



## FACT SHEET: NEW RESEARCH FROM IAS 2009

This fact sheet highlights important research developments being presented at the 5<sup>th</sup> IAS Conference on HIV Pathogenesis, Treatment and Prevention (IAS 2009). A complete list of conference research appears on the online [Programme-at-a-Glance](#) and/or the CD-ROM distributed at registration, which includes the full text of all accepted abstracts. (Several plenary session talks that address issues summarized below are noted in parentheses.) Reporters should note that this preview reflects data recorded in abstracts written and submitted before the meeting; results may be updated in the meeting presentation. **All abstract findings are embargoed for date and time of presentation at the conference.**

### CLINICAL RESEARCH

Compelling developments in clinical HIV research include studies on how antiretroviral therapy (ART) affects TB and malaria rates, progress in diagnosing and treating often-neglected children with HIV in resource-limited settings, improved understanding of cancer incidence and prevalence in adults with HIV, and work on new antiretroviral (ARV) agents and combinations.

#### ***Antiretroviral therapy eases TB and malaria rates***

HIV fuels tuberculosis (TB) epidemics in many African countries by making people more susceptible to TB. Wider use of ART in Cape Town over the past three years appeared to drive a significant drop in the TB rate ([abstract WELBB105](#)). Comparing 174 HIV positive people studied in 2005 with 310 in 2008, Cape Town clinicians charted a decline in TB prevalence from 9.2% to 2.9%. In contrast, the TB rate rose moderately among HIV negative people in Cape Town.

HIV and malaria can breed severe combined epidemics because malaria boosts viral load and HIV infection makes people more vulnerable to malaria.<sup>[1]</sup> Malaria is endemic throughout Africa and southern Asia, regions with high HIV rates. A 1,020-person study in Uganda provides important data on how ART for HIV positive people affects malaria risk ([abstract TUPDB104](#)).

Clinicians tracked people in the DART ARV trial for four years after they began therapy, evaluating any fever-inducing illness for a possible malaria diagnosis. The incidence (new infection rate) of malaria fell with each additional year of ART, from 591 per 1,000 person-years after one year of treatment, to 476 after two years, 259 after three years, and 153 beyond three years. Multivariate statistical analysis determined that a lower CD4-cell count when starting ART independently raised the risk of a new malaria diagnosis. The investigators suggest that ART can help lower the malaria burden in regions with high rates of both diseases.

#### ***Successes and challenges with ART for children***

Without ART, half of all children infected with HIV at birth die from AIDS before their second birthday. UNAIDS estimates that 370,000 children under the age of 15 became infected in 2007 alone.<sup>[2]</sup> Yet only 200,000 children across the world are receiving ART. A landmark randomized trial published late in 2008 found that early HIV diagnosis and early ART lower infant mortality by 76% and the rate of progression to AIDS by 75%.<sup>[3]</sup> Several abstracts to be presented at IAS 2009 address issues of HIV diagnosis and ART in children.

Thailand began its national free ART programme in 2000 and aggressively treats infected children. In 3,409 children who started ART between January 2000 and December 2005, researchers calculate a 93% survival rate after one year of treatment and 88% survival after five years ([abstract MOAB101](#)). Of 305 children (9%) who died, 274 (90%) died of AIDS and most died in the first months of treatment because of advanced HIV disease. Higher pretreatment weight for age, higher CD4%, and less advanced clinical stage significantly bettered the odds of survival.

A study of 5,484 children starting ART in southern Africa found that only 146 of 310 children whose treatment failed (47%) got switched to a new ARV combination over a median of 16 months ([abstract MOAB104](#)). Median time between failure and switching measured 4.8 months. Delays in switching after virologic failure pose a grave risk that ARV-resistant virus will emerge. But such delays can be expected in poor clinics because most do not have viral load tests to detect failure and because drugs for second-line regimens can be scarce. The good news: a 97% survival rate one year after switching, and an 89% retention-in-care rate.

