



## Microbiology Division

### Sexually Transmitted Infections Reference Centre

#### BACKGROUND

The mission of the Sexually Transmitted Infections (STI) Reference Centre is to be a resource of knowledge and expertise in regionally relevant STIs to the South African Government, to SADC countries and to the African continent at large, in order to assist in the planning of policies and programmes related to the control and effective management of STIs. Intelligence on the aetiology of major STI syndromes, as well as antimicrobial resistance data related to gonococcal infections, are communicated in a timely manner to the National and Provincial Departments of Health in South Africa as well as to those working in public health and directly with STI patients. The STI Reference Centre functions as a training centre, assisting with training of medical technologists, medical scientists, doctors, nurses and other healthcare staff. The unit also aims to be a centre of scientific excellence in the field of STIs by pursuing operational research relevant to public health and to that end has established several international links with STI researchers overseas. Finally, the STI Reference Centre is the operational base of the African Region of the International Union against STIs (IUSTI).

#### ACTIVITIES, HIGHLIGHTS AND ACHIEVEMENTS

##### MICROBIOLOGICAL SURVEILLANCE OF STIs IN SOUTH AFRICA

In 2007, microbiological surveillance for STIs was undertaken in three South African Provinces, namely Gauteng, the Western Cape and the Free State.

The microbiological surveillance consists of two components:

- a) Aetiological surveillance of three major STI syndromes: the male urethritis syndrome (MUS), the vaginal discharge syndrome (VDS) and the genital ulcer syndrome (GUS).
- b) Antimicrobial surveillance of resistance of gonococci from MUS patients to ciprofloxacin and ceftriaxone.

Surveillance activities were completed in Salt River Clinic, Cape Town (Western Cape) and Alexandra Health Centre, Johannesburg (Gauteng) by May 2007. The Cape Town surveillance was undertaken in collaboration with the University of Stellenbosch at the NHLS Microbiology Department, Tygerberg Hospital

(Professor Elizabeth Wasserman and team). Surveillance activities were initiated at Pelonomi Polyclinic, Bloemfontein (Free State) in October 2007 and will continue through into 2008.



Figure 1: Alexandra Health Centre (Gauteng)

The aetiological surveillance confirmed that gonorrhoea continues to be the main cause of MUS (71% Johannesburg, 85% Cape Town), that STIs account for only about 50% of VDS presentations in women, and that genital herpes accounts for most of the cases of GUS where the aetiology is detected (87% Johannesburg, 71% Cape Town).

Antimicrobial resistance testing has shown a rising prevalence of isolation of ciprofloxacin-resistant gonococci in both Johannesburg and Cape Town. In 2007, 20% of 245 Cape Town isolates and 32% of 149 Johannesburg isolates were resistant to ciprofloxacin (MIC  $\geq$  1 mg/l).



Figure 2: STI Reference Centre's Chief Technologist, Ms Lindy Scott, performing antimicrobial resistance testing on *Neisseria gonorrhoeae* isolates.

The data were presented in the form of electronic communications and a surveillance report to the National and relevant Provincial Departments of Health, as well as to the Cape Town and City of Johannesburg Health Departments. The data were also presented in January 2007 to the Essential Drugs Programme's Primary Health Care Sub-Committee and formed the basis for the revision of STI syndromic management guidelines which are due to be published in 2008. Data will also be disseminated in early 2008 in the NICD Bulletin and Communiqué.

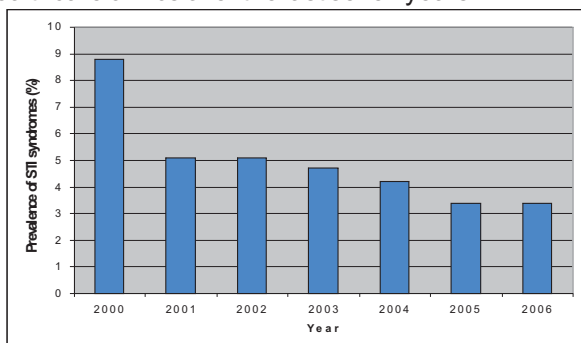
**MICROBIOLOGICAL SURVEILLANCE OF STIs IN NAMIBIA AND LESOTHO**

In March 2007, Prof. David Lewis and Mr. Frans Radebe assisted the Namibian Ministry of Health and Social Welfare with training of medical technologists and nurses in order to undertake aetiological surveillance of MUS, VDS and GUS presentations at two primary healthcare centre sites, Katatura Health Centre (Windhoek) and Oshakati Hospital. Gonococcal antimicrobial susceptibility testing was also performed. E-testing of isolates in real-time showed higher levels of ciprofloxacin resistance in Oshakati Hospital compared to Katatura Health Centre. Molecular and serological testing of specimens will be performed at the STI Reference Centre in March 2008 when three Namibian technologists will come to the NICD for training.

