

HIV This Week: what scientific journals said

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1. Vaccines

The potential impact of a moderately effective HIV vaccine with rapidly waning protection in South Africa and Thailand

Andersson KM, Stover J. *Vaccine*. 2011 Jun 22. [Epub ahead of print]

Although published data from the recent ALVAC/AIDS VAX trial in Thailand (RV144) indicated that the HIV vaccine provided very modest protection overall (31.2%), new analysis of trial data has suggested higher efficacy levels earlier in the follow-up period. CDC and UNAIDS organised several modelling research teams to explore the implications of the trial results and potential utility of this vaccine. Andersson and Stover explored the **impact of a vaccine with moderate but rapidly waning protection** (78%, 1.43 years) using an exponential decay function fit to trial data. They **varied programme coverage levels** (20-80%), **vaccine efficacy** (30-90%), **timing** (single or multi-year programmes), **prioritisation** (general or populations at higher risk), and **background levels of all other prevention programmes** (constant or scaled-up). They simulated these various vaccination scenarios in two representative countries using demographic projections generated with Spectrum modelling software. They **assumed the vaccine becomes available in 2020 and target coverage is achieved by 2025**. A general vaccination strategy in **South Africa** covering 60% of the population, for example, would **prevent 3.0 million infections between 2020 and 2030—36% of expected infections**—and would be very effective, requiring only **39 vaccinations/infection averted**. The same strategy in Thailand would prevent 81,000 infections—35% of expected infections—but would require 1725 vaccinations/infection averted. **Prioritising only populations at higher risk of exposure in Thailand** would reduce total vaccinations given by more than ten-fold and would still prevent 52,000 infections—23% of expected infections—while requiring only **220 vaccinations/infection averted**. Outcomes were sensitive to programme coverage, vaccine efficacy, and background levels of all other prevention programmes. A vaccine with rapidly waning protection could have a substantial impact on the epidemic in South Africa and Thailand. Due to the short duration of effect, large numbers of vaccinations would be needed to maintain high population coverage levels. Further research into the immunological effects of booster vaccinations is warranted.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/21703322>

Editor's note: In October 2009, the RV144 prime-boost vaccine trial in a large community-based trial in Thailand reported modest protection at 42 months—a 31% reduction with a wide confidence interval of 1%-51%. Some people doubted these findings but at AIDS Vaccine 2011 conference held this month in Thailand, the results of joint efforts across the vaccine field showing immunological correlates of protection were reported to scientific acclaim. This means that we understand better now why the vaccine protected some people. These results brought the work of the CDC/UNAIDS vaccine modelling consensus group, launched in a dedicated issue of *VACCINE* at the conference, into sharp focus. [You can download the entire issue at <http://www.sciencedirect.com/science/journal/0264410X/29/36>]. We invited modelling groups to assess the impact of an RV144-like partially protective vaccine, basing their models on data showing that vaccine efficacy had been 60% at 12 months, waning thereafter, and estimating the effects over a 10-year period of a single mass vaccination of 30% and 60% of sexually active adults. For settings such as Thailand, the USA, South Africa, and Australia, they found that RV144-like vaccines would have modest impact, averting 5-15% of infections over 10-year periods, especially in countries with high incidence. Vaccination with the complete prime-boost regimen would be cost-effective at 150 US\$ per person in South Africa and at 500 US\$ in the USA. The Andersson-Stover modelling team found that the number of vaccinations required to avert one HIV infection with a programme starting in 2020 varied by setting and could be improved with prioritisation of sub-populations at higher risk of HIV exposure. Plans are underway now to study the effects of a booster dose on immune responses, to conduct a trial in Thailand among men who have sex with men, and to conduct a trial in South Africa using clade C inserts rather than the B/E inserts that were used in RV144 regimen to match circulating Thai HIV subtypes. We are on our way!

2. Blood donation

Deferral from donating blood of men who have sex with men: impact on the risk of HIV transmission by transfusion in France

Pillonel J, Heraud-Bousquet V, Pelletier B, Semaille C, Velter A, Saura C, Desenclos JC, Danic B; the blood donor epidemiological surveillance study group. *Vox Sang.* 2011 Jun 21. [Epub ahead of print]

In France, men who have sex with men are permanently excluded from blood donation. This policy is felt to be discriminatory by activist men who have sex with men. Furthermore, the policy is not fully respected because some men who have sex with men do not report their sexual behaviour before donating. Pillonel and colleagues estimated the fraction of the current risk of HIV attributed to men who have sex with men. They then constructed a model based on data obtained from behavioural and epidemiological surveys to **assess the impact of a new strategy in which men who have sex with men would only be deferred if they report more than one sexual partner in the last 12 months**. Thirty-one HIV seroconversions occurred among repeat donors between 2006 and 2008, giving a risk of one in 2,440,000 donations. Fifteen of these seroconversions (48%) were men who have sex with men. If all men who have sex with men had abstained from donating blood, the risk would have been 1 in 4,700,000 donations, half the current risk. **The new strategy would result in an overall HIV risk of between 1 in 3,000,000 (close to the current risk) to 1 in 650,000 donations (3.7 times higher than the current risk)**. Changing the current deferral policy **may increase the risk of transfusion-transmission of HIV**. However, this does not take into account a **possible better compliance by men who have sex with men with a less stringent policy that would be perceived as more equitable**. Conversely, relaxing the policy could encourage some men who have sex with men to seek an HIV test in blood centres. Thus, further qualitative study is needed to assess possible changes in compliance linked to a new policy.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/21692806>

Editor's note: Donor selection and continuous improvements in screening assays have improved the viral safety of the blood supply dramatically since 1985. Nonetheless, there is residual risk because of the window period which occurs after a donor has become infected and before markers of infection can be detected. Therefore, donor selection remains an important element to reduce the risk that a contaminated blood donation will slip through to be transfused. In France, despite the lifetime blood donation deferral policy in place for all men who have had sex with men, half of the current risk of HIV transmission by transfusion is attributed to blood donors who are such men. Clearly, some men who have sex with men donate blood while in the window period, hiding their sexual behaviour, possibly because they view the current policy as discriminatory. Alternately, they may be donating blood after a risk exposure to get a free RNA test, aware of the fact that NAT (nucleic acid amplification) testing is used to try to detect acute infection. The lifetime deferral policy for men who have sex with men is being challenged in several countries, with some countries proposing that men who have sex with men who have been sexually abstinent for one year or more be allowed to donate and others considering whether to make their policies consistent for everyone, i.e. exclusion from donation if the person has had more than one sexual partner in the previous 12 months. The key information missing from risk calculations and decision-making can only come from qualitative studies: will relaxing the policy send the message that self-deferral is not important, increasing the risk, or will a policy perceived to be more equitable improve blood safety by enhancing responsibility?

3. Mobility

Cruising for truckers on highways and the internet: sexual networks and infection risk

Apostolopoulos Y, Sönmez S, Shattell M, Kronenfeld J, Smith D, Stanton S. *AIDS Educ Prev.* 2011 Jun;23(3):249-66.