Newborns whose HIV positive mothers take ARVs to prevent perinatal transmission often receive a single dose of nevirapine, which can evoke nevirapine-resistant virus if the child becomes infected. As a result, guidelines often recommend a regimen based on the protease inhibitors (PIs) lopinavir/ritonavir when nevirapine-exposed children begin ART. But nevirapine is generally cheaper and more accessible than lopinavir in developing countries. A Johannesburg study randomized 195 nevirapine-exposed children who started lopinavir/ritonavir to keep those PIs (plus stavudine and lamivudine) or to switch to nevirapine if they reached and maintained a viral load below 400 copies/mL for at least three months ([abstract MOAB103](#)). Six months after randomization, 65.6% of children in the switch group and 49.5% in the nonswitch group had a viral load below 50 copies/mL. However, more children in the nonswitch group consistently maintained a viral load below 1,000 copies/mL. The investigators suggest their results offer proof-of-concept that switching to nevirapine is effective in this scenario.

### ***Cancer risks and treatment in people with HIV***

Since potent ARV combinations began prolonging lives of HIV positive people, cancers originally not linked to HIV became more prevalent in patients responding to ART.<sup>[4]</sup> Evidence on whether HIV raises the risk of so-called non-AIDS cancers differs from one malignancy to the next. Three oral abstract presentations at IAS 2009 add to the understanding of non-AIDS cancers.

Analyzing cancer rates in 9,595 people who started ART after 1995, Dutch investigators recorded 224 non-AIDS cancers diagnoses (2.3%) ([abstract WEAB104](#)). Three factors independently boosted the risk of a new non-AIDS cancer: every year with a CD4 count below 350 cells/mm<sup>3</sup> raised the risk 9%; every year with a detectable viral load raised the risk 9%; and every year of HIV infection raised the risk 4%.

A study of 5,029 HIV positive US Naval Center beneficiaries tracked a continuing rise in anal cancer diagnoses from 1985 through 2008, with rates of 17 per 100,000 person-years before potent ART combinations became available, 91 during early ART combination years, and 244 in late ART combination years ([abstract WEAB101](#)). The results indicate that ART did not protect people in this cohort from anal cancer.

South African researchers analyzed results of large loop excision of cervical intraepithelial neoplasia in 2,031 women with cervical cancer, an AIDS-defining cancer and the most common cancer among South African women ([abstract WEAB103](#)). Half of the women had HIV infection. Four months after the procedure, the failure rate was significantly higher in women with HIV (45.0%) than in those without HIV (16.8%). ART did not improve chances of response to large loop excision.

### ***Fine tuning therapy with antiretrovirals new and old***

The past few years saw several ARVs in new and familiar drug classes added to the list of treatment options (see Appendix 1 for a table of studies related to these newer ARVs). Ongoing research continues to refine the best way to use both new and old agents (see Pedro Cahn plenary lecture, 22 July).

A noncomparative study of three recently licensed drugs combined for patients with multiple regimen failures found an 86% virologic success rate after 48 weeks ([abstract TUPDB204](#)). Study participants combined the PIs darunavir/ritonavir, the nonnucleoside etravirine, and the integrase inhibitor raltegravir, plus nucleosides and, in 12%, the fusion inhibitor enfuvirtide. No one had taken any of the three main study drugs before, but median number of prestudy mutations making HIV resistant to PIs was 4, to nonnucleosides 1, and to nucleosides 6. After 24 weeks, 93 people (90%) had reached a viral load below 50 copies/mL. At week 48, 89 (86%) still had a sub-50-copy viral load. These high response rates confirm that people with heavy ARV experience can often control HIV with the right new regimen.

A nonrandomized study of 101 similar treatment-experienced patients offers some evidence countering the practice of prescribing several nucleosides in salvage regimens prescribed after earlier treatment failure ([abstract TUPDB205](#)). Such patients typically have HIV highly resistant to nucleosides, because most of them have taken many nucleosides in failing regimens. In their latest ARV regimen, nine of these patients took no nucleosides, 17 took one, 64 took two, and 11 took three. Defining virologic response as a viral load below 50 copies/mL after 24 weeks on the new regimen, these clinicians charted response rates of 100% in people who took no nucleosides, 82% in those who took 1, 76% in those who took 2, and 36% in those who took 3. Multivariate analysis figured that a higher number of active drugs in the salvage regimen, but not a higher number of nucleosides, independently improved chances of virologic response.

