



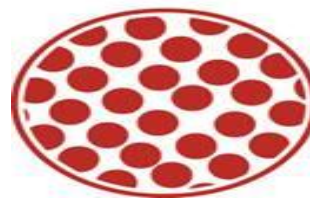
**NATIONAL HEALTH
LABORATORY SERVICE**



INCIDENCE AND PREVALENCE OF SEXUALLY TRANSMITTED INFECTIONS AMONG SCHOOL STUDENTS IN THE EASTERN CAPE, SOUTH AFRICA

Dumisile Venessa Maseko

**Sexually Transmitted Infections Reference Centre
National Institute for Communicable Diseases,
National Health Laboratory Service**



**4WARD 2011
4th FIDSSA CONGRESS
8-11 SEPTEMBER
THE ELANGENI HOTEL
DURBAN • SOUTH AFRICA**

Background

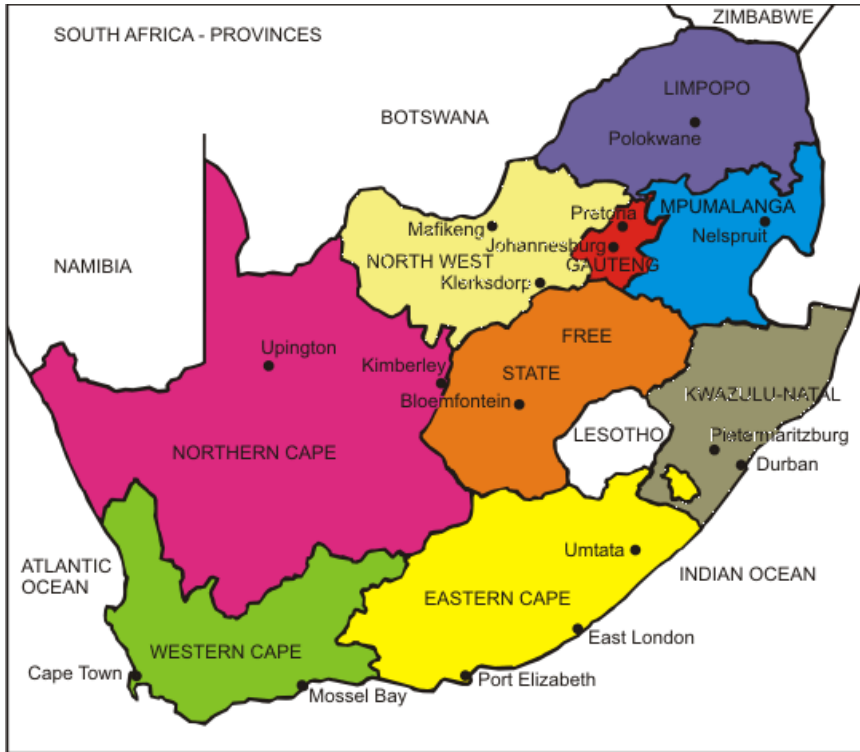
- ✘ About two-thirds of all people with HIV globally live in sub-Saharan Africa.
- ✘ Heterosexual contact is the chief transmission mode of HIV and sexually transmitted infections (STI).
- ✘ South Africa has the largest number of persons at the age 15-49 years living with HIV/AIDS (5.6m, 2009).
- ✘ As in many regions of the world, STI are highly prevalent among young people 15- 24 years of age.

Study Objectives

- ✘ To determine the prevalence of gonorrhoea, chlamydial infection, trichomoniasis and herpes simplex virus type 2 (HSV-2) infection in South African adolescents at two time points, a year apart.
- ✘ To determine the incidence of the above infections in the subgroup of adolescents who were screened at both time intervals.



South African Adolescent Project



- ✘ This study forms a part of a larger cluster-randomized intervention trial.
- ✘ 18 schools (7 paired urban, 2 paired rural) in Mdantsane and Berlin in the Eastern Cape participated in the trial.

South African Adolescent Project

- ✘ 1057 of 1118 eligible sixth-grade students participated in the trial.
- ✘ Intervention consisted either of an HIV/STI risk-reduction intervention targeting sexual risk behaviors, or an attention-matched health promotion control intervention targeting health issues unrelated to sexual behavior.
- ✘ Follow-up with behavioral questionnaires took place at 3, 6, 12, 42 and 54 month after the intervention.
- ✘ At 42 and 54M, biological samples were collected for STI screening.

