

## ADOLESCENTS IN SOUTH AFRICA: ASSESSMENT OF RISK

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## Background

- The prevalence of STIs and BV is unacceptably high in key populations at risk of HIV such as adolescents & women (Johnson *et al.*, 2011; Misana *et al.*, 2012)
- The national STI incidence rates in South Africa were 4.6% (Day *et al.*, 2010)
- Adolescent study 2015 Eastern Cape: 31.1% in women & 8.8% in men (O'Leary *et al.*, 2015)
- The national prevalence of BV 34% - 58% (Dols *et al.*, 2011; Meyer *et al.*, 2005; Frohlich *et al.*, 2005)



## WISH: Women's Initiative in Sexual Health

- 298 young women between the ages of 16-22 years
- 149 southern peninsular of Cape Town – seen longitudinally for 3 visits 2 or 3 months apart
- 149 urban settlement in Johannesburg – seen once
- Behavioural and socio-demographic information at enrollment
- Blood and genital sampling at each visit
- Standardized to two weeks after their contraceptive injection or in the luteal phase if on oral contraceptives



## Sexual risk behaviour

Characteristic	Clinical site		p-value
	Cape Town	Johannesburg	
Number	149	149	
Heterosexual (n/N)	<b>96%</b> (123/128)	<b>96%</b> (104/108)	0.7586
Age in years [median (IQR)]	<b>18</b> (17-20)	<b>18</b> (17-20)	0.0597
Age of sexual debut (years) [median (IQR)]	<b>16</b> (15-17)	<b>16</b> (15-17)	0.1526
Lifetime number of sex partners [median (IQR)]	<b>2</b> (1-13)	<b>2</b> (1-10)	<b>0.0070</b>
Condom used always (n/N)	<b>16%</b> (20/129)	<b>36%</b> (49/138)	<b>0.0002</b>
Multiple partners in the past 12 months (n/N)	<b>29%</b> (38/129)	<b>15%</b> (21/138)	<b>0.0076</b>
Sex with known/ suspected IV drug user (n/N)	<b>1%</b> (1/129)	<b>9%</b> (12/138)	<b>0.0029</b>
Ever used a vaginal drying agent used (n/N)	<b>8%</b> (10/129)	<b>1%</b> (2/138)	<b>0.0165</b>
Ever douched (n/N)	<b>12%</b> (16/129)	<b>2%</b> (3/138)	<b>0.0014</b>
Known previous symptomatic STI (n/N)	<b>16%</b> (21/129)	<b>7%</b> (10/138)	<b>0.0229</b>

## STIs: Cape Town and Johannesburg

Type of infection	Clinical site		p-value
	Cape Town	Johannesburg	
Chlamydia trachomatis (n/N)	<b>42%</b> (62/149)	<b>17%</b> (26/149)	<0.0001
Neisseria gonorrhoeae (n/N)	<b>11%</b> (17/149)	<b>5%</b> (7/149)	<b>0.0342</b>
Trichomonas vaginalis (n/N)	7% (11/149)	3% (5/149)	0.1306
Mycoplasma genitalium (n/N)	4% (6/149)	3% (5/149)	0.7690
HSV-2 DNA positive (n/N)	<b>5%</b> (7/149)	<b>1%</b> (1/149)	<b>0.0357</b>
HSV-2 Seropositive (n/N)	<b>21%</b> (31/147)	<b>4%</b> (5/139)	<0.0001
Candidal hyphae and spores (n/N)	7% (10/149)	7% (10/149)	0.0555
HPV:			
High risk (n/N)	54% (80/149)	53% (55/103)	0.8979
Low risk (n/N)	46% (69/149)	36% (37/103)	0.3414
Multiple (n/N)	78% (78/100)	71% (45/63)	0.3559
Bacterial vaginosis:			
Nugent score 7-10 (n/N)	47% (69/149)	42% (63/149)	0.4830
Intermediate Nugent 4-7 (n/N)	12% (17/149)	15% (23/149)	0.3960

