

Comparison of a Portable Colposcope with State of the Art Cervical Screening in the U.S., Peru, and Tanzania”

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Disclosures

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- I have no financial relationships or conflict of interest to disclose.





Who are we?



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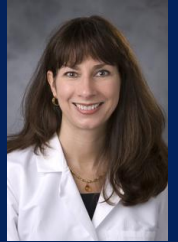
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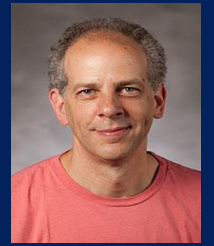
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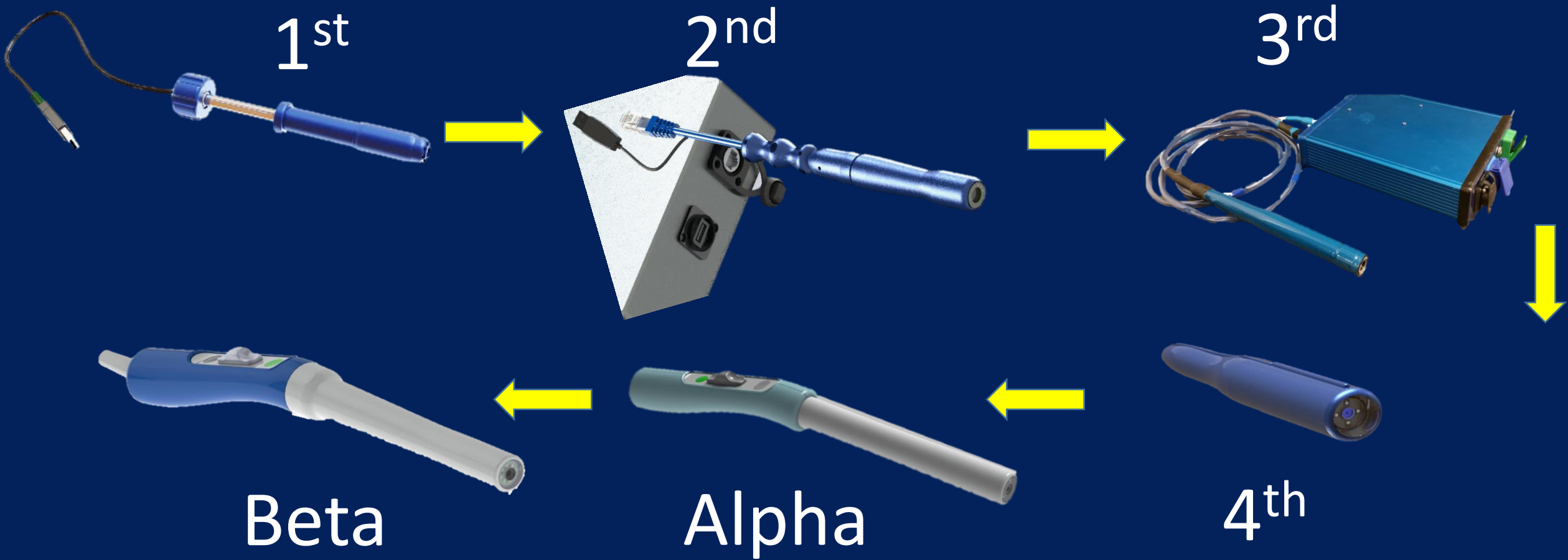
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Duke ECE



The Pocket Colposcope Evolution



Colposcopy/Cervicography



Leisegang Optik-2
\$20,000USD



Canon SX50HS
US \$500USD



Where?



