HIV This Week: what scientific journals said

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1. HIV and chronic disease

Why reinvent the wheel? Leveraging the lessons of HIV scale-up to confront non-communicable diseases


The dramatic scale-up of HIV services in lower-income countries has led to the development of service delivery models reflecting the specific characteristics of HIV and its treatment as well as local contexts and cultures. Given the shared barriers and challenges faced by health programmes in lower-income countries, many of the implementation approaches developed for HIV programmes have the potential to contribute to the continuity care framework needed to address non-communicable diseases in resource-limited settings. HIV programmes are, in fact, the first large-scale chronic disease programmes in many countries, offering local and effective tools, models, and approaches that can be replicated, adapted, and expanded. As such, they might be used to 'jumpstart' the development of initiatives to provide prevention, care, and treatment services for non-communicable diseases and other chronic conditions.


Editors’ note: With chronic non-communicable diseases (NCD) such as diabetes, cardiovascular disease, cancers, and chronic respiratory disease now the leading causes of death globally, attention is turning to the successes of scale-up of services for HIV infection, itself a chronic condition. Millennium Development Goal (MDG) 6 is focused on HIV, tuberculosis, and malaria, but it also refers to 'other major diseases'. The United Nations NCD high-level meeting that will take place in September 2011 will push to see integration of chronic disease indicators in the MDGs and outline strategies to reach these goals. The five priority interventions are tobacco control, salt reduction, improved diets and physical activity, reduction of hazardous alcohol intake, and essential drugs and technologies. This article on not reinventing the wheel is essential reading for all of us. Episodic care and relief of acute symptoms characterise most health service delivery in low- and middle-income countries, the exception being antiretroviral therapy programmes. As the NCD field looks to HIV chronic care for inspiration, the unique features of HIV service delivery are drawing attention. These include innovative service delivery models (including task shifting/sharing, data monitoring for improved care, procurement strengthening, etc.), civil society involvement, engagement of people living with HIV, local leadership and ownership, domestic and international funding, and multi-sectoral engagement. The hallmark of HIV service delivery is continuity of care with a focus on commitment to lifelong antiretroviral therapy by individuals, by programme planners, and by funders. This commitment is built on a base of activism, leadership, community engagement, and health worker empowerment, with donors stepping forward in response. The growing NCD movement can take a leaf from the HIV book but change will come more quickly if we work together to raise awareness, mobilise effective responses, and integrate services to provide continuity of care for chronic conditions worldwide—while prioritising primary prevention of hypertension, tobacco and alcohol addiction, diabetes, obesity, and HIV risk, based on clear understandings of their underlying determinants.

An epidemic in evolution: the need for new models of HIV care in the chronic disease era

Chu C, Selwyn PA. J Urban Health. 2011 Mar 1. [Epub ahead of print]

Since the beginning of the AIDS epidemic, models of HIV care have needed to be invented or modified as the needs of patients and communities evolved. Early in the epidemic, primary care and palliative care predominated; subsequently, the emergence of effective therapy for HIV infection led to further specialization and a focus on increasingly complex antiretroviral therapy as the cornerstone of effective HIV care. Over the past decade, factors including (1) an aging, long-surviving population; (2) multiple co-morbidities; (3) polypharmacy; and (4) the need for chronic disease management have led to a need for further evolution of HIV care models. Moreover, geographic diffusion; persistent disparities in timely HIV diagnosis, treatment access, and outcomes; and the aging of the HIV provider workforce also suggest the importance of reincorporating primary care providers into the spectrum of HIV
care in the current era. Although some HIV-dedicated treatment centres offer comprehensive medical services, other models of HIV care potentially exist and should be developed and evaluated. In particular, primary care- and community-based collaborative practices—where HIV experts or specialists are incorporated into existing health centres—are one approach that combines the benefits of HIV-specific expertise and comprehensive primary care using an integrated, patient-centred approach.


Editors’ note: Primary care was at the forefront when AIDS was first recognised in high-income countries and treatment options were limited. In some settings, but not all, the advent of antiretroviral therapy led to specialty care in designated HIV treatment centres. Now changes are needed in HIV service delivery in the USA to respond to factors such as increasing numbers of people who have been on antiretroviral therapy for years and an aging specialist provider population. This reflective article underscores the rationale for a paradigm shift to integrated primary care. Cardiovascular disease, hypertension, and diabetes have become prevalent among people with HIV who now have improved survival because of antiretroviral therapy. Drug interactions and medication-associated toxicities highlight the need for primary care providers who can diagnose co-morbidities and coordinate comprehensive care. Several models are proposed, including collaborative or ‘shared care’ strategies, that combine HIV-expertise with the 4 elements of primary care: comprehensiveness, continuity, coordination, and accessibility. HIV disease management is chronic disease management, potentially spanning several decades and it now requires attention to co-morbidities and awareness of and management of aging-related issues.

