

Memorial Sloan Kettering Cancer Center

# **Colorectal cancer screening in West Africa**

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# **CRC screening**

- Why is it important?
- How is it used in the US?
- Can it be applied to low resource settings?
- Where do we go from here?

#### Why CRC screening is important: Estimated new cases 2015

Cancer Statistics, 2015 -

Estimated New	/ Cases
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			Males	Females		
Prostate	220,800	26%		Breast	231,840	29%
Lung & bronchus	115,610	14%	1.1	Lung & bronchus	105,590	13%
Colon & rectum	69,090	8%		Colon & rectum	63,610	8%
Urinary bladder	56,320	7%		Uterine corpus	54,870	7%
Melanoma of the skin	42,670	5%		Thyroid	47,230	6%
Non-Hodgkin lymphoma	39,850	5%		Non-Hodgkin lymphoma	32,000	4%
Kidney & renal pelvis	38,270	5%		Melanoma of the skin	31,200	4%
Oral cavity & pharynx	32,670	4%		Pancreas	24,120	3%
Leukemia	30,900	4%		Leukemia	23,370	3%
Liver & intrahepatic bile duct	25,510	3%		Kidney & renal pelvis	23,290	3%
All Sites	848,200	100%	_	All Sites	810,170	100%

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Cancer Statistics, 2015

Rebecca L. Siegel, MPH<sup>1</sup>\*; Kimberly D. Miller, MPH<sup>2</sup>; Ahmedin Jemal, DVM, PhD<sup>3</sup>



#### Why CRC screening is important: Estimated deaths 2015

#### **Estimated Deaths**

				Males	Females		
	Lung & bronchus	86,380	28%		Lung & bronchus	71,660	26%
	Prostate	27,540	9%	17	Breast	40,290	15%
	Colon & rectum	26,100	8%		Colon & rectum	23,600	9%
	Pancreas	20,710	7%		Pancreas	19,850	7%
Liver &	intrahepatic bile duct	17,030	5%		Ovary	14,180	5%
	Leukemia	14,210	5%		Leukemia	10,240	4%
	Esophagus	12,600	4%		Uterine corpus	10,170	4%
	Urinary bladder	11,510	4%		Non-Hodgkin lymphoma	8,310	3%
No	n-Hodgkin lymphoma	11,480	4%		Liver & intrahepatic bile duct	7,520	3%
	Kidney & renal pelvis	9,070	3%		Brain & other nervous system	6,380	2%
	All Sites	312,150	100%	_	All Sites	277,280	100%

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Cancer Statistics, 2015

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#### Removal of polyps reduces the incidence of cancer

- Removal of adenomatous polyps reduces the incidence of cancer, and the diagnosis of CRCs at earlier stages reduces mortality.(1,2)
- Prospective studies have proven that screening for colorectal polyps and cancer using a variety of methods reduces CRC mortality, even long-term after screening.(3-5)

#### • Screening for CRC is cost effective in term of the qualityadjusted life-years gained compared to non-screening.

1. Winawer SJ et al. Prevention of colorectal cancer by colonoscopic polypectomy. The National Polyp Study Workgroup. The New England journal of medicine. 1993;329(27):1977-81.

2. Lieberman DA. Clinical practice. Screening for colorectal cancer. The New England journal of medicine. 2009;361(12):1179-87.

3. Zauber AG, et al. Colonoscopic polypectomy and long-term prevention of colorectal-cancer deaths. The New England journal of medicine. 2012;366(8):687-96.

4. Shaukat A MS et al. Long-term mortality after screening for colorectal cancer. The New England journal of medicine. 2013;369(12):1106-14.

5. Loberg M, et al. Long-term colorectal-cancer mortality after adenoma removal. The New England journal of medicine. 2014;371(9):799-807.



# **CRC screening**

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## **US screening recommendations**

- Screening for CRC is recommended for men and women over age 50
  - Compliance remains suboptimal since more than one third of Americans report not having participated in a screening program.