DUKE



KCMC



La Liga

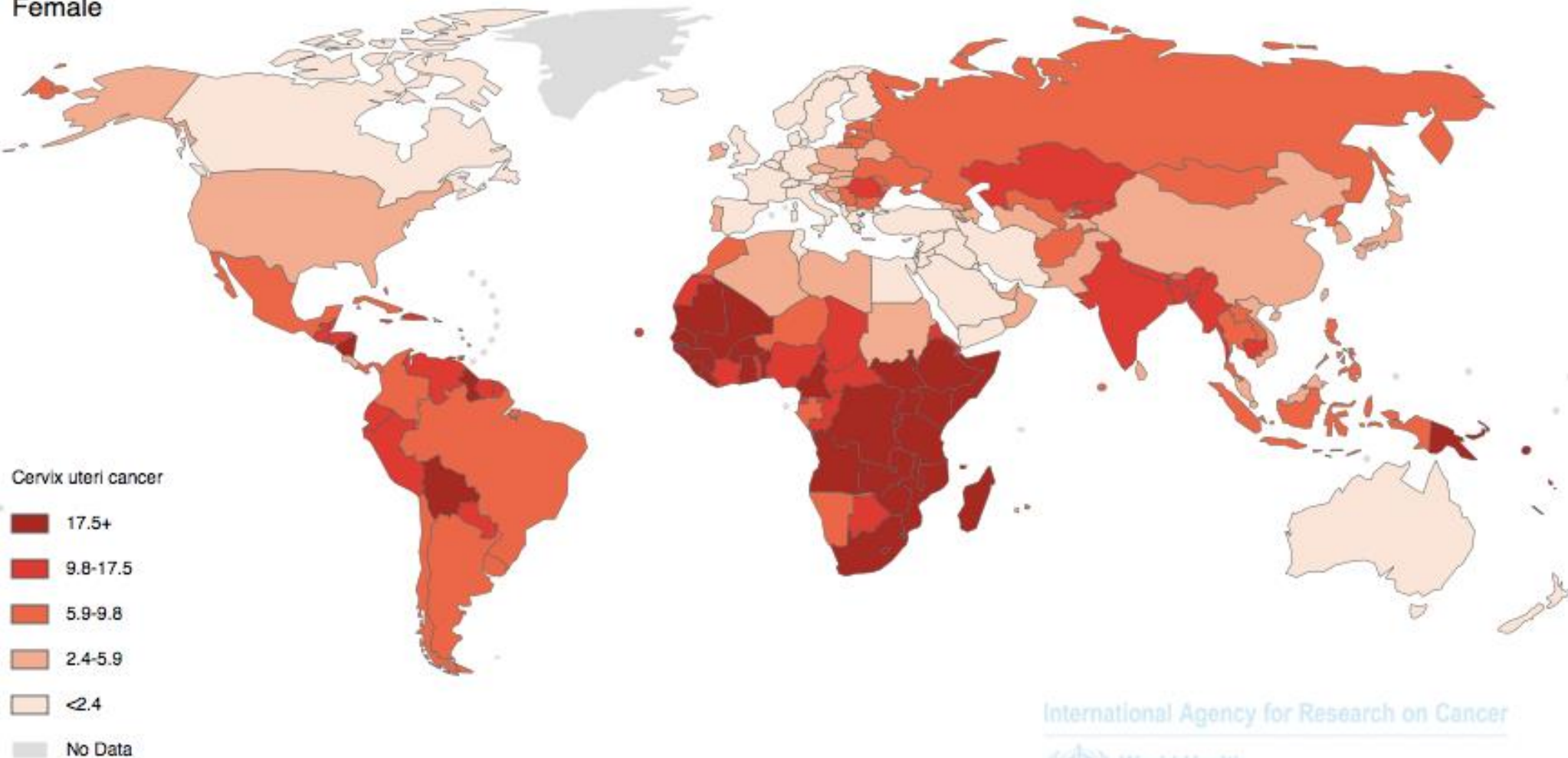


Why do we need this?



Mortality ASR

Female



International Agency for Research on Cancer



Source: GLOBOCAN 2012 (IARC)

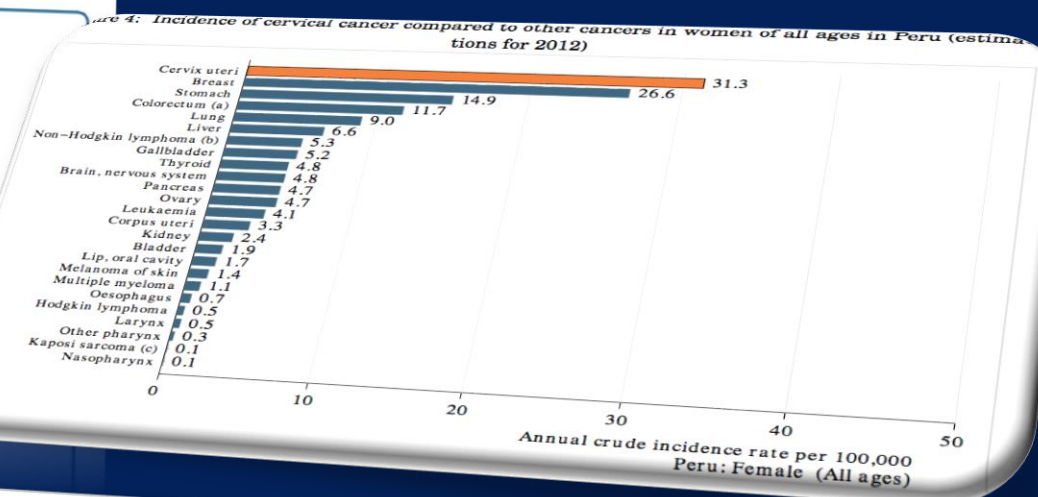
Cervical Cancer in Peru

KEY STATS.

About **4,636 new cervical cancer cases** are diagnosed **annually** in Peru (estimations for 2012).

Cervical cancer **ranks as the 1st cause** of female cancer in Peru.

Cervical cancer is the **1th most common** female cancer in women aged **15 to 44 years** in Peru.



Indicator	Peru	South America	World
Annual number of new cancer cases	4,636	45,008	527,624
Crude incidence rate ^a	31.3	22.2	15.1
Age-standardized incidence rate ^a	32.7	20.3	14.0
Cumulative risk (%) at 75 years old ^b	3.4	2.0	1.4

Data processed at 15 nov 2015

<http://www.hpvcentre.net/statistics/reports/PER.pdf>



Cervical Cancer in Tanzania

KEY STATS.

About **7,304 new cervical cancer cases** are diagnosed **annually** in **Tanzania** (estimations for 2012).

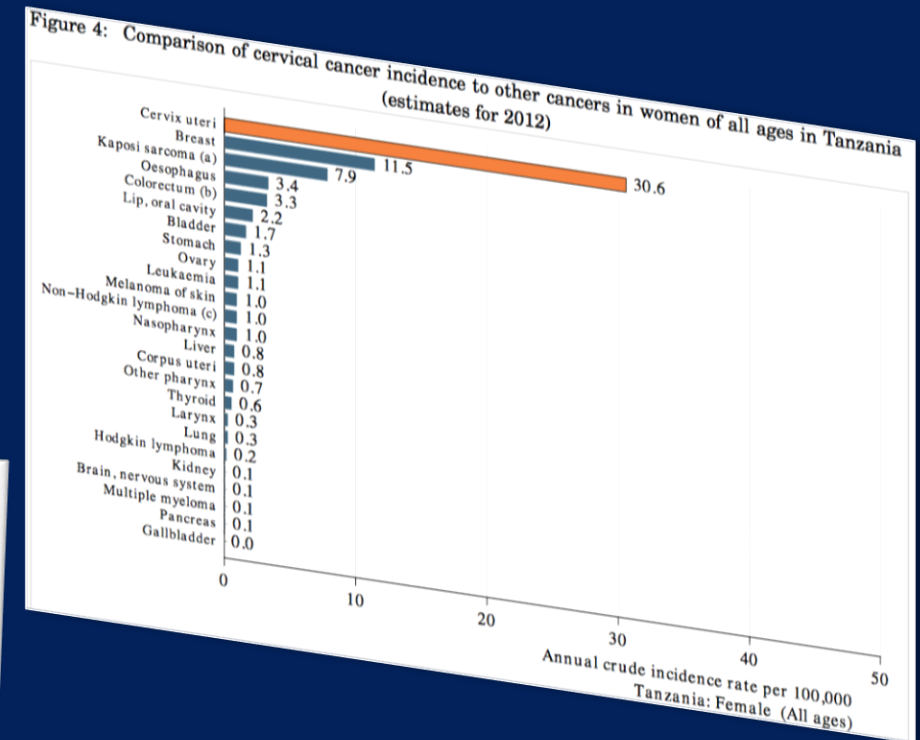
Cervical cancer **ranks*** as the **1st leading cause** of female cancer in **Tanzania**.