Two technologists from Lesotho spent two weeks at the STI Reference Centre in April 2007 to test STI aetiological surveillance specimens. The specimens had been collected in 2006 at Leribe and Maseru following training of the Lesotho surveillance team, consisting of nurses and medical technologists, undertaken by staff from the STI Reference Centre.

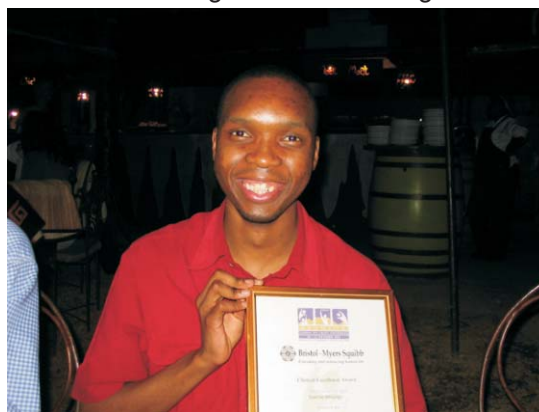
**CLINICAL SURVEILLANCE OF STIs IN GAUTENG**

The Gauteng STI surveillance project, run by the STI Reference Centre in collaboration with the Gauteng Provincial Health Department, continued to collect data in 2007. The data show a decrease in STI presentations to the 20 sentinel Gauteng primary healthcare clinics over the last seven years.



**Figure 3: Relative prevalence of STI syndromes presenting to the 20 sentinel sites of the Gauteng STI Surveillance Programme as a proportion of the total patient headcount for those patients aged 5 years old and above.**

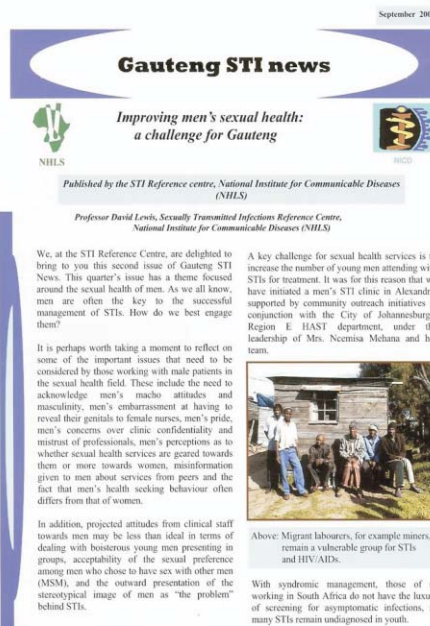
The 2000-2006 data were presented at the joint ISSTD-JUSTI world meeting in Seattle, USA and at the 2<sup>nd</sup> Joint FIDSSA Congress at Spier, Western Cape. Mr Sakhile Mhlongo won the best STI poster prize for his poster on the Gauteng Surveillance Programme.



**Figure 4: Mr Sakhile Mhlongo with his prize for best STI poster at the 2nd FIDSSA Congress.**

The STI Reference Centre presented data on STI surveillance, both clinical and microbiological, to Gauteng Provincial Department of Health staff in April 2007. This was the first such annual training day linked to the Gauteng Surveillance Programme and was well attended.

In 2007, the STI Reference Centre launched "Gauteng STI News" which contains information on STI projects undertaken by the NICD in Gauteng, data from Gauteng microbiological and surveillance programmes as well as reviews on important STI topics. These newsletters are distributed in triplicate to every primary healthcare centre in Gauteng where the target audience is nurses working with STI patients.



