

Cervical Cancer Prevention Program in Zambia

CIDRZ/UAB

Groesbeck Parham, MD

Disclosures

Groesbeck P. Parham, MD

**No Relevant Financial Relationships with
Commercial Interests**

Center for Infectious Disease Research in Zambia

- **Zambian NGO: MOH/UAB**
- **Health service delivery and support**
- **Research**
- **Programmatic focus**
 - HIV prevention, care, and treatment
 - TB prevention and treatment
 - Reproductive health and family planning
 - Prevention of maternal and neonatal mortality
 - **Cervical cancer prevention**

Cervical cancer in Zambia

- Age adjusted incidence and mortality rates
 - 6th highest in the world, 2nd highest in Africa
- Most common cancer in Zambia (30%)
- Most common cancer in women (30%)
- Most common cause of cancer-related death in women (30%)
- Cervical cancer screening coverage <5%

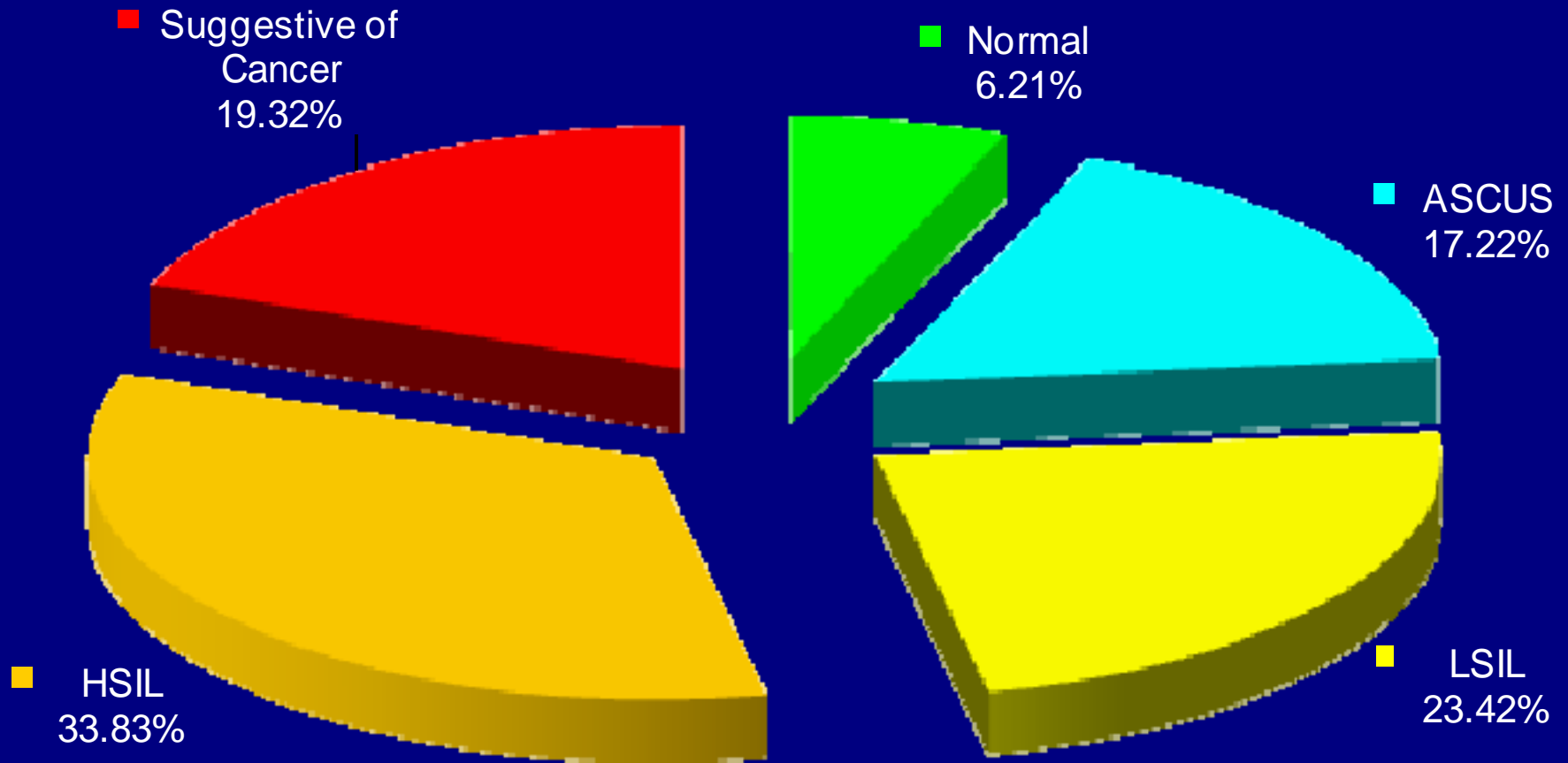
HIV in Zambia

- HIV infection prevalence (age 15-49)
 - 16% nationally, 23% Lusaka
- 60% HIV infected are women