Cervical cancer is the **1th most common** female cancer in **women aged 15 to 44 years** in **Tanzania**.

Table 3: Cervical cancer incidence in Tanzania (estimates for 2012)

Indicator	Tanzania	Eastern Africa	World
Annual number of new cancer cases	7,304	45,707	527,624
Crude incidence rate ^a	30.6	25.8	15.1
Age-standardized incidence rate ^a	54.0	42.7	14.0
Cumulative risk (%) at 75 years old ^b	5.8	4.6	1.4

Data sourced on 15 Nov 2015



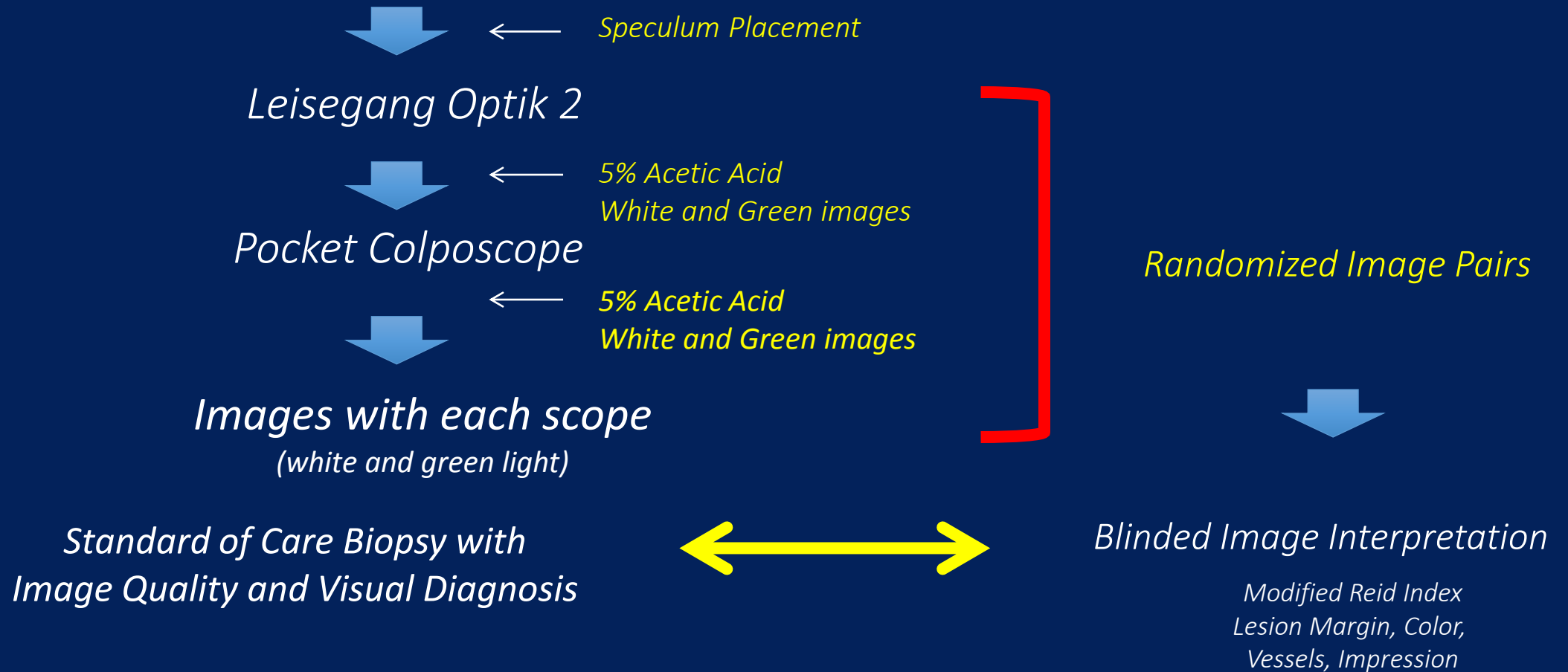
<http://www.hpvcentre.net/statistics/reports/TZA.pdf>

