

**Attending the 5th IAS Conference
on HIV Pathogenesis, Treatment and Prevention (IAS 2009)
Cape Town, South Africa in July 2009**



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The event was organized by the International AIDS Society (IAS), in partnership with South African-based NGO, Dira Sengwe, organizer of the series of South African AIDS Conferences.

Held every two years, the conference attracts more than 5.000 delegates from all over the world. It is a unique opportunity for the world's leading scientists, clinicians, public health experts and community leaders to examine the latest developments in HIV-related research, and to explore how scientific advances can – in very practical ways – inform the global response to HIV/AIDS.

There were four tracks organised and the conference featured daily plenary sessions, abstract and non-abstract driven sessions as well as a number of posters on display.

The Basic Sciences Track focused on virology, immunology, pathogenesis and pre-clinical research into drugs and vaccines.

The Clinical Sciences Track covered the spectrum from treatment and low cost monitoring in resource-limited settings to new treatments, strategies and advanced technology topics.

The Biomedical Prevention Track focused on strategies for preventing HIV transmission that have a biomedical basis, such as vaccines, microbicides, chemoprophylaxis and substitution therapy for drug dependence.

New to IAS 2009, **the Operations Research Track** focused on applied research and other analyses designed to improve the quality and implementation of HIV programmes and policy.

I would like to point out few sessions, abstracts and poster presentations that inspired me. I found the following sessions most useful, interesting and motivating, either to be implemented at the national level or because I was provided with the insight to the current developments in the fight against HIV and AIDS.

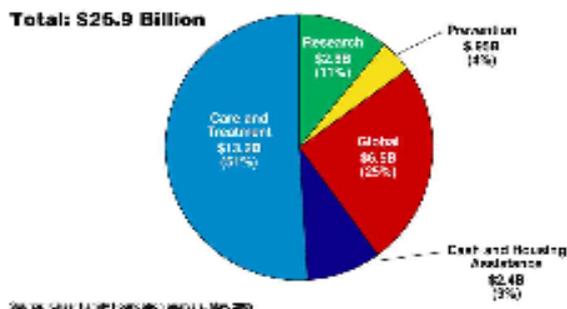
Special Session: Global HIV Research, Policy and Programme Implementation under the New U.S: Administration

This session examined implications of the Obama Administration and included presentations by NIAID Director Anthony Fauci and newly confirmed Ambassador at Large and Global AIDS Coordinator Eric Goosby. The U.S. President's Emergency Plan for AIDS Relief (PEPFAR),

launched in 2003, is the largest international health assistance programs in history. U.S. President Barack Obama's new global health strategy promises to extend the achievements in fighting HIV/AIDS, tuberculosis and malaria to tackle health systems strengthening, maternal and child health and neglected tropical diseases. Dr Fauci said that the PEPFAR program started by George Bush would continue under Obama, but would no longer require funding recipients to emphasise sexual abstinence. He also indicated that the Obama administration is "very much in favour" of lifting restrictions on HIV-positive visitors and that there is a "clear intention" on the part of both the administration and Democrats in Congress to remove the federal ban on funding for needle exchange.

Newly appointed US Ambassador at Large and Global AIDS Co-ordinator, Eric Goosby, said the WHO would look at scientific research when deciding whether to lift the global treatment threshold to 350 cells/mm³, but must also consider economic realities. The annual cost of caring for someone who starts treatment late in the course of the disease (with a CD4 cell count of less than 50) is twice as high as the cost of care for someone who began treatment earlier.

U.S. Federal Government Funding for HIV/AIDS by Category, President's FY 2010 Budget Request



Engagement Tour- visit to Ubuntu TB/HIV clinic in Khayelitsha

Khayelitsha is a large township with around 500.000 inhabitants located on the outskirts of Cape Town and has one of the highest HIV prevalence rates in South Africa. The majority of population lives in informal housing, and there are high rates of poverty, unemployment and crime. In 2007 antenatal HIV prevalence was 30.2% and 31% of all adults on ART in Cape Town Metropolitan area are treated in Khayelitsha. The TB incidence rate that is one of the highest in the world reached nearly 1,600 per 100.000 in 2006 and TB/HIV co-infection is close to 70%.

Medecins Sans Frontiers (MSF) started working in Khayelitsha in 1999 supporting a pilot programme on PMTCT. In 2001, the first patient received ART and by the end of 2008, more than 10.000 people have been put on ART. HIV and TB care and treatment are provided through an integrated approach, enabling a "one stop" service for co-infected patients.