Raltegravir remains the only licensed integrase inhibitor, though elvitegravir is in late stages of development. IAS 2009 features an early report on another ARV in this class, S/GSK1349572 ([abstract TUAB105](#)). This small, double-blind, dose-ranging trial randomized integrase inhibitor-naïve people with a viral load over 5,000 copies/mL to 2, 10, or 50 mg of S/GSK1349572 or to placebo. They took no other ARVs. After 10 days, viral load among 35 patients who completed all study visits dropped an average of 1.51 to 2.46 log copies/mL across the three active-treatment groups. Among people taking 50 mg of S/GSK1349572 monotherapy, 70% reached a viral load below 50 copies/mL. S/GSK1349572 did not lose activity against virus sampled from these patients during the study, and mutations associated with resistance to raltegravir or elvitegravir did not emerge.

## **BIOMEDICAL PREVENTION**

IAS 2009 offers research insights into the role of ART in HIV prevention, further analysis of the prophylactic impact of male circumcision, a multi-study analysis of how intravaginal practices affect HIV risk in women, and other new work on standard prevention strategies (Appendix 2).

### ***Impact of ART on sexual behavior and fetal health***

Some authorities fear that free ART has a sexual disinhibiting effect on HIV positive people and thus could lead to further spread of the virus. The first study to address this hypothesis in sub-Saharan Africa involves 899 HIV positive female sex workers in Mombasa, Kenya, 147 of whom started ART from 1993 through 2008 ([abstract WEPDC106](#)). Far from encouraging these women to have more risky sex with more partners, ART raised the likelihood of 100% condom use by 69% and lowered the likelihood of having multiple sex partners by 23%. ART-treated and untreated women reported the same frequency of sex.

Among women taking ARVs to prevent mother-to-child transmission (MTCT) of HIV, potent combination ART reduced rates of abortion, stillbirth, and prematurity in a 3,273-woman study in Malawi and Mozambique ([abstract TUAC102](#); also see Louise Kuhn plenary lecture, 20 July). Women began nevirapine-based combination ART at 14 to 25 weeks of gestation if eligible to receive ART for their own health. Significantly fewer women beginning combination ART at least 90 days before delivery died (0.7% versus 7.4%). Abortion and stillbirth rates were significantly lower in women who took combination ART for more than 30 days (4.3% versus 25.7%). ART also reduced prematurity rates by 70.8% and did not make low birth weight more common. (For more MTCT studies, see Appendix 2.)

### ***Effect of male circumcision, condom use, and ART on epidemic***

Mathematical modeling 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 ([abstract WEAC105](#)). The findings do not contradict results of three randomized trials that establish circumcision as an effective method to cut the risk of HIV acquisition by heterosexual men.<sup>[5-7]</sup> The World Health Organization recommends circumcision as one part of HIV prevention programmes in countries with high HIV prevalence.<sup>[8]</sup>

This model estimated the impact of different population rates of male circumcision (51%, 75%, 90%), condom use (14%, 50%, 80%), and ART coverage (21%, 50%, 80%) on HIV acquisition in heterosexual men. The model used published HIV prevalence and all-cause mortality rates from 2003 through 2008 and forecast trends to 2025. Increased condom use and ART coverage—on their own or in combination—proved the most effective ways to limit new HIV infections (range 64% to 95% reduction) and deaths (range 10% to 34% reduction). In contrast, circumcision lowered those rates from 3% to 13% and from 2% to 4%, respectively. (Also see Ron Gray plenary lecture, 21 July.)

### ***Does circumcision lower HIV risk in MSM?***

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.<sup>[5-7]</sup> 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 ([abstract MOPDC105](#)).