Study Design

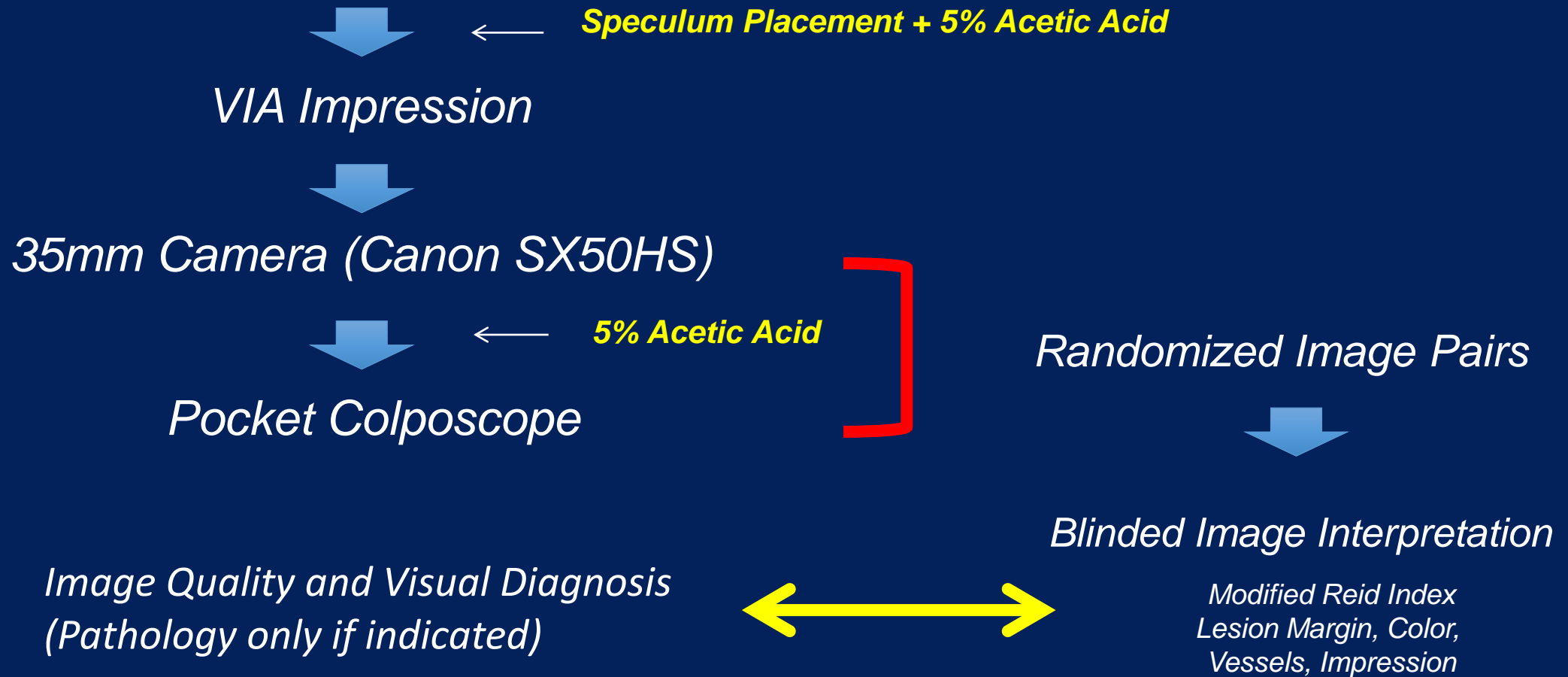
*A Pilot Comparison of the POCkeT Colposcope and
Standard-of-Care Cervical Screening
At 3 Centers*