Informed Consent and Confidentiality

- ✘ Participants and guardian/parents consented to all of the following:
 - Questionnaires
 - First-catch urine for *Neisseria gonorrhoeae*, *Chlamydia trachomatis* and *Trichomonas vaginalis*
 - Blood for HSV-2 serology

- ✘ Questionnaires and specimens were labelled with unique study numbers.



Participants Follow-up

- ✘ Participants received their results by telephone from study coordinators.
- ✘ It was agreed during the consent process that parents/guardians would not receive the results.
- ✘ Participants with positive NG, CT or TV results received free treatment with either single dose oral Azithromycin 2g (NG and CT, 1g CT) or single dose oral metronidazole 2g (TV).
- ✘ Participants with positive HSV-2 serology received counselling and all participants with positive STI results received appropriate health education.
- ✘ Partner notification was initiated for all NG, CT and TV infections.

Laboratory Methods

Urine

- ✘ Aptima Combo 2 (GenProbe) for *N. gonorrhoeae* (NG) and *C. trachomatis* (CT)
- ✘ Aptima TV for *T. vaginalis* (TV)
- ✘ Confirmations of positive NG/CT - Aptima NG, Aptima CT
- ✘ Confirmation of positive TV - real-time PCR for TV (Sacace Biotechnologies, Italy)

Blood

- ✘ HSV-2 IgG detection with the Herpesselect 2 Elisa IgG (Focus Diagnostics, USA)
- ✘ Retesting of Equivocal results by Kalon HSV-2 Elisa IgG (Kalon Biological, UK)

STI Prevalence vs. Incidence

Prevalence:

- ✘ Measures how commonly STIs occur in a population.
- ✘ Measures the STI burden.

Incidence:

- ✘ Measure of the number of new cases in a population in a given time period.
- ✘ Measures the risk of developing an STI.

Overview of Prevalence Results

- ✘ Nine hundred fifty-nine (91%) and 977 (92%) of the 1057 adolescents were tested for STIs at 42M and 54M, respectively.
- ✘ At 42M, 149 (15.5%) had curable STIs and 67 (7.0%) had HSV-2 infection.
- ✘ At 54M, 154 (15.8%) had curable STIs and 104 (10.7%) had HSV-2 infection.
- ✘ Females had a higher prevalence of all STIs at both visits ($p < 0.001$).

Prevalence in Male Participants at 42M and 54M

	42M	54M	P-value
Number	446	457	
Mean Age (SD)	16.1 (1.3)	17.1 (1.3)	
STI Prevalence % (95% CI)			
<i>N. gonorrhoeae</i>	0.9 (0.3 -2.4)	1.8 (0.8 -3.5)	p = 0.3849
<i>C. trachomatis</i>	3.1 (1.8 -5.3)	7.2 (5.2 -10.0)	p = 0.0066
<i>T. vaginalis</i>	0.9 (0.3 -2.4)	0.0 (0.0 -1.0)	p = 0.0591
HSV-2 seroprevalence	3.2 (1.8 -5.3)	5.1 (3.4 -7.5)	p = 0.1798

Prevalence in Female Participants

42M and 54M

	42M	54M	P-value
Number	513	520	
Mean Age (SD)	15.5 (1.2)	16.5 (1.1)	
STI Prevalence % (95% CI)			
<i>N. gonorrhoeae</i>	8.8 (6.6 – 11.6)	7.7 (5.7 – 10.3)	p=0.5720
<i>C. trachomatis</i>	17.9 (14.9 – 21.5)	18.3 (15.2 – 21.8)	p=0.9356
<i>T. vaginalis</i>	7.2 (5.3 – 9.8)	4.0 (2.6 – 6.1)	p=0.0304
HSV-2 seroprevalence	10.3 (8.0 – 13.3)	15.6 (12.8 – 19.0)	p=0.0123

Estimation of Incidence Rates - I

Incidence was measured by analysis of prevalence at 54M for those participants who also attended the 42M follow-up.