Ms. Mpumi Matangana, clinic's operational manager, a professional nurse showed us how to wear surgical masks and told us about their concerns. We were wearing masks because of the risk of tuberculosis in the clinic and also to support the effort of the staff members to destigmatize the use of masks. The biggest challenge the clinic is facing is the lack of human resources. Another major challenge is ensuring children get their anti-retroviral medication. Most of the children are in the care of their grandmothers, since the parents have died. Grandmothers have problems with giving the rights dosages to children, they often spill the syrups and it is very hard for them to go to the clinic for new medicaments. The lack of medicaments to meet the needs of patients with difficult HIV/AIDS cases was also mentioned. In this area, 16 percent of patients are experiencing treatment failure on their first-line regimen within five years and a significant number these patients then fail on this alternative treatment line within two years.

The network of clinics is supporting “adherence clubs,” which are open to patients whose health status has been stable for at 13 months. These clubs provide an opportunity for information sharing and discussion, checking patients’ weight, and distribution of medication.



The Ubuntu Clinic in Khayelitsha treats tuberculosis and HIV
Credit: UNAIDS/G. Williams



Khayelitsha- low-income community of about 500.000 people which lies to the east of Cape Town
Credit: I. Jovic

Satellite Session: Learning by Doing? Operational Research to Strengthen HIV Prevention, Care and Treatment Scale-up in Resource-Limited Settings: What, Why and How?

The Operations Research (OR) theme has been introduced as new theme under Track D and it has attracted the second largest number of abstracts for the conference under this track. Satellite session on OR – what, why and how was well attended by more than 150 delegates and the quality of presentations was of a high standard and included interesting practical experiences. The session was organized by MSF, IAS and International Union against Lung Diseases.

Operational research provides decision-makers with information to enable them to improve the performance of their programs. Operational research helps to identify solutions to problems that limit program quality, efficiency and effectiveness, or to determine which alternative service delivery strategy would yield the best outcomes. In simple terms, it is described as “the science of better”.

The OR is critical to improve the performance of the prevention, treatment and care programmes in terms of quality and quantity at country level. The basic principles of OR were highlighted as follows:

- Effectiveness
- Efficiency, and
- Quality

OR helps in identifying the service delivery problems within the health systems and beyond. It is critical in the case of scale up. Key observations of the session were:

- The presentations made a compelling case drawing experience from a Malawian TB programme and how the OR added value to scale-up. It enabled them to redefine their programmes include the monitoring of recurrent TB cases.
- The presentations highlighted how the OR was conducted within the routine programme system.
- The question of what is OR and what is NOT Operations Research and what are the differences between the Randomised Control Trails and OR was presented.
- The question of what is relevant in the context of increasing programme outcomes, assessing feasibility and advocating for a policy change with evidence was discussed.
- GFATM representatives pointed out that 10% of each grant may be used for or within a monitoring and evaluation component, but this money is rarely used! This may be due to lack of capacity at the country level to identify the need for operational research priorities and its implementation at country level. This was echoed by few delegates during question and answer session. GFATM presentation also named few countries that utilized the money under operational research.
- There are still opportunities within the GFATM grants to develop and submit operational research proposals linked to global fund programme and this can be done in collaboration with the fund portfolio manager.
- There was a report back on the 2 day OR training programme organized by IAS as pre-conference event.
- Some of the questions that were raised during the Q & A are: what is impact evaluation and does impact evaluation take into OR data? How to get ethics committee's approval and how difficult was that? What kind of research background is required to attend the training programme organized by IAS during the conference? What are the long term partnership with southern academics on OR? Should OR protocol go through the ethics committee approval or not?

BACKGROUND READING

GFATM, GUIDE TO OPERATIONAL RESEARCH IN PROGRAMS SUPPORTED BY THE GLOBAL FUND,

http://www.theglobalfund.org/documents/publications/brochures/operationalresearch/OperationalResearch_en.pdf

WHO, HIV department. Reports of the workshop on Generic Tools for Operations Research on HIV service provision, http://www.who.int/hiv/pub/operational/or_summary_2006.pdf

Symposium: Antiretroviral Therapy for prevention: the time has come?