2. Young people and condoms

Making sense of condoms: social representations in young people's HIV-related narratives from six African countries


Condoms are an essential component of comprehensive efforts to control the HIV epidemic, both for those who know their status and for those who do not. Although young people account for almost half of all new HIV infections, reported condom use among them remains low in many sub-Saharan African countries. In order to inform education and communication efforts to increase condom use, Winskell and colleagues examined social representations of condoms among young people aged 10-24 in six African countries/regions with diverse HIV prevalence rates: Swaziland, Namibia, Kenya, South-East Nigeria, Burkina Faso, and Senegal. They used a unique data source, namely 11,354 creative ideas contributed from these countries to a continent-wide scriptwriting contest, held from 1 February to 15 April 2005, on the theme of AIDS. The authors stratified each country sample by the sex, age (10-14, 15-19, 20-24), and urban/rural location of the author and randomly selected up to 10 narratives for each of the 12 resulting strata, netting a total sample of 586 texts for the six countries. They analyzed the narratives qualitatively using thematic data analysis and narrative-based methodologies. Differences were observed across settings in the prominence accorded to condoms, the assessment of their effectiveness, and certain barriers to and facilitators of their use. Moralization emerged as a key impediment to positive representations of condoms, while humour was an appealing means to normalize them. The social representations in the narratives identify communication needs in and across settings and provide youth-focused ideas and perspectives to inform future intervention efforts.


Editors’ note: The ‘Scenarios for Africa’ contest invited young Africans to contribute scripts for 5-minute fiction films about HIV. Winning ideas were selected by national and international juries and thus far 35 films in fiction have been produced by leading African directors. These researchers examined selected narrative scripts from 6 non-neighbouring countries for insights into how young people make sense of the role of condoms in the response to AIDS and how they would communicate their understanding to others. Social representations are not like attitudes that are based on conscious evaluative judgements. Rather, they are often pre-conscious and they communicate culturally-shared
norms and values in symbolic form. This study assessed the social representations of condoms among young people through analysis of their spontaneous mentions of condoms, rather than through their answers to quantitative questions. The results are fascinating and should inform condom programming tailored to context-specific challenges. Although there was no consistent relationship between social representations of condoms and HIV prevalence or majority religion, there was a striking relationship between how prominent condoms are and how favourably they are viewed in the film scripts submitted by a country’s young people and the level of condom use reported by young people in the country’s Demographic and Health Survey. Among the many implications of the study findings are the urgent need to promote male role models who insist on condom use and refuse to concede under pressure and the importance of positive messages, drawing on humour, to overcome misinformation and moralisation.

3. National Responses

Strange bedfellows: the Catholic Church and Brazilian National AIDS Programme in the response to HIV/AIDS in Brazil


The HIV epidemic has raised important tensions in the relationship between Church and State in many parts of Latin America where government policies frequently negotiate secularity with religious belief and doctrine. Brazil represents a unique country in the region due to the presence of a national religious response to AIDS articulated through the formal structures of the Catholic Church. As part of an institutional ethnography on religion and HIV in Brazil, Murray and colleagues conducted an extended, multi-site ethnography from October 2005 through March 2009 to explore the relationship between the Catholic Church and the Brazilian National AIDS Programme. This case study links a national, macro-level response of governmental and religious institutions with the enactment of these politics and dogmas on a local level. Shared values in solidarity and citizenship, similar organizational structures, and complex interests in forming mutually beneficial alliances were the factors that emerged as the bases for the strong partnership between the two institutions. Dichotomies of Church and State and micro and macro forces were often blurred as social actors responded to the epidemic while also upholding the ideologies of the institutions they represented. The authors argue that the relationship between the Catholic Church and the National AIDS Programme was formalized in networks mediated through personal relationships and political opportunity structures that provided incentives for both institutions to collaborate.