Empirical evidence on the heterosexual partnerships of long-haul truckers suggests **connections among occupational stressors, substance misuse, structural factors, and risk for sexually transmitted**

infections and HIV. Yet the potential risks associated with same-sex partnerships of **truckers and truckchasers** (men who specifically cruise for truckers) remain largely unknown. Drawing from diverse sources as well as primary and secondary data from 173 truckers and "truckchasers," Apostolopoulos and colleagues discuss how **trucking and cruising contexts**, in conjunction with Internet fora, jointly **create a risk-enabling environment for truckers and their sex contacts.** Findings point toward an elusive but **extensive sexual network that spans across the Internet and highways** and takes advantage of truckers' mobility as it bridges disparate epidemiological spaces and populations. The **delineation of cruising within the hypermasculine occupational sector of trucking** adds new insights to the study of sexual health, which is particularly important considering the risk-laden sex contacts of truckers and truckchasers and potential for infection spread.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/21696243>

Editor's note: When we think of highways as sexual marketplaces, we may think of the trans-African highways or of India's National Highway 8 that links New Delhi to Mumbai. This article addresses the sexual risk environment of the hypermasculine subculture of the US trucking sector, in which truckers are perceived as 'the last of the modern cowboys', traversing the country alone on 18-wheelers, embodying manliness. Truckchasers are men who are drawn to truckers, arranging their lives around opportunities for sexual contact with them. Access to the Internet at trucking terminals, truck stops, and in truck cabs provides opportunities for arranging anonymous in-person hook-ups along highways, enabled by truckers' mobility and their CB (citizens' band) short-distance radios. There are specific social network sites, listservs, chat rooms, and bulletin boards for truckers and truckchasers to meet virtually and arrange sex in wooded highway rest stops, public toilets, picnic areas, and truck stops. This ethnographic research suggests that condoms are rarely used in these anonymous sexual encounters, increasing the risk that straight-identified truckers and bisexual truckchasers may transmit HIV and sexually transmitted infections to their female sexual partners with whom unprotected sex is the norm. This baseline assessment calls out for innovative web-based risk reduction approaches aimed at normalising safer sex practices as the truly masculine thing in this cruising milieu.

HIV Prevention for migrants in transit: developing and testing TRAIN

Bahromov M, Weine S. AIDS Educ Prev. 2011 Jun;23(3):267-80.

This study was a pilot investigation of the **feasibility, acceptability, and effects** of TRAIN (Transit to Russia AIDS Intervention with Newcomers) a **three-session HIV preventive intervention for Tajik male labour migrants** performed in transit. Sixty adult Tajik male labour migrants on the **5-day train ride from Dushanbe to Moscow** were randomly assigned to either the intervention or a control condition. Each initially completed **an in-person survey then another 3 days later** (immediately postintervention), and participated in a **cell phone survey three months later.** All participants came to all intervention sessions, were satisfied with the programme, and completed all postassessments. In comparison with the controls, the TRAIN group reported significant **increases in condom use with sex workers and non-sex workers, condom knowledge, worry about HIV, talking with persons about HIV, talking with wife about HIV, community activities, and religious activities.** HIV prevention performed in transit is feasible, acceptable, and potentially efficacious in diminishing HIV risk behaviours in labour migrants.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21696244>

Editor's note: The TRAIN programme is the first published example of an HIV prevention trial performed in transit. Train 227 from Dushanbe to Moscow crosses the borders of 4 countries: Uzbekistan, Turkmenistan, Kazakhstan, and Russia. The vast majority of its 630 people in its 20-passenger rail cars are Tajik male labour migrants. They are difficult to reach when they are at home with their families in the winter and then are dispersed across the metropolis when they reach Moscow. This trial found that a time-limited programme of 3 sessions conducted over 3 days in the off hours of the train's dining car was acceptable

and had short-term effects such as increased condom use with sex workers reported 3 months after the programme. Next steps include designing programmes for migrants' wives, on their own or with their husbands, and expanding the TRAIN programme through well-designed effectiveness studies. A key issue for the researchers is how to address the violations of the human rights of the Tajik migrants who were harassed and bribed by border police from each country along the way.

4. Knowledge translation

Using research to influence sexual and reproductive health practice and implementation in sub-Saharan Africa: a case-study analysis

Tulloch O, Mayaud P, Adu-Sarkodie Y, Opoku BK, Lithur No, Sickie E, Delany-Moretlwe S, Wambura M, Changalucha J, Theobald S. Health Res Policy Syst. 2011 Jun 16;9 Suppl 1:S10.

Research institutions and donor organizations are giving growing attention to how research evidence is communicated to influence policy. In the area of sexual and reproductive health and HIV there is less weight given to understanding how evidence is successfully translated into practice. Policy issues in sexual and reproductive health can be controversial, influenced by political factors and shaped by context such as religion, ethnicity, gender and sexuality. The case-studies presented in this paper analyse findings from sexual and reproductive health and HIV research programmes in sub-Saharan Africa: 1) **Maternal syphilis screening in Ghana**, 2) **Legislative change for sexual violence survivors in Ghana**, 3) **Male circumcision policy in South Africa**, and 4) **Male circumcision policy in Tanzania**. The authors' analysis draws on two frameworks: Sumner et al's synthesis approach and Nutley's research use continuum. The analysis emphasises the relationships and communications involved in using research to influence policy and practice and recognises a distinction whereby **practice is not necessarily influenced as a result of policy change—especially in sexual and reproductive health where there are complex interactions between policy actors**. Both frameworks demonstrate how policy networks, partnership and advocacy are critical in shaping the extent to which research is used and the **importance of on-going and continuous links between a range of actors** to maximise research impact on policy uptake and implementation. The **case-studies illustrate the importance of long-term engagement between researchers and policy makers and how to use evidence to develop policies** which are sensitive to context: political, cultural, and practical.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21679377>

Editor's note: The analyses of the case studies of sexual and reproductive health (SRH) policy changes provided here are thought-provoking. Research evidence in this highly politicised field does not simply speak for itself. For research findings to influence SRH policy and programming—sometimes called GRIPP (getting research into policy and practice)—networks of collaborative partnerships, media coverage, knowledge brokers, advocacy, and tailored communication strategies are needed to connect researchers with policy makers and practitioners. Weak public understanding and engagement with science constitutes an initial hurdle that must be overcome to aid stakeholders in understanding the policy implications of new research findings. As described in the male circumcision case study from South Africa, participation of scientists in civil-society government structures facilitated 'change from within'. In Tanzania, knowledge translation of the male circumcision findings into services is requiring an inclusive, interconnected constructive partnership and continuous communication between policymakers, researchers, advocacy groups, donors, and health practitioners. These case studies demonstrate that the existing policy context is the key pre-condition for research use but policy outcomes can be influenced by concrete actions that increase the probability of research being used by policy actors.

5. Treatment

Reduced renal function is associated with progression to AIDS but not with overall mortality in HIV-infected Kenyan adults not initially requiring combination antiretroviral therapy

Gupta SK, Ong'or WO, Shen C, Musick B, Goldman M, Wools-Kaloustian K. *J Int AIDS Soc.* 2011 Jun 11;14:31.