The Soweto study involved 378 MSM who reported their sex practices and got tested for HIV infection. HIV prevalence stood at 13.2%, and 76.4% of the men reported exclusive insertive anal intercourse. Multivariate analysis that factored in other HIV risk factors found that, among MSM who exclusively practice insertive anal intercourse, uncircumcised men ran a 4.5 times higher risk of HIV infection than circumcised men. The authors believe their finding can be tested in a randomized trial. Two previous (nonrandomized) studies of circumcision in MSM found scant evidence of a protective effect.<sup>[9,10]</sup>

### ***Intravaginal practices raise HIV risk in African megastudy***

Intravaginal practices such as cleansing, inserting solid products, and using agents that tighten or dry the vagina proved common in a nine-study, 14,766-woman analysis in sub-Saharan Africa ([abstract TUAC204](#)). Median prevalence of intravaginal practices measured 76% in the studies analyzed and ranged from 18% to 95% across studies. Cleansing with water had no apparent impact on HIV infection risk, but univariate statistical analysis determined that cleansing with other products raised the HIV risk by 44% and practices other than cleansing raised the risk by 88%. The investigators note that the practices studied may lower effectiveness of intravaginal microbicides, which have not yet been proven effective in cutting HIV risk.

### ***Acyclovir fails to prevent HIV transmission in third trial***

A placebo-controlled trial of daily acyclovir therapy found that this antiviral did not prevent transmission of HIV in heterosexual couples with one HIV-positive partner and one negative partner ([abstract WELBC101](#)). 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.<sup>[11,12]</sup> 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 ([abstract WELBC102](#)).

## **OPERATIONS RESEARCH**

This new conference track focuses on intervention studies, economic evaluation and financing, and impact and integration of programmes. Track D topics also include strengthening human resources, infrastructure, and health care, and implementing operational research. Among the intriguing Track D studies at IAS 2009 are new data on progress in scaling up access to ART, changing traits of people starting ART in sub-Saharan Africa, the impact of donor decisions on national responses, ARV programme cost analyses, and innovative strategies such as home-based HIV care.

### ***Substantial Single-Year Gains in ART Access During 2008***

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 ([abstract WELBD105](#)). Despite this substantial progress, the groups 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.

### ***Lab monitoring lowers AIDS rate, saves lives in five-year trial***

Guiding ART with lab tests like CD4-cell count and viral load significantly lowered the new AIDS rate and mortality in people starting their first ARVs in Uganda and Zimbabwe ([abstract TUSS102](#)). Results of the five-year DART trial emphasize the value of these lab tests in determining when a failing regimen should be replaced with new ARVs. Because most resource-poor clinics cannot afford these tests, they switch patients to different ARVs only when a person gets diagnosed with a new AIDS condition.

### ***ART getting to patients at earlier HIV stage in Africa***

Three studies in the same oral abstract session (WEAD1) offer evidence that HIV positive people in sub-Saharan Africa are starting ART at an earlier point in their disease course. ([Appendix 3](#)) Combined, the studies involve over 151,000 people and show significantly higher CD4-cell counts among those starting ART in recent years and other findings indicating improving care for people with HIV.

### ***Disbursing HIV funds proves problematic in Lesotho***

Only one-fifth of a November 2006 Global Fund HIV/AIDS grant of \$40 million got spent in Lesotho by February 2009, according to a study by a global health initiatives group ([abstract TUAD102](#)). Reasons for the delay ironically include loss of government staff to donor-funded activities. Other problems cited by the health initiatives group are personnel shortages at all levels, cumbersome procurement processes, donor implementation conditions, and donor policies precluding shifting of funds across priorities. (Also see Stefano Bertozzi plenary lecture on financing, 21 July.)

### ***Home HIV care measures up to clinic care in Uganda***

People starting ART in Jinja, Uganda did as well if monitored at home or at an HIV clinic, according to results of a cluster-randomized trial involving 1,453 patients ([abstract MOAD101](#)). People in the home-care group received their ARVs, support, and monitoring

monthly from lay workers, while visiting the clinic every six months. People in the clinic-care group attended the clinic every month and received care from junior clinicians and experienced counselors. From February 2005 through January 2009, mortality and virologic failure rates were nearly identical in the two groups.

