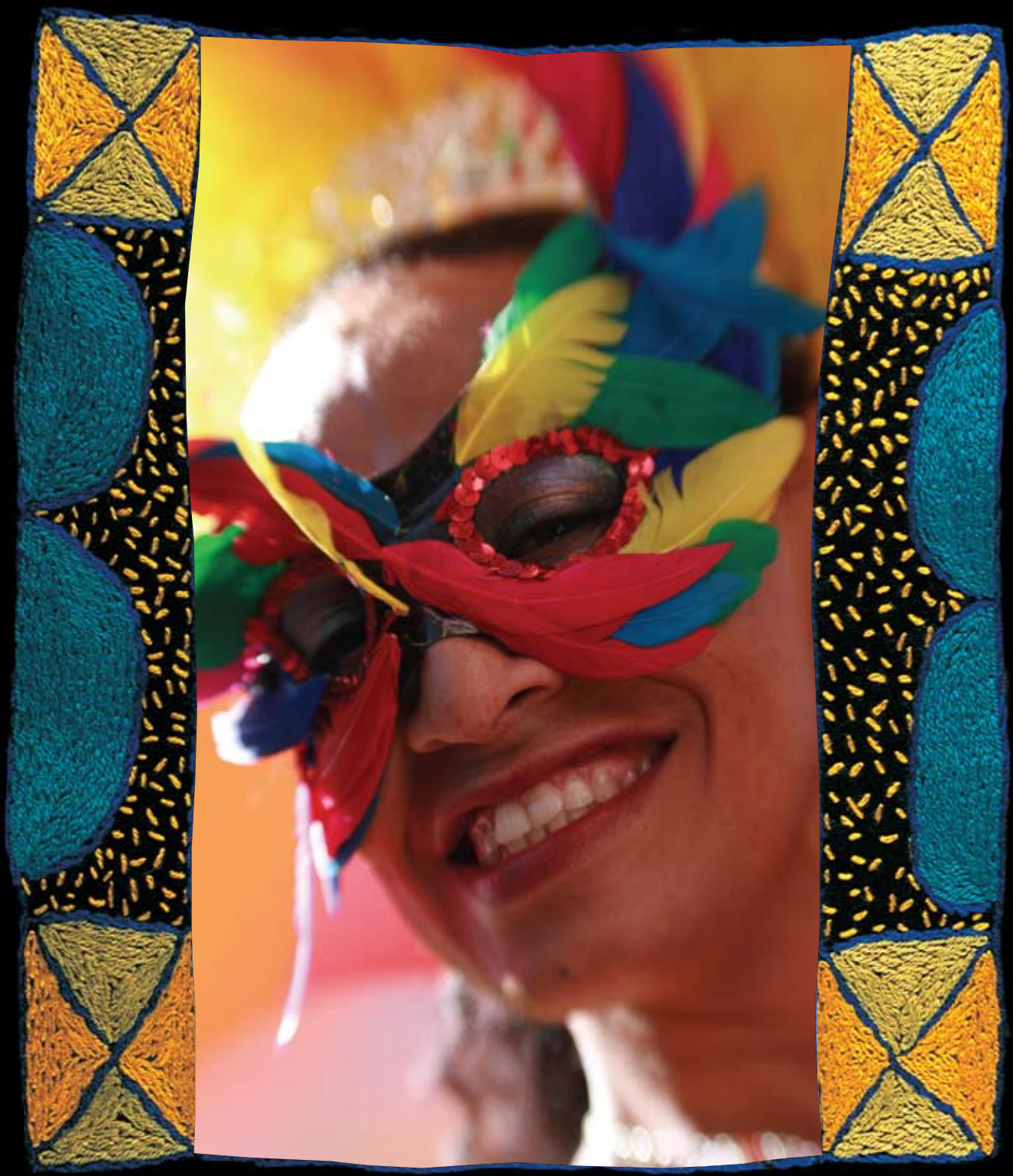
SOUTHERN AFRICAN JOURNAL OF HIV MEDICINE



APRIL 2010

APRIL 2010

SOUTHERN AFRICAN JOURNAL OF HIV MEDICINE

ISSUE THIRTY-SEVEN

CONTENTS

Cover: *The Cape Town 2010 PRIDE Parade highlighted many of the city's visible lesbian, gay, bisexual and transsexual communities. Our cover photo, taken by Sandra Maytham-Bailey, shows a masked drag performer in her colourful attire. Photos elsewhere in this issue were taken at the same event (photographer Eubel Gonzalez).*

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

FROM THE EDITOR

It is an interesting time in South Africa ... with public debate on education, the judicial system, and whether or not politicians should be allowed to say and sing what they like in public, to name just a few issues. The journal also takes on controversy this quarter, and I hope will elicit some debate. I remind you that the opinions expressed in its pages are not necessarily supported by the editorial committee or the Clinicians Society!

The first three papers in this issue are such articles, the first being the Ruben Sher Memorial Lecture delivered by Judge Edwin Cameron some weeks ago. He describes his own testing experience and makes a case for why the human rights activism around testing is less relevant in the era of effective HIV treatment, and why HIV testing should be normalised. The SA Government will be attempting to do just that through countrywide scale-up of testing. An intriguing article probes the impact of a 'sexual abstinence month', and Kenyon grapples with some epidemiological 'holy cows' and questions the attribution of poverty as a driver for the epidemic in southern Africa.

The new public sector guidelines are out, and for easy reference we asked Celicia Serenata from SANAC to give a succinct summary of the differences. Our review this quarter looks at cytomegalovirus co-infection, but also comments on treatment options for South African practitioners and calls for antiviral price review. We thank visiting opthalmologist Sophia Pathai for her corroborating comment.

The last three articles are original research. The first looks at mortality trends in a hospital district after the introduction of ART, the second at mental health, and the third at laboratory abnormalities in HIV-infected pregnant women.

Remember, we will welcome your letters should any of the above invoke the need to respond! However, I hope this edition will also raise discussions at your place of work and among your colleagues. Whichever, I hope you enjoy it, and am happy that we have got to a position in our country where relevant and appropriate issues can be freely debated.

LINDA-GAIL BEKKER
Editor

MESSAGE FROM THE EXECUTIVE

Weirdness appears to be affecting African HIV prevention efforts recently. Governments seem to think that criminalising HIV transmission, on a continent where the vast majority of people do not know their status, is an important way to control HIV. Legislation has been enacted, or is being considered in several countries, despite evidence that this simply stigmatises people with HIV. A particularly bizarre and disturbing bill being considered in Uganda called for the death penalty against gay men who transmit HIV (implying that it is more OK to transmit if you are straight). It also implies that HIV in Uganda, where numbers of cases have been on the rise for the past few years, is driven by gay men, when all data suggest that the epidemic remains heterosexual. Human rights and other organisations appear to have stopped the Uganda bill; not because it was seen as dangerous, rather because it was a threat to donor funding – Obama called the bill 'odious'. You can read our letter to the Ugandan parliament at http://www.sahivsoc.org/.

What is most frustrating, though, is the silence of the medical fraternity in all this. Where are the local health care worker and public health organisations, condemning their government's idiocy? For too long patients have had to rely on treatment activist organisations and international agencies to protect them. Health care worker organisations should loudly condemn unscientific approaches to dealing with HIV, especially when these may harm their patients.

HIV prevention has proven very complicated. Quick-fix, emotional, prejudiced and unscientific solutions are hardly going to help. Governments listen to health care workers, as we have status and power. Organisations need to stand up to dangerous policy and legislation.

FRANCOIS VENTER
President

FROM THE EDITOR

It is an interesting time in South Africa ... with public debate on education, the judicial system, and whether or not politicians should be allowed to say and sing what they like in public, to name just a few issues. The journal also takes on controversy this quarter, and I hope will elicit some debate. I remind you that the opinions expressed in its pages are not necessarily supported by the editorial committee or the Clinicians Society!

The first three papers in this issue are such articles, the first being the Ruben Sher Memorial Lecture delivered by Judge Edwin Cameron some weeks ago. He describes his own testing experience and makes a case for why the human rights activism around testing is less relevant in the era of effective HIV treatment, and why HIV testing should be normalised. The SA Government will be attempting to do just that through countrywide scale-up of testing. An intriguing article probes the impact of a 'sexual abstinence month', and Kenyon grapples with some epidemiological 'holy cows' and questions the attribution of poverty as a driver for the epidemic in southern Africa.

The new public sector guidelines are out, and for easy reference we asked Celicia Serenata from SANAC to give a succinct summary of the differences. Our review this quarter looks at cytomegalovirus co-infection, but also comments on treatment options for South African practitioners and calls for antiviral price review. We thank visiting opthalmologist Sophia Pathai for her corroborating comment.

The last three articles are original research. The first looks at mortality trends in a hospital district after the introduction of ART, the second at mental health, and the third at laboratory abnormalities in HIV-infected pregnant women.

Remember, we will welcome your letters should any of the above invoke the need to respond! However, I hope this edition will also raise discussions at your place of work and among your colleagues. Whichever, I hope you enjoy it, and am happy that we have got to a position in our country where relevant and appropriate issues can be freely debated.

LINDA-GAIL BEKKER
Editor

MESSAGE FROM THE EXECUTIVE

Weirdness appears to be affecting African HIV prevention efforts recently. Governments seem to think that criminalising HIV transmission, on a continent where the vast majority of people do not know their status, is an important way to control HIV. Legislation has been enacted, or is being considered in several countries, despite evidence that this simply stigmatises people with HIV. A particularly bizarre and disturbing bill being considered in Uganda called for the death penalty against gay men who transmit HIV (implying that it is more OK to transmit if you are straight). It also implies that HIV in Uganda, where numbers of cases have been on the rise for the past few years, is driven by gay men, when all data suggest that the epidemic remains heterosexual. Human rights and other organisations appear to have stopped the Uganda bill; not because it was seen as dangerous, rather because it was a threat to donor funding – Obama called the bill 'odious'. You can read our letter to the Ugandan parliament at http://www.sahivsoc.org/.

What is most frustrating, though, is the silence of the medical fraternity in all this. Where are the local health care worker and public health organisations, condemning their government's idiocy? For too long patients have had to rely on treatment activist organisations and international agencies to protect them. Health care worker organisations should loudly condemn unscientific approaches to dealing with HIV, especially when these may harm their patients.

HIV prevention has proven very complicated. Quick-fix, emotional, prejudiced and unscientific solutions are hardly going to help. Governments listen to health care workers, as we have status and power. Organisations need to stand up to dangerous policy and legislation.

FRANCOIS VENTER
President

FORUM

STIGMA, HUMAN RIGHTS, TESTING AND TREATMENT - TIME FOR ACTION

Ruben Sher Memorial Lecture, 26 November 2009

Edwin Cameron
Constitutional Court of South Africa

Ruben Sher came into my life at perhaps its darkest moment. I was diagnosed with HIV on a rainstorm-filled Friday afternoon in the second half of December 1986. My well-meaning doctor, who had not obtained my consent, phoned me with the bad news and left me in anguish, not only for the weekend but for the ensuing years.

His one act of solicitude in telling me that I was infected with HIV was to suggest that I contact Professor Ruben Sher at the South African Institute of Medical Research (SAIMR).

Uncounselled, unadvised and unsupported, I saw a grim future ahead. And indeed the ensuing years - years of fear, silence and inner shame - were hard.

My HIV diagnosis was shocking for two reasons. I was 33 at the time. I was building a growing practice as a human rights lawyer at a time of challenge and excitement. My diagnosis meant death. There was no cure for AIDS. Indeed, there was no treatment for it. Palliation was the best that medical science could offer. The mortality figures from North America and Western Europe, where the epidemic still seemed predominant, were horrific. By late 1986 perhaps half a million people had died of AIDS in North America alone - most of them, like myself, gay men in the prime of their lives. I had no doubt that death would overtake me soon.

The further reason why my diagnosis shocked me so was in many ways worse. It was the sense of shame, embarrassment, defilement and pollution I felt at being infected with HIV - possibly the most stigmatised disease in human history. I thought my shame stemmed from the fact that, only just out of the closet as an openly gay man, I had become infected with HIV.

This is an outline of a lecture delivered to the SA HIV Clinicians Society on 26 November 2009. The author is indebted to Nicholas Ferreira and Ting Ting Cheng for considerable help.

But, as I was soon to discover, my shame and the stigma of AIDS had little to do with homosexuality.
I became involved in AIDS work not because of my own bodily engagement with the epidemic, but through my human rights work. And through it I met people who, seemingly very different from myself in that they were black and mostly women and mostly poor, nevertheless shared with me a sense of fear and horror at being known to have HIV.

In this bleakest time, I did follow my doctor's advice. I contacted Ruben Sher at the SAIMR. I well knew who he was. An avuncular Spike Milligan-like presence on TV, he had already assumed the role of a foremost public health commentator on AIDS. And he did not merely seem avuncular. He was in truth a voice of compassion and reason in the midst of an epidemic of stigma and fear.

While many of his clinical and academic colleagues - including surgeons at Baragwanath and some academics at Wits - called for isolation and compulsory screening, Ruben stood out as a voice of rationality and justice.

He made the obvious points - that HIV is difficult to transmit; that testing could be imprecise; and that there was no cure for those who sought to be diagnosed. But in times of panic the obvious is rarely stated. Ruben's courage and clarity and persistence in voicing the call for justice in dealing with the epidemic justify our honouring his memory this evening.

At one of the lowest points in my life, on a warm March day in 1987, I went to see him. He offered me kindness and reassurance and, importantly, utter confidentiality. He suggested that I be tested again. And when (inevitably) the test returned positive, he imparted the news, as such news should always be imparted, with gentle matter-of-fact kindness.

As the epidemic grew, Ruben and I started working together. He asked me onto platforms with him. We started being invited to speak together. We even trav-

elled together. I remember one eccentric expedition to Tzaneen, where he and I were billeted in a luxury country lodge for the purpose of speaking to hundreds of farm workers and local officials about AIDS.

Working with Ruben could be trying. In fact, he could drive you nuts. He had a joke he invariably told. It was that you could get HIV whether you are heterosexual, homosexual, bisexual or trisexual. What is trisexual, Ruben would ask his audiences? He would confide triumphantly - it was someone who will try anything.

He had another joke. This one I like better. It was about a rich suburban lady who phoned him suspecting that her Malawian gardener had HIV. She confided to Ruben her fears about her proximity to him. Might he have infected me, she asked? His reply - according to him - was 'Madam, when last did you have sex with your gardener?'

I greatly cared for Ruben and honoured his roles as an academic, as a crusader for right, as a caring clinician and as an astute physician. He gave me a gavel when I became a judge - but the symbol of dispensing to all alike without fear or favour was as appropriate for him as it was for my new job.

For tonight's lecture I hope to meld the themes that entwined my own life with that of Ruben Sher - namely HIV infection, testing, stigma and shame.

FOUR SOCIAL FACTS – MASS SCALE, MEDICAL MANAGEABILITY, CONTINUING DEATHS, AND STIGMA

Four features of the AIDS epidemic stand out in any attempt to grapple with its social meaning.

- First, its scale. Even on recently adjusted lower estimates, AIDS is human society's largest microbially borne pandemic for seven centuries - since one-third of Europe's people died in the great plague of the mid-14th century. Estimates reckon that globally there are around 33 million people living with HIV or AIDS.[1] Of these the great majority (67% or 22 million in 2007) are in sub-Saharan Africa.[2] More than 13 million are black women, and roughly 2 million black children.[3] The total number of people who have died of AIDS is probably close to 30 million (in South Africa, according to the Actuarial Society of South Africa, 2.5 million).[4] Many more deaths are likely to come.
- Against this numbing volume of human fragility, suffering and death stands counterpoised a second fact - that infection with HIV is now fully medically manageable. The revolution that the arrival of treatment implied was not universally or immediately recognised.[5] But it was momentous. If diagnosed early enough, with properly administered combinations of antiretroviral (ARV) medications, the bodily progression of HIV can be stopped, and those sick with AIDS can be restored fully to life and health.

My presence here tonight - more than 12 years after I fell severely ill with AIDS - is evidence of the long-term success and sustainability of treatment. Perhaps the most important political fact about treatment is it works for poor and wealthy patients, in rural and urban settings, and in economically developed as well as undeveloped areas.[6] Given the shroud of horror that surrounded the disease in Western Europe and North America in its first 15 years, and still surrounds it almost everywhere else, this is still a radiant fact. But, as I will show, it continues to be insufficiently appreciated.

- Third, despite the medical manageability of the disease, and the fact that treatment for it - certainly compared with other long-term chronic conditions such as insulin-dependent diabetes - is relatively simple, and that it is increasingly available, millions of people are still dying of AIDS. Especially in Africa: in 2007, 1.5 million people died (75% of all AIDS deaths), 350 000 of them in South Africa. In any terms, this is monstrous: avoidable human suffering, unnecessary deaths, wasted lives.

But why are people still dying of AIDS in Africa and elsewhere when the disease can be easily managed?[7] Much death and illness can be ascribed to the developmental deficits of the locations worst affected: poor health care infrastructure, missing or poorly trained personnel, Africa's burdens of disease (including other easily preventable and treatable diseases),[8] and poverty.

- But much is due to the fourth and most signal fact about AIDS - namely the stigma that surrounds it. It is this I want to talk about tonight: the fact that dying and suffering that is attributable to stigma persists in an epidemic of otherwise manageable disease.

STIGMA AND PUBLIC HEALTH/POLITICAL RESPONSES TO AIDS

Stigma is the mark of blame, rejection, disapproval and shame that society places on conduct and conditions that repel it or elicit its moral censure.

From the first day, society's reaction to AIDS has been defined by stigma.

More than any other disease - more than leprosy, tuberculosis, and the black death, for all of which people

felt understandable fear of contagion - HIV has been intensely stigmatised, even though its transmission occurs in known and narrow circumstances.[9]

It was stigma arising from its initial manifestation among gay men that led President Ronald Reagan to maintain what Randy Shilts called a 'ritualistic'[10] (and blameful) silence about AIDS, for six long years, from 1981 to 1987, implicitly conniving in the deaths of hundreds of thousands of men in the prime of their lives.

It was stigma, less than the rational pursuit of public health goals, that led countries as different as Sweden[11] and Cuba[12] to isolate and detain those with HIV.

And, perhaps most catastrophically, it was stigma that caused our own country's President Thabo Mbeki to question the viral aetiology of AIDS. He did so because he took umbrage at the notion of an epidemic of sexually transmitted disease manifesting in mass form among black Africans.[13]

For 28 years, stigma has pervaded and defined this epidemic. This triggered debate between those who advocated applying ordinary public health measures to the disease, and those who contended that this was inapposite and unjust.

Many argued that the disease should be treated by applying well-known public health principles - primarily in identifying, reporting and isolating those infected with HIV.

Yet HIV was different.

- First, for 15 long years doctors could do very little about it. They could offer only palliation. So diagnosis had strictly limited value.
- Second, a different approach was warranted because of the years of relative wellness that most enjoy before AIDS sets in, and because of difficulties (both technical and patient-related) in diagnosing infection.
- But the overriding - and most persuasive - argument for exceptional treatment of HIV was that society's reaction to it was exceptional.[14]

It was not the infectiousness of HIV, or its viral properties, or its morbid or mortal effects (for in this it was not intrinsically different from many other conditions) that made this disease different: it was stigma.[15]

It was stigma that necessitated anti-discrimination protections for those with HIV or suspected to have it, in medical care, housing, jobs, public facilities and anti-violence legislation.[16]

THE PARADIGM OF AIDS EXCEPTIONALISM

The ensuing debate resulted in a decisive victory for those who urged human rights protections for people with HIV/AIDS. The preponderant, if not quite universal, consensus among public health experts was that AIDS required special treatment. The only dissentients seemed to be policy deviants making ill-judged populist appeals - and even these proved mostly ineffectual.

In our own country, the African National Congress government came to power just as the epidemic seeped remorselessly southwards. In August 1994 it adopted a national AIDS plan that expressly espoused the international human rights consensus, and enacted a very sizeable body of legislation that protects the rights of those with HIV and prohibits unfair discrimination against them.[17] The courts have followed suit.[18]

The most eloquent voices justifying this approach were Dr Jonathan Mann[19] and later Justice Michael Kirby.[20] Their powerful advocacy of the 'AIDS paradox' - the notion that human rights protections for those with and at risk of HIV is an integral component of sound public health practice, and not its enemy - achieved not only moral, but intellectual predominance in virtually all places where international and national AIDS policy was made.

And rightly so. The wellspring of the AIDS paradox is stigma. Because of discrimination and ostracism people are reluctant to be tested, and hence cannot be reached for counselling, treatment and behaviour change interventions.[21] Traditional public health measures (mandatory testing,[22] partner notification, quarantine) merely fuel their fears, driving the disease underground, thus proliferating its spread.

The rational way out is therefore more, not fewer, human rights safeguards for those with HIV: to allay their fears, and to alleviate the horrific impact on them of abuses and malpractices. Only with its main bearers thus protected can the epidemic be rationally managed.[23]

Stigma, the source of the problem, was in this approach confronted obliquely - by protecting those with HIV from its effects; first, by shielding them from the terrifying invasion traditional public health approaches entailed; and second by enacting anti-discrimination protections to diminish the injustice of ostracism.

AIDS EXCEPTIONALISM AND BROADENING ACCESS TO TESTING

But the key practical product of the AIDS paradox, and perhaps its most telling achievement, lay not in warding off invasive public health measures, nor in the enactment of anti-discrimination laws. It took effect in

the medical diagnosis of HIV. It was to hedge testing for HIV with significant prerequisites.

To test for HIV a health care practitioner could not assume consent: nor could it be implicitly, or even generally, given. It had to be explicit, and it had to be specific.

In many jurisdictions,[24] it had to be given in writing. In some, even written consent was not valid unless the test was preceded by statutorily prescribed counselling. In the pre-test counselling session, the counsellor had to warn the patient not merely of the medical implications of a positive diagnosis, but of its social repercussions - the discrimination and ostracism the patient would almost certainly face in consequence.

What is more, because of the risk that those choosing to test might be inferentially associated with HIV, testing had to be done in near-secret - at separate locations, on separate days, in unmarked (or code-marked) rooms. And special measures had to be taken to ensure that the resultant patient information was handled confidentially.

The unquestionable consequence of all this was massive disinducement to testing.

And not without reason. For as long as the major outcome of a positive diagnosis was ostracism, and for as long as doctors were powerless to offer more than palliation, there was little justification for exhorting those at risk to be tested. Its only point was to help them make better lifestyle and safer sex choices.

The disinducement was therefore warranted - and the AIDS paradox served us well for the epidemic's first 15 years.

In some parts of the world, it still serves us well. In the countries of South and East Asia, and in comparably affected regions, human rights activists continue to report that an HIV diagnosis too often provides an excuse for mistreatment, exclusion and denial of medical and other facilities. It remains primarily a badge of shame and a basis for ostracism (including the enactment of harsh criminal laws that target those with HIV).[25]

I can attest to these harsh realities, for they were vividly reported to me in Colombo in September 2007, and in Beijing in October 2008.

In these countries reluctance to testing for HIV remains understandable.

Yet the causes may lie in a distinctive epidemiological pattern. In countries such as India, China and Malaysia the epidemic remains overwhelmingly associated with groups that are still socially and politically marginalised - mainly men who have sex with men, commercial sex workers and intravenous drug users. Public health interventions and policy in these countries necessarily have to recognise this - also in relation to testing.

Yet, since the mid-1980s, the most striking demographic feature of the epidemic has been its racial and continental overload. Most people with HIV are Africans. And most of those dying of AIDS are Africans - more specifically, Africans in the Bantu-speaking regions of central and southern Africa.

In these regions, AIDS is a mass epidemic of heterosexually transmitted disease.