**Figure 5: Gauteng STI News.**

## RANDOMISED PLACEBO-CONTROLLED TRIAL OF THE ADDITION OF ACYCLOVIR TO CURRENT SYNDROMIC MANAGEMENT OF GENITAL ULCERATION

This study, performed in collaboration with the Centers for Disease Control and Prevention (Dr Gabriela Paz-Bailey, CDC Principal Investigator) was completed at the end of 2006 and data were cleaned and analysed during 2007. A late-breaker oral presentation slot was awarded at the joint ISSTD-IUSTI world meeting in Seattle, USA where the preliminary study findings were released. The study found that the addition of acyclovir, given as 400 mg three times a day for 5 days to men with genital ulcers attending South African primary healthcare centres, significantly improved ulcer healing at day 7 (61% acyclovir group versus 42% in the placebo group) and shedding of HIV-1 from genital ulcers (24% of the acyclovir group and 37% of the placebo group shed HIV-1 at day 7). The study data were discussed in depth with members of the National Department of Health HAST Directorate at special herpes trial study day co-organized by the Reproductive Health and HIV Research Unit and the STI Reference Centre in August 2007. The trial is of international importance and is one of several that are being undertaken to assess the benefit of either episodic or suppressive anti-herpes therapy in terms of ulcer healing and decrease of HIV transmission to uninfected partners. The results will be formally presented in a scientific publication in 2008 and the study data will be presented at a World Health Organization meeting in April 2008.

## SCREENING HIV-INFECTED INDIVIDUALS FOR STIs

PEPFAR funds, through the NICD:CDC co-operative agreement, were used in 2007 to establish a screening programme for HIV-infected individuals attending the HIV treatment centre at Helen Joseph Hospital. The work was undertaken in collaboration with Dr Ian Sanne and Dr. Cindy Firnhaber from the University of the Witwatersrand's Clinical HIV Research Unit.

This surveillance initiative aims to determine the burden of sexually transmitted infections (STIs) among asymptomatic HIV-infected patients attending an HIV treatment centre in Johannesburg. *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Trichomonas vaginalis* and *Mycoplasma genitalium* infections were detected by molecular methods, microscopy was performed for bacterial vaginosis and candidiasis whilst serology was used to detect syphilis and herpes simplex virus type 2 infections. Patients were treated aetiologically for detected STIs and given partner notification slips. During the first 12 months of the service, 521 men and 545 women were screened for STIs. Asymptomatic gonococcal and *T. vaginalis* infections are more prevalent than *C. trachomatis* infections in this HIV-infected population. Low levels of active syphilis and high levels of HSV-2 infections were observed. In the absence of effective HIV vaccines and

microbicides, STI screening of asymptomatic HIV-infected patients may enhance current HIV prevention strategies. The data will be submitted for presentation at an international STI meeting in 2008.

## ORANGE FARM 2 STUDY: A COMMUNITY STUDY OF MALE CIRCUMCISION

The randomized controlled trial previously conducted in Orange Farm, south of Johannesburg, demonstrated that male circumcision was able to reduce the risk of HIV acquisition by more than 50% among young men. This result has now been confirmed by two further studies published in 2007, one in Kisumu (Kenya) and the other in Rakai (Uganda).

The current research project, which commenced in the latter part of 2007, aims to establish a male circumcision intervention in Orange Farm in order to evaluate its impact on knowledge, attitudes and practice regarding male circumcision, existing means of prevention (behaviour change, condom use, STI treatment-seeking behaviour and HIV VCT), and the spread of HIV, HSV-2, gonorrhoea and chlamydial infection.

The project is funded by the French Agence Nationale de Recherches sur la SIDA et les hépatites virales (ARNS). The STI Reference Centre is the main NICD collaborating unit. The study is being led by Prof Bertran Auvert (Professor of Public Health, University of Versailles). Within South Africa, Prof David Lewis is a co-Principal Investigator with Dr Dirk Taljaard (Progressus, South Africa).

The STI screening baseline survey of 2,600 community members from Orange Farm took place between October and November 2007.

## EVALUATION OF MATERNAL SYPHILIS AND HIV SCREENING AND TREATMENT

Prevention of Mother to Child Transmission (PMTCT) has become a major HIV prevention focus in South Africa, with HIV diagnosis and antiretroviral prophylaxis provided free of charge. The national guidelines have recommended universal syphilis testing at the first antenatal care visit and HIV voluntary counseling and testing as part of routine ANC patient management. Key to any PMTCT programme is early HIV testing, ideally at the first ANC visit (if not prior to pregnancy).

