SOUTHERN AFRICAN
JOURNAL
OF HIV MEDICINE

JULY 2009

JULY 2009

SOUTHERN AFRICAN JOURNAL OF HIV MEDICINE

ISSUE THIRTY-FOUR

CONTENTS

Cover: *AIDS ribbons in Zulu beadwork, photographed on World AIDS Day at the Centre for African Art, now in Florida Road, Durban (Peter Bendheim/Independent Contributor/africanpictures.net).*

Photos featured inside this issue were taken by Exhibition Photographs at the ***4th Southern African AIDS Conference in*** *Durban – the largest yet, with 5 000 attendees and speakers from across the globe. 'More than ever before we need to come together as a region, declare war on the epidemic and begin to see the rates in southern Africa decline' (Congress Chair Professor Linda-Gail Bekker, Desmond Tutu HIV Foundation) .*

CONTENTS

PUBLISHERS
SAMA Health & Medical Publishing Group
Tel: (021) 681 7200
Article submissions: www.sahivmed.org.za

FOR MORE INFORMATION CONTACT
SA HIV CLINICIANS SOCIETY
Suite 233, PostNet Killarney
Private Bag X2600, Houghton, 2041
www.sahivsoc.org
E-mail: sahivsoc@sahivsoc.org
Tel: +27 (0) 11 341 0162
Fax: +27 (0) 11 341 0161

Printed by Tandym Print
ISSN 608-9693

THE SOUTH AFRICAN MEDICAL ASSOCIATION

FROM THE EDITOR

I am lucky enough to be writing this on a remote Madagascar peninsula. We've become acquainted with intriguing lemurs and the fearsome fusa, chameleons and boa constrictors, and just at the moment life is really not too shabby! I feel a twinge of guilt that the promised fertility and TB and health care worker guidelines do not feature in this issue, but they are well on their way and will make a double-act appearance in the next one.

However, our second issue does have a nice array of other interest! The study by Van Deventer shows how, at primary health clinic level, extraordinary things are being done to make an impact on the morbidity and mortality of HIV. Our colleagues from Nigeria are sending through some interesting copy, and an article in this edition looks at knowledge, attitudes and practices of long-distance truck drivers there. Firnhaber and Michelow give a useful review of the impact of human papillomavirus and cervical carcinoma in HIV infection. Price's provocative piece on culture and moralism may have application in a number of prevention areas. Von Mollendorf reviews early acute HIV infection. There is increasing evidence of its impact, and already the pendulum is swinging back to earlier treatment.

The HIV AIDS Vaccine Ethics Group based at UKZN (Pietermaritzburg) has been instrumental in helping South African researchers unpack the ethical and legal complexities of involving minors in research, and in this issue Slack and Strode examine some of the issues surrounding mandatory reporting of activities or events during such research.

This issue is the first after the gratifyingly successful 4th South African AIDS Conference. To remind those of you who attended and give those who didn't a taste of some of the subjects covered, we asked the track chairs of each of the six tracks and their respective rapporteurs for a concise report. We also publish reports on two excellent satellite symposia.

Finally, we have received the sad news that a friend, respected colleague, activist and treater, Dr Steve Andrews, passed away in Cape Town recently. South Africa has lost a hero. Our sincere condolences go to his family and loved ones. We will miss you, Steve.

LINDA-GAIL BEKKER
Editor

MESSAGE FROM THE EXECUTIVE

It is with shock and disbelief that we heard of the death of Dr Steve Andrews. South Africa has lost a passionate humanitarian and a superb doctor. The Society owes him a huge debt – he has been part of a small and committed group that has overseen the little HIV interest group grow to one of the largest and most influential medical special interest organisations in the world. His dedication and hard work on the Exco, his leadership in terms of ethics, guidelines and policy, and his moral clarity on so many things we deal with will be sorely missed.

Meetings were never boring when Steve was in the room. He would bring energy, controversy and humour to the most tedious, humdrum and badly chaired policy meeting, making sure that everyone was on their toes. His passion meant that he was constantly engaged in some battle. Whether it was with medical aids refusing to pay for treatments for his patients, a government refusing to take responsibility for its people, SAMA not making a stand on something, or a pharma company making a drug available at high prices after he had assisted them with a clinical trial, he would wade in fearlessly and bravely, telling it like it is.

His patients' problems were legendary. He would revel in acing me when I had a hard case that I needed advice on – I would say 'I have an HIV patient with x disease, y weird sexual fetish, and z terrible social circumstances,' and he'd laugh loudly and say 'I have 10 of those. I raise you a drug addiction, four girlfriends, a boyfriend, AND he is senior in government.' He was safe hands for referrals of difficult cases in the private sector, and recognised by his peers as a major academic force.

I am going to miss visiting Cape Town, with Steve insisting on taking me out for a beer that became several and then dinner, where we solved all the country's health problems, as well as reversing the global HIV epidemic. He had an infectious fire for justice, often trading late-night e-mails with us for hours, interspersed with politically incorrect cartoons. I am going to miss him very, very much. We all are.

Hamba kahle, Steve.

Francois, on behalf of the SA HIV Clinicians Society Exco

FROM THE EDITOR

I am lucky enough to be writing this on a remote Madagascar peninsula. We've become acquainted with intriguing lemurs and the fearsome fusa, chameleons and boa constrictors, and just at the moment life is really not too shabby! I feel a twinge of guilt that the promised fertility and TB and health care worker guidelines do not feature in this issue, but they are well on their way and will make a double-act appearance in the next one.

However, our second issue does have a nice array of other interest! The study by Van Deventer shows how, at primary health clinic level, extraordinary things are being done to make an impact on the morbidity and mortality of HIV. Our colleagues from Nigeria are sending through some interesting copy, and an article in this edition looks at knowledge, attitudes and practices of long-distance truck drivers there. Firnhaber and Michelow give a useful review of the impact of human papillomavirus and cervical carcinoma in HIV infection. Price's provocative piece on culture and moralism may have application in a number of prevention areas. Von Mollendorf reviews early acute HIV infection. There is increasing evidence of its impact, and already the pendulum is swinging back to earlier treatment.

The HIV AIDS Vaccine Ethics Group based at UKZN (Pietermaritzburg) has been instrumental in helping South African researchers unpack the ethical and legal complexities of involving minors in research, and in this issue Slack and Strode examine some of the issues surrounding mandatory reporting of activities or events during such research.

This issue is the first after the gratifyingly successful 4th South African AIDS Conference. To remind those of you who attended and give those who didn't a taste of some of the subjects covered, we asked the track chairs of each of the six tracks and their respective rapporteurs for a concise report. We also publish reports on two excellent satellite symposia.

Finally, we have received the sad news that a friend, respected colleague, activist and treater, Dr Steve Andrews, passed away in Cape Town recently. South Africa has lost a hero. Our sincere condolences go to his family and loved ones. We will miss you, Steve.

LINDA-GAIL BEKKER
Editor

MESSAGE FROM THE EXECUTIVE

It is with shock and disbelief that we heard of the death of Dr Steve Andrews. South Africa has lost a passionate humanitarian and a superb doctor. The Society owes him a huge debt – he has been part of a small and committed group that has overseen the little HIV interest group grow to one of the largest and most influential medical special interest organisations in the world. His dedication and hard work on the Exco, his leadership in terms of ethics, guidelines and policy, and his moral clarity on so many things we deal with will be sorely missed.

Meetings were never boring when Steve was in the room. He would bring energy, controversy and humour to the most tedious, humdrum and badly chaired policy meeting, making sure that everyone was on their toes. His passion meant that he was constantly engaged in some battle. Whether it was with medical aids refusing to pay for treatments for his patients, a government refusing to take responsibility for its people, SAMA not making a stand on something, or a pharma company making a drug available at high prices after he had assisted them with a clinical trial, he would wade in fearlessly and bravely, telling it like it is.

His patients' problems were legendary. He would revel in acing me when I had a hard case that I needed advice on – I would say 'I have an HIV patient with x disease, y weird sexual fetish, and z terrible social circumstances,' and he'd laugh loudly and say 'I have 10 of those. I raise you a drug addiction, four girlfriends, a boyfriend, AND he is senior in government.' He was safe hands for referrals of difficult cases in the private sector, and recognised by his peers as a major academic force.

I am going to miss visiting Cape Town, with Steve insisting on taking me out for a beer that became several and then dinner, where we solved all the country's health problems, as well as reversing the global HIV epidemic. He had an infectious fire for justice, often trading late-night e-mails with us for hours, interspersed with politically incorrect cartoons. I am going to miss him very, very much. We all are.

Hamba kahle, Steve.

Francois, on behalf of the SA HIV Clinicians Society Exco

TRIBUTE

IN MEMORY OF DR STEVE ANDREWS (1970 - 2009)

Dr Steve Andrews died unexpectedly on 27 June 2009 at the age of 39. He is survived by his wife Lyndall and daughter Sarah.

Steve qualified as a medical doctor from the University of Cape Town in 1993. In 1997 he attained Membership of the College of Family Practitioners (SA), being awarded the medal for the best candidate. In 2004 he obtained a Master's degree in Bioethics from the University of Cape Town. Steve was involved in the design and implementation of large HIV programmes in both the public and private sectors. He was a medical advisor for the Aid for AIDS managed care programme, the Médecins Sans Frontières Khayelitsha Antiretroviral Programme, and Strategic Evaluation Assessment and Development Consulting (which evaluates PEPfAR-funded programmes). He ran a busy private practice in Cape Town, focusing on patients needing salvage antiretroviral therapy. Steve served the Southern African HIV Clinicians Society with distinction: he was a member of the executive committee from 2001, served on several treatment guideline committees, and founded the society's regular Cape Town journal clubs.

Steve's strong sense of justice resulted in his becoming a treatment activist who worked closely with the Treatment Action Campaign. He provided cheap generic fluconazole in defiance of patent regulations prior to the Pfizer fluconazole donation, and was an active participant in various campaigns to lower the price of antiretrovirals. Despite his prominent role in these campaigns, Steve was the site principal investigator of a large number of pharmaceutical industry trials, which allowed many of his patients to access antiretrovirals before the public sector scale-up and, latterly, access to drugs potentially useful for salvage therapy.

Steve was an outstanding postgraduate teacher. He conducted many training sessions for primary care doctors in southern Africa and ran a website offering HIV training. His passion and marvellous self-deprecating sense of humour disarmed the most hardened sceptic. His seminars on ethical aspects of HIV were particularly memorable – he would get the most jaded doctors up on their feet, arguing passionately.

Steve's death is a tragic loss not only to the Society but to the wider HIV community. South Africa has lost an HIV champion. We extend our condolences to his family, friends, colleagues and patients.

GARY MAARTENS

CPD QUESTIONS

Journal 34

Two CPD points are awarded for the correct completion and submission of the questions below.

CPD questionnaires must be completed online via www.cpdjournals.org.za.
After submission you can check the answers and print your certificate.
Questions may be answered up to 6 months after publication of each issue.
This programme is available free of charge to members of the HIV Clinicians Society and SAMA only.

1. True (A) or false (B) – click on the correct answer:
   Acute HIV infection (AHI) is usually defined as the time from entry of the virus into the body to completion of seroconversion.

2. True (A) or false (B) – click on the correct answer:
   Early-stage HIV infection generally refers to the interval between seroconversion and the establishment of the viral load set point.

3. True (A) or false (B) – click on the correct answer:
   The magnitude of the viral set point has no influence on the prognosis of disease progression.

4. True (A) or false (B) – click on the correct answer:
   Fortunately, rapid HIV tests are initially invariably positive because of the rapid immune response.

5. True (A) or false (B) – click on the correct answer:
   The classic mononucleosis-like symptoms of acute HIV-1 infection may last days to weeks.

6. True (A) or false (B) – click on the correct answer:
   Because of the high viral burden in the blood and genital secretions in AHI, a disproportionate amount of HIV transmission may occur during this time.

7. True (A) or false (B) – click on the correct answer:
   The period during which treatment should be given for AHI is not clear.

8. True (A) or false (B) – click on the correct answer:
   The South African HIV Clinicians Society Guidelines do not currently recommend ART for AHI as there is no definite evidence supporting this therapy.

9. True (A) or false (B) – click on the correct answer:
   Cervical cancer is one of the most common cancers in women worldwide.

10. True (A) or false (B) – click on the correct answer:
    After breast, colon and lung cancers, cervical cancer is the next most common cause of cancer death among women.

11. True (A) or false (B) – click on the correct answer:
    Cervical cancer and its precursor lesions are caused by infection with the human papillomavirus (HPV).

12. True (A) or false (B) – click on the correct answer:
    HPV is associated with both squamous and glandular dysplasia.

13. True (A) or false (B) – click on the correct answer:
    A strong relationship exists between HIV and HPV, two sexually transmitted viruses.

14. True (A) or false (B) – click on the correct answer:
    Invasive cervical cancer in HIV-positive women tends to occur 10 - 15 years earlier than in their HIV-negative counterparts.

15. True (A) or false (B) – click on the correct answer:
    Primary prevention of cervical cancer includes adopting safe sex practices and HPV vaccination.

16. True (A) or false (B) – click on the correct answer:
    South Africa and Swaziland have the highest incidence rates per capita of tuberculosis (TB) in the world.

17. Which one of the following is FALSE? Factors that could contribute to the TB epidemic are:
    a) Overpopulation
    b) Economic hardship and poor living conditions
    c) Halitosis
    d) Conflict and turmoil leading to displacement and migration.

18. True (A) or false (B) – click on the correct answer:
    In South Africa, by far the biggest driver of TB is HIV.

19. True (A) or false (B) – click on the correct answer:
    A person's CD4 cell count has little influence on TB risk.

20. True (A) or false (B) – click on the correct answer:
    A Cochrane meta-analysis showed that the use of isoniazid would reduce active TB by about one-third in people with HIV.

SOUTHERN AFRICAN HIV CLINICIANS SOCIETY

APPLICATION / RENEWAL FORM

MEMBERSHIP FEES FOR 2009

Annual Membership Fees: **Private Sector** R290 / **Public Sector** R145 / **Associate Member** R115

Renewal Fees are valid for 12 months from date of receipt of payment. Payments may be made by cheque or electronic transfer payable to: 'Southern African HIV Clinicians Society', Nedbank Campus Square, Branch code: 158-105 Account No: 1581 048 033. **Please fax proof of payment to the Database Manager on 086 682 2880** or post to: Suite 233, PostNet Killarney, Private Bag X2600, Houghton, 2041 Tel: + 27 (0) 11 341 0162 E-mail: sahivsoc@sahivsoc.org. Website: www.sahivsoc.org

NB! PLEASE PRINT LEGIBLY FOR ACCURATE ENTRY INTO THE DATABASE IN ORDER TO ENSURE RECEIPT OF SERVICES:

First name: Initials:

Surname: Title:

Specialty:

Practice address

Postal Address:

City:

State/Province:

Country: Postal Code:

HPCSA.No: Tel.No

Fax: Cell:

E-mail:

Please tick relevant box:

- Do you practice in the Private Sector ☐ or in the Public Sector ☐ or Both ☐
- Would you like to be added to the Society's Provider Network for HIV Patient referrals? Yes ☐ No ☐
- Would you like your quarterly journal, the *Southern African Journal of HIV Medicine*, to be posted to you? Yes: ☐ No ☐
  (I will read journals on-line, on the Society website: http://www.sajhivmed.org.za)
- Preferred method for receiving your quarterly newsletter *Transcript:* E-mail ☐ Post ☐
- Name(s) of HIV Training Courses successfully completed:……
  . ……

Method of payment: Electronic transfer: ☐ Direct deposit: ☐ Post/Cheque: ☐ Cash: ☐

Amount Paid: **Payment Date:**

SOCIETY SERVICES:-

Quarterly issues of *Southern African Journal of HIV Medicine*
Quarterly newsletter *Transcript*
CPD Points for: Branch Meetings,
Journal questionnaires, published submissions
HIV/Aids CME: Courses/Alumni programme as training for Dip.
HIV Med.Advocacy & day-time telephonic consultancy
Conference information and discounts
Regional and international representation
Specialty sub-groups
Local and International Guidelines

ORIGINAL ARTICLE

HIV/AIDS-RELATED KNOWLEDGE, SEXUAL PRACTICES AND PREDICTORS OF CONDOM USE AMONG LONG-DISTANCE TRUCK DRIVERS IN NIGERIA

P N Aniebue, *MB BS, FWACP*
Department of Community Medicine, University of Nigeria Teaching Hospital, Enugu, Nigeria

U U Aniebue, *MB BS, FWACS*
Department of Obstetrics and Gynaecology, University of Nigeria Teaching Hospital

Background. Long-distance truck drivers (LDTDs) are exposed to high-risk sexual behaviour because of the nature of their work and are at high risk for HIV acquisition. Assessing their sexual practices and condom use is an important step in HIV/AIDS prevention in this target group.

Objective. To determine HIV/AIDS-related knowledge, sexual practices and predictors of condom use among Nigerian LDTDs.

Design, setting, subjects. A cross-sectional survey of 116 LDTDs in Enugu, Nigeria, was carried out using pre-tested structured questionnaires.

Results. The 116 respondents ranged in age from 21 to 69 years with a mean of 40.5 years; 95.7% were aware of HIV/AIDS, 88.8% identified unprotected sexual intercourse as a mode of transmission, and 78.4% knew that use of a condom during sexual intercourse protects against HIV/AIDS transmission. Ninety-eight drivers (84.5%) engaged in extramarital sexual relationships and 42.9% had multiple sexual partners. Of the drivers 43.1% had used condoms at some stage and 28.6% used them consistently. Reasons for non-use were mainly unavailability, sexual dissatisfaction and religious convictions. Age, marital status and educational status were significant predictors of condom use among sexually active LDTDs.

Conclusion. Condom use among LDTDs is low despite their high-risk sexual behaviour. Promotion campaigns to improve the general acceptability of condoms are recommended. Improved distribution of condoms at the stations where the drivers stop would improve accessibility and use.

The United Nations AIDS Report (2005, cited by Ibrahim[1]) showed that HIV is continuing to spread to an alarming extent all over the world, particularly Africa. By the end of 2006 it was estimated that there were 2.99 million Nigerians living with HIV/AIDS, and heterosexual transmission accounted for nearly 80% of cases of HIV infection.[2] Long-distance truck drivers (LDTDs) are known to engage in high-risk sexual behaviour. Long periods away from home and family results in high levels of engagement with commercial sex workers, so drivers are exposed to HIV and other sexually transmitted infections (STIs).

The correct and consistent use of condoms is an important component in the prevention of STIs, including HIV infection, and is reported to be the most reliable method of prevention other than abstinence.[3] Although knowledge about condoms is relatively high and increasing in many African countries, including Nigeria, there has as yet been no commensurate increase in their use.[3]

The aim of this study was to determine HIV/AIDS-related knowledge, sexual practices and predictors of condom use among LDTDs in Nigeria. The findings may inform policy makers on how to design effective programmes to promote condom use in this high-risk group.

MATERIALS AND METHODS

A cross-sectional survey of 130 male LDTDs was carried out at three major truck depots in Enugu, south-eastern Nigeria. The minimum sample size was calculated using the formula $p \times q/(SE)^2$, where p = prevalence, q = 100–p and SE = sampling error tolerated.[4] Using a

prevalence of 65.6% from a previous study[5] and a sampling error of 5% the minimum sample size required was calculated as 93, but a total of 130 drivers were studied to accommodate attrition.

The drivers were consecutively recruited into the study over a 3-month period. The objectives of the study were explained to them and confidentiality was assured by non-inclusion of identifying characteristics in the questionnaire that was used for data collection. Verbal consent was then received from each driver before recruitment into the study.

The pre-tested structured questionnaire was administered to the drivers by medical students specially trained for the survey. Information obtained from the questionnaires were the socio-demographic characteristics of the drivers, their knowledge of HIV/AIDS, sexual practices and condom use, and factors influencing condom use. Data analysis was carried out with Epi Info version 2002 computer software. The chi-square test was used for testing statistical significance. A *p*-value <0.05 was considered to indicate statistical significance.

RESULTS

Of a total of 130 questionnaires distributed 116 were correctly filled in, giving a response rate of 89.2%. The drivers ranged in age from 21 to 69 years. Twenty-seven (23.3%) were single, 88 (75.9%) married and 1 (0.9%) widowed. They were predominantly Christians and the majority had secondary or primary education (Table I). Of the drivers 95.7% were aware of HIV/AIDS, and the major source of information on this was the media (41.9%). Other sources included health talks (25.2%), friends (21.3%) and church (11.6%). Knowledge of modes of transmission and prevention of HIV/AIDS is shown in Table II. One hundred and three drivers (88.8%) knew that HIV could be transmitted through unprotected sexual intercourse, and 91 (78.4%) identified condom use as one of the modes of prevention of transmission.

TABLE I. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF 116 LDTDs STUDIED

Age (yrs)	***N***
21 - 30	29
31 - 40	37
41 - 50	31
51 - 60	12
>60	7
Marital status	
Single	27
Married	88
Widowed	1
Religion	
Christianity	87
Islam	27
Others	1
Educational level	
No formal education	8
Primary education	49
Secondary	48
Tertiary	11

TABLE II. KNOWLEDGE OF MODES OF TRANSMISSION AND PREVENTION OF HIV/AIDS (%) AMONG 116 LDTDs STUDIED

Mode of transmission*	
Unprotected sexual intercourse	88.8
Blood transfusion	86.2
Needles/syringes/sharps	77.6
Breastfeeding	66.4
Mother-to-child transmission	59.5
Hand shaking	18.1
Preventive measures*	
Marital faithfulness	90.5
Screening of blood	88.8
Abstinence	86.2
Condom use	78.4
Prayers	39.7
Preventive drug	17.2

* There were multiple responses.

Ninety-eight drivers (84.5%) engaged in extramarital sexual relationships. Forty-two of these (42.9%) had multiple sexual partners, while one (0.01%) was bisexual. During the 6 months prior to the study 92 drivers (79.3%) had engaged in extramarital sex.

Fifty drivers (43.1%) had ever used condoms during extramarital sex, 38 (38.8%) had used condoms in their last extramarital sexual relationship, and 28.6% consistently used condoms when engaged in extramarital sexual relationships. The majority of those who used condoms (71.2%) got them from a pharmacy shop, other sources being sexual partners (2 cases) and a health facility (1). The main reasons for not using a condom were unavailability (16 cases, 30.8%), perception of reduced sexual satisfaction (15, 28.8%), religion (8, 15.4%), embarrassment about buying condoms (5, 9.4%), itching (5, 9.4%) and fear that the condom would burst or tear (3, 5.8%). Use of condoms during extramarital sex had been suggested by 82.0% of the drivers and by 18.0% of their partners. Table III shows the relationship between condom use in the last extramarital sexual relationship and socio-demographic characteristics of the drivers. Condom use was significantly higher among drivers with higher levels of education, unmarried drivers and drivers in the younger age group.

DISCUSSION

Condoms are a key preventive strategy as rates of HIV and other sexually transmitted infections continue to increase. When used correctly and consistently male

TABLE III. RELATIONSHIP BETWEEN SOCIO-DEMOGRAPHIC VARIABLES AND USE OF CONDOM IN LAST EXTRA-MARITAL SEX (73 SUBJECTS)

	Used condom	Did not use condom	*p*-value
Age (yrs)			
21 - 30	9 (39.1%)	14 (60.9%)	χ^2=12.82,
31 - 40	20 (60.6%)	13 (39.4%)	df 3,
41 - 50	7 (26.9%)	19 (73.1%)	*p*<0.001
>50	2 (12.5%)	14 (87.5%)	
Marital status			
Single/widowed	15 (60.0%)	10 (40.0%)	χ^2=6.37,
Married	23 (31.5%)	50 (68.5%)	df 1, *p*=0.01
Educational status			
No formal/primary	14 (26.9%)	38 (73.1%)	χ^2=6.57,
Secondary	20 (52.6%)	18 (47.4%)	df 2,
Tertiary	4 (50.0%)	4 (50.0%)	*p*=0.037

condoms can provide as much as 94% reduction in the risk of HIV transmission.[6] Many drivers in this study were aware of HIV/AIDS, the media being their major source of information. This finding is consistent with a previous report on HIV/AIDS knowledge among LDTDs.[7] The majority of the drivers correctly identified unprotected sex as a mode of transmission of HIV/AIDS and the consistent use of condoms as a preventive measure.