The World Health Organization (WHO) has recently recommended that antiretroviral therapy be initiated in all individuals with CD4 counts of less than 350 cells/mm³. For countries with resources too limited to expand care to all such patients, it would be of value to be able to identify and target populations at highest risk of HIV progression. Renal disease has been identified as a risk factor for disease progression or death in some populations. Times to meeting combination antiretroviral therapy initiation criteria (developing either a CD4 count < 200 cells/mm³ or WHO stage 3 or 4 disease) and overall mortality were evaluated in antiretroviral therapy-naïve, HIV-infected Kenyan adults with CD4 cell counts ≥200/mm³ and with WHO stage 1 or 2 disease. Cox proportional hazard regression models were used to evaluate the associations between renal function and these endpoints. Gupta and colleagues analysed data of **7383 subjects with a median follow-up time of 59 (interquartile range, 27-97) weeks**. In Cox regression analyses adjusted for age, sex, WHO disease stage, CD4 cell count and haemoglobin, estimated **creatinine clearance < 60 mL/min was significantly associated with shorter times to meeting cART initiation criteria** (HR 1.34; 95% CI, 1.23-1.52) and overall mortality (HR 1.73; 95% CI, 1.19-2.51) compared with creatinine clearance ≥60 mL/min. Estimated **glomerular filtration rate < 60 mL/min/1.73 m² was associated with shorter times to meeting antiretroviral therapy initiation criteria** (HR 1.39; 95% CI, 1.22-1.58), **but not with overall mortality**. Creatinine clearance and glomerular filtration rate remained associated with shorter times to antiretroviral therapy initiation criteria, but neither was associated with mortality, in weight-adjusted analyses. In this large natural history study, **reduced renal function was strongly associated with faster HIV disease progression in adult Kenyans not initially meeting antiretroviral therapy initiation criteria**. As such, renal function measurement in resource-limited settings may be an inexpensive method to identify those most in need of antiretroviral therapy to prevent progression to AIDS. The initial association between reduced creatinine clearance, but not reduced glomerular filtration rate, and greater mortality was explained by the low weights in this population.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21663693>

Editor's note: This large retrospective study in Kenya investigated the natural progression of HIV infection before antiretroviral therapy is initiated, finding that reduced kidney function was associated with faster disease progression. However, viral load test results were not available and it is very possible that systemic inflammation associated with high viral loads was causing both poor kidney function and increased HIV disease progression. One practical application of these findings is to monitor patients who do not meet treatment guideline eligibility criteria more frequently if they show evidence of reduced renal function. This would help them start antiretroviral therapy before CD4 counts fall too far below the recommended start level.

6. Injecting drug use

Expanded syringe exchange programmes and reduced HIV infection among new injection drug users in Tallinn, Estonia

Uuskula A, Des Jarlais DC, Kals M, Ruutel K, Abel-Ollo K, Talu A, Sobolev I. *C Public Health.* 2011 Jun 30;11(1):517. [Epub ahead of print]

Estonia has experienced an HIV epidemic among people who inject drugs with the **highest per capita HIV prevalence in Eastern Europe**. Uuskula and colleagues assessed the effects of expanded syringe exchange programmes in the capital city, Tallinn, which has an estimated 10,000 people who inject drugs. Syringe exchange programmes' implementation was monitored with data from the Estonian National Institute for Health Development. **Respondent driven sampling interview surveys with HIV testing were conducted in Tallinn in 2005, 2007 and 2009** (involving 350, 350 and 327 people who inject drugs

respectively). HIV incidence among new injectors (those injecting for ≤ 3 years) was estimated by assuming (1) new injectors were HIV seronegative when they began injecting, and (2) HIV infection occurred at the midpoint between first injection and time of interview. **In 2005, 230,000 syringes were exchanged rising to 440,000 in 2007 and 770,000 in 2009.** In all three surveys, people who inject drugs were **predominantly male (80%), ethnic Russians (>80%), and young adults** (mean ages 24 to 27 years). **The proportion of new injectors decreased significantly over the years (from 21% in 2005 to 12% in 2009, $p=0.005$).** HIV prevalence among all respondents stabilised at slightly over 50% (54% in 2005, 55% in 2007, 51% in 2009), and decreased among new injectors (34% in 2005, 16% in 2009, $p=0.046$). **Estimated HIV incidence among new injectors decreased significantly from 18/100 person-years in 2005 and 21/100 person-years in 2007 to 9/100 person-years in 2009 ($p=0.026$).** In Estonia, a transitional country, a **decrease in the HIV prevalence among new injectors and in the numbers of people initiating injection drug use coincided with implementation of large-scale syringe exchange programmes.** Further reductions in HIV transmission among people who inject drugs are still required. Provision of 70 or more syringes per people who inject drugs per year may be needed before significant reductions in HIV incidence occur.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21718469>

Editor's note: Although HIV prevalence among people who inject drugs in many industrialised countries declined and has remained at low levels, many transitional countries with hostile policy environments have increasing HIV prevalence among drug users. In Eastern Europe, on average 9 needles/syringes are distributed per year per person who injects drugs (from 4 in Russia to 151 in the Czech Republic) and 1% of those living with HIV receive antiretroviral therapy (less than 1% in Russia to 81% in Czech Republic). Although only 5 to 12% of people who inject drugs in Estonia report currently receiving antiretroviral therapy, Estonia benefitted from Global Fund support to scale up harm reduction including needle syringe programmes that increased coverage to 70 syringes per person injecting per year and increased methadone treatment slots from 49 to 209 by 2009. The findings of these repeated surveys, conducted using innovative strategies to recruit hard-to-reach individuals, suggest that at the same time that harm reduction programmes were being expanded, both the numbers of new injectors fell and HIV incidence among new injectors declined. This suggests that the population at risk of HIV exposure may be falling and that prevention services are reaching new injectors, often the most difficult population to reach.

7. Condoms

Female condom use in the rural sex industry in China: analysis of users and non-users at post-intervention surveys

Liao S, Weeks MR, Wang Y, Li F, Jiang J, Li J, Zeng X, He B, Dunn J. AIDS Care. 2011 Jun;23 Suppl 1:66-74.

Changes in sexual attitudes and behaviours and resurgence of the sex industry in China have increased concerns about HIV and sexually transmitted infections (STI). Little attention has been paid to the **significant and growing sex industry in rural China**. Promotion of barrier protection in this context is most effective to prevent STIs and pregnancy. The **female condom is a barrier method that gives women more autonomy in its application**, and has other advantages, but has been little promoted and tested in high risk contexts in China. The China/US Women's Health Project was designed to promote female condoms use in addition to male condoms through outreach programmes conducted in sex work establishments in rural and small urban towns in southern China, using the original female condom 1. The study used quantitative and qualitative methods to document the **pre-programme context, programme delivery process, and post-programme outcomes of female condom use**. In this paper Liao and colleagues compare post-intervention female condom users and non-users in the first study sites, two rural towns in a single county in **Hainan Province**. Examination of cross-sectional six-month and 12-month surveys indicated that, despite relatively high male condom use, about **one-third of the women in sex work establishments in these rural towns reported having adopted female condoms** at each post-programme survey. Compared with non-users, **female condom users were more likely to be freelance**

women in boarding houses, more sexually experienced, married with children, more sexually active in the prior month, and more exposed to the programme. The rural context hampered intervention implementation, particularly the significant limits in health and human resources available to manage prevention of HIV/STIs among women in the sex industry. These challenges highlight the **need to better understand the context of the rural sex industry and capacity of local resources** for better prevention efforts and the benefits that new prevention technologies like female condoms can offer.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21660752>

Editor's note: Massive internal migration in China is creating risk environments in which migrant labour participates in sex work, as providers or consumers. This study in two rural towns aimed to increase overall protected sex among women in the local sex industry working in hairdressing/massage parlours, roadside restaurants, and boarding houses. Project staff introduced the female condom, delivering 818 female condoms and more than 9000 male condoms over the project's 1-year period. At baseline, 45% of sex workers in the two towns had used male condoms to protect every sex act in the previous 30 days. Protected sex using either male or female condoms rose to over 50% in cross-sectional surveys. At 6 months, 29% of women and at 12 months 30% of women who had heard of the female condom had tried it. Repeat female condoms users tended to be freelance women working out of boarding houses, be older, and have a family to support, which suggests that affordability will be a key determinant of uptake. This was a small study and the timeframe was short but these initial results are encouraging. Further introduction and promotion of the female condom in rural China could fill a gap for sex workers now having unprotected sex with multiple paying partners.