This project, funded through PEPFAR through collaboration with the Division of STD Prevention at the CDC, sought to determine factors influencing provision of correct syphilis, HIV testing and PMTCT management in Gauteng and the Northern Cape provinces. Between March and August 2008, 1306 notes in Gauteng Province and 1372 notes in the Northern Cape Province were reviewed. In Gauteng, three delivery hospitals (Lillian Ngoyi, Kalafong, George Mukhari) and their respective feeder clinics were recruited as study sites. Likewise, in the Northern Cape, three further delivery hospitals (Galeshwe,

Barkley West, Kuruman) and their feeder clinics were also recruited. Results were shared with the Provincial and National Departments of Health at the end of 2007 by the CDC Principal Investigator, Dr. Thu-Ha Dinh. It is hoped that data will be able to be disseminated and published in 2008.

### ALEXANDRA MEN'S STI CLINIC

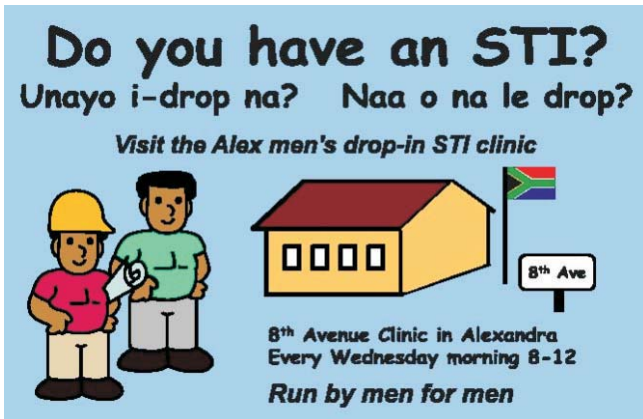


Figure 6: Alexandra men's STI clinic card.

The STI clinic for men in Alexandra, staffed by the STI Reference Centre, had another successful year in 2007. Numbers of weekly attendances has risen since commencement of the clinic in 2005, from about 4-6 attendances per clinic to 12-15 attendances per clinic session. Over time, there has been a trend to see young men and the proportion of those under 24 has risen substantially. The clinic has been the site of STI surveillance activities as well as a study looking at the prevalence of HPV infection among men with and without genital warts. It is planned to analyze the first three year's data in 2008 to assess trends of relevance and report this to the City of Johannesburg Region E HAST department, who have been very supportive of this collaboration since its inception.

### MEN'S FOCUS GROUP STUDY IN ALEXANDRA

This short study aimed to perform individual interviews of male patients presenting with acute STIs, as well as to discuss issues with six focus groups of men. The study was based at Alexandra Health Centre in Johannesburg. Male patients presenting with STIs were recruited from the Alexandra Health Clinic as well as four other local clinics in the township. Men for the focus groups were recruited from taverns, sports centres, taxi ranks and street corners in Alexandra. The focus groups were undertaken by Dr Jami Leichter and Ms Alison Friedman from CDC (Atlanta) with assistance from STI Reference Centre staff, in particular Sr Martha Sello, Mr Alex Vezi and Mr Siphon Mbabela. In total, six focus groups were held with a total of 58 men participating. Nineteen patients who had consulted the clinics on the day with an acute STI were enrolled and interviewed.



Figure 7: Improving the sexual health of Alexandra's men was a key theme in 2007.

The predominant views of the local men were that most clinic staff did not provide sufficient privacy and dignity for those presenting STIs. Therefore many preferred to rather be treated by a traditional healer or private doctor, even though it involved higher costs. Most men also had limited or no knowledge regarding STIs in respect of causes, transmission, and link to HIV/AIDS. Acutely infected participants who were individually interviewed stated that sometimes they were not examined by female nurses before treatment, and several stated that they received no education regarding the prevention of recurrences. A formal report will be written and shared with our colleagues in the City of Johannesburg Health Department.

### ASSESSMENT OF THE PlasmAcute<sup>R</sup> TEST TO DETECT HIV SEROCONVERTERS

The STI Reference Centre completed a study to assess the ability of the PlasmAcute<sup>R</sup> test to detect HIV seroconverters among a population of male miners at East Driefontein Hospital on the West Rand in February 2007. The data were presented as a poster at the joint ISSTD-World IUSTI meeting in Seattle, USA in August 2007. The poster won the prize for the best poster at this international meeting, attended by 1,300 participants.