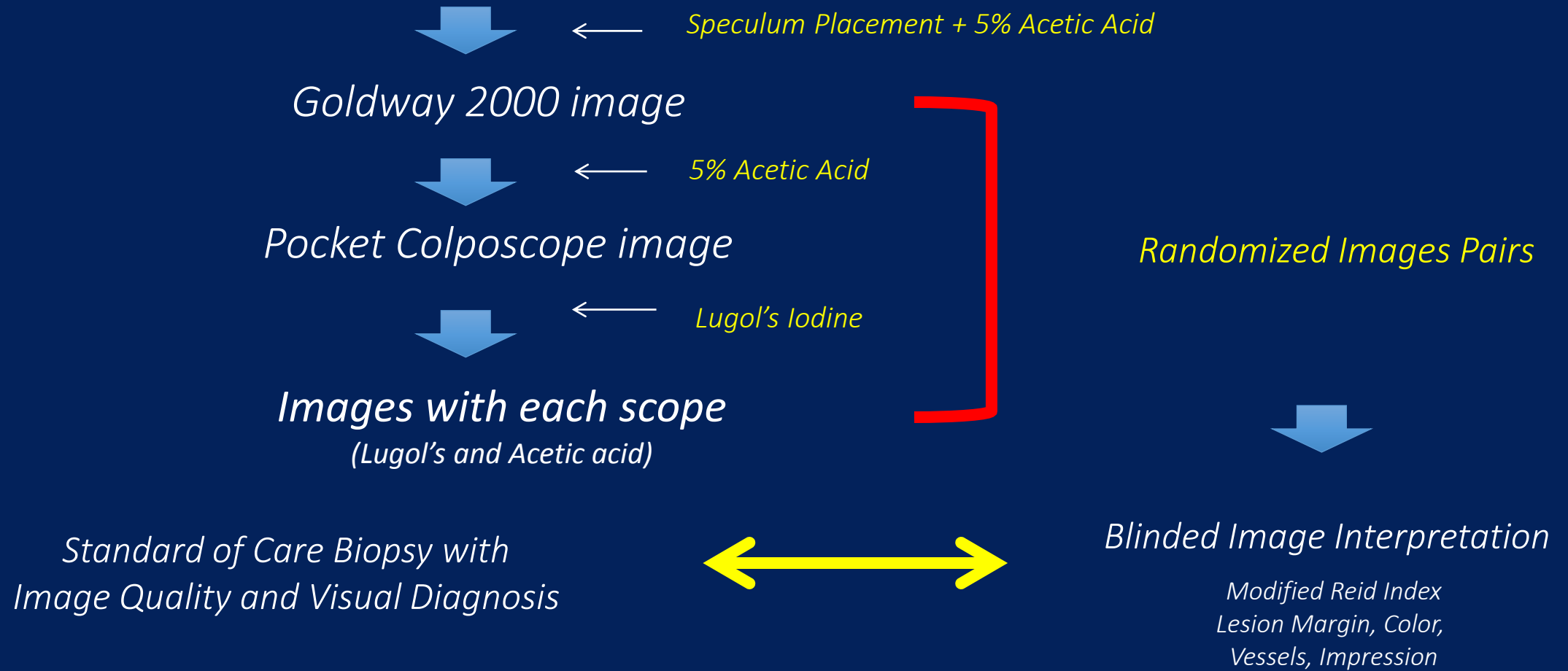
Clinical Study Protocol at Duke



Clinical Study Protocol at KCMC



Clinical Study Protocol at La Liga



Representative Images - Duke



Representative Images - Peru



Representative Images - Tanzania

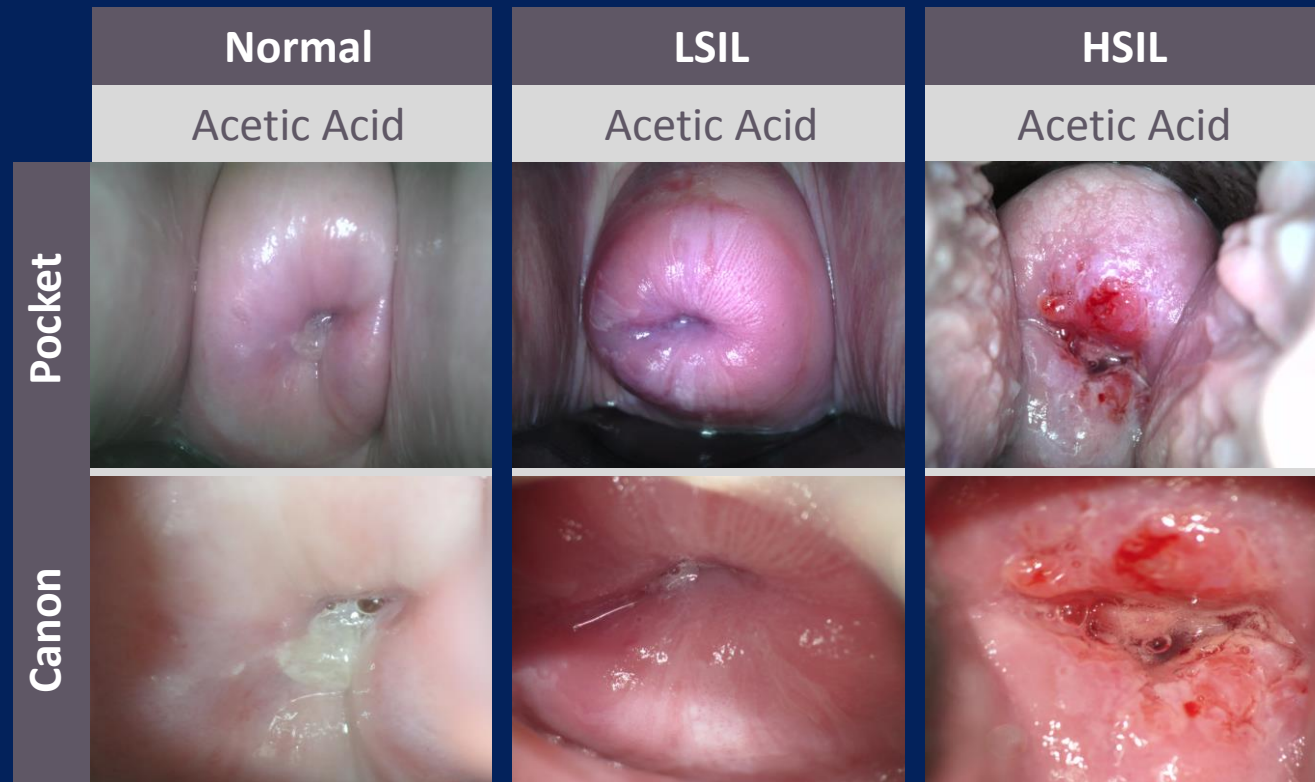


Image Concordance: Duke

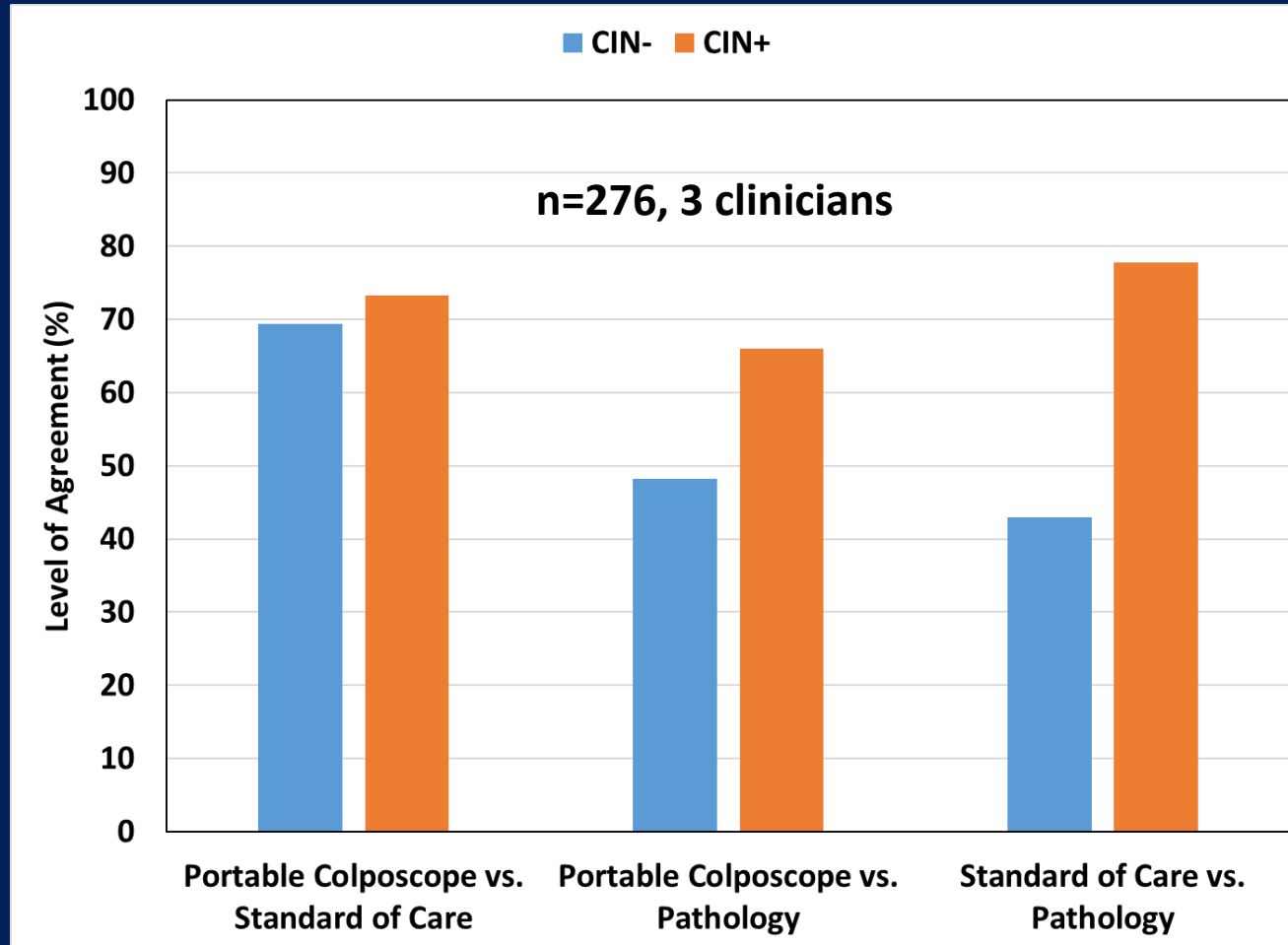


Image Concordance: Duke

(3 clinicians) Cut Off \geq CIN 1	# of image pairs	Level of Agreement (%)	<i>kappa</i>	p-value
Portable Colposcope vs. Standard of Care Colposcope	276	72.1	0.3949	0.00009
Portable Colposcope vs. Pathology	276	58.7	0.1437	0.0085
Standard of Care Colposcope vs. Pathology	276	63.4	0.2157	0.0001

(n=276, 3 clinicians) Cut Off \geq CIN 1	Sensitivity	Specificity	PPV	NPV
Portable Colposcope vs. Pathology	66.0	48.2	71.6	50.0
Standard of Care Colposcope vs. Pathology	77.8	43.0	66.0	57.6