#### **Risk of CRC if a relative has CRC**





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### **Barriers to screening?**

- Inconvenience
- Bowel preparation
- Discomfort
- Lack of information
- Lack of access



#### **CRC screening in the African American community**

- African American patients, especially males, often decline colonoscopy screening
  - Despite high incidence of colorectal cancer
  - "doctor didn't spend enough time discussing screening"
  - Pts report little knowledge of CRC and fear of the health care system

#### Successfully overcoming barriers: Bronx, NY

- Utilized:
  - Patient navigators
  - Streamlined referral network
  - Guidelines for referrals
  - Fact sheet

• Results: missed appointment rate decreased from 67% to 5% for colonoscopy

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- 25.9% had an abnormal finding
  - 2% had CRC

Kanna, Journal of General Internal Medicine, 22(6), 835-240. 2007

# **CRC screening**

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#### **Global cancer statistics 2012**

#### Estimated New Cases

#### **Estimated Deaths**



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#### **Global Cancer Statistics**, 2012

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### African Research Group for Oncology (ARGO)

 Originally a consortium of MSKCC and OAU in Nigeria to study colorectal cancer

 Goal: improve training, research, and treatment to improve the outcomes of patients with cancer in Nigeria





## ARGO





- prospective database
- tissue bank

2. What are outcomes of pts with CRC?

- 3. Can pts with breast cancer be identified earlier?
- 4. How can care for breast cancer be standardized?



- 1. Post graduate courses
- 2. Masters in Clinical Research
- 3. Soudavar Fellowships
- 4. ARGO Pilot Grants
- 5. K Award
- 6. Pathology



- 1. Can pts with CRC be identified at early stages?
- 2. Developing ARGO SOPs
- 3. CRC therapeutic trial
- 4. Early discharge after breast surgery
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#### **Post Graduate Courses**



Tues, 28th - Thur, 30th April, 2015





#### **Disease Management Team**





### African Research Group for Oncology (ARGO)

Age	55.43 (17.07-100.2)
Male	83 (56.8)
Blood in stool	78 (66.7)
>6 months bleeding	23%
Weight loss	88%
Rectal primary	53%
Metastatic disease	64%

#### Survival with CRC in Nigeria is poor

 6 month survival (95% confidence interval) was 62.6% (53.6-72.1)

12 month survival
was 48.4% (38.9 60.1)



**OS** from diagnosis

Months from diagnosis

# How do we decrease this mortality rate?

- Prevention
  - Lifestyle changes
- Screening
  - Prevent CRC
  - Diagnose CRC at earlier stage

Improve treatment options for CRC

# How do we identify patients with early stage disease?

- Retrospective colonoscopy data 2007-2011
  - 139 patients with LGI bleeding
  - 12 patients (8.6%) were diagnosed with CRC
  - 20 patients (14.4%) were diagnosed with polyps
- Utilization of stool based screening strategies
  - cost effective in setting like Nigeria
  - high prevalence of benign rectal bleeding
  - culturally challenging

## **Prospective colonoscopy study**

- Prospective cross sectional study involving consecutive patients with rectal bleeding who underwent colonoscopy
- Eligibility criteria
  - Inclusion criteria was all 45 year old subjects with rectal bleeding lasting up to one week
  - Exclusion criteria
    - inflammatory bowel disease,
    - colorectal polyps, colorectal adenoma or CRC,
    - family history of polyposis
    - contraindication to colonoscopy

#### Results

Patients	100
Male	58 (58.0%)
Age (years, median)	58.5 (45-95)
Duration of rectal bleeding	6 (0.25-360)
(months, median)	
Saw MD for bleeding	84 (84.0%)

### **Result of colonoscopy**

Colonoscopy	N=100
findings	
Hemorrhoids	71 (71.0%)
Diverticulum present	30 (30.0%)
Polyps present	21 (21.0%)
CRC present	20 (20%)

# Step one: Determine probability of colorectal cancer



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# Step 2: determine the probability of polyps, given no colorectal cancer



# Modeling

- A useless (random) model will have a cindex of 0.5.
- The c-index of our model for cancer is 0.895 which is quite good. The same idea can be applied to the probability of polyps (without cancer). The c-index of our model for polyps is 0.710.

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## **Future plans**

- Overcoming barriers
  - Financial
  - Access to care
  - Training
  - Education/cultural acceptance
- Developing screening tests that work in low resource environments



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#### Thank you