Everywhere you go, everyone is saying condom, condom. But are they being used consistently? Reflections of South African male students about male and female condom use

Mantell JE, Smit JA, Bekinska M, Scorgie F, Milford C, Balch E, Mabude Z, Smith E, Adams-Skinner J, Exner TM, Hoffman S, Stein ZA. Health Educ Res. 2011 Jun 21. [Epub ahead of print]

Young men in South Africa can play a critical role in preventing new human immunodeficiency virus (HIV) infections, yet are seldom targeted for HIV prevention. While reported condom use at last sex has increased considerably among young people, consistent condom use remains a challenge. In this study, 74 male higher education students gave their perspectives on male and female condoms in **10 focus group discussions**. All believed that condoms should be used when wanting to prevent conception and protect against HIV, although many indicated that consistent condom use was seldom attained, if at all. Three possible situations for not using condoms were noted: (i) **when sex happens in the heat of the moment and condoms are unavailable**, (ii) **when sexual partnerships have matured** and (iii) **when female partners implicitly accept unprotected sex**. Men viewed it as their responsibility to have male condoms available, but attitudes about whose decision it was to initiate condom use were mixed. Almost all sexually active men had male condom experience; however, very few had used female condoms. Prevention initiatives should **challenge traditional gendered norms that underpin poor condom uptake** and continued use and **build on the apparent shifts in these norms that are allowing women greater sexual agency**.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21693684>

Editor's note: This article's verbatim quotes from the focus group discussions among male students at a higher education institution in South Africa make for interesting reading. The overall sexual script that emerges is that men expect women to refuse or resist sex without a condom. They understand that women expect men to acquire, carry, and use the male condom, whether or not it is discussed or requested beforehand. However, a woman not asking if the man has a condom implies that she is not sufficiently worried about HIV risks and doesn't care. If sex proceeds without condom use, women who then propose it later in the relationship may be signifying mistrust or having been unfaithful. As for the female condom, its

use should be initiated by the woman because 'until girls are proud of the female condom we will never use them'. However, some men believed that condom use was no longer exclusively their responsibility, reflecting a reshaping of gender norms in this age group that has grown up half under Apartheid and half in the transition to democracy. Recognising women's growing independence and power in post-Apartheid South Africa, the researchers recommend concrete actions to strengthen HIV prevention among young people, including reinforcing positive, less risky forms of masculinity and increasing women's agency and bargaining power over their sexual lives.

8. HIV testing

Will patients "opt in" to perform their own rapid HIV test in the emergency department?

Gaydos CA, Hsieh YH, Harvey L, Burah A, Won H, Jett-Goheen M, Barnes M, Agreda P, Arora N, Rothman RE. *Ann Emerg Med.* 2011 Jul;58 Suppl 1:S74-8.

Gaydos and colleagues evaluated the feasibility and accuracy of existing point-of-care HIV tests performed by an untrained patient compared with the routinely used HIV point-of-care test offered to patients in 2 urban emergency departments. From April 2008 through December 2009, **patients who had completed a standard HIV oral fluid test performed by a trained health care professional and who were unaware of their results were recruited to perform a rapid point-of-care HIV test.** Patients were given a choice of the oral fluid or the fingerstick blood point-of-care test. Evaluation of acceptability to perform the mechanics of the test was accessed by questionnaire. For the "self-test," the **participant obtained his or her own sample and performed the test.** The patient's results were compared with standard oral fluid results obtained by the health care professional. Overall, 478 of 564 (85%) patients receiving a standard oral fluid HIV test volunteered, with a mean age of 38 to 39 years. Ninety-one percent of participants chose oral fluid and 9% chose blood ($P < .05$). **Self-test results were 99.6% concordant with health care professionals' test results.** For the self-testers, 94% of oral fluid testers and 84.4% of blood testers reported trusting the self-administered test result "very much." Furthermore, **95.6% of the oral fluid group and 93.3% of the blood group would "probably" or "definitely" perform a test at home, if available.** This study demonstrated that a significant proportion of patients offered a self-HIV point-of-care test volunteered and **preferred using oral fluid.** Patients' results agreed with standard HIV point-of-care results. The majority of participants trusted their results and would perform a point-of-care HIV test at home, given the opportunity.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21684413>

Editor's note: This pilot study sought to find out if significant staff time and money could be saved if emergency room patients performed their own HIV test. All the participants had already had blood drawn for an HIV test so willingness to volunteer for HIV testing or to have a first HIV test was not being assessed—85% of those approached agreed to the point-of-care self test. The vast majority chose an oral fluid test over pricking their own finger. The results were 99.6% concordant with those obtained by health care professionals. More than 80% of volunteers reported feeling 'in control of own health'. Further study is warranted in other settings of self point-of-care HIV testing using clear instructional materials and with proper oversight provided by staff, as was done here.

9. Basic science

Designing a genome-based HIV incidence assay with high sensitivity and specificity

Park SY, Love TM, Nelson J, Thurston SW, Perelson AS, Lee HY. *AIDS.* 2011 Jun 29. [Epub ahead of print]

Considerable inaccuracy in estimates of human immunodeficiency virus (HIV) incidence has been a serious obstacle to the development of efficient HIV prevention interventions. **Accurately distinguishing recent or incident infections from chronic infections enables one to monitor epidemics and evaluate the impact of HIV prevention/intervention trials.** However, serological testing has not been able to realise these promises due to a number of critical limitations. This study is aimed to design a novel scheme of

identifying incident infections in a highly accurate manner, based on the **characteristics of HIV gene diversification within an infected individual**. Park and colleagues perform a comprehensive meta-analysis on 5596 full envelope HIV genes generated by **single genome amplification-direct sequencing from 182 incident and 43 chronic cases**. They devise a binary classification test based on the **tail characteristics of the Hamming distance distribution of sequences**. The authors identify a **clear signature of incident infections**, the **presence of closely related strains** in the sampled **HIV envelope gene sequences** in each HIV infected patient, in both single-variant and multi-variant transmissions. The **sequence similarity used as a biomarker** is found to have **high specificity and sensitivity, greater than 95%**, and is **robust to viral and host specific factors such as the clade of the viral strain, viral load, and the length and location of sequences in the HIV envelope gene**. Because of rapid and continuing improvements in sequencing technology and cost, sequence based incidence assays hold great promise as a means of **quantifying HIV incidence from a single blood test**.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21716075>

Editor's note: Current laboratory tests to estimate HIV incidence, such as the STARHS testing algorithm, the BED assay, and the avidity assay, have critical limitations that make interpretation of their results a challenge. They have variable sensitivity, i.e. the proportion of incident infections correctly identified as incident varies from 42-100% (median 89%), and variable specificity, i.e. the proportion of chronic infections correctly identified as chronic varies from 49.5-100% (median 86.8%). Accurately estimating HIV incidence is critical for assessing the effectiveness of HIV prevention programmes and for efficient allocation of resources, both human and financial. The biomarker described here, a genome-based HIV incidence assay, requires only one blood specimen and has high sensitivity and specificity regardless of viral clade and viral load. It measures HIV gene diversification as the Hamming distance, i.e. the number of base differences between a pair of sequences. In incident infections (first year), the Hamming distance is low because there are a fair number of identical or near identical sequences in each lineage of the transmitted founder virus. The HIV population diversifies over time because HIV is a sloppy copier of itself and identical sequences decrease exponentially over time. This genome-based assay has a couple of problems. Although most infections are established by a single founder virus, multi-variant transmission occurs in 36% of anal-sex transmissions and 60% of injecting-related transmissions. The assay picks up the increased Hamming distance diversity and variance and classifies these infections as chronic. In end stage HIV disease, viral diversity declines so this sequencing-based assay might incorrectly identify these people as having incident infections. Nonetheless, this new powerful tool, reporting a sensitivity of 97% and specificity of 100% in this study, is an exciting development for the HIV field.