Cervical cancer precursors in HIV infected women

- Prevalence – higher
- Spontaneous regression rates - lower
- Recurrence rates following treatment - higher

Cytological screening of HIV-infected women in Lusaka (n = 150)



2006 conclusion

- Cervical cancer screening, especially of HIV-infected women, was urgent
- Roll out of the HPV vaccine was paramount

Selection of prevention modality

Asset mapping

- No certified cytologist
- One pathologist with experience in reading cervical histology at the University
- Shortage of gynecologists - 9 in Lusaka, 15 in the nation
- Target population low income, undereducated, informal settlements



Choice of prevention modality

Single visit VIA and cryotherapy

- Nurse-led
- Affordable and cost effective
- Documented acceptability
- Documented efficacy: Reduces incidence and prevalence of CIN and cervical cancer mortality rates
- Endorsed by Zambian MOH

Selection of prevention modality

Digital photography for primary screening

- Enhanced visual examination (magnification)
- Distance-consultation for expert medical opinion
- Monitoring and evaluation of nurses
- Patient education
- Medical records documentation
- Easy to learn
- Mobile
- Battery operated

Infrastructure and resources

- Integrated services into government-operated public health clinics
- Linked services to HIV care and treatment program and university hospital
- Resources (PEPFAR, MOH, UTH, UAB, private donors)

Operationalization

- Targeted HIV-infected women
- To avoid stigmatization, we did not turn away HIV negatives or unknown status
- Created community outreach unit to raise awareness





Pfaendler KS et al *Gynecol Oncol* 2008
Mwanahamuntu MH et al *AIDS* 2009
Parham GP et al *JLGTD* in press