Editors’ note: Latin America is a region with one of the strongest organized religious movements worldwide and Brazil is the country with the world’s largest population—125 million people or 73% of the population—that reports being Catholic. The first cases of AIDS were reported in the early 1980s when Brazil was in the midst of countrywide political discussion about its future. This discussion’s result was a vision of political solidarity that shaped an economically, socially, and politically democratic Brazil. Religious community organisations had been active in confronting the country’s dictatorship, based on principles anchored in Liberation Theology that emphasised grass-roots involvement, emancipation, building individual self-esteem, and people’s ownership of social problems and solutions. This 5-year ethnographic study examines the ebb and flow of the relationships between the Catholic Church and government structures responding to AIDS through data collected at 5 field sites in Sao Paulo, Rio de Janeiro, Porto Alegre, Brasilia, and Recife. Common ground was found early in the epidemic around the theme of care and support, with the Church providing care for needy people living with HIV, with HIV-positive priests reaching out to the civil society and human rights department of the National AIDS Programme, and with the relative autonomy of church dioceses to respond to local needs with a degree of autonomy. Although solidarity took precedence over ideology in these partnerships, the topic of prevention was fraught with debate, with the ‘lesser evil’ argument about condoms seen as supporting decadence which contrasted with the view that ‘it’s a sin not to use it’. This case study of Brazil provides useful insights into the role of historical political processes and social actors in constructing religious responses to the HIV epidemic.
The integration of multiple HIV/AIDS projects into a coordinated national programme in China


External financial support from developed countries is a major resource for any developing country's national AIDS programme. The influence of donors on the content and implementation of these programmes is thus inevitable. China is a large developing country that has received considerable international support for its AIDS programme. In the early stage of the response, each large HIV project independently implemented their activities according to their project framework. When internationally funded projects were few and the quantity of domestic support was minimal, their independent implementation did not pose a problem. When many HIV projects were simultaneously implemented in the same locations, problems emerged such as inconsistency and overlap in data collection. China has thus coordinated and integrated all large international and domestic HIV projects into one national programme. The process of integration began slowly and initially consisted of unified data collection. Integration is now complete and encompasses the processes of project planning, budgeting, implementation, monitoring and evaluation. The process was facilitated by having a single coordinating body, cooperation from international agencies, and financial commitment from the government. Some problems were encountered during this process, such as initial reluctance from health-care staff to allocate additional time to coordinate projects. This paper describes that process of integrating domestic and foreign HIV projects and may serve as a useful example for other developing countries for management of scarce resources.


Editors’ note: China has made striking changes in its response to AIDS, following the ‘Three Ones’ key principles of one agreed action framework that provides the basis for coordinating the work of all partners, one national AIDS coordinating authority, and one agreed country level monitoring and evaluation system. Local AIDS authorities had become inundated with report writing to a multitude of different donors, a problem of misspent or unspent funds emerged in areas with many overlapping projects, and inconsistencies in data collection, coding schemes, and data reliability hampered government-led planning. The first step was to unify and standardize data collection with the result that 56 forms with 225 variables were reduced to 25 forms and 19 indicators. The online comprehensive HIV data system that became operational in January 2008 includes data on newly identified HIV infections, drug users in the methadone programme, and people living with HIV on the national free antiretroviral therapy programme. It was analysis of data in this database that led China to the decision to offer antiretroviral therapy to HIV-positive people in discordant couples, regardless of CD4 count, when linkages revealed significant levels of HIV transmission prior to medical eligibility for antiretroviral therapy. Budget integration has helped ensure adequate funding for full implementation of activities complementary to the national programme. For example, the national harm reduction programme uses government funds for the purchase of equipment, methadone, and personnel training and Global Fund funds for methadone treatment and needle exchange service delivery. Although integration means up-front investment in coordinating planning, budgeting, implementation, and evaluation of multiple projects, it reaps dividends in time and effort saved later in project management and in increased effectiveness of the AIDS response.

4. Mobile phones and HIV

India calling: harnessing the promise of mobile phones for HIV healthcare


The technology that has been able to straddle the digital divide most effectively in resource-constrained settings has been the mobile phone. The tremendous growth seen in Africa and Asia in mobile phone use over the last half decade has spurred plans to integrate mobile phones with healthcare delivery globally. A major challenge in HIV healthcare is sustaining good adherence to antiretroviral treatment. This report focuses on specific applications of mobile phones in the area of HIV healthcare delivery. It highlights the widespread use of mobile phones in developing areas of the world, those which have a heavy burden of HIV and infectious diseases. There is scope for exploiting existing mobile phone technology and infrastructure for healthcare enhancement in resource-constrained settings.

