

## High prevalence of bacterial vaginosis among adolescent girls attending secondary schools in Tanzania

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## Introduction (1)

- Globally, there are approximately 380,000 new HIV infections among girls and young women aged 10-24 every year
- In young women in sub-Saharan Africa the high incidence of HIV cannot be fully explained by behavioural factors alone
- There is evidence of high rates of HIV positivity following the first few episodes of sexual intercourse after sexual debut
- Disturbances of the vaginal microbiota, including bacterial vaginosis (BV) increases the susceptibility to HIV



## Introduction (2)

The aims of our study were

- To characterize the vaginal microbiota of adolescent girls in Tanzania around the time of their sexual debut
- To describe risk factors for BV in this study population



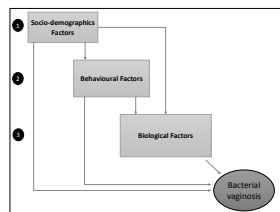
## Methods (1)

- Cross-sectional study
  - Girls attending secondary schools in Mwanza City
  - Ages 17 and 18 years old
- Informed consent/assent
- Face to face structure interview
- Nurse-assisted, self-collected swabs were obtained for STI and BV testing
- BV was diagnosed by Nugent score



## Methods (2)

- BV was considered as a binary outcome
  - Nugent scores 7-10 were considered BV positive
- Hierarchical approach to investigate the effects of socio-demographic, behavioural characteristics and biological risk factors for BV



Adapted from Victora, Int J Epidemiology, 1997



## Methods (3)

- Definition of sexual activity
  - No sexual activity
  - Noncoital sexual activity
  - Penile/vaginal sex



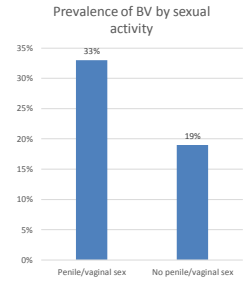
## Results (1)

- 403 girls were enrolled
    - 386 had BV results and included in the analysis
  - Sexual activity
    - No sexual activity = 57% (220/386)
    - Noncoital sexual activity = 1% (3/386)
    - Penile/vaginal sex = 42% (163/386)
- } No penile/vaginal sex = (58%)223/386
- Overall noncoital sexual activity in all girls
    - Genital touching = 9% (35/386)
    - Receptive oral sex = 2% (9/386)



## Results (2)

- BV prevalence was 25% (95/386)
- Other RTIs/STIs
  - Vaginal yeast: 5%
  - Chlamydia: 2%
  - Gonorrhoea: 2%
  - Trichomoniasis: 5%
  - HPV: 19%
  - HSV-2: 2%
  - HIV: 1%
- 48 participants tested positive for at least one STI
  - 14 (29%) reported having never had penile-vaginal sex



## Results: Socio-demographic factors

	BV Positive n/N (%)	Unadjusted odds ratio (95% CI)	Adjusted odds ratio* (95% CI)
<b>Age, 18 years old</b>	40/171 (23%)	0.88 (0.56 to 0.42)	0.89 (0.56 to 1.43)
<b>Socio-economic status (SES) indicator, owns a**</b>			
(4) Car	2/24 (8%)	0.70 (0.49 to 1.01)	<b>0.70 (0.49 to 1.01)</b>
(3) TV, but no car	39/165 (24%)		
(2) Mobile phone, but no car/TV	49/183 (27%)		
(1) None of the above	5/14 (36%)		
<b>Religion</b>			
Christian	81/326 (25%)	1	1
Muslim	12/53 (23%)	0.89 (0.44 to 1.77)	0.94 (0.47 to 1.88)
Other	2/7 (29%)	1.21 (0.23 to 6.36)	1.18 (0.22 to 6.27)

\* Adjusted for SES indicator

\*\*SES indicator was fitted as a continuous covariate

## Results: Behavioural factors

	BV Positive n/N (%)	Unadjusted odds ratio (95% CI)	Adjusted* odds ratio (95% CI)
<b>Intravaginal cleansing</b>			
Water only	8/34 (24%)	0.97 (0.42 to 2.23)	0.58 (0.23 to 1.48)
Other substances	8/24 (33%)	1.58 (0.65 to 3.82)	0.92 (0.34 to 2.50)
<b>Genital touching</b>			
	14/57 (40%)	2.22 (1.08 to 4.57)	1.34 (0.53 to 3.38)
<b>Receptive oral sex</b>			
	7/9 (78%)	11.5 (2.35 to 56.3)	<b>6.44 (1.23 to 33.7)</b>
<b>Penile-vaginal sex</b>			
	53/163 (33%)	2.08 (1.30 to 3.32)	<b>1.92 (1.19 to 3.11)</b>
<b>Number of life-time partners</b>			
One	33/123 (27%)	1.58 (0.94 to 2.66)	1.55 (0.91 to 2.64)
More than one	20/40 (50%)	4.31 (2.13 to 8.72)	<b>3.52 (1.69 to 7.34)</b>
<b>Condoms at last sex</b>			
	24/77 (31%)	0.76 (0.25 to 2.32)	0.94 (0.25 to 3.47)

\*Adjusted for SES indicator, receptive oral sex and number of life-time sexual partners except for penile-vaginal sex which is not adjusted for number of life-time sexual partners

## Results: Biological factors

	BV Positive n/N (%)	Unadjusted odds ratio (95% CI)	Adjusted odds ratio* (95% CI)
<b>Vaginal yeast</b>	3/21 (14%)	0.50 (0.14 to 1.72)	0.52 (0.15 to 1.87)
<b>Chlamydia / gonorrhoea</b>	4/17 (14%)	0.94 (0.30 to 2.96)	0.69 (0.20 to 2.34)
<b>Trichomoniasis</b>	6/17 (35%)	1.72 (0.62 to 4.78)	0.95 (0.31 to 2.91)
<b>HPV</b>	45/125 (36%)	2.35 (1.46 to 3.79)	<b>1.73 (1.02 to 2.94)</b>

\*Adjusted for SES indicator, receptive oral sex, number of life-time sexual partners and Human papillomavirus status.

## Limitations

- Cross-sectional study
- Evidence of underreporting of sexual activity in this population
- Prevalence of many STIs were too low to investigate associations with BV

## Conclusions

- High prevalence (25%) of BV found among adolescents girls attending secondary school in Tanzania
- High prevalence of HPV, but not HSV-2
- The strong associations between BV, number of lifetime sex partners, oral sex and HPV
- In conclusion, our data suggest that some young women in East Africa are entering sexual debut with altered vaginal microbiota, which increases their susceptibility to HIV infection

## Acknowledgements

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