Acetowhite lesion





Cryotherapy equipment

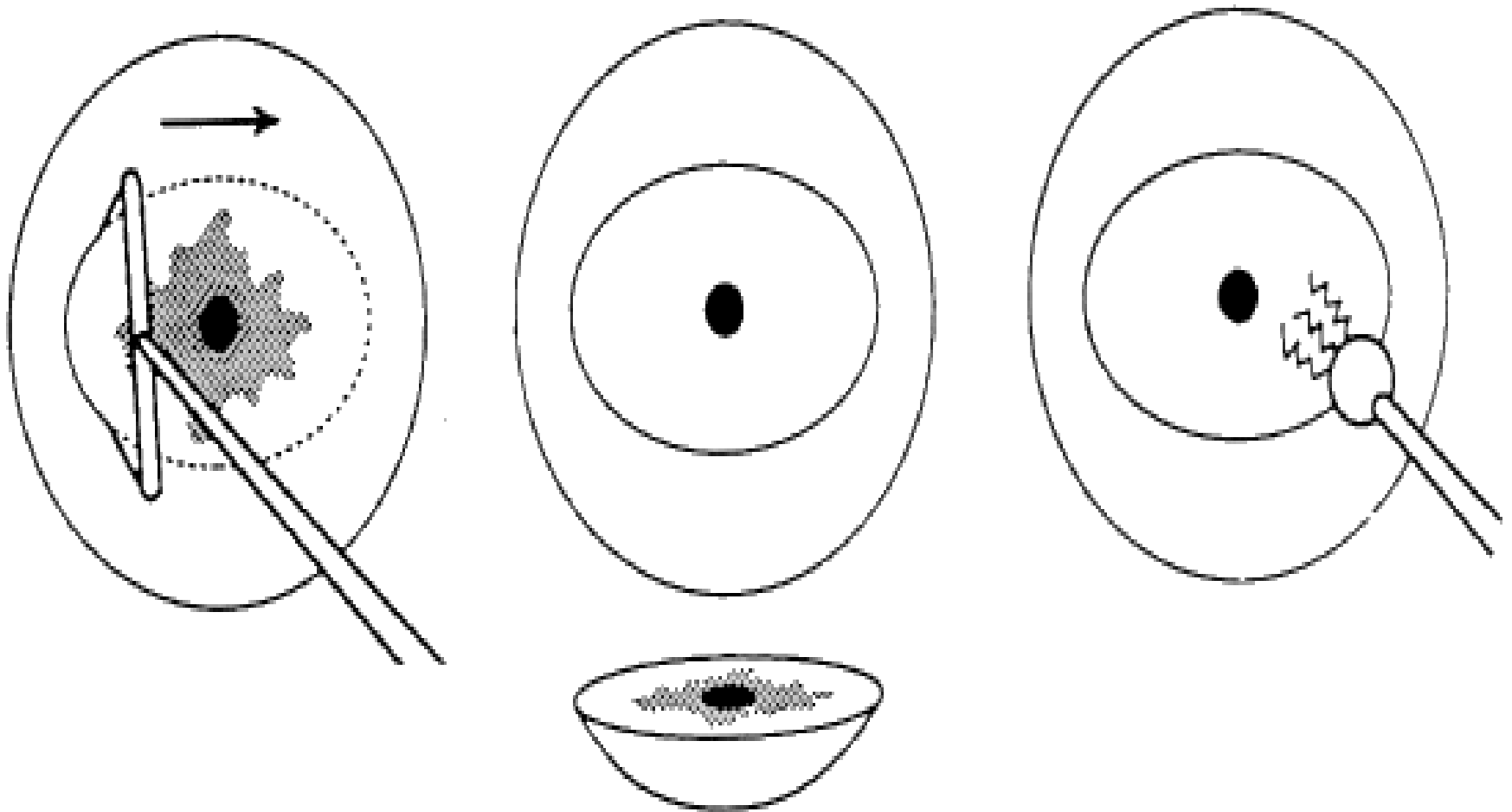


Cryoprobes

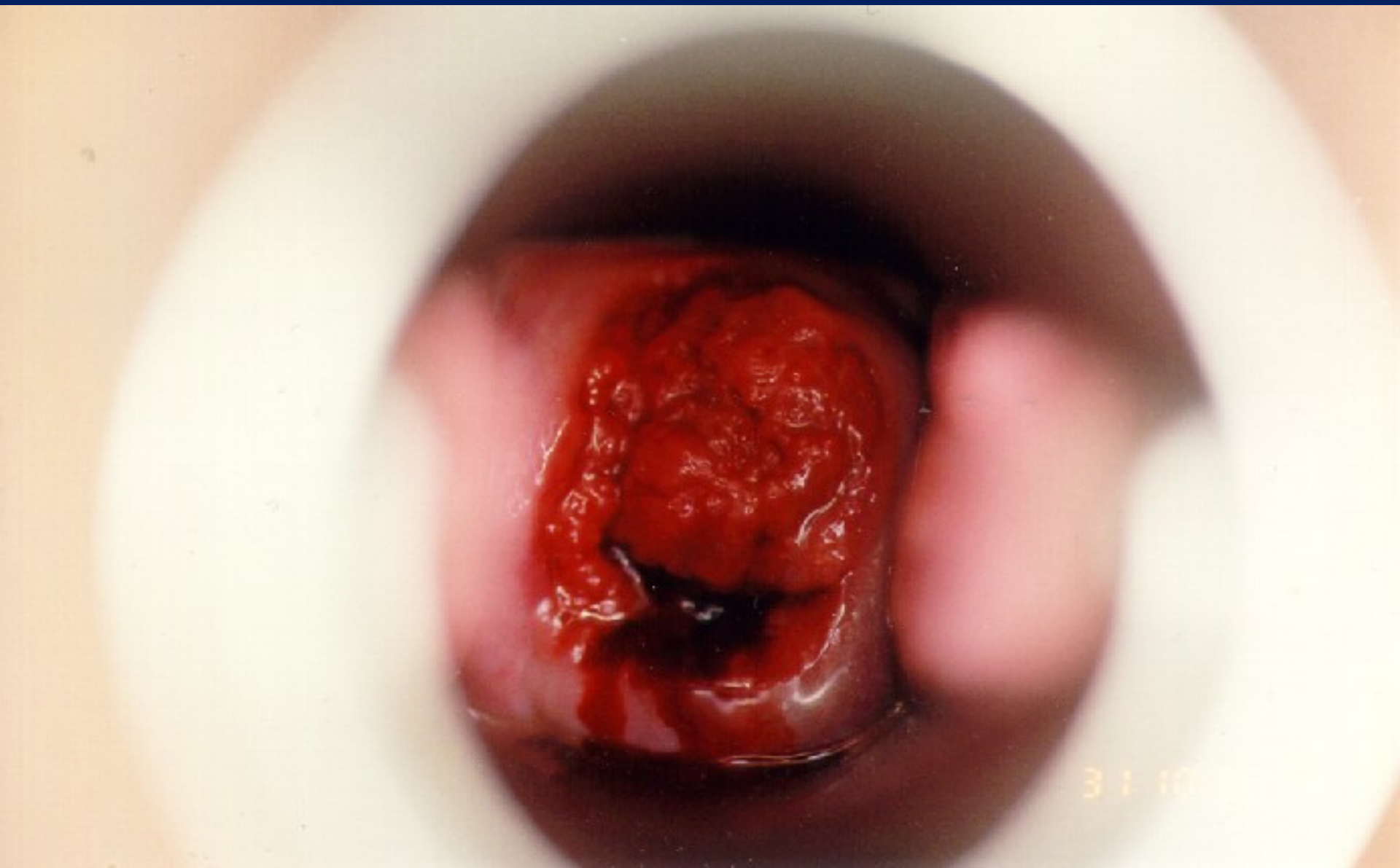




Excisional biopsy



Suspicious for cancer











CIDRZ Cervical Cancer Prevention Program