Editors’ note: Many of the countries with the highest HIV burden of disease have experienced explosive growth of mobile telecommunications in the last few years. An estimated 5 billion cell phones are in use worldwide and their potential for improving health care delivery has only begun to be exploited. For example, automated reminders on mobile phones can be used to improve adherence to antiretroviral therapy, to maintain abstinence in the 6 weeks following male circumcision surgery, and to reduce missed appointments. They can be used to collect and transmit patient data to central monitoring systems and can empower patients to stay connected with health care providers. In ten years, we will look back at the paradigm shift that mobile phones brought to the response to HIV and ask if we could have adopted this innovation more quickly.

**Short message service reminder intervention doubles sexually transmitted infection/HIV re-testing rates among men who have sex with men**


The objective of this study was to evaluate the impact of a short message service (SMS) reminder system on HIV/sexually transmitted infection (STI) re-testing rates among men who have sex with men. The SMS reminder programme started in late 2008 at a large Australian sexual health clinic. SMS reminders were recommended 3-6 times monthly for men who have sex with men considered high-risk based on self-reported sexual behaviour. The evaluation compared **HIV negative men who have sex with men who had a HIV/STI test between 1 January and 31 August 2010 and received a SMS reminder (SMS group)** with those tested in the same time period (**comparison group**) and **pre-SMS period (pre-SMS group, 1 January 2008 and 31 August 2008)** who did not receive the SMS. HIV/STI re-testing rates were measured within 9 months for each group. Baseline characteristics were compared between study groups and multivariate logistic regression used to assess the association between SMS and re-testing and control for any imbalances in the study groups. There were 714 HIV negative men who have sex with men in the SMS group, 1084 in the comparison group and 1753 in the pre-SMS group. In the SMS group, 64% were re-tested within 9 months compared to 30% in the comparison group (**p<0.001**) and 31% in the pre-SMS group (**p<0.001**). After adjusting for baseline differences, re-testing was 4.4 times more likely (95% CI 3.5 to 5.5) in the SMS group than the comparison group and 3.1 times more likely (95% CI 2.5 to 3.8) than the pre-SMS group. SMS reminders increased HIV/STI re-testing among HIV negative men who have sex with men. SMS offers a cheap, efficient system to increase HIV/STI re-testing in a busy clinical setting.


Editors’ note: The Shang Ring Device for adult male circumcision: a proof of concept study in Kenya


5. Male circumcision

The Shang Ring Device for adult male circumcision: a proof of concept study in Kenya

The objective of this study was to assess safety, preliminary efficacy, and acceptability of the Shang Ring, a novel disposable device for adult male circumcision, in Kenya where 40 HIV-negative men were recruited in Homa Bay, Kenya. Circumcisions were performed by a trained physician or nurse working with one assistant. Follow-up was conducted at 2, 7, 9, 14, 21, 28, 35 and 42 days after circumcision. **Rings were removed on day 7.** Pain was assessed using a visual analog scale (0=no pain,10=worst possible). Men were interviewed at enrollment and on days 7 and 42. All 40 procedures were completed successfully. **Mean procedure and device removal times were 4.8 (sd±2.0) and 3.9 (sd±2.6) minutes, respectively.** There were six mild adverse events, including three penile skin injuries, two cases of edema, and one infection; all resolved with conservative management. In addition, there were three partial ring detachments between days 2-7. **None required treatment or early ring removal.** Erections with the ring were well tolerated, with a mean pain score of 3.5 (sd±2.3). By day 2, 80% of men were back to work. At 42 days all participants were very satisfied with their circumcision and would recommend the procedure to others. The results of Barone and colleagues demonstrate that the Shang Ring is safe for further study in Africa. Acceptability of the Shang Ring among participants was excellent. With short procedure times, less surgical skill required, and the ease with which it can be used by non-physicians, the Shang Ring could facilitate rapid roll-out of male circumcision in sub-Saharan Africa.


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Editors' note: WHO and UNAIDS recommend three surgical techniques for adult male circumcision: the forceps guided method, the sleeve resection method, and the dorsal slit method ([www.malecircumcision.org](http://www.malecircumcision.org)). In the absence of task sharing and other methods to optimise the volume and efficiency of male circumcision service delivery, these methods entail 20 to 30 minutes of surgical time. This study of the Shang Ring shows promise and suggests that further data should be collected in sub-Saharan African settings with this device. The Shang Ring consists of 2 concentric plastic rings that are available in China in 32 sizes for use with neonates to adults. Following local anaesthesia, the locking rings compress the foreskin with no need for sutures. In addition to the impressive number of minutes saved per procedure, this study found the rings to be acceptable with all 32 of the men who attended the 6 week follow-up visit stating that they would recommend circumcision generally and specifically with the Shang Ring. Given the millions of adult male circumcisions that countries are aiming to achieve by 2015, there is tremendous interest in the potential time-saving features of medical devices. The WHO Technical Advisory Group on Innovations in Male Circumcision, which has a mandate to examine data on new circumcision devices formally submitted to it, will hold its first meeting in July 2011. You can expect further innovations in male circumcision service delivery in the future.