Points to note:

1. 100% of participants with positive NG, CT or TV results at the 42M visit were treated and presumed cured.
2. The annual incidence of STIs with short time intervals (i.e. < 1 year) from infection to spontaneous cure may be under-estimated (e.g. gonorrhoea).
3. STIs acquired and successfully treated between 42M and 54M would not be counted at 54M and therefore the annual incidence would be under-estimated.

Estimation of Incidence Rates - II

- ✘ Overall annual incidence rates was based on results of 934 (96%) students who attended 42M/54M visits.
- ✘ Incidence rates for students who reported ever having had vaginal intercourse were calculated.
- ✘ The majority of participants were sexually active at 54M (77% males, 66% females).

Incidence estimations at 54M (overall by gender)

	Males	Females
Number	434	500
Mean Age (SD)	17.1 (1.2)	16.5 (1.1)
STI Incidence rate (new cases/1000) (95% CI)		
<i>N. gonorrhoeae</i>	18.4 (8.7 -36.6)	76.0 (55.6 – 102.8)
<i>C. trachomatis</i>	73.7 (52.4 -102.5)	184.0 (152.4 – 220.4)
<i>T. vaginalis</i>	0.0 (0.0 -10.6)	40.0 (25.7 – 61.3)
HSV-2 seroprevalence	28.0 (15.9 -49.9)	64.4 (44.9 – 91.3)

Incidence Estimations at 54M

(overall and sexually active male subgroup)

	Males (overall)	Males (sexually active)
Number	434	334
Mean Age (SD)	17.1 (1.2)	17.2 (1.2)
STI Incidence rate (new cases/1000) (95% CI)		
<i>N. gonorrhoeae</i>	18.4 (8.7 -36.6)	18.0 (7.3 – 39.6)
<i>C. trachomatis</i>	73.7 (52.4 -102.5)	77.8 (53.3 – 112.0)
<i>T. vaginalis</i>	0.0 (0.0 -10.6)	0.0 (0.0 – 13.7)
HSV-2 seroprevalence	28.6 (15.9 -49.9)	18.6 (7.6 – 41.0)

Incidence Estimations at 54M

(overall and sexually active female group)

	Females (overall)	Females (sexually active)
Number	500	331
Mean Age (SD)	16.5 (1.1)	16.6 (1.1)
STI Incidence rate (new cases/1000) (95% CI)		
<i>N. gonorrhoeae</i>	76.0 (55.6 – 102.8)	108.8 (79.3 – 147.2)
<i>C. trachomatis</i>	184.0 (152.4 – 220.4)	244.7 (201.4 – 293.9)
<i>T. vaginalis</i>	40.0 (25.7 – 61.3)	54.4 (34.2 – 84.8)
HSV-2 seroprevalence	64.4 (44.9 – 91.3)	87.8 (60.2 – 126.0)

Conclusion

- ✘ This study demonstrated an extremely high STI burden among youth in the Eastern Province of South Africa.
- ✘ STIs were common in both males and females, emphasizing the need to enhance STI control among all young people.
- ✘ The prevalence and incidence rates for the four STIs analysed were higher in females, emphasizing their vulnerability to STIs and HIV.
- ✘ More research is needed to determine the key drivers of STI acquisition among youth and to identify cost-effective behavioral interventions.

Acknowledgements

- ✘ John B Jemmott III, Loretta S Jemmott, Anita Heeren, Scarlett Bellamy, Craig Carty and staff - University of Pennsylvania, Philadelphia, USA.
- ✘ Anthea Klopper -General Practice, East London, South Africa
- ✘ Ann O’Leary CDC –Atlanta, Georgia, USA.
- ✘ Zolani Ngwane -Haverford College, Pennsylvania, Philadelphia, USA.
- ✘ Joanne Tyler -University of Fort Hare, Alice, South Africa.
- ✘ David Lewis and staff – STI Reference Centre, NICD/NHLS, Johannesburg, South Africa.

Recommendations

- ✘ A targeted effort is necessary to inform youth, especially female adolescents, about STI symptoms and signs as well as consequences of untreated infections.
- ✘ Current prevention activities for both STIs and HIV should be enhanced for youth and sexual partners.
- ✘ The integration of STI screening into primary care visits will increase the number of adolescents diagnosed and treated for STIs.
- ✘ STI education and behavioral change initiatives should be incorporated into school curricula.