Image Concordance: Peru

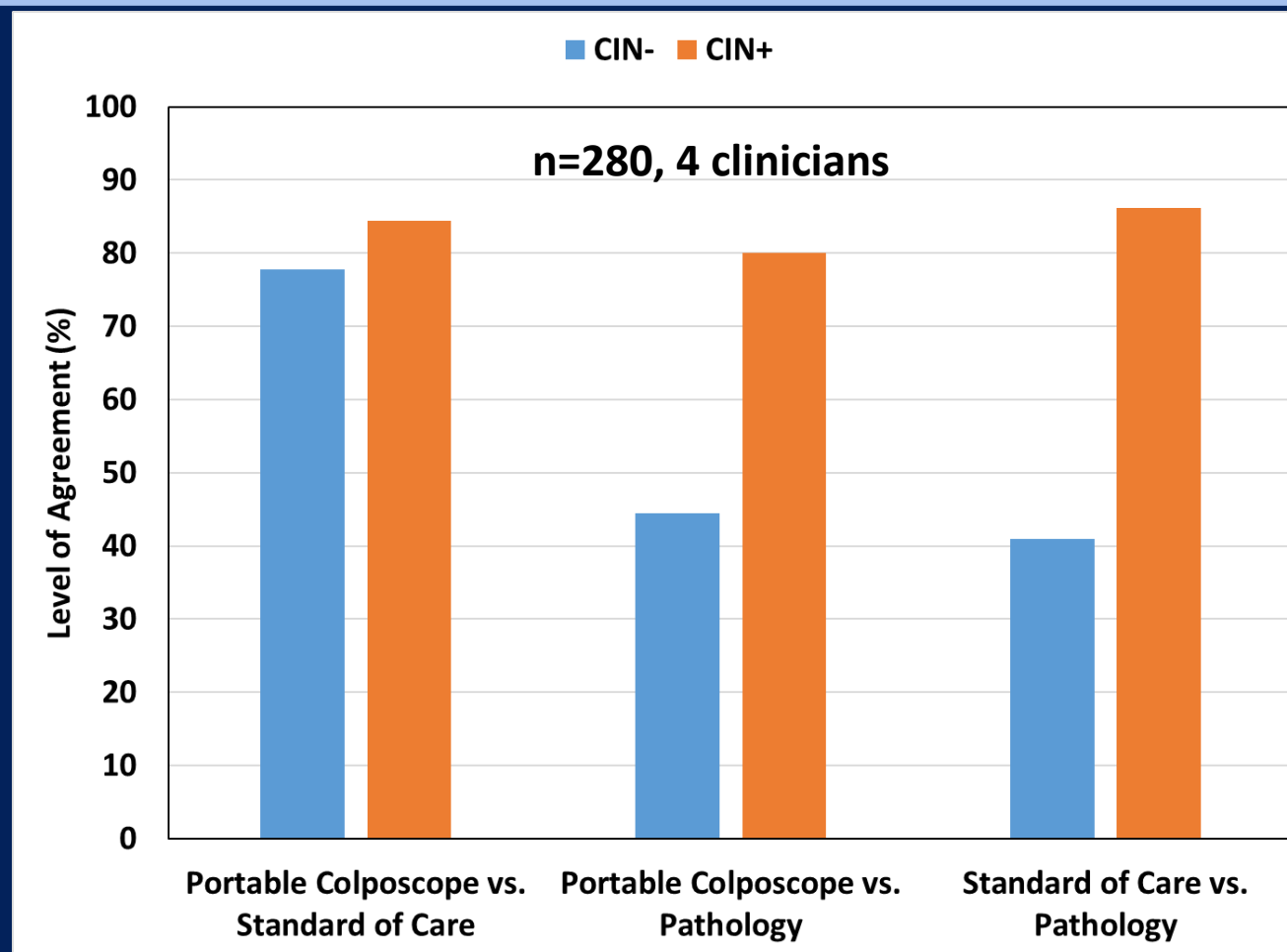


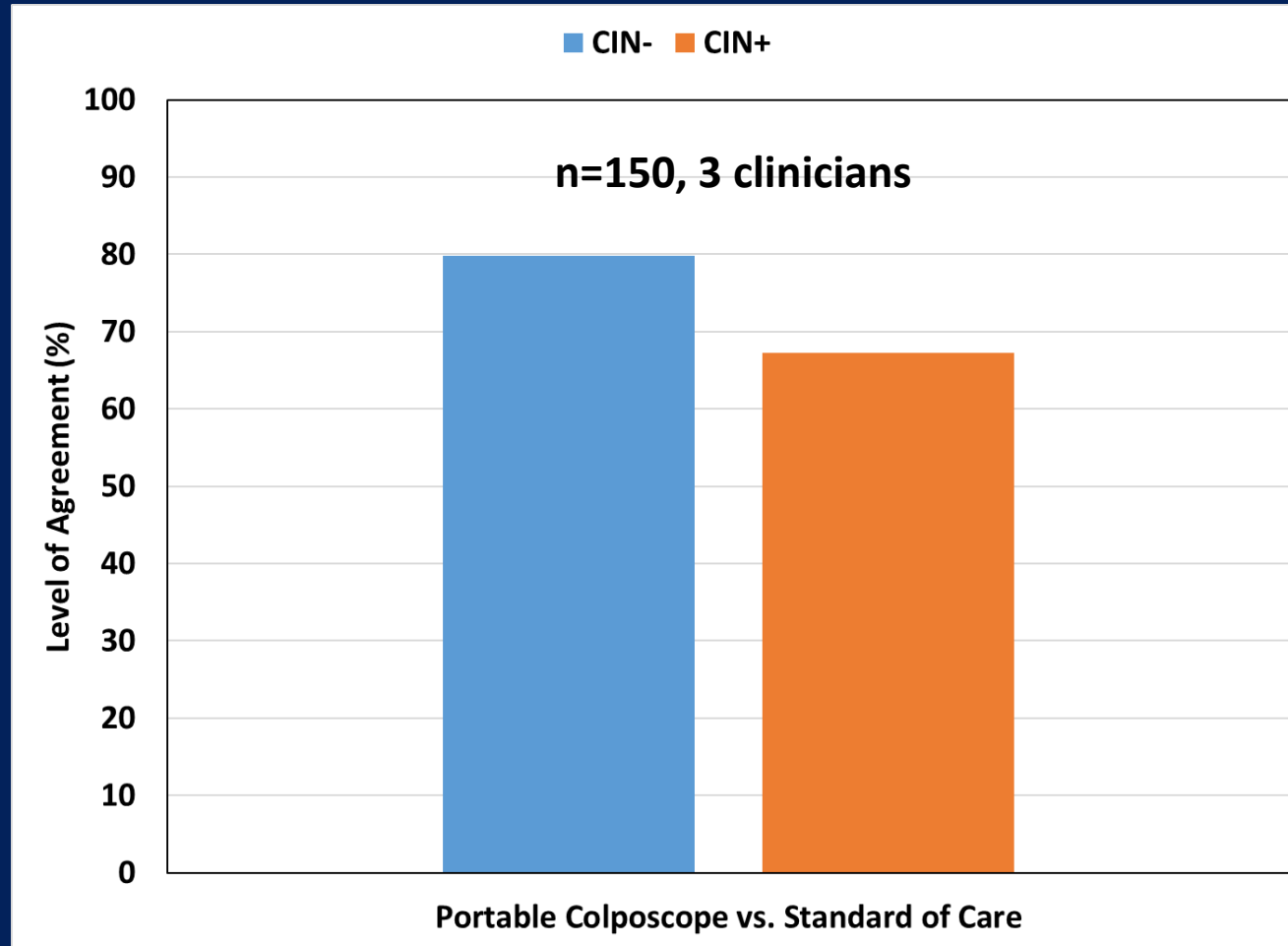
Image Concordance: Peru

(4 clinicians) Cut Off \geq CIN 1	# of image pairs	Level of Agreement (%)	<i>kappa</i>	p-value
Portable Colposcope vs. Standard of Care Colposcope	280	82.5	0.5937	0.00009
Portable Colposcope vs. Pathology	274	61.3	0.2396	0.00009
Standard of Care Colposcope vs. Pathology	274	62.4	0.2646	0.00009