10. Comorbidity

Sex hormones, insulin resistance, and diabetes mellitus among men with or at risk for HIV infection

Monroe AK, Dobs AS, Xu X, Palella FJ, Kingsley LA, Witt MD, Brown TT. *J Acquir Immune Defic Syndr*. 2011 Jun 23. [Epub ahead of print]

The objective of this study was to examine the relationship of free testosterone and sex hormone-binding globulin with insulin resistance and diabetes mellitus in HIV disease. The design was a cross-sectional analysis of **322 HIV-uninfected and 534 HIV-infected men** in the Multicenter AIDS Cohort Study. The main **outcomes were diabetes mellitus and homeostasis model assessment (HOMA)-insulin resistance**. Diabetes mellitus was defined as fasting serum glucose ≥ 126 or self-reported diabetes mellitus and use of diabetes mellitus medications. HOMA-insulin resistance was calculated from fasting serum glucose and fasting insulin. Compared with HIV-uninfected men in this sample, HIV-infected men were younger, with lower body mass index, and more often black. HIV-infected men had lower free testosterone ($p < 0.001$) and higher sex hormone-binding globulin ($p < 0.0001$). **The adjusted odds ratio for diabetes mellitus was 1.98 (95% CI 1.04-3.78)**; mean adjusted log HOMA-insulin resistance was 0.21 units higher in HIV-infected men ($p < 0.0001$). Log sex hormone-binding globulin, but not log free testosterone, was associated with diabetes mellitus (OR = 0.44, 95% CI 0.25, 0.80) in both groups. Log free testosterone and log sex

hormone-binding globulin were inversely related to insulin resistance ($p < 0.05$ for both), independent of HIV. **Compared to HIV-uninfected men, HIV-infected men had lower free testosterone, higher sex hormone-binding globulin, and more insulin resistance and diabetes mellitus.** Lower free testosterone and lower sex hormone-binding resistance were associated with insulin resistance regardless of HIV serostatus. This suggests that **sex hormones play a role in the pathogenesis of glucose abnormalities among HIV-infected men.**

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21705912>

Editor's note: The higher sex hormone-binding globulin levels seen in men with HIV infection in this cross-sectional study should confer a protective effect against insulin resistance but the converse was seen: HIV-positive men were more insulin resistant and more likely to have diabetes mellitus than HIV-negative men. Hepatitis C infection was associated with insulin resistance in this study and ever having used the antiretroviral stavudine (d4T) was strongly associated with both insulin resistance and diabetes mellitus, as were lower levels of the sex hormone testosterone. The latter association is likely mediated by body fat, particularly visceral adipose tissue. Diabetes is a common problem among people living with HIV and preventing its development will reduce the risk of cardiovascular and kidney disease. Getting rid of central fat through lifestyle changes to promote weight loss would improve both insulin sensitivity and increase testosterone levels. What would be the down side of that?

Impact of HAART exposure and associated lipodystrophy on advanced liver fibrosis in HIV/HCV-coinfected patients

Loko MA, Bani-Sadr F, Winnock M, Lacombe K, Carrieri P, Neau D, Morlat P, Serfaty L, Dabis F, Salmon D; for the ANRS CO 13 HEPAVIH Study Group. J Viral Hepat. 2011 Jul;18(7):e307-e314.

The impact of antiretroviral drug exposure and associated lipodystrophy and/or insulin resistance on advanced liver fibrosis in HIV/HCV-coinfected patients is not fully documented. Loko and colleagues determined the prevalence of advanced liver fibrosis (defined by hepatic stiffness ≥ 9.5 kPa) and associated factors, focusing on the **impact of highly active antiretroviral therapy and its major adverse effects (lipodystrophy and insulin resistance) in 671 HIV/HCV-coinfected patients** included in the ANRS CO13 HEPAVIH cohort. **One hundred ninety patients (28.3%) had advanced liver fibrosis.** In univariate analysis, advanced liver fibrosis was significantly associated with male sex, higher body mass index, HCV infection through injecting drug use, a lower absolute CD4 cell count, a longer history of antiretroviral treatment, longer durations of protease inhibitors, non-nucleoside reverse transcriptase inhibitors and NRTI exposure, lipodystrophy, diabetes, and a high homeostasis model assessment method (HOMA) value. The only antiretroviral drugs associated with advanced liver fibrosis were efavirenz, stavudine and didanosine. In multivariate analysis, **male sex** (OR 2.0, 95% CI 1.1-3.5; $P=0.018$), HCV infection through **injecting drug use** (OR 2.0, 95% CI 1.1-3.6; $P=0.018$), **lipodystrophy** (OR 2.0, 95% CI 1.2-3.3; $P=0.01$), **median didanosine exposure longer than 5 months** (OR 1.7, 95% CI 1.0-2.8; $P=0.04$) and a **high HOMA value** (OR 1.1, 95% CI 1.0-1.2; $P=0.005$) remained significantly associated with advanced liver fibrosis. **Mitochondrial toxicity and insulin resistance thus appear to play a key role in liver damage associated with HIV/HCV-coinfection**, and this should be taken into account when selecting and optimizing antiretroviral therapy. Antiretroviral drugs with strong mitochondrial toxicity (e.g. didanosine) or a major effect on glucose metabolism should be avoided.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21692942>

Editor's note: It is important to understand the reasons behind the finding that HIV/hepatitis C co-infection is associated with a more rapid progression to liver cirrhosis and liver failure than hepatitis C infection alone. Factors that have been linked to this more rapid progression include uncontrolled HIV replication and late initiation of antiretroviral therapy, daily alcohol intake, and a longer estimated duration of hepatitis C infection. There have been concerns that the beneficial effects of antiretroviral therapy on the progression of

fibrosis might be offset by hepatic toxicity. This cross-sectional study found that didanosine was the only antiretroviral drug independently associated with advanced liver disease in multivariate analysis. Lipodystrophy, both lipoatrophy (subcutaneous fat loss) and lipohypertrophy (increased girth or buffalo hump), was associated with fibrosis severity. These two factors, didanosine exposure and lipodystrophy, suggest that mitochondrial toxicity is playing an important role in liver fibrosis progression. It is important therefore to consider this, along with concerns about insulin resistance, in selecting antiretroviral drugs for people living with the two diseases and when discussing positive health strategies.