Overall Outcomes
(Jan 2006 – April 2010)

- 21 nurses, 4 physicians (Zambia)
- 18 clinic sites
- >41,000 screened (1/3 HIV infected)
- Services integrated into public health clinics
- Trained 51 health professionals from 8 countries: Peoples Republic of China, Botswana, SA, Tanzania, Uganda, Kenya, Zimbabwe, Cameroon, ***India, Nigeria, Ghana***

Programmatic Outcomes

Cohort

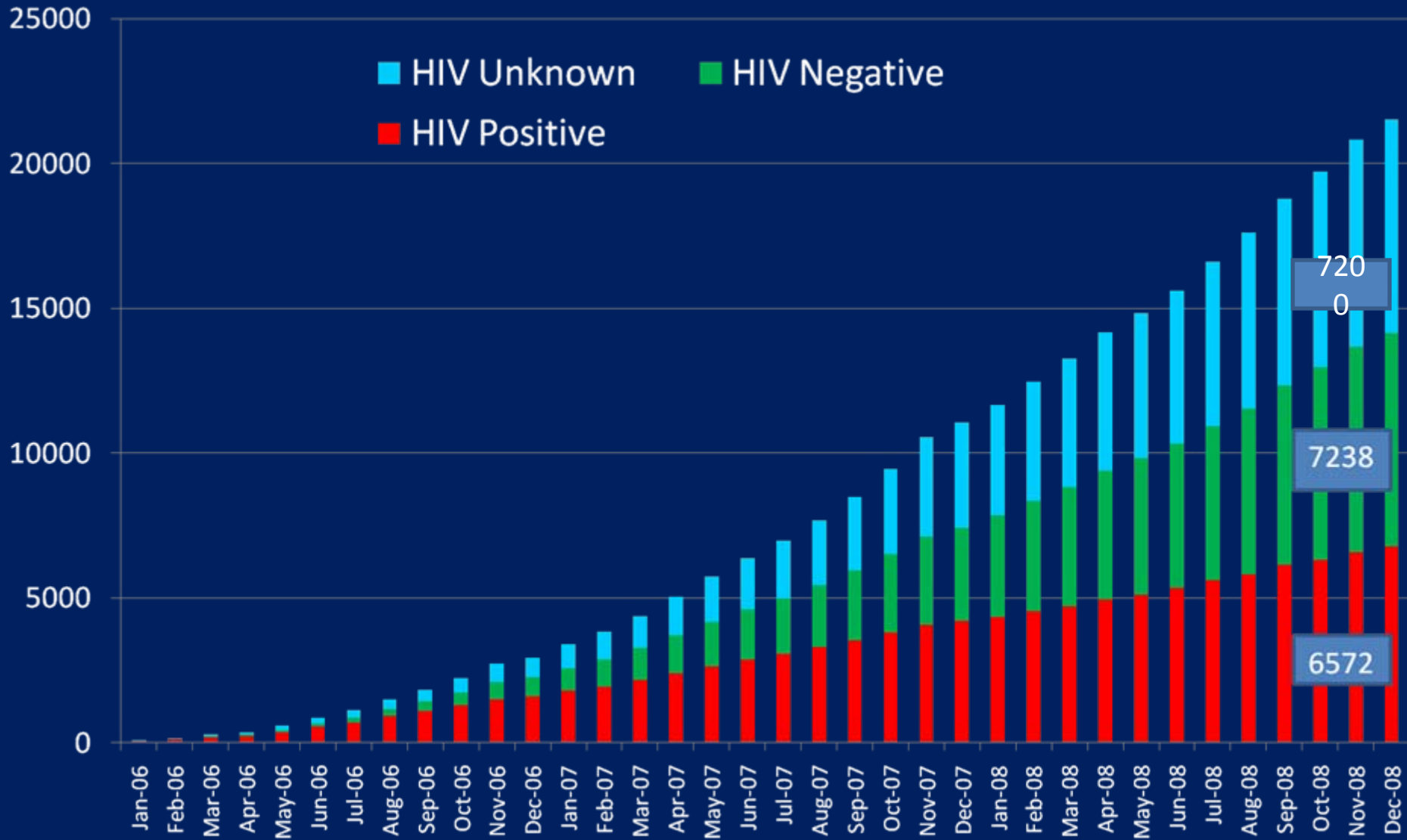
- HIV-infected women
- Analyzed data from women enrolled Jan 2006 – Dec 2008

