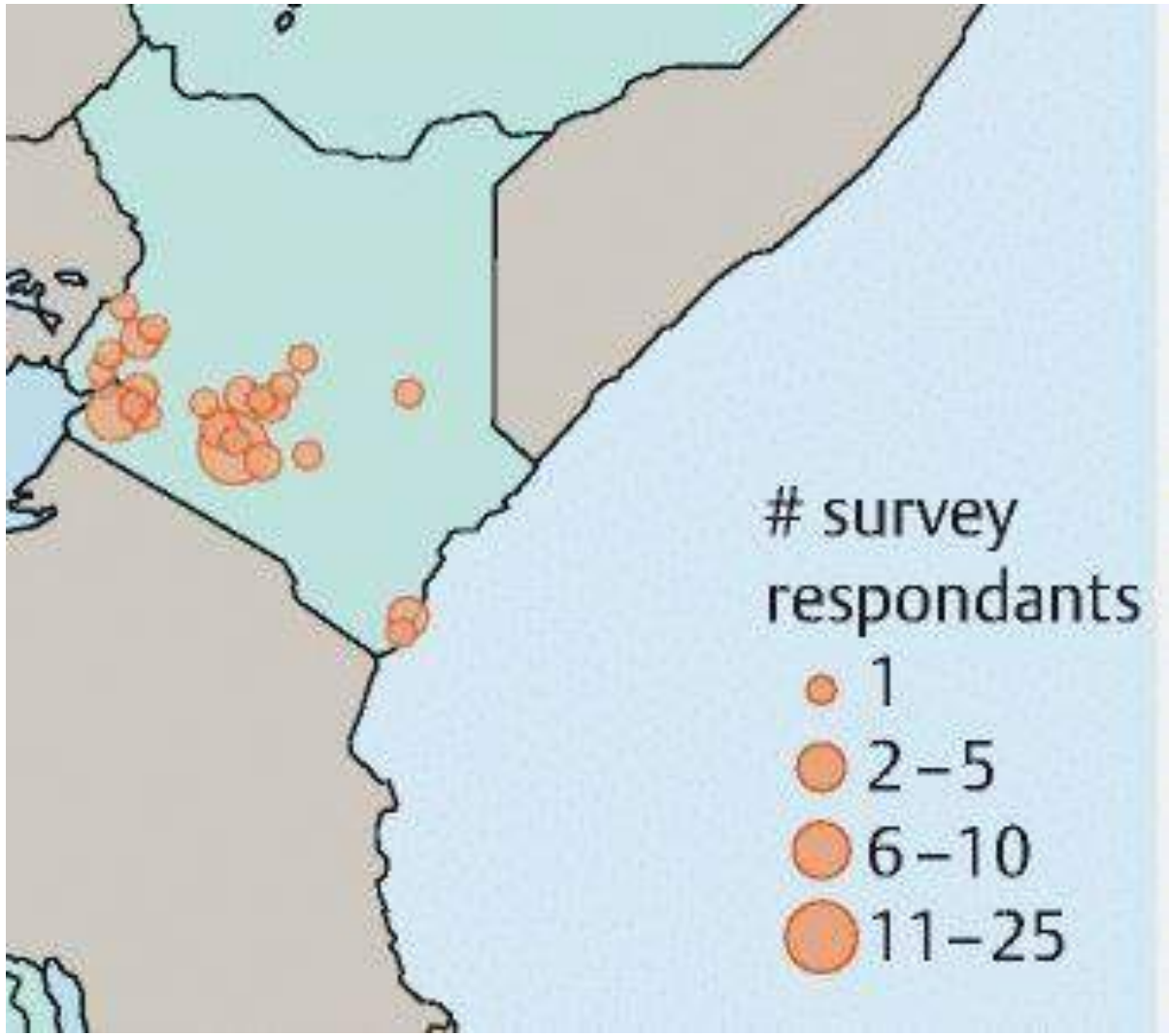
Original article

Gastrointestinal endoscopy capacity in Eastern Africa

Michael Mwachiro‡ , Hillary M. Topazian‡ , Violet Kayamba , Gift Mulima , Elly Ogutu , Mengistu Erkie , Gome Lenga , Thomas Mutie , Eva Mukhwana , Hailemichael Desalegn , Rezene Berhe , Berhane Redae Meshesha , Bongani Kaimila , Paul Kelly , David Fleischer , Sanford M. Dawsey , Mark D. Topazian

- Study of government, private and faith based institutions
- Survey done through the country associations
- Responses from 87 participants in 91 facilities