Despite this high level of knowledge about HIV/AIDS many of the drivers (84.5%) still engaged in risk-taking behaviour, including extramarital sex. However, only 43.1% had ever used condoms and only 28.6% used condoms consistently during sex with casual partners. Ekanem *et al.*[5] reported that of intra-city bus drivers in Lagos, western Nigeria, 65.6% had ever used condoms and 11.6% consistently used them. In contrast, Podhista *et al.*[8] reported a high level (58.5%) of consistent condom use in a study of LDTDs in Thailand.

The high rate of condom use in societies such as Thailand could be explained by low resistance to their use.[9] Our finding of lower rates of consistent condom use may reflect the fact that in Nigeria there is an aversion to condom use, which is generally believed to be a licence to sexual promiscuity.

Use of condoms in the last episode of extramarital sex was significantly higher among drivers with secondary education or above, those who were single, and the younger age group. Other studies have corroborated this finding.[3,10] It may suggest that health promotion and condom use is beginning to be effective in younger, better educated people. This should be encouraged, and appropriate media promotions of condom use utilised in order to bridge the educational divide.

The reasons given by the drivers for not using condoms included unavailability of condoms, reduced sexual satisfaction, religious beliefs, and embarrassment when buying condoms. This underscores the need for educational campaigns to improve the general acceptability of condoms.[11] Enhanced distribution of condoms at the truck terminals might help improve their accessibility, reduce the embarrassment associated with purchase, and so increase use.

Condom use is still low among LDTDs despite their high levels of HIV-related knowledge and ongoing high-risk sexual behaviour. Enhanced distribution of condoms at truck terminals could improve access to and use of condoms in this group. There is a need for increased and sustained campaigns to educate people about condoms, using appropriate messages in the local language.

We acknowledge the help of C Okoye, S Mgbekwere and E Agbeyeke in distributing the questionnaires used for the survey.

REFERENCES

1. Ibrahim MTO, Opara WEK, Tanimono T. Knowledge of HIV/AIDS, infection prevention practices and accidental skin cuts in barbing saloons in Sokoto, Nigeria. *Nigeria Medical Practitioner* 2007; 51(6): 123-127.
2. Federal Ministry of Health, Abuja, Nigeria. *National Guidelines on Prevention of Mother to Child Transmission of HIV (PMTCT).* Abuja: Federal Ministry of Health, 2007: 1.
3. Sabitu K, Illiyasu Z, Baba SE. Sexual behaviour and predictors of condom use among students of a Nigerian tertiary institution. *Niger J Med* 2007; 16(4): 338-342.
4. Akpala O. *Epidemiologic Research. A Practical Approach for the Medical and Nursing Sciences.* Enugu: University of Nigeria, 1994: 64-65.
5. Ekanem EE, Afolabi BM, Nuga AO, Adebayo SB. Sexual behaviour HIV-related knowledge and condom use by intra-city commercial bus drivers and motor park attendants in Lagos, Nigeria. *Afr J Reprod Health* 2005; 9(1): 78-87.
6. Holmes KK, Levine R, Weaver M. Effectiveness of condoms in preventing sexually transmitted infections. *Bull World Health Organ* 2004; 82(45): 454-461.
7. Onwasigwe CN, Aniebue PN, Ndu AC. Awareness and sexual behaviour of Nigerian long distance drivers. *Journal of College of Medicine* 2001, 6(1): 44-46.
8. Podhista C, Wawer MJ, Pramuairatama A, Kaungsukkasem U, Mcnamara R. Multiple sexual partners and condom use among long distance truck drivers in Thailand. *AIDS Educ Prev* 1996; 8(6): 490-498.
9. Marck J. Long-distance truck driver sexual cultures and attempts to reduce HIV risk behaviours amongst them: a review of the African and Asian literature. In: Caldwell JC, Caldwell P, Anarfi J, *et al.*, eds. *Resistances to Behavioural Change to Reduce HIV/AIDS Infection in Predominantly Heterosexual Epidemics in Third World Countries.* Canberra: Health Transition Centre, National Centre for Epidemiology and Population Health, Australian National University.
10. Sunmola AM. Sexual practices, barriers to condom use and its consistent use among long distance truck drivers in Nigeria. *AIDS Care* 2005; 17(2): 208-221.
11. Chigbu B, Onwere S, Kamanu C, Aluka C, Feyi-Waboso PA. Awareness, acceptability and use of male condoms for contraception and prevention of sexually transmitted infection among female students in a tertiary institution in south eastern Nigeria. *Niger J Clin Pract* 2007; 10(3): 267-268.

ORIGINAL ARTICLE

THE ROLE OF THE MULTIDISCIPLINARY TEAM MEETING IN AN ANTIRETROVIRAL TREATMENT PROGRAMME

C van Deventer, *MD ChB, FCFP (SA), MFamMed (Med)*
Principal Family Physician, Southern District, North West Province, and Senior Lecturer, Rural Health and Family Medicine, University of the Witwatersrand

M Radebe, *MB*
Potchefstroom Hospital, North West

The importance of adherence in the management of patients on combination antiretroviral therapy has been well documented.[1-6] However, for sustainability of the overall programme adequate patient 'tracking' is required in order to understand where the programme may be failing.

Fogarty *et al.*[6] reviewed 18 descriptive studies in published articles and 57 conference proceedings and found over 200 variables regarding patient adherence to antiretroviral therapy (ART), falling into four broad areas:

- factors related to treatment regimen
- social and psychological factors
- institutional resources
- personal attributes.

They found that more complex regimens were associated with decreased adherence. Social and psychological factors reflecting emotional adjustment to HIV/AIDS and provider support were associated with improved adherence, as was access to institutional resources. Personal attributes showed a mixed relationship; gender was not consistently related to adherence, but younger age, minority status, and a history of substance abuse were often associated with non-adherence. An intervention search yielded 16 interventions employing a wide range of behavioural, cognitive and affective strategies. However, evidence of effectiveness of the interventions appeared to be poor.

According to Nischal *et al.*,[7] studies have indicated that at least 95% adherence to ART regimens is optimal. It has been demonstrated that a 10% higher level of adherence results in a 21% reduction in disease progression. The various factors affecting success of ART are social aspects such as motivation to begin therapy, ability to adhere to therapy, lifestyle pattern, financial support, family support, pros and cons of starting therapy, and pharmacological aspects such as tolerability of the regimen and availability of the drugs. Furthermore, the regimen's pill burden, dosing frequency, food requirements, convenience, toxicity and drug interaction profile compared with other regimens need to be considered before starting ART. Lack of trust between clinician and patient, active drug and alcohol use, active mental illness (e.g. depression), lack of patient education, inability of patients to identify their medications, and lack of reliable access to primary medical care or medication may all contribute to inadequate adherence.

Mehta *et al.*[4] found the following factors in an extensive study on adherence: Adherence increases with age, except in the most elderly (those aged over 75 years).[8] It is known that the very elderly often have co-morbidities such as vision, hearing or memory impairment as well as multiple chronic illnesses. In several studies of patients with HIV infection, chronic illness, mental illness, older age and male gender were associated with decreased adherence. Lower socio-economic status (SES) has been shown to be another contributor to decreased adherence.[9] Socio-economic factors specifically related to decreased adherence are unstable or poor housing, low income and low level of education. The presence of psychiatric illness is commonly associated with decreased adherence.[10] Other psychological factors affecting adherence among the mentally ill are hostility, guilt, anxiety, paranoia and grandiosity.[11] In contrast, in a prospective study of HIV-infected individuals, adherent patients (defined as ≥80% adherence) had significantly less depression than non-compliant patients.[12] Negative attitudes about medications or illness may also interfere with patient adherence. Among the mentally ill, reasons cited for not taking medications were fear of addiction and the belief that medication use was a sign of weakness.[13] Among HIV-infected patients, attitudes and beliefs related to decreased adherence included the patient's acceptance/perception of disease, and perceived lack of benefit.[13]

THE POTCHEFSTROOM WELLNESS CLINIC

The ART clinic at Potchefstroom Hospital, known as the Wellness Clinic, was accredited in November 2005 and currently manages >3 000 adults and children. There is a dedicated team with good continuity of nursing, counselling and administration personnel but a high turnover of doctors and allied health workers. Early in the clinic's history it was decided to hold multidisciplinary meetings monthly, in order to understand and deal with difficulties arising from the management of patients on ART. The meetings started in January 2006 and are ongoing.

Patients with perceived problems affecting their optimal management were identified by personnel at the Wellness Clinic during routine consultations, and booked for the bi-weekly multidisciplinary team (MDT) discussion. This team consisted of the physician and family physician involved in the clinic, the unit manager, one nurse, the pharmacist, the social worker and the dietician, one counsellor and a data collector.

THE ROLE OF THE MDT MEETING

An audit of the minutes of the 2006 MDT meetings was done. All the minutes of the 2006 MDT meetings were examined and patients identified together with the decisions made regarding them. The files of these patients were drawn and the following variables were investigated:

- the original and most recent CD4 cell count and viral load (VL)
- reason for being on the MDT's agenda
- if there was an adherence issue, the reason for the poor adherence
- whether support was available or not
- interventions decided upon
- the outcomes, where possible, of any interventions.

RESULTS

According to the minutes, 76 people were discussed. All were adults, 39% were female, and their mean age was 38 years.

Of the files 13 could not be found for the audit, but reasons for inclusion in the MDT meetings included the following: 6 patients (8%) had virological failure with no apparent cause, as they had good pill counts at each visit and were physically well. There was documented poor adherence in 5 patients (7%), reflected in ongoing poor pill counts. Forty-eight patients (63%) had defaulted treatment for varying lengths of time. In 2 patients (3%) the reasons for inclusion were not clear from the minutes or the files. Eight (11%) were included because of alcohol abuse concerns and 7 (9%) for a variety of other reasons.

Since the group of defaulters was the largest group, it was investigated in more detail. Some of the patients had more than one reason for defaulting, while 13 patients had no real documented reason. Work was cited as being a problem by 7 patients, especially with contract workers being moved to different areas to work. Six patients said that they had had financial problems. However, most of these were already on disability grants. Alcohol played a role in 4 patients and a variety of other reasons were given by the remaining 25. These included parasuicide, mental retardation, hospital admission, felt sick from pills/not feeling better, incarceration, lost in down-referral process, transfer out, recent birth, painful legs, ashamed to come, domestic upheavals and disputes, traditional medication, amputated leg, staff confidentiality issues, cryptococcal meningitis, and tuberculosis treatment (streptomycin).

In each case, a course of action was discussed and decided upon by the multidisciplinary team.

INTERVENTIONS

The following were the most common interventions decided upon by the MDT:

- 3 months' adherence counselling and prophylaxis and re-initiate if appropriate
- buddy system, e.g. someone to accompany the patient to the clinic visits
- social worker intervention
- individual interviews
- home visits
- link appropriate patients to Alcoholics Anonymous.

OUTCOMES

The results of these interventions were then analysed from the available files.

Thirteen files could not be found. Four patients were confirmed as lost to follow-up. Viral loads had decreased in 23 patients after the interventions discussed above, while 17 patients' viral loads had remained in the same range or increased. Viral loads had not been properly done or recorded in 4 patients. Five patients had died, and 10 had other outcomes, e.g. ART stopped.

DISCUSSION

Following the MDT discussion and intervention, 23 of the available 63 files (36%) of patients who had been referred to the meeting because of staff and performance concerns indicated that they were doing well at the time of the audit, with virological and clinical stability. This audit revealed that non-adherence or difficulty coping with the ART programme was often caused by

social and psychological problems. This tends to be a difficult area for health workers to intervene in, and the programmes have to rely on social welfare as well as community-based groups as active partners.

Alcohol appears to have a small but significant influence, as was found in larger studies on adherence.[4,6,9] More males than females in the MDT group were encountering problems as a result of their alcohol histories, but women were also affected.

Work-related absenteeism often applied to contract workers, especially where artisans were moved for certain periods to other provinces or countries. It remains a crucial part of general and individual counselling that work be taken into consideration and that medication amounts be negotiated, or referral letters written for patients who plan to be away for a period of time.

Deaths are not always reported to the hospital, and a number of the patients recorded as lost to follow-up may in fact have died.

Other ways to minimise loss to follow-up include optimised 'tracking' systems including 'defaulter tracing', down-referrals to satellite clinics closer to home, and involvement of other community-based organisations in tracing patients and doing home visits.

The multidisciplinary team meeting at the Potchefstroom Wellness Clinic did play a role in identifying and solving problems relating to patients on ART. Since the team represents a core of interested people, there is the potential to expand its role to discuss new policies, novel interventions and issues in the clinic and the programme as they arise.

The challenge with providing an optimal service for patients is that each person has their own story and many need individualised attention. Without this understanding, and good relationships between personnel and patients, the battle for optimal care within the ART programmes cannot be won.

A few patient stories

A young woman who had started ART had had a boyfriend for 10 years. He suddenly left her for another woman. She had repeated counselling but became profoundly depressed, which influenced her adherence.

An older married couple were both patients at the Wellness Clinic and on ART, but the husband was apparently being abused by his wife and eventually died in hospital from an HIV-related infection. The wife never came back in spite of intensive counselling and support from the clinic personnel.

Two mothers insisted on their daughters taking traditional medicines and stopping HAART. Both young women eventually returned to the clinic in spite of this pressure.

A very problematic patient, who is still receiving HAART, returns to the clinic with repeated STIs. She has been caught lying about her pills and pill counts, comes and goes as she wishes, and is constantly abusive towards clinic staff.

REFERENCES

1. Sherr L. Understanding adherence. *J HIV Ther* 2000; 5: 30-35.
2. Crespo-Fierro M. Compliance/adherence and care management in HIV disease. *J Assoc Nurses AIDS Care* 1997; 8: 43-54.
3. Chesney MA, Morin M, Sherr L. Adherence to HIV combination therapy. *Soc Sci Med* 2000; 50(11): 1599-1605.
4. Mehta S, Moore RD, Graham NMH. Potential factors affecting adherence with HIV therapy. *AIDS* 1997; 11(14): 1665-1670.
5. Day M. Patient adherence to HAART regimens: Challenges for physician assistants and health care providers. *The Internet Journal of Academic Physician Assistants* 2003; 3(1). http://www.ispub.com/journal/the_internet_journal_of_academic_physician_assistants/volume_3_number_1_7/article/patient_adherence_to_haart_regimens_challenges_for_physician_assistants_and_health_care_providers.html (accessed 18 June 2009).
6. Fogarty L, Roter D, Larson S, Burke J, Gillespie J, Levy R. Patient adherence to HIV medication regimens: a review of published and abstract reports. *Patient Educ Couns* 2002; 46(2): 91-92.
7. Nischal KC, Khopkar U, Saple DG. Improving adherence to antiretroviral therapy. *Indian J Dermatol Venereol Leprol* 2005; 71: 316-320.
8. Fedder DO. Drug use in the elderly: issues of noncompliance. *Drug Intell Clin Pharmacol* 1984, 18: 158-162.
9. Kissinger P, Cohen D, Brandon W, Rice J, Morse A, Clark R. Compliance with public sector HIV medical care. *J Natl Med Assoc* 1995; 87: 19-24.
10. Young J, Howard Z, Shepler L. Medication noncompliance in schizophrenia: codification and update. *Bull Am Acad Psychiatry Law* 1986; 14: 105-122.
11. Pugh R. An association between hostility and poor adherence to treatment in patients suffering from depression. *Br J Med Psychol* 1983; 56: 205-208.
12. Singh N, Squier C, Hayes P. Determinants of compliance in patients with HIV: prospective assessment with implications for enhancing compliance. Paper presented at the 34th Interscience Conference on Antimicrobial Agents and Chemotherapy, Orlando, Fla, 4 - 7 October 1994.
13. Youssef F. Adherence to therapy in psychiatric patients: an empirical investigation. *Int J Nurs Stud* 1984; 21: 51-57.

CONFERENCE REPORT

SA AIDS 2009 MSM SATELLITE CONFERENCE, RESEARCH AND ADVOCACY: SHARING THE STRENGTH, BRIDGING THE GAP

30 - 31 March 2009, Durban

E Burrell, *MPH*
Desmond Tutu HIV Foundation, Cape Town

Over 35 participants from four African nations, the USA, the UK and the European Union – 21 of whom gave oral presentations – were brought together for this satellite conference, the first such to accompany the South African AIDS Conference. This executive summary reviews the conference proceedings in each of the following categories: New MSM Research and Challenges, Current LGBT Programmes Overview and Needs Assessment, and Developing Advocacy and Funding Strategies.

Current research outputs underscored what we know to be a very difficult situation. Among men who have sex with men (MSM) in South Africa, Kenya and Malawi there are documented high-risk sexual behaviours; limited access to water-based lubricants; low knowledge of HIV; fatalistic views of HIV, sickness, and death; barriers to accessing care, HIV testing, antiretrovirals (ARVs) and support; vulnerability to homoprejudice and sexual violence; a lack of general security; and the most vulnerable being least connected to resourced gay communities.[1-5] Research challenges included developing standardised protocol definitions to produce comparable data outputs across sites, obtaining and verifying more representative samples, recruitment of high-risk MSM to research studies and delivery services, identifying and accessing bisexual men, and mapping the crossover of disparate hetero- and homosexual HIV epidemics.[6-11]

Lesbian, gay, bisexual, and transgender (LGBT) advocates, service providers and support organizations outlined plans to mainstream LGBT-sensitive and specific health care into general health systems, with sex-positive and holistic care packages.[12-14] There was a call to better understand MSM populations; create an LGBT sexual health training manual for clinicians; recognise the role of religion in sexual-identity formation; and address the almost complete lack of current bi- and trans-specific research and programming.[12-19] Underscored was the need for more and better resourced LGBT safe-spaces, and action against sexual violence targeting LGBT folk.[12,13,16] Outside of South Africa, the paramount issue was an urgent need to de-criminalise homosexuality.[1,4,11,15,19]

Advocacy tools and funding strategies require the anticipation of research outcomes and the preparation of targeted advocacy packages for specific audiences, such as government and religious leaders.[20,21] Data outputs should be used more effectively to leverage secure funds for continued and better research.[22,23] Advocacy 'champions' within the LGBT community need to be identified and groomed to liaise with donors in meeting funding goals.[20,24] Especially in this time of global financial downturn, the focus must be on value for money, prioritising quality research projects and evidence-based interventions, while adopting flexible programme development and step-wise approaches to roll-out.[20,22-24]

Throughout the satellite, researchers and advocates alike expressed a need for more open dialogue in order to develop a single framework with which to approach shared goals. There is a need to work collectively towards security for African LGBT people, engaging all levels of government in discourse around negative-rights legislation, while also holding them accountable. More streamlined approaches to research and service delivery must be developed, delegating responsibilities to those best suited to the task. And lastly, programme expansion must be informed by sound scientific research and guided by rigorous monitoring and evaluation, an ideal opportunity for LGBT research-advocate partnership.

REFERENCES

1. Dhaliwal M. MSM in Southern Africa ... intersections of policy, human rights, and public health. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
2. Rispel L. The Johannesburg/eThekwini Men's Study (JEMS): Lessons learnt and future pointers. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
3. Dladla S. RDS prevalence study in Soweto, South Africa. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
4. Sanders E. High-incidence cohort in Kilifi, Kenya. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
5. Burrell E. New HIV prevention research: The Cape Town PrEP Studies. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
6. Nel J. Levels of empowerment and emerging LGBT communities in South Africa. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
7. Reddy V. Is AIDS a death sentence? Preliminary outcomes of a survey among Tshwane's MSM. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.

8. Struthers H. Diversity, definitions, and directions. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
9. Burrell E. Recruiting high-risk MSM for a HIV prevention clinical trial in Cape Town, South Africa. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
10. Metcalf C. 'Eish, but the whites are scarce!': JEMS research challenges. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
11. Muhaari A. Experiences of working with MSM in Mombassa. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
12. Nel D. Service delivery to vulnerable groups. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
13. Valentine M. Multidimensional approach to MSM sex and its impact on risk behaviour. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
14. Rebe K. Health4Men: A clinical service for MSM in Cape Town. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
15. Trapence G. An overview of MSM programs in Malawi. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
16. Mkhize N. Drop-in LGBT centre in Durban. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
17. Hendricks P. HIV and Muslim MSM. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
18. Bowley C. An assessment of male to female transgender person's needs who are MSM in South Africa. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
19. Chibwezo W. Sexual reproductive health and MSM in Malawi. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
20. Avertt S. Integrating research outcomes into advocacy (agitating for a better world). SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
21. Swartz I. Research as advocacy tool: making the evidence work for us. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
22. Mah T. Resources for HIV prevention for MSM. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
23. Seale A. Resources, tools, and strategic considerations for funding strategies for MSM and LGBTI programmes and services. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.
24. Avertt S. Negotiate safely with your funders: Three observations. SA AIDS 2009 MSM Satellite Conference, 30 - 31 March 2009, Durban.

CONFERENCE REPORT

THE 3I's SATELLITE SYMPOSIUM: REDUCING THE RISK OF TUBERCULOSIS IN HIV-INFECTED INDIVIDUALS

4th Southern African AIDS Conference, 31 March 2009, Durban

Gavin J Churchyard, *MB BCh, PhD*
Aurum Institute for Health Research, Johannesburg
Lois J Eldred, *DrPH*
Johns Hopkins University School of Medicine, Baltimore, Md, USA

'I have twelve minutes to give this talk, but I can make my point in twelve seconds: There's a lot of TB in our HIV services and we need to do something about it!' said Dr Steve Lawn of the Desmond Tutu HIV Centre at the University of Cape Town at the start of the '3I's Satellite Symposium' held on 31 March 2009, just before the 4th South African AIDS Conference (SAAC).

HIV-infected individuals, especially those requiring antiretroviral therapy (ART), are at a greatly increased risk of developing active tuberculosis - and one consequence of this has been the resurgent TB epidemic in sub-Saharan Africa and other settings with a high burden of HIV.

People working in HIV/ART services can reduce the risk of TB in people with HIV by performing three activities that the World Health Organization (WHO) has promoted as the '3I's' strategy: *infection control* (measures to reduce the spread of TB, especially in health facilities); *intensified case finding* to proactively identify TB in people with HIV; and *isoniazid preventive therapy* to prevent active TB.

South Africa and other countries have endorsed the 3I's strategy as policy, but implementation has been slow and somewhat limited. For this purpose, the 3I's symposium, sponsored by the Aurum Institute, Thibela, and the Consortium to Respond Effectively to the AIDS TB Epidemic (CREATE), was held to increase awareness of these measures to reduce HIV-associated TB and to encourage the implementation of existing guidelines.

'Just do it should be the mantra of this symposium,' Professor Gavin Churchyard of the Aurum Institute told the standing-room-only audience. But to show just *how* to do it, more than a dozen experts at the meeting spoke about the gaps between policy and present practice, identified the barriers to implementation and offered possible solutions. Several recently completed or ongoing research studies were described that could help guide future policy and implementation. Speakers shared their hands-on experience about on how to put the 3I's into practice.

OVERVIEW OF TB/HIV IN SOUTH AFRICA IN THE HIV AND TB CLINICS

There has been a threefold jump in mortality in South Africa over the past several years, and although there is often an underlying disease, such as HIV, 'TB has been the most commonly reported cause of death on the death certificate', according to Professor Anton Stoltz of the Foundation for Professional Development, 'and it is killing people in the prime of their lives.'

Globally South Africa ranks fifth in the absolute number of people with new smear-positive TB, but the countries with heavier burdens (such as China, India and Indonesia) are far more populous. Swaziland and South Africa have the highest incidence rates per capita in the world (with close to 1 000 cases per 100 000 people), according to 2006 data from the WHO.

At the same time, the type of TB being diagnosed in South Africa has changed over the past decade with a dramatic increase in smear-negative TB, extrapulmonary TB, retreatment TB and now increasingly drug-resistant TB.