Outcome measures

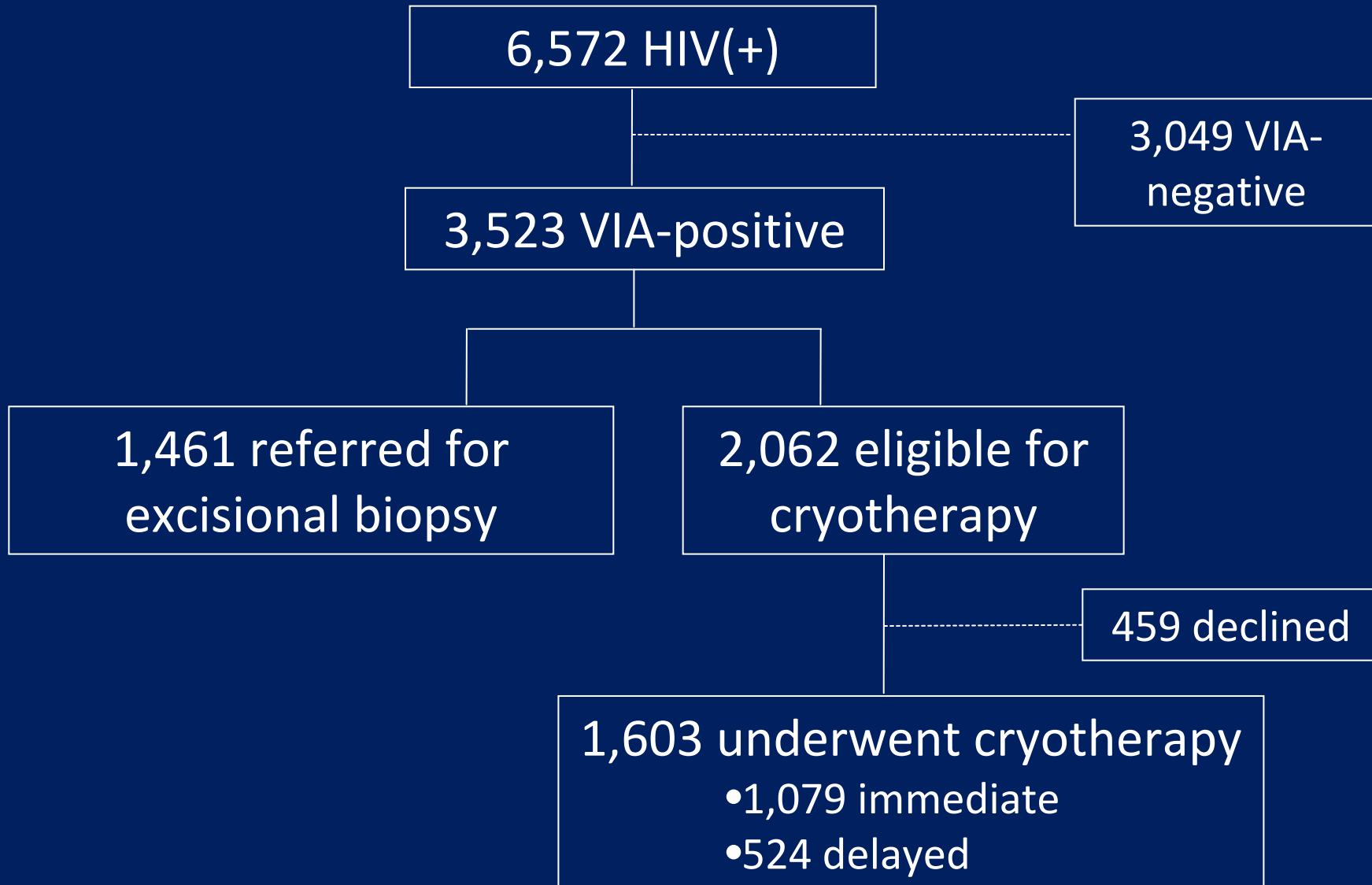
- Description of major programmatic outcomes