This Session was organized to provide a current and comprehensive view of the evolving use of antiretroviral therapy (ART) to prevent the transmission of HIV-1. The use of ART to prevent mother to baby transmission of HIV-1 has been one of the greatest advances in HIV prevention. To prevent primary sexual transmission of HIV, seven trials of pre-exposure prophylaxis are underway involving more than 20.000 volunteers and these trials were described. Secondary prevention of HIV, from a subject with known infection to their sexual partner, is a critical prevention opportunity. Since ART agents are now available worldwide, the public health implications of treatment are of paramount importance. "Treatment as prevention" and preliminary results from an

ongoing clinical trial (HPTN052) designed to determine the degree of benefit and durability of ART prevention benefit were discussed. Finally, people with acute HIV-1 infection, generally unaware of their status, disproportionately contribute to the spread of HIV-1. Acute HIV infection and the potential use of ART for acute infection will be put forth.

In summary, this session dealt with one of the most dynamic and compelling research in HIV/AIDS prevention.

PrEP (HIV pre- exposure prophylaxis)

Pre-exposure prophylaxis (PrEP) involves the use of oral antiretroviral treatment to prevent HIV infection and is used to prevent sexual transmission of HIV. It is a novel approach, currently being evaluated in Phase II/III trials which will yield results in 2010 and 2011. Most of these trials are testing the use of current antiretrovirals (tenofovir with or without emtricitabine in oral or topical formulations) for the prevention of infection.

| Completed, ongoing and planned advanced stage clinical trials of antiretrovirals for prevention (oral and topical), current status | | | | | | |
|--|--|---------------------------------------|--|--------------------|------------------------|------------------|
| Study | Product | N, Population | Countries | Enrollment Started | Status as of Jul 2009 | Expected Results |
| West Africa Tenofovir Trial | TDF oral (d) | 936 Women | Ghana, Cameroon, Nigeria | 2004, Q2 | Completed | Published 2007 |
| US Extended Tenofovir Safety Trial | TDF oral (d) | 400 MSM | US | 2005, Q1 | Fully enrolled | 2010, Q1 |
| Bangkok Tenofovir Study (BTS) | TDF oral (d) | 2400 M&F IDU | Thailand | 2005, Q2 | 97% enrolled | 2010, Q4 |
| TDF-2 | TDF/FTC oral (d) | At least 1800 M&F heterosexuals | Botswana | 2007, Q1 | 48% enrolled | 2011, Q4 |
| iPREX, UCSF | TDF/FTC oral (d) | 3000 MSM | Peru, Ecuador, Brazil, US, Thailand South Africa | 2007, Q1 | 67% Enrolled | 2011, Q1 |
| CAPRISA 004 Trial | TFV 1% gel (i) | 900 Women | South Africa | 2007, Q2 | Fully enrolled | 2010, Q2 |
| Partners PrEP | TDF oral (d) TDF/FTC oral (d) | 3900 Discordant heterosexual partners | Kenya, Uganda | 2008, Q2 | 48% enrolled (couples) | 2012, Q4 |
| FEM-PrEP | TDF/FTC oral, (d) | 3900 Women | Kenya, Malawi, South Africa, Tanzania, Zambia | 2009, Q2 | Enrolling | 2012 |
| VOICE, MTN-003 | TDF oral (d) TDF/FTC oral (d) TFV 1% gel | 4200 Women | Malawi, Uganda, South Africa, Zambia, Zimbabwe | Expected: 2009, Q3 | Preparing | 2013, Q1 |
| IAVI E 001, E002 Phase II/III | TDF/FTC oral (i, d) | 150 Discordant couples At-risk M&F | Kenya Uganda | Expected, 2009, Q3 | Preparing | 2010, Q2 |

Lynn A. Paxton, MD MPH: HIV pre-exposure prophylaxis

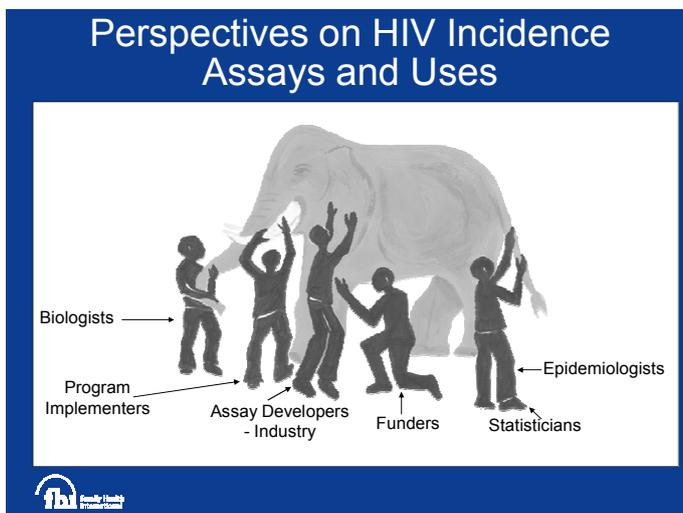
As a prevention intervention PrEP is controversial for two reasons. First is the perception that it will be prohibitively costly as a widely-used prevention measure. A poster by UK researchers (Hill) disputed this. They took the cheapest current annual prices for antiretroviral drugs in the developing world (about \$50 for 3TC and \$200 for tenofovir), and estimated the average lifetime treatment cost for a developing-world patient at \$10,000. Using these figures, they calculated that 3TC PrEP would be cost-effective (that is, would cost less than \$10,000 per infection averted) in areas where annual incidence was over 1% (as in most of sub-Saharan Africa) and tenofovir/3TC would be cost-effective where incidence was over 3% (as in southern Africa and vulnerable populations in many other areas). In situations of extremely high incidence (as in young women in South Africa), 3TC PrEP might cost as little as \$600 per infection averted a year.