### ***Linking community and clinic teams keeps Rwandan patients in care***

Telling community health workers which ART patients miss clinic visits to facilitate follow up helped get most missing patients back into care and clarified reasons for missing appointments in rural Rwanda ([abstract TUPDD104](#)). From May to November 2008, community workers tried to contact 650 people who missed clinic appointments by more than 90 days. They learned that incorrect data entries explained 251 purportedly missed visits (39%). Reasons for the other 399 missed appointments were transfer to other clinics (58%), death (19%), and nonattendance (23%). Of the 92 people in this last group, community workers re-enrolled 81 (88%) in care.

### ***Ugandan HIV test programme improves partner HIV status disclosure***

In rural Uganda, routine HIV testing emphasizing HIV status disclosure and partner referral encouraged sex partners of tested people to have their own HIV test and to disclose their own results ([abstract TUPDD105](#)). But proportions of tested partners remained low in this group, rising from 13% before the programme began to 24% afterwards. The proportion of tested people who knew their partner's HIV status rose significantly during the three-month study but reached only 36%. Women were about 40% less likely than men to know their partner's HIV status. The investigators call for interventions "to increase disclosure and uptake of partner HIV-testing especially among women and patients testing HIV-positive."

## **BASIC SCIENCE**

Basic cellular and genetic research continues to play a critical role in determining causes and manifestations of HIV infection, as two studies of HIV in breast milk demonstrate at IAS 2009. Another salient genetic study involves the impact of gene shifts on viral load in people infected with HIV-1 subtype C.

### ***Spontaneous CD4-cell activation in mammary glands***

A study of lactating HIV positive women documented spontaneous activation of latently infected CD4 cells isolated from breast milk, regardless of viral suppression with antiretroviral therapy ([abstract TUAA105](#)). All blood and breast milk samples collected from six women taking antiretrovirals and nine untreated women contained highly activated CD4 T cells that spontaneously secreted HIV-1 antigens and viral RNA, regardless of whether HIV-1 RNA could be detected in breast milk or blood. The findings suggest an unsuspected HIV-1 cellular reservoir that could play a pivotal role in viral transmission to breastfed infants.

### ***CD4 gene change affects HIV risk in infants***

A natural change in a CD4 gene that could affect HIV-1 binding to CD4 T cells correlated with overall and breast milk-related risk of infection in a study of 131 Kenyan infants of HIV positive mothers ([abstract TUPDA105](#)). Ninety-two infants (75%) had the usual (wild-type) genetic configuration at amino acid position 868, 37 infants (19%) inherited the gene shift at this position from one parent (heterozygotes), and two infants (5%) inherited the genetic change from both parents (homozygotes). Thirty infants (23%) became infected, seven of them after one month of age. Heterozygous infants had a two times higher overall risk of HIV infection than wild-type infants, and homozygous infants had a four times higher overall risk. Heterozygosity or homozygosity raised the risk of infection after one month (implicating breast milk transmission) almost six times.

### **Genital immune traits may explain higher HIV risk in African women**

Kenyan women differ markedly from US women in several genital tract immune traits that could lie behind a higher risk of HIV infection among African women than US women ([abstract WELBA102](#)). Comparing 18 young women in San Francisco with 36 women in Kenya, researchers documented significantly higher levels of three immune-cell activation markers in the Kenyan women and significantly lower levels of SLPI (secretory leukocyte protease inhibitor), which may protect CD4 T cells from HIV infection. None of the study participants had HIV infection or any other sexually transmitted disease. These intriguing results require confirmation in a larger study.

### **Gene tied to lower viral loads in HIV-1C-infected Zulu/Xhosa**

A histocompatibility leukocyte antigen (HLA) complex class II allele, HLA DRB\*1303, correlated with lower viral loads in subtype C-infected Zulu/Xhosa people of South Africa who had not taken antiretrovirals ([abstract MOPDA104](#)). The finding is especially intriguing because this gene sequence change did not appear to affect HIV-1-specific CD4 T-cell responses, and because subtype C is the most prevalent HIV-1 family in the world. (HLA class II genes control cells that present antigen to T cells and thus play a key role in immune responses.) The study involved 427 people, 16 of whom (4%) had the HLA DRB\*1303 allele. Viral load was significantly lower in people with this genetic shift than in those without it (8,500 versus 43,000 HIV-1 RNA copies/mL).