11. Microbicides

Epidemiological impact of tenofovir gel on the HIV epidemic in South Africa

Williams BG, Abdool Karim SS, Karim QA, Gouws E. *J Acquir Immune Defic Syndr*. 2011 Jun 7. [Epub ahead of print]

Tenofovir gel, an antiretroviral-based vaginal microbicide, reduced HIV acquisition by 39% in women in a recent randomised controlled clinical trial in South Africa. To inform policy, Williams and colleagues used a dynamical model of HIV transmission, calibrated to the epidemic in South Africa, to determine the population-level impact of this microbicide on HIV incidence, prevalence, and deaths and to evaluate its cost-effectiveness. **If women use tenofovir-gel in 80% or more of sexual encounters (high coverage), it could avert 2.33 (0.12 to 4.63) million new infections and save 1.30 (0.07 to 2.42) million lives and if used in 25% of sexual encounters (low coverage), it could avert 0.50 (0.04 to 0.77) million new infections and save 0.29 (0.02 to 0.44) million deaths, over the next 20 years.** At US\$0.50 per application, the cost per infection averted at low coverage is US\$2,392 (US\$562 to US\$4,222) and the cost per disability-adjusted life year saved is US\$104 (US\$27 to US\$181); at high coverage the costs are about 30% less. Over twenty years the use of tenofovir gel in South Africa could avert up to 2 million new infections and 1 million AIDS deaths. **Even with low rates of gel use it is highly cost-effective and compares favourably with other control methods.** This female controlled prevention method could have a significant impact on the epidemic of HIV in South Africa. Programmes should aim to achieve gel use in more than 25% of sexual encounters to significantly alter the course of the epidemic.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21654503>

Editor's note: As this model shows, widespread use of 1% tenofovir vaginal gel by South African women before and after each sex act would have important population-level impacts, helping bring down HIV incidence more rapidly. Although several of the model's assumptions can be questioned, e.g. roll-out of product is not likely to start in 2012 and a cost of 60 cents US per sexual encounter or 30 cents per dose remains to be negotiated, the overall results hold—significant numbers of HIV infections and HIV-related deaths can be averted in South Africa through tenofovir gel use under cost-effective conditions. Concerted efforts are underway to confirm the CAPRISA 004 findings through the FACTS 001 trial in South Africa that is testing the same dosing schedule (once in the 12 hours before sex and once in the 12 hours after sex). Confirmatory evidence will facilitate product development, technology transfer, licensing, and marketing of tenofovir gel to women at risk of HIV exposure. The VOICE trial underway in South Africa, Uganda, and Zimbabwe will answer the question of whether daily dosing with tenofovir gel works as well, less well, or better than use before and after sex. Watch this space!

12. Epidemiology

Concurrency revisited: increasing and compelling epidemiological evidence

Mah TL, Shelton JD. *J Int AIDS Soc*. 2011 Jun 20;14:33.

Multiple sexual partnerships must necessarily lie at the root of a sexually transmitted epidemic. However, that overlapping or concurrent partnerships have played a pivotal role in the generalised epidemics of sub-Saharan Africa has been challenged. **Much of the original proposition that concurrent partnerships**

play such a role focused on modelling, self-reported sexual behaviour data, and ethnographic data. While each of these has definite merit, each also has had methodological limitations. Actually, more recent cross-national sexual behaviour data and improved modelling have strengthened these lines of evidence. However, heretofore the epidemiologic evidence has not been systematically brought to bear. Though assessing the epidemiologic evidence regarding concurrency has its challenges, a careful examination, especially of those studies that have assessed HIV incidence, clearly indicates a **key role for concurrency**. Such evidence includes: 1) the early and dramatic rise of HIV infection in generalised epidemics that can only arise from transmission through **rapid sequential acute infections** and thereby concurrency; 2) clear evidence from incidence studies that a major portion of transmission in the population occurs via concurrency both for concordant negative and discordant couples; 3) **elevation in risk associated with partner's multiple partnering**; 4) **declines in HIV associated with declines in concurrency**; 5) **bursts and clustering of incident infections** that indicate concurrency and acute infection play a key role in the propagation of epidemics; and 6) a lack of other plausible explanations, including serial monogamy and non-sexual transmission. While other factors, such as **sexually transmitted infections, other infectious diseases, biological factors and HIV sub-type**, likely **play a role in enhancing transmission**, it appears most plausible that these would amplify the role of concurrency rather than alter it. Additionally, critics of concurrency have not proposed plausible alternative explanations for why the explosive generalised epidemics occurred. Specific behaviour change messaging bringing the concepts of multiple partnering and concurrency together appears salient and valid in **promoting safer individual behaviour and positive social norms**.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21689437>

Editor's note: It is unclear why there have been and continue to be arguments overall the role of sexual partnership concurrency. Effective HIV prevention messages from the beginning of the response have highlighted ideas such as 'when you sleep with a person you are sleeping with every person they have ever had sex with'. Modelling has suggested that primary infection amplifies the importance of concurrent sexual partnerships substantially, but concurrency and primary infection do not completely explain diverse epidemics in sub-Saharan Africa (see Eaton, *HIV This Week* Issue 87). Although primary infection can be important in fuelling ongoing transmission (see Powers, *HIV This Week*, Issue 93), the level of transmission seen in the HPTN 052 study when CD4 counts were 350-550 cells/ul suggests that the bulk of transmission is not acute infection related. Furthermore, transmission related to acute infection does not explain the doubling times seen in the southern Africa epidemics. Emphasising the role of sexual networking in spreading HIV infection can help people understand how their own risk is influenced by others beyond their immediate sexual partner but helping people to learn their HIV status and tailor their prevention response may have a bigger impact on decelerating HIV incidence than a focus on the role of concurrency alone.

13. Cost-efficacy

Cost-efficacy analysis of the MONET trial using UK antiretroviral drug prices

Gazzard B, Hill A, Anceau A. *Appl Health Econ Health Policy*. 2011 Jul 1;9(4):217-23.

In virologically suppressed patients, **switching to darunavir/ritonavir (DRV/r) monotherapy maintains HIV RNA suppression, and could also lower treatment costs**. The purpose of this analysis was to calculate the potential cost savings from the use of DRV/r monotherapy in the United Kingdom (UK). In the MONET trial, 256 patients with HIV RNA <50 copies/mL on current highly active antiretroviral therapy for over 24 weeks (non-nucleoside reverse-transcriptase inhibitor [NNRTI] based [43%] or protease inhibitor [PI] based [57%]), **switched to DRV/r 800/100mg once daily, either as monotherapy (n=127) or with two NRTIs (n=129)**. The UK costs per patient with HIV RNA <50 copies/mL at week 48 (responders) were calculated using a 'switch included' analysis to account for additional antiretrovirals taken after initial treatment failure. By this analysis, **efficacy was 93.5% versus 95.1% in the DRV/r monotherapy and triple therapy arms, respectively**. British National Formulary 2009 values were used. Before the trial, the

mean annual cost of antiretrovirals was £6906 for patients receiving NNRTI-based highly active antiretroviral therapy, and £8348 for patients receiving PI-based highly active antiretroviral therapy. During the MONET trial, the mean annual per-patient cost of antiretrovirals was £8642 in the triple therapy arm, of which 55% was from NRTIs and 45% from PIs. **The mean per-patient cost in the monotherapy arm was £4126, a saving of 52% versus triple therapy.** The mean cost per responder was £9085 in the triple therapy arm versus £4413 in the DRV/r monotherapy arm. Based on the MONET results, **the lower cost of DRV/r monotherapy versus triple therapy in the UK would allow more patients to be treated for fixed budgets, while maintaining HIV RNA suppression at <50 copies/mL. If all patients meeting the inclusion criteria of the MONET trial in the UK were switched to DRV/r monotherapy, there is the potential to save up to £60 million in antiretroviral drug costs from the UK NHS budget.**

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21682350>

Editor's note: Standard of care antiretroviral therapy involves three drugs: 2 nucleoside analogues and either an NNRTI (non-nucleoside reverse-transcriptase inhibitor) or PI (protease inhibitor). Monotherapy with the use of the protease inhibitor boosted darunavir (DRV/r) is an option in the European treatment guidelines but is not included in the International AIDS Society guidelines. However, both sets of guidelines recommend starting antiretroviral therapy at 350-500 cells/uL. Increasing survival, steady HIV incidence, and changes in treatment eligibility all are increasing treatment demand and costs at a time of significant pressure on health care budgets. The MONET trial, a 144-week controlled phase 3b open-label trial in 11 European countries, Russia, and Israel has recruited patients with viral loads below 50 copies/mL and with no history of virological failure since starting antiretroviral therapy. The trial results at 48 weeks showed that virological suppression is maintained with DRV/r monotherapy (Arrabas et al *AIDS* 2010; 24:223-30). Although these results cannot be extrapolated to treatment-naïve populations or those on treatment with detectable viral loads and more frequent monitoring may be required when on DRV/r monotherapy, there remains the potential for significant cost savings, as shown in this analysis specific to the UK setting.