What is distinctive about this epidemic is not merely that the vectors of transmission are different - it is that its consequences are omnipresent.

It is impossible to ask any audience in central or southern Africa who among them have lost family members to AIDS, without a massed sea of hands rising in result. AIDS is everywhere, and its deathly impact presses on every household, every family, every workplace and every street.

And the worst is this. Despite the availability of treatment, despite the good news of its increasingly known efficacy, despite the knowledge of family support and despite legislative and social protections against discrimination, many people in Africa continue to contemplate testing for HIV with dread reluctance.[26] More than dread: deathly reluctance.

DISINCENTIVES TO TESTING

The fact is that many Africans experience stigma so intensely that they 'prefer' (if in such constrained circumstances one can speak of preferences) to die, rather than to be diagnosed with HIV.[27]

Part of this deathly dread stems from the external manifestations of stigma - the enacted discrimination, exclusion, dispossession and violence that are the social product of stigma; since undoubtedly well-warranted fear of discrimination by others inhibits many from choosing to be tested.

But a greater part, in my view, and perhaps the more crucial part, results from internal stigma. This is because too often the external stigma of AIDS finds an ally within - in internalised feelings of contamination, shame, self-revulsion, abasement, defilement and dread that those with HIV and at risk of it experience about themselves - even when they know they will receive acceptance and support from others.

Much of this, I suggest, derives from the fact that, overwhelmingly, HIV is a sexually transmitted disease: and we still poorly understand the intensity, intimacy, embarrassment and shame that our need for sexual connection - which seems to be inescapably human - occasions.[28]

A great deal has been written about external stigma; but surprisingly little - perhaps astonishingly little - about internal stigma. (In a review article in the issue of the journal *AIDS* published to coincide with the international AIDS conference in Mexico in August 2008, there was extensive discussion of stigma and its external manifestations, but no apparent recognition at all of its internal dimension.[29])

Internal stigma consists not of fear of discrimination or hostile treatment at the hands of peers or colleagues, or dread of others' reactions. It is something more opaque, and therefore difficult to confront. It is often stronger than a cognitive appreciation that friends, family and colleagues will offer love; it is stronger even than the knowledge that treatment is now readily accessible (even in many poor African countries). It ultimately proves stronger than the capacity to make life-affirming choices, because it paralyses them in favour of postponement, avoidance and death.

It is the most intractable part of stigma because it comes not from others, but springs from within. And it is more insidious, and more destructive, than external stigma, since it eludes the direct politically determined confrontation with which we fight discrimination.

The result of internal stigma is death, needless death, and its gross attendant human and social costs of suffering, bereavement and loss.

INTERNAL STIGMA AND OBSTACLES TO TESTING – THE ROLE OF HUMAN RIGHTS PROTECTIONS

Recognising stigma's internal dimension raises a new set of questions. These have been particularly hard for AIDS activists and human rights protagonists to confront.

If stigma stems not only from the hostile 'other', but partly from within those who themselves have HIV, we need new methods of understanding its origins and its effects. We need to understand with greater insight what we are combating.

Here I have made an inflammatory suggestion. It is that the very differentness attributed to AIDS, especially in the health care setting, is one of the principal causes of internal stigma, or at least powerfully underscores it. The suggestion involves a provocative corollary: that the human rights protections, carefully and necessarily erected during the early stages of the epidemic to protect against discrimination, have themselves become a potent source of harm.[30]

Particularly in HIV testing, human rights safeguards have become harmful because they emphasise the differentness of AIDS. This reinforces internally those who are scared to test the exceptional, untoward, and distinctive features of AIDS.

Instead of people being diagnosed with mundane medical regularity, and steered towards treatment, diagnosis is hedged around with a fuss and palaver and hullabaloo that accentuates the feelings of self-disabling ignominy those at risk of HIV experience.

In the age of treatment - where AIDS can be medically managed, if only those suffering its effects can be reached timeously - this is a hideous cost.

We cannot without untruth deny or ignore the part that the protections erected against testing play in exacting this cost. Exceptionalism was a necessary response to the public ignorance, disdain, moralism and ostracism those with and at risk of HIV experienced; but it was also its logical counterpart.

Exceptionalism, born in reaction to stigma, has itself helped spawn stigma.

A new and grim equation must be inscribed on the wall of AIDS remembrance, a footnote to the activists' famously plangent equation in the 1980s that Silence = Death: the new equation is that Differentness = Death.

These considerations have given rise to acrid debate between those urging radical expansion of testing in mass-prevalence areas where treatment is available, and those who resist it.

The debate echoes that about AIDS exceptionalism in the 1980s. And its logical and formal premises have hardly changed: its essence still concerns the extent to which ordinary medical precepts and procedures should be applied to the management of HIV.

The contesting protagonists have changed. No longer, as in the 1980s, are the protagonists of de-exceptionalising the disease AIDS-ignorant policy wonks insensitive to its science and politics. They are experts who are themselves deeply versed in the clinical and human skills of AIDS treatment and prevention.

But, more significantly even, the factual setting of the debate has changed. The increasing availability of treatment is now the most important social fact about AIDS.

The test for AIDS policy is whether we can ensure that treatment effectively eclipses stigma, yet without sacrificing any single patient's right to choice, or to confidentiality.

And in this difficult quest, rigid policy positions are unefficacious and unhelpful.

On one side, those who support testing expansion point out that:

- 'Unlike other infectious diseases (e.g. syphilis, hepatitis B), for which consent for testing is implicitly assumed by virtue of medical consultation, and diagnosis is encouraged, the diagnosis of HIV infection has often been actively avoided. In many ways the approach to diagnosis of HIV infection has been more similar to that of an incurable genetic disorder than to an infectious disease'.[31]
- As a matter of fact, this analysis is incontestably accurate. Yet it provoked intensely ireful reaction.
- This was because of the same authors' assertion that 'the emphasis on human rights in HIV/AIDS prevention has reduced the importance of public health and social justice, which offer a framework for prevention efforts in Africa that might be more relevant to people's daily lives, and more likely to be effective'.[32]

On the other side, human rights advocates have resisted the medical 'normalisation' of HIV diagnosis, principally on the premise that expanded HIV testing infringes patient autonomy, and that it exposes those subjected to it to violation of their rights.[33]

Instead of radically and immediately increasing access to testing to diminish the deficit between treatment and death in Africa, we have been told that we must focus on the anxieties of 'the disempowered and still fearful ... by demanding investment in dignified health systems and protection from harmful social and legal effects of their health status being known'.[34]

The argument of those favouring expansion, that death is the ultimate rights violation, and that testing inhibitions collude with it, has not been acknowledged to have force against the motive forces of a 'real world' 'influenced by poverty-determined life choices, gender based violence, [and] fears of discrimination and stigma'.[35]

In this setting, human rights advocates have treated with suspicion or resisted:

- Rapid and more easily accessible forms of testing for HIV (including home-test kits) - currently, HIV tests are not available at the largest retail pharmacy chain in South Africa, Clicks Pharmacy, as well as Dis-chem Pharmacies, another large pharmacy chain. Yet home test kits are available for pregnancy, ovulation, prostate cancer, cannabis, and alcohol (breathalyser): some of the arguments against rapid access to testing are feeble, but some should justly be denounced as bizarre.[36]
- Legislation that compels mothers who might risk passing HIV to their babies to test for HIV so as to be able to receive prophylaxis that would reduce the risk.[37]
- The implementation of opt-out testing in Botswana (a mass-prevalence country where patients presenting for treatment at any public health facility have since 2002 been tested for HIV unless expressly refusing)[38] - even though evidence indicates that 'opt-in' requirements (where the patient must expressly choose to be HIV tested) cause deaths.[39]
- More recently, an article suggesting that universal ARV provision to everyone testing positive for HIV (using a mathematical model of HIV reduction in which everyone seroconverting to HIV is tested within a year) could be an important possible means of preventing and even eliminating endemic HIV dissemination,[40] triggered vigorous criticism from those concerned at its overly medicalist approach.

A group of respected human rights experts issued a statement complaining that the analysis did not address 'the issues of acceptability and safe applicability of universal testing and treatment in the face of widespread stigma and discrimination', and that it 'threatens to serve as justification for imposing mandatory HIV testing'.

This response seemed to me not only to miss the point of the mathematical model; it attributed an unconcern about rights protections to the authors which seems to me troublingly misplaced.[41]

It also failed to appreciate that the authors' argument finally unseamed one of the great canards of the epidemic, namely the supposed disjunct between treatment and prevention, by successfully telescoping the two into one overriding public health strategy.

In my view, we should immediately urge the Health Professions Council to adopt testing guidelines that permit for radically expanded testing.

In this regard, I commend the suggested minimum reasonable approach to testing that Nathan Geffen propounds for a busy, resource-stretched, but functional public health facility.

He suggests that the counsellor follows the following standard procedure with all patients who s/he judges have some risk for HIV:

'Ms X, I would like to proceed to give you an HIV test. If you have HIV, we can help you to live a healthy life because there are safe and effective medicines to treat you.'

At this point Ms X either says No (which is unlikely) or permits the blood to be drawn.[42]

To propound radically expanded testing - in this or other forms, including opt-out testing that does not even mention HIV specifically when a patient presents for general medical treatment - is not to ignore stigma (or to sacrifice confidentiality). It is to seek to mitigate it by more directly effective interventions than have hitherto been applied - including the beneficent effect of more widespread testing and diagnosis - as well as bringing home the fact that testing is a necessary first step to life-restoring treatment.[43]

It is here where recognising the role of internal stigma is critical. To see that stigma is not exclusively external, and that anxiety about testing is not solely about discrimination, is to open a vista of new, more flexible and supple policy positions, and more fruitful debate.[44]

Crucial to that is recognising the cost that human rights may now be exacting in fuelling stigma and in impeding access to testing and treatment.

This is not to decry the vital role of human rights activists in the past - or in the present: it is to question the focus of their engagement. The current trend toward enacting harsh criminal statutes in Africa, that specifically target people with HIV, seems to me a much more pressing and important issue than resisting expansion of treatment.

What is more, there has been a heavy shift of the weight of the argument in favour of expansion of treatment.[45] President Zuma, in a remarkable address to the National Council of Provinces on 29 October 2009, urged 'a massive mobilisation campaign' for testing. The President stated:

'Let me emphasise that although we have a comprehensive strategy to tackle HIV and AIDS that has been acknowledged internationally, and though we have the largest anti-retroviral programme in the world, we are not yet winning this battle. We must come to terms with this reality as South Africans. We must accept that we need to work harder, and with renewed focus, to implement the strategy that we have developed together. We need to do more, and we need to do better, together. We need to move with urgency and purpose to confront this enormous challenge. If we are to stop the progress of this disease through our society, we will need to pursue extraordinary measures. We will need to mobilise all South Africans to take responsibility for their health and well-being and that of their partners, their families and their communities. All South Africans must know that they are at risk and must take informed decisions to reduce their vulnerability to infection, or, if infected, to slow the advance of the disease.

'Most importantly, all South Africans need to know their HIV status, and be informed of the treatment options available to them. Though it poses a grave threat to the well-being of our nation, HIV and AIDS should be treated like any other disease.

'There should be no shame, no discrimination, no recriminations. We must break the stigma surrounding AIDS.'[46]

Common ground between testing expansionists and human rights proponents exists. It lies in their joint commitment to lessening AIDS deaths and human suffering. But harnessing the joint energy in service of those worst affected by the epidemic will require greater flexibility than has until now been evident.

Instead, until now, responses from human rights protagonists have seemed to suggest an overly defensive posture, reacting with alarm to creative new models and suggestions, rather than engaging constructively with them, in the light of the central and luminous fact that testing is the indispensable prerequisite to treatment and care, and thus that it embodies the difference between life and death.[47]

The AIDS epidemic has made the world sadder and older and perhaps wiser.

Some of what we have learnt from the epidemic is that due commitment to medical beneficence cannot always be assumed. We have also learned that technology and science alone will not provide answers if they ignore complex human reactions that spring from the material conditions of people's lives.

But suspicion about medical beneficence and reserve about technology's role does not justify rigid, inflexible and unresponsive defence of human rights protections that may have become outdated and inapposite.

Ruben Sher would have regretted the inaccurate characterisations and unproductive dichotomies that have resulted.

AIDS has been a heavy consciousness, burdening our beings and exacting, at least in Africa, a continuing daily price in grief and bereavement and mourning.

But in the end AIDS exacts its toll on human bodies.
If all could see that more clearly - those at risk of HIV no less than human rights activists and the medical

specialists eager to expand testing and thus save lives - we may begin to assert the primacy of the material and the rational over the shadow of stigma and misconception.

1. See UNAIDS Report on the Global AIDS Epidemic (hereinafter 'UNAIDS Report', at p. 33, available at http://data.unaids.org/pub/GlobalReport/2008/JC1510_2008GlobalReport_en.zip (accessed 21 October 2009).
2. *Idem* at p. 30.
3. *Idem* at p. 33 (globally, there are 2 million children (under 15) living with HIV, of whom almost 90% live in Africa).
4. http://www.actuarialsociety.org.za/Portals/1/Documents/ab739d74-e6fe-483f-b205-718f20195c12.xls; see also on the website of the Treatment Action Campaign http://www.tac.org.za/community/keystatistics. There are an estimated 5.7 million people in South Africa living with HIV in 2007, making this the largest HIV epidemic in the world. UNAIDS Report above at p. 40.
5. See the sceptical, even pessimistic, approach of Catherine Campbell, *Letting Them Die: Why HIV/AIDS Prevention Programmes Fail* (Indiana University Press, 2003), p. 5 ('there is little hope of pharmaceutical solutions being available in ways that can be affordably and effectively implemented in the short-term future by many of the poorest countries where HIV flourishes'), and p.19 (while ART has a role in 'reducing the immensity of the suffering of those who have already been infected, and of their loved ones and careers', 'on their own they neglect the needs of the majority who are not yet infected'); and more recent but comparable scepticism in Helen Epstein's *The Invisible Cure: Why We Are Losing The Fight Against AIDS in Africa* (Picador, 2008).
6. Since 1986 Partners In Health and Zanmi Lasante have provided HIV care in squatter settlements in rural Haiti: see 'Scaling-up HIV treatment programmes in resource-limited settings: the rural Haiti experience', Koenig, Leandre and Farmer, available at http://www.pih.org/inforesources/Articles/AIDS_2004_Koenig-et-al_Scaling_up_HIV_treatment.pdf; Farmer *et al.*, 'An information system and medical record to support HIV treatment in rural Haiti', available at http://groups.csail.mit.edu/medg/people/hamish/hiv-emr-bmj.pdf; also joint partnerships between Médecins sans Frontières (MSF) and the Department of Health in South Africa such as the HIV/AIDS programme in Lusikisiki, Eastern Cape, available at http://www.msf.org.za/docs/lusikisiki_final_report_2006.pdf; the 2000 joint programme in Khayelitsha, Western Cape, 'Comprehensive HIV service development at primary care clinics', available at http://www.msf.org.za/docs/Khayelitsha_report_July_2005.pdf. Experience in countries including Botswana, Tanzania, Thailand, Brazil and Zambia indicates that policy on health care funding can be adjusted to eliminate user charges for HIV treatment, helping to overcome socio-economic barriers and increasing rates of long-term adherence to medication, see 'Progress on global access on antiretroviral therapy, a report on '3 by 5' and beyond', March 2006, available at http://www.who.int/hiv/fullreport_en_highres.pdf.
7. According to a 2008 World Health Organization report, 'Towards universal access: Scaling up priority HIV/AIDS interventions in the health sector', 2.9 million people are receiving ARV therapy in sub-Saharan Africa, while 6.7 people need it. Worldwide, 4 million people have access to ARV therapy, while 9.5 million lack access. Available at http://www.who.int/hiv/pub/tuapr_2009_en.pdf (accessed 22 October 2009). The number of new HIV infections continues to outstrip the increase each year in the number of people on ARV therapy by 2.5 to 1 (UNAIDS report). For South Africa, then health minister Barbara Hogan told SABC radio news on Wednesday 28 January 2009 that 700 000 were on ARV treatment: http://www.iol.co.za/index.php?set_id=1&click_id=125&art_id=nw20090128183422743C506795 (accessed 31 January 2009) - but UNAIDS estimates that 1.3 - 2.1 million South Africans need treatment now.
8. Such as tuberculosis, measles and syphilis - see appendix to Helen Epstein's *The Invisible Cure: Africa, the West, and the Fight against AIDS* (Farrar, Straus and Giroux, May 2007).
9. Stigma (a process model): 'Disease stigmatisation can be defined as a social process by which people use shared social representations to distance themselves and their ingroup from the risk of contracting a disease by (*a*) constructing it as preventable or controllable; (*b*) identifying 'immoral' behaviours in contracting the disease; (*c*) associating these behaviours with 'carriers' of the disease in other groups; and (*d*) thus blaming certain people for their own infection and justifying punitive action against them' (Deacon, *Understanding HIV/AIDS Stigma.* Cape Town: HSRC Press, 2005, p. 23).
10. Randy Shilts, *And the Band Played On: Politics, People, and the AIDS Epidemic* (Stonewall Inn Editions, 1987), p. 588.
11. See Danziger R, 'HIV testing and HIV prevention in Sweden' (*British Medical Journal* 24 January 1998), available at http://findarticles.com/p/articles/mi_m0999/is_n7127_v316/ai_20303083/pg_2 (accessed 31 January 2009).
12. Hansen H, Groce N, 'Human immunodeficiency virus and quarantine in Cuba' (*JAMA* 2003; 290: 2875), available at http://jama.ama-assn.org/cgi/content/full/290/21/2875 (accessed 31 January 2009).
13. See Nicoli Nattrass, *The Moral Economy of AIDS in South Africa* (Cambridge University Press, March 2004), *Mortal Combat: AIDS Denialism and the Struggle for Antiretrovirals in South Africa* (University of Natal Press, July 2007), and *Denying AIDS: Conspiracy Theories, Pseudoscience, and Human Tragedy* (Springer Verlag, February 2009) co-written with Seth C Kalichman.
14. Ronald Bayer, 'Public health policy and the AIDS epidemic. An end to HIV exceptionalism?' (*N Engl J Med* 1991; 324: 1500-1504); see also Ronald Bayer and Claire Edington, 'HIV testing, human rights, and global AIDS policy: Exceptionalism and its discontents' (*Journal of Health Politics, Policy and Law* 2009; 34(3)).
15. Wynia MK, 'Routine screening: Informed consent, stigma, and the waning of HIV exceptionalism' (*Am J Bioethics* 2006; 6(4): 5) explains AIDS exceptionalism as 'the notion that being diagnosed with HIV is so different from any other diagnosis that it must be handled very differently. There should be exceptional confidentiality protections, because the information involved is so sensitive; exceptional informed consent, because the test is so personally invasive; and exceptional caution prior to testing, since a positive result can be so disruptive'. It has rightly been pointed out that this view of HIV testing in particular derives from the genetic counselling model of testing for untreatable conditions, which no longer applies: Frieden TR, *et al.*, 'Applying public health principles to the HIV epidemic' (*N Engl Med J* 2005; 335: 22: 2397).
16. Titles I and II of the Americans with Disabilities Act (ADA) protects individuals with disabilities from discrimination in employment and in the enjoyment of all public entities such as schools, doctors' rooms and shopping malls. The express intent of the ADA was to define 'disabilities' broadly (see *Board of Nassau County v. Arline*, 480 U.S. 273 (1987); and in the ADA Amendments Act of 2008). Similarly to Title I of the ADA, the US Rehabilitation Act of 1973 prohibits discrimination on the basis of disability in programmes conducted by Federal agencies, in programmes receiving Federal financial assistance, in Federal employment, and in the employment practices of Federal contractors.
17. The Labour Relations Act 66 of 1995 prohibits unfair labour practices (including against job applicants) on grounds of 'disability'; the Employment Equity Act 55 of 1998 specifically mentions HIV status as a prohibited ground of unfair discrimination and prohibits testing of employees and job applicants for HIV status unless the Labour Court determines it justifiable; the Code of Good Practice on HIV/AIDS and Employment was approved by the Southern African Development Community (SADC) in September 1997 and a Ministerial Code of Good Practice on HIV/AIDS and Employment was promulgated in terms of the Employment Equity Act 55 of 1998 on 1 December 2000; the Promotion of Equality and Prevention of Unfair Discrimination Act 4 of 2000 prohibits unfair discrimination on the grounds of 'disability' (which was anticipated to include HIV/AIDS, but is not expressly so defined), contains directive principles on HIV/AIDS, establishes an 'Equality Review Committee' and requires the Minister of Justice and Constitutional Development to give special consideration to the inclusion of, among others, HIV/AIDS as an expressly prohibited ground of discrimination (the ERC in 2006 apparently recommended to the Minister of Justice that 'HIV/AIDS status' be formally included under the listed grounds of discrimination in the Equality Act); the Medical Schemes Act 101 of 1998 includes HIV-related diseases as a category benefiting from 'Prescribed Minimum Benefits', provides for the compulsory cover of medical and surgical management of opportunistic infections, and prohibits denial of membership on the basis of 'disability or state of health'; the National Health Act 61 of 2003 provides for the introduction of a 'National Policy on Testing for HIV' (the policy was published in August 2000), describes the circumstances under which HIV testing may be conducted and sets out requirements for pre- and post-test counselling and informed consent; the National Education Policy Act 27 of 1996 provides for the drafting of national policies on educators and learners - the Minister of Education in August 1999 issued a 'National Policy on HIV/AIDS for Learners and Educators' which prohibits unfair discrimination against learners, students and educators with HIV/AIDS.
18. See *Hoffmann v South African Airways* 2001 (1) SA 1 (CC).
19. Justice Kirby correctly credits Jonathan Mann with initiating the human rights approach in the epidemic - see 'The never-ending paradoxes of HIV/AIDS and human rights' (*African Human Rights Law Journal* 2004; 163, 165f).
20. Justice Kirby explains his engagement with the epidemic, and the first paradox, in 'The never-ending paradoxes of HIV/AIDS and human rights' (*African Human Rights Law Journal* 2004; 163).
21. As Justice Kirby puts it, the first paradox was necessary 'because only behaviour change could curb the spread of HIV, and a human rights-based approach was regarded as the most feasible way to ensure the knowledge of an means to effect the behaviour change': 'The never-ending paradoxes of HIV/AIDS and human rights' (*African Human Rights Law Journal* 2004; 163).
22. 'WHO and UNAIDS have asserted that there is no public health justification for mandatory HIV screening as it does not prevent the introduction or spread of HIV' (UNHCR '10 key points on HIV/AIDS and the protection of refugees, IDPs and other persons of concern', 12 April 2006), available at http://www.unhcr.org/444e20f32.html (accessed 20 November 2009).
23. See Anand Grover (UN Special Rapporteur), '[r]ight of everyone to the enjoyment of the highest attainable standard of physical and mental health', paras 26 - 27, submitted to the UN General Assembly 64th session, 10 August 2009: 'Importantly, a rights-based approach addresses structural barriers to achieving informed consent within the appropriate health-care continuum. Such an approach is especially cognizant of the power imbalances resulting from inequalities in knowledge, experience and trust between the health-care provider and the individual, particularly those from vulnerable groups. Importantly, stigma and discrimination serve as disincentives for such patients to seek out services ad providers to treat patients equally. 'Compulsory, and, at times, routine testing is disempowering and frequently compromises human rights. Such testing is coercive and generally results in inadequate provision of information and counselling, compromising informed consent and deterring individuals from accessing test results and appropriate services.'
24. In the United States, for example, eight states currently require written consent for HIV testing - New York, Massachusetts, Wisconsin, Nebraska, Rhode Island, Pennsylvania, Michigan, and Alabama. However, bills are currently pending in the New York and Massachussetts state legislatures eliminating written consent for HIV testing. California and Illinois eliminated their written consent requirement in 2008.
25. See Burris S and Cameron E, 'The case against criminalization of HIV transmission' (*JAMA* 2008; 300(5): 578-581); see also my address, Criminal statutes and criminal prosecutions in the epidemic: help or hindrance? at the 17th International AIDS Conference, August 2008, Mexico City; Lawrence K Altman, 'Seeking better laws on HIV', *New York Times,* 8 August 2008, available at http://www.nytimes.com/2008/08/09/health/09aids.html?_r=3&oref=slogin&tref=world&pagewanted (accessed 21 October 2009); Rebecca Wexler, 'Criminalization of HIV', International Relations and Security Network, 27 August 2008, available at http://www.isn.ethz.ch/isn/Current-Affairs/Security-Watch/Detail/?id=90570&lng=en (accessed 21 October 2009).
26. I explore some of this in my Ronald Louw Memorial Lecture (May 2006), 'Normalising testing, normalising AIDS' (*Theoria,* April 2007, pp. 99-108).
27. See Jonny Steinberg, *The Three-Letter Plague* (US title *Sizwe's Test*) (Simon & Schuster, February 2007).
28. This I try to grapple with in chapter 2 of *Witness to AIDS* (Tafelberg, 2005).