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**Appendix 1. Reports on recently licensed and experimental antiretrovirals**

<b>Generic name (brand name)</b>	<b>Drug class</b>	<b>Approval status (US and Europe)</b>	<b>Abstracts at IAS 2009</b>
Maraviroc (Celsentri, Selzentry)	CCR5 inhibitor	Licensed	<i>Abstract TUAB103:</i> The MERIT study of maraviroc in antiretroviral-naive patients with R5 HIV-1: 96-week results
Raltegravir (Isentress)	Integrase inhibitor	Licensed	<i>Abstract TUPDB204:</i> Efficacy and safety of raltegravir plus etravirine and darunavir/ritonavir in treatment-experienced patients with multidrug-resistant virus: 48-week results from the ANRS 139 TRIO trial
Raltegravir (Isentress)	Integrase inhibitor	Licensed	<i>Abstract WELBB104:</i> Raltegravir (RAL) intensification does not reduce low-level residual viremia in HIV-1-infected patients on antiretroviral therapy (ART): results from ACTG A5244
Raltegravir (Isentress)	Integrase inhibitor	Licensed	<i>Abstract WEAC104:</i> Tenofovir DF/emtricitabine/raltegravir appears safe and well-tolerated for non-occupational post-exposure prophylaxis
S/GSK1349572	Integrase inhibitor	Phase 1 trials	<i>Abstract TUAB105:</i> Potent antiviral activity of S/GSK1349572, a next generation integrase inhibitor (INI), in INI-naive HIV-1-positive patients
Etravirine (Intelence)	Nonnucleoside reverse transcriptase inhibitor	Licensed	<i>Abstract TUPDB204:</i> Efficacy and safety of raltegravir plus etravirine and darunavir/ritonavir in treatment-experienced patients with multidrug-resistant virus: 48-week results from the ANRS 139 TRIO trial
Darunavir (Prezista)	Protease inhibitor	Licensed	<i>Abstract TUPDB204:</i> Efficacy and safety of raltegravir plus etravirine and darunavir/ritonavir in treatment-experienced patients with multidrug-resistant virus: 48-week results from the ANRS 139 TRIO trial
Darunavir (Prezista)	Protease inhibitor	Licensed	<i>Abstract TUAB202:</i> 48-week lipid- and glucose-related safety profile of darunavir/ritonavir in treatment-experienced, paediatric patients in DELPHI
Darunavir (Prezista)	Protease inhibitor	Licensed	<i>Abstract WELBB102:</i> Efficacy of darunavir/ritonavir as single-drug maintenance therapy in patients with HIV-1 viral suppression: a randomized open-label non-inferiority trial, MONOI-ANRS 136
L50	Tat inhibitor	Preclinical studies	<i>Abstract TUAA102:</i> Broad and potent inhibition of both HIV-1 reverse transcription and mRNA transcription by a potent Tat peptidomimetic binding to the Tat-transactivating RNA sequence