14. National responses

Challenging urban health: towards an improved local government response to migration, informal settlements, and HIV in Johannesburg, South Africa

Vearey J. *Glob Health Action*. 2011;4. doi: 10.3402/gha.v4i0.5898. Epub 2011 Jun 9

J. Vearey explored local government responses to the urban health challenges of migration, informal settlements, and HIV in Johannesburg, South Africa. **Urbanisation in South Africa is a result of natural urban growth and (to a lesser extent) in-migration from within the country and across borders.** This has led to the development of informal settlements within and on the periphery of urban areas. The **highest HIV prevalence nationally is found within urban informal settlements.** South African local government has a 'developmental mandate' that calls for government to **work with citizens to develop sustainable interventions to address their social, economic, and material needs.** Through a mixed-methods approach, four studies were undertaken within inner-city Johannesburg and a peripheral urban informal settlement. **Two cross-sectional surveys** - one at a household level and one with migrant antiretroviral clients - were supplemented with semi-structured interviews with multiple stakeholders involved with urban health and HIV in Johannesburg, and **participatory photography and film projects** undertaken with urban migrant communities. The findings show that local government requires support in developing and implementing appropriate intersectoral responses to address urban health. **Existing urban health frameworks do not deal adequately with the complex health and development challenges identified;** it is essential that urban public health practitioners and other development professionals in South Africa engage with the **complexities of the urban environment.** A revised, **participatory approach to urban health - 'concept mapping'** - is suggested which requires a **recommitment to intersectoral action, 'healthy urban governance' and public health advocacy.**

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21686331>

Editor's note: Over half the world's population is now urban and, as a result of rural-urban migration and cross-border migration from other countries into urban areas, almost 60% of the South African population is urban. Urban growth in South Africa is putting pressure on HIV and other health services, on adequate housing, and on basic services such as water, sanitation, and refuse removal. Urban health and development challenges include urban inequalities, migration, informal settlements, urban HIV prevalence, residents with 'weak rights to the city', and survivalist livelihood strategies. Applying social determinants of health frameworks, such as the 'urban living conditions model', the WHO Commission on Social Determinants of Health conceptual framework for action, and the conceptual framework of the WHO Knowledge Network on Urban Settings, to the interlinked challenges of migration and informal settlements in the urban South Africa setting can be disappointing. By definition such frameworks are intended to provide a guide to understanding a complex reality rather than answers on where and how to intervene. The alternative proposed here is concept mapping, whereby local government officials engage with the diversity of urban populations to create a city-specific concept map, anchored in intersectoral action, healthy urban governance, and public health advocacy, to inform tailored, multi-level responses to urban health challenges.

15. Men who have sex with men

Behaviour, intention or chance? A longitudinal study of HIV seroadaptive behaviours, abstinence and condom use

McFarland W, Chen YH, Nguyen B, Grasso M, Levine D, Stall R, Colfax G, Robertson T, Truong HH, Raymond HF. AIDS Behav. 2011 Jun 5. [Epub ahead of print]

Seroadaptive behaviours have been widely described as preventive strategies among men who have sex with men and other populations worldwide. However, causal links between intentions to adopt seroadaptive behaviours and subsequent behaviour have not been established. McFarland and colleagues conducted a longitudinal study of 732 men who have sex with men in San Francisco to assess consistency and adherence to multiple seroadaptive behaviours, abstinence and condom use, whether prior intentions predict future seroadaptive behaviours and the likelihood that observed behavioural patterns are the result of chance. **Pure serosorting (i.e., having only HIV-negative partners) among HIV-negative men who have sex with men and seropositioning (i.e., assuming the receptive position during unprotected anal sex) among HIV-positive men who have sex with men were more common, more successfully adhered to and more strongly associated with prior intentions than consistent condom use.** Seroconcordant partnerships occurred significantly more often than expected by chance, reducing the prevalence of serodiscordant partnerships. Having no sex was intended by the fewest men who have sex with men, yet half of HIV-positive men who have sex with men who abstained from sex at baseline also did so at 12 month follow-up. Nonetheless, **no preventive strategy was consistently used by more than one-third of men who have sex with men overall** and none was adhered to by more than half from baseline to follow-up. The effectiveness of seroadaptive strategies should be improved and used as efficacy endpoints in trials of behavioural prevention interventions.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/21644001>

Editor's note: This 12-month study assessed HIV-negative and HIV-positive men's intentions against their subsequent reported sexual behaviour in 8 categories: no sex, only oral sex, 100% condom use, pure serosorting (sex only with same serostatus partners), oral sex serosorting (oral sex if the partner's status is not the same or is unknown), condom serosorting (condom use always unless partner has the same status), seropositioning (insertive if seronegative, receptive if seropositive), and condom seropositioning (condom use always unless being insertive for seronegative men or receptive for HIV-positive men). The study showed that use of several of these seroadaptive strategies was the result of prior intentional risk reduction. Although the transmission probabilities and effectiveness of seroadaptive strategies have not been defined, pure serosorting among HIV-negative men and seropositioning among HIV-positive men in this San

Francisco study were more consistently adhered to than 100% condom use. An obvious pre-requisite for these seroadaptive strategies is knowledge of serostatus. Apart from Seattle, San Francisco may have the highest level of HIV testing among men who have sex with men in North America.

16. Alcohol and HIV

Adding fuel to the fire: alcohol's effect on the HIV epidemic in Sub-Saharan Africa

Hahn JA, Woolf-King SE, Muyindike W. *Curr HIV/AIDS Rep.* 2011 Jun 29. [Epub ahead of print]

Alcohol consumption adds fuel to the HIV epidemic in sub-Saharan Africa, which has **the highest prevalence of HIV infection and heavy episodic drinking** in the world. Alcohol consumption is associated with behaviours such as **unprotected sex and poor medication adherence**, and biological factors such as **increased susceptibility to infection, comorbid conditions, and infectiousness**, which may synergistically increase HIV acquisition and onward transmission. Few interventions to decrease alcohol consumption and alcohol-related sexual risk behaviours have been developed or implemented in sub-Saharan Africa, and **few HIV or health policies or services in sub-Saharan Africa address alcohol consumption**. Structural interventions, such as **regulating the availability, price, and advertising of alcohol**, are challenging to implement due to the **preponderance of homemade alcohol and beverage industry resistance**. This article reviews the current knowledge on how alcohol influences the HIV epidemic in sub-Saharan Africa, summarises current interventions and policies, and identifies areas for increased research and development.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21713433>

Editor's note: This makes for sobering reading. Fully 4% of deaths worldwide are attributed to alcohol consumption. The prevalence of heavy episodic alcohol drinking among drinkers is the highest in sub-Saharan Africa where 31% of alcohol consumption is from unrecorded alcohol that is brewed, fermented, or distilled from locally grown grains or fruits. Heavy alcohol consumption is associated with sexual risk-taking and decreased self-care behaviours such as poor adherence to medications but for those not on antiretroviral therapy, it is associated with lower CD4 counts and shorter time to CD4 counts under 200 cells/uL. Integration of brief interventions into HIV testing programmes to reduce alcohol consumption shows promise but structural interventions to regulate alcohol are needed to change the risk environment (taxes on alcohol, drunk driving laws, national awareness campaigns, etc.). Governments need to overcome resistance by the alcohol beverage industry and devise ways to regulate sales of home-made alcohol if they are to make headway in addressing the multi-factorial effects of alcohol on HIV epidemics in sub-Saharan Africa.