29. Anish P, *et al.*, 'Stigma in the HIV/AIDS epidemic: a review of the literature and recommendations for the way forward' (*AIDS* 2008, 22 (suppl 2): S67-S79). It is notable that the foundational work of Erving Goffman (1922-1982), which the authors cite (from Stigma*: Notes on the Management of Spoiled Identity* (1963)) does recognise that 'the social label of deviance *compels stigmatized individuals to view themselves* ... as discredited or undesirable' - yet there is no explication in the context of AIDS of this vital 'self-viewing' aspect. See also Robert Crawford, 'The boundaries of the self and the unhealthy other: Reflections on health, culture and AIDS' (*Soc Sci Med* 1994; 38(10): 1347-1365).
30. Compare, recognising this point, De Cock KM, *et al.* (2002) 'Shadow in the continent: public health and HIV/AIDS in Africa in the 21st century' (*Lancet* 2002; 360: 67) at p. 69 ('Paradoxically, treating HIV/AIDS as being different from other infectious diseases probably enhances stigma rather than reduces it. The emphasis that has been placed on anonymity for HIV-infected people, which is different from confidentiality and analogous to secrecy, might also have been counter-productive. Anonymity is impossible to maintain as immune deficiency progresses'); and Frieden TR, *et al.* 'Applying public health principles to the HIV epidemic' (*N Engl J Med,* 2005; 335: 22: 2397) at p. 2398 (suggesting that targeting HIV testing at those perceived to be at risk may perpetuate stigma).
31. De Cock KM, *et al.*, 'Shadow in the continent: public health and HIV/AIDS in Africa in the 21st century' (*Lancet* 2002; 360: 67-72), at p. 68.
32. *Idem.*
33. A recent statement, 'Civil society statement on ART as prevention: Scaling down HIV requires scaling up human rights, testing and treatment', submitted to the participants at the WHO consultation on ART as HIV prevention (available at http://www.icaso.org/resources/2009/ART_statementEN.pdf, accessed 20 November 2009), states: 'We urge UN bodies, donors and researchers involved in this exploration to be mindful that people living with HIV and many who are highly vulnerable to it remain unable to gain access to HIV testing and to initiate treatment earlier, in a timely fashion, as a result of many human rights violations, as well as clinical and systemic barriers. Research models that do not adequately consider and address these barriers do a disservice to the important goal of making ART available to all as both prevention and treatment.

    'It is neither desirable *nor possible* to scale up voluntary HIV testing and treatment sustainably to implement ART as prevention without addressing these human rights, clinical and health-systems challenges. Supporting and strengthening civil society organizations in affected communities in the work of creating enabling environments are crucial to achieve this goal.

    'Any feasibility study or pilot study of ART as prevention must include an assessment of the social, policy and legal framework to address impediments to human rights protections and barriers to testing and treatment uptake before the study proceeds.'
34. Mark Harrington (Executive Director of Treatment Action Group) blog post on the Critical Path AIDS Project, 4 December 2008, in response to web discussions regarding the Granich article ('Universal voluntary HIV testing and immediate antiretroviral therapy', Lancet March 2009). The blog post is available at http://critpath.org/pipermail/healthgap_critpath.org/2008-December/000513.html (accessed 21 October 2009).
35. *Idem.*
36. Some AIDS activist organisations oppose rapid home-test kits on the basis that counselling would be absent, and that those testing positive might react unpredictably; already suggested presciently a 1997 *Lancet* article by Merson MH, *et al.*, 'Rapid self-testing for HIV' (*Lancet* 1996; 348: 352-353); yet see 'SA HIV home test kits withdrawn' (24 May 2005), available at http://news.bbc.co.uk/2/hi/africa/4576179.stm (accessed 21 October 2009); Natasha Joseph, 'Student devastated by home HIV test result', 30 October 2007, available at http://www.iol.co.za/index.php?set_id=1&click_id=125&art_id=vn20071030055441964C325889 (accessed 21 October 2009); http://www.avert.org/testing.htm ('AVERT opposes the legalisation of the sale of home testing kits in the UK because of the lack of post-test counselling'); 'Risks associated with home-use medical tests', Health Canada, available at http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/med/medtest-eng.php#ri (accessed 21 October 2009) ('There is also a significant chance that people may interpret test results incorrectly and/or decide to change their treatment or lifestyle unnecessarily, if they don't consult a qualified health care provider. Interpretation of test results should always be part of a comprehensive health assessment').
37. See the debate between Chersich and Richter and Scorgie *et al.* in M. Chersich M and Richter M, 'HIV testing and ARV prophylaxis for newborns without their mothers' consent', *Southern African Journal of HIV Medicine*, Autumn 2008, pp. 6-8; and rebuttal by Scorgie F, Filiano BA and Shapiro K, 'Coercive policies do not make for better health outcomes', *Southern African Journal of HIV Medicine*, Autumn 2008, pp. 8-9.
38. Because about one-quarter of those with HIV in the USA are still undiagnosed, the Centers for Disease Control (CDC) has now published guidelines recommending routine HIV testing in all heath care settings in patients between 13 and 64 years, the patient being told that testing is done unless patients opt out - separate signed consent and prevention counselling are no longer required. (Lifson AR *et al.*, 'Routine opt-out HIV testing', *Lancet* 2007; 369: 539-540.)
39. See 'Reduction in HIV testing due to opt-in consent linked to significant loss of life' (31 October 2009), referring to research findings by Michael April *et al.*, available at http://www.infectiousdiseasenews.com/article/50172.aspx (accessed 20 November 2009).
40. Granich RM, *et al.*, 'Universal voluntary HIV testing with immediate antiretroviral therapy as a strategy for elimination of HIV transmission: a mathematical model' (*Lancet* 2009; 373: 48-57).
41. See 'Testing millions', a message from AIDS Healthcare Foundation President Michael Weinstein (available at http://www.testingmillions.org/):

    'We at AIDS Healthcare Foundation (AHF) believe that the best way to reach the estimated 33 million people living with HIV/AIDS is to identify those who do not know they are infected and link them to treatment. This is also the best route to combating the spread of the disease, as it is believed that the source of the majority of new infections are people who are HIV positive, but do not know it.

    'Clearly, testing in much greater numbers is urgently needed. AHF's Testing Millions campaign is designed to not only increase testing, but also to establish a new, more streamlined testing model that - if widely adopted - could result in a dramatic drop in new infections and deaths.'
42. Nathan Geffen's proposal continues: The counsellor then does the test. If it comes back negative, s/he tells Ms X that she's HIV-negative. If and only if s/he has time, the counsellor also gives her some condoms and informs her that using condoms during sex is a good way to reduce the risk of contracting HIV. If the test comes back positive, the counsellor explains in a few minutes the following:
    - That Ms X needs to have a CD4 and viral load test every X months and what these measure.
    - When Ms X's CD4 drops below 350, Ms X must start ARV treatment which involves taking one pill (maybe two) once daily for the rest of her life.
    - Ms X can continue to have sex using condoms.
    - Ms X can have a child if she chooses, but she will need to take measures to reduce the risk of the child contracting HIV. (The same goes for a Mr X.)
    - Counsellor refers Ms X to a treatment literacy class/support group/structure of some kind.
    - Counsellor informs Ms X that if she is distressed or confused, she can contact him/her for further counselling.
43. See 'Reduction in HIV testing due to opt-in consent linked to significant loss of life', *Infectious Diseases News* 31 October 2009, available at http://www.infectiousdiseasenews.com/article/50172.aspx.
44. I am indebted to Gregg Gonsalves (private communication, 4 February 2009) for the following perceptive comments: 'The fear of death and the fear of lack of access to treatment constitute an important aspect of the internal stigma and present a substantial barrier to consent to testing. The fear of testing stems from a deep psychological desire to avoid the knowledge that one has been infected with the disease and is therefore dying, compounded by the lack of knowledge of treatment and whether treatment will be available. In addition, the nature of the calculation that one makes relating to one's relationship with death or behavior feeds into fear and internal stigma.'
45. Federal health officials in the United States will conduct a study implementing the strategy 'Test and Treat' in two locations with some of the country's highest HIV infection rates, Washington, DC and the Bronx. The goal is to stop the spread of HIV by routinely testing virtually every adult in the community and providing prompt treatment to those who test positive. This is a first step not to measure whether the programme actually works to slow the epidemic, but to find out whether such a strategy can even be carried out given the many obstacles to testing and treatment. Susan Okie, 'Fighting HIV a community at a time', *New York Times* 27 October 2009, available at http://www.nytimes.com/2009/10/27/health/27hiv.html (accessed 20 November 2009).
46. Available at http://www.tac.org.za/community/files/PRES%20ZUMA%20ADDRESS%20TO%20NCOP%20291009.pdf (accessed 20 November 2009).
47. Granich *et al.* do not, as has been claimed, give 'unexamined endorsement [to] annual universal testing': rather, they pose a hypothetical question - if there were such testing, and immediate antiretroviral therapy, would endemic HIV transmission cease; and their suggestive - hopeful - answer is yes. See the discussion on AIDSMAP of the Granich *et al.* article, available at http://www.aidsmap.com/cms1282664.aspx (accessed 20 November 2009): '[u]niversal testing and treatment is only likely to be cost-effective in settings where HIV is hyper-endemic and where AIDS seriously threatens long-term stability and growth. Further cost-effectiveness analysis will be needed. The WHO analysis looks at the relative costs of pursuing the universal approach *or* treating people when their CD4 count falls below 350 cells/mm^3. The universal approach demands substantially greater expenditure during the first two decades, but begins to become cheaper than the default treatment approach by 2030. This balance and time-scale may differ in other countries in the southern Africa region.' For criticism of the Granich hypothesis, see Dr Geoffrey Garnett, from Imperial College London, in a commentary piece published in *The Lancet*: 'At its best, the strategy would prevent morbidity and mortality for the population, both through better treatment of the individual and reduced spread of HIV. At its worst, the strategy will involve over-testing, over-treatment, side effects, resistance, and potentially reduced autonomy of the individual in their choices of care.'

    Imogen Foulkes, 'Universal test "would slash AIDS"', BBC News 26 November 2008, available at http://news.bbc.co.uk/2/hi/7749437.stm (accessed 20 November 2009).

INNOVATIVE RESPONSES FOR PREVENTING HIV TRANSMISSION: THE PROTECTIVE VALUE OF POPULATION-WIDE INTERRUPTIONS OF RISK ACTIVITY

Justin O Parkhurst, *BSE, MPhil (Oxford), DPhil (Oxford)*
Health Policy Unit, London School of Hygiene and Tropical Medicine, Keepel Street, London, UK
Alan Whiteside, *MA, DEcon*
Director, HEARD (Health Economics and HIV/AIDS Research Division), University of KwaZulu-Natal, Durban

Concurrent partnering contributes to high HIV prevalence. This is in part due to the natural history of the virus. After transmission, an individual's viral load spikes in a period of 'acute infection' during which they are highly infectious.[1,2] Models estimate that around 10 - 45% of HIV acquisition arises from sex with an individual in the acute infection period.[3]

If everyone in a population abstained from high-risk sex for a given period of time, in theory the viral loads of all recent seroconverters should pass through the acute infection period. When risk behaviour resumed there would be almost no individuals in the high-viraemic phase, thereby reducing infectivity, and HIV incidence would fall. Recurring population-wide shifts in risk behaviour are not unheard of. Many, in fact, occur as part of existing religious observances. The month of Ramadan in Muslim communities is perhaps one of the most obvious cases. Ramadan sees significant behaviour changes. In addition to fasting from sunrise to sunset, observant individuals abstain from coitus during daylight hours.[4] There is anecdotal evidence that risky sexual behaviours are also significantly reduced over this period. In Indonesia, for instance, it was reported that research with sex workers was not possible during Ramadan because people 'abstained from sex from one end of the month to the other ... Many sex workers returned to home villages during this time.'[5]

This article argues that a population-wide interruption of risk behaviour for a set period of time could reduce HIV incidence and make a significant contribution to prevention efforts. It calls for mathematical modelling of periodic risk behaviour interruptions, as well as encouragement of policy interventions to develop campaigns of this nature. A policy response, such as a 'safe sex/no sex' campaign in a cohesive population, deserves serious consideration as an HIV prevention intervention. In some contexts, periods of abstinence from risk behaviour could also be linked to existing religious practices to provide policy options.

THE ARGUMENT

There are scientific reasons to believe that population-wide periods of risk reduction could be effective. Additionally there is evidence to suggest that sexual behaviours, including periods of abstinence, driven by religious reasons, may have kept the prevalence low in Muslim countries. According to UNAIDS only one country in North Africa and the Middle East region (Sudan) had an HIV prevalence over 0.2%. In South and South-East Asia, predominantly Muslim countries such as Pakistan, Bangladesh and Indonesia show similarly low HIV prevalences, typically below 0.2%.[6] There are serious challenges in attributing cause, however. The practice of male circumcision is near universal, and is highly protective against men acquiring HIV.[7-9] While Islam permits polygamy, it prohibits sex outside marriage and discourages the consumption of alcohol and homosexual sex. All these factors may help explain the lower levels of seroprevalence in countries with large Muslim populations.[10] Norms and patterns of sexual behaviour may also be quite different in observant Muslim communities compared with other groups. Indonesia, for instance, has a low national prevalence rate, estimated to only be around 0.2%, but Papua province has a majority Christian population and an HIV prevalence of 2.4%, over 10 times the national rate.[11]

There are, however, cases where HIV prevalence appears to be unusually low in Muslim areas, even given high levels of risk activity. In Dhaka, Bangladesh, for instance, HIV prevalence apparently remains low despite common risk behaviours of injection drug use and commercial sex.[12] So while confounding makes it

hard to attribute the protection derived from Ramadan practices of abstinence, there is scientific plausibility for considering it as an intervention.

A potential intervention would be an aggressive national campaign to ensure that everyone who is sexually active in a population either commit to 100% condom use or refrain for sexual intercourse over a period of a month or longer. This would be a national campaign with buy-in from leadership at every level, from the President (or King) through church and business down to local community leaders. It could be trialled best in small homogeneous populations, and indeed the National Emergency Response Council on HIV/AIDS (NERCHA) in Swaziland has been considering it (personal communication with author AW). There is also evidence from Mozambique that a 2-month 'cooling off' period during which people would abstain from starting any new sexual relationships would be feasible and acceptable.[13]

TESTING AND VALIDATION

Avenues can be explored to test or validate the idea that population-wide interruptions in risk behaviour would slow the spread of HIV. On a theoretical level, ideally we feel that this should be further explored through mathematical modelling and estimation exercises. Such exercises could predict how a population-wide abstinence campaign might reduce infections, both in the month of abstinence and over the course of a year through reduction in average viral loads when risk activity resumes. However, models may require some additional survey data to inform their parameters.

In practice, an experimental trial would be impossible and unethical (abstinence is known to be protective on its own), nor would it be feasible to control some groups when such a wide-scale mobilisation effort might be needed to promote the behaviour change. However, discussions are under way to actually attempt interruptions in risk behaviour in this manner, and these must be observed with sufficient evaluation research to be built in. Risk behaviours can be assessed before, during and after the intervention period to assess the impact they may have had. This can be done with surveys as well as in-depth investigation of particular groups to help avoid respondent bias. A campaign for a month of 'safe sex/no sex' would also produce easily verifiable data with regard to adherence, evidenced in the number of births occurring nine months after the campaign. Finally, in theory, the average HIV viral load in the population could also be monitored before, during and after the period of abstinence to see how much it impacted on infectiousness, and to get better estimates of effectiveness in practice over modelling efficacy calculations. However, this might require very large sample sizes to show significant results.

DISCUSSION

A population-wide 'month off' from risk behaviour may help to interrupt the spread of HIV by allowing the acute infection period to pass and the HIV viral load to fall before risk activity is resumed. The month of Ramadan may provide one example of this that has unknowingly been protective for Muslim societies.

We investigated whether there were other opportunities for abstinence from particular practices similar to Ramadan through a review of major world religions. We did not find examples of sustained population-wide abstinence from sexual activity outside of Islamic societies. Small groups might do so, however, such as the Marange Apostolic sect in Zimbabwe's Manicaland, who were found to abstain from sex during Passover (and also found to have lower prevalence of HIV than surrounding populations).[14,15] However, many religions do incorporate some form of abstinence or asceticism – whether it is the Christian Lenten restrictions for 40 days,[4] the Hindu Brahmacharya practices (where some young men restrict sexual activity[16]), or Buddhist general notions of self-restraint including life-long dietary restrictions. What is critical about periods such as Lent and Ramadan, however, is that they provide clear, extended time periods into which a campaign promoting abstinence from sexual risk behaviour might be incorporated.

While converting people to a religion is not a reasonable public health strategy, these insights do raise the possibility of campaigns to regularly, if only temporarily, reduce risk behaviour across a population. The World Health Organization, for instance, has promoted 'tobacco-free' days.[17] In this vein, key HIV risk behaviours can be targeted in populations. A 'safe sex/no sex' campaign for a limited period of time may be a reasonable public health intervention strategy to attempt in some settings.

In hyper-epidemic countries in particular, policy makers, populations and politicians are open to new ideas to address the epidemic. Prevalence rates and incidence rates are at unacceptably high levels and to be successful interventions take time and require long-term behaviour change. The 'safe sex/no sex' campaign has the advantage of requiring a one-off short-term adaption, being relatively cheap, having nation-building qualities, and not carrying stigma. Finally, many elements can be easily monitored.

While universal permanent abstinence from sex work may be impossible to achieve, a month of 'no commercial sex' or 'no new partners' might be more possible in some populations in which sex work appears to be a driving influence on spread (mining communities in southern Africa, for instance[18]). Permanent monogamy may be a challenging long-term goal for some, but a

'month of monogamy' might be a useful starting point. It has rarely been attempted to put such ideas into practice, but they may reap significant benefits for HIV prevention.

REFERENCES

1. Chin J. *The AIDS Pandemic: The Collision of Epidemiology with Political Correctness.* Oxford: Radcliffe Publishing, 2007.
2. Halperin DT, Epstein H. Concurrent sexual partnerships help to explain Africa's high HIV prevalence: implications for prevention. *Lancet* 2004; 364: 4-6.
3. 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.
4. Ryan FT. *The Sacred Art of Fasting: Preparing to Practice.* Woodstock, VT: SkyLight Paths Publishing, 2005.
5. Pisani E. *The Wisdom of Whores: Bureaucrats, Brothels, and the Business of AIDS.* London: Granta Books, 2008.
6. UNAIDS. *Report on the Global HIV/AIDS Epidemic.* Geneva: UNAIDS, 2008.
7. Gray RH, Kigozi G, Serwadda D, *et al.* Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial. *Lancet* 2007; 369: 657-666.
8. Bailey RC, Moses S, Parker CB, *et al.* Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomised controlled trial. *Lancet* 2007; 369: 643-656.
9. Auvert B, Taljaard D, Lagarde E, Sobngwi-Tambekou J, Sitta R, Puren A. Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: the ANRS 1265 trial. *PLoS Med* 2005; 2: 0001-0011.
10. Gray P. HIV and Islam: is HIV prevalence lower among Muslims? *Soc Sci Med* 2004; 58: 1751-1756.
11. Statistics Indonesia (BPS), ORC Macro. *Indonesia Demographic and Health Survey 2007.* Calverton, Md: BPS and Macro International, 2008.
12. Foss AM, Watts CH, Vickerman P, *et al.* Could the CARE-SHAKTI intervention for injecting drug users be maintaining the low HIV prevalence in Dhaka, Bangladesh? *Addiction* 2006; 102: 114-125.
13. Halperin D, Cipriano E, Senda R, *et al.* A two-month national 'cooling-off' period?: Acceptability of an intensive behavior change campaign to reduce acute HIV infection in Mozambique. Presentation at the HIV Acute Infection Meeting, Boston, 22 - 23 September, 2009.
14. Gregson S, Ndlovu J, Mlilo M, Dauka E. Fluctuations in sexual activity, the validity of sexual behaviour estimates for short time-intervals, and HIV intervention evaluation in rural Zimbabwe. *J Sex Res* 2001; 2: 180-181.
15. Gregson S, Zhuwau T, Anderson RM, Chandiwana SK. Apostles and zionists: the influence of religion on demographic change in rural Zimbabwe. *Popul Stud* 1999; 53: 179-193.
16. Alter JS. Celibacy, sexuality, and the transformation of gender into nationalism in North India. *The Journal of Asian Studies* 1994; 53: 45-66.
17. World Health Organization. Showing the Truth, Saving Lives: *The Case for Pictoral Health Warnings.* Geneva: WHO, 2009.
18. Campbell C. 'Letting Them Die': *Why HIV/AIDS Prevention Programmes Fail.* Oxford: James Currey, 2003.

OPINION

'DIFFERENTIAL POVERTY RATES ARE RESPONSIBLE FOR THE RACIAL DIFFERENTIALS IN HIV PREVALENCE IN SOUTH AFRICA': AN ENDURING AND DANGEROUS EPIDEMIOLOGICAL URBAN LEGEND?

Chris Kenyon, *MB ChB, BA (Hons), MPH, FCP*
Division of Infectious Diseases and HIV Medicine Unit, Department of Medicine, University of Cape Town

It is widely held to be axiomatic in South African epidemiological and social science circles that it is not worth comparing the risk factors underpinning the dramatic differences in HIV spread in South Africa's racial groups, as these are all explained by corresponding differences in socio-economic status. The available evidence, however, suggests that HIV is not simply contoured along lines of socio-economic deprivation; rather, other – largely culturally determined – factors such as the practice and acceptance of multiple concurrent sexual partnerships play a key role. Comparison of sexual behaviours between South Africa's different races supports the likelihood that cultural and not socio-economic factors are the mediators of differential racial HIV spread. Finally, it is argued that the failure of many South African experts in the study of HIV to consider race as a valid variable for analysis, and allied to this their continued exaggeration of the importance of socio-economic rather than cultural factors, has contributed to the relative failure of our national AIDS strategy.

With the aim of presenting an overview of the key literature that analyses the relationship between class, race, culture and HIV in South Africa, a literature review was conducted using Pubmed and Google Scholar to search for the following key words: 'South Africa', 'socioeconomic status', 'socioeconomic', 'poverty', 'wealth', 'education', 'HIV prevalence', 'HIV risk' and 'sexual behaviour'.