Professor Stoltz listed multiple factors that could contribute to the TB epidemic, starting with overpopulation, climate change and malnutrition, as well as conflict and turmoil leading to displacement and migration. Lack of strong political will to provide adequate support of the health system has resulted in low cure rates, high default rates and inadequate follow-up of patients, ultimately spawning an epidemic of drug-resistant TB. Poor infection control practice in health facilities has led to the spread of TB (drug-susceptible and drug-resistant) to other patients and to health care workers. Economic hardship and poor living conditions lead to spread of TB in communities as well.

'Poor people living in shacks with little air circulation are at high risk of infecting each other,' said Professor Stoltz. 'But by far the biggest driver of TB is HIV.'

Nowhere is this more evident than in the Western Cape of South Africa, where Dr Lawn said that 'three oceans have come together, the Atlantic Ocean on the West and Indian Ocean on the East; and in between the two there is a vast ocean of TB and HIV'. In fact, in one of the peri-urban communities where Dr Lawn works, TB notifications exceed 2 000 per 100 000 - rates unprecedented in the era of modern multidrug chemotherapy - despite a model local TB programme. Everyone living in this resource-strapped community is at substantial risk of TB, but the risk is greatest in people with HIV, even when they are on ART.

'The burden of TB among people with HIV before, during and *after* ART initiation is huge,' according to Dr Lawn. In one analysis of the cumulative burden of TB in people arriving into an ART clinic in Gugulethu, 'more than half have had one or more episodes of TB before they even set foot in the door. Another quarter of the patients either have active TB on treatment or previously undiagnosed TB. So, at baseline, two thirds of the people either have had or have TB currently,' said Dr Lawn. Most of the previous TB cases occurred within the 2 - 3 years before initiating ART.

In another study of 235 patients enrolling into the ART programme, Dr Lawn and colleagues actively screened for TB using culture instead of induced sputum. They found that 25% (*N*=58) had culture-positive TB and the risk was even greater (at 38%) in those with CD4 counts below 100.[1] But in the absence of culture it would have been difficult to identify everyone with TB - 22% of those with culture-positive TB had no TB symptoms (cough, fever, night sweats or weight loss), 30% had no sign of TB on chest radiograph, and fluorescent smear microscopy was positive in only 14%. Culture, while sensitive, took over 3 weeks to produce a diagnosis, and drug sensitivity testing (via Lowenstein-Jensen medium) took 3 months.

Once on ART, the risk of TB is extremely high during the first 3 months, probably due to unmasking of TB missed by baseline screening.[2] During the first year on ART in the Gugulethu study, about 11% developed incident TB after which the risk plateaued at around 4 - 5% per year. Even after 3 years on ART, the TB incidence remained four or five times higher than the background rate in the HIV-negative p opulation.

The key determinant of TB risk is a person's CD4 cell count, and those with poor immune recovery on ART are at even higher risk. In the Gugulethu cohort, for every rise of 100 cells/µl, there was a 25% reduction in risk of TB. Even with optimal CD4 cell count recovery (over 500 cells/µl), the incidence of TB remains about twice the background rate in the HIV-negative population.

Conversely, many people are only diagnosed with HIV after they have been placed on treatment for active TB. Globally, about 1.4 million TB cases are co-infected with HIV - leading to about 0.5 million deaths each year - while in South Africa there are about 350 000 co-infected cases of TB (for an HIV infection rate of about 70% among TB patients).

Since there are drug interactions and overlapping toxicities between ART and TB treatment, 'one of the most critical questions in this population has been when the optimal time is to initiate antiretrovirals in people on TB treatment', said Dr Kogie Naidoo of the Centre for the AIDS Programme of Research in South Africa (CAPRISA). To answer this question, Dr Naidoo and colleagues conducted a randomised trial of 642 patients with HIV and CD4 cell counts below 500 cells/µl who were on standard TB treatment. Patients began ART in one of three time periods:

- During the first 2 months of intensive TB treatment (early integrated treatment)
- After the 2-month intensive phase of TB treatment was completed (later integrated treatment), or
- After the entire 6 - 8-month course of TB treatment is completed (sequential treatment).

An interim Safety Monitoring Committee review of the data found that patients in the two integrated treatment arms had a 56% lower death rate than those in the sequential treatment arm. The sequential treatment arm was subsequently terminated, though the two integrated treatment arms of the study are ongoing.

Of note, 'TB outcomes were similar in both arms - mortality in the sequential treatment arm occurred late in TB treatment and after TB treatment was completed, hence the TB programme may not be aware of the higher mortality,' said Dr Naidoo. The programmatic implications include offering every TB patient HIV testing and counselling, and those with TB-HIV (and CD4 <500) should be started on ART while they are still taking TB treatment. Dr Francois Venter of Johannesburg Hospital said this would probably mean that TB nurses should be initiating patients on ART. If South Africa were to do this widely, Dr Naidoo estimated that 150 000 more TB patients would be placed on ART and about 10 000 deaths prevented annually.

But even though concurrent ART improves TB outcomes, the management of active TB is still quite complicated in people with HIV. TB remains the leading key cause of death in ART services - probably more than we know, since much TB goes undiagnosed.[3] Despite ART, people with prevalent or incident TB and HIV are two

or three times more likely to die than their HIV-negative counterparts. In addition, people with HIV and TB contribute to onward transmission in the community and the clinic. Although many cases of TB in people with HIV are sputum smear-negative, Dr Lawn noted that 'smear-negative does not mean non-infective ... Smear-negative TB cases may be contributing substantially to TB transmission within the clinic, [especially] because patients with HIV are exquisitely susceptible to infection.'

'We need adjunctive strategies to prevent TB - upstream of ART services,' he said. That is, strategies such as the 3I's - the first and perhaps most fundamental of which is infection control.

TB INFECTION CONTROL (IC)

'TB infection control is the strongest preventive tool we have; it is crucial that we get this basic step right in the first place,' said Lesley Odendal, an IC co-ordinator for Médecins Sans Frontières (MSF) in Khayelitsha, and one of three speakers on the subject at the symposium.

IC measures are essential to prevent the spread of *Mycobacterium tuberculosis* to vulnerable patients, health care workers, the community and those living in congregate settings. The concept of IC has been around ever since Florence Nightingale wrote that hospitals 'should do the sick no harm'. For years, TB IC measures were standard policy in health care settings until they fell out of practice with the advent of TB chemotherapy. Since the outbreak of extensively drug-resistant TB (XDR-TB) - where there were clear indications of transmission at the Church of Scotland Hospital in Tugela Ferry in KwaZulu-Natal - TB IC has once again become a public health priority.[4]

'High rates of TB infection and disease in health care workers have been demonstrated in a number of studies, implicating nosocomial transmission,' said Dr Lilanganee Telisinghe of the Aurum Institute. These include a recent literature review by Menzies *et al.* that 'found that latent TB infection was consistently associated with ... occupational exposure,' she said.[5] Those who worked longer in some areas had consistently higher rates of TB than that of the general population, plainly making TB IC an occupational safety issue - 'and a human rights issue,' Ms Odendal pointed out.

There is an established hierarchy of controls to reduce the risk of TB transmission, beginning with *administrative and workplace measures* to reduce the generation of infectious TB particles in the facility and prevent the spread of the disease by quickly identifying, separating and investigating suspects and treating the TB cases; *environmental control measures* to reduce the concentration of infectious TB particles in a facility by ventilation or air cleaning; and *personal respiratory protection* to decrease or prevent inhalation of infectious TB particles by staff and clients.

Administrative and workplace control measures include a written infection prevention and control plan for each facility. Procedures in the plan need administrative support, including quality assurance, as well as training and supervision of staff. Patients and the community need to be made aware of how TB is transmitted (and taught cough etiquette). Finally, every facility needs to communicate and work closely with the TB programme to co-ordinate these efforts.

Although Menzies *et al.* reported that administrative controls may be less effective in lower middle-income countries than in high-income settings (where training and resources may improve implementation), Dr Sidney Parsons, an engineer specialising in IC at the Council for Scientific and Industrial Research (CSIR), said that administrative measures remain the very foundation of IC.

'Fundamentally, everything starts and ends with the infection control plan,' he said, noting that generic IC plans or templates alone are inadequate. 'We've got to develop a specific plan for every facility because every facility is unique, and we need to make certain that the plan is in writing, easy to understand, and accessible. The plan must be practical, affordable, comprehensive and creative but in line with the accepted hierarchy of controls.'

Speakers alluded to a document released by the WHO last year to help countries and programmes prioritise TB IC interventions: 'Essential actions for effective TB infection control: Safety without stigma' (http://www.stoptb.org/wg/tb_hiv/assets/documents/10%20Essential%20Actions%20for%20Effective%20TB%20Infection%20Control.pdf). These steps highlight community engagement, developing a facility IC plan, safe sputum collection, promoting cough etiquette, triaging TB suspects, rapid diagnosis and treatment, improved room ventilation, protecting health care workers, capacity building and monitoring IC practices.

'With the exception of improving room ventilation, these are all administrative policy measures,' Dr Parsons reiterated.

Environmental TB IC measures may include engineering solutions, such as mechanical ventilation or air filtration systems, which are expensive to install and costly to maintain. Dr Telisinghe described experiments by Dr Rod Escombe and colleagues showing that low-cost measures, such as natural ventilation and ultraviolet germicidal irradiation (UGI), could help reduce the risk of TB infection in facilities in resource-limited settings. A Peruvian study found that simply opening the win-

dows could work better than mechanical ventilation.[6] More recently, using guinea pig studies and mathematical models, Escombe *et al.* concluded that the use of UV lights could significantly reduce TB infection and disease - provided there is adequate mixing of room air (to enhance air movement, and hence the transportation of droplet nuclei, through the upper-room UV disinfecting zone).[7]

Once environmental and administrative controls are in place, personal respiratory protection - wearing an N95 or FFP2 respirator mask to prevent inhalation of infectious TB particles - may offer additional benefit.

'The evidence for using N95 masks comes from mathematical modelling, laboratory testing ... and expert opinion,' said Dr Telisinghe. There is little epidemiological evidence demonstrating effectiveness in the field. Still, the case is strong enough for health care workers to wear them in high-risk settings.

However, masks are often not available or used in health facilities, Ms Odendal noted. 'You need all three components - and all require education for patients and training for health care workers.' She added that TB treatment, isoniazid preventive therapy and ART are all part of TB IC.

A mathematical model for XDR-TB transmission in rural South Africa published in *The Lancet* estimated that the combination of IC measures with TB treatment could avert 48% of facility-based XDR-TB cases (range 34 - 50%) by the end of 2012.[8] The combined measures included early discharge of patients from hospitals, enforced respirator and mask use, improved natural ventilation, isolation of patients into 5-bed units, rapid drug sensitivity testing (and appropriate treatment), hospital-based HIV testing and counselling, and ART use. Of note, although respirators would only prevent 2% of the total cases, consistent use would prevent about two-thirds of the cases among health care workers.

MSF and the Western Cape Department of Health are working on improving TB IC at all nine of the clinics providing TB services in Khayelitsha. Dr Telisinghe described site assessments of the risk of TB infection in different clinic areas that found that while some TB IC was in place, there was room for improvement. Ms Odendal described the steps subsequently taken, including the establishment of IC committees at each facility, training and provision of information materials, implementing triage and intensified case-finding, and the provision of respirator masks for staff, and paper masks for cough hygiene to all clients in waiting areas. They have improved natural ventilation by installing wind-driven air extractors (whirly-birds) on existing buildings, and established outdoor waiting rooms that have roofs but are otherwise open - though they have heaters and blankets to make patients more comfortable. Finally, sputum collection booths have been moved outside.

Unfortunately, many designs for new health facilities lack natural ventilation and rely on forced ventilation systems, according to Dr Parsons. 'Is this the way to go in resource-limited settings with unreliable electricity?' he asked. 'On the other hand, are we going to try to use "simple" solutions that we know won't work? We need to design appropriately.' He cautioned the audience against assuming that 'simple' measures are always adequate.

'I was in Peru with Rod Escombe for some of his tests', he said, 'and the rooms he investigated had five metre high ceilings and [high] windows-to-floor ratios ... do you find that in all the facilities in our hospitals? No you don't. It's not that I don't agree with the open window policy, in fact, I really support opening windows, but I think we need to put it in the appropriate context.'

'We need to act in a multidisciplinary group to resolve these issues,' he said, adding that engineers and architects need to be engaged, and often have better access to the national legal and regulatory framework that should guide TB IC in facilities. For example, the National Infection Prevention and Control Policy and Strategy (April 2007) makes reference to a long list of regulations in South Africa, including the Occupational Health and Safety Act 85 of 1993, which mandates that hazards in the workplace be analysed and responded to appropriately, with the regulations regarding hazardous biological agents addressed in notice R1390.

'Anybody who runs or manages a health facility and does not adhere to the regulations embedded in the Occupational Safety Health Act is actually culpable,' he said. Dr Parsons also referred to new proposed building codes of which many health care workers may not be aware (see Appendix 1). These codes need to be enforced at every type of health facility, he stressed, 'not just at the multidrug resistant TB facilities', because people with TB could be encountered anywhere within the health system. But the provincial departments of health have to be held accountable to upgrade health facilities.

'Four hundred million rand has been made available per year for 3 - 4 years to the provinces to address infection control in facilities. We can only account for something like 110 million,' he said, and urged the audience to find out what was going on in their province.

TB IC also needs to be addressed within the home and community, according to Ms Odendal.

'The hype around drug-resistant TB is actually driving the TB epidemic underground because people don't

want to go for diagnosis if there is a chance they have drug-resistant TB and will be isolated,' she said. Community-based treatment of drug-resistant TB would offer one solution, 'but the lack of guidance regarding TB IC in homes and communities has been a big barrier.'

MSF is pioneering community-based drug-resistant TB treatment in Khayelitsha. To reduce the risk of transmission in the home between starting treatment and sputum culture conversion, the following measures have been adopted in households. First, there is an initial assessment of crowding and ventilation in the home, and the vulnerability of household members. Then a risk reduction plan is developed, involving education about TB transmission and cough hygiene, and separate sleeping arrangements when necessary. Patients and other household members are given at least two IC education sessions and follow-up, and patients are given paper masks to be worn in overcrowded and closed conditions.

Most households have been able to minimise contact between the patient and vulnerable household members, by arranging separate sleeping for patients and improving natural ventilation, according to Ms Odendal. 'Once they have been provided with information and support, people are more than willing to make necessary changes and able to reduce the risk of TB transmission. If a safe environment could not be brought about, patients are hospitalised until culture conversion,' she said.

In the meantime, they are trying to address TB IC in the community through treatment literacy campaigns to encourage community acceptance and support for ambulatory treatment. They are also engaging taxi associations and drivers in the taxi ranks with the goal of increasing ventilation on public transport, and promotion of cough hygiene. They hope to expand these efforts to other overcrowded settings such as prisons, mines, schools and detention centres.

INTENSIFIED CASE-FINDING (ICF)

Another measure that could help with TB IC efforts in the community is ICF - since more aggressive and earlier case detection could reduce the period of time during which people are unwittingly spreading TB in the community. Dr Celine Gounder of Johns Hopkins University described study after study demonstrating that case detection rates are too low in many settings where TB is common.

For example, Professor Robin Wood and colleagues in the Western Cape found that the prevalence of pulmonary TB among people with HIV was 7.6% - but passive case-finding (waiting for people to come in to have their illness investigated) only resulted in a third of the smear-positive TB diagnoses.[9] Dr Liz Corbett reported that ICF detected a prevalence of 3.8% of previously undiagnosed pulmonary TB among HIV-positive goldminers.[10] Other ICF studies have found high rates among HIV-positive pregnant women, and contacts of other smear-positive cases. Studies where people attending ART clinics are routinely screened for TB have found even higher rates of case detection.

ICF in communities in Zambia and South Africa also detects large numbers of previously undiagnosed TB cases, according to Musonda Simwinga, manager of the Zambian AIDS-related TB (ZAMSTAR) study. The trial involves randomly allocating 24 whole communities across Zambia and South Africa to receive one of two public health interventions: community-enhanced case-finding (increasing access to diagnostic services within the community), or targeting households of TB patients and counselling the whole household to make better use of diagnostic services within the existing health system.

According to Simwinga, prevalence studies for the trial demonstrated a huge burden of tuberculosis, with a culture-positive prevalence of 960/100 000 in two Zambian sites and 2 200/100 000 in two South African sites (14 894 adults).

'Many adults with a chronic cough have never sought care in their local health centre, and even when they have, they have often not been offered available diagnostic tests,' he said. Or they may present quite late for diagnosis and care.

'Patients who are identified through passive case-finding are picked up much later in the course of their disease,' Dr Gounder said, 'and as a result, their illness is often more severe.' For instance, a study in the Western Cape found higher frequencies of major symptoms such as weight loss among cases detected through passive case-finding.[11] Late recognition also leads to poorer outcomes: Professor Churchyard found a higher case fatality rate after initiating treatment among goldminers whose TB was detected by passive case-finding rather than ICF.[12]

'Intensified case finding should also have an impact on disease duration and thereby transmission of disease,' said Dr Gounder, noting that in another study by Professor Wood '87% of the total person years of untreated sputum smear-positive TB is among people with HIV - so people with HIV are a very significant source of disease transmission within the community.'

The WHO recommends that people living with HIV, their household contacts, groups at high risk for HIV and those in congregate settings should be regularly

screened for TB whenever they come into contact with the health services. But even though 109 countries have adopted ICF as part of their national TB/HIV policy, implementation has been limited.

'Are our HIV care services, our ART services, our VCT service points aware of intensified case finding or that they should implement it? Probably not; if they are, they are not convinced that it is their responsibility. They say it is for somebody working within the TB clinic,' said Dr Kgomotso Vilakazi-Nhlapo of the National Department of Health, who added that 'the communities aren't demanding it yet. And there is also a lack of training on screening for TB in HIV-positives.'

But one of the key barriers is the lack of agreed-upon tools that can be used by trained counsellors and health care workers to screen for TB in people with HIV.

'The difficulties screening for TB in HIV-infected patients are well known', said Dr Salome Charalambous of the Aurum Institute, 'and include the lack of typical symptoms, an increase in smear-negative TB, atypical chest X-ray changes, a large incidence of extrapulmonary disseminated TB and also the presence of other pulmonary disease [such as *Pneumocystis jirovecii* pneumonia]. So for symptom screening, we don't really know which symptoms are the best to use. Sputum microcopy is rapid and cheap, but patients are smear-negative ... and we must be careful not to overstretch our laboratories. With chest X-rays, there are issues with access and interpretation.'

Dr Charalambous described several studies exploring optimal screening methods. She noted conflicting data on usefulness of chest X-rays. In Botswana's IPT programme, a pilot study suggested that X-rays didn't add much to screening, but more recent experience has suggested that X-rays do indeed detect some cases of TB in asymptomatic patients. In one study in South African goldminers, adding a chest X-ray to a symptom screening tool (night sweats, cough and weight loss) improved sensitivity from around 60% to 90%.[13]

In another study, 381 patients at Tshepong Wellness Clinic in North West Province were screened for active TB before starting ART. TB was diagnosed in 31.6%.

'Using a symptom screen alone would miss one quarter of the TB cases, while chest radiography improved sensitivity substantially,' said Dr Charalambous. 'One thing I'd like to emphasise, is that [in this study] 62.5% of patients had TB symptoms, so even if we are just screening with symptoms, we would still have to further screen these patients with sputum microscopy and culture, which would lead to overstretching our laboratory facilities. That's a problem that we're going to have to deal with.'

South Africa's National Guidelines state that TB screening should take place before initiating ART and that TB should be suspected if any two symptoms are observed (including weight loss of 1.5 kg or more, cough >2 weeks, night sweats over 2 weeks or fever >2 weeks). The diagnosis should then be confirmed by smear microscopy or culture. Before initiating IPT, sputum should be sent for microscopy and culture if there are one or more symptoms.

In practice this does not seem to happen, according to an analysis Dr Charalambous conducted in Aurum's clinics. Even when clinic visit forms (with a checklist of symptoms) have been filled out and show that patients had two or more symptoms of TB, sputum was very rarely sent in for microscopy or culture.

'Only about 1.8% was screened correctly according to South African national guidelines,' she said. As a result, they are recommending changes to the screening form. 'Clinical data systems we use should facilitate care by prompting care providers to screen for TB.'

A range of screening tools are needed at the different points where people with HIV enter into care, according to Dr Vilakazi.

'One size does not fit all - different settings have particular needs. You can't have the same tools for prevention of mother-to-child transmission (PMTCT) as you have for prisons, community screening, household contacts,' she said. But if ICF is to be rolled out at VCT clinics, effective referral mechanisms need to be established to make certain that someone who is screened by a counsellor as a TB suspect makes it to a TB clinic for diagnosis.

'Referral systems between HIV [services] and TB diagnostic and treatment centres are mostly only verbal. Patients are referred, but not properly "encouraged" to reach services. How do we follow up? How do we ensure the patient has been screened?' She noted that patients often don't follow through on the referral because they are too sick or busy. 'So we need to promote the use of HIV resources to strengthen TB diagnostics capacity at all levels. We need to address long laboratory turn-around times and promote TB diagnostic capacity in all of our ART clinics.'

'We need to develop practical guidelines at national level to operationalise ICF,' she said. 'National Policy should emphasise ICF as the gatekeeper for IPT and IC. To implement IC, you need to know how to exclude TB so that you can triage the patients. And you cannot say a person should start IPT without first excluding TB.'

ISONIAZID PREVENTIVE THERAPY (IPT)

Access to isoniazid to prevent TB is even more limited, even though a Cochrane meta-analysis of seven major studies conclusively showed that its use would reduce active TB by about one-third in people with HIV.[14]

'In the global TB report that came out last year from the WHO, it was reported that only 29 000 people were started on IPT globally. That's less than 0.1% of the estimated 33 million people estimated to be infected with HIV globally compared with 3 million people on ART globally and 2.1 million on ART in sub-Saharan Africa,' said Professor Harry Hausler of the TB/HIV Care Association. 'If you think about ART versus IPT, 10 - 20% of people who are HIV positive are eligible for antiretroviral therapy, but close to 40% of people who are HIV positive are eligible for IPT. So we should be looking at *6 million* people on IPT globally rather than 29 000.'

In South Africa, only 6 818 out of the 455 150 people who tested positive last year (1.5%) were put on IPT.

The current Department of Health IPT guidelines may partly be to blame for the low uptake, as people on ART are not eligible while a positive tuberculin skin test (TST) is required to qualify for IPT.

'TST is in fact an obstacle to IPT,' said another speaker, Dr Kerrigan McCarthy of the Reproductive Health and HIV Research Unit (RHRU). 'Firstly there's the hassle of the supply chain management of TST (for tuberculin syringes, PPD RT23/cold chain management).' An appreciable percentage of clients don't return to have their TST interpreted. In addition, Dr McCarthy said that Johannesburg clinics reported wide variations in the promotion of TSTs interpreted as positive, indicating lack of consistency in performing and interpreting the test. 'Quality control of TST is impossible; if the quality of a test cannot be controlled, that test should not be used.'

Even when patients who are eligible under the current guidelines are identified, many health care providers are reluctant to administer IPT, because they fear it may cause drug resistance or severe toxicity, or they believe it is not needed in someone on ART.

At present there is very little evidence to suggest that IPT promotes drug-resistant disease, according to Professor Harry Hausler of the TB/HIV Care Association, who chaired the session on IPT at the symposium.

'When active TB occurs among those given IPT, standard four-drug first-line therapy works,' he added, citing evidence from one 2006 meta-analysis that included over 18 000 people on IPT showing a slight increase in INH resistance but a fairly low relative risk (1.45, 95% confidence interval (CI) 0.85 - 2.47).[15,16] However, the authors recommend ongoing surveillance to exclude an increase in INH resistance with the roll-out of large-scale IPT programmes. If INH is used appropriately - not given to people with active liver disease or to those who abuse alcohol, with monthly monitoring and vitamin B_6 - severe toxicity is rare. Finally, at least one open-label study suggests that ART and IPT synergistically decrease TB when given together.[17]

Preliminary data from the first 6 months of the Botswana IPT study seem to support that IPT can be safely and effectively administered even to rather ill patients, according to Dr Tefera Agizew, Senior Medical Research Officer, TB/HIV Research, BOTUSA.