17. Maternal health

WHO 2010 guidelines for prevention of mother-to-child HIV transmission in Zimbabwe: modelling clinical outcomes in infants and mothers

Ciaranello AL, Perez F, Maruva M, Chu J, Engelsmann B, Keatinge J, Walensky RP, Mushavi A, Mugwagwa R, Dabis F, Freedberg KA; for the CEPAC-International Investigators. *PLoS One.* 2011;6(6):e20224. Epub 2011 Jun 2

The Zimbabwean national prevention of mother-to-child HIV transmission programme provided primarily single-dose nevirapine from 2002-2009 and is currently replacing single-dose nevirapine with more effective antiretroviral regimens. Published HIV and prevention of mother-to-child HIV transmission models, with local **trial and programmatic data, were used to simulate a cohort of HIV-infected, pregnant/breastfeeding women in Zimbabwe** (mean age 24.0 years, mean CD4 451 cells/ μ L). Ciaranello and colleagues compared five prevention of mother-to-child HIV transmission regimens at a fixed level of prevention of mother-to-child HIV transmission medication uptake: 1) no antenatal antiretrovirals (comparator); 2) single-dose nevirapine; 3) WHO 2010 guidelines using **"Option A" (zidovudine during pregnancy/infant NVP during**

breastfeeding for women without advanced HIV disease; lifelong 3-drug antiretroviral therapy for women with advanced disease); 4) WHO "Option B" (antiretroviral therapy during pregnancy/breastfeeding without advanced disease; lifelong antiretroviral therapy with advanced disease); and 5) "Option B+:" lifelong antiretroviral therapy for all pregnant/breastfeeding, HIV-infected women. Paediatric (4-6 week and 18-month infection risk, 2-year survival) and maternal (2- and 5-year survival, life expectancy from delivery) outcomes were projected. Eighteen-month pediatric infection risks ranged from 25.8% (no antenatal antiretrovirals) to 10.9% (Options B/B+). Although maternal short-term outcomes (2- and 5-year survival) varied only slightly by regimen, **maternal life expectancy was reduced after receipt of single-dose nevirapine** (13.8 years) or Option B (13.9 years) compared to no antenatal antiretrovirals (14.0 years), Option A (14.0 years), or Option B+ (14.5 years). **Replacement of single-dose nevirapine with currently recommended regimens for prevention of mother-to-child HIV transmission** (WHO Options A, B, or B+) **is necessary to reduce infant HIV infection risk in Zimbabwe.** The planned transition to Option A may also improve both paediatric and maternal outcomes.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21655097>

Editor's note: The results of these computer simulation models applied in the Zimbabwe context are likely applicable to other settings in sub-Saharan Africa where prolonged breastfeeding is common. The largest improvements in both paediatric and maternal outcomes result from offering lifelong antiretroviral therapy to all pregnant women with HIV infection regardless of CD4 count (Option B+). As countries move away from single dose nevirapine, they need to consider the potential adverse effects of antiretroviral therapy discontinuation in Options A and B, such as marked increases in viral load, inflammatory markers, and risk for both AIDS and non-AIDS-related events. But should they choose these options, the most important influence on maternal life expectancy is Prong 4 linkage to post-natal maternal HIV care so that antiretroviral therapy is initiated in a timely fashion. This will reduce the costly morbidity and mortality associated with delayed maternal antiretroviral therapy initiation.

18. Tuberculosis

Spread of extensively drug-resistant tuberculosis in KwaZulu-Natal province, South Africa

Moodley P, Shah NS, Tayob N, Connolly C, Zetola N, Gandhi N, Friedland G, Sturm AW. PLoS One. 2011;6(5):e17513. Epub 2011 May 31

In 2005 a cluster of 53 HIV-infected patients with extensively drug-resistant tuberculosis (XDR-TB) was detected in the Msinga sub-district, the catchment area for the Church of Scotland Hospital (CoSH) in Tugela Ferry, in KwaZulu-Natal province, South Africa. KwaZulu-Natal is divided into 11 healthcare districts. Moodley and colleagues sought to **determine the distribution of XDR TB cases in the province in relation to population density.** In this cross-sectional study, the KwaZulu-Natal tuberculosis laboratory database was analysed. Results of **all patients with a sputum culture positive for Mycobacterium tuberculosis from January 2006 to June 2007** were included. **Drug-susceptibility test results** for isoniazid, rifampicin, ethambutol, streptomycin, kanamycin, and ofloxacin were available for all patients as well as the location of the hospital where their clinical diagnosis was made. In total, **20,858 patients attending one of 73 hospitals** or their adjacent clinics had cultures positive for *M. tuberculosis*. Of these, **4170 (20%) were MDR-TB cases.** Four hundred and forty three **(11%) of the MDR tuberculosis cases displayed the XDR tuberculosis susceptibility profile.** Only 1429 (34%) of the MDR-TB patients were seen at the provincial referral hospital for treatment. The proportion of XDR-TB amongst culture-confirmed cases was highest in the Msinga sub-district (19.6%), followed by the remaining part of the Umzinyati district (5.9%) and the other 10 districts (1.1%). **The number of hospitals with at least one XDR-TB case increased from 18 (25%) to 58 (80%) during the study period.** XDR-TB is present throughout KwaZulu-Natal. **More than 65% of all diagnosed MDR-TB cases,** including XDR-TB patients, **were left untreated** and likely remained in the community as a source of infection.

Abstract : <http://www.ncbi.nlm.nih.gov/pubmed/21655324>

Editor's note: Multi-drug resistant (MDR) tuberculosis is a threat to the success of tuberculosis control programmes and its extensively resistant form (XDR) has no effective treatment. At the start of this study, XDR-TB patients were detected in 16 hospitals in 5 districts of KwaZulu Natal and 18 months later fully 58 hospitals had cases involving all 11 districts of the province. Over 80% of reported cases of TB were not culture-confirmed which means that no drug sensitivity tests were performed, leaving a potential pool of drug-resistant transmitters in hospitals and in the community. The South African government is moving rapidly to introduce the Gene Xpert MTB/RIF, an automated diagnostic test that can identify Mycobacterium tuberculosis and resistance to rifampicin. Rapid implementation of the new South African antiretroviral therapy eligibility guidelines of CD4 under 350 cells/uL will help decrease the numbers of susceptible people living with HIV but infection control strategies in hospitals and in the community are needed as well to prevent transmission of MDR/XDR tuberculosis. Tuberculosis, formerly known as the 'captain of death' must be fought on all fronts.

That was *HIV this week*, signing off.

Editors' notes on journal access

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