THE ARGUMENT THAT CLASS DETERMINES RACIAL DIFFERENCES IN HIV PREVALENCE

A salient feature of the literature on this topic is how commonly it is assumed (with little or no substantiating evidence) that racial differences in HIV rates in South Africa can all be explained by socio-economic differentials. According to one of the premier textbooks on HIV/AIDS in South Africa, the reason HIV prevalence rates differ between races is that 'marginalisation and discrimination on the basis of race and/or ethnicity are key factors influencing vulnerability to HIV infection' (p. 63).[1] Similarly, Mitton's paper entitled 'The sociological spread of HIV/AIDS in South Africa' argues that AIDS is 'primarily an illness of marginalised persons' and hence has spread faster among black Africans due to their marginalised position in apartheid society.[2] No evidence is provided in either of these two pieces to back up these claims.

A more convincing argument is that HIV is a disease of poverty and inequality, and black Africans' ongoing state of economic deprivation (both relative and absolute) is the underlying determinant of the racial divergences in HIV rates. In many of the articles that make this argument no empirical evidence is provided. As an example, McCoy *et al.* claim without any supporting evidence that 'critically the profound link between AIDS and poverty must be recognised and broken [in dealing with South Africa's HIV epidemic]'.[3] A further example is Gilbert and Walker's 'Treading the path of least resistance: HIV/AIDS and social inequalities – a South African case study'. Here an unreferenced assertion is simply made that 'there is a strong link between low income, high unemployment and poor education ... and rates of HIV infection' (p. 1106).[4] Other papers which assume that socio-economic factors determine racial differential HIV rates include those by Tladi,[5] Phatlane,[6] Cunha[7] and Marks.[8]

An urban legend can be defined as 'a story or anecdote that is based on hearsay and widely circulated as true'.[9] Characteristically, when the storyteller is questioned as to the evidence backing up the story they claim that there were eye-witnesses, but when pressed it emerges that these were friends of friends. In a similar vein, one of the striking features of the above-quoted papers is how they either present no evidence or references

to back up their claims or else refer to other papers that have no empirical data to substantiate their assertions.

An exception to this is a paper by Fassin and Schneider,[10] which argues that 'social inequalities in income and employment status' are, together with sexual violence and enhanced mobility, the three social factors responsible for the magnitude of South Africa's epidemic. They provide evidence to back up the assertion that 'social inequalities in income and employment status are powerful predictors of HIV infection' in the form of a study in a mining company that stratified HIV status by race and occupational status (Fig. 1). The authors claim that the higher HIV rates in blacks than whites, and in the unskilled versus the skilled job categories, are 'the legacy of centuries of colonial exploitation and racial segregation, culminating in the institution of apartheid in the second half of the 20th century'. Their argument is that 'epidemiologically this segregation translates as differential HIV seroprevalence between black and white groups and between social classes'. They do not, however, comment on why the HIV rate within each occupational stratum is so much higher in the black than the white workers. As an example, within the lowest job category, the HIV rate is five times higher in blacks than whites. The original authors of the study note that this patterning does not support the hypothesis that socio-economic differentials determine racial differences in HIV.[11]

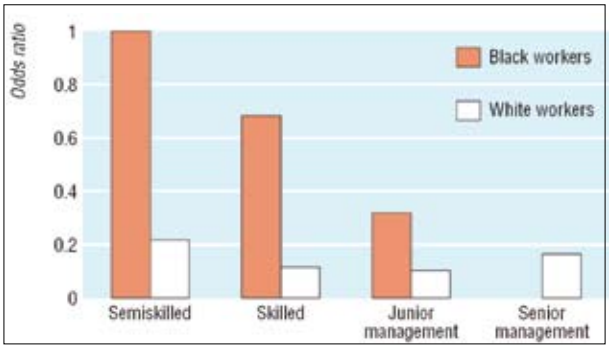


Fig. 1. Odds ratios for HIV prevalence among employees in South Africa.[10]

One of the most compelling proponents of the poverty-inequality thesis is the anthropologist Mark Hunter. He too is unable to provide much empirical evidence to back up his engaging ethnographic material. One of the few pieces of quantitative evidence he does advance is that HIV incidence and prevalence rates are higher in informal than formal settlements in South Africa.[12] This is based on the 2005 Human Sciences Research Council (HSRC) HIV survey.[13] There is, however, not much one can conclude from the fact that HIV prevalences in formal and informal urban settlements are 9% and 17% respectively, when no attempt is made to control for the fact that race (which was itself strongly correlated with HIV status) co-varies with type of urban settlement.

HOW IS HIV CONTOURED ALONG THE LINES OF RACE AND CLASS IN SOUTH AFRICA?

Johnson, Budlender and Kirk have undertaken much more thorough analyses of the relationship between income, race and HIV. Kirk[14] analysed South Africa's national antenatal clinic HIV survey data to try to tease out the relationship between income, race and HIV. Unfortunately the antenatal survey does not collect information about income, but Kirk was able to use other data sources to show that the level of poverty in a magisterial district is negatively associated with the HIV prevalence among women attending antenatal services in that district. This finding was backed up by his analysis, which found that women with no education are at a lower risk of HIV infection than women who received high-school education (women with university education had the lowest HIV rates). Johnson and Budlender's review of this topic demonstrates some of the complex ways in which race, class and culture interact to produce South Africa's HIV epidemic.[11] One of these pieces of evidence is their presentation of a multivariate logistic regression analysis of the antenatal clinic data to reveal that racial differences persist despite controlling for socio-economic status (which was done here by using education level) (Table I).

TABLE I. ODDS RATIOS FOR HIV INFECTION IN DIFFERENT RACE GROUPS BASED ON A MULTIVARIATE ANALYSIS OF THE 1998 AND 1999 HIV ANTENATAL SURVEY DATA[11]

	Odds ratio	*p*-value
African	1	-
Asian	0.23	0.05
Coloured	0.17	<0.001
White	0.13	<0.001

Three more recent studies from South Africa have confirmed the finding that HIV is not simply a disease of poverty. Using a cohort study of 3 881 individuals in eight villages in rural South Africa between 2001 and 2004, Hargreaves *et al.* were able to show that there was no association between HIV incidence and household wealth for the men and women.[15] Less educated women did, however, have a higher rate of infection. In the second study, Barnighausen *et al.* used data from a longitudinal HIV surveillance and linked demographic surveillance in rural KwaZulu-Natal to test the relationship between socio-economic status, education and HIV incidence.[16] HIV incidence was found to be related to household wealth – with the incidence lowest in the low- and high-wealth brackets and highest in the middle-income bracket. Education level in this study was found to be associated with a lower risk of acquiring HIV. Likewise, the Carltonville Project found no difference in HIV prevalence between the employed and the unemployed.[17] Finally, a cluster randomised

trial designed to evaluate the impact of a microfinance lending scheme on HIV incidence found it had no impact despite improving the economic wellbeing of the participants.[18]

There is conflicting evidence regarding the extent to which HIV knowledge or risky behaviour varies by socio-economic status. A multivariate study using data from the 1998 South African Demographic and Health Survey found 'little evidence that poverty is associated with risky sexual behaviour'. Poorer women were, however, slightly less likely to have the necessary knowledge about HIV.[19] In contrast, Hallman, using household survey data from 14 - 24-year-olds in Kwazulu-Natal, showed that among females but not males low wealth is associated with earlier sexual debut, having had multiple sexual partners in the year before the survey, and lower chances of condom use at last sex.[20]

One of the reasons why South Africans are still debating whether HIV is or is not a disease of poverty may relate to the poor quality of our national surveys. This is illustrated by the way that good-quality evidence from elsewhere in Africa has established that 'HIV infection does not disproportionately affect the poorer in sub-Saharan Africa'.[21] This was the title of a paper that published the results of eight national HIV-serolinked demographic surveys. The most salient finding was that in all eight countries, adults in the wealthiest quintiles had a higher prevalence of HIV than those in the poorer quintiles. There was a step-wise increase in HIV with wealth quintiles in most cases. Three other HIV-serolinked demographic studies, from Kenya,[22] Tanzania[23] and Burkino Faso,[24] have produced similar results (Fig. 2). A review article from the 'Poverty, Wealth and HIV' supplement in the journal *AIDS* concluded that poor individuals are not necessarily more likely to be exposed to HIV and therefore 'AIDS cannot accurately be termed a disease of poverty' (p. S15).[25]

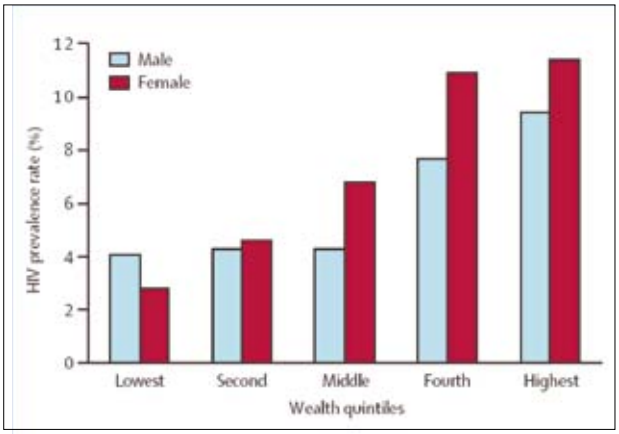


Fig. 2. HIV prevalences for males and females by wealth quintiles in Tanzania.[45]

So what do the equivalent South African sero-surveys tell us about the relationship between HIV, wealth, race and sexual behaviours in South Africa? Remarkably little. The HSRC is the only body that has received funding to conduct nationally representative serolinked surveys of all South Africans. It has conducted three such surveys, in 2002, 2005 and 2008. By tracking knowledge, sexual behaviours and HIV prevalence, the HSRC surveys are supposed to be South Africa's flagship surveys to track progress in dealing with our epidemic. Unfortunately, the surveys fail to a considerable extent on all three accounts. Knowledge about HIV and its prevention, we are told, has declined from 2002. It is, however, hard to interpret what this means, given the ambiguities associated with one of the two questions assessing HIV knowledge: 'To prevent HIV infection, a condom must be used for every round of sex?' If a mutually monogamous couple with no recent other relationships has undergone couple HIV testing and both are negative, they would be quite correct to answer 'no' to this question. According to the HSRC they would score zero for this answer. Sexual behaviours are tracked, but nowhere in any of the HSRC surveys is sexual partner concurrency (arguably the key risk factor in our setting) evaluated in any way. In the last survey we are informed that the percentage of persons who had more than one sexual partner in the past year is 'a factor contributing to concurrent sexual partnerships' (p. 41). This factor is then used as a surrogate for concurrency. No evidence is provided to back up this assumption.

Arguably the most marked inadequacy in the three HSRC surveys is how poorly the epidemic is mapped. Sexual behaviour surveys in the USA, such as the National Health and Social Life Survey (NHSLS), have found that 'the vast majority of sexual partnerships originate within tightly circumscribed social settings, resulting in partnerships involving persons with similar characteristics' (p. 255).[26] Most sexual partnerships and marriages therefore occur within the same racial/ethnic, class, age and religion categories. This effect is strongest for race/ethnic group. The NHSLS found that 91% of short-term relationships and 93% of marriages were between persons of the same racial/ethnic group. It would be very useful to know if this is the case, as seems likely, in South Africa, but this kind of basic information was not assessed in the HSRC surveys. For similar reasons, the HSRC surveys are unable to break the epidemic down by socio-economic status or education levels – except to show that HIV rates are higher in informal than formal settlements. In their current format our surveys are simply not able to answer the most basic questions such as the relationship between HIV, income and race. In fact, race seems an almost taboo variable in the surveys. At no stage, for example, are sexual behaviours compared between racial groups. In the 2008 survey, there is only one place in the 120-page report where HIV rates are broken down by race – in a small table in Appendix A, where overall HIV rates in each racial group are presented.

If we cannot explain South Africa's racial differences in HIV by economic differentials, then how can we? An obvious, if rather simplistic, way to examine this question is to compare sexual behaviours between the races premised on the fact that HIV is spread by sex and more specifically via sex networks. Comparing sex networks is especially important, since differences in network structure are more likely to explain large differences in HIV rates than individual level differences. Network level differences, for example, have been shown to explain a third of the difference in sexually transmitted infections between races in the USA.[27] We were unable to find a single published study that makes a comprehensive comparison of sexual behaviours in different racial groups in South Africa. We therefore conducted an analysis of a representative sample of 3 531 14 - 25-year-old Cape Town inhabitants in the Cape Area Panel Survey (CAPS). Individual level behavioural risk factors did not vary much by race (in fact, the lifetime number of sexual partners was highest in the white group). However, this was not the case for network factors. Blacks were much more likely to have engaged in concurrency themselves or to have a partner who engaged in concurrency (Table II).[28]

Various lines of evidence have supported the importance of concurrency in HIV spread in this area. Numerous epidemiological studies have shown a strong link between partner concurrency and the incidence of sexually transmitted infections.[29-31] The most compelling difference in sexual behaviours between high- and low-prevalence HIV countries globally is that sexual partner concurrency is far more prevalent in the high-incidence countries of southern and eastern Africa.[32,33] Modelling exercises have shown that the key way concurrency increases HIV transmission is at a network level, where it increases the network interconnections in a manner that creates 'superhighways' for HIV spread.[34] In this way concurrency increases HIV transmission exponentially – even if the number of sex partners does not increase.

What then are the underlying reasons for the racial differences in sexual behaviour in South Africa – in this case, the elevated concurrency rates in blacks? Two main categories of factors have been advanced as being important in the promotion of high concurrency rates – cultural and socio-economic factors. In a separate study looking at the determinants of concurrency in the CAPS dataset, we found that the relationship between income quintile and concurrency found on univariate analysis disappeared on multivariate analysis.[35] In addition, when we broke concurrency rates down by income quintile for each race and gender, there was no relationship between concurrency and income in any of these groups. This supports the view that, as in Uganda, it is cultural factors which are responsible for the high concurrency rates.[36] Indeed, the '10 Countries' study found that a crucial factor underpinning high concurrency rates in the 10 countries in southern and eastern Africa was that it was regarded as normative for men to have multiple concurrent partners.[37]

It is important to acknowledge three important caveats to the findings presented here. Firstly, the analyses presented have attempted to ascertain the relationship between poverty and HIV. No studies in South Africa that we are aware of have examined the role of socio-economic inequalities in HIV spread. Secondly, we cannot exclude the possibility that high poverty rates over generations may have had an effect on producing a set of enduring norms pertaining to sexual behaviour in blacks which, due to its population level effect, applies as much to wealthier blacks. This would mean that analyses such as our CAPS data, which controlled for wealth using contemporary levels of wealth, are unable to discern this legacy-of-poverty effect. Thirdly, there is good evidence that the HIV epidemic is following the pattern of many other behaviour-related diseases (such as smoking-related ones) which were more prevalent among the wealthy in the early stages, but became more prevalent among the poor as knowledge of the ill effects gathers.[38]

SHOULD WE DOWNPLAY WHAT IS PSYCHOLOGICALLY PAINFUL?

The HSRC Survey of 2005 revealed HIV prevalences of 19.9%, 3.2% and 0.5% for 15 - 49-year-old blacks, coloureds and whites, respectively.[13] The racial differ-

TABLE II. CONCURRENCY RATES BY RACE AMONG 14 – 25-YEAR-OLD CAPETONIANS[26]

	Blacks (%)	Coloureds (%)	Whites (%)
Partner engaged in concurrency	33	13.2	11.9
Any partner definitely or possibly had concurrent partner	68.2	34.9	25.9
Interviewee has had two sexual relationships simultaneously at some stage	30.1	10.8	4.9
Respondents who have had 1, 2 or ≥3 concurrent relationships:			
1	19.1	5.9	4.5
2	7.2	1.3	0.6
≥3	2.0	0.5	0.6
Concurrently concurrent	15.3	2.7	1.3
More than one partner had a concurrent relationship	10.8	3.1	2.4

ences in HIV within South Africa are therefore similar in magnitude to those between the highest and lowest prevalence countries in the world. Finding the underlying determinants for these differences should therefore provide us with important clues as to the nature of the 'holy grail' in South African HIV research – what we need to do to stop the scandalously high current incidence rates. According to recently published data from a surveillance site in rural KwaZulu-Natal, 3.4% of adults acquired HIV during 2008, and this incidence rate has not declined at all over the past 5 years.[39] Our investigations along these lines provided strong support for the view that a (largely) culturally driven practice of concurrency was the likely key factor responsible for the elevated HIV rates seen in blacks. Although at the 4th SA AIDS Conference there was considerable interest in dealing with multiple concurrent partnerships, there still remains an embarrassing paucity of evidence that has been generated in South Africa on the link between concurrency and HIV transmission, and on the cultural and other factors responsible for our high concurrency rates.

As described above, part of the reason for this has been a peculiar reluctance to use race as an analytical variable as regards to HIV. The origins of this racial blind spot are not hard to fathom. Concepts of white racial and cultural superiority were central to the ideology of apartheid. Thabo Mbeki would later characterise this ideology as one where black people were made to feel 'their inferiority by being reminded of their role as germ carriers … [and attend] schools where they learn a history that pictures black people as human beings of a lower order, unable to subject passion to reason'.[40] Given this background, when, in the early days of the new non-racial dispensation, a new and lethal disease that was sexually transmitted was found to disproportionately affect black South Africans, it should not be too surprising that the investigating experts biased their assessments of aetiology towards socio-economic factors. To suggest that cultural practices were responsible might have sounded at best insensitive and at worst racist. An example of these dynamics is a book published earlier this year by a respected South African professor of anthropology on the topic of how differences in sex networks explain the different HIV trajectories in Uganda and South Africa.[41] In the preface, the author explains that he 'largely ignores race'; as he explains, 'it appears to me that with respect to sex and choice of sexual partners, race does not predict or determine significant social differences' (p. xviii). The only argument he produces to justify ignoring race is his rejection of apartheid, which sought to 'convince South Africans that they were more different from one another than they in fact are'. This belief, he explains, 'was empirically, not just morally, wrong. I treat South Africa as an African country and do not distinguish South Africans by race.' Despite sexual behaviour being one of the most culturally varied of all human behaviours[42] and despite the abundant evidence of the striking differences in racial HIV rates, Thornton simply assumes there are no differences in the makeup of sexual networks by race in South Africa. Because we reject apartheid, his argument seems to be, we must ignore all the evidence to the contrary and simply assume away all racial differences in sexual behaviour and sex network makeup. Ironically, if this reluctance to venture into uncomfortable psychological spaces explains part of the origins of this denial of cultural/behavioural explanations for HIV's rapid spread in South Africa (termed third-generation denialism here), its origins have much in common with South Africa's more famous forms of HIV denialism. Both Mbeki's biological HIV denialism (a virus can't cause a syndrome) and his second-generation treatment denialism (which sought to encourage vegetables and vitamins over antiretrovirals) had their origins in a similar psychological process, which sought to downplay cognitions dissonant with his belief in the dawn of an African renaissance.[43] More important than the similarity in their origins, however, is the similar effects that first- to third-generation denialism are having in undermining HIV prevention efforts. It is not just that the average South African does not have a good idea of which sexual behavioural factors are responsible for the high HIV rates, but an unacceptably high proportion of leaders and experts in the field do not either.

It is interesting to note how a country without this legacy of race-based conflict, such as Uganda, was able in a short space of time to undergo a process of painful introspection which correctly identified and successfully targeted the practices of multiple concurrent partnerships that were fuelling the epidemic.[44] It is surely time for South Africa to rectify this blind spot and venture into the psychologically painful but productive places that Uganda did decades ago. One of the reasons why urban legends are believed and spread is because they construct and reinforce the conceptual framework of the group within which they are told. If we contrast the unquestioning acceptance of the-poverty-explains-racial-HIV-differences thesis with the amount of evidence underpinning it, then it follows that not only did its spread share certain features in common with urban legends, but as with urban legends, its spread reveals more about the psychologies of its followers than about the differential HIV spread it purported to explain.

REFERENCES

1. Gouws E, Abdool Karim Q. *HIV infection in South Africa: the evolving epidemic.* In: Abdool Karim SS, Abdool Karim Q, eds. HIV/AIDS in South Africa. Cambridge: Cambridge University Press, 2005.
2. Mitton J. The sociological spread of HIV/AIDS in South Africa. *Journal of the Association of Nurses in AIDS Care* 2000; 11 (4):17-26.
3. McCoy D, Wood R, Dudley L, Barron P. *South Africa: The HIV pandemic.* In: Beck EJ, Mays N, Whiteside A, Zuniga JM, eds. The HIV Pandemic. Oxford: Oxford University Press, 2006.
4. Gilbert L, Walker L. Treading the path of least resistance: HIV/AIDS and social inequalities – a South African case study. *Soc Sci Med* 2002; 54(7): 1093-1110.