During the first 6 months of the study, all eligible participants received open-label INH with vitamin B_6 (after which point they were randomised to continue with 30 months of placebo or INH). Of 1 995 subjects enrolled in the trial, only 7 (0.35%) were diagnosed with active TB (3 of whom were culture positive). There was no evidence of INH resistance. Adherence was also good by pill count: 91% took more than 80% of the pills.

Severe adverse events were seen in 28 (1.4%) of participants: 19 were due to hepatitis (for a rate of 0.95% compared with an expected range of 0.5 - 5.3%), 5 were rashes, and 4 were other events. There was 1 death, due to hepatic encephalopathy. Most of the hepatitis was asymptomatic. However, a couple of factors, such as having a CD4 cell count below 200 cells/µl, and a problem with alcohol, were significant risk factors for severe hepatitis.

'Alcohol dependence screening is recommended to reduce the risk of hepatitis,' said Dr Agizew.

However, in the much larger Thibela TB study in South African goldmines, comparing the effectiveness of community-wide IPT in addition to standard TB control, hepatitis has been quite rare in preliminary findings, according to Professor Churchyard.

'Isoniazid is safe,' he said. 'And this is a group of men that are elderly and drink - I wouldn't say excessively, but they drink and have a high rate of hepatitis B and use traditional medicine. And yet despite all this, in an analysis of almost 13 500 individuals, we only had 3 cases of hepatitis - only one of which was severe -and the patient fully recovered.' (Other events included hypersensitivity, which was seen in 55 participants, and peripheral neuropathy in 41 of the first 13 425 patients.)[18]

Initially, adherence wasn't quite as good in this study, with only about 40 - 50% adherence by 6 months, but this has now been improved to about 80%.

Professor Churchyard also presented some of the first resistance data from the study so far (Table I).

'We would expect to see a higher proportion of INH resistance in people taking IPT, as INH won't work against INH-resistant TB,' said Professor Churchyard. 'And although it is slightly higher in terms of INH resistance, it is not significantly higher.'

Similarly, Dr Neil Martinson of the Perinatal HIV Research Unit reported that IPT did not drive resistance in a study he conducted comparing different TB preventive therapy regimens, including IPT for 6 months, and continuous IPT. There was no resistance in 14 out of 19 TB cases out of 328 patients who received 6 months of isoniazid (specimens were not available for 5), and only 1 case of MDR TB in the 7 breakthroughs out of 164 people on the continuous IPT arm.

That being said, Dr Martinson stressed that it was very important to exclude active disease - but he wasn't certain that chest X-rays would really be appropriate in the field.

'I would recommend not doing a chest X-ray. I think it's really an excuse just to keep people away from receiving isoniazid preventive treatment, especially when we consider that IPT is meant for well people,' he said. 'Clearly asymptomatic TB in HIV-infected individuals is a concern, but my experience is that TB is a fairly malignant disease in people who are HIV-infected. If you have at least two visits, one month apart, before giving IPT, most patients/most people who are HIV-infected and who have got active TB are not going to be walking around feeling good for more than a month.' However, he also said he thought 'that anyone who is HIV-infected should have a TB culture'.

Dr Martinson set some targets for the future, calling for CD4 counts to be routinely available at the time of HIV diagnosis (perhaps with point-of-care testing): for at least 20% to be investigated with a TB sputum culture; for 60% of those who do not yet qualify for ART to be put onto IPT; for an 80% adherence rate; and for less than 2% breakthrough TB cases.

As Dr Vincent Tihon of the SA Department of Health noted, putting this into operation in clinics will take real-world models and tested tools - but these are currently being developed. Dr McCarthy described the development and implementation of a systematic method of integrating TB/HIV services at urban clinics in Johannesburg. Before starting the effort, 'there was no systematic screening. IPT uptake was limited and in 2007, less than 100 people in the entire city of Johannesburg had TST done,' she said.

'Now to do this we used what we call the "Roadmap of Care" - a framework for integrated TB/HIV services that uses a "Provider-initiated testing and counselling register" and a "Wellness register"; as well as other materials to facilitate implementation' (for copies contact Padma Dayah, pdayah@rhru.co.za).

Data collection in the registers is manual, which increases staff workload, so staff training in data collection is critical. However, now 'we are able through the register, to track and understand all of the factors involved in TB and HIV integration and see month by month, exactly, the progress towards implementation'.

After successful piloting in four inner city clinics, the Roadmap of Care is being rolled out on a larger scale in Johannesburg, North West Province and Ekurhuleni. 'IPT in fact represents a success for TB/HIV integration. It's not only just the value of the preventive efficacy of INH - this represents the tip of the iceberg of the population that is reached through HIV services,' she said. 'IPT will not only do those individuals a service by preventing TB, but we access the entire spectrum of the population for HIV testing, TB screening and all of the other services that go along with it.' Good follow-up mechanisms are also essential to ensure adherence, detect cases of active TB if any are missed, and appropriately treat and monitor those patients.

'Political commitment to IPT is essential, and community and activist awareness as well as promotion of TB prevention activities are critical. Client awareness of IPT can drive prevention efforts and improve health-seeking behaviour,' she said.

'Community mobilisation has also supported the rapid and large-scale uptake in Thibela,' said Professor Churchyard. 'It creates the awareness of both TB and IPT and it has created a demand for IPT, and strong support for this study. Communication is essential to the community mobilisation and underpins all of those processes.'

TABLE I. PRELIMINARY DRUG SUSCEPTIBILITY OF TB ON IPT

Active TB	IPT (*N*=66)		Comparison (*N*=129)	
	First episodes, *N*=53 % (95% CI)	Retreatment, *N*=13 % (95% CI)	First episodes, *N*=97 % (95% CI)	Retreatment, *N*=32 % (95% CI)
Any INH	7 13.2% (5.5 - 25.3)	1 7.4% (1.9 - 36.0)	8 8.2% (3.6 - 15.6)	8 25% (11.5 - 43.4)
MDR	1 1.9%	1 7.7%	3 3.1%	4 12.5%

As for political commitment, the meeting's final word came from the South African Department of Health.

'The political commitment has increased significantly in the past few months where TB and HIV have really gone high on the agenda,' said Dr Tihon. First, the department is considering several proposed changes to the IPT policy that may remove some of the barriers to access. These include removing the TST requirement; considering IPT for pregnant women with HIV, as benefits outweigh the risks; and considering IPT for patients who have been stable on ART for 6 or more months who have no signs and symptoms of TB.

'It is quite critical to start talking about how we are going to implement it,' he added. Consequently, the Department of Health has instructed the provinces to develop clear operational plans for IPT implementation.

'It will require training, standard operating procedures, technical guidance that is very practical, how to exclude TB, who is eligible and how to monitor people who are starting on IPT,' he said, noting that RHRU's work could serve as a model. But ultimately, he said, successful implementation of IPT will be dependent upon the delivery of quality HIV services, effective TB screening, adherence support and follow-up. 'The HIV programme really has to take the responsibility and the leadership in strong collaboration with the TB programme so that people will say: It works, it's safe and let's just do it!'

We thank the Chairs and presenters for sharing their expertise. Mr Theo Smart is thanked for preparing the final report.

REFERENCES

1. Edwards D, Vogt M, Bangani N, *et al.* Baseline screening for TB among patients enrolling in an ART service in South Africa. 16th Conference on Retroviruses and Opportunistic Infections, 8 - 11 February 2009, Montreal, Canada. Abstract 780.
2. Lawn S, Myer L, Edwards D, *et al.* Short- and long-term risks of TB associated with CD4 cell response to ART in South Africa. 16th Conference on Retroviruses and Opportunistic Infections, 8 - 11 February 2009, Montreal, Canada. Abstract 788.
3. Lawn SD, Myer L, Orrell C, *et al.* Early mortality among adults accessing a community-based antiretroviral service in South Africa: implications for programme design. *AIDS* 2005; 19(18): 2141-2148.
4. Gandhi NR, Moll A, Strum A, *et al.* Extensively drug-resistant tuberculosis as a cause of death in patients co-infected with tuberculosis and HIV in a rural area of South Africa. *Lancet* 2006; 368 (9547): 1575-1580.
5. Menzies D, Joshi R, Pai M. Tuberculosis among health-care workers in low- and middle-income countries: A Systematic [Occupational lung disease in high- and low-income countries, ed. M Chan-Yeung, No. 5 in the series]. *Int J Tuberc Lung Dis* 2007; 11(6): 593-605.
6. Escombe AR, Oeser CC, Gilman RH, *et al.* Natural ventilation for the prevention of airborne contagion. *PLoS Med* 2007; 4(2): e68.
7. Escombe Roderick A, Moore DAJ, *et al.* Upper-room ultraviolet light and negative air ionization to prevent tuberculosis transmission. *PLoS Med* 2009; 6(3): e1000043.
8. Basu S, Andrew JR, Poolman EM, *et al.* Prevention of nosocomial transmission of extensively drug-resistant tuberculosis in rural South African district hospitals: an epidemiological modelling study. *Lancet* 2007; 370: 1500-1507.
9. Wood R, Middelkoop K, Myer L, *et al.* Undiagnosed tuberculosis in a community with high HIV prevalence: implications for tuberculosis control. *Am J Respir Crit Care Med* 2007; 175(1): 87-93.

APPENDIX 1. SA BUILDING CODES OF PRACTICE, THE PROPOSED SANS 10400, SECTION 0, PARA 4.4.10

Occupancy	Minimum outdoor air requirements		Pressure relative to adjacent area
	Air changes per hour	l/s per person	
Health care facilities			
Surgical and critical care			
Operating theatres and suites	20	-	Positive
Wound intensive care (burns)	6	-	Positive
Critical and intensive care, treatment and delivery rooms	6	-	Positive
Trauma, ER waiting rooms, radiology waiting rooms and triage	12	-	Negative
Diagnostics and treatment areas			
Bronchoscopy, sputum collection, examination and treatment room (general)	12	-	Negative
Medication room	4	-	Negative
Physical therapy and hydrotherapy	6	-	Negative
Inpatient nursing areas			
General wards, paediatric wards and labour/delivery/recovery/postpartum rooms	2	-	Positive
Airborne infection/protective environment wards and anterooms or airlocks	12	-	Negative
Laboratories			
Microbiological (molecular)	6	-	Positive
Bacteriological P1	6	-	Negative
Bacteriological P2, P3 and P4	12	-	Negative
General biochemistry, cytology, histology, nuclear medicine, pathology and serology	6	-	Negative
Radiology			
General radiology areas	6	-	Negative

10. Corbett EL, Charalambous S, Moloi VM, *et al.* Human immunodeficiency virus and the prevalence of undiagnosed tuberculosis in African gold miners. *Am J Respir Crit Care Med* 2004; 170(6): 673-679.
11. den Boon S, Verver S, Lombard CJ, *et al.* Comparison of symptoms and treatment outcomes between actively and passively detected tuberculosis cases: the additional value of active case finding. *Epidemiol Infect* 2008; 136: 1342-1349.
12. Churchyard GJ, Kleinschmidt I, Corbett EL, *et al.* Factors associated with an increased case-fatality rate in HIV-infected and non-infected South African gold miners with pulmonary tuberculosis. *Int J Tuberc Lung Dis* 2000; 4(8): 705-712.
13. Day JH, Grant AD, Charalambous S. Screening for tuberculosis prior to isoniazid preventive therapy among HIV-infected gold miners in South Africa. *Int J Tuberc Lung Dis* 2006; 10(5): 523-529.
14. Woldehanna S, Volmink J. Treatment of latent tuberculosis infection in HIV infected persons. *Cochrane Database Syst Rev* 2004; (1): CD000171.
15. Nolan CM, Goldberg SV. Treatment of isoniazid-resistant tuberculosis with isoniazid, rifampin, ethambutol, and pyrazinamide for 6 months. *Int J Tuberc Lung Dis* 2002; 6(11): 952-958.
16. Mitchison DA, Nunn AJ. Influence of initial drug resistance on the response to short-course chemotherapy of pulmonary tuberculosis. *Am Rev Respir Dis* 1986; 133(3): 423-430.
17. Golub JE, Saraceni V, Cavalsante SC, *et al.* The impact of antiretroviral therapy and isoniazid preventive therapy on tuberculosis incidence in HIV-infected patients in Rio de Janeiro, Brazil. *AIDS* 2007; 21: 1441-1448.
18. Mngadi K, Churchyard GJ, Grant A, *et al.* 38th IUATLD Conference, 8 - 12 November 2007, Cape Town. Abstract PS-71835-10.

CONFERENCE REPORT

'SCALING UP FOR SUCCESS': THE 4TH SOUTHERN AFRICAN AIDS CONFERENCE

31 March - 3 April 2009, Durban

Track rapporteurs and members of the Scientific Committee

There are an estimated 6 million South Africans living with HIV today. The HIV and AIDS and STI Strategic Plan for South Africa, ambitious though it is, provides an excellent framework to implement nationally to begin to make a dent in the epidemic by 2011. But plans without implementation and scale are of little value.

The 4th South African HIV Conference held at the International Convention Centre, Durban, on 31 March - 3 April 2009 attempted to address some of the operational gaps and prioritise our efforts to get the 'best bang for our bucks' before 2011. With the theme 'Scaling up for success', overwhelming attendance, participation and feedback indicated that many of the goals set by the scientific and organising committee were met. Perhaps most significant to many of us was the tangible and positive spirit of determination and cooperation between researchers, practitioners, activists, civil society and government at the conference, which bodes well for the busy time ahead.

A large portion of the scientific programme was abstract driven (almost 2 000 abstracts were received) with 6 tracks, listed below with chairs and co-chairs. Each track had 4 oral sessions covering a series of themes derived from the abstract submissions. Perhaps one of the best innovations this year was the addition of the community engagement programme that ran as a theme throughout the whole conference, culminating in a full post-conference workshop on 3 April at the same venue.

This year, two South Africans and an African representative chaired each track. We warmly thank them for taking the time to engage and appreciate the contribution they have already made.

Track 1: Basic sciences
Chairs: *Thumbi N'dungu, Jo-Ann Passmore, Rosemary Musonda*
Rapporteur: *Victoria Kasprowicz and team*
Track 2: Clinical Sciences
Chairs: *Doug Wilson, Vivian Black, Moses Sinkala*
Rapporteur: *Claire Von Mollendorf and team*
Track 3: Epidemiology, Prevention and Public Health Systems
Chairs: *Virginia Zweigenthal, Guy de Bruyn*
Rapporteur: *Lilian Dudley and team*
Track 4: Social and Economic Sciences, Human Rights and Ethics
Chairs: *Catherine Slack, Vasu Reddy, Michaela Clayton*
Rapporteur: *Catherine Slack and team*
Track 5: Best Practices and Programs
Chairs: *Astrid Dearham, Nigel Rollins*
Rapporteur: *Astrid Dearham and team*
Track 6: Community Exchange Encounters
Chairs: *Victor Lakay, Peter Mathebula, Pauline Sambo*
Rapporteur: *Victor Lakay and team*

TRACK 1: BASIC SCIENCES

Two major themes were highlighted from the studies in this track. Firstly, renewed emphasis was placed on the identification of correlates of HIV control and protection. Secondly, the research community has begun to focus research efforts on two special subsets of infected individuals: elite controllers and individuals in the acute phase of infection.

ELITE CONTROLLERS

Bruce Walker (Ragon Institute of MGH, MIT and Harvard) presented a talk in the plenary session entitled 'Elite control of HIV: Implications for treatment and vaccines'. Dr Walker suggested that elite controllers might be able to act as a successful model for T-cell vaccination. He reported that the CD8 T-cell response is responsible for inducing the less fit virus found in elite controllers. Walker emphasised that it is the interplay between adaptive immunity (cytotoxic T lymphocyte neutralisation), host genetics (HLA) and viral genetics (fitness) that is responsible for determining infection outcome. Data were presented showing that CTLs are shaping HIV evolution, and that strongly targeted epitopes are being lost at the population level. More information on his efforts and those of his fellow researchers can be found at www.elitecontrollers.org.

EARLY INFECTION

Andile Nofemela (UCT) presented an excellent talk entitled 'Characterisation of transmitted HIV-1 ENV variants from Mbeya, Tanzania') in which he highlighted the observation that 73% of new infections are caused by infection of a single virus. This 'bottle-neck' effect supports the findings of others that also show that the viral populations in the majority of newly infected individuals are largely homogenous. Gama Bandawe (UCT) reported that shorter and less glycosylated V1 loops were associated with enhanced entry efficiency of certain isolates. Many groups reported on work carried out investigating the immune response in the acute phase and reported on a common theme that early immunological events are complex, and that some may predict viral set-point and disease progression. For example, Wendy Burgers (UCT) showed data indicating that HIV-specific immune activation occurs early and predicts poor disease outcome. Pholo Maenetje (NICD) shared data that showed that HIV-specific T cells may be more prone to viral infection. Clive Gray (NICD) presented data showing that HIV-1-specific T-cell immune responses at 3 months do not predict viral load set point and that the early immune responses are characterised by waves of 'waxing and waning' whereby responses frequently appear and then disappear. The reasons for this remain unclear. Various other talks focused on the quality and quantity of T-cell immune responses in adult and paediatric HIV-1 infection. Interestingly, Koleka Mlisana (UKZN) reported that 33% of individuals in the CAPRISA acute infection cohort progressed to CD4 counts <350 within 3 years of infection, 40% of whom were started on antiretroviral therapy (ART). Moving away from characterising immune responses in the periphery, Lindi Roberts (UCT) presented some interesting data looking at the genital tract. Essentially, inflammatory cytokine responses, e.g. IL-6 and TNF-alpha, were found to be associated with HIV disease progression. It is important to remember that a number of factors may play a role in the control of HIV, including CD4 T-cell immunity, CD8 T-cell immunity, innate immunity, neutralising antibodies, viral genetics and host genetics.

ANTIBODIES AND INNATE IMMUNITY

Even though Lynn Morris (NICD) presented a great talk on 'Limited neutralising antibody specificities drive neutralisation escape in early HIV-1 subtype C infection', which demonstrated that the immune system can make antibodies that have an effect on viral load, and Dr William Carr presented a talk on the role of NK cells, there was a paucity of presentations and scientific discussion on role of antibodies and the innate arm of the immune response.

IN SUMMARY

The key points from this track of the conference are: elite controllers may hold the key to understanding HIV immune control; in acute infection immune system damage occurs early and predicts the course of disease; further research on the role of antibodies and innate immunity in immune control is required.

TRACK 2: CLINICAL SCIENCES

ANTIRETROVIRAL TREATMENT

A number of presentations looked at successes of ART programmes, including Alison Riddick's study from rural Hlabisa. This study showed a reduction in adult medical admissions from 2002 to 2007 following the introduction of ART, with no deaths recorded secondary to ART toxicity. The International epidemiologic Databases to Evaluate AIDS (IeDEA) cohort, which included 6 078 children from seven hospitals in Johannesburg, Cape Town and Durban, showed good survival and clinical, immunological and virological outcomes among children initiated on ART. Of concern was inequity of access, with 20% of South African children being treated at these seven urban sites.

Reassuring data from Khayelitsha showed that women who switched from efavirenz to nevirapine at a CD4 cell count >250 cells/µl did not have more adverse events than those who initiated nevirapine at a CD4 cell count <250 cells/µl. However, the numbers in the high CD4 cell count group were too small to show statistical significance.

SYSTEMS

A study done in KwaZulu-Natal and Limpopo evaluating the Integrated Management of Childhood Illness (IMCI) showed that while HIV is common in children presenting at primary care facilities and the HIV algorithm performs well in identifying HIV-infected children, IMCI-trained health care workers do not routinely use the algorithm and do not test for HIV regularly among sick children.

A presentation from the Africa Centre suggests that HIV-exposed infants are less likely to be vaccinated than HIV-unexposed infants. It was suggested that maternal HIV is responsible for this.

A number of presenters showed the devastating effects of HIV, particularly for younger infants (<6 months of age), through retardation of early growth, increased susceptibility to infections and a higher case fatality rate. It is vital to reduce vertical transmission and identify and treat HIV-infected infants early for opportunistic infec-

tions and with ART. Data from Chris Hani Baragwanath Hospital highlighted shortcomings in the prevention of mother-to-child transmission (PMTCT) programme, with 15.1% of women with positive infants reporting that they tested HIV negative in pregnancy (probably due to late seroconversion or confusion secondary to the complex coding system) and only 36% of mother-infant pairs receiving single-dose nevirapine.

TUBERCULOSIS

A file review from the Hlabisa district showed that mortality in patients on ART doubled in the presence of prevalent or incident tuberculosis. This mortality rate is higher than that reported in other studies but may reflect the extent of HIV advancement and also time in the programme, since higher mortality in the first 100 days is well described in ART programmes.

After improvement of infection control, including basic administrative, environmental and personnel measures, in Tugela Ferry, admissions of patients with extensively drug-resistant (XDR) and multi-drug resistant (MDR) tuberculosis decreased significantly (p=0.02) from 2006 to 2008. Community infection control remained an unaddressed challenge. A case series of four children from Tugela Ferry showed that a diagnosis of XDR TB took many months. The average duration of treatment was 18 months and all children were successfully treated.

OPPORTUNISTIC INFECTIONS

Preliminary data from Ngwelezane Hospital showed no differences in wound infections between HIV-positive and negative patients who had open fractures treated with internal or external fixation. Potential modifiers were albumin (lower in HIV-positive group) and age (younger in HIV-positive group).

A study from the Africa Centre reporting on HIV and HBV co-infection in KZN showed rates as high as 10%. Of concern was that less than 50% of patients started on nevirapine had follow-up alanine transaminase monitoring.

A review of 23 years of records from hospitals in KZN showed a dramatic increase in incidence of Kaposi's sarcoma (20 times in males) and an age shift towards a younger population.

NEW DEVELOPMENTS

Lesley Scott presented a paper on the use of dried blood spots compared with plasma for viral load analysis. Results were equivalent, suggesting that dried blood spots be utilised to monitor response to ART among patients. With a proposed shift towards decentralising ART services, this is an important finding.

IN SUMMARY

Antiretroviral therapy continues to have a significant impact on morbidity and mortality in both the adult and paediatric HIV epidemic in South Africa – there are operational issues around scale up which need ongoing monitoring and evaluation. The TB epidemic continues unabated and exerts a major impact on ART scale-up and now added surveillance and inflectional control to limit multidrug resistance. New point-of-care diagnostics for diagnosis and monitoring remain areas requiring ongoing research.

TRACK 3: EPIDEMIOLOGY, PREVENTION AND PUBLIC HEALTH

MEASUREMENT

Several papers discussed the need for rigorous methods for measuring incidence. These include laboratory assays to estimate incidence (McWalter), assays from cohort studies (Hargrove), and modelling incidence from antenatal survey data (Dorrington).

Johnson presented a mathematical model measuring the effects of different types of sexual risk behaviour on the spread of HIV. He demonstrated that the highest transmission rates were in multiple concurrent heterosexual partnerships (MCPs). He estimated that reducing unprotected sex in non-spousal relationships could reduce the HIV incidence in South Africa by a third over the next 10 years.

EPIDEMIC DRIVERS

A regional study by Soul City confirmed that MCPs are common practice, and HIV risk and MCP messages from communication strategies are not internalised. Zembe found that transactional sex among young South African women is seen as normative behaviour, and is associated with alcohol use and intimate partner violence (IPV). High levels of IPV were associated with males older than 35 years, multiple sexual partners, high alcohol intake, and failure to use condoms (Townsend).

PREVENTION INTERVENTIONS

The session focused on male circumcision in different settings, including Orange Farm (Taljaard), Kenya (Loolpapit) and the Eastern Cape (Peltzer). Male circumcision is feasible and acceptable in these settings, and had a high uptake. The importance of linking medical intervention with the cultural context of initiation practices was emphasised. In South Africa, service is doctor dependent, although the Orange Farm team approach reduced dependence on doctors. In Kenya other categories of trained health workers performed the surgery. Scaling up in South Africa may require such alternative models of delivery.