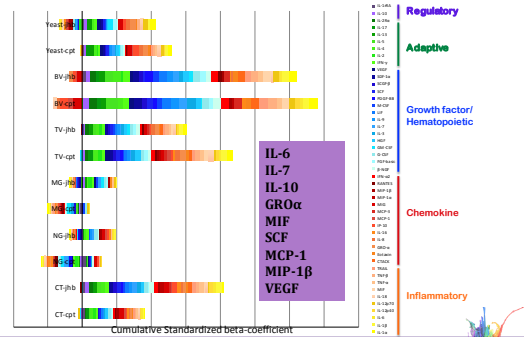
## Cape Town Incidence and prevalence

	Prevalence			Incidence	
	Baseline	Visit 2	Visit 3	Visit 2	Visit 3
STI or BV					
Chlamydia trachomatis [% (n/N)]	<b>42</b> (62/149)	<b>34</b> (43/127)	<b>19</b> (17/88)	<b>40</b> (17/43)	<b>29</b> (5/17)
Neisseria gonorrhoeae [% (n/N)]	<b>11</b> (17/149)	<b>6</b> (8/127)	<b>8</b> (7/88)	<b>50</b> (4/8)	<b>43</b> (3/7)
Trichomonas vaginalis [% (n/N)]	<b>7</b> (11/149)	<b>8</b> (10/127)	<b>7</b> (6/88)	<b>50</b> (5/10)	<b>50</b> (3/6)
Mycoplasma genitalium [% (n/N)]	<b>4</b> (6/149)	<b>6</b> (7/127)	<b>7</b> (6/88)	<b>71</b> (5/7)	<b>83</b> (5/6)
HSV-2 DNA positive [% (n/N)]	5 (7/149)	4 (5/127)	5 (4/88)	100 (5/5)	75 (3/4)
<b>HSV-2 seroprevalence [% (n/N)]</b>	5 (7/149)	27 (43/125)	24 (24/98)	11 (3/27)	13 (3/24)
HPV High risk types [% (n/N)]	<b>54</b> (80/149)	<b>48</b> (61/127)	<b>54</b> (110/202)	<b>38</b> (30/62)	<b>88</b> (56/61)
HPV Low risk types [% (n/N)]	<b>46</b> (69/149)	<b>33</b> (42/127)	<b>35</b> (71/202)	<b>40</b> (27/42)	<b>41</b> (29/71)
Multiple HPV types [% (n/N)]	<b>78</b> (78/100)	<b>39</b> (50/127)	<b>20</b> (41/202)	<b>14</b> (11/50)	<b>51</b> (21/41)
Candidal hyphae and spores [% (n/N)]	<b>7</b> (10/149)	<b>11</b> (14/126)	<b>13</b> (11/84)	<b>86</b> (12/14)	<b>82</b> (9/11)
BV Nugent score 7-10 [% (n/N)]	<b>47</b> (69/147)	<b>48</b> (61/126)	<b>46</b> (39/84)	<b>13</b> (8/61)	<b>18</b> (7/39)
Intermediate Nugent 4-6 [% (n/N)]	<b>12</b> (17/147)	<b>9</b> (11/127)	<b>7</b> (6/88)	<b>56</b> (5/9)	<b>29</b> (2/7)

## Vaginal pH

	Cape Town	Johannesburg	p-value
All [median (IQR)]	<b>4.7 (4.4-5.3)</b>	<b>5.0 (4.7-5.6)</b>	<b>&lt;0.0001</b>
No STI or BV [median (IQR)]	<b>4.4 (4.1-4.7)</b>	<b>5.0 (4.4-5.6)</b>	<b>0.0004</b>
Altered flora (4-6) [median (IQR)]	5.0 (4.6-5.6)	5.0 (5.0-5.6)	0.3147
BV (7-10) [median (IQR)]	<b>5.0 (4.7-5.3)</b>	<b>5.3 (4.7-5.6)</b>	<b>0.0403</b>
BV and any STI [median (IQR)]	<b>4.7 (4.4-5.3)</b>	<b>5.0 (4.7-5.6)</b>	<b>0.0516</b>