**Appendix 2. Key abstract-based research on HIV prevention strategies from IAS 2009**

<b>Strategy</b>	<b>No. and type of study participants</b>	<b>Site(s)</b>	<b>Oral abstracts at IAS 2009</b>
Acyclovir to prevent HIV transmission	3,408 heterosexual couples in which one partner had HIV	Botswana, Kenya, Rwanda, South Africa, Tanzania, Uganda, Zambia	<i>Abstract WELBC101</i> : Twice-daily acyclovir to reduce HIV-1 transmission from HIV-1 / HSV-2 co-infected persons within HIV-1 serodiscordant couples: a randomized, double-blind, placebo-controlled trial
Antiretroviral therapy for PMTCT	2,637 mother-infant pairs	Malawi	<i>Abstract WELBC103</i> : Both maternal HAART and daily infant nevirapine are effective in reducing HIV-1 transmission during breastfeeding in a randomized trial in Malawi: 28 week results of the Breastfeeding, Antiretroviral and Nutrition (BAN) Study
Antiretroviral therapy for PMTCT	570 women with HIV infection	Botswana	<i>Abstract WELBB101</i> : A randomized trial comparing HAART regimens for virologic efficacy and the prevention of mother-to-child HIV transmission among breastfeeding women in Botswana
Contact tracing and partner notification	2,021 HIV positive people and 2,180 of their sex partners	Northwestern Cameroon	<i>Abstract TUAD201</i> : Integrated HIV contact tracing and partner notification in Cameroon: a feasible HIV infection risk reduction intervention for resource-poor settings
Postexposure prophylaxis (PEP)	249 adults without HIV infection	Ten French hospitals	<i>Abstract WEAC102</i> : Tolerability of post-exposure prophylaxis (PEP) of HIV infection with the combination of tenofovir/emtricitabine and lopinavir/ritonavir tablet formulation (Truvada+ Kaletra)
PEP	39 adults without HIV infection	Fenway Community Health, Boston, USA	<i>Abstract WEAC104</i> : Tenofovir DF/emtricitabine/raltegravir appears safe and well-tolerated for non-occupational post-exposure prophylaxis
Prevention of mother-to-child transmission (PMTCT)	13 traditional birth attendants (midwives)	Catchment area of 2 health centers in Lilongwe, Malawi	<i>Abstract MOAD104</i> : Evaluating the benefits of incorporating traditional birth attendants in PMTCT service delivery in Lilongwe semi-urban district
PMTCT	3,095 infants of HIV positive mothers	DREAM programme centers in Malawi and Mozambique	<i>Abstract TUAC101</i> : Extended use of highly active antiretroviral therapy during pregnancy in Southern Africa is highly protective in HIV-1 prevention of mother-to-child-transmission also in women with higher CD4 cell counts

**Appendix 2 (continued). Key abstract-based research on HIV prevention strategies at IAS 2009**

<b>Strategy</b>	<b>No. and type of study participants</b>	<b>Site(s)</b>	<b>Oral abstracts at IAS 2009</b>
PMTCT	3,273 HIV positive pregnant women	DREAM programme centers in Malawi and Mozambique	<i>Abstract TUAC102:</i> Favorable pregnancy outcomes with reduction of abortion, stillbirth, and prematurity rates in a large cohort of HIV+ women in Southern Africa receiving highly active antiretroviral therapy for prevention of mother-child-transmission
PMTCT	140 partners of HIV positive pregnant women	Kenya	<i>Abstract TUAC105:</i> Male partner HIV-1 testing and antenatal clinical attendance associated with reduced infant HIV-1 acquisition and mortality
PMTCT	29,095 women at 43 centers	Cote d'Ivoire, Senegal, South Africa, Zambia	<i>Abstract WELBD101: Evaluation of PMTCT coverage in four African countries: The PEARL Study</i>

**Appendix 3. New abstract-based research on changing traits of African patients starting antiretroviral therapy (ART)**

<b>First author (abs. no.) *</b>	<b>Sites</b>	<b>No. of patients</b>	<b>Study years</b>	<b>Median CD4 cells/mm<sup>3</sup> when ART starts</b>	<b>Other key findings</b>
Nash (WEAD103)	Ethiopia, Kenya, Lesotho, Mozambique, Nigeria, Rwanda, South Africa, Tanzania	103,124	2005 to 2008	115 in 2005, 140 in 2008	Sites enrolled a median of 43 new ART patients per quarter
Tierney (WEAD101)	Kenya, Uganda	33,597	2003 to 2008	91 in 2003, 152 in 2008	Self-paying when starting ART: 32% in 2003, 0% in 2006 and after; >2-hour travel to clinic: 28% in 2003, 15% in 2008
Le Path (WEAD104)	Rural Malawi	17,728	2001-2003 to 2007-2008	110 in 2001-2003, 176 in 2007-2008	Early survival rate 81% in 2001-2002, 94% in 2007-2008; 76% with stage 3/4 disease in 2001-2003, 44% in 2007-2008

\*All studies are from oral abstract session WEAD1.