No studies described interventions to reduce MCPs, transactional sex and IPV, which highlights a major gap in prevention research, and a need for closer collaboration between social and medical scientists.

PMTCT

The session described the operational effectiveness of a dual-therapy PMTCT regimen, and long-term ART as an intervention for PMTCT. Studies demonstrated improved outcomes in cohorts of pregnant women on long-term ART, with reductions of MTCT to 2.7% at Frere Hospital (Bera) and 5.1% in a community-based clinic cohort (Fitzgerald). Good-quality local trials of the effectiveness and timing of ART in pregnancy to prevent MTCT will provide additional evidence.

Although few studies were presented on postnatal transmission, important data on the low rate of adherence of HIV-positive women to early breastfeeding cessation (24 weeks) were presented. Cessation of breastfeeding after 24 weeks may be more feasible, and further research is needed into prophylactic regimens to protect infants from infection during the breastfeeding period (Goga).

HEALTH SYSTEMS AND PROGRAMME EVALUATION

A review of 3 years of ART at multiple NGO sites identified factors associated with increased mortality, poor adherence and loss to follow-up. The first 6 months of treatment had the highest loss to follow-up, and adolescents initiating HAART were identified as needing additional support (Fatti).

Good patient adherence to ART was associated with reduced health care costs and investment in interventions to improve adherence and monitoring of adherence is recommended (Nachega).

The International Epidemiologic Database to evaluate AIDS (IeDEA), a large cohort study collecting individual patient data in the region, identified a trend for men and children to access treatment late. Sentinel surveillance of patient-based data could provide important clinical information in the monitoring of the national ARV programme (Cornell).

Integration of services, including HIV services, with family planning, sexually transmitted infection (STI) clinics, cervical screening, and TB services, was found to be acceptable to clients and providers, and resulted in increase in uptake of HIV testing and other services (Menziwa, Chabikulu, Leon, Bomela).

Contributors: *Catherine Slack, Ann Strode, Nicola Barsdorf, Jenny Koen, Zaynab Essack, Michaela Clayton and Vasu Reddy*

TRACK 4: SOCIAL AND ECONOMIC SCIENCES, HUMAN RIGHTS AND ETHICS

Track 4 examined how social-behavioural, economic and legal/human rights factors shape BOTH our epidemic AND responses to it. In the track there were a number of key **interventions** that were continually raised due to the social-cultural and human rights implications. There were also a number of vulnerable and marginalised **groups** that were focused on.

KEY INTERVENTIONS

HIV testing. Three sessions focused on testing, where it was noted that uptake of testing is still low and resources are limited. In the main, there was greater acceptance that more than one model is needed. Client-initiated testing needs to be re-tooled and taken to people in innovative ways. It needs to be compressed in a way that does not short-change on consent or confidentiality. The merits of self-testing were noted provided there was adequate support through, for example, telephone counsellors. It was also observed that the health system may not be ready to manage a routine offer of testing and will have to be strengthened to do so.

Male circumcision (MC). Two sessions focused on MC. It was noted that this priority for scale-up will require attention to consent, counselling and confidentiality (the 3 Cs); that monitoring behavioural disinhibition and the ability of men to abstain until the wound heals is a key part of roll-out; and that providing this service to adolescents will require understanding of the legal framework and parental involvement in many instances.

Partner reduction. The need to reduce MCPs came up repeatedly in satellites, plenarys and oral sessions. Key issues included the need to proceed to implement and monitor MCP programmes in the absence of perfect tools; the need to acknowledge that culture is a highly contested construct and that cultural practices can be challenged; that MCP programmes will compete with messages from the commercial media; and that involving celebrities in de-norming MCP will be important.

KEY GROUPS

Children. A special session on children demonstrated innovative research into the lives of children in the SADC region. It was noted that the full range of children made vulnerable by HIV must be recognised; that a significant number of children remain invisible because they are not registered at birth and remain marginalised from education and support systems; that children living on the streets need far more tailored services and protection; and that children are best assisted by strengthening their families, and a key way to do this is through social protection policies.

Migrant populations. A dedicated oral session and satellite highlighted the needs and rights of migrant populations. Their relative poverty, lack of services, separation from regular partners and stigma increase both HIV risk and impact for this group. The need for better information and services was underscored. In terms of treatment access, it was noted that in the main it is not the legal and policy environment that may be problematic for migrants, but implementation of these rights that is lacking.

People living with HIV (PLWHIV). It was noted that far better integration of HIV and sexual/reproductive services is needed for PLWHIV and that policies and programmes need a far better focus on discordant couples. Food price rises are directly affecting HIV prevention as people move in search of food and work, and this situation is affecting AIDS care, because people on treatment cannot get the nutrition they need in many instances. It was noted that welfare grants are a critical safety net.

MEN WHO HAVE SEX WITH MEN

A dedicated satellite looked at the needs and rights of men who have sex with men (MSM). It was noted that stigma and in some cases criminalisation of same-sex relationships drive MSM from services, and better surveillance is needed, as well as programmes for this group.

In terms of **prison populations,** a dedicated satellite session focused on their increased risk. It was argued that HIV care, management and prevention in prisons must be better integrated into policy instruments, and funding is needed for service delivery to this vulnerable group.

In terms of **sex workers,** one presentation highlighted how criminalisation of sex work limits their uptake of services, and argued that such work should be decriminalised and a customised package rolled out.

Several sessions addressed the needs and rights of **research participants** in large-scale HIV trials, and the communities from which they are drawn. Because the current array of methods (such as abstinence, fidelity, condoms and circumcision) may not address the particular needs of young women and older women in stable relationships, new tools such as microbicides are needed. Research literacy was advanced as a tool to offset power imbalances between investigators and participants and involve communities more authentically in research. It was stressed that these efforts must avoid tokenism and that sound partnerships with communities can buffer disappointing trial results – which are an inevitable part of product development.

A special session was devoted to SADC countries' implementation of key human rights norms. It was noted that major gains have been made – for example, all 14 countries have a law or national policy that prohibits unfair discrimination against PLWHIV. A key concern was that in 4 out of 14 countries there are specific laws making the intentional transmission of HIV a crime, and in 9 out of 14 countries there are laws criminalising same-sex relationships, heightening stigma and undermining services. It was noted that such laws contribute to the structural conditions that fuel HIV.

Other contributors: *Ann Strode, Nicola Barsdorf, Jenny Koen, Zaynab Essack*

TRACK 5: BEST PRACTICES AND PROGRAMMES

The following themes emanated from this track, which covered evidence-based policy and practice, and models of prevention, treatment, care and support activities in communities, the workplace and the media.

EDUCATION, THE YOUTH AND HIV

Grierson *et al.* found that peer networks are not consistent across the population but cluster according to key socio-demographic characteristics. More targeted interventions that recognise gender differences and the role of partner violence are needed in peer education programmes (Rogan *et al.*). In an evaluation of adolescent programmes, Nkala *et al.* found that although adolescents are aware of the risks of HIV transmission, they were not personalising it and the repeated pregnancy testing at the clinic was indicative of unprotected sex. Once the adolescents tested HIV positive, they were lost to follow-up.

There is a substantial gap in tracing adolescents who become infected but have never tested (Chagan *et al.*).

In high-risk hospital catchment areas, testing strategies for children needed to be conducted in both health facility (outpatient department, ward) and mobile community settings (Chabikuli *et al.*).

Reporting on the establishment of a male clinic, Mgwele *et al.* found this to be the first port of entry for men into the public health system. Critical success factors included the location, operating hours, staff and the services that were offered. In terms of intergenerational sex, Pretorius *et al.* found that a variation in age difference results in persistence of the HIV epidemic. The establishment of more gay-friendly services was also advocated in the 'Men and HIV' theme.

DECENTRALISATION AND NURSE-BASED SERVICES

There was support for the down-referral of patients to primary care level as well as integrated health care. However, standardised guidelines were still considered to be lacking (Mabaso *et al.*, Carolus *et al.*, Vintges *et al.*).

The issues of nurse prescription and pharmacy support were still a concern. The re-defining of roles of health care workers was one way of addressing the increasing workload and waiting lists (Draper). The generally poor or non-existent state of health services in prisons was highlighted (United Nations). The transient nature of the offender population may be fuelling HIV and TB in the community, as the prevalence of HIV in prisons is estimated to be 6 - 50 times greater than that of the general adult population. Prison systems are rarely included in country plans, and there is a need to be proactive and take responsibility for putting HIV response plans in prisons into the National AIDS response.

BEST PRACTICES AND HEALTH SYSTEMS

Innovative strategies reported were the use of cell phones for mass messaging (Benjamin) and targeting the youth with online, interactive MTV-like programmes using celebrities as role models with HIV messages about prevention and testing (Pahl *et al.*). Men were the focus of the 'One Man Can' and 'You Can Count on Me' initiatives to facilitate and encourage awareness about HIV/AIDS (Colvin *et al.*, Becker *et al.*).

The need for dedicated health care worker programmes that offer psychosocial support, encourage HIV testing and TB screening and provide HIV treatment and support if a worker tests positive was raised (Vazi *et al.*).

Mobile clinics aimed at the asymptomatic, males, defaulters, the elderly and under-serviced areas, and offering not only voluntary counselling and testing but also screening for chronic disease, were promoted (Van Schaik *et al.*).

Overall there was a call for health systems to document best practices (Eghtessadi *et al.*), and the importance of partnerships for sustainable, measurable and quality programmes was highlighted.

Other contributors: *Meg Osler, Maria Sibanyoni*

TRACK 6: COMMUNITY EXCHANGE ENCOUNTERS

Unprecedented numbers of PLWHIV and HIV activist delegates attended the 4th South African AIDS Conference.

Instead of just covering the Community Exchange Encounters track, rapporteurs for Track 6 attended almost every session on the programme, as well as evaluating all six tracks from a community, PLWHIV perspective.

It was felt that this unprecedented turnout was in keeping with the sentiment that activists must scale up participation in AIDS conferences to ensure that the experiences and needs of HIV-positive communities remain at the epicentre of TB/HIV research projects and programmes.

FINANCING: 'HIV IS NOT IN RECESSION'

In the past months we have seen trillions of dollars spent on so-called financial 'bailouts' that are supposed to stimulate economic recovery. A tiny part of this sum could buy quality, sustainable health care for millions of poor people.

There is a multi-billion dollar deficit currently facing the Global Fund and a continued increase in demand with decreasing of resources. Drugs are notably most abundant where infections are least prevalent. The current global economic recession has meant a strong backlash due to possible budgeting cutbacks for HIV programmes. The lessons learned from HIV interventions continue to transform organisation and delivery of all health services. HIV treatment must become part of primary health care.

The Department of Health budget allocation for ARVs through the current HIV/AIDS conditional grant to provinces is at least R1 billion short of the amount initially budgeted to treat 220 000 people this year. A great need therefore exists to work collectively to achieve these ambitious targets and ensure that sufficient resources are mobilised *and properly managed.* In November 2008 the National Department of Health instituted an ARV moratorium in the Free State province. There are already similar shortages manifesting in other provinces across South Africa, including Gauteng, South Africa's richest province.

TASK-SHIFTING

Médecins Sans Frontières (MSF) and the Reproductive Health Research Unit (RHRU) presented compelling data showing that task-shifting is essential due to the overburdened state of clinics and the chronic nature of ART management. The ways that have been presented for task shifting to be implemented are unfair to community health care workers, nurses and doctors. Current laws and regulations that separate the roles of community health care workers, nurses and doctors must change. Government must implement policy on task-shifting based on extensive consultation with health care workers, health systems experts and community activists to address the lasting inequalities which continue to see health resources and responsibilities concentrated in hospitals, in urban areas, and in the hands of doctors.

ARV TREATMENT

We need more 'bang for our bucks'. Nachega's 'Excellent adherence to ART predicts lower direct health care costs for HIV-infected adults' showed that poor ART

adherence is a major predictor of virological failure, resistance, disease progression and death. There is a need for communities to access ARVs that do not cause drug toxicity but that are more expensive. Dr Francois Venter presented an interesting plenary, 'Key drugs for the next five years', and made the point that toxicity drives ARV regimen switches, particularly resulting from D4T. Tenofovir is good replacement for D4T but is unaffordable to the majority at current prices. Communities must embark on a larger campaign for access to essential medicines, including other exciting new ARVs such as etravirine, raltigravir and tipranavir.

OPPORTUNISTIC INFECTIONS: TB

A plenary presented by Robin Wood on HIV/TB control indicated that despite reasonably functioning TB programmes, TB rates are continuing to rise to unprecedented numbers in HIV hyperendemic areas. There is still not enough progress in health systems or scientific developments to combat HIV-associated TB. The Treatment Action Campaign (TAC), TB/HIV Care and other organisations are mobilising for better, more integrated TB/HIV programmes and improved treatments; but government must join in this struggle beyond mere rhetoric. There is a need for vastly increased resources – biomedical, financial and human – in order to integrate TB and HIV treatment.

OPPORTUNISTIC INFECTIONS: CERVICAL CANCER

In 'Development in progress: A policy analysis of the national cervical cancer screening policy factoring in HIV/AIDS' Bomela described strong community support for the integration of cervical cancer programmes into HIV care and highlighted that financial resources are lacking, women are not educated about how and where to access cervical screening services, and nurses are not adequately trained to implement guidelines. This advocacy seeks to mobilise women in communities to increase screening and public access to HPV vaccines.

YOUTH

HIV awareness programmes in schools are poorly funded. There is a strong need for peer-to-peer programmes in HIV education and a greater emphasis on skills development. A satellite session on 'Progress towards achieving NSP targets for children' exposed shortcomings of the Department of Health and Department of Education. There are no specific policies on teenage pregnancy or circumcision. The Department of Education has recommitted itself to the ABC strategy (Abstain, Be faithful, Condomise), yet condoms are not made available in schools, thus failing learners. Communities must mobilise to ensure that condoms and accurate information on their use are readily available to sexually active youth.

CONCLUSION

There may be a mistaken perception that the battle for health care in South Africa has been won, but this perception is incorrect. We must improve access to and quality of services where they are needed most if we are to achieve the NSP goals. **But ... growing financial constraints, the necessity for task-shifting, and rising rates of TB prove that the struggle continues! NOW is the time for communities to refocus and mobilise around these critical issues!**

CERVICAL CANCER AND THE HUMAN IMMUNODEFICIENCY VIRUS: A REVIEW

Cynthia S Firnhaber, *MD, MS, DTM&H*
Clinical HIV Research Unit, University of the Witwatersrand and Helen Joseph Hospital, Johannesburg

Pam Michelow, *MB BCh, MSc, MIAC*
Cytology Unit, Department of Anatomical Pathology, National Health Laboratory Service and University of the Witwatersrand

Globally cervical cancer is one of the commonest cancers in women. It comprises approximately 12% of all cancers and is the commonest cancer in women in developing countries. The most recent compilation of global data indicates that an estimated 490 000 new cases of cervical cancer occur annually worldwide and nearly 80% of these are in developing countries, where screening programmes are not well established and are poorly organised. Cervical cancer is the leading cause of cancer death among women. It is estimated that 270 000 women die annually from cervical cancer, 85% of them in low-resource nations.[1-3] In Africa, cervical cancer comprises 23.3% of all cancers in women.[4] According to the South African National Cancer Registry (NCR) data, the lifetime risk for the development of cervical cancer in 1998 was 1 in 26 for South African women and 1 in 21 for black South African women.[5] These are believed to be minimal rates, as the registry publishes only data collected from the pathology laboratories and is not a population-based cancer registry.

HIV/ AIDS poses a severe threat to global health. In addition, the HIV epidemic has hit hardest in regions of high prevalence of cervical dysplasia and cancer. The HIV epidemic in South Africa is one of the worst in the world. The prevalence of HIV among South African women attending antenatal clinics in 2006 was 29.1%.[6] With improved access to antiretroviral therapy, women are expected to live longer as the risk of death from opportunistic infections decreases. It is assumed that the incidence of cervical cancer and the prevalence of precursor lesions will increase, especially in countries that lack well-organised cervical screening. However, this remains to be seen.

HUMAN PAPILLOMAVIRUS

Cervical cancer and its precursor lesions are caused by infection with the human papillomavirus (HPV). The human papillomaviruses are part of the Papovaviridae family of viruses and consist of tightly coiled, circular, double-stranded DNA with about 8 000 base pairs in their genome. The papillomavirus is an obligatory intranuclear virus that must infect mitotically active cells to institute infection. Within the cervix HPV most commonly infects the mitotically active transformation zone at the squamo-columnar junction, which explains in part why HPV is associated with both squamous and glandular neoplasia. Over 100 different HPV types have been identified, of which approximately 30 - 40 infect the anogenital tract. HPV viruses of the anogenital tract are divided into 'low-risk' and 'high-risk' types depending on their ability to produce neoplasia.[7,8] There are a variety of opinions on how the human papillomavirus types should be classified. One commonly used classification (Munoz) published in 2003 divided them into 15 oncogenic (high-risk) types (HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 73, 82) and 12 non-oncogenic (low-risk) types (HPV 6, 11, 40, 42, 43, 44, 54, 61, 70 and 72, 81 and CP6108).[9] The vast majority of HPV viral infections are cleared within 14 months in women with competent immune systems. However, through a complicated cascade of events some infections evade the immune system, becoming a persistent infection. Persistent HPV infection is the first step towards cervical dysplasia and cancer. The E6 and E7 proteins of oncogenic HPV types are known to facilitate the degradation of tumour suppression proteins.[2] With the loss of suppression of these oncogenes, the cell cycle is disturbed. Factors that may increase the risk of persistent infection and cell dysregulation include immune suppression, cigarette smoke, multiple sexual partners, age of first intercourse, hormonal birth control and possibly other sexually transmitted infections such as *Chlamydia*.[7,8]

RELATIONSHIP BETWEEN HIV AND HPV VIRUSES

According to Denny *et al.*,[10] a strong relationship exists between two significant sexually transmitted viruses, HIV and HPV. Cervical cancer was made an AIDS-defining diagnosis by the Centers for Disease Control (CDC) in 1993. The natural history of cervical neoplasia is one of progression and regression, partially mediated by local cervical immunity. This process is not well understood.[11] In HIV-positive women with cervical neoplasia, both pro-inflammatory and anti-inflammatory pathways in the cervical mucosa were found to be suppressed in comparison with the local mucosal en-

vironment of HIV-negative women.[12] HIV may increase the risk of HPV replication or transcription by a direct viral-viral interaction.[13,14]

HPV IN HIV-SEROPOSITIVE WOMEN

HPV oncogenic types 16 and 18 account for 90% of high-grade intraepithelial precursor lesions in HIV-negative women.[15] However, data from a variety of studies in southern Africa show a diversity of HPV types. In Zambia Professor Parham in a 150-women study found that 98% of HIV-infected women harboured at least one type of HPV (85% had a high-risk HPV type), with a median of four types per participant. HPV 52 was the most common.[16] A study in South Africa of 148 HIV-infected women showed similar results, with 95% of the women harbouring HPV, a median of three HPV types per participant, and 85% of women having one or more oncogenic HPV types (HPV 16 accounted for 30%, followed by 35 and 53).[17] Data from other developing countries in South America and Asia also show a large diversity of oncogenic HPV types (including 16 and 18) in addition to other types, such as 33, 35, 52 and 81.[18,19] Which oncogenic types are causing cervical cancer in HIV-seropositive women in Africa still needs to be determined. Recent results from a study in Kenya indicate that the prevalence of HPV 16 was similar in HIV-seropositive and HIV-seronegative women with invasive cervical cancer.[20]

CERVICAL LESIONS IN HIV-POSITIVE WOMEN

Several studies have shown that invasive cervical cancer in HIV-positive women tends to present 10 - 15 years earlier than in their HIV-negative counterparts. In addition, HIV-positive women with invasive cervical cancer have a much greater degree of immunosuppression than HIV-positive women without cervical cancer. Women with CD4 counts below 200 cells/µl are significantly more likely than HIV-negative women to have advanced-stage disease at presentation.[21,22]

HIV-positive women have higher rates of HPV and cervical abnormalities than HIV-negative women. A study by Denny *et al.*[10] of 400 untreated HIV-infected women who underwent HPV DNA testing, cytology, colposcopy, histology and a CD4 count every 6 months for 36 months showed that 68% of women were positive for high-risk HPV DNA, 35% had low-grade squamous intraepithelial lesions (LSIL) on Pap smear, and 13% had high-grade squamous intraepithelial lesions (HSIL) on Pap smear.

Abnormal cytology and the presence of high-risk HPV DNA were strongly correlated with low CD4 counts and high viral loads. A study by Yamada and co-workers in Kenya[23] demonstrated cervical HPV infection in 17% of HIV-negative and 49% of HIV-positive women. LSIL was found in 6.9% HIV-negative and 21% of HIV-positive women, and HSIL in 0.6% of negative and 5.8% of positive women. HSIL was strongly associated with high-risk HPV types and low CD4 counts.

A study by Cardillo *et al.*[24] showed HIV viral load to be significantly higher in women with cytological abnormalities. This study concluded that the degree of immunosuppression may contribute to the development of a squamous intraepithelial lesion, but once the lesion is established, disease progression may not be affected by CD4 counts. A Finnish study[25] of 153 HIV-positive women followed up for a mean of 5.6 years showed 33% to have cervical neoplasia. The risk of cervical neoplasia was not associated with decreased CD4 counts, duration of HIV infection or use of antiretrovirals.[25]

The vast majority of LSIL regress spontaneously in immunocompetent women. HIV-positive women with LSIL have a lower rate of regression and more tendency to progression. In a study by Massad *et al.*,[26] progression of cervical dysplasia was observed in 14% of HIV-positive women compared with 7% of HIV-negative women. Regression to normal was noted in 43% of HIV-positive women and 66% of HIV-negative women. In a study by Ahdieh *et al.*,[27] cervical dysplasia regressed in only 45% of HIV-positive women after a median of 2.7 years, which was significantly lower than the regression rate in HIV-negative women.

In summary, HIV-positive women tend to have a higher prevalence of HPV, more HPV types with multiple oncogenic-type infection, more HPV persistence and a higher prevalence of cytological abnormalities than their HIV-negative counterparts, and tend to present at an earlier age with cervical cancer.

PREVENTION OF CERVICAL CANCER

Prevention of cervical cancer can be primary or secondary. Primary prevention modalities include adopting safe sex practices and HPV vaccination. Secondary preventive (screening) techniques include cytology, visual inspection of the cervix and HPV testing.

PRIMARY PREVENTION

Sexual abstinence is the only way to completely prevent transmission of HPV. Transmission of HPV appears to be fairly easy. Correlated HPV types have been found on the external genitalia and cervix of women without any history of sexual intercourse and in reportedly monogamous couples.[28-30] The rate of HPV transmission may be lower in circumcised males.[31] The efficacy of condoms in preventing transmission of HPV is uncertain. One small study[32] showed a decrease in the rate of genital HPV infection from 89.3/100 patient-years to 37.8/100 patient-years in women reporting 100%

condom use. Consistent use of condoms may increase HPV clearance and increase the rate of regression in HIV-negative women.[32] The impact of condom use on HPV transmission in HIV-positive women is unknown.

Two vaccines that protect against certain types of HPV have recently become available. Cervarix (GlaxoSmith-Kline) produces antibodies to HPV types 16 and 18 while Gardasil (Merck) produces antibodies to HPV types 16, 18, 6 and 11 (the latter two cause genital warts).[33,34] Overseas trials have suggested that these two vaccines reduce the incidence of cervical cancer significantly, as it has been estimated that approximately 70% of cervical cancer is caused by HPV types 16 and 18. However, cervical screening will still be necessary as 30% of cervical cancers are caused by HPV types other than 16 and 18. Also, it will be required for women who have not received the vaccine.