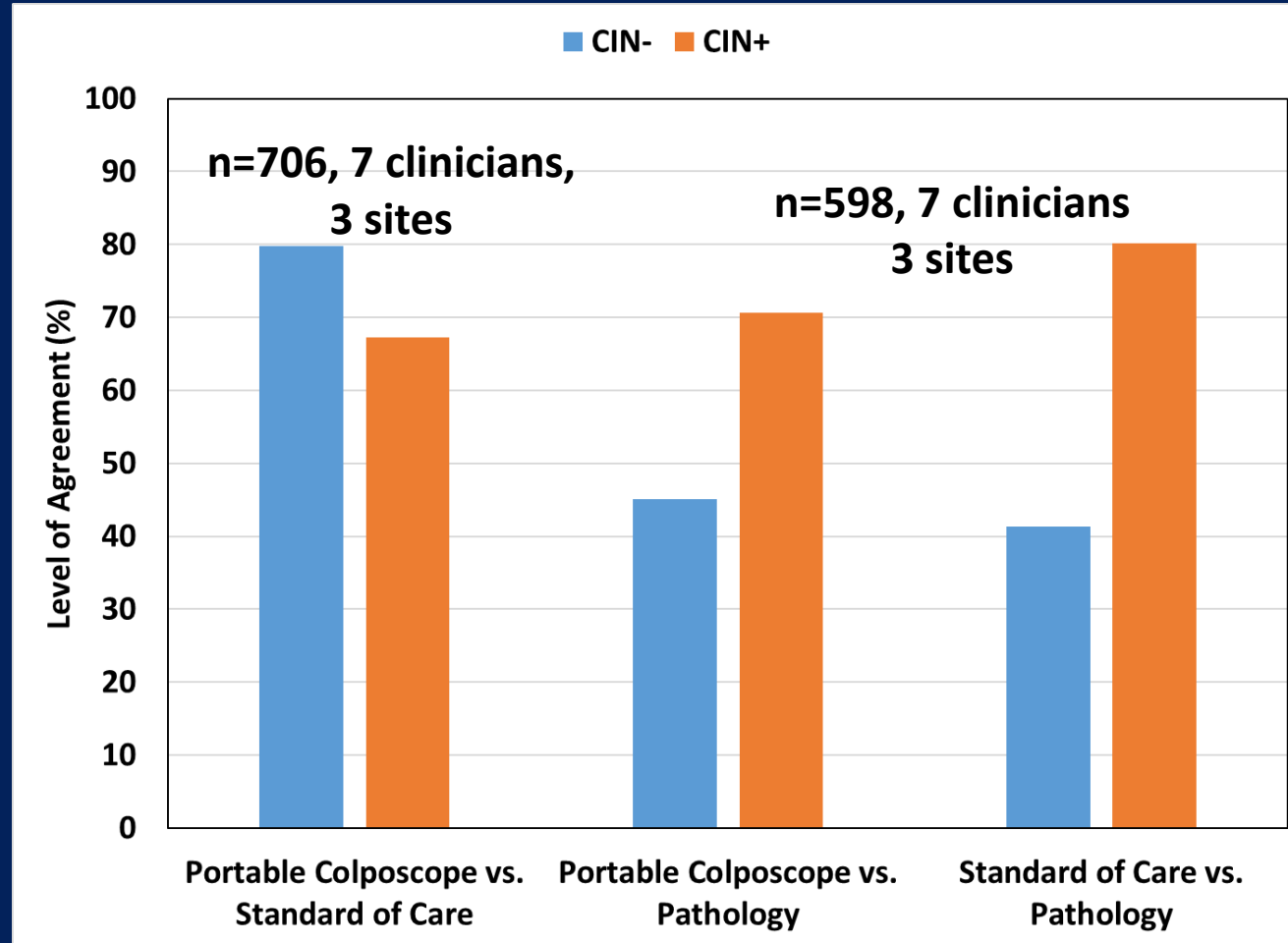
(n=274, 4 clinicians) Cut Off \geq CIN 1	Sensitivity	Specificity	PPV	NPV
Portable Colposcope vs. Pathology	80.0	44.4	56.5	71.1
Standard of Care Colposcope vs. Pathology	86.2	41.0	56.9	76.6



Image Concordance: Tanzania



Overall Pooled Image Concordance



Overall Pooled Image Concordance

(7 clinicians) Cut Off \geq CIN 1	# of image pairs	Level of Agreement (%)	<i>kappa</i>	p-value
Portable Colposcope vs. Standard of Care Colposcope	706	76.8	0.5132	0.00009
Portable Colposcope vs. Pathology	598	59.4	0.1603	0.00009
Standard of Care Colposcope vs. Pathology	598	63.0	0.2232	0.00009

(n=598, 7 clinicians) Cut Off \geq CIN 1	Sensitivity	Specificity	PPV	NPV
Portable Colposcope vs. Pathology	70.7	45.1	61.9	54.8
Standard of Care Colposcope vs. Pathology	80.2	41.3	63.4	62.3



Conclusions

Reasonable Image Concordance between devices and clinicians in all three countries

Comparative Diagnostic Accuracy with comparative sensitivity & specificity between device and SOC

Imaging Quality that is equivalent to high-end colposcopy

Low Cost – Approximately \$500USD

Portable – Connectivity to laptop, tablet, or smartphone

Easy to Use

Secure Image Transmission and Storage – Cloud Based

Timely Expert Consultation – Local and Worldwide

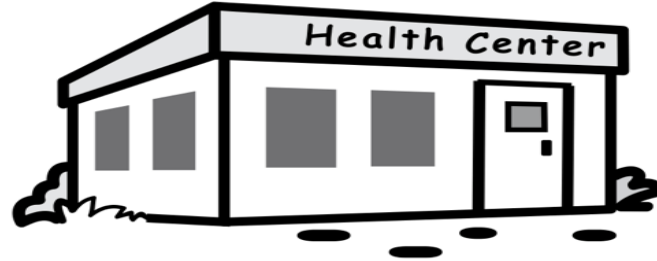
Image Database for Educational programs and QI

Potential for Computer Algorithms

Potential for Speculum Free Imaging



At the health centre



*HPV Prescreen → POCkeT → Onsite
Treatment Cryotherapy or Cold Coagulation*



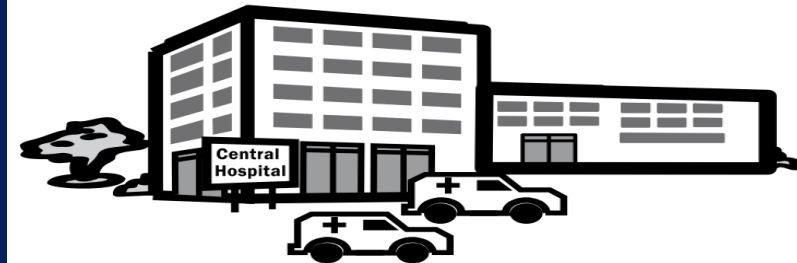
LEEP or Hysterectomy

At the district hospital



Cancer Therapy

At the central hospital



**“THE IDEA THAT
SOME LIVES
MATTER LESS
IS THE ROOT
OF ALL THAT’S
WRONG WITH
THE WORLD.”**

Dr. Paul Farmer,
Partners in Health