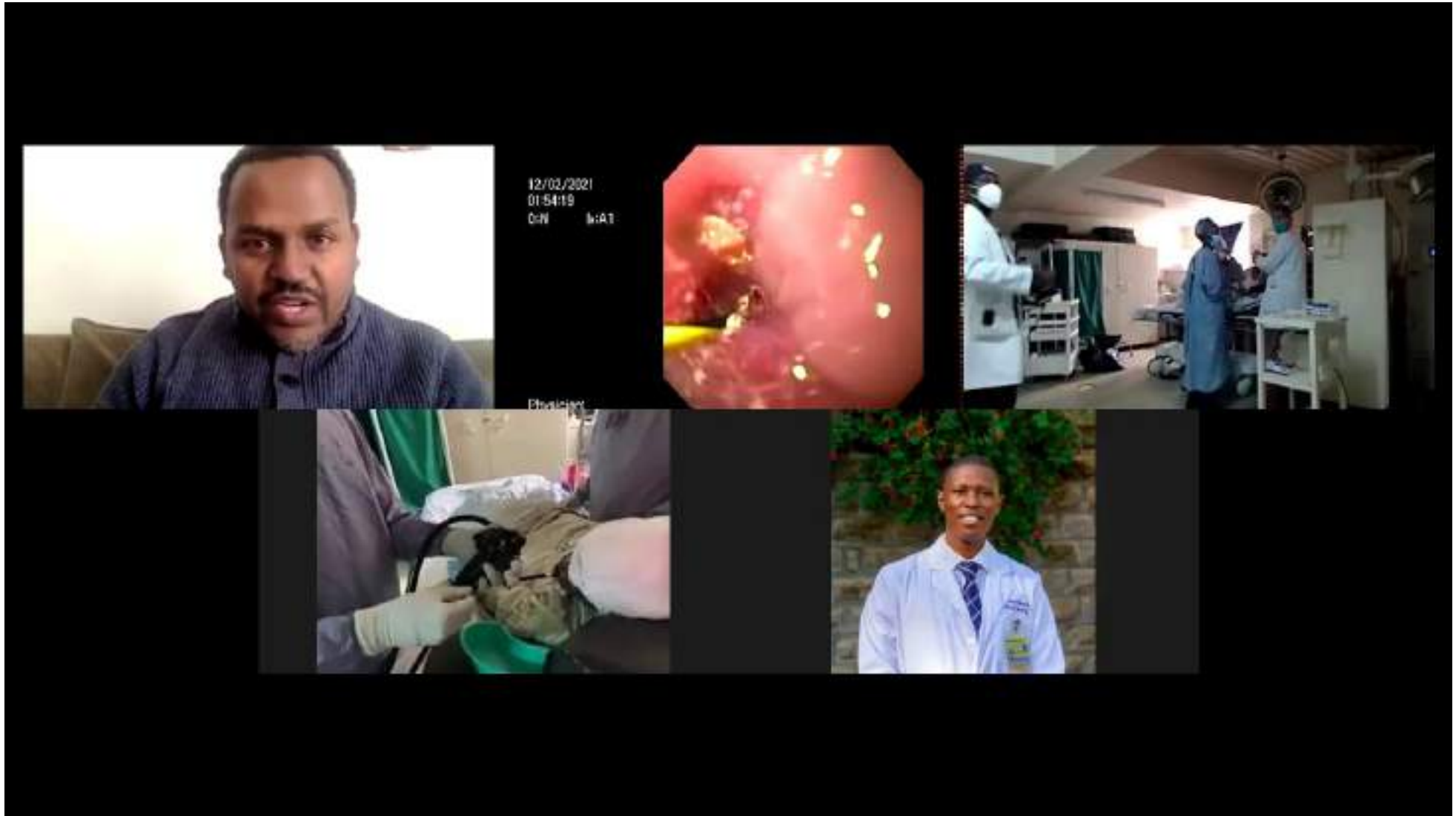
Mwachiro, M., Topazian, H. M., et al. (2021).

After you find dysplasia what next?

- A trial of treatment of early disease also completed- EXPECT Study
- Feasible to do Endoscopic Mucosal Resection +/- Radio Frequency Ablation in our setup
- Follow up and cost of endoscopy plus supplies will be long term challenge
- Low dysplasia rates will affect large scale roll out
- Esophageal submucosal dissection still not feasible in our setup- long learning curve/ low dysplasia rates

Endoscopy training

Remote mentorship- Live Dual link: Tenwek and Addis- Stent case



Remote mentorship- Live Dual link: USA and Uganda- Kyabirwa

Other ongoing efforts: Sponge studies in Tanzania

› Int J Cancer. 2021 Mar 1;148(5):1208-1218. doi: 10.1002/ijc.33366. Epub 2020 Nov 21.

Minimally invasive esophageal sponge cytology sampling is feasible in a Tanzanian community setting

Daniel R S Middleton [1], Blandina T Mmbaga [2 3 4], Maria O'Donovan [5], Behnoush Abedi-Ardekani [6], Irene Debiram-Beecham [7], Gissela Nyakunga-Maro [2 3 4], Venance Maro [3 4], Martin Bromwich [5], Amini Daudi [2 3], Timothy Ngowi [2], Rehema Minde [3], Jackson Claver [3], Alex Mremi [3 4], Amos Mwasamwaja [2 3 4], Joachim Schüz [1], Rebecca C Fitzgerald [7], Valerie McCormack [1]

Other ongoing efforts: Sponge studies in Malawi

- Led by Dr Shiraz Khan
- Shiraz leading by example!!!

Screening: From Inception to reality

- Start with what we have
- Lugol's chromoendoscopy for first degree relatives of pathology confirmed patients
- Focus on high incidence counties

Tenwek Hospital
STEP Program
Fighting Esophageal Cancer
Surgical Treatment . Early detection . Palliation

AfrECC Foundation Reception @ DDW Baker-Botts L.L.P.

-45 attendees
-AfrECC Foundation Board members
-Industry Leaders
-GI community
-AfrECC countries' embassy representatives

Presentation(s)
Michael Mwachiro: AfrECC
David Fleischer: AfrECC Foundation
Followed by Q & A

Thank you

Dr Michael Mwachiro

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Partners

Funding

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Bridging the global divide in cancer care