Patient enrollment (Jan 2006 – Dec 2008)

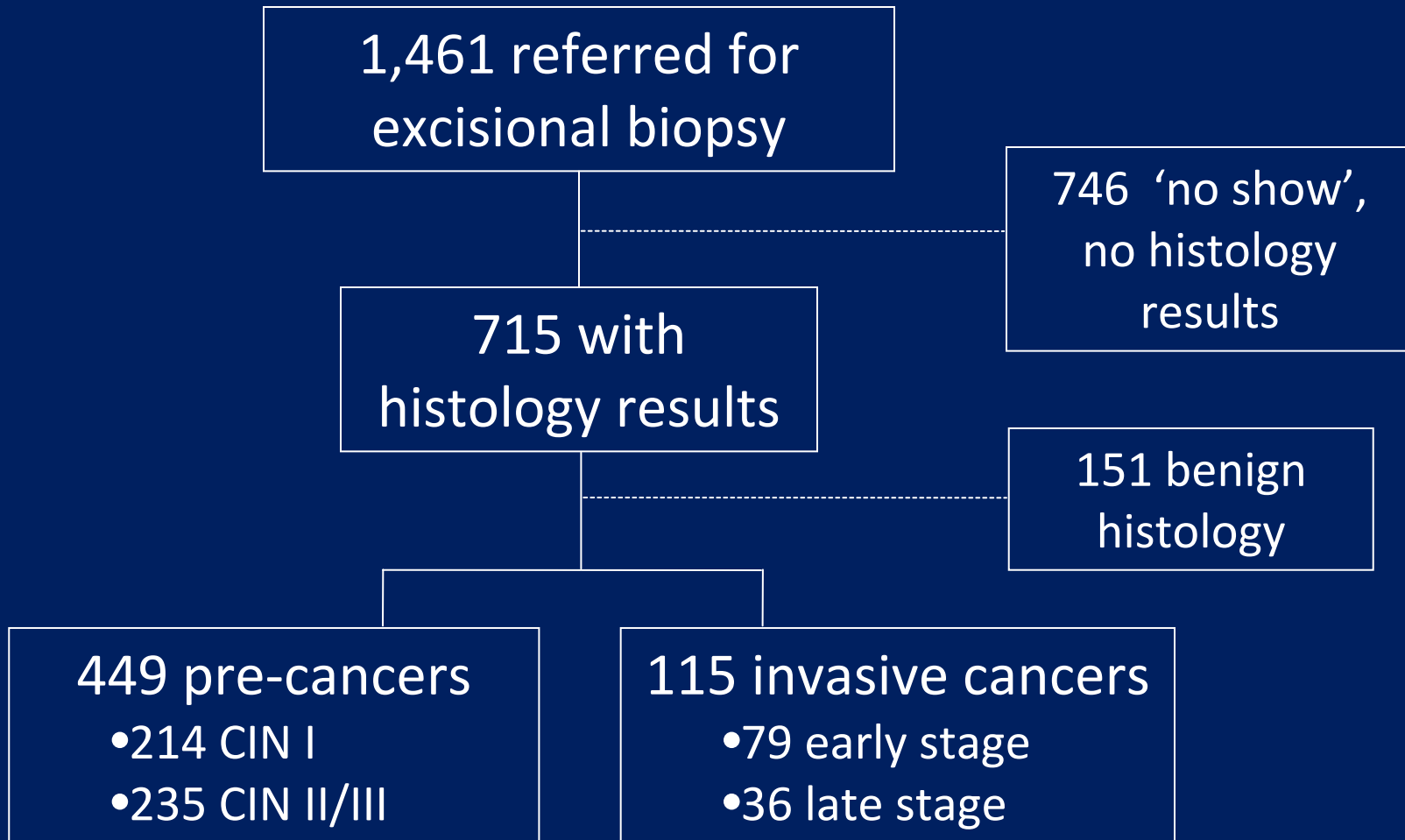
n=21,010



Programmatic outcomes



Major programmatic outcomes



Measuring program effectiveness

Conditional probability model

- Progression and cure rates
 - from published literature
- Observed counts
 - from programmatic data
- Modelled estimation of cancer deaths prevented

Indicators of program effectiveness

	Pathology result	Progression rates	Treatment modality	Cure rates
VIA positive	--	0.06	Cryotherapy	0.7
Pre-cancer	CIN I	0.06	Local excision	0.7
	CIN II/III	0.3	Local excision	0.9
Early stage	Stage Ia	1	Surgery/XRT	0.9
	Stage Ib	1	Surgery/XRT	0.7
	Stage IIa	1	Surgery/XRT	0.7
Late stage	Stage IIb	1	XRT	0.6
	Stage IIIa	1	XRT	0.4
	Stage IIIb	1	XRT	0.3
	Stage IVa	1	XRT	0.1
	Unknown	1	XRT	0.3

Indicators of program effectiveness

	Pathology result	N	Estimated # of cancers	Cancer deaths prevented
VIA positive	--	1,603	96	67
Pre-cancer	CIN I	214	13	9
	CIN II/III	235	71	64
Early stage	Stage Ia	62	62	56
	Stage Ib	17	17	12
	Stage IIa	4	4	3
Late stage	Stage IIb	6	6	4
	Stage IIIa	2	2	1
	Stage IIIb	3	3	1
	Stage IVa	0	0	0
	Unknown	21	21	6

Sensitivity analysis	Estimated # of cancers	Cancer deaths prevented
Std progression/Std cure*	295	223
Low progression/Low cure	264	183
Low progression/High cure	264	224
High progression/Low cure	351	250
High progression/High cure	351	302
Std progression/Low cure	295	209
Std progression/High cure	295	253
Low progression/Std cure	264	196
High progression/Std cure	351	268

Cancer deaths prevented
183-302 out of 6,572 HIV (+)
screened

- For every 22 - 35 women
screened we prevent 1 cancer
death

233 cancer deaths prevented
out of 6,572 HIV (+) screened

- For every 29 women screened
we prevent 1 cancer death

Limitations

Limitations due to programmatic factors

- Healthcare infrastructure under-capacitated
- Substantial loss to follow-up

Limitations in data analyses

- Differential missing data
- Projections regarding cancers prevented were developed assuming optimal conditions
- Cost data not analyzed yet

Conclusions

- VIA + cryotherapy based 'screen and treat' program in a low-income African nation can prevent deaths from cervical cancer in HIV (+) women
- Adherence to follow-up visits is a challenge and requires significant investment

The future

- HPV vaccination
- HPV DNA-based screening

Co-Authors

Groesbeck Parham ^{1,2,3},
Mulindi Mwanahamuntu ^{2,3},
Andrew Westfall ³,
Vikrant Sahasrabuddhe ⁴,
Kristin King ⁵,
Benjamin Chi ^{1,3},
Carla Chibwasha ^{1,3},
Krista Pfaendler ⁶,
Victor Mudenda²,
Sharon Kapambwe ^{2,3},
Jeffrey Stringer ^{1,3}

¹*Univ of Alabama at Birmingham School of Medicine, Birmingham, AL US*

²*University Teaching Hospital, Lusaka, Zambia*

³*Center for Infectious Disease Research in Zambia, Lusaka, Zambia*

⁴*Vanderbilt University School of Medicine, Nashville, TN, US*

⁵*University of Michigan, Ann Arbor, MI, US*

⁶*University of Cincinnati, Cincinnati, OH, US*

Acknowledgements

- Patients
- Zambian Ministry of Health
- CIDRZ Cervical Cancer Prevention Program nurses and staff
- University Teaching Hospital of Zambia
- Sten Vermund
- Mike Saag

“Every woman has the right to live a life
free from cervical cancer”