5. Tladi LS. Poverty and HIV/AIDS in South Africa: an empirical contribution. *Journal of Social Aspects of HIV/AIDS* 2006; 3(1): 369-381.
6. Phatlane SN. Poverty and HIV/AIDS in Apartheid South Africa. *Social Identities* 2003; 9(1): 73-91.
7. Cunha M. South African politics, inequalities, and HIV/AIDS: Applications for public health education. *Journal of Developing Studies* 2007; 23(1-2): 207-219.
8. Marks S. 2002. An epidemic waiting to happen? The spread of HIV/AIDS in South Africa in social and historical perspective. *African Studies* 2002; 61(13): 13-26.
9. Mirriam-Websters Collegiate Dictionary. 11th ed. Springfield, Ill.: Miriam-Webster, 2003.
10. Fassin D, Schneider H.The politics of AIDS in South Africa: beyond the controversies. *BMJ* 2003; 326: 495-497.
11. Johnson L, Budlender D. *HIV Risk Factors: A Review of the Demographic, Socioeconomic, Biomedical and Behavioural Determinants of HIV Prevalence in South Africa.* Cape Town: Centre for Actuarial Research, University of Cape Town, 2002.
12. Hunter M. The changing political economy of sex in South Africa: The significance of unemployment and inequalities to the scale of the AIDS pandemic. *Soc Sci Med* 2007; 64: 689-700.
13. Shisana O, Rehle T, Simbayi LC, *et al. South African National HIV Prevalence, HIV Incidence, Behaviour and Communication Survey,* 2005. Cape Town: HSRC Press, 2005.
14. Kirk D. Risk factors associated with HIV prevalence. Honours research project, Department of Actuarial Science, University of Cape Town, 2001.
15. Hargreaves JR, Bonell CP, Morison LA, *et al.* Explaining continued high HIV prevalence in South Africa: Socioeconomic factors, HIV incidence and sexual behaviour change among a rural cohort, 2001 - 2004. *AIDS* 2007; 21 (suppl. 7): S39-S48.
16. Barnighausen T, Hosegood V, Timaeus IM, Newell M. The socioeconomic determinants of HIV incidence: evidence from a longitudinal, population-based study in rural South Africa. *AIDS* 2007; 21 (suppl. 7): S29-S38.
17. Williams BG, Gilgen D, Campbell CM, Taljaard D, MacPhail C. *The Natural History of HIV/AIDS in South Africa: A Biomedical and Social Survey.* Johannesburg: CSIR, 2000.
18. Pronyk, PM, Hargreaves JR, Kim JC, *et al.* Effect of a structural intervention for the prevention of intimate-partner violence and HIV in rural South Africa: a cluster randomised trial. *Lancet* 2006; 368: 1973-1983.
19. Le Booysen F, Sumerton J. Poverty, risky sexual behaviour, and vulnerability to HIV infection: evidence from South Africa. *J Health Popul Nutr* 2002; 20(4): 285-288.
20. Hallman K. Gendered socioeconomic conditions and HIV risk behaviours among young people in South Africa. *African Journal of AIDS Research* 2005; 4(1): 37-50.
21. Mishra V, Assche SB-V, Greener R, *et al.* HIV infection does not disproportionately affect the poorer in sub-Saharan Africa. *AIDS* 2007; 21 (suppl. 7): S17-S28.
22. Johnson K, Way A. Risk factors for HIV infection in a national adult population: evidence from 2003 Kenya Demographic and Health Survey. *J Acquir Immune Defic Syndr* 2006; 42: 627-636.
23. Tanzania Commission for AIDS (TACAIDS), National Bureau of Statistics (NBS), and ORC Macro. *Tanzania HIV/AIDS Indicator Survey 2003-04.* Calverton, Md: TACAIDS, NBS, and ORC Macro, 2005.
24. Lachaud JP. HIV prevalence and poverty in Africa: micro- and macro-econometric evidences applied to Burkina Faso. *J Health Econ* 2007; 26: 483-504.
25. Gillespie S, Kadiyala S, Greener R. Is poverty or wealth driving HIV transmission? *AIDS* 2007; 21 (suppl. 7): S5-S16.
26. Laumann EO, Mahay J, Paik M. Network data collection and its relevance for the analysis of STDs: The CHSLS and the NHSLS. In: Morris M, ed. *Network Epidemiology.* Oxford: Oxford University Press, 2004.
27. Laumann EO, Youm Y. Racial/ethnic/ethnic group differences in the prevalence of sexually transmitted diseases in the United States: A network explanation. *Sex Transm Dis* 1999; 26(5): 250-261.
28. Kenyon C, Dlamini S, Boulle A, White R, Badri M. 2009. A network level explanation for the differences in HIV prevalence in South Africa's racial/ethnic groups. *African Journal of Aids Research* 2009; 8(3): 243-254.
29. Ghani AC, Swinton SJ, Garnett GP. The role of sexual partnership networks in the epidemiology of gonorrhea. *Sex Transm Dis* 1997; 24(1): 45-56.
30. Potterat JJ, Zimmerman-Rogers HZ, Muth SQ, *et al.* Chlamydia transmission: concurrency, reproduction number, and the epidemic trajectory. *Am J Epidemiol* 1999; 150(12): 1331-1339.
31. Kenyon C, Badri M. The role of concurrent sexual relationships in the spread of sexually transmitted infections in young South Africans. *Southern African Journal of HIV Medicine* 2009; Summer, 29-36
32. Wellings K, Collumbien M, Slaymaker E, *et al.* Sexual behaviour in context: a global perspective. *Lancet* 2006; 368: 1706-1728.
33. Halperin DT, 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; 26: 19-23.
34. Morris M, Kretzschmar M. Concurrent partnerships and the spread of HIV. *AIDS* 1997; 11(5): 641-648.
35. Kenyon C, Boulle A , Badri M, Asselman V. 'I don't use a condom (with my regular partner) because I know that I'm faithful, but with everyone else I do': the cultural and socioeconomic determinants of sexual partner concurrency in young South Africans. Presented at the IAS Conference, 19 - 22 July 2009, Cape Town. Abstract No. MOPEC022
36. Epstein H. *The Invisible Cure: Africa, the West and the Fight against AIDS.* London: Penguin, 2007.
37. Jana M, Nkambule M, Tumbo D, Goldstein S, Weiner R, for The Soul City Institute Regional Programme (2007). One love: Multiple and concurrent sexual partnerships in southern Africa. A Ten Country Research Report. http://www.soulcity.org.za/programmes/research/research-reports (accessed 20 June 2009).
38. Lopman B, Lewis J, Nyamukapa C. HIV incidence and poverty in Manicaland, Zimbabwe: is HIV becoming a disease of the poor? *AIDS* 2007; 21 (suppl 7): S57-S66.
39. Bärnighausen T, Tanser F, Newell ML. Lack of a decline in HIV incidence in a rural community with high HIV prevalence in South Africa, 2003 - 2007. *AIDS Res Hum Retroviruses.* 2009; 25(4): 405-409.
40. Mbeki T. ZK Matthews Memorial Lecture, University of Fort Hare, Alice, South Africa, 12 October 2001.
41. Thornton RJ. *Unimagined Community: Sex, Networks and AIDS in Uganda and South Africa.* London: University of California Press, 2008.
42. Youm Y, Paik A. The sex market and its implications for family formation. In: Laumann EO, Ellingson S, eds. *The Sexual Organization of the City.* Chicago: University of Chicago Press, 2004.
43. Kenyon C. Cognitive dissonance as an explanation of the genesis, evolution and persistence of Thabo Mbeki's HIV denialism. *African Journal of AIDS Research* 2008; 7(1): 29-35.
44. Kirby D. Changes in sexual behaviour leading to the decline in the prevalence of HIV in Uganda: confirmation from multiple sources of evidence. *Sex Transm Infect* 2008; 84 (suppl. 2): ii35-41.
45. Shelton JD, Cassel MM, Adetunji J. Is poverty or wealth at the root of HIV? *Lancet* 2005; 366: 1057-1058.

CHANGES TO THE ART GUIDELINES – AN OVERVIEW

Celicia Serenata
South African National AIDS Council Secretariat

In 2009 the South African National AIDS Council (SANAC) Treatment Technical Task Team (TTT) finalised recommendations for changes to the national standard treatment guidelines for adult and paediatric management and treatment, as well as changes in the prevention of mother-to-child transmission of HIV (PMTCT) guidelines, moving away from monotherapy to dual therapy. President Zuma announced changes in the national antiretroviral therapy (ART) programme on World AIDS Day 2009. Subsequently additional changes were made to the treatment guidelines to be in line with these new Presidential mandates, which came into effect on 1 April 2010.

The purpose of the changes to the guidelines is not just to meet the Presidential mandates, but also to bring the guidelines in line with international recommendations and ensure the use of more efficacious drugs, including the phasing out of stavudine from the national ART programme. Electronic versions of the treatment guidelines are available on the SANAC website (www.sanac.org.za). The following is a brief summary of the key changes.

PRIORITY GROUPS

Owing to the high cost associated with ART, and the high burden of people in need of ART in South Africa, eligibility criteria have been adapted only for priority groups. These are:

- HIV-infected pregnant women
- HIV-infected infants
- People with both tuberculosis (TB) and HIV infection
- People with multidrug-resistant (MDR) or extensively drug-resistant (XDR) TB.

ELIGIBILITY TO START ART

- CD4 count <200 cells/µl, irrespective of clinical stage, OR
- CD4 count <350 cells/µl in patients with TB/HIV co-infection, or pregnant women, OR
- WHO stage 4 disease, irrespective of CD4 count, OR
- MDR/XDR TB, irrespective of CD4 count.

In addition, certain patients are fast-tracked to be initiated on ART, which means they should be started within 2 weeks of receiving their CD4 result and choosing to start lifelong ART:

- Pregnant women
- Patients with a CD4 count below 100 cells/µl
- Any patient with WHO stage 4 disease
- Any patient with MDR or XDR TB.

NATIONAL REGIMENS

National regimens for children and adolescents are set out in Table I.

National regimens for mothers and infants are set out in Tables II and III.

NATIONAL REGIMEN FOR INFANTS

CHILDREN

For children, eligibility criteria to start ART are:

- All children under 1 year of age, irrespective of CD4 level
- Children between 1 and 5 years with clinical stage 3 or 4, or a CD4 percentage of 25 or below, or an absolute CD4 count under 750
- Children over 5 and up to 15 with clinical stage 3 or 4, or CD4 350 and below.

The first-line regimens for children are:

- Infants and children under 3: abacavir + lamivudine + lopinavir/ritonavir
- Children 3 and older: abacavir + lamivudine + efavirenz.

TABLE I. NATIONAL REGIMENS FOR CHILDREN AND ADOLESCENTS

First line		
All new patients needing treatment	TDF + 3TC/FTC + EFV/NVP	For TB co-infection EFV is preferred For pregnant women or women of child-bearing age, not on reliable contraception, NVP is preferred
Currently on d4T-based regimen with no side-effects	d4T + 3TC + EFV/NVP	Remain on d4T if well tolerated Early switch with any toxicity Substitute TDF if at high risk of toxicity (high body mass index, older, female, TB treatment)
Contraindication to TDF: renal disease	AZT+ 3TC + EFV/NVP	
Second line		
Failing on a d4T or AZT-based first-line regimen	TDF + 3TC/FTC + LPV/r	Virological failure must be followed by intensive adherence management If repeat viral load remains >1 000 in 3 months despite adherence intervention, switch
Failing on a TDF-based first-line regimen	AZT + 3TC + LPV/r	Virological failure must be followed by intensive adherence management, as re-suppression is often possible If repeat VL remains >1 000 in 3 months despite adherence intervention, switch.
Salvage therapy		
Failing any second-line regimen	Specialist referral	Intensively explore and address issues relating to causes of non-adherence If VL remains high, refer where possible, but *maintain* on failing regimen

TABLE II. NATIONAL REGIMEN FOR MOTHERS

Woman	Regimen	Comment
Eligible for lifelong ART (i.e. CD4 ≤350/µl or WHO clinical stage 3 or 4)	TDF + 3TC/FTC + NVP	Start lifelong ART within 2 weeks
Currently on lifelong ART	Continue ART	Substitute EFV with NVP if in first 12 weeks of pregnancy
Contraindication to TDF (renal disease)	AZT + 3TC + NVP	
Not eligible for ART, i.e. CD4 >350/µl and WHO stage 1 or 2	AZT from 14 weeks sdNVP + AZT 3-hrly in labour TDF + FTC single dose (stat) post-delivery	
Unbooked and presents in labour	sdNVP + AZT 3-hrly in labour TDF + FTC single dose post-delivery	Assess maternal ART eligibility before discharge

TABLE III. NATIONAL REGIMEN FOR INFANTS

Infant	Regimen	Comment
Mother on lifelong ART	NVP at birth and then daily for 6 weeks irrespective of infant feeding choice	
Mother on PMTCT	NVP at birth and then daily for 6 weeks continued as long as any breastfeeding	If formula fed, baby can stop NVP at 6 weeks
Mother did not get any ARV before or during delivery	NVP as soon as possible and daily for at least 6 weeks continued as long as any breastfeeding	Assess ART eligibility for the mother-within 2 weeks
Unknown maternal status because orphaned or abandoned	Give NVP immediately Test infant with rapid HIV test. If positive, continue NVP for 6 weeks. If negative, discontinue NVP	Follow-up 6-week HIV DNA PCR

If a child is currently on a stavudine-based regimen, and is not experiencing any side-effects, the regimen should be maintained. Substitutions are only made once lipodystrophy is suspected.

The second-line regimens for children are:

- Children 3 and older: zidovudine + didanosine + lopinavir/ritonavir
- Children failing on the first-line regimen: zidovudine + didanosine + lopinavir/ritonavir

- Children failing on the zidovudine or didanosine-based regimen: abacavir + lamivudine + lopinavir/ritonavir

HIV-INFECTED PREGNANT WOMEN WITH CD4 ABOVE 350

These women follow the new national PMTCT guidelines, namely:

- Zidovudine from 14 weeks
- Single-dose nevirapine and zidovudine 3-hourly during labour
- Tenofovir and emtricitabine single-dose after delivery.

If a women presents in labour without having started either ART or the PMTCT regimen at 14 weeks, she should still receive the single-dose nevirapine and zidovudine 3-hourly and tenofovir and emtricitabine as per above.

FINAL COMMENTS

Even though these guidelines are focused on the public sector, it is hoped that they will also be adopted in the private and NGO sectors. Implementing these new guidelines would not just be of immediate benefit to the patient needing treatment. As has been shown in recent studies, patients on ART have a decreased viral load, and this impacts on HIV transmission. This meets the major objective of what President Zuma announced on 1 December 2009 – decrease mortality, and increase HIV prevention.

REVIEW

HELD TO RANSOM - CMV TREATMENT IN SOUTH AFRICA

Fatima Laher[1], *MB BCh, Dip HIV Man (SA)*
Gail Ashford [2], *FCFP, Dip HIV Man (SA), DMH (SA)*
Angela Cescon[3], *BSc/BPHE*
Claire Cullen[4], *MB BCh*
Erica Lazarus[1], *MB BCh, Dip HIV Man (SA)*
Adrian Puren[5], *MB BCh PhD*
Linda Visser[6], *FCOphth*
[1]*Perinatal HIV Research Unit, Soweto, Johannesburg*
[2]*Donald Gordon Medical Centre, Parktown, Johannesburg*
[3]*Faculty of Health Sciences, Simon Fraser University, Canada*
[4]*Department of Ophthalmology, University of Limpopo and Dr George Mukhari Hospital, Limpopo Province*
[5]*National Institute for Communicable Diseases, Sandringham, Johannesburg*
[6]*Department of Ophthalmology, University of KwaZulu-Natal, Durban*

Cytomegalovirus is a multi-systemic infection reactivated in the immunocompromised. Diagnosis and treatment are prohibitively costly in sub-Saharan Africa, and efforts need to be made for their price reduction to support the expanding highly active antiretroviral treatment programme in the region.

Almost all humans are latently IgG-seropositive for the double-stranded DNA human herpesvirus 5 named cytomegalovirus (CMV). CMV is an AIDS-defining World Health Organization (WHO) stage 4 opportunistic infection for both adults and children, seen when the CD4 T-cell count falls below 100 cells/µl and as an immune reconstitution syndrome after starting highly active antiretroviral therapy (HAART).[1]

CLINICAL MANIFESTATIONS

Active CMV disease may present multi-systemically, with significant morbidity and mortality. Organ system manifestations include:

CMV retinitis (CMV-R). This is a visual emergency usually presenting with blurred vision, floaters, black spots, flashing lights, distortions, redness and photophobia, but sometimes asymptomatic. WHO clinical diagnosis guidelines for CMV-R include dilated pupil indirect fundoscopic identification of 'discrete patches of retinal whitening with distinct borders, spreading centrifugally, often following blood vessels, associated with retinal vasculitis, haemorrhage and necrosis'.[2] Figs 1 and 2 show CMV-R before and after local treatment, respectively. This fundoscopic picture is known as the 'pizza pie' appearance. CMV-R may result in blindness.[3]

CMV of the gastro-intestinal tract. Colitis is symptomatic as chronic watery diarrhoea that may become bloody, and oesophagitis symptomatic as dysphagia, anorexia and weight loss. Hepatitis may occur, and there are reports of acalculous cholecystitis.

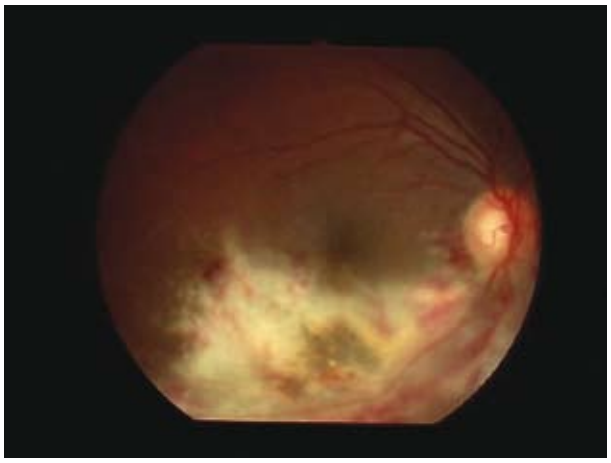


Fig. 1. CMV Retinitis at baseline. Full-thickness retinal necrosis along the inferotemporal arcade with some haemorrhage. There is minimal vitritis and mild macular oedema (courtesy Dr Linda Visser, University of KwaZulu-Natal).

CMV adrenalitis. Adrenal insufficiency may manifest as postural hypotension, fatigue, hyponatraemia, hyperkalaemia and acidosis. It has a high mortality rate.[4]

CMV pneumonitis. Manifestations are tachypnoea, hypoxia and dry cough, which are commonly misdiagnosed as *Pneumocystis jirovecii* pneumonia.[5]

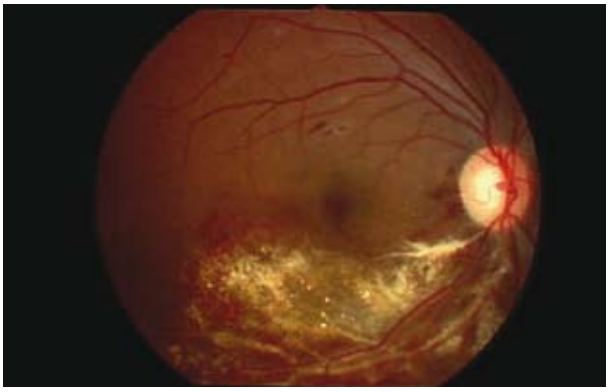


Fig. 2. CMV retinitis after six intra-ocular ganciclovir injections. Note scarring in the area of previous necrosis. There is less vitritis, and the macular oedema has resolved. Haemorrhages may take months to resolve, and intraretinal gliosis can usually be seen late (courtesy Dr Linda Visser, University of KwaZulu-Natal).

CMV of the neurological system.[6] Encephalitis presents with headache, subacute personality changes, decreased concentration, and progressive dementia. Transverse myelitis may occur. CMV is a recognised cause of acute inflammatory demyelinating polyradiculopathy (Guillain-Barré syndrome), the hallmarks of which are rapidly progressive ascending and often asymmetrical paraesthesiae, sensory loss and areflexia, as well as urinary retention, constipation and incontinence. The cerebrospinal fluid may demonstrate polymorphonucleocytosis and raised protein, and the diagnostic method of choice is polymerase chain reaction (PCR) testing of the cerebrospinal fluid for CMV DNA.

SOUTH AFRICAN SPECTRUM OF DISEASE

Most data for CMV in the developed world were established in the 1990s, before the HAART era. CMV-R was found in a third of AIDS patients, with a large resulting burden of blindness.[7] In one pre-HAART Swiss study of 48 patients, median survival after CMV retinitis was 6 months.[8] HAART improved survival markedly in AIDS CMV-R patients.[9]

There is a paucity of CMV data in the developing world. CMV has been called the 'neglected disease of the AIDS pandemic' because of poor diagnostic and treatment capability.[1] In South Africa's pre-HAART era, 90 AIDS patients were treated for CMV-R at the University of Natal over 7 years, and the incidence was noted to increase with time.[10] A cross-sectional study screening all HIV-infected patients with CD4 counts <50 cells/µl in Khayelitsha, South Africa, diagnosed CMV-R in 2% of these patients using dilated pupil indirect ophthalmoscopy.[1] In a South African autopsy study of 47 HIV-infected cadavers where the clinician-attributed cause of death had been tuberculosis, CMV pneumonitis was proven in 15% and 66% tested positive for CMV-DNA.[11]

South Africa has both a high burden of HIV disease[12] and a large, expanding HAART programme.[13] Many South African HIV-infected patients present for initiation of HAART when the CD4 count is less than 100 cells/µl,[14] and often the median is less than 50 cells/µl,[15] which makes them susceptible to CMV disease. The return to health and longevity that HAART confers[16] shapes a powerful argument to treat CMV efficiently and prevent its debilitating effects.

DIAGNOSTIC OPTIONS

A variety of testing options exist to identify active systemic CMV infection (Table I). Viral culture is traditionally accepted as the 'gold standard' method of detection.[17] Simpler and more rapid options are now proving as or more effective.[18] The pp65 antigen assay can provide very sensitive results in less than 6 hours, the main drawback being the need for immediate sample processing after retrieval in order to ensure test validity. Serological tests for the presence of IgM and IgG antibodies may have little diagnostic value in the immunocompromised patient. CMV DNA-PCR tests provide sensitive results that can reproducibly quantify CMV viral loads.[19] In HIV-infected patients, both DNA-PCR and pp65 antigen assay have proven to be more predictive in detecting CMV than serology or viral culture.[20] The CMV pp67 mRNA test is a promising new method used in research settings.

TREATMENT: THE URGENT NEED FOR VALGANCICLOVIR PRICE REDUCTION IN SA FOR CMV TREATMENT IN HIV PATIENTS

CMV treatment strategies (Table II) include systemic as well as local products, the latter for opthalmological indications. After completion of an induction phase, patients remain on maintenance therapy until immune recovery (CD4 >100 cells/µl).

Because southern African health facilities are poorly resourced, widespread use of intra-ocular ganciclovir (GCV) is not feasible.[1] Specialist ophthalmological services are scarce in the state sector, and sometimes non-existent in rural areas. Intra-ocular GCV may not always be acceptable to patients, and is not without procedure-related adverse effects such as endophthalmitis.[10] Most importantly, intra-ocular GCV does not prevent spread of CMV to the other eye, and completely fails to treat disseminated CMV.[1,10]

Unfortunately, the exorbitant cost of systemic CMV treatments is prohibitive in the state sector. Systemic GCV necessitates a 3-week stay in hospital for intravenous induction, followed by oral maintenance GCV.[21] Lengthy intravenous induction is not always realistic in resource-poor settings and may place

TABLE I. CMV DIAGNOSTIC TESTS

Test	Tube/transport	Samples	Volume required	Turnaround time	Price estimate (2009)
CMV viral culture (shell vial)	No preservative Send on ice to arrive at lab and be processed within 24 hours	Urine, CSF aspirate, breastmilk Blood not an ideal sample	1 ml	2 - 7 d (state), 3 - 28 d (pvt)	R82 (state), R97.11 (pvt)
CMV pp65 antigen (IFA)	EDTA, room temperature, must be received at NICD before 14h00 same day as collection	Whole blood Result may be impossible if patient neutropenic	5 ml	1 - 3 d	R171 (state), R182.97 (pvt)
CMV IgG and IgM	Yellow-top	Blood (serum)		1 d	IgG R104.85 (pvt), IgM R113.76 (pvt)
Qualitative CMV DNA-PCR	EDTA	Any sample including blood, CSF, etc.		1 d	R607.14 (pvt)
Quantitative CMV DNA-PCR (i.e. CMV viral load)	EDTA	Whole blood		1 d	R1 214.18 (pvt)

pvt = estimated prices courtesy Toga Laboratories; state = estimated prices courtesy NHLS/NICD.

TABLE II. CMV TREATMENT IN ADULTS

Drug		Dose	Price estimates across sectors			Safety
			Private	State	NGO	
Valganciclovir (Valcyte; Roche) 450 mg per tablet, 60 tablets per bottle	Initiation phase	900 mg bd po with meals × 21 days	R24 719.87 for 21 days	R19 479.32 for 21 days	Specially imprinted price-reduced boxes can be ordered by NGOs from Roche Switzerland*	Doubles ddI levels Monitor FBC 2 - 3 × week Discontinue if neutrophils <0.5 $\times 10^9$/l or platelets <25$\times 10^9$/l. Adjust doses in renal failure
No generics currently available in South Africa	Maintenance phase	900 mg/d po with meals until HAART restores CD4 count >100 cells/µl	R17 657.05 per month	R13 913.85 per month		
Ganciclovir (Cymevene; Roche)	Induction phase: intravenous	5 mg/kg IV bd × 21 days	R2 558.24 for 5 vials	R1 789.65 for 5 vials	N/A	Beware pancytopenia Monitor FBC every 2 days Reduce dose by 30 - 50% if neutrophils 0.5 - 0.8$\times 10^9$/l. Discontinue if neutrophils <0.5 $\times 10^9$/l. Cautious use with AZT or ddI: similar toxicities
Inj.: 500 mg in 10 ml vials ×5 Caps: 250 mg (84), 500 mg (90) No generics currently available in South Africa	Maintenance phase: oral	1 g tds po	Oral ganciclovir is not available in South Africa Suggest maintenance with valganciclovir			
	Local treatment for CMV retinitis	In a recumbent patient, 2 mg of a 25 mg/ml ganciclovir solution in normal saline is injected with a 1 ml syringe and 30G needle, 4 mm behind the limbus of the eye superiorly with the patient looking down. Patients are given intravitreal ganciclovir injections twice a week for the first 2 weeks, then weekly until immune recovery or retinitis quiescence[9]				

*Minimum order of CHF 10 000. Each 60-tab box of 450 mg tablets costs CHF 500, plus freight and insurance changes apply (estimated CHF 177.40 + 40.20 respectively for a 26-box order) (CHF = Swiss franc, 1 CHF = 7.47309 ZAR, exchange rate at 1 June 2009). NGO orders can be placed only at Roche Basle (sandra.torriani_cazzato@roche.com). The lead time is 3 months after receipt of firm order. Prices quoted are per Roche, May/June 2009.
FBI = full blood count; AZT = zidovudine.

immune-compromised patients at risk of contracting nosocomial illnesses.