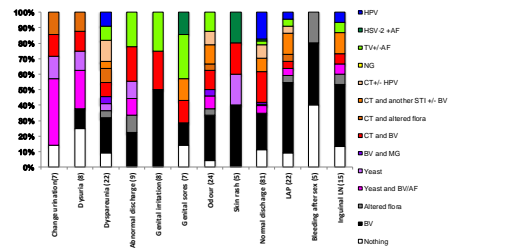
## Genital inflammation per STI – Cape Town and Johannesburg



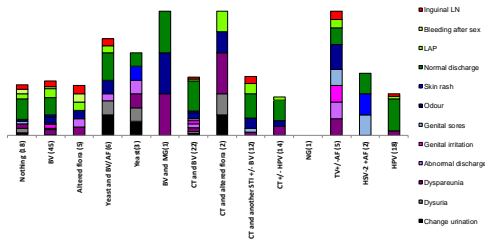
## Clinical signs and symptoms Cape Town

	Baseline	Visit 2	Visit 3
Number	40	57	60
Dysuria [% (n/N)]	5% (2/40)	5% (3/57)	5% (3/60)
Change in micturition pattern [% (n/N)]	3% (1/40)	5% (3/57)	5% (3/60)
No vaginal discharge [% (n/N)]	35% (14/40)	42% (24/57)	47% (28/60)
Normal vaginal discharge [% (n/N)]	58% (23/40)	51% (29/57)	52% (31/60)
Abnormal vaginal discharge [% (n/N)]	8% (3/40)	9% (5/57)	2% (1/60)
Dyspareunia [% (n/N)]	28% (11/40)	12% (7/57)	7% (4/60)
Vaginal odour [% (n/N)]	20% (8/40)	14% (8/57)	13% (8/60)
Genital irritation [% (n/N)]	5% (2/40)	9% (5/57)	2% (1/60)
Abdominal pain [% (n/N)]	25% (10/40)	9% (5/57)	13% (8/60)
Genital warts or ulcers	5% (2/40)	4% (2/57)	5% (3/60)
Bleeding during or after sex [% (n/N)]	5% (2/40)	5% (3/57)	0% (0/60)
Genital area skin rash [% (n/N)]	3% (1/40)	2% (1/57)	5% (3/60)
Enlarged inguinal lymph nodes [% (n/N)]	18% (7/40)	9% (5/57)	7% (4/60)

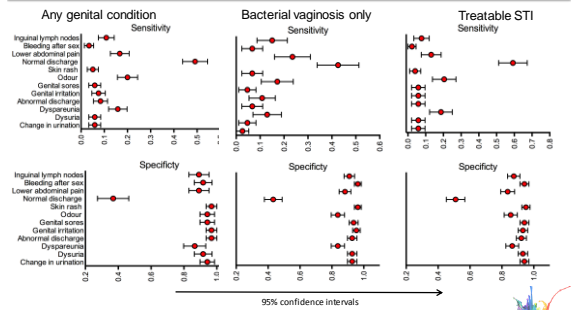
## Composition of symptoms



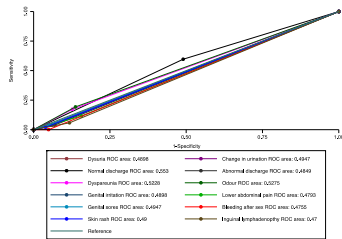
## Symptoms per STI



## Sensitivity and specificity



## ROC - any curable STI



## Summary

- Cape Town cohort engaged in more risky behaviour
- Very high prevalence of BV and STIs
- Higher prevalence of chlamydia, gonorrhoea and HSV-2 in Cape Town
- pH in Cape Town was lower
- Differential levels of inflammation seen particularly with chlamydia
- Most common symptom was "normal discharge"
- Poor correlation symptoms and bacterial conditions



## And finally...

- High rates of STIs
- Lack of symptoms
- Poor correlation symptoms and infection
- High levels inflammation
- Risk of HIV acquisition

Time to move away from syndromic management ?





## Acknowledgments



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