The second reason PrEP has been controversial is due to the perception within communities and community leaders that the approach may do more harm than good, whether through toxicity,

resistance, behavioural disinhibition or unethical practice by researchers, and two trials have already been halted because of these perceptions.

Symposium: New strategies and Controversy in HIV testing and Surveillance

There are several new methods to provide HIV testing services and conduct surveillance such as provider-initiated, mobile, community, and home-based HIV testing; serologic and PCR-based incidence assays; and special sampling of most-at-risk populations. In addition, countries worldwide are increasingly using nationally-representative HIV surveys to collect biologic and behavioural information, and assess the capacity of health facilities to provide HIV-related care and prevention services. These surveys assist with calibration of other surveillance tools, and assess the impact of large scale programmes on healthcare access. Scientific, logistical, and ethical issues arise in the implementation of these new methods.



Timothy Mastro: HIV incidence assays: scientific basis and application

The session concluded with a discussion of HIV testing for hard-to-reach populations, and Joseph Amon focused his remarks on MSM, migrants, and prisoners, although concluded that many others would meet a definition of 'Hard-to-Reach', notably men. Mr. Amon recommended that testing scale up should be done with attention to human right protections, including addressing stigma, discrimination, and violence. Elimination of anti-sodomy laws, still present in 38 African states, is vital, and there should be expansion of prison prevention programs as well. Unless human rights were set as the context for these problems then structural barriers for testing and treatments would continue. Government leadership and cross sectoral responses beyond only the health sector were emphasized as the only way forward.

Lessons learned and points for discussion:

- Data was presented from **ongoing trials of microbicides** and Pre-Exposure Prophylaxis trials, including a Phase III trial on the microbicide Pro2000 involving more than 9,389 women and an "adherence and drug absorption study" that looks at "whether antiretrovirals (ARVs) can be used effectively for HIV prevention in the form of an applicator gel or a pill that can be taken orally once a day- also known as **PrEP**."
- Preclinical ex-vivo tests of the entry inhibitor drug maraviroc as a possible **microbicide** have found that the drug only produced a moderate protective effect against HIV; a 50-60%

inhibition of HIV infection of penile tissue and an 85% inhibition in colorectal tissue, when given at high doses.