The benefits of valganciclovir are evident: it is taken orally, easy to administer in resource-poor settings, well tolerated, and efficacious in both induction and maintenance phases of treatment.[21] Its cost currently prevents its use in South African CMV AIDS patients.

Second-line intravenous treatment options such as foscarnet and cidofovir are avoided because of nephro-toxicity.

PAEDIATRIC CMV TREATMENT AND PREVENTION IN PREGNANCY

Congenital CMV causes a broad range of neurodevelopmental deficits in both symptomatic and initially asymptomatic neonates, including microcephaly, chorioretinits and sensorineural hearing loss.

A 6-week course of intravenous ganciclovir has been shown to be effective in preventing hearing loss, improving weight gain and head circumference, and resolving hepatic dysfunction, hepatomegaly and retinitis. Ganciclovir toxicity, especially neutropenia, can however be life-threatening.[22]

Results of a small pharmacokinetic study show that oral valganciclovir at a dose of 16 mg/kg provided similar plasma levels of drug compared with 6 mg/kg intravenous ganciclovir, so it appears that valganciclovir is a promising option for treating neonatal and paediatric patients.[23]

Vertical CMV transmission is trans-placental, and the rate is observed to be higher in HIV-1-infected mothers. Infants who are co-infected with HIV-1 and CMV are more likely to have rapid HIV disease progression.[24]

Valganciclovir and ganciclovir are both considered potentially teratogenic from animal data, but there are no controlled studies in pregnant women.

A recent development in March 2009 is a CMV vaccine that may offer future public health benefits for pregnant women by eliminating congenital CMV.[25]

HOW CAN VALGANCICLOVIR PRICE REDUCTION BE ACHIEVED IN SOUTH AFRICA?

Currently, the cost of CMV treatment makes it unaffordable to most.

Letters of concern on behalf of the South African HIV Clinicians Society have been sent to Roche urging price reduction of CMV treatments in the sub-Saharan African region. Various organisations internationally are lobbying for price reduction, including Médecins Sans Frontières, Universities Allied for Essential Medicines and the Clinton HIV/AIDS Foundation.

Valganciclovir for CMV treatment in AIDS patients must be placed on our state tender request list. Currently it is available through state discretionary funds to transplant patients only. Government should consider compulsory licensing for price-slashed generic production of valganciclovir for the state sector.

REFERENCES

1. Heiden D, Ford N, Wilson D, *et al.* Cytomegalovirus retinitis: The neglected disease of the AIDS pandemic. *PLoS Med* 2007; 4(12): 1845-1851.
2. World Health Organization. *Revised WHO Clinical Staging and Immunological Classification of HIV/AIDS and Case Definitions of HIV and Related Conditions.* Geneva: WHO, 2006.
3. Jacobson MA, Stanley H, Holtzer C, *et al.* Natural history and outcome of new AIDS-related cytomegalovirus retinitis diagnosed in the era of highly active antiretroviral therapy. *Clin Infect Dis* 2000; 30: 231-233.
4. Eddleston M, Peacock M, Juniper M, *et al.* Severe cytomegalovirus infection in immunocompetent patients. *Clin Infect Dis* 1997; 24: 52-56.
5. Baughman RP. Cytomegalovirus: The monster in the closet? *Am J Respir Crit Care Med* 1997; 156(1): 1-2.
6. McCutchan JA. Cytomegalovirus infections of the nervous system in patients with AIDS. *Clin Infect Dis* 1995; 20: 747-754.
7. Holbrook JT, Jabs DA, Weinberg DV, Lewis RA, *et al.* Visual loss in patients with cytomegalovirus retinitis and acquired immunodeficiency syndrome before widespread availability of highly active antiretroviral therapy. *Arch Ophthalmol* 2003; 121: 99-107.
8. Olmari M, Gabriel V, Sansonetti A, *et al.* Long-term visual outcome in CMV retinitis. Presented at the Xth International Conference on AIDS, Yokohama, Japan, 7-12 August 1994 (abstract no. PB0517).
9. Gross JG, Bozzette SA, Mathews WC, *et al.* Longitudinal study of cytomegalovirus retinitis in acquired immune deficiency syndrome. *Ophthalmology* 1990; 97(5): 681-686.
10. Visser L. Managing CMV retinitis in the developing world. *Comm Eye Health* 2003; 16(47): 38-39.
11. Martinson NA, Karstaedt A, Venter WD, *et al.* Causes of death in hospitalized adults with a premortem diagnosis of tuberculosis: an autopsy study. *AIDS* 2007; 21(15): 2043-2050.
12. National Department of Health, South Africa. Report: The National HIV and Syphilis Prevalence Survey South Africa 2007. http://data.unaids.org/pub/Report/2008/20080904_southafrica_anc_2008_en.pdf (accessed 7 May 2009).
13. National Department of Health, South Africa. HIV and AIDS and STI Strategic Plan for South Africa for 2007-2011, 2007. www.doh.gov.za/docs/misc/stratplan/2007-2011/part1.pdf (accessed 7 August 2009).
14. Keiser O, Orrell C, Egger M, *et al.* Public-health and individual approaches to antiretroviral therapy: Township South Africa and Switzerland compared. *PLoS Med* 2008; 5(7): e148. doi:10.1371/journal.pmed.0050148.
15. Coetzee D, Hildebrand K, Boulle A, *et al.* Outcomes after two years of providing antiretroviral treatment in Khayelitsha, South Africa. *AIDS* 2004; 18(6): 887-895.
16. Lima VD, Hogg RS, Harrigan PR, *et al.* Continued improvement in survival among HIV-infected individuals with newer forms of highly active antiretroviral therapy. *AIDS* 2007; 21(6): 685-692.
17. Müller LV, Hampl W, Hinz J, *et al.* High variability between results of different in-house tests for cytomegalovirus (CMV) monitoring and a standardized quantitative plasma CMV PCR assay. *J Clin Microbiol* 2002; 40(6): 2285-2287.
18. Mocarski ES, Shenk T, Pass RF. Cytomegaloviruses. In: Knipe DM, Howley PM, Griffin DE, eds. *Fields Virology.* 5th ed, Philadelphia: Lippincott Williams & Wilkins, 2007: 2701-2772.
19. Boeckh M, Boivin G. Quantitation of cytomegalovirus: methodologic aspects and clinical applications. *Clin Microbiol Rev* 1998; 11(3): 533-554.
20. Dodt KK, Jacobsen PH, Hofmann B, *et al.* Development of cytomegalovirus (CMV) disease may be predicted in HIV-infected patients by CMV polymerase chain reaction and the antigenemia test. *AIDS* 1997; 11: F21-F28.
21. Martin DF, Sierra-Madero J, Walmsley S, *et al.*, for the Valganciclovir Study Group. A controlled trial of valganciclovir as induction therapy for cytomegalovirus retinitis. *N Engl J Med* 2002; 346: 1119-1126.
22. Nasetta L, Kimberlin D, Whitley R. Treatment of congenital cytomegalovirus infection: implications for future therapeutic strategies. *J Antimicrob Chemother* 2009; 63: 862-867.
23. Kimberlin D, Acosta E, Sanchez P, *et al.* Pharmakokinetic and pharmacodynamic assessment of oral valganciclovir in the treatment of symptomatic congenital cytomegalovirus disease. *J Infect Dis* 2008; 197: 836-845.
24. Kovacs A, Schluchter M, Easley K, *et al.* Cytomegalovirus infection and HIV-1 disease progression in infants born to HIV-1-infected women. *N Engl J Med* 1999; 341: 77-84.
25. Pass RF, Zhang C, Evans A, *et al.* Vaccine prevention of maternal cytomegalovirus infection. *N Engl J Med* 2009; 360: 1191-1199.

Invited Comment

Cytomegalovirus can cause a wide spectrum of multi-systemic disorders including pulmonary disease, gastro-intestinal disorders and disabling central or peripheral neurological dysfunction, as well as other manifestations that are well described by Laher *et al.* in their article. However, retinal disease is by far the most common clinical manifestation of CMV for patients with HIV, and this devastating condition has rightly been termed 'the neglected disease of the AIDS pandemic'.[1]

Cytomegalovirus retinitis (CMVR) is the most frequent cause of visual loss in individuals with AIDS, and before availability of HAART in the USA approximately 30% of patients with AIDS developed CMVR.[2] Direct involvement of the optic disc and macula, retinal detachment and immune recovery-related phenomena can all complicate the condition, and may lead to visual impairment or blindness. A recent survey in Botswana suggests that up to 16.5% of individuals accessing HAART in a hospital setting have CMVR, in alignment with the findings of Visser, based in Durban.[3,4] The high burden of HIV disease and the increasing scale-up of HAART provision in South Africa (with patients often initiating treatment at low CD4 counts) suggest that cytomegalovirus disease, whether ocular or systemic, will have a huge impact on HIV-related morbidity and mortality.

Detection of systemic CMV disease may need to be augmented by diagnostic laboratory tests, as outlined by the authors. However, retinal CMV disease is considered to have a characteristic appearance on ophthalmoscopy. Clinical examination of the fundus by indirect ophthalmoscopy is the gold standard for detection of CMVR, yet in many resource-limited settings the geographical and numerical maldistribution of ophthalmologists to HIV-affected individuals renders this an untenable situation. Furthermore, the cost of treatment is prohibitive, and intra-ocular injections for CMVR also require ophthalmic expertise.

As HIV clinicians and eye care professionals, we are in a position to curtail the 'neglect' of CMV – diagnosis and management of CMV infection, whether systemic or ocular, should be part of routine care. The development of novel strategies to train non-ophthalmologists to screen for CMVR means that ocular case detection may be possible even with decentralisation of HIV services to primary care levels. However, detection of CMV infection is just the first of many steps. A major obstacle faced in South Africa is the challenge of making treatment available, effective and affordable. We need to rise to the challenge and lobby for availability of economically priced treatment, otherwise we risk leaving our patients vulnerable to the scourge of CMV disease – and potentially a life filled with darkness.

Sophia Pathai
Clinical Research Fellow
International Centre for Eye Health
London School of Hygiene and Tropical Medicine

REFERENCES
1. Heiden D, Ford N, Wilson D, Rodriguez WR, *et al.* Cytomegalovirus retinitis: the neglected disease of the AIDS pandemic. *PLoS Med* 2007; 4(12): e334.
2. Hoover DR, Peng Y, Saah A, *et al.* Occurrence of cytomegalovirus retinitis after human immunodeficiency virus immunosuppression. *Arch Ophthalmol* 1996; 114(7): 821-827.
3. Nkomazana O, Tshitswana D. Ocular complications of HIV infection in sub-Saharan Africa. *Current HIV/AIDS Reports* 2008, 5: 120-125.
4. Visser L. Managing CMV retinitis in the developing world. *Comm Eye Health* 2003; 16(47): 38-39.

ORIGINAL ARTICLE

ANALYSIS OF TRENDS IN TOTAL AND AIDS-RELATED DEATHS CERTIFIED AT MOSVOLD HOSPITAL, INGWAVUMA, KWAZULU-NATAL, FROM 2003 TO 2008

C H Vaughan Williams, *MB BS, DCH, MFamMed, DOH*
District Family Physician, Umkhanyakude Health District Office, Jozini, KwaZulu-Natal

Objectives. To analyse mortality trends from deaths registered at Mosvold Hospital, Ingwavuma, KwaZulu-Natal, and possible impact of programmes to treat and prevent HIV infection.

Design. Longitudinal study of death certifications from 2003 to 2008.

Setting. Mosvold Hospital mortuary, Ingwavuma.

Subjects. Counterfoils of form 83/BI-1663, Notification/Register of Death/Stillbirths (Republic of South Africa, Department of Home Affairs), completed at Mosvold Hospital from January 2003 to December 2008.

Outcome measures. Age at death, cause of death, patterns of deaths grouped by age, gender and cause of death.

Results. AIDS-related deaths were the cause of 53% of deaths, particularly affecting the 20 - 59-year and under-5 age groups. Since 2005 there has been a decline in deaths in the 20 - 59 age group and an increase in average age at death.

Conclusions. The decrease in mortality from 2005 may be associated with antiretroviral roll-out reducing mortality from AIDS-related illnesses.

Mosvold Hospital is situated in northern KwaZulu-Natal near the borders of Swaziland and Mozambique. According to estimates by the Department of Health, the hospital serves a population of about 108 000.[1] The population is rural and poor, with adult unemployment at 60%. Five per cent of households have piped water and 3.6% of households are supplied with electricity. Government health care in the Ingwavuma sub-district, in which Mosvold Hospital is situated, is provided by the hospital, 10 residential clinics and 3 mobile clinic teams. The hospital mortuary is the only government mortuary serving the Mosvold sub-district. Most deaths occurring in the sub-district, both within and outside the hospital, are certified by medical staff.

Antiretroviral drugs (ARVs) were first prescribed in September 2004 as part of the national antiretroviral roll-out programme. Table I shows the total number of patients started on ARVs from 2004 to 2008. The number of females started in each year was greater than the number of males, and from the beginning of the roll-out at least 11% of the patients enrolled were children.

In a previous study,[2] an analysis of 4 years' mortality data from 2003 to 2006 indicated that AIDS-related illnesses were responsible for 53% of deaths certified at the hospital during the period of the study. There was evidence of an increase in average age at death of women between 2005 and 2006, suggesting a positive impact of the ARV roll-out. The present analysis investigated the continuing impact of HIV/AIDS on mortality and life expectancy and observed trends over the period during which HIV treatment and prevention of mother-to-child transmission therapy (PMTCT) were introduced.

The use of nevirapine for PMTCT was commenced in 2002. Dual PMTCT, adding zidovudine to nevirapine, was started in April 2008.

METHODS

Data from counterfoils of form 83/BI-1663, Notification/Register of Death/Stillbirths (Republic of South Africa, Department of Home Affairs), completed at Mosvold Hospital from 1 January 2003 to 31 December 2008, were entered into a database (Microsoft Access).

ETHICAL CONSIDERATIONS

The publication of statistics on the causes of death certified at Mosvold Hospital was approved by the Mosvold Hospital Ethical Committee.

RESULTS

Figs 1 and 2 show age at death in males and females according to HIV-related and non-HIV-related causes. Most deaths between the ages of 20 and 54 years are due to AIDS-related causes.

Table II shows the average age at death by year for males and females (>9 years) between 2003 and 2008 according to AIDS-related and non-AIDS-related causes. Average age at death for females declined between 2003 and 2005, and appeared to increase again from 2005 and 2007. The pattern for male deaths is less marked.

TABLE I. PATIENTS STARTED ON ANTIRETROVIRAL DRUGS AT MOSVOLD HOSPITAL, INGWAVUMA, KWAZULU-NATAL, FROM SEPTEMBER 2004

Year	Males (each year)	Females (each year)	Total patients started per year	Cumulative total	Children <15 yrs started per year	Cumulative number of children <15 yrs	% children <15 yrs
2004	47	78	125	125	14	14	11.2
2005	198	324	522	647	62	76	11.7
2006	367	518	885	1 532	150	226	14.8
2007	397	691	1 088	2 620	170	396	15.1
2008	406	746	1 152	3 772	139	535	14.2

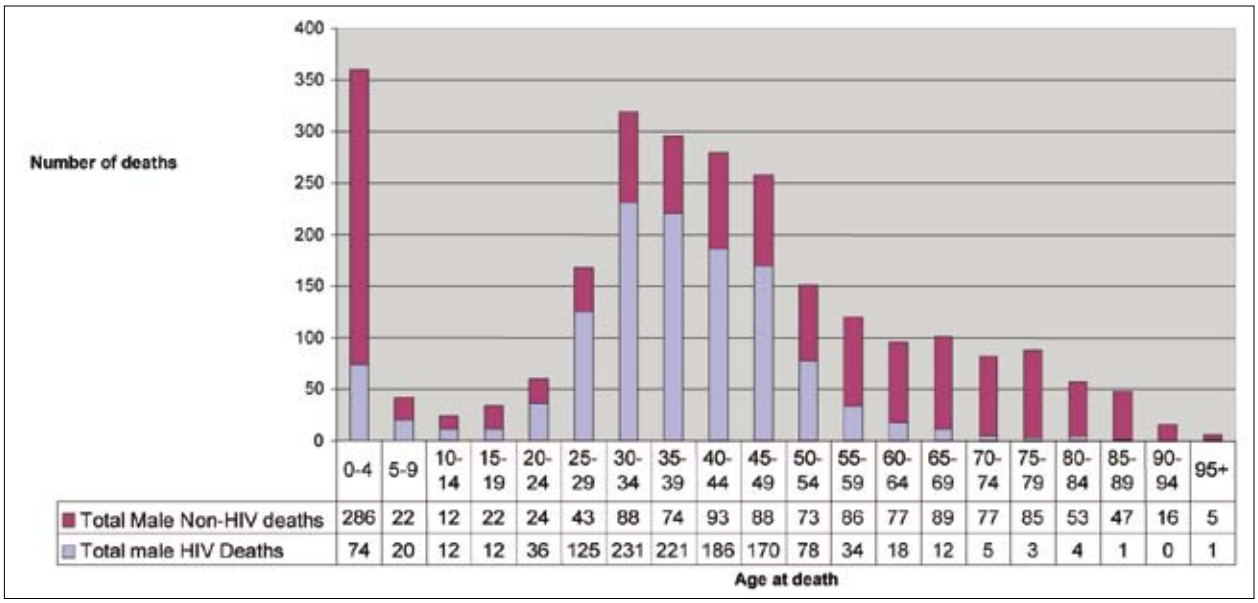


Fig. 1. Total male deaths 2003 - 2008 certified at Mosvold Hospital, Ingwavuma, northern KwaZulu-Natal, grouped according to HIV/AIDS-related and non-HIV/AIDS-related causes of death.

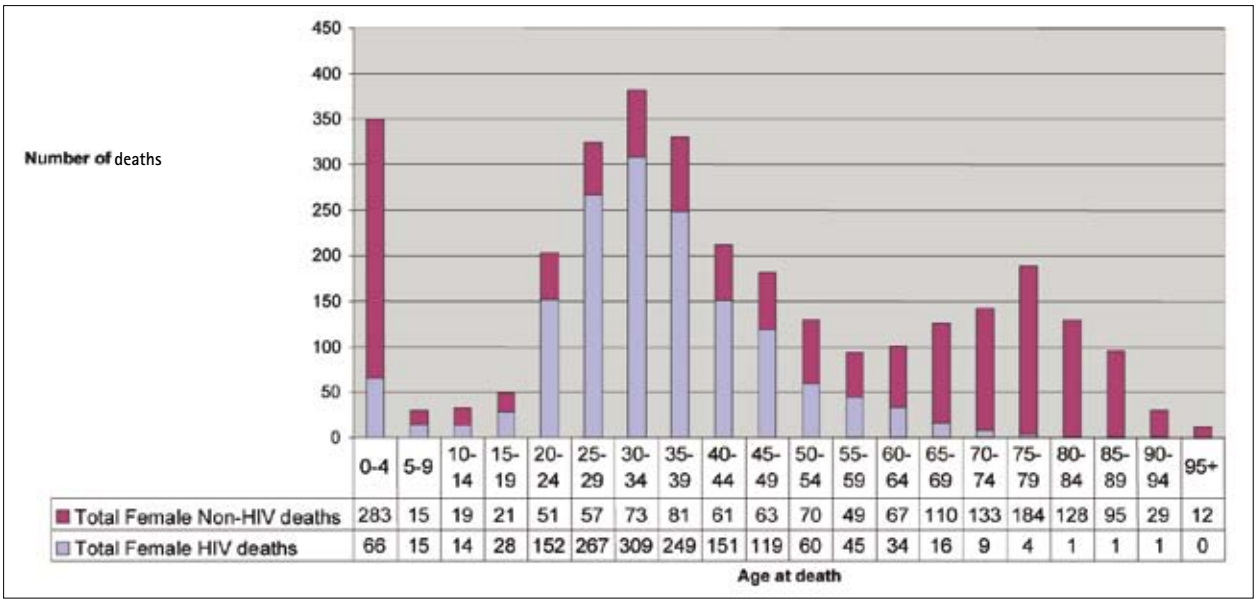


Fig. 2. Total female deaths 2003 - 2008 certified at Mosvold Hospital, Ingwavuma, northern KwaZulu-Natal, grouped according to HIV/AIDS-related and non-HIV/AIDS-related causes of death.

Fig. 3 shows the trends in number of deaths certified at Mosvold Hospital for the 15 - 59-year age group and deaths attributable to AIDS-related causes. There is a 39% reduction in all-cause mortality and a 38% reduction in AIDS-related deaths in women and a 24% reduction in all-cause mortality in men with a 29% reduction in deaths attributable to AIDS.

DISCUSSION

The National HIV and Syphilis Survey South Africa in 2007[3] estimated the antenatal HIV prevalence for Umkhanyakude District to be 39.8%, an increase on the 2006 estimate of 36.3% and higher than the national estimate of 28%. High mortality from HIV/AIDS is consistent with these estimates.

In a survey of HIV infection prevalence in the southern part of Umkhanyakude District, near Mtubatuba, Tanser *et al.*[4] found that HIV prevalence peaked at 51% in women in the 25 - 29-year age group and at 44% for men aged 30 - 34 years, which is consistent with the mortality patterns found in this study of a population in the same district.

In a report by Statistics South Africa entitled 'Mortality and causes of death in South Africa, 2006',[5] the proportion of deaths according to age group had a similar pattern to that found in this study, with peaks in the under-5, 30 - 34 and, for females, 75 - 79-year age groups. Deaths in the 15 - 59-year age group increased between 2002 and 2006, but with a decreasing annual increase between 2005 and 2006 compared with previous years.

The pattern of mortality according to age at death and cause of death in this study shows that HIV/AIDS is a leading cause of mortality in persons between the ages of 15 and 59, as well as causing substantial mortality in the under-5 age group. However, the decline in deaths in the 15 - 59 age group after 2005, mostly AIDS related, combined with increased age at death since the

TABLE II. AVERAGE AGE OF DEATH IN PERSONS AGED >9 YEARS – DEATHS CERTIFIED AT MOSVOLD HOSPITAL, INGWAVUMA, KWAZULU-NATAL, JANUARY 2003 – DECEMBER 2008

		Males		Females	
Year		Average age at death	95% CI	Average age at death	95% CI
2003	All causes	47.5	45.8 - 49.2	48.5	46.6 - 50.4
	HIV/AIDS	39.4	38.0 - 40.8	35.1	33.7 - 36.5
2004	All causes	45.6	43.9 - 47.3	45.3	43.5 - 47.1
	HIV/AIDS	38.8	37.5 - 40.1	36.2	34.9 - 37.5
2005	All causes	45.9	44.2 - 47.6	44.1	42.4 - 45.7
	HIV/AIDS	37.9	36.5 - 39.3	35.9	34.6 - 37.2
2006	All causes	45.6	43.8 - 47.3	47.7	45.8 - 49.6
	HIV/AIDS	38.7	37.2 - 40.2	35.4	33.9 - 36.8
2007	All causes	47.54	45.7 - 49.4	50.01	48.0 - 52.0
	HIV/AIDS	39.62	38.1 - 41.2	37.17	35.5 - 38.8
2008	All causes	47.31	45.3 - 49.3	49.06	46.8 - 51.3
	HIV/AIDS	40.62	38.7 - 42.6	35.1	33.4 - 36.8

CI = confidence interval.