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6. Diagnostic testing

Accurate CD4 T-cell enumeration and antiretroviral drug toxicity monitoring in primary healthcare clinics using point-of-care testing


The objective of this study was to evaluate the accuracy of point-of-care tests for CD4 cell, clinical chemistry, and haemoglobin in primary healthcare clinics in Mozambique. Point-of-care tests and laboratory-based assays were conducted on adult HIV-positive patients enrolled consecutively at primary healthcare clinics in Mozambique. **Patients were tested on-site with CD4 (Pima), clinical chemistry (Reflotron) and haemoglobin (HemoCue) point-of-care test devices using finger prick blood.** Results obtained on paired blood samples were used for agreement analysis (bias and limits of agreement). **Repeatability analysis** was also performed for point-of-care CD4 cell counting. **Primary health nurses operating the Pima, Reflotron and HemoCue point-of-care test devices produced results with low levels of bias** for CD4 T-cell counts (-52.8 cells/μl), alanine aminotransferase (-0.2 U/l), aspartate aminotransferase (-4.0 U/l) and haemoglobin (0.95 g/dl). CD4 T-cell counts in paired specimens of finger prick and venous blood tested on the CD4 point-of-care test device were in close agreement (bias -9 cells/μl, coefficient of variation 10.6%). The repeatability of point-of-care CD4 cell counting was similar to that observed with laboratory instruments (bias -6.2 cells/μl, coefficient of variation 10.7% vs. bias -5.7 cells/μl, coefficient of variation 7.5%). **Primary health clinic nurses generated accurate results for CD4 T-cell counts, liver enzymes and haemoglobin using simple**
point-of-care devices on finger prick samples at decentralized antiretroviral therapy antiretroviral therapy clinics. **Point-of-care diagnostics to monitor antiretroviral therapy at primary healthcare level is technically feasible** and should be utilized in efforts to decentralize HIV care and treatment.


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**Editors’ note:** Treatment 2.0 entails decentralised antiretroviral therapy services delivered simply and inexpensively to patients close to where they live. When diagnostic and monitoring test specimens must be transported to centralised laboratories, costs rise, results are delayed, treatment initiation may be less timely, and patients may be lost to follow-up. This promising study assessed point of care CD4 count testing and drug toxicity monitoring conducted by primary health care nurses using finger prick capillary blood samples. The results were compared to laboratory testing of venous blood samples using reference instruments. 697 patients were enrolled in the study of whom 68.4% were women. Point of care CD4 count testing misclassified 5.2% and 17.0% of patients at the 200 and 350 cells/µl levels, respectively, however, all the 200 level misclassifications and 60% of the 350 level misclassifications were in favour of treatment initiation. Tests of repeatability found that the point of care tests performed similarly to laboratory tests. With appropriate training, ongoing supervision, and planning of human resource needs, point of care testing can be shifted to community clinics to benefit patient care.

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**Pooling strategies to reduce the cost of HIV-1 RNA load monitoring in a resource-limited setting**


Quantitative human immunodeficiency virus (HIV) RNA load testing surpasses CD4 cell count and clinical monitoring in detecting antiretroviral therapy failure; however, its cost can be prohibitive. Recently, the use of pooling strategies with a clinically appropriate viral load threshold was shown to be accurate and efficient for monitoring when the prevalence of virologic failure is low. Van Zyl and colleagues used laboratory request form information to identify specimens with a low pretest probability of virologic failure. Patients aged ≥15 years who were receiving first-line antiretroviral therapy and had individual viral load results available were eligible. **Blood plasma, dried blood spots, and dried plasma spots were evaluated.** Two pooling strategies were compared: minipools of 5 samples and a 10 ×10 matrix platform (liquid plasma specimens only). A deconvolution algorithm was used to identify specimens with detectable viral loads. The virologic failure rate in the study sample was <10%. Specimens included were **liquid plasma specimens tested in minipools** (n=400), of which 300 were available for testing by matrix, and specimens tested with minipools only: **dried blood spots** (n=100) and **dried plasma spots** (n=185). **Pooling methods resulted in 30.5%-60% fewer HIV RNA tests required to screen the study sample.** For plasma pooling, the matrix strategy had the better efficiency, but **minipools of 5 dried blood spots had the best efficiency overall and were accurate at a >95% negative predictive value with minimal technical requirements.** In resource-constrained settings, a combination of preselection of patients with low pretest probability of virologic failure and pooled testing can reduce the cost of virologic monitoring without compromising accuracy.