The prevalence of HPV types in southern Africa as discussed above may differ from those overseas, so data from HPV vaccination studies elsewhere may not be as helpful in southern Africa. The safety and efficacy of the preventive HPV vaccines in HIV-positive women also remains to be determined, as it is not known whether a sufficient antibody response to the vaccine will be obtained. Ideally girls should be vaccinated before risk of exposure to either HIV or HPV. In addition, HIV-positive women have a higher rate of infection with multiple HPV types, which may impact negatively on the efficacy of current vaccines against HPV types 16 and 18. Another type of HPV vaccine that is still in the early phases of testing is the therapeutic vaccine, to be given to women already infected with HPV to block the E6 and E7 oncogenic proteins and thus prevent progression.[35]

SCREENING FOR CERVICAL CANCER

Cervical screening programmes are traditionally based on cervical smears. In countries with well-organised cytologically based cervical screening programmes (such as Mexico, Columbia and many developed nations), the reduction in the incidence of and mortality from cervical cancer has been dramatic.[36,37] A cervical smear-based screening programme is a three-step (visits) approach, viz. women have a smear taken at a clinic, women with abnormal smears then have to be referred to a colposcopy centre for colposcopic biopsy to confirm the cervical results, and then, once confirmed, women have to be referred for treatment of the lesion.

Cytology is associated with a significant false-negative rate. The estimated sensitivity is only 50 - 60% for detection of cervical intra-epithelial neoplasia HSIL or greater in routine screening settings. The range of sensitivities and specificities of conventional cytology for the detection of HSIL in screening studies are 40 - 86% and 88 - 99%, respectively.[38-41] Despite these limitations, cervical cytology remains the only proven method for reducing the incidence and mortality of cervical cancer in large-scale population screening.

South Africa's cervical screening programme includes three smears in a lifetime at 10-year intervals starting at age 30. If this could be undertaken effectively, it is estimated that 66% of invasive cervical cancer would be eliminated.[42] Although South Africa's screening programme was launched in 2000, it has yet to be implemented on any large scale. A cytologically based cervical screening programme requires a reasonably well-functioning health care system. Unless good follow-up and referral mechanisms are in place, women may be lost to follow-up at any one of these steps. Accessibility of colposcopy and treatment of cervical dysplasia is currently very limited in the South African public sector.

Visual inspection of the cervix with acetic acid (VIA) has been investigated as an alternative to cytology in low-resource nations. VIA is a simple procedure involving swabbing the cervix with 5% acetic acid and after a few minutes observing any change of colour of a normal pink cervix to white. The white areas may represent cervical dysplasia. The normal columnar epithelium is dark pink to red. If in the area of the mitotically active transition zone, the white areas may be indicative of cervical dysplasia and can be treated with cryotherapy at the same visit.[43] The convenience and relative simplicity of VIA makes it preferable to the Pap smear in many resource-limited settings, because it does not require the client to return to the clinic for her results.

Assessment of VIA accuracy in large cross-sectional, randomised controlled trials in developing countries in HIV-negative women indicates that its sensitivity in detecting high-grade precancerous lesions ranges from 66% to 96% (median 84%), its specificity from 64% to 98% (median 82%), its positive predictive value from 10% to 20% and its negative predictive value from 92% to 97%.[44,45] The major strengths of VIA include its simplicity: there is no need to prepare the patient; it can be taught to nurses, nurse-midwives and other health workers in a short space of time; it costs less than other approaches in routine use; there is real-time availability of results (results are available immediately, eliminating the need for multiple visits in most cases, and reducing loss to follow-up); there is potential for immediate linkage with investigation/treatment; and no specimen transport, expensive laboratory equipment or highly trained personnel are needed.

The major limitations of VIA include low specificity (generally less than 85%) – a considerable number of women who test positive do not have disease, resulting in excessive diagnosis and treatment, and unnecessary anxiety;

lack of standardised methods of quality control (there is no permanent record of the test that can be reviewed later); training and competency of screeners are difficult to evaluate; its ability to detect endocervical lesions is limited as a result of difficulties in sampling and visualising the endocervical canal, as well as less experience among readers in recognising glandular cell lesions; and tests to follow up women who have been treated are lacking. Finally, the efficacy and cost-effectiveness of VIA-based population screening programmes in reducing the incidence of, and mortality from, cervical cancer are not known and remain to be established, as do the long-term complications of over-treatment.[43-45] VIA has mostly been evaluated as an once-in-a-lifetime screening test, and its performance in periodic screening has not been assessed. Validation in HIV-positive women is required.

The vast majority of HPV infections will clear spontaneously, especially in women below the age of 30 years, so HPV DNA testing has good negative predictive value but less good positive predictive value. Other disadvantages of HPV DNA testing are the cost, dependence on reagents currently produced by very few commercial manufacturers, and low specificity in younger women. HPV testing usually requires sophisticated laboratories with highly trained personnel, often not available in low-resource nations. In addition, samples for HPV tests need to be transported to the laboratory and patients need to return to the clinic for results, so there is potential loss to follow-up.[46-48] A rapid HPV test for use in low-resource countries, the HPV Digene Fast Test, has recently been developed. It obviates the need for sophisticated laboratories, and one study has shown good results.[49] Further investigations in this regard are required, especially in HIV-seropositive women.

Various combinations of cytology, VIA and HPV testing have been described, but the best method of screening in both HIV-positive and HIV-negative women has yet to be determined.[50,51]

TREATMENT OF CERVICAL DYSPLASIA

If colposcopy has confirmed the Pap smear cytology result of a high-grade lesion with histological results of CIN 2 or CIN 3, treatment of the lesion is required. Treatment can be done via a variety of methods. A very efficient outpatient procedure requiring only local anaesthesia is called either LEETZ (loop electrosurgical excision of the transition zone) or LEEP (loop electrosurgical excision procedure) biopsy. The procedure uses a thin electrified wire to remove the lesion up to 7 mm in depth from the transitional zone. LEEP or LEETZ is a very effective procedure in non-HIV-seropositive women, with a success rate of 80 - 85%.[44,52] However, a study in Soweto indicated that in HIV-seropositive women in South Africa the failure rate may be as high as 50% (defined as incomplete margins on pathological specimens).[53] Close follow-up is required in HIV seropositive women and additional procedures may be needed.

More definitive treatment includes the cone biopsy. This is an effective mode of treatment, but requires referral to a centre with a skilled gynaecologist, inpatient admission, and operating room availability.[52]

Cryotherapy can be done after the VIA procedure, during the same visit as discussed above, eliminating the anxiety and loss to follow-up that lengthy delays in follow-up visits cause and reducing the inconvenience of work, child-care and transportation issues. The procedure needs a consistent supply of nitrous oxide with a cryotherapy gun and probe. Freezing the lesion requires application of the gas for about 2 minutes and the patient should come for follow-up visits at 6 weeks, 6 months and 12 months (Gosbeck Parham, personal communication). Recurrent lesions found after VIA are referred for LEEP. Cryotherapy means that there are no pathology results, so it is not known what lesion was treated. Large lesions and lesions spreading into the cervical canal cannot be treated with cryotherapy and need to be referred for LEEP.[43]

Hysterectomy is reserved for refractory cases of carcinoma *in situ* that cannot be treated appropriately with the above methods.

OTHER TREATMENT MODALITIES

Micronutrients, vitamins (vitamins A, E and C) and antiretroviral agents (gancyclovir and cidofovir) have not shown any positive effect in the treatment of cervical dysplasia and should not be recommended.[52] As HPV infection is an immunomodulated disease, there is some hope that HIV antiretroviral therapy (ART) would improve regression rates and prevent the progression of cervical dysplasia as ART has improved the outcomes of patients suffering from Kaposi's sarcoma.[54] However, findings of reversal of cervical dysplasia in HIV-positive women receiving ART have been quite controversial, with disparate results.[55,56] Reports indicate that antiretroviral drugs may improve outcomes in cervical dysplasia in HIV-infected women. However, other cohort studies show that ART has no effect on cervical dysplasia.[57] As HPV is already integrated into the host genome and oncogenic gene changes are already occurring, ART given after the lesions have been developed may be too late to change the course of the HPV disease progression. Larger prospective cohort studies are needed to assess the effectiveness of ART in preventing cervical cancer in women with HPV-HIV co-infection.

With the effective ART roll-out in South Africa many women will survive opportunistic diseases, and cervical cancer screening needs to be on the agenda of HIV/ART

clinics. With the overwhelmed public sector obstetrics and gynaecology services in South Africa, limited accessibility, long waiting periods between Pap smears, colposcopy and LEEP, disjointed care and loss to follow-up between departments, cervical cancer screening and treatment need to be available and offered in HIV clinics as an integrated service.

REFERENCES

1. Ferlay J, Bray F, Pisani P, Parkin DM. International Agency for Research on Cancer (IARC). *GLOBOCAN 2002: Cancer Incidence, Mortality and Prevalence Worldwide.* Lyon, France: IARCPress; 2004; Cancer Base No. 5, version 2.0.
2. Parkin D, Whelan S, Ferlay J, *et al.*, eds. *Cancer Incidence in Five Continents.* Vol. VIII. Lyon: IARC Press, 2002 (IARC Scientific Publications No. 155).
3. Steward BW, Kleihues P. *World Cancer Report.* Lyon: IARC Press, 2003.
4. Parkin D, Sitas F, Chirenje M, Stein L, Abratt R, Wabinga H. Cancer in indigenous Africans – burden, distribution and trends. *Lancet Oncol* 2008; 9: 683-692.
5. Mqoqi N, Kellet P, Sitas F, Jula M. Incidence of histologically diagnosed cancer in South Africa, 1998-1999. *National Cancer Registry Report.* Johannesburg: National Health Laboratory Service, 2004: 116.
6. Summary of Biennial Report on the State of the South African HIV/AIDS Epidemic. South African Department of Health Study, 2006. www.doh.gov.za/docs/reports (accessed 28 December 2008).
7. Shew M, Fortenberry D, Wanzhu T, *et al.* Association of condom use, sexual behaviours, and sexually transmitted infections with the duration of genital human papillomavirus infection among adolescent women. *Arch Pediatr Adolesc Med* 2006; 160: 151-156.
8. IAC Task Force. Human papillomavirus. *Acta Cytol* 1998; 42: 50-58.
9. Muñoz N, Bosch FX, de Sanjosé S, *et al.* Epidemiologic classification of human papillomavirus types associated with cervical cancer. *N Engl J Med* 2003; 348: 518-527.
10. Denny L, Boa R, Williamson A, *et al.* Human papillomavirus infection and cervical disease in human immunodeficiency virus-1 infected women. *Obstet Gynecol* 2008; 111: 1380-1387.
11. Stanley M. Immune responses to human papillomavirus. *Vaccine* 2006; 24: suppl 1, S16-S22.
12. Kobayashi A, Greenblatt R, Anastos K, *et al.* Functional attributes of mucosal immunity in cervical neoplasia and effects of HIV infection. *Cancer Res* 2004; 64: 6766-6774.
13. Dolei A, Curreli S, Marongui P, *et al.* Human immunodeficiency virus infection *in vitro* activates naturally integrated human papillomavirus type 18 and induces synthesis of L1 capsid protein. *J Gen Virol* 1999; 80: 2937-2944.
14. Vernon S, Hart C, Reeves W, Icenogle J. The HIV-1 Tat protein enhances E2-dependant human papillomavirus 16 transcription. *Virus Res* 1993; 27: 133-145.
15. Smith JS, Lindsay L, Hoots B, *et al.* Human papillomavirus type distribution in invasive cervical cancer and high grade cervical lesions: A meta-analysis update. *Int J Cancer* 2007; 121: 621-632.
16. Parham GP, Sahasrabuddhe VV, Mwanahamuntu MH, Shepherd BE, Hicks ML, Stringer EM. Prevalence and predictors of squamous intraepithelial lesions of the cervix in HIV-infected women in Lusaka, Zambia. *Gynecol Oncol* 2006; 103(3): 1017-1022.
17. Firnhaber C, Zungu K, Williamson A, *et al.* Diverse and high prevalence of human papillomavirus associated with a significant high rate of cervical dysplasia in HIV-infected women in Johannesburg. *Acta Cytol* 2009; 53: 10-18.
18. Cerqueira DM, Moraes DD, Camara GN, *et al.* High HPV genetic diversity in women infected with HIV-1 in Brazil. *Arch Virol* 2007; 152(1): 75-83.
19. Bollen LJ, Chuachoowong R, Kilmarx PH, *et al.* Human papillomavirus (HPV) detection among human immunodeficiency virus-infected pregnant Thai women: implications for future HPV immunization. *Sex Transm Dis* 2006; 33(4): 259-264.
20. De Vuyst H, Gichangi P, Estambale B, Njuguna E, Franceschi S, Temmerman M. Human papillomavirus types in women with invasive cervical carcinoma by HIV status in Kenya. *Int J Cancer* 2008; 122: 244-246.
21. Lomalisa P, Smith T, Guidozzi F. Human immunodeficiency virus infection and invasive cervical cancer in South Africa. *Gynecol Oncol* 2000; 77: 460-463.
22. Moodley M, Moodley J, Kleinschmidt I. Invasive cervical cancer and human immunodeficiency virus infection: a South African perspective. *Int J Gynecol Cancer* 2001; 11(3): 194-197.
23. Yamada R, Sasagawa T, Kirumbi L, Kingoro A, Karanja D, Kiptoo M. Human papillomavirus infection and cervival abnormalities in Nairobi, Kenya, an area with a high prevalence of human immunodeficiency virus infection. *J Med Virol* 2008; 80: 847-855.
24. Cardillo M, Hagan R, Abadi J, Abadi M. CD4 T-cell count, viral load and squamous intraepithelial lesions in women infected with the human immunodeficiency virus. *Cancer (Cancer Cytopathol)* 2001; 93: 111-114.
25. Lehtovirta P, Paavonen J, Heikinheimo O. Risk factors, diagnosis and prognosis of cervical intraepithelial neoplasia among HIV-infected women. *Int J STD AIDS* 2008; 19: 37-41.
26. Massad S, Ahdieh L, Benning L, *et al.* Evolution of cervical abnormalities among women with HIV-1: evidence from surveillance cytology in the WH study. *J Infect Dis* 2001; 27: 432-442.
27. Ahdieh L, Li R, Levine A, Massad L, *et al.* Highly active antiretroviral therapy and cervical squamous intraepithelial lesions in human immunodeficiency virus-positive women. *J Natl Cancer Inst* 2004; 96: 1070-1076.
28. Winer R, Lee S, Hughes J, *et al.* Genital human papillomavirus infection: incidence and risk factors in a cohort of female university students. *Am J Epidemiol* 2003; 157: 218-226.
29. Moscicki A. Impact of HPV infection in adolescent populations. *J Adolesc Health* 2005; 37: 6 suppl, S3-S9.
30. Castellsague X, Bosch F, Munoz N, *et al.* Male circumcision, penile human papillomavirus infection and cervical cancer in female partners. *N Engl J Med* 2002; 346: 1105-1112.
31. Winer R, Hughes J, Feng Q, *et al.* Condom use and the risk of genital human papillomavirus infection in young women. *N Engl J Med* 2006; 354: 2642-2654.
32. Holmes K, Levine R, Weaver M. Effectiveness of condoms in preventing sexually transmitted infections. *Bull World Health Organ* 2004; 82: 454-461.
33. Harper D, Franco EL, Wheeler C, *et al.* Efficacy of a bivalent L1 virus-like particle vaccine in prevention of infection with human papillomavirus types 16 and 18 in young women: a randomised controlled trial. *Lancet* 2004; 364: 1757-1765.
34. Villa LL, Costa RL, Petta CA, *et al.* Prophylactic quadrivalent human papillomavirus (types 6, 11, 16, and 18) L1 virus-like particle vaccine in young women: a randomised double-blind placebo-controlled multicentre phase II efficacy trial. *Lancet Oncol* 2005; 6(5): 271-278.
35. De Jong A, O'Neil T, Khan A, *et al.* Enhancement of human papillomavirus (HPV) type 16 E6 and E7 specific T cell immunity in healthy volunteers through vaccination with TA-CIN, an HPV 16 L2E7E6 fusion protein vaccine. *Vaccine* 2002; 20: 3456-3464.
36. Aristizabal N, Cuello C, Correa P. The impact of vaginal cytology on cervical cancer risks in Cali, Columbia. *Int J Cancer* 1984; 34: 5-9.
37. Lazcano-ponce E, Palacio-Meijia L, Allen-Leigh B, *et al.* Decreasing cervical cancer mortality in Mexico: effect of Papanicoloau coverage, birth rate and the importance of diagnostic validity of cytology. *Cancer Epidemiol Biomarkers Prev* 2008; 17: 2808-2817.
38. Nanda K, McCrory DC, Myers ER, *et al.* Accuracy of the Papanicolaou test in screening for and follow-up of cervical cytological abnormalities: A systematic review. *Ann Intern Med* 2000; 132: 819.
39. Bastian L, Datta S, Hasselbald V, Hickey J, Myers E, Nanda K. *Evaluation of Cervical Cytology,* 5. Rockville, MD: Agency for Health Care Policy and Research (AHCPR), 1999. Evidence report/technology assessment prepared by Duke University under contract 290-97-0014. AHCPR puplication 99-E010. hstat nlm nih gov/hq/Hquest/db/local epc er cyt/screen/DocTitle/s48139 (accessed 25 February 2003).
40. Fahey MT, Irwig L, Macaskill P. Meta-analyses of Pap test accuracy. *Am J Epidemiol* 1995; 141: 680-689.
41. Mannino JR. Natural history of false-negative Papanicolaou smears: A prospective study using screening colposcopy in addition to cytology. *J Am Osteopath Assoc* 1998; 98: 546.
42. Sankaranarayanan R, Budukh A, Rajkumar R. Effective screening programmes for cervical cancer in low and middle income developing countries. *Bull World Health Organ* 2001; 79: 954-962.
43. Carr K, Sellors J. Cervical cancer screening in low resource settings: using visual inspection with acetic acid. *J Midwifery Womens Health* 2004; 49(4): 329-337.
44. Sankaranarayanan R, Gaffikin L, Jacob M, Sellors J, Robles S. A critical assessment of screening methods for cervical neoplasia. *Int J Gynecol Obstet* 2005; 89: 504-512.
45. Miller BA, Nazeer S, Fonn S, *et al.* Report on consensus conference on cervical cancer screening and management. *Int J Cancer* 2000; 86: 440-447.
46. Wright TC, Schiffman M, Solomon D, *et al.* Interim guidance for the use of human papilloma virus DNA testing as an adjunct to cervical cytology for screening. *Obstet Gynecol* 2004; 103: 304-309.
47. Howard M, Sellors J, Kaczorowski J. Optimizing the hybrid capture II human papillomavirus test to detect cervical intraepithelial neoplasia. *Obstet Gynecol* 2002; 100: 980-982.
48. Sellors J. HPV in screening and triage: towards an affordable test. *HPV Today* 2005; 8: 4-5.
49. Qiao Y, Sellors J, Eder P, *et al.* A new HPV-DNA test for cervical cancer screening in developing regions: a cross-sectional study of clinical accuracy in China. *Lancet Oncol* (in press).
50. Goldie S, Gaffikin L, Goldhaber-Fiebert J, *et al.* Cost-effectiveness of cervical cancer screening in five developing countries. *N Engl J Med* 2005; 353: 2158-2168.
51. Mandelblatt J, Lawrence W, Gaffikin L, *et al.* Costs and benefits of different strategies to screen for cervical cancer in less-developed countries. *J Natl Cancer Inst* 2002; 94: 1469-1483.
52. Cox MD. Management of precursor lesions of cervical carcinoma: history, host defense, and a survey of modalities. *Obstet Gynecol Clin North Am* 2002; 29: 751-758.
53. Adam Y, van Gelderen C, de Bruyn G, *et al.* Predictors of persistent cytologic abnormalities after treatment of cervical intraepithelial neoplasia in Soweto, South Africa: A cohort study in a HIV high prevalence population. *BMC Cancer* 2008; 8: 211.
54. Nasti G, Marellotta F, Berretta M, *et al.* Impact of highly antiretroviral therapy on the presenting features and outcome of patients with acquired immunodeficiency syndrome-related Kaposi sarcoma. *Cancer* 2003; 98(11): 2440-2446.
55. Heard I, Tassie JM, Kazatchikine M, *et al.* Highly active antiretroviral therapy enhances regression of cervical intraepithelial neoplasia in HIV-seropositive women. *AIDS* 2002; 16: 1799-1802.
56. Minkoff H, Ahdieh L, Massad LS, *et al.* The effect of highly active antiretroviral therapy on cervical cytologic changes associated with oncogenic HPV among HIV-infected women. *AIDS* 2001; 15: 2157-2164.
57. Lillo F, Ferrari D, Veglia F, *et al.* Human papillomavirus infection and associated cervical disease in human immunodeficiency virus-infected women: effect of highly active antiretroviral therapy. *J Infect Dis* 2001; 184: 547-551.

CLINICAL

ACUTE HIV: WHAT IS NEW AND DO WE TREAT?

Claire von Mollendorf, *MB BCh, BSc Med Sc Hons*
Technical Advisor Maternal Health, Reproductive Health and HIV Research Unit, University of the Witwatersand, Johannesburg

Health care providers are faced with a number of challenges with regard to acute HIV infection. The first of these is recognition, because the acute retroviral symptoms mimic a number of other viral infections. The second challenge is treatment, as treating early HIV has a number of benefits and risks both on an individual and a public health level. This review hopes to address some of these questions.

Although the HIV pandemic is not a new phenomenon, there are still significant gaps in knowledge that influence progress in prevention and treatment strategies. Most of these gaps involve the first few days and weeks of infection, i.e. the period of acute HIV infection.

Acute HIV infection (AHI) is usually defined as the time from entry of the virus into the body to completion of seroconversion, while early-stage HIV infection generally refers to the interval between seroconversion and the establishment of the viral load set point. The magnitude of the viral set point is prognostic for disease progression.[1]

Tests such as rapid HIV tests are initially negative in acute HIV as there is a delayed immune response. Seroconversion can occur as late as 6 months after exposure, while detectable levels of viraemia and p24 antigenaemia develop over the first 3 - 4 weeks of infection.[2,3]

Evolution of symptoms of the acute retroviral syndrome usually coincides with high levels of viraemia and the host's initial immunological response. The classic mononucleosis-like symptoms of acute HIV-1 infection (fever, joint pain, inguinal lymphadenopathy and night sweats) may last several days to weeks and are found in at least 47% of patients with AHI.[4,5]

Several studies suggest that individuals with acute HIV infection can be identified in sexually transmitted infection (STI) clinics and perhaps other high-risk settings.[5,6]

The detection of acute HIV infection is important not only from a research and prevention point of view but because it may also allow for early treatment that could modify the natural history of the disease.[7]

METHODS

MEDLINE and PubMed databases were searched using the keywords 'Acute HIV', 'natural history of HIV', 'HIV in Africa' and 'immunology of HIV'. More recent articles were focused on, i.e. those published after 2000.