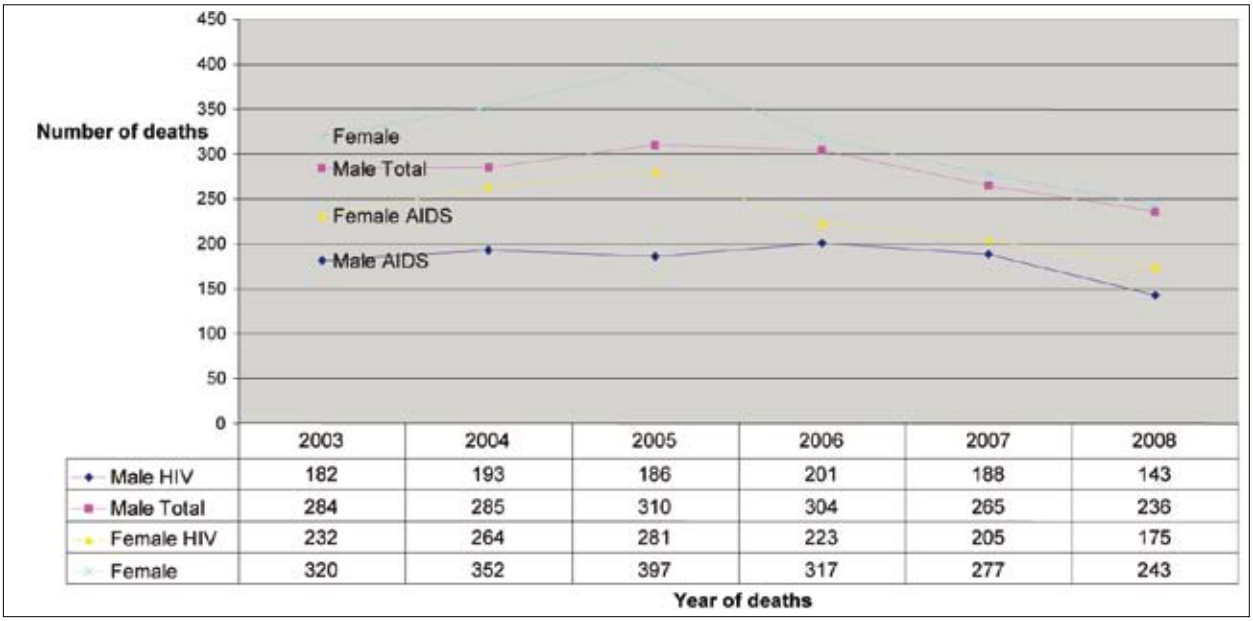


Fig. 3. Deaths per year in the age group 15 - 59 years certified at Mosvold Hospital, Ingwavuma, KwaZulu-Natal.

start of the ARV roll-out, suggests that roll-out may be reducing mortality from AIDS-related illness in the 15 - 59-year age group. The greater impact on female mortality compared with male mortality may be explained by the greater number of females compared with males enrolled onto ARV treatment.

REFERENCES

1. Zondi T, Ngomane N. Health and health care systems situational analysis. In: *Umkhanyakude Health District Situational Analysis*. Braamfontein: Health Systems Trust, 2002: 10.
2. Vaughan Williams CH. Analysis of impact of HIV/AIDS on deaths certified at Mosvold Hospital, Ingwavuma, northern KwaZulu-Natal from 2003 - 2006. *South African Journal of Family Practice* 2007; 49(5): 16a-16e. http://www.safpj.co.za/index.php/safpj/article/view/628/756 (accessed 15 June 2009).
3. National Department of Health, South Africa. 2008. The National HIV and Syphilis Survey South Africa 2007. http://www.doh.gov.za/docs/reports/2007/antenatal/antenatal_report.pdf (accessed 14 June 2009).
4. Tanser F, Hosegood V, Bärnighausen T, *et al*. Cohort profile: Africa Centre Demographic Information System (ACDIS) and population-based HIV survey. *Int J Epidemiol* 2008; 37: 956-962. http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2557060 (accessed 15 June 2009).
5. Statistics South Africa. 2008. Statistical Release P0309.3: Mortality and causes of death in South Africa, 2006 Findings from death notification. http://www.statssa.gov.za/publications/statsdownload.asp?PPN=P0309.3&tSCH=4254 (accessed 14 June 2009).

ORIGINAL ARTICLE

FEELINGS OF HOPELESSNESS IN STABLE HIV-POSITIVE PATIENTS ON ANTIRETROVIRALS

M Y H Moosa, *MMed (Psych), FCPsych*
F Y Jeenah, *MMed Psych, FCPsych*
Department of Psychiatry, University of the Witwatersrand, Johannesburg

Aim. The coping skills and styles individuals utilise to deal with the stress of HIV infection greatly influence the psychological impact of this illness and potential consequent feelings of hopelessness. The aim of this study was to describe levels of hopelessness in a group of stable, non-depressed HIV-positive patients receiving antiretroviral therapy, and factors associated with hopelessness.

Method. Thirty randomly selected non-depressed patients (according to *Diagnostic and Statistical Manual of Mental Disorders,* 4th edition (DSM-IV) criteria) were included in this study. Demographic and other data were obtained from all subjects, who also completed the Beck's Hopelessness Scale (BHS). The 20 true-false items of the BHS (29) measured three major aspects of hopelessness, which was interpreted on the total scale score as follows: ≤3 minimal, and >3 significant.

Results. The study population comprised 30 patients with a mean age of 37.9 years (standard error (SE) 1.18) (range 28 - 51 years). The mean BHS score was 4.03 (SE 0.55), with a range from 0 to 12. There were no statistically significant correlations between BHS scores of the study population and gender, marital status, employment status, level of education, years since the diagnosis of HIV, or number of children ($p>0.05$). Eighteen subjects (60%) scored 3 or less on the BHS, considered minimal levels of hopelessness. However, 12 (40%) scored more than 3, which is considered significant; of these 23% had scores of 7 or more. There was no statistically significant association between BHS scores and gender, employment status, level of education, number of children or number of years since diagnosis ($p>0.05$). However, patients who were married or living with partners were statistically more likely to score higher on the hopelessness scale compared with those who were single ($p<0.05$).

Conclusion. Hopelessness is a psychological distress reaction that is common but largely undetected in stable HIV-positive patients on antiretrovirals. Feelings of hopelessness may result in increase in risk-taking behaviour (e.g. unprotected sex, drug use, sharing needles) and attempted suicide.

Coping is defined as 'the cognitive and behavioral efforts made by an individual to alter or manage the problems caused by stressful situations'.[1] The effectiveness of coping is associated with variables such as extent of social support,[2,3] personality factors such as self-esteem and control,[4] and rate of occurrence of stressful events.[5] Individuals with active behavioural coping strategies are likely to have fewer mood disturbances, a better quality of life[6] and a reduction in risk-taking behaviour,[7] whereas individuals with inadequate and avoidant coping styles are likely to have higher levels of emotional stress and increased feelings of hopelessness or negative expectations.[3,8-11]

The dynamics of hope are multifaceted and comprise a complex combination of 'hope', 'despair' and 'hopelessness'.[12] With hope, the individual fights against inability to cope and has the belief that life is worth living both in the present and the future. Despair is a downward process that results in being stuck in a situation, losing grip, sinking into a narrow existence, losing perspective of the future and questioning the possibility of hope.[13] Hopelessness includes helplessly giving up everything (including hope) and living in emptiness in the face of an assumed non-existent future.

Hopelessness or negative expectation is among the psychological variables that are predictive of suicide. The patient misconstrues his or her experience in a negative way and anticipates serious outcomes for his or her problems. This sense of hopelessness may lead the person to believe that suicide is the only feasible strategy

for dealing with seemingly insoluble problems.[14-17] Beck *et al.*,[18] in a 10-year prospective follow-up study of 165 patients hospitalised with suicidal ideation, confirmed that hopelessness was predictive of actual suicide.

The prevalence of HIV and AIDS in South Africa has reached pandemic proportions. Living with HIV in a country where HIV is hugely stigmatised can be extremely stressful and causes mental suffering. The poorest sectors of society are most vulnerable and the consequences for them are most severe. Loss of income, additional care-related expenses and mounting medical fees push affected households deeper into poverty. The burden of coping often rests with women, who are faced with stepping up to a role as income-earners, mothers and caregivers. HIV has resulted in disintegration of family units and households.

The effectiveness of the coping abilities and styles individuals utilise to deal with the stresses of HIV greatly influences the psychological impact of this illness. Furthermore, the presence of co-morbid personality and adjustment disorders (which have an increased prevalence in the HIV-positive population)[19] also impacts on coping abilities. Persons with these disorders are more likely to cope in a dysfunctional way.[20]

There is evidence that hopelessness in individuals with HIV and AIDS may be associated with depression,[21] which may lead to decreased adherence to medication regimes, further suppression of immunity and accelerated disease progression as well as risk of suicide. From a psychobiological perspective, active coping is associated with higher total lymphocyte, CD4 and natural killer cell counts,[22,23] while a passive[24] or fatalistic–resigned coping style and hopelessness[25] are associated with poor HIV treatment adherence and rapid progression of HIV disease,[26] particularly if they are associated with depression and occurrence of severe stressful events.[27,28]

To measure hopelessness, Beck *et al.*[29] developed the 20-item Beck's Hopelessness Scale (BHS), applied exploratory factor analysis and argued that the scale measures three specific components (affective, motivational and cognitive). The KR-20 coefficients (measures of the scale's internal consistency) range from 0.82 to 0.93. In general practice, the correlation between the BHS and ratings of hopelessness was 0.74 and in suicide attempters it was 0.62. The hopelessness construct is a factor in many mental disorders and is highly correlated with measures of depression and suicidal intent and ideation.[30]

Much of the work on psychiatric morbidity in HIV has been done in the Western world. Despite the high prevalence of HIV in South Africa, very few studies have been published on the ability of individuals to cope with the illness. Furthermore, in South Africa HIV-infected patients may be at greater risk for psychopathology than patients in the developed world because of their potentially stressful living conditions. The aim of this report was to describe levels of hopelessness and associated factors in a group of stable, non-depressed HIV-positive patients receiving antiretroviral (ARV) therapy.

METHODS

The study was part of a larger prospective, randomised and controlled study designed to compare response to treatment, effects on immune markers and adherence to ARVs in patients with depression compared with those without depression. The sampling was a convenience sampling, as it included only patients attending the Perinatal HIV Research Unit clinic at Chris Hani Baragwanath Hospital, Johannesburg. Volunteers who were 18 years and older and medically stable and had been on antiretroviral therapy for more than 6 months were screened for possible inclusion in the study.

Thirty randomly selected non-depressed patients (according to *Diagnostic and Statistical Manual of Mental Disorders,* 4th edition (DSM-IV) criteria) were included in the study. Depressive symptoms were determined using the Hamilton Depression Rating Scale (HAMD) (the higher cut-off score of 14 or more was regarded as indicative of a diagnosis of depression). Additional data (age, gender, marital status, employment status, level of education, number of children, and number of years since diagnosis of HIV) were obtained from all subjects, who also completed the BHS. The 20 true-false items of the BHS29 measured three major aspects of hopelessness, which was interpreted on the total scale score as follows: ≤3 minimal, and >3 significant.

The study was approved by the Committee for Research on Human Subjects, University of the Witwatersrand. For statistical analyses, the subjects were divided into two groups, those with a BHS score of ≤3 and those with a score of >3. Descriptive statistics were computed as means and frequencies (count and percentages). Comparisons were made between the two groups with regard to gender, marital status, employment status, number of children, level of education and number of years since diagnosis by the use of contingency tables (chi-square test with Fischer's exact test). Logistic regression was computed to determine any significant correlations between BHS scores and exposure variables. All analysis was done using the Statistical Package for Social Sciences 10.0 for Windows (SPSS Inc., Chicago, Ill.). A value of $p<0.05$ was considered significant.

RESULTS

The study population comprised 30 patients, with a mean age of 37.9 years (standard error (SE) 1.18) (range 28 - 51 years). All had acquired HIV infection through heterosexual contact and had disclosed their status to their partner or a significant member of their family. The majority of patients (63.3%) were on a nevirapine-based first-line regimen. Adherence to medication was good, with most patients virally suppressed and with a mean CD4 count of 405.37 cells/µl (SE 48.26). Clinically all the patients were non-depressed, and the mean HAMD score was 2.1 (SE 1.63) with a range from 0 to 5.

The mean BHS score was 4.03 (SE 0.55), with a range from 0 to 12 (Fig. 1).

Eighteen subjects (60%) scored 3 or less on the BHS, considered minimal levels of hopelessness. However, 12 (40%) scored more than 3, which is considered significant; of these 23% had scores of 7 or more. Comparisons between these two groups with respect to some variables are listed in Table I.

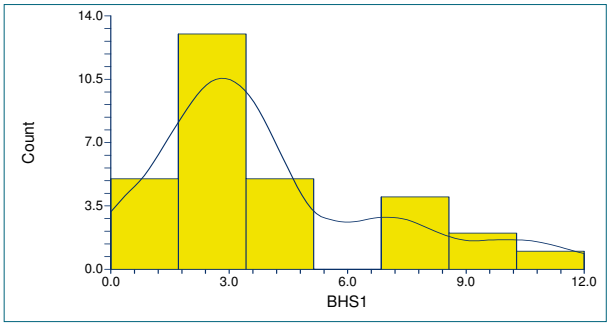


Fig. 1. Histogram of Beck's Hopelessness Scale scores.

There were no statistically significant correlations between BHS scores of the study population and gender (r=-0.19, p=0.313), marital status (r=0.33, p=0.071), employment status (r =-0.26; p=0.162), level of education (r=-0.22; p=0.240), years since the diagnosis of HIV (r=0.24; p=0.203), or number of children (r=0.11; p=0.567). However, there was a trend indicating that subjects who were female, unemployed, married and/or had more children were more likely to experience higher levels of hopelessness.

There was no statistically significant association between BHS scores and gender (p=0.184), employment status (p=0.769), level of education (p=0.933), number of children (p=0.933), or number of years since diagnosis (p=0.755). However, patients were who married or living with partners were statistically more likely to score higher on the hopelessness scale compared with those who were single (p=0.019).

DISCUSSION

Although the sample was small, this study found that a significant proportion (40%) of a group of HIV-positive patients had mild to moderate levels of hopelessness as measured by the BHS, despite being medically stable, adherent to their antiretroviral medication and virally suppressed, and having high CD4 counts. Similar results of 'mild' feelings of hopelessness were reported by Remien *et al.*[21] However, nearly all their patients maintained the conviction that good times lay ahead and that their lives were worthwhile.

This finding is of relevance because there is published evidence that hopelessness may play a key role in the

TABLE I. FREQUENCY OF BECK'S HOPELESSNESS SCALE SCORES IN RELATION TO PATIENT VARIABLES

Variables	Study population (*N*=30)	BHS score ≤3 (*N*=18)	BHS score >3 (*N*=12)	
Gender				
Male	6 (20%)	2 (6.7%)	4 (13.3%)	Fisher's exact
Female	24 (80%)	16 (53.3%)	8 (26.7%)	p=0.184
Marital status				
Single/divorced/widowed	18 (60%)	14 (46.7%)	4 (13.3%)	Fisher's exact
Married/cohabiting	12 (40%)	4 (13.3%)	8 (26.7%)	p=0.01912
Employment status				
Employed	9 (30%)	5 (16.7%)	4 (13.3%)	Fisher's exact
Unemployed	21 (70%)	13 (43.3%)	8 (26.7%)	p=0.769
Level of education				
Grade 0 - 7	2 (6.7%)	1 (3.3%)	1 (3.3%)	χ^2=0.139; df 2;
Grade 8 - 12	25 (83.3%)	15 (50%)	10 (33.3%)	p=0.933
Tertiary	3 (10%)	2 (6.7%)	1 (3.3%)	
No. of years since diagnosed				
0 - 5	11 (36.7%)	7 (23.3%)	4 (13.3%)	Fisher's exact
> 5	19 (63.3%)	11 (36.7%)	8 (26.7%)	p=0.755
No. of children				
None	3 (10%)	2 (6.7%)	1 (6.7%)	χ^2=0.065; df 2;
1	10 (33.3%)	6 (20%)	4 (20%)	p=0.967
>1	17 (56.7%)	10 (33.3%)	7 (33.3%)	

prediction of suicidal behaviour.[30] A high BHS score alerts the therapist to unstated or denied suicidal intentions. Remien *et al.*[21] reported that despite 'mild' feelings of hopelessness and no current suicidal ideation, several of their patients considered suicide an option for the future should they become more impaired. In interpreting the results of the present study, hopelessness may best be construed as a risk factor. However, unlike certain other predictors of suicide, such as age, sex, or race, hopelessness is a characteristic that can be modified. Given the relatively slow natural progression of HIV infection and the increased survival made possible by recent medical therapies, there should be a focus on interventions that promote the expression of negative feelings (i.e. anger) and the development of effective coping strategies that can significantly improve psychological status[31] and possibly increase survival time.[32] Failure to do this may mean that HIV-positive subjects repress their feelings of anger and alleviate their discomfort by risk-taking behaviour such as unprotected sex, drug use and sharing needles.[33]

Like the process of learning, which involves the formation of new connections between nerve cells in the brain, psychotherapy works by changing the way the brain functions. Certain types of psychotherapy, particularly cognitive-behavioural therapy (CBT) and interpersonal therapy (IPT), can help improve coping skills. The aim of IPT is to solve problems within a brief period rather than devise lifetime solutions, and its emphasis is on restoring the patient to an adequate level of functioning rather than on personality change.[34] A study by Rush *et al.*[35] showed that depressed patients treated with cognitive therapy showed a more rapid reduction in hopelessness scores than a comparison group of depressed patients treated with an antidepressant drug.

Although this study did not find any significant correlation between feelings of hopelessness and previously reported stressors such as unemployment, having more children to care for and lack of support, there were suggestions of a trend towards this. The small sample size and the very select sample in this study may have contributed to this finding. Contrary to Remien *et al.*'s[21] finding that long-term survivors of HIV and AIDS were more resilient and positive in terms of their mood and outlook, our patients appeared to become more hopeless with time. It is possible that we are not only failing to identify these feelings but do not provide any psychological support for persons expressing such feelings at our ARV rollout clinics.

A possible objection to the use of the BHS in prediction of suicide is that it yields a large proportion of false positives. The almost inevitable over-inclusiveness of valid predictors of a rare phenomenon such as suicide was first demonstrated by Meehl and Rosen[36] and has since been widely discussed.[37-39] However, it should be noted that the connotations of the terms 'false negative' and 'false positive' may not be completely appropriate. Generally these terms are applied when a specific test is able or unable to demonstrate the presence or absence of a known disease, such as diabetes or tuberculosis. The BHS attempts to identify the potential for fatal suicide attempts and not the behaviour itself. Many persons with high scores on this scale may continue to be at risk for suicide beyond the observation period, even though they have not yet made a fatal suicide attempt

CONCLUSION

This small study suggests that hopelessness may be a common psychological distress reaction present in stable HIV-positive patients on ARVs that may go undetected. These feelings of hopelessness may result in an increase in risk-taking behaviour (e.g. unprotected sex, drug use, sharing needles) and attempted suicide. We recommend that the staff at ARV rollout clinics become aware of this possibility and use the BHS as a screening tool to identify such individuals and refer them for basic psychotherapy to improve coping skills and reduce feelings of hopelessness.

REFERENCES

1. Lazarus RS. Coping therapy and research: past, present, and future. *Psychosom Med* 1993; 55: 234-247.
2. Pakenham KI, Dadds MR, Terry DJ. Relationships between adjustment to HIV and both social support and coping. *J Consult Clin Psychol* 1994; 62: 1194-1203.
3. Wolf TM, Balson PM, Morse EV, *et al.* Relationship of coping style to affective state and perceived social support in asymptomatic and symptomatic HIV-infected persons: implications for clinical management. *J Clin Psychiatry* 1991; 52: 171-173.
4. Folkman S, Chesney M, Pollack L, *et al.* Stress, control, coping, and depressive mood in human immunodeficiency virus-positive and -negative gay men in San Francisco. *J Nerv Ment Dis* 1993; 181: 409-416.
5. Vedhara K, Nott KH. Psychosocial vulnerability to stress: a study of HIV-positive homosexual men. *J Psychosom Res* 1996; 41: 255-267.
6. Friedland J, Renwick R, McColl M. Coping and social support as determinants of quality of life in HIV/AIDS. *AIDS Care* 1996; 8: 15-31.
7. Martin DJ. Coping with AIDS and AIDS-risk reduction efforts among gay men. *AIDS Educ Prev* 1993; 5: 104-120.
8. Krikorian R, Kay J, Liang WM. Emotional distress, coping, and adjustment in human immunodeficiency virus infection and acquired immune deficiency syndrome. *J Nerv Ment Dis* 1995; 183: 293-298.
9. Fleishman JA, Fogel B. Coping and depressive symptoms among people with AIDS. *Health Psychol* 1994; 13: 156-169.
10. DeGenova MK, Patton DM, Jurich JA, *et al.* Ways of coping among HIV-infected individuals. *J Soc Psychol* 1994; 134: 655-663.
11. Nicholson WD, Long BC. Self-esteem, social support, internalized homophobia, and coping strategies of HIV gay men. *J Consult Clin Psychol* 1990; 58: 873-876.
12. Kylma J, Vehvilainen-Julkunen K, Lahdevirta J. Hope, despair and hopelessness in living with HIV/AIDS: a grounded theory study. *J Adv Nurs* 2001; 33: 764-775.
13. Kylma J. Despair and hopelessness in the context of HIV: a meta-synthesis on qualitative research findings. *J Clin Nurs* 2005; 14: 813-821.
14. Beck AT, Brown G, Berchick RJ, *et al.* Relationship between hopelessness and ultimate suicide. *Am J Psychiatry* 1990; 147: 190-195.
15. Dyer JA, Kreitman N. Hopelessness, depression, and suicide intent in parasuicide. *Br J Psychiatry* 1984; 144: 127-133.
16. Nekanda-Trepka CJS, Bishop S, Blackburn M. Hopelessness and depression. *Br J Clin Psychiatry* 1983; 132: 954-956.
17. Wetzel KD, Margulies T, Davis R, *et al.* Hopelessness, depression, and suicide intent. *J Clin Psychiatry* 1980; 41: 159-1608.
18. Beck AT, Steer RA, Kovacs M, *et al.* Hopelessness and eventual suicide: a 10-year prospective study of patients hospitalized with suicidal ideation. *Am J Psychiatry* 1985; 142: 559-563.
19. Chuang HT, Jason GW, Pajurkova EM, *et al.* Psychiatric morbidity in HIV infection. *Int Conf AIDS* 1990; 6: 176.
20. Perkins DO, Davidson EJ, Leserman J, *et al.* Personality disorder in patients infected with HIV: a controlled study with implications for clinical care. *Am J Psychiatry* 1993; 150: 309-315.
21. Remien RH, Rabkin J, Katoff L, Williams J. Suicidality and psychological outlook

in long term survivors of AIDS. *Int Conf AIDS* 1991; 7: 50.
22. Goodkin K, Fuchs I, Feaster D, *et al.* Life stressors and coping style are associated with immune measures in HIV-1 infection: A preliminary report. *Int J Psychiatry Med* 1992; 22: 155-172.
23. Goodkin K, Blaney NT, Feaster D, *et al.* Active coping style is associated with natural killer cell cytotoxicity in asymptomatic HIV-1 seropositive homosexual men. *J Psychosom Res* 1992; 36: 635-650.
24. Solano L, Costa M, Salvati S, *et al.* Psychosocial factors and clinical evolution in HIV infection: a longitudinal study. *J Psychosom Res* 1993; 37: 39-51.
25. Reed GM, Kemeny ME, Taylor SE, *et al.* Realistic acceptance as a predictor of decreased survival time in gay men with AIDS. *Health Psychol* 1994; 13: 299-307.
26. Kalichman SC, Rompa D. HIV treatment adherence and unprotected sex practices in people receiving antiretroviral therapy. *Sexually Transmitted Infections* 2003; 79; 59-61.
27. Leserman J, Petitto JM, Perkins DO, *et al.* Severe stress, depressive symptoms, and changes in lymphocyte subsets in human immunodeficiency virus-infected men. *Arch Gen Psychiatry* 1997; 54: 279-285.
28. Evans DL, Leserman J, Perkins DO, *et al.* Severe life stress as a predictor of early disease progression in HIV infection. *Am J Psychiatry* 1997; 154: 630-634.
29. Beck AT, Weissman A, Lester D, *et al.* The measurement of pessimism: the hopelessness scale. *J Consult Clin Psychol* 1974; 42: 861-865.
30. Aish A and Wasserman D. Does Beck's Hopelessness Scale really measure several components? *Psychol Med* 2001; 31(2): 367-372
31. Greer S, Moorey S, Baruch JDR, *et al.* Adjuvant psychological therapy for patients with cancer: a prospective randomised trial. *BMJ* 1992; 304: 675-680.
32. Spiegel D, Bloom J, Kraemer HC, *et al.* The beneficial effect of psychosocial treatment on survival of metastatic breast cancer patients: a randomized prospective outcome study. *Lancet* 1989; 14: 888-891.
33. Kelly JA, Murphy DA, Bahr R, *et al.* Factors associated with severity of depression and high-risk sexual behavior among persons diagnosed with human immunodeficiency virus (HIV) infection. *Health Psychol* 1993; 12: 215-219.
34. Klerman GL, Weissman MM, Rounsaville BJ, *et al. Interpersonal Psychotherapy of Depression.* New York: Basic Books, 1984.
35. Rush AJ, Beck AT, Kovacs M, *et al.* Comparison of the effects of cognitive therapy and pharmacotherapy on hopelessness and self-concept. *Am J Psychiatry* 1982; 139: 862-866.
36. Meehl PE, Rosen A. Antecedent probability and the efficiency of psychometric signs, patterns, or cutting scores. *Psychol Bull* 1955; 52: 194-216.
37. Galen RS, Gambino SR. *Beyond Normality: The Predictive Value and Efficiency of Medical Diagnoses.* New York, John Wiley & Sons, 1975.
38. Reinhardt HE. Statistical theory and clinical practice in predicting rare phenomena. *Psychol Rep* 1979; 45: 468-470.
39. Vanderplas JM, Vanderplas JH. Multiple- versus single-index predictors of dangerousness, suicide, and other rare behaviors. *Psychol Rep* 1979; 45: 343-349.