Figure 8: Mr Frans Radebe won the prize for the best poster at the 2007 ISSTD-IUSTI world meeting.

A further study was initiated in 2007 to further assess this test in women at high risk of STIs and HIV in collaboration with the Mothusimpilo Project in Carletonville, on South Africa's West Rand. The project is being funded by PlasmAcute<sup>®</sup> AS (Norway) and the Polio Research Foundation (South Africa).



**Figure 9: Mock demonstration of taking blood in a Mothusimpilo Project mobile van at the PlasmAcute<sup>®</sup> study site in Carltonville**

**TEACHING AND TRAINING ACTIVITIES**

During 2007, both medical technologists from Namibia and Lesotho and nurses from South Africa, Namibia and Lesotho were trained in microbiological surveillance. The STI Reference Centre participated in the NICD training rotation for Microbiology Registrars and offered both a short course and a long course during 2007.



**Figure 10: Microbiology registrars working with *Neisseria gonorrhoeae* isolates.**

**IUSTI-AFRICA**

Prof Lewis has, with the support of the NICD Executive Director, continued to undertake the duties as Director for the Africa Region for the International Union against

STIs. During 2007, more contacts were made in terms of networking and sharing of information on STIs across Africa. The work fits in well with the strategic goals and mission of the NICD as a whole. As part of these duties, Prof Lewis accepted a position on the steering committee for the 2008 International Conference on AIDS and STIs in Africa (ICASA) to be held in Senegal in December 2008. This is a major HIV/STI conference for Africa and it is expected that 5,000 delegates will attend. It will be an ideal opportunity to discuss STI related issues for the continent.



**Figure 11: Prof Lewis (2nd from the right) with other key members of the ICASA steering committee after a press conference in Dakar, Senegal, to announce the conference.**

In June 2007, Prof Lewis was asked to be part of the Action Planning team for the World Health Organization's Global Sexual Health Strategy document, which aims to improve the quality of STI services and surveillance worldwide. Prof Lewis is the organizer for the next world IUSTI meeting which will be held in the Western Cape in November 2009.

To assist in the dissemination of key STI related information across Africa, Prof Lewis developed, with enormous assistance from his secretary Mrs. Aulette Goliath, the first IUSTI-AFRICA Regional Newsletter. The newsletter is currently sent out twice a year in English, French and Portuguese. Its format discusses STI issues in various African countries, STI surveillance, STI research in Africa, topical reviews and news on conferences relevant to Africa.

**COLLABORATIONS**

**Microbiological Surveillance Project**

- Ms Eva Marumo, National Department of Health
- Prof Elizabeth Wasserman, NHLS Microbiology Laboratory, University of Stellenbosch
- Ms Anneke van der Spoel van Dijk, NHLS Microbiology Laboratory, University of the Free State
- Dr Muvili Simba, Alexandra Health Centre

**Gauteng Clinical Surveillance Project**

Dr D Moloi, Gauteng Provincial Department of Health

**Episodic Herpes Trial**

Dr Gabriela Paz Bailey, CDC (Atlanta)

**Men's Focus Groups Project**

Dr Jami Leichter and Dr Gabriela Paz Bailey, CDC (Atlanta)

**ANC Study**

Dr Mary Kamb and Dr. Thu-Ha Dinh, CDC (Atlanta)

**STI providers' Study**

Dr Mary Kamb and Dr Susan Hariri, CDC (Atlanta)

**Patient-focuses HIV VCT Study**

Dr Mary Kamb and Dr Jami Leichter, CDC (Atlanta)

**STI screening of HIV patients**

Dr Ian Sanne and Dr Cindy Firnhaber, Clinical HIV Research Centre

**Male Circumcision Study**

Prof Bertran Auvert, Paris-Ile-de-France-Ouest Medical School, University of Versailles  
Dr Dirk Taljaard, Progressus

**PlasmAcute test assessment**

Dr Odd Odinsen and Dr Jochen Felbel, PlasmAcute AS

**CAPACITY BUILDING**

Ms Precious Magooa, Medical Scientist at the STI Reference Centre, registered as an MSc student in 2007. Her project is entitled "Detection and molecular epidemiology of ciprofloxacin-resistant *Neisseria gonorrhoeae* using real-time PCR". The project is co-supervised by two STI Reference Centre staff, Prof David Lewis and Dr Etienne Müller.