PUBLIC HEALTH ISSUES

The diagnosis of acute HIV infection is important from a public health point of view.[8] Patients are highly infectious and HIV transmission occurs readily owing to a massive viral burden in the blood and genital secretions.[9] Acute HIV may therefore account for a disproportionate amount of HIV transmission. Patients may be unaware that they are infected and continue to engage in risky behaviour, putting others at risk. The differential d iagnosis of an unexplained viral syndrome in a sexually active adult should always include acute HIV.[10]

A study in heterosexual couples in the Rakai district of Uganda showed an increased risk of HIV transmission in the period just following HIV acquisition. In 10 out of 23 initially uninfected couples both partners seroconverted within the same 10-month follow-up period. A 'per-act transmission rate' of 0.0082 was calculated for this 'early transmission' group by dividing the total number of transmission events by the total number of sex acts reported by the 23 couples. A much smaller transmission rate was obtained for couples who were serodiscordant at enrollment.[11]

Another study from Botswana showed that identification of acute HIV was possible in a public health setting. This was viewed as an important part of reducing the epidemic in this country in combination with early use of HAART, risk reduction counselling, partner notification and contact tracing.[12]

NATURAL HISTORY OF AHI

The natural history of HIV-1 has been well characterised in industrialised countries. A cohort study of homosexual men showed a steep decline in CD4+ T-cell counts after seroconversion. HIV RNA load at the

first HIV-seropositive visit (~3 months after seroconversion) was highly predictive of AIDS, with prognosis correlating with subsequent HIV RNA measurements. The CD4+ T-cell decline was generally more severe in patients with higher CD4+ T-cell count levels before infection, which may reflect greater HIV replication.[1]

A subgroup of patients from a Swiss and Australian cohort showed that both the incubation period of AHI (time between HIV infection and AHI) and duration of AHI were associated with the late prognosis of HIV infection. The incubation period of AHI was independently associated with progression towards AIDS.[13]

Information regarding the natural history of HIV-1 infection in Africa is limited. In a prospective cohort study of female sex workers in Mombasa, Kenya, the survival rate was similar to that for HIV-1-infected individuals in developed countries before the introduction of highly active antiretroviral therapy (HAART). This was supported by a review of African studies from Uganda and Malawi. A higher viral load set point and more severe acute HIV-1 illness predicted faster progression to death. Disease in an African cohort, however, did not progress faster to AIDS than an industrialised country cohort.[14,15]

PRESENTING SIGNS AND SYMPTOMS

It is estimated that between 40% and 90% of patients with AHI experience an acute retroviral syndrome (ARS). Symptoms usually occur 2 - 6 weeks after exposure to HIV-1 and typically last 14 days, but may persist for as long as 10 weeks.[4]

The significance of the severity of seroconversion symptoms is not known, but the presence of seroconversion symptoms has been correlated with more rapid disease progression.[4,14]

Common symptoms include fever (>80 - 90%), fatigue (>70 - 90%), pharyngitis (50 - 70%), weight loss, night sweats (50%), lymphadenopathy (40 - 70%), arthralgia or myalgia (50 - 70%), headache (32 - 70%), skin rash (>40 - 80%), and nausea, vomiting and diarrhoea (30 - 60%). The rash is typically maculopapular and usually involves the trunk. It may be difficult to detect in black African cohorts. Other less frequent symptoms include aseptic meningitis (24%), oral ulcers (10 - 20%) and genital ulcers (5 - 15%), while frequent nonspecific laboratory findings include leukopenia (40%), thrombocytopenia (45%) or mild transaminitis (21%).[16] Other unusual presentations include myopericarditis, acute renal failure, cranial nerve VII palsy, radiculopathy and opportunistic infections such as candidiasis, cytomegalovirus infection, and *Pneumocystis jirovecii* pneumonia.[4]

The nonspecific nature of acute retroviral symptoms and the extensive differential diagnosis often make the identification of this syndrome challenging. It is important to consider this diagnosis in order to obtain an appropriate history, perform an appropriate risk factor assessment, perform a thorough physical examination, and order appropriate diagnostic tests.[4,17]

DIAGNOSIS OF AHI

In an article by Fiscus *et al.*, AHI was considered to be present if HIV RNA results were positive and one of the following conditions were met: (*i*) rapid antibody tests both negative; (*ii*) rapid antibody tests discordant and Western blot results negative or indeterminate; and (*iii*) rapid antibody tests discordant and Western blot results weakly positive with subsequent band evolution.[18]

In contrast, Hoen *et al.* used three laboratory criteria to confirm the diagnosis of primary HIV infection: (*i*) positive p24 antigenaemia; (*ii*) negative HIV enzyme-linked immunosorbent assay (ELISA) or positive ELISA in a patient who could be confirmed HIV negative within the past 3 months; and (*iii*) <3 bands in the Western blot test.[19]

The p24 band is usually the first to become positive in the Western blot test during seroconversion. If this is the only band present the HIV antibody test is considered to be indeterminate. This result should be correlated with the HIV-1 plasma RNA level.[4]

As CD4+ T-cell counts can briefly decrease during acute infection, they are generally not reliable markers of immune status during the first 6 months of infection.[4]

TREATMENT

The value of initiating antiretroviral therapy during AHI is uncertain. There are no randomised control trials examining the long-term effects of early treatment on the clinical course and prognosis of HIV infection. Results from studies are conflicting, and some evidence shows that early treatment may not alter the viral set point consistently following interruption.[4,20]

The benefits and risks of initiating therapy for AHI continue to be discussed. Potential benefits include the control of acute retroviral symptoms, prevention of abnormal helper T-cell function and reduction in the pace of decline, delaying or preventing decreased immune function and vulnerability to opportunistic infections, decreasing the initial viral load set point, which may decrease transmission, limiting viral evolution and diversity, potential slowing of the rate of disease progression among patients with a genetic predisposition, and decrease in the size of the latent HIV pool.[4,20]

Risks include increased cost, adverse effects and abnormal metabolic findings, drug resistance, long-term challenges to adherence, and unknown long-term toxicities or expected duration of benefit.[4]

A US study in 47 patients showed that initiation of HAART within 90 days of HIV-1 infection was associated with reduced HIV-1 virus levels, improved CD4+ T-cell counts and immune conservation, decreased opportunistic infections, and decreased frequency of respiratory and mucocutaneous conditions when used for 78 weeks. Rapid progression to AIDS also was avoided. However, side-effects of combination therapy were commonly reported in this study.[21]

IMMUNOLOGICAL EFFECTS OF ART IN PATIENTS WITH AHI

The limited benefit of antiretroviral therapy initiated during AHI may be explained to some degree by the early depletion of lymphocyte reservoirs in the gastrointestinal tract reported in some studies. This may also help to explain the conflicting evidence between early observations demonstrating apparent immunological benefit with early antiretroviral treatment with the inability to control viral replication after treatment interruption.[20]

Only a few reports describe the effects of HAART on HIV-specific T-cell responses during acute HIV infection.[22,23] However, limitations such as small sample size, short duration of follow-up and lack of concomitant virological data need to be taken into account when interpreting these results.[23] In a cohort of 16 HIV-1-infected individuals who received their diagnosis at the time of seroconversion and who were started on HAART within 72 hours, a robust HIV-1-specific CD4+ T-cell proliferative response was observed and viraemia was contained.[22]

One prospective cohort study followed up participants from the time of acute infection and examined different virological profiles related to various treatment interventions. No correlation was observed between baseline viral load and HIV-specific CD4+ and CD8+ T-cell responses. Subjects who started HAART at the time of acute infection had no better HIV-specific T-cell responses than those who started therapy after seroconversion, and the absence of any treatment or the incomplete virological control did not prevent the development of an HIV-specific CD4+ T-cell response. This may imply that early therapy aimed at preserving the HIV-specific immune response may not be necessary in all subjects.[23]

WHEN TO START TREATMENT

The period during which treatment for acute HIV should be given is not clear. Benefits have being shown up to 3 - 4 months after infection, but long-term effects on morbidity and mortality are unknown. Most clinicians would choose to treat within the first 6 months after seroconversion.[4]

Guidelines for initiation of therapy for patients in whom acute HIV-1 infection has been diagnosed are often vague and lack consensus.

The US Department of Health and Human Services (DHHS) guidelines recommend consideration of treatment for patients who received their diagnosis <6 months after infection. These guidelines consider treatment to be optional as clinical trials information is limited and benefits and risks of treatment need to be weighed up when considering initiating treatment.[24]

The British HIV Association (BHIVA) guidelines recognise that there are inconsistent study results on treatment in acute HIV. The justification for treating AHI is to preserve specific anti-HIV immune responses, reduce morbidity associated with high viraemia and CD4+ T-cell depletion and reduce the risk of HIV transmission. These guidelines recommend treatment of AHI for the relief of symptoms of ARS with neurological involvement, for any AIDS-defining illness or a CD4+ T-cell count persistently <200 cells/ml. BHIVA guidelines recommend that there is currently insufficient evidence to support treatment for other indications.[25]

Both the International AIDS Society–USA Panel recommendations and South African HIV Clinicians Society Guidelines do not currently recommend ART for AHI as there is no definitive evidence supporting this therapy.[26,27]

Reasons not to treat patients with AHI include no proven efficacy of treatment in this period, drug toxicity, and the potential development of drug resistance. Treatment should only be considered in a research trial or in the presence of very severe symptoms after consultation with an expert HIV clinician.[27]

EXPECTED OUTCOMES OF EARLY TREATMENT

The time taken to achieve viral suppression in AHI may be dependent on a number of host factors. High initial viral loads may prolong the time to viral suppression, while the relatively intact immune system and lower total body viral burden in patients may decrease time to suppression.[4]

Subjects from a multicentre Acute Infection and Early Disease Research Program cohort were enrolled in a study within 6 months of HIV seroconversion and self-selected whether to initiate HAART. CD4+ T-cell counts at 24, 48 and 72 weeks were compared between treated and untreated groups. Initiation of HAART within 2 weeks of seroconversion was associated with viral load and CD4+ T-cell count benefits for 24 weeks after ter-

mination of HAART. Later initiation of HAART showed less benefit in CD4+ T-cell counts, but viral load benefit lasted till week 72. The limitations of the study included a lack of random allocation of treatment, variation in duration of treatment, lack of statistical significance of the CD4+ T-cell count and viral load benefits at 72 weeks, the small sample size, and the need for longer follow-up to assess the durability of the apparent benefit.[28]

The application of HAART treatment for AHI is limited by high costs, drug resistance, and drug-related toxicities. New treatment options such as supervised treatment interruption (STI) are being investigated as alternative options. With the STI strategy, HAART is intermittently stopped once viral load has been reduced to a low level, in order to boost natural immunity by brief exposure to the virus.[29]

In a longitudinal open-label study of STI in 14 patients with acute HIV-1 infection, only transient control of viraemia was achieved after drug interruption. A gradual increase in viraemia and decline in CD4+ T-cell counts was observed in most patients, even after a year or more of viral containment.[29]

Data from the SMART (Strategies for Management of Anti-Retroviral Therapy) trial provided evidence that episodic use of ART based on CD4+ T-cell levels was inferior to use of continuous therapy for treatment-experienced patients and therefore should not be routinely recommended. There was no evidence that interrupting drug exposure was related to fewer adverse events such as myocardial infarction, stroke and renal and liver disease.[30]

The follicular dendritic cell network (FDC) in lymphoid tissues is the major site of HIV storage in the presymptomatic and late stages of disease. In a review of 21 patients from 4 sites, there was no correlation between the duration of infection and accumulation of HIV into the FDC network. The data suggested that a large pool of infectious virus is established soon after infection and that initiation of antiretroviral therapy when symptoms of primary HIV infection are recognised is unlikely to prevent substantial accumulation of virus in the FDC network. Early treatment might, however, maintain immune responses by preserving CD4+ T cells and reducing the FDC virus pool.[31]

CONCLUSION

While it is important on an individual and public health level to identify acute HIV infections, uncertainty still remains regarding the treatment of these identified infections. On a case-by-case basis there may be benefit in treating individuals who present with severe symptoms or persistently low CD4+ T-cell counts to maintain immune system integrity. With regard to the public health benefits, the reduction in transmission needs to be weighed up against the cost and toxicity of widespread treatment.

Other strategies such as vaccines and microbicides also need to be considered in this context in the prevention of transmission and infections.

The author would like to thank Dr Vivian Black for her critical review of the article.

REFERENCES

1. Lyles RH, Munoz A, Yamashita TE, *et al.* Natural history of human immunodeficiency virus type 1 viraemia after seroconversion and proximal to AIDS in a large cohort of homosexual men. *J Infect Dis* 2000; 181: 872-880. http://www.journals.uchicago.edu/doi/pdf/10.1086/315339 (accessed 2 February 2009).
2. Busch MP, Satten GA. Time course of viraemia and antibody seroconversion following human immunodeficiency virus exposure. *Am J Med* 1997; 102: 117-126.
3. Lindback S, Thorstensson R, Karlsson AC, *et al.* Diagnosis of primary HIV-1 infection and duration of follow-up after HIV exposure. Karolinska Institute Primary HIV Infection Study Group. *AIDS* 2000; 14: 2333-2339. http://www.aidsonline.com/pt/re/aids/pdfhandler.00002030-200010200-00014.pdf (accessed 2 February 2009).
4. Kassutto S, Rosenberg ES. Primary HIV type 1 infection. *Clin Infect Dis* 2004; 38: 1447-1453. http://www.journals.uchicago.edu/doi/pdf/10.1086/420745 (accessed 2 February 2009).
5. Bollinger RC, Brookmeyer RS, Mehendale SM, *et al.* Risk factors and clinical presentation of acute primary HIV infection in India. *JAMA* 1997; 278: 2085-2089. http://jama.ama-assn.org/cgi/reprint/278/23/2085 (accessed 11 February 2009).
6. Stevens W, Akkers E, Myers M, *et al.* High prevalence of undetected, acute HIV infection in a South African primary care clinic. Abstract, 3rd International AIDS Society (IAS) Conference on HIV Pathogenesis and Treatment, Rio de Janeiro, Brazil, 24-27 July 2005.
7. Pilcher CD, Eron JJ Jr, Galvin S, Gay C, Cohen M. Acute HIV revisited: new opportunities for treatment and prevention. *J Clin Invest* 2004; 113: 937-945. http://www.jci.org/articles/view/21540/pdf (accessed 24 February 2009).
8. Janssen RS, Holtgrave DR, Valdiserri RO, Shephard M, Gayle HD, De Cock KM. The serostatus approach to fighting the HIV epidemic: prevention strategies for infected individuals. *Am J Public Health* 2001; 91: 1019-1024. http://www.ajph.org/cgi/reprint/91/7/1019 (accessed 24 February 2009).
9. Pilcher CD, Eron JJ Jr, Vemazza PL, *et al.* Sexual transmission during the incubation period of primary HIV infection. *JAMA* 2001; 286(14): 1713-1714. http://jama.ama-assn.org/cgi/content/extract/286/14/1713 (accessed 11 February 2009).
10. Geise R, Maenza J, Celum CL. Clinical challenges and diagnostic approaches to recognizing acute human immunodeficiency virus infection. *Am J Med* 2001; 111: 237-238. http://linkinghub.elsevier.com/retrieve/pii/S0002934301008877 (accessed 24 February 2009).
11. Wawer MJ, Gray RH, Sewankambo NK, *et al.* Rates of HIV-1 transmission per coital act, by stage of HIV-1 infection, in Rakai, Uganda. *J Infect Dis* 2005; 191: 1403-1409. http://www.journals.uchicago.edu/doi/pdf/10.1086/429411 (accessed 24 February 2009).
12. Novitsky V, Woldegabriel E, Wester C, *et al.* Identification of primary HIV-1C infection in Botswana. *AIDS Care* 2008; 20(7): 806-811. http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2605733 (accessed 24 February 2009).
13. Vanhems P, Hirschel B, Phillips AN, *et al.* Incubation time of acute human immunodeficiency virus (HIV) infection and duration of acute HIV infection are independent prognostic factors of progression to AIDS. *J Infect Dis* 2000; 182: 334-337. http://www.journals.uchicago.edu/doi/pdf/10.1086/315687 (accessed 9 March 2009).
14. Lavreys L, Baeten JM, Chohan V, *et al.* Higher set point plasma viral load and more-severe acute HIV type 1 (HIV-1) illness predict mortality among high-risk HIV-1-infected African women. *Clin Infect Dis* 2006; 42: 1333-1339. http://www.journals.uchicago.edu/doi/pdf/10.1086/503258 (accessed 2 February 2009).
15. *Bull World Health Organ* 4004; 82(6): 462-469. http://www.who.int/bulletin/en/ (accessed 10 February 2009).
16. Kahn JO, Walker BD. Acute human immunodeficiency virus type 1 infection. *N Engl J Med* 1998; 339: 33-39. http://content.nejm.org/cgi/content/full/339/1/33 (accessed 24 February 2009).
17. Lavreys L, Thompson ML, Martin HL, *et al.* Primary human immunodeficiency virus type 1 infection: Clinical manifestations among women in Mombasa, Kenya. *Clin Infect Dis* 2000; 30: 486-490. http://www.journals.uchicago.edu/doi/pdf/10.1086/313718 (accessed 2 February 2009).
18. Fiscus SA, Pilcher CD, Miller WC, *et al.* Rapid, real-time detection of acute HIV infection in patients in Africa. *J Infect Dis* 2007; 195: 416-424. http://www.journals.uchicago.edu/doi/pdf/10.1086/510755 (accessed 2 February 2009).
19. Hoen B, Dumon B, Harzic M, *et al.* Highly active antiretroviral treatment initiated early in the course of symptomatic primary HIV-1 infection: Results of the ANRS 053 trial. *J Infect Dis* 1999; 180: 1342-1346. http://www.journals.uchicago.edu/doi/pdf/10.1086/315002 (accessed 2 February 2009).

20. Hicks CB, Gay C, Ferrari G. Acute HIV infection: the impact of anti-retroviral treatment on cellular immune responses. *Clin Exp Immunol* 2007; 149: 211-216.S. http://www3.interscience.wiley.com/cgi-bin/fulltext/117996335/PDFSTART (accessed 17 February 2009).
21. Berrey MM, Schacker T, Collier AC, *et al.* Treatment of primary human immunodeficiency virus type 1 infection with potent antiretroviral therapy reduces frequency of rapid progression to AIDS. *J Infect Dis* 2001; 183: 1466-1475. http://www.journals.uchicago.edu/doi/pdf/10.1086/320189 (accessed 2 February 2009).
22. Rosenberg ES, Altfeld M, Poon SH, *et al.* Immune control of HIV-1 after early treatment of acute infection. *Nature* 2000; 407: 523-526. http://www.kendallasmith.com/follow/Walker_Nature_9_28_00.pdf (accessed 17 February 2009).
23. Lacabaratz-Porret C, Urrutia A, Doisne JM, *et al.* Impact of antiretroviral therapy and changes in virus load on human immunodeficiency virus (HIV)-specific T cell responses in primary HIV infection. *J Infect Dis* 2003; 187: 748-757. http://www.journals.uchicago.edu/doi/pdf/10.1086/368333 (accessed 17 February 2009).
24. Panel on Antiretroviral Guidelines for Adults and Adolescents. *Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents.* Department of Health and Human Services. November 3, 2008; 1-139. http://aidsinfo.nih.gov/contentfiles/AdultandAdolescentGL.pdf (accessed 11 February 2009).
25. Gazzard BG (BHIVA Treatment Guidelines Writing Group). British HIV Association guidelines for the treatment of HIV-1-infected adults with antiretroviral therapy 2008. 2008 British HIV Association. *HIV Med* 2008; 9: 563-608. http://www.bhiva.org/files/file1030835.pdf (accessed 11 February 2009).
26. Hammer SM, Eron JJ, Reiss P, *et al.* Antiretroviral treatment of adult HIV infection: 2008 Recommendations of the International AIDS Society–USA Panel. *JAMA* 2008; 300(5): 555-570. http://jama.ama-assn.org/cgi/reprint/300/5/555 (accessed 9 March 2009).
27. Maartens G, Venter F, Meintjes G, Cohen K. HIV Clinicians Society Guidelines: Antiretroviral therapy in adults. *Southern African Journal of HIV Medicine* 2008; Jan: 18-31. http://www.sajhivmed.org.za/index.php/sajhivmed/article/view/68/34 (accessed 15 February 2009).
28. Hecht FM, Wang L, Collier A, *et al.* A multicenter observational study of the potential benefits of initiating combination antiretroviral therapy during acute HIV infection. *J Infect Dis* 2006; 194: 725-733. http://www.journals.uchicago.edu/doi/pdf/10.1086/506616 (accessed 2 February 2009).
29. Kaufmann DE, Lichterfeld M, Altfeld M, *et al.* Limited durability of viral control following treated acute HIV infection. *PLoS Med* 2004; 1(2): 137-148. http://medicine.plosjournals.org/archive/1549-1676/1/2/pdf/10.1371_1549-1676_1_2_complete.pdf (accessed 2 February 2009).
30. Jülg B, Goebel FD. Treatment interruption in HIV therapy: a SMART strategy? *Infection* 2006; 34: 186-188. http://www.springerlink.com/content/573032284h528150/ (accessed 2 March 2009).
31. Schacker T, Little S, Connick E, *et al.* Rapid accumulation of human immunodeficiency virus (HIV) in lymphatic tissue reservoirs during acute and early HIV infection: Implications for timing of antiretroviral therapy. *J Infect Dis* 2000; 181: 354-357. http://www.journals.uchicago.edu/doi/pdf/10.1086/315178 (accessed 2 February 2009).

OPINION

CONSERVING (NOT PRESERVING) CULTURE: AVOIDING THE DAMAGE TO CULTURE OF VEILED MORALISM IN HIV EDUCATION

Leigh Price, *PhD*
Shanduko Centre for Agrarian and Environmental Research, Harare, Zimbabwe

Language mechanisms in much HIV discourse insist that a Western-based moralism dominates. These mechanisms include the use of strategic absences of information about the moral grounding of texts, and slippages of meaning where one word is used to refer to many meanings. A common slippage of meaning is use of the word 'polygamy' to refer to a range of behaviours, thus hiding low-HIV-risk sexual practices (polyfidelity) under the same umbrella as high-risk practices (promiscuity) and advocating their general removal. Another dubious method of achieving a moral position is to take a true premise and use it to advance a false conclusion. For example, the true premise that wife inheritance in its historical form is an HIV risk factor does not automatically lead to the conclusion that wife inheritance 'must' be eradicated. This is only one possible conclusion. Another more culturally sensitive conclusion could be that wife inheritance should be embarked upon, as should all sexual relationships, in a context of HIV tests and safer sexual practice. I argue that moralism (such as 'wife inheritance is morally wrong') cloaked as science (the claim that science 'proves' the moral position that wife inheritance is wrong) is a threat to traditional culture and discriminates against upholders of traditional lifestyles.

Drawing primarily from my experience of HIV education in a development setting in southern Africa, I offer a weak (realist) moral relativism as an alternative to on the one hand the positivist-based, absolutist morality that threatens to destroy traditional cultures in the name of HIV education, and on the other hand extreme cultural relativism in which 'anything goes'. Possibly HIV educators have not done enough to include some traditional safer sex practices in their professional inventory of acceptable behaviours, such as *hlobonga* (thigh sex) and polygamy interpreted as polyfidelity. My hope is that by being more respectful of traditional culture, while encouraging cultural change where necessary, HIV education will register greater success in achieving safer sexual practice. This article will be particularly useful for writers and researchers tasked with achieving behavioural change and/or writing educational materials on HIV in the southern African context.

Criticisms of the ABC (Abstain, Be faithful, Condomise) and abstinence/faithfulness approaches are well established,[1] and yet these remain the core of HIV education. In August 2008, the Global Live HIV Prevention Working Group (GLHWG), representing the thoughts of over 50 prominent HIV activists from around the world, agreed that while behaviour change was a vital part of HIV prevention, current behaviour change strategies of the abstain/be faithful style were not living up to expectations. A key recommendation made by the GLHWG was that prevention strategies should be more culturally and contextually sensitive.[2]

However, culture has also been suggested as a key driver of the HIV pandemic in southern Africa,[3,4] and as a result in the HIV arena in southern Africa today people are talking about 'culture'. For example, UNESCO's main health and culture project is called 'Culture, HIV and AIDS'.[5] A key aspect of the cultural approaches to HIV education involves education around gender issues; it is assumed that women's lack of empowerment, which is largely culturally defined, is linked to women's inability to negotiate safer sex. Another key aspect of cultural approaches to HIV education involves advocacy against people having multiple partners; it is assumed that the traditional culture of much of southern Africa sanctions multiple partnerships and that this is linked to increased vulnerability to HIV infection.

These two trends in HIV education, of respecting culture but also making culture partially responsible for the HIV pandemic, have created an uncomfortable tension. In this commentary I try to resolve this tension, specifically as it pertains to educational interventions.

METHODOLOGY

To carry out this examination of HIV education I use a form of critical discourse analysis (CDA), based on the work of Norman Fairclough.[6-8] Fairclough's discourse analysis work is distinctive in that he explicitly admits a connection to the critical realism (CR) of

Roy Bhaskar.[9] A significant characteristic of CR is that validity is not only judged by empirical measurement but also by explanation. The validity of the claims that I make in this commentary must therefore be judged *inter alia* by their ability to explain the current status quo of HIV education and culture. Furthermore, CR accounts allow judgemental rationalism, allowing us to decide between, in this case, better or worse sexual behaviours. However, the associated epistemic relativism of CR allows a variety of interpretations of facts. In this case, a variety of behaviours may arguably achieve a similar goal of safer sex.