- The report that was released by the HIV Vaccine and Microbicide Resource Tracking Working Group, finds that **funding for AIDS vaccine research** has declined from around \$930 million to \$870 million.
- **Health worker shortages**- There was an article that examines suggestions to help overcome the workforce gaps, such as the **concept of taxing** "governments or companies in developed countries who employ health workers from developing countries to balance out the skills loss occurring in those countries" and "**task-shifting**"- when nurses and lay health workers are trained to perform tasks traditionally performed by doctors.
- Innovative methods of delivery of HIV care using **home-based care** and **nurse-initiated** or nurse- driven management of antiretroviral treatment (ART) are feasible and can have good treatment outcomes in resource-limited settings such as Uganda and Lesotho. Investments in HIV have also led to innovative improvements to expand the health workforce to meet the broader health needs of communities.
- Prevention efforts have focused on couples-based HIV testing. Although couples studies in central Africa have shown that condom use increases when couples learn about their **discordant status**, these same studies had shown that 20 to 43% of couples continue to have unprotected intercourse despite knowledge of their sero-status. This behaviour is often motivated by the desire to have children. Despite being unable to assess intentionality for pregnancy in the first cohort, if a portion of these pregnancies were intentional, these couples were risking HIV transmission in order to conceive. In high-income settings there are high-tech interventions such as sperm washing available that make conception for sero-discordant couples safe. However, even in free-at-the-point-of-care health systems like the United Kingdom, assisted conception procedures like sperm washing are charged for.
- The battle against HIV is not in competition with battles against other major diseases in the developing world. Quite the opposite; the lessons learned during the global response to HIV have led to improvements and **innovations in health systems** that can yield huge benefits in fighting many of the world's worst pandemics.
- HIV infection rates among babies are significantly cut when mothers are given prolonged ARV treatment during **breastfeeding**.
- **Pregnant women and breastfeeding women** who have CD4 counts less than 350 should receive HAART for their own health. This intervention will be beneficial to maternal health, and will reduce maternal mortality and improve the quality of lives of young mothers.
- Prevention of mother-to-child transmission programs have to think about **child survival**, in general, and can't simply focus on HIV prevention. Because there's very little point of preventing HIV if we are simply causing other fatal diseases in these children. So we have to think about the promotion of child survival, in addition to thinking about prevention of HIV. Some of the attempts to look at providing formula and shortening the duration of breastfeeding have unfortunately been a failure. They have not improved child survival, and they have caused other diseases among children.
- New **WHO treatment guidelines for low- and middle-income settings** are to be released in November.
- Mathematical modelling in South Africa suggests that wider ART availability and condom use could have a greater impact than male circumcision in preventing HIV infection among **heterosexual men**.
- Three African trials that randomized heterosexual men to immediate or delayed circumcision all found that **circumcision lowers HIV** acquisition risk in those men by two thirds. No randomized trials have addressed the impact of circumcision in men who have sex with men (MSM) in Africa or elsewhere. But a cohort study in Soweto, South Africa yields some evidence that circumcision may protect MSM who practice insertive anal intercourse but not receptive anal intercourse.

- Circumcisions and more recently shown that it protects men from **herpes and HPV**.
- Placebo-controlled trial of daily **acyclovir therapy** found that this antiviral did not prevent transmission of HIV in heterosexual discordant couples. Two earlier placebo-controlled trials also determined that acyclovir does not cut the risk of HIV infection, even though it often lowers genital ulcer rates. In finding that daily acyclovir slows HIV disease progression in African men and women infected with HIV-1 and herpes virus, a second randomized trial suggested acyclovir therapy may be a useful public health intervention in certain populations.
- WHO, UNICEF and UNAIDS document a 33% **increase in antiretroviral-treated** people living in 93 low- and middle-income countries in 2008, including a 40% increase in sub-Saharan Africa. Despite this substantial progress, the organisations speculate that universal access to ART by 2010 is unlikely, given a number of obstacles including weak and fragmented health systems, poor integration of services, stigma and discrimination.
- The expansion of HIV testing programmes and the advocacy of universal testing and treatment of those who test positive as a means of prevention must **not violate the human rights** of target populations. People's right to know they had HIV is meaningless without an equal right to the health information they need to make sense of knowing.
- Representatives from the organisations Human Rights Watch and the AIDS and Rights Alliance of Southern Africa (ARASA) told testing advocates to ensure that **testing is not coercive**, that it is linked to treatment provision and treatment education, that the peer counsellors who perform testing understand confidentiality and informed consent, and that those who test positive are not subjected to ostracism within their communities.
- Meta-analysis of data on **vaginal practices** and HIV infection from ten African cohorts has found that both vaginal washing with soap and wiping the vagina with cloths, tissues or paper were associated with an increased risk of acquiring HIV. The use of products to dry or tighten the vagina, often referred to as 'dry sex', did not however have a statistically significant association with HIV infection.
- Ten years ago there was less than US\$1 billion available for HIV programmes globally. By 2009, there is US\$14 billion available. These **investments** have generated substantial returns in addressing the HIV epidemic- in particular, four million people who would otherwise be dead are now on HIV treatment and alive. Data suggest that the number of new infections has peaked, due in part to successful prevention efforts. In addition, new evidence presented at this conference suggests that treatment on a large scale can not only save the lives of individual patients receiving care, but also curb the epidemic by reducing viral loads and thereby infectiousness.
- **G8 leaders** must meet their commitments to finance universal access to treatment and prevention despite the economic crisis.
- "Evidence presented here in Cape Town builds on earlier studies demonstrating that targeted investments in HIV are leveraging additional benefits to maternal and child health," said IAS President Julio Montaner. "In this way, the **Millennium Development Goals 4, 5 and 6**- to reduce child mortality, improve maternal health and combat HIV- reinforce one another and must always be pursued in tandem."