ORIGINAL ARTICLE

IS PREGNANCY ASSOCIATED WITH BIOCHEMICAL AND HAEMATOLOGICAL CHANGES IN HIV-INFECTED NIGERIAN WOMEN?

L O Omo-Aghoja[1], *MB BS, FWACS, FMCOG, FICS*
E Abe[2], *MB BS, FWACS*
V W Omo-Aghoja[3], *BDS, FMCDS*
A Onowhakpor[1], *MB BS, FWACS*
P Feyi-Waboso[4], *MB BS, FWACS*
[1]*Department of Obstetrics and Gynaecology, College of Health Sciences, Delta State University, Abraka, Nigeria*
[2]*Department of Obstetrics and Gynaecology, Central Hospital, Benin City, Nigeria*
[3]*Department of Oral and Maxillofacial Surgery, Central Hospital, Sapele, Nigeria*
[4]*Department of Obstetrics and Gynaecology, Abia State University Teaching Hospital, Aba, Nigeria*

Background. While there is evidence that HIV affects the course and outcome of pregnancy, reports on the effects of pregnancy on HIV infection remain conflicting, especially in low-resource settings.

Methodology. A prospective study of two demographically similar cohorts of HIV-seropositive women, 154 pregnant and 151 non-pregnant, was conducted in a hospital setting in Nigeria.

Results. Cases and controls were matched for age, but parity in controls was significantly higher than in cases (p<0.0001). The time between diagnosis and treatment commencement was greater in controls compared with cases (p<0.0001). Electrolyte, urea and creatinine levels were within normal limits, with mean serum urea and potassium higher in controls compared with cases (p=0.002 and p=0.023). Aspartate aminotransferase (AAT)/serum glutamic oxaloacetic acid transaminase (SGOT), alanine aminotransferase (ALT)/serum glutamic-pyruvic transaminase (SGPT) and amylase levels were higher in controls compared with cases (p=0.001, p=0.0001 and p=0.05), but the mean CD4 count was higher in cases compared with controls (p=0.001). The haematological parameters were within normal limits and comparable in cases and controls. A comparison of CD4 count, total white blood cell count and packed cell volume across the three trimesters in the cases did not reveal any statistically significant differences in these parameters.

Conclusion. Pregnancy did not affect biochemical and haematological parameters in HIV-infected Nigerian women.

The rate of HIV infection in pregnancy is high.[1-7] There is evidence that HIV infection in pregnant women is associated with adverse maternal and fetal outcomes.[2,5,6] The effects of HIV infection include severe anaemia, infectious morbidities and vertical transmission.[2,5,8-14] In a Malawian study, AIDS and anaemia were the leading causes of maternal mortality,[15] and in Zaire maternal mortality rates in HIV-infected women were 10 times those of HIV-negative women.[16] A personal communication revealed that in a recent unpublished report from a Nigerian Teaching Hospital, HIV/AIDS accounted for 20.2% of maternal deaths.

However, the effect of pregnancy on HIV disease progression remains contentious. Evidence from developed countries suggests that pregnancy does not accelerate the progression of HIV disease,[17-21] while reports from low-resource settings imply otherwise, indicating that pregnancy may influence the rate of disease progression.[2] It has been suggested that other factors, including genetics, nutritional status and intercurrent infections, may be responsible for the rate of HIV disease progression in low-resource settings.[2,22,23] John and colleagues report an association between CCR5 promotor polymorphism and increased maternal mortality in a Kenyan cohort.[23]

The objectives of the present study were to determine the association between pregnancy and biochemical and haematological changes in HIV-infected Nigerian women as a possible indicator of disease severity.

METHODOLOGY

This study was conducted in Central Hospital, Benin City, Nigeria, which provides tertiary care to patients in Benin City and its environs. It was a prospective study of two demographically similar cohorts of HIV-seropositive women, 154 pregnant and 151 non-pregnant. The cases were pregnant women attending the antenatal clinics of the hospital from October 2005 to October 2007. Once a pregnant case was identified, the next non-pregnant HIV-seropositive patient presenting to the HIV treatment, control and prevention programme unit of the hospital and matched for social class (patient's educational status and husband's occupation,[24] location of residence, size of apartment, average weekly income, number and types of cars if any, types of electronic and electrical gadgets at home) was selected as a control. Any patient who experienced repeated attacks of malaria or other intercurrent infections was excluded from the study.

Upon recruitment, both pregnant and non-pregnant women had a data sheet completed that elicited information on socio-demographic variables, time since diagnosis of seropositive status, duration of antiretroviral therapy, and biochemical and haematological parameters. Specifically, the following biochemical measurements were done: serum electrolyte, urea and creatinine levels, serum fasting blood sugar (FBS), serum aspartate aminotransferase (AAT)/ glutamic oxaloacetic acid transaminase (SGOT), alanine aminotransferase (ALT)/ serum glutamic-pyruvic transaminase (SGPT), total bilirubin, serum amylase, serum cholesterol, very low-density lipoprotein (VLDL) and lactate dehydrogenase (LH). In addition, a full blood count (FBC - packed cell volume (PCV), white blood cell (WBC) count, platelet count and differentials) and CD4 cell count were performed.

The study was approved by the hospital's Human Ethics Committee and was carefully explained to the patients, and only those who gave informed written consent were recruited into the study.

The Statistical Package for Social Sciences (SPSS) version 13 was used for the data management and statistical analysis, with Fisher's exact test, the chi-square test or Student's *t*-test (as appropriate) being used for comparison of the mean absolute values and standard deviations (SDs). The level of significance was 0.05.

RESULTS

The socio-demographic profile and time since diagnosis and commencement of treatment are set out in Table I. The pregnant women had had their HIV diagnosis for periods ranging from 1 to 30 months (median 10 months) and had been on treatment for periods ranging from 1 to 30 months (median 8 months), while the non-pregnant women had had their HIV diagnosis for periods ranging from 14 to 29 months (median 17 months) and had been on treatment for periods ranging from 2 to 29 months (median 16 months).

The median age of the pregnant women was 29.4 years, with a range of 18 - 36 years (mean 28.6, SD 4.6) and the median age of the non-pregnant women 30.2 years, with a range of 16 - 42 years (mean 29.2, SD 3.9). The median parity in the pregnant women was 1.00, with a range of 0 - 7 (mean 1.25, SD 1.59), and that for the non-pregnant women 2.00, with a range of 0 - 13 (mean 2.10, SD 2.29). This difference was statistically significant ($p<0.0001$). The median estimated gestational age at booking was 26 weeks, with a range of 2 - 42 weeks (mean 25.8, SD 8.13). In the pregnant

TABLE I. COMPARISON OF THE SUMMARY STATISTICS OF THE SOCIO-DEMOGRAPHIC PROFILE, DURATION OF DIAGNOSIS AND TREATMENT OF CASES V. CONTROLS

Parameters	*N*	Mean (SD)	Median	*p*-value
Age (yrs)				
Cases	154	28.6 (4.2)	29.4	
Controls	151	28.9 (4.1)	30.2	0.239
Parity				
Cases	154	1.25 (1.59)	1.00	
Controls	151	2.10 (2.29)	2.00	<0.0001
EGA at booking (wks)				
Cases	154	25.8 (8.13)	26.00	
Controls	151	N/A	N/A	
Time since diagnosis (mo.)				
Cases	154	10.27 (6.12)	10.00	
Controls	151	16.86 (1.69)	17.00	<0.0001
Duration of treatment (mo.)				
Cases	154	8.86 (5.99)	8.00	
Controls	151	15.02 (3.82)	16.00	<0.0001

SD = standard deviation; EGA = estimated gestational age.

group a median of 10 months had elapsed since the diagnosis of HIV, with a range of 1 - 30 months (mean 10.27, SD 6.12), and in the non-pregnant group a median of 17 months had elapsed, with a range of 14 - 29 months (mean 16.86, SD 1.69). This difference was statistically significant (p<0.0001).

Serum electrolyte, urea and creatinine levels in cases versus controls are set out in Table II. The mean serum urea and potassium levels, though within normal limits, were higher in non-pregnant than pregnant women, as were the mean serum aspartate aminotransferase (AAT)/ serum glutamic oxaloacetic acid transaminase (SGOT), alanine aminotransferase (ALT)/ serum glutamic-pyruvic transaminase (SGPT) and serum amylase (Table III). However, the CD4 cell count was higher in the pregnant women than in the controls (p=0.001), while the haematological parameters were within normal limits and comparable between cases and controls (Table IV). Comparison of the mean CD4

TABLE II. COMPARISON OF MEANS OF SERUM ELECTROLYTE, UREA AND CREATININE LEVELS OF CASES V. COHORTS

Parameter	*N*	Mean (SD)	*p*-value
Sodium (mmol/l)			
Cases	154	139.36 (17.21)	0.260
Controls	151	142.00 (19.99)	
Potassium (mmol/l)			
Cases	154	4.15 (0.65)	0.023
Controls	151	4.48 (0.96)	
Urea (mmol/l)			
Cases	154	6.67 (9.81)	0.002
Controls	151	11.70 (14.70)	
Creatinine (mmol/l)			
Cases	154	1.16 (1.44)	0.629
Controls	151	1.24 (1.26)	

TABLE III. COMPARISON OF MEANS OF OTHER BIOCHEMICAL PARAMETERS OF CASES V. CONTROLS

Parameters	*N*	Mean (SD)	*p*-value
FBS (mg/dl)			
Cases	154	79.67 (8.41)	0.808
Controls	151	91.00 (13.92)	
AAT/SGOT (U/l)			
Cases	154	35.66 (35.28)	0.001
Controls	151	57.91 (68.17)	
ALT/SGPT (U/l)			
Cases	154	17.29 (16.27)	<0.0001
Controls	151	27.68 (24.89)	
Amylase (U/l)			
Cases	154	69.3 (37.86)	0.05
Controls	151	83.17 (45.36)	
VLDL (mg/dl)			
Cases	154	67.79 (162.75)	0.045
Controls	151	31.58 (53.28)	

TABLE IV. COMPARISON OF MEANS OF HAEMATOLOGICAL PARAMETERS OF CASES V. CONTROLS

Parameter	*N*	Mean (SD)	*p*-value
CD4 count (cells/µl)			
Cases	154	378.16 (272.57)	0.001
Controls	151	279.74 (230.74)	
Total WBC ($\times 10^9$/l)			
Cases	154	5.64 (1.77)	0.304
Controls	151	5.35 (2.81)	
Lymphocytes ($\times 10^9$/l)			
Cases	154	2.15 (2.04)	0.920
Controls	151	2.17 (1.96)	

count, total WBC count and PCV in the three trimesters of pregnancy did not reveal any statistically significant differences in the respective values.

DISCUSSION

A systematic review and meta-analysis of seven cohort studies from 1983 to 1996 suggested that there is an association between adverse maternal outcomes and pregnancy in HIV-infected women. The summary odds ratios for the risk of an adverse maternal outcome related to HIV infection and pregnancy were 1.8 (85% confidence interval (CI) 0.99 - 3.3) for death, 1.41 (95% CI 0.85 - 2.33) for HIV disease progression, and 1.63 (95% CI 1.00 - 2.67) for progression to an AIDS-defining illness. This association appeared to be stronger in the one study in this group conducted in a resource-poor setting.[2]

The objective of the present study was to describe any biochemical and haematological differences in the plasma of pregnant and non-pregnant HIV-infected Nigerian women. In all women, the parameters assessed were within normal limits. The CD4 count was significantly higher in the pregnant compared with the non-pregnant controls, despite the fact that the non-pregnant women had been on antiretroviral drugs for longer.

Nutritional factors and intercurrent infections have been shown to play a role in disease progression in low-resource settings. These factors were controlled for in this study, as the two groups were matched for social class and women with intercurrent infections were excluded from the study. The prognosis for HIV disease in pregnancy is worse for patients with intercurrent infections such as malaria, urinary tract infections, sexually transmitted infections and parasitic infestation.[2,24] Malnutrition, infections and infestations are generally widespread in low resource-settings.

In conclusion, this study failed to show any independent association between pregnancy and abnormal blood parameters that may suggest disease severity in HIV-infected Nigerian women. It is reasonable to suppose that any increased morbidity and mortality of pregnancy may be modulated through the combined effects of nutritional factors, intercurrent infections and genetic factors. Efforts to address these are likely to contribute to reducing the burden of HIV morbidity in infected pregnant Nigerian women.

Conflict of interest. We confirm that this study was self-funded by the authors and that the outcome is a true reflection and interpretation of the scientific findings and was in no way influenced by the authors. The work is original and it is not being considered for publication by any other journal.

REFERENCES

1. McIntyre J. Maternal health and HIV. *Reprod Health Matters* 2005; 13(35): 129-135.
2. McIntyre J. Mothers infected with HIV. *Br Med Bull* 2003; 67: 127-135.
3. Offiong RA, Bunza FM, Uya AO. Prevalence of HIV infection among prenatal patients in Abuja. *Tropical Journal of Obstetrics and Gynaecology* 2001; 18: suppl. 1, 12. .
4. Urassa E, Massawe S, Mgaya H, Lindmark G, Nystrom L. Female mortality in reproductive ages in Dar es Salaam, Tanzania. *East Afr Med J* 1994; 71: 226-231.
5. Mertz KJ, Parker AL, Halpin GJ. Pregnancy-related mortality in New Jersey, 1975 to 1989. *Am J Public Health* 1992; 82: 1082-1088.
6. Huss M, Bongain A, Bertrandy M, Hofman P, Grimaud D, Gillet JY. Maternal mortality in Nice. Results of a reproductive age mortality survey using death registries in the Nice University Hospital, 1986-1993. *J Gynecol Obstet Biol Reprod* (Paris) 1996; 25: 636-644.
7. Rosenfield A, Mwaba P, Chintu C, Grange JM, Ustianowski A, Zumla A. A study of maternal mortality in resource-poor countries. *Journal of the American Medical Women's Association* 2002; 57: 167-168.
8. Public Health Service Task Force. Recommendations for use of antiretroviral drugs in pregnant HIV-1-infected women for maternal health and interventions to reduce perinatal HIV-1 transmission in the United States. June 16, 2003. http://www.aidsinfo.nih.gov/guidelines (accessed 30 March 2004).
9. Ahmed Y, Mwaba P, Chintu C, Grange JM, Ustianowski A, Zumla A. A study of maternal mortality at the University Teaching Hospital, Lusaka, Zambia: the emergence of tuberculosis as a major non-obstetric cause of maternal death. *Int J Tuberc Lung Dis* 1999; 3: 675-680.
10. Bicego G, Boerma JT, Ronsmans C. The effect of AIDS on maternal mortality in Malawi and Zimbabwe. *AIDS* 2002; 16: 1078-1081.
11. Iloki LH, G'Bala Sapoulou MV, Kpekpede F, Ekoundzola JR. Maternal mortality in Brazzaville (1993-1994). *J Gynecol Obstet Biol Reprod* (Paris) 1997; 26: 163-168.
12. MacLoed J, Rhode R. Retrospective follow-up of maternal deaths and their associated risk factors in a rural district Tanzania. *Trop Med Int Health* 1998; 3: 130-137.
13. Kumar RM, Uduman SA, Khurrana AK. Impact of pregnancy on maternal deaths AIDS. *J Reprod Med* 1997; 42: 429-434.
14. National Committee on Confidential Enquiries into Maternal Deaths. A review of maternal deaths in South Africa during 1998. *S Afr Med J* 2000; 90: 367-373.
15. McDermott JM, Slutsker L, Steketee RW, Wirima JJ, Breman JG, Heymann DL. Prospective assessment of mortality among a cohort of pregnant women in rural Malawi. *Am J Trop Med Hyg* 1996; 55: 66-70.
16. Ryder RW, Nsuami M, Nsa W, *et al.* Mortality in HIV-1-seropositive women, their spouses and their newly born children during 36 months of follow-up in Kinshasa, Zaire. *AIDS* 1994; 8: 667-672.
17. Bledsoe K, Olopoenia L, Barnes S, Delapenha R, Saxinger C, Frederick W. Effect of pregnancy on progression of HIV infection. *Int Conf AIDS* 1990; 6: 288.
18. Bessinger R, Clark R, Kissinger P, Rice J, Coughlin S. Pregnancy is not associated with the progression of HIV disease in women attending an HIV outpatient program. *Am J Epidemiol* 1998; 147: 434-440.
19. McIntyre JA. HIV in Pregnancy: A Review. Occasional Paper No. 2. Geneva: World Health Organization, 1999.
20. Weisser M, Rudin C, Battegay M, Pfluger D, Kully C, Egger M. Does pregnancy influence the course of HIV infection? Evidence from two large Swiss cohort studies. *J Acquir Immune Defic Syndr Hum Retrovirol* 1998; 17: 404-410.
21. Ahdieh L. Pregnancy and infection with human immunodeficiency virus. *Clin Obstet Gynecol* 2001; 44: 154-166.
22. Villamor E, Msamanga G, Spiegelman D, Peterson KE, Antelman G, Fawzi W. Pattern and predictors of weight gain during pregnancy among HIV-1 women from Tanzania. *J Acquir Immune Deficiency Syndr* 2003; 32 (5): 560-569.
23. John GC, Bird T, Overbaugh J, *et al.* CCR5 promoter polymorphism in Kenyan perinatal human immunodeficiency virus type 1 cohort: association with increased 2-year maternal mortality. *J Infect Dis* 2001; 184: 89-92.
24. Olusanya O, Okpere E, Ezimokhai M. The importance of social class in voluntary fertility control in developing country. *West Afr J Med* 1985; 4(4): 205- 212.
25. Ayisi JG, van Eijk AM, ter Kuile FO, *et al.* The effect of dual infection with HIV and malaria on pregnancy outcome in western Kenya. *AIDS* 2003; 17: 585-594.

CPD QUESTIONS

Journal 37

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:
   ART will be offered to adult patients with a CD4 count <200 cells/µl and an AIDS-defining illness.

2. True (A) or false (B) – click on the correct answer:
   ART will be offered only to adult patients with tuberculosis and CD4 <350 cells/µl.

3. True (A) or false (B) – click on the correct answer:
   Adult patients with multidrug-resistant tuberculosis are excluded from ART due to drug-drug interactions.

4. True (A) or false (B) – click on the correct answer:
   Children diagnosed with cryptococcal meningitis between the ages of 5 and 15 will be considered for ART when the CD4 count is below 350 cells/µl.

5. True (A) or false (B) – click on the correct answer:
   Children diagnosed with TB between the ages of 5 and 15 will be considered for ART when the CD4 count is below 350 cells/µl.

6. True (A) or false (B) – click on the correct answer:
   ART should be deferred in infants <12 months who have a CD4 percentage above 25.

7. True (A) or false (B) – click on the correct answer:
   D4T toxicity occurs most frequently in patients who have a high body mass index and are younger, male and/or on TB treatment.

8. True (A) or false (B) – click on the correct answer:
   Older men with lipodystrophy, reduced creatinine clearance and low BMI should preferentially receive tenofovir.

9. True (A) or false (B) – click on the correct answer:
   Pregnant women who do not need ART for their own health should commence AZT from the first month of pregnancy.

10. True (A) or false (B) – click on the correct answer:
    Pregnant women who are commencing ART for their own health may do so with EFV or NVP from the time of booking.

11. True (A) or false (B) – click on the correct answer:
    Ganciclovir can be given intra-ocularly instead of intravenous and oral therapy to treat cytomegalovirus retinitis.

12. True (A) or false (B) – click on the correct answer:
    Ganciclovir should be used cautiously with AZT since it has similar bone marrow toxicities.

13. True (A) or false (B) – click on the correct answer:
    Intravenous ganciclovir in pregnancy can reduce congenital abnormalities in HIV co-infected women.

14. True (A) or false (B) – click on the correct answer:
    CMV is a cause of transverse myelitis in HIV-infected patients.

15. True (A) or false (B) – click on the correct answer:
    In order to perform HIV testing, the provider must have signed written consent or he or she will be liable.

16. True (A) or false (B) – click on the correct answer:
    Feelings of hopelessness falsely predict suicide.

17. True (A) or false (B) – click on the correct answer:
    Depression in individuals with HIV/AIDS has not been found to affect adherence to medication regimens.

18. True (A) or false (B) – click on the correct answer:
    Valganciclovir can be used in the oral form to initiate and maintain CMV treatment in HIV CMV retinitis.

19. True (A) or false (B) – click on the correct answer:
    HIV has been shown unequivocally to be a disease of poverty.

20. True (A) or false (B) – click on the correct answer:
    There is no evidence that multiple concurrent partners are linked to higher rates of sexually transmitted infections.