A TANGLE OF SCIENCE, MORALITY AND CULTURE

In much of the HIV educational literature available in southern Africa there is a tangle of science, morality and culture, and in the battle for clarity it seems that traditional culture loses, while only a certain type of morality wins. For example, the science of the sexual transmission of HIV apparently gives support to the idea that polygamy is an HIV liability. The two issues, HIV transmission and polygamy, are so closely linked in much HIV information, education and communication (IEC) material that it is common to come across the misconception that polygamy actually causes HIV infection. Assuming that something is the case, when in fact it is not true, or is at least arguable, is a language strategy that can avoid dissent.[10] For example, the statement 'Zimbabweans agreed that polygamy spreads HIV' can be found on the website of World Links for Development.[11]

Additionally, in much HIV educational material the following terms are incorrectly used synonymously: 'polygamy', 'promiscuity', 'small-house phenomenon' (where a man is secretly polygamous), and 'multiple concurrent partners' (as it suggests, similar to the 'small-house phenomenon' but including situations where the partners do not set up house together).[12] 'Slippage of meaning' or vagueness can be manipulative, such as using one word to mean several things or not being clear as to the meaning in context. In this case, using 'polygamy' to mean many different kinds of non-monogamy could be seen as strategic.[13] While there is evidence that promiscuity, the small-house phenomenon and multiple concurrent partnerships provide preconditions for higher HIV risk,[4,14,15] this relationship has not been conclusively demonstrated for traditional polygamy.[15] On the contrary, there is evidence that lower rates of transmission are present in traditional polygamous communities. For example, in the north of Ghana, where 44% of families are polygamous, the lowest prevalence rates in the country have been recorded.[15] Additionally, where polygamy is the norm but promiscuity is socially unacceptable (such as in Senegal, where Islam strictly forbids promiscuity), people may be at less risk than in societies that frown on polygamy but accept a long series of monogamous relationships.[15] It appears that polygamy can create closed sexual communities that may protect against HIV transmission.[15]

I therefore suggest that the popularity of HIV arguments against the traditional, polygamous lifestyle is not based on scientific evidence but rather on a particular moral position. By conflating all non-monogamous behaviours together, educators can use HIV issues strategically to achieve cultural change towards their version of a moral society. The result is potentially a powerful neo-colonial force that will perhaps succeed where the colonial missionaries failed; namely, it may achieve a large-scale conversion of people away from traditional lifestyles.

POLYGAMISTS IN SOUTHERN AFRICA NOT RECEIVING ADEQUATE HIV EDUCATION

Because a majority of HIV texts do not accept or include traditional polygamist lifestyles, traditional polygamists are not receiving education that addresses their specific circumstances. This discrimination is facilitated by the common avoidance of direct mention of moral positions by educators. Absences of information or presuppositions can be manipulative.[17] For example, in much mainstream HIV literature, especially of the ABC kind, Western Christian-based ideals of the nuclear family are presupposed, while rarely being identified as such. Here it is necessary to qualify that only the dominant Christian position in southern Africa supports monogamy; some Christian sects find no evidence against polygamy. The effect of the omission of the moral base of much HIV education is that the nuclear, monogamous family approach is portrayed as 'what any right-minded person would think' rather than, to a significant extent, a personal, moral, religious choice, which might be different in a different culture.

While the ABC message will seem natural to a monogamous Western-influenced urban African, it is likely to seem foreign to a polygamous, traditional African, such as a Shangaan. One problem with the ABC construction is that it apparently leaves no way for a polygamous family to have children, since condoms are presented as their only safe option. While the ABCs are reader-friendly, the positioning of the condom option at the end of the list also implies that it is a last resort and that people really ought to be faithful to their (only) partner or abstain.[1,18] For a Shangaan, the ABCs will seem to be 'against our culture' and to choose safer sexual behaviour, since it is dressed in Western morality, will be to choose Western morality. For many advocates of safer sex, their task is to convert the Shangaan from polygamy to monogamy. I disagree. I think their task is to encourage safer sex, and it is possible to have safer sex within a polygamous context.[15,16]

CRIES OF 'IT'S AGAINST OUR CULTURE': BOTH VALID AND NOT VALID

Therefore, while I have some problems with cries of 'it's against our culture', which I will mention later, I also have some sympathy for them. When a person enters an HIV counselling centre, she or he should be offered a variety of information, education and communication (IEC) and counselling options, based on her or his religious and cultural preferences. This is just as important as offering packages in vernacular languages. To offer an HIV package steeped in Western morality, but merely translated into, for example, the Shangaan language, is effectively (if not purposively) to use a Trojan horse approach to changing culture; the recipients of safer sex interventions become initiated into Western sexual morality as a by-product of their safer sex education. The questionable assumption here is that the same message is appropriate in all contexts and this message merely needs to be translated into different languages.

PRACTICAL ADVICE ON CONSERVING CULTURAL HERITAGE IN THE CONTEXT OF HIV

However, it would be remiss to assume that all cultural practices are appropriate after the HIV pandemic, simply because of their historical existence. This is where unthought-through cries of 'it's against our culture' need to be questioned. How do we conserve cultural heritage, while nevertheless ensuring safer sexual practice?

We can do this by looking at a cultural practice and asking 'If it is unsafe according to our medical understanding of the modes of transmission of the virus, how can we change it in a way that is culturally sensitive?' Many cultural practices are clearly unsafe as they are, such as the use of unsterilised blades for circumcision ceremonies. However, the essential aspect of the practice can be conserved by making relatively minor changes. Circumcision can be carried out safely if sterile conditions are maintained. Similarly, some sexual practices may be unsafe as they are, but can lose their high risk through relatively small changes. For example, the practice of a man marrying his brother's widow is risky in its historical form. However, it would be significantly less risky if the wife and future husband were properly tested for HIV, then received safer sex counselling depending on the outcome of the tests. Attempting to stamp out the practice, instead of exploring ways to adapt it, could be a sign that inappropriate moralism is present. In this example of wife inheritance, educators should avoid making strategic use of the presence of the (surmountable) HIV hazards of the practice to achieve an unrelated, moral, culture-changing goal of stopping the practice. This is an example of the questionable use of science to justify a moral position.

Because, like Sayer,[19] I am a weak moral relativist, I agree that there are arguments against wife inheritance, such as those influenced by religion or feminism. Personally, I am convinced by many feminist arguments. I also believe it is important to allow religious commentators to air their views. However, people with values they would like to argue for (moralists) should be up-front about their moral position. Because of HIV education, traditional people are changing their culture, sometimes when they do not need to do so from a medical point of view. Moralists are not drawing clear lines between values derived from medical facts and values derived from other arenas and are exploiting the confusion. To try to change culture because of religious or social equality reasons, but to do so indirectly by using the HIV pandemic, is to be condescending towards the recipients of HIV education. To preach a message of morality but to cloak it as something else is to mistrust the power, even the truth, of that message.

HLOBONGA (THIGH SEX) AS A SAFER SEX ALTERNATIVE

From the perspective of reducing HIV infection, trying to 'amend' people's 'immorality' at the same time as their safer sex behaviour might be counter-productive; some people turn away from safer sex education altogether if it seems too foreign to their moral norms.[20] Perhaps further evidence of the conflation of Western morality and HIV education is that traditional practices that may limit the spread of HIV, such as the traditional pre-marriage practice of thigh sex (*hlobonga* in Zulu), have not been adequately explored. In the past *hlobonga* allowed for safer sexual experimentation.[21,22] *Hlobonga* does not involve the sharing of bodily fluids and therefore poses a low risk of sexual transmission of infections. Furthermore, because *hlobonga* is not abstinence, given a broad definition of sex, it might satisfy those who suggest that abstinence 'is not part of our culture'. There is evidence that *hlobonga* was used successfully in the past *inter alia* to prevent sexually transmitted diseases. In the early 1900s many migrant African mineworkers (such as the Zulu and Shangaan) preferred *hlobonga* to conventional sex in the absence of their wives, whereas the Basotho workers disdained the activity as a mere boyish activity. The Basotho preferred conventional heterosexual intercourse. By the 1930s the Basotho had a much higher rate of syphilis, nearly 10 times higher than certain other tribal groupings of workers.[22] Incidentally, *hlobonga* was traditionally the preferred method used by men who had sex with men (MSM); many of the mineworkers took male 'wives' during their time away from home, and *hlo-*

bonga was frequently used for sexual experimentation between young herdboys.[22]

ABCTs INSTEAD OF THE ABCs

Perhaps, in order to be sensitive to the traditionalists and to begin the process of finding a properly southern African approach to HIV education, the ABCs (if we decide to keep them at all) should become the ABCTs (Abstain, Be faithful, Condomise, Try traditional thigh sex). 'Be faithful' might also be re-interpreted to include both the fidelity of monogamous couples and the polyfidelity of traditional polygamous unions. Polyfidelity describes the situation where the spouses of the polygamous household carry out intercourse only among themselves. Advice might also be given on the importance of having HIV tests when choosing multiple spouses. Perhaps the traditional practice whereby a man must marry his brother's widow could also be reinterpreted in the context of HIV with the insistence on HIV testing and/or symbolic marriage that brings the widow into the household and gives her children security but does not involve conjugal rights. Thigh sex would be appropriate safer sex for both heterosexual and homosexual activities. The historical existence of thigh sex among African MSM provides an antidote to so-called traditionalists who claim that homosexuality is un-African. Note how these suggestions do not detract from the original ABC message but add to it. The suggestions allow the ABCs to become more inclusive of a variety of lifestyle options. In their current form, the ABCs discriminate against African people who practise their traditional culture. The ABCTs approach encourages a return to some of the traditional practices, such as *hlobonga*, and the traditional polyfidelity of polygamous unions. Koktvedgaard Zeitzen[23] addresses some of the difficult and controversial issues facing modern polygamists such as prejudice and women's emancipation. A recent *New Scientist* article[24] has found that men in polygamous marriages tend to live longer than men in monogamous relationships, further indicating that blanket positions against polygamy may need to be reassessed. A hope for the educational approach advocated here, which accepts many kinds of sexual union, is that it will reduce HIV transmission by making HIV education palatable to a wider variety of people.

CONSERVING, NOT PRESERVING, CULTURE

To conserve culture is to ensure that it keeps its distinct characteristics but continues to serve the interests of its practitioners. Nevertheless, in a changing world, culture must also necessarily change if it is to remain useful. To preserve culture is to keep it pure from modern influences, and is perilous in the current HIV context. In this article, I have argued that we can achieve safer sexual practice while conserving, but not preserving, culture if we avoid the conflation of Western morality with safer sexual practice and accept the validity of a broader range of moral positions. HIV behavioural interventions based on feminist or religious premises are particularly vulnerable to inadvertent, veiled moralistic positions, especially, but not uniquely, concerning the issue of polygamy. However, we should not stop addressing moral issues; rather, we should make our moral positions transparent and meticulously avoid clouding morals informed by medical values with morals informed by values drawn from other sources.

Conflict of interest. There was no conflict of interest in the writing of this article.

REFERENCES

1. Barnett T, Pankhurst J. HIV/AIDS: sex, abstinence, and behaviour change. *Lancet Infect Dis* 2005; 5(9): 590-593.
2. Global HIV Prevention Working Group (GHPWG). *Behavior Change and HIV Prevention: (Re)Considerations for the 21st Century.* 2008. http://www.globalhivprevention.org/august2008_release.html (accessed 20 January 2009).
3. Ntseane PG. Cultural dimensions of sexuality: empowerment challenge for HIV/AIDS prevention in Botswana. Paper presented at the International Seminar/Workshop on Learning and Empowerment: Key Issues in strategies for HIV/AIDS Prevention, 1-5 March 2004, Chiangmai, Thailand. http://www.unesco.org/education/uie/pdf/Ntseane.pdf (accessed 5 September 2005).
4. Halperin D, Epstein H. Why is HIV prevalence so severe in Southern Africa? The role of multiple concurrent partnerships and lack of male circumcision: Implications for AIDS prevention. *Southern African Journal of HIV Medicine* 2007; March: 19-25.
5. UNESCO (United Nations Educational, Scientific and Cultural Organization) *Culture, HIV and AIDS.* 2008. www.unesco.org/culture/aids (accessed 4 January 2009).
6. Fairclough N. *Language and Power.* New York: Longman, 1989: 152-154.
7. Fairclough N. *New Labour, New Language?* London: Routledge, 2000: 157-163.
8. Fairclough N. *Analysing Discourse: Textual Analysis for Social Research.* London: Routledge, 2003.
9. Bhaskar R. *Reclaiming reality: A Critical Introduction to Contemporary Philosophy.* London: Verso, 1989.
10. Fairclough N. *New Labour, New Language?* London: Routledge, 2000: 163.
11. WorLD (World Links for Development). *Challenges to HIV Prevention.* 2000. http://www.world-links.org/aidsweb/goal3.html (accessed 22 December 2008).
12. Brady E. *Healing Logics: Culture and Medicine in Modern Health Belief Systems.* Logan: Utah State University Press, 2001: 137.
13. Fairclough N. *New Labour, New Language?* London: Routledge, 2000: 157.
14. Chingandu L. *Multiple Concurrent Partnerships: The Story of Zimbabwe – Are Small Houses a Key Driver?* Harare: Southern African Information Dissemination Service, 2007. http://www.kubatana.net/html/archive/hivaid/070612lc.asp?sector=HIVAID (accessed 5 January 2008).
15. CHGA (Commission on HIV/AIDS and Governance in Africa). *Securing Our Future: Report of the Commission on HIV/AIDS and Governance in Africa. An Initiative of the Secretary-General of the United Nations.* Addis Ababa: United Nations Economic Commission for Africa, 2008. http://www.uneca.org/chga/Report/ (accessed 4 January 2009).
16. Kalipeni E, Craddock S, Oppong J, Ghosh J. *HIV and AIDS in Africa: Beyond Epidemiology.* Oxford: Blackwell Publishing, 2004: 74.
17. Fairclough N. *Language and Power.* New York: Longman, 1989: 152-154.
18. Wetherell M, Yates S, Taylor S. *Discourse as Data: A Guide for Analysis.* London: SAGE, 2001: 259.
19. Sayer A. *Realism and Social Science.* London: Sage Publications, 1999: 172-189.
20. Underhill K, Montgomery P, Operario D. Sexual abstinence only programmes to prevent HIV infection in high income countries: Systematic review. *BMJ* 2007; 335: 248.
21. Epprecht M. 'Unnatural vice' in South Africa: The 1907 Commission of Enquiry. *The International Journal of African Historical Studies* 2001; 34(1): 121-140. http://www.jstor.org/pss/3097289 (accessed 22 December 2008).
22. GALZ (Gays and Lesbians of Zimbabwe). *Unspoken Facts: a History of Homosexualities in Africa.* Harare: GALZ, 2008: 162.
23. Koktvedgaard Zeitzen M. *Polygamy: A Cross-cultural Analysis.* Oxford: Berg Publishers, 2008.
24. Callaway E. Polygamy is the key to a long life. *New Scientist* 2008; 19 August. http://www.newscientist.com/article/dn14564-polygamy-is-the-key-to-a-long-life.html (accessed 20 December 2008).

OPINION

SEX, LIES AND DISCLOSURES: RESEARCHERS AND THE REPORTING OF UNDER-AGE SEX

Ann Strode, *BA LLB, LLM*
Faculty of Law, University of KwaZulu-Natal, Pietermaritzburg

Catherine Slack, *BA, MA Clin Psych*
HIV/AIDS Vaccines Ethics Group, School of Psychology, University of KwaZulu-Natal, Pietermaritzburg

Children (persons under 18) are a vulnerable group and require legal protection because of their youth and inexperience.[1] As a result, various provisions in the law ensure the care and protection of children through mechanisms such as mandatory reporting obligations, which generally require persons in positions of authority, in special relationships with children or even strangers to report to the authorities when a child is in need of care and protection.[2] Within this context, a recent change in the law has placed an obligation on any person who is aware of a sexual offence having been committed against a child to report this to the police in terms of the Criminal Law (Sexual Offences and Related Matters) Amendment Act, hereafter referred to as the 'Sexual Offences Act'.[3] Given that it is an offence in terms of this Act to have sex below the age of 16, researchers involved in research with teenage participants in the course of which they may become aware that participants are engaging in sex or sexual activity but are under the age of 16 will be obliged to inform the police of this fact.

This article describes the changes introduced by the Sexual Offences Act and the implications it poses for the research relationship. It proposes non-compliance with certain provisions in this Act when specific conditions are met, and concludes with recommendations for advocacy against inappropriate and senseless reporting of consensual under-age sex or sexual activity.

OVERVIEW OF THE SEXUAL OFFENCES ACT

On 16 December 2007 parts of the new Sexual Offences Act came into operation. Among other things the Act aims to address the vulnerability of children (persons under 18) to sexual abuse or exploitation by enacting a number of new, expanded or amended provisions. It provides among others that:

- A male or female under the age of 12 years is incapable of consenting to a sexual act (section 57(1)).
- The age of consent to sexual penetration and other related sexual activities is 16 (s 15 and 16).
- If anyone engages in consensual sexual activity (which includes penetration) with a child between the ages of 12 and 16, they are both committing the crime of statutory rape.
- If anyone engages in consensual sexual activity (which includes non-penetrative direct or indirect contact with the genital organs or mouth) with a child between the ages of 12 and 16, they have both committed the crime of statutory sexual assault (s 16).
- Sexual exploitation of children, with or without their consent, is an offence. This can occur when a person unlawfully uses a child as a sex worker (s 17(1)). It is also an offence to facilitate the involvement of a child in sex work and to live off the earnings of a child involved in sex work (s 17(2) and (5)).
- Children may not be involved in or exposed to child pornography (s 19).
- It is an offence to compel children to witness various sexual acts or offences (s 21).
- It is an offence to 'flash' or expose certain body parts to children (s 22).

This Act also creates a broad obligation to report any sexual offence involving a child. Section 54(1) places this duty on 'any person' to report this information 'immediately' to a police officer. The duty comes into operation once the person is 'aware' of a sexual offence involving a child. The *Oxford Dictionary* defines awareness as 'having knowledge', so any person with information that any of the child sexual offences described in the Act have been committed is obliged to report this to the police. Any person failing to comply with this obligation commits an offence and may be sentenced to a fine or a maximum of 5 years in prison or both (s 54(1)(b)).

IMPLICATIONS AND RECOMMENDATIONS

In many instances researchers may become aware through biomedical or social science research that an adolescent is involved in a sexual offence because they will have knowledge of a child's sexual activity – this may be because they ask adolescents questions about their sexual activity, identify sexually transmitted diseases or provide HIV testing services or access to contraceptives. Many of these adolescents will be between the ages of 12 and 16. Through these interactions researchers may well gain knowledge of a sexual offence that has been committed against or by a child.

The issue of reporting under-age sex is very complex, as in our view there are various categories of under-age sex. The first is under-age sex that is non-consensual, for example an adolescent of any age who has been raped. The second is under-age sex that is 'consensual' but could be regarded as abusive or exploitative, for example, a 15-year-old having sex with an 35-year-old for air time. The third is under-age sex and sexual activity that is 'consensual' and non-exploitative, for example, two 15-year-olds in a peer relationship.

Accordingly, we argue that under-age sex and sexual activity that is 'consensual' and non-exploitative should be treated differently from the first two categories. We submit that researchers should *not* report consensual, non-exploitative under-age sex or activities to the police. This approach requires researchers and research ethics committees to agree to not apply one portion of the Sexual Offences Act, and opens researchers to the possibility of being charged with violating the Act.

However, we argue that reporting consensual non-exploitative underage sex is in direct conflict with the principles articulated in the Children's Act,[4] which expressly allows children under the age of 16 to access services such as contraceptive advice and methods, HIV testing, and medical treatment – the underlying principle being that they ought to be drawn into the service system and not excluded from it by the paternalistic approach of the criminal law.

Our approach is in line with the rights provided for in the Children's Act, which recognises the emerging autonomy of children by giving them the right to access to information on health promotion and the prevention and treatment of ill-health/diseases (s 13), to confidentiality regarding their health status provided this is in their best interests (s 13), to consent independently to HIV testing from the age of 12 (s 130) and to access contraceptives independently, and to confidentiality in this regard from the age of 12 (s 134). This approach can also be defended on the ethical grounds that harmful activities (non-consensual or exploitative) are reported, but that non-harmful activities (consensual and non-exploitative) are not reported because this is unlikely to protect children, may erode trust in adult or authority figures, and may decrease the veracity of disclosures children make to research staff – impeding the ability to steer them to appropriate services. Furthermore, the Sexual Offences Act itself seems to imply that where under-age sex is not exploitative prosecutions are only to be instituted in exceptional circumstances. Section 15(2)(a) states that where both children were under the age of 16 at the time of the alleged offence prosecutions are only to be instituted if authorisation has been obtained from the National Director of Public Prosecutions.

If this approach is considered to be unworkable because, for instance, researchers are vulnerable to being charged with being in contravention of the Sexual Offences Act, then researchers could consider reporting all sexual offences, including instances of consensual non-exploitative sexual activity. In this case, there could be either formalistic of full compliance with the law. If researchers opt for formalistic compliance they could do this through submitting a monthly sheet of names of adolescents having committed the sexual offences of consensual sex or sexual activity under the age of 16 with a member of their peer group, using a brief form. This could be sent to their closest police station. This form could contain the names of the adolescents but not other details, thus to some extent protecting the relationship between participant and researcher. Alternatively, there could be full compliance with the law by providing the police with all details of the under-age sex including the names and addresses of the participants.

We think both approaches have disadvantages because they may: (*i*) baffle community groups being mobilised for the research; (*ii*) impact on the scientific validity of the data the research is collecting, as adolescents may be less truthful; (*iii*) impact on enrolment practices, perhaps skewing enrolment towards a certain category of adolescent, affecting the generalisability of the data; (*iv*) increase risks of social harms for adolescents (like stigma); (*v*) be difficult to explain to adolescents and parents in the consent process; (*vi*) represent a threat to confidentiality as, in small communities, adolescents may be known to the police, and the protection of the list once in the hands of the police cannot be guaranteed; and (*vii*) erode beneficial aspects of the research such as steering adolescents in need to the appropriate services.

CONCLUSIONS

We argue that researchers should not comply with the mandatory reporting obligations for under-age consensual, non-exploitative sexual activity on the carefully considered grounds described above.

In *all other cases* there should be reporting, even of sex or sexual activity that is described as consensual by the adolescent, but appears exploitative in nature.

This approach may actually require researchers to work harder than if they merely followed the letter of the law, by requiring them to assess the consensual, non-exploitative nature of the sexual activity, intervene in various ways to assist children, and design consent forms and processes with enough detail to enable parents and children to fully understand when reporting of sexual activity will occur.

We argue that because mandatory reporting of underage sex/sexual activity (even consensual and non-exploitative activity) may alienate children from services and 'punish' them by reporting their conduct to the police, advocacy is needed for a change to the Sexual Offences Act to ensure consistency with the approach taken in the Children's Act.

REFERENCES

1. Kruger JM, Robinson JA. The legal status of children and young persons. In: Robinson JA, ed. *The Law of Children and Young Persons*. Durban: Butterworths, 1997: 1-48. .
2. South African Law Reform Commission. Report on the Review of the Child Care Act (2002). http://www.doj.gov.za/salrc/reports/r_prj110_childcare/r_pr110_cont_2002dec.pdf (accessed 20 May 2009).
3. Act No. 32 of 2007.
4. Act No. 38 of 2005.

Erratum

In the article entitled 'The ghost of AIDS denialism: Manguzi Hospital and dual loyalty', which appeared in the third issue of this journal last year, there was an error in order of authorship. The first author should have been Donna Knapp van Bogaert, and the correct citation is as follows: Donna Knapp van Bogaert, Marlise Richter. The ghost of AIDS denialism: Manguzi Hospital and dual loyalty. *Southern African Journal of HIV Medicine* 2008; 9(3): 8-12, 14.