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**Editors’ note:** When viral load monitoring is not available and only CD4 count and clinical monitoring are used to detect treatment failure, some people who are actually doing well on first-line regimens will be unnecessarily switched to more expensive second-line regimens while others who really do need to switch will stay on a failing first-line regimen. When failure is not recognised, the risk of HIV resistance increases—and if this is resistance to thymidine analogue mutations [TAMs] or K65R, second-line regimen effectiveness may be compromised. However, viral load testing is expensive so ways of bringing down costs without compromising accuracy are needed to increase access for more people. This study assessed a strategy of pooling specimens from people who were unlikely to have treatment failure, based on 2 criteria: age of 15 years or more and being on a first-line NNRTI (non-nucleoside reverse transcriptase inhibitor) regimen. The lower the pre-test probability of antiretroviral therapy failure is, the higher are the savings gained by pooling compared to testing each specimen from every individual on its own. Although pooling 100 blood plasma specimens together was more efficient than
mini-pooling 5 dried plasma spot (DPS) specimens at a time, this strategy would not be practical. More time and expertise are required for pooling over mini-pooling and laboratories may have to wait for 100 specimens to accumulate before testing them which would preclude rapid decision making. The actual efficiency gains will vary by setting as a result of different staffing, reagent, and equipment costs and both require a centralised laboratory, but in this setting 30.5% fewer tests were needed with the mini-pooling strategy, resulting in a significant cost saving.

7. **Mobility: sea, land, and sex**

**Southern Africa ports as spaces of HIV vulnerability: case studies from South Africa and Namibia**


There is increasing recognition that in order to respond to the HIV epidemic migrants and mobile populations must be included in national and regional responses. **While migration in and of itself does not necessarily contribute to increased risk of HIV infection, some migrants and mobile populations do face increased HIV risk.** With its immense coastline and extensive transport industry, Southern Africa provides an excellent case study to examine the HIV risks and vulnerabilities of mobile workers and local communities through **port settings**. The International Organization for Migration's research in Southern African ports illustrates why HIV policies and programmes must **focus on spaces where migrants and mobile populations interact with sedentary populations** (including sex workers and other sexual partners) **in environments conducive to multiple concurrent partnerships**, in order to reduce HIV risk and increase access to treatment, care, and support for all.


**Editors' note:** Although migrants and mobile populations are identified as key populations, they face different individual, environmental, and structural factors influencing their risk of HIV. These case studies focus on two port settings as 'spaces of vulnerability'. They are Durban Port, South Africa's main trade gateway and the busiest and biggest port in Africa, and Walvis Bay, Namibia’s only deep-water port and a key node for two highways linking Namibia to Angola, Zambia, Botswana, and South Africa. Land transport workers and seafarers stay at these ports for relatively short periods but they may interact with sex workers, creating a triangle of risky sex with dock workers and other local people. Lack of recreational opportunities, lack of tailored HIV information, poor access to health services, language difficulties, and separation from regular sexual partners create conditions for HIV transmission, particularly when migration and poverty among women underpin local sex work, alcohol disinhibits sexual behaviour, and HIV awareness and risk perception are low. This article emphasises combination prevention strategies and lays out 12 recommendations to address gaps and challenges. If you would like to become involved in the Global Partnership on HIV and Mobile Workers in the Maritime Sector that was formed in 2009, you can write to seafarers@iom.int.

8. **Vaccines**

**Genetic impact of vaccination on breakthrough HIV-1 sequences from the STEP trial**


Rolland and colleagues analyzed HIV-1 genome sequences from **68 newly infected volunteers** in the STEP HIV-1 vaccine trial. To determine whether the vaccine exerted selective T cell pressure on breakthrough viruses, they **identified potential T cell epitopes in the founder sequences and compared them to epitopes in the vaccine**. The authors found **greater distances to the vaccine sequence for sequences from vaccine recipients than from placebo recipients**. The most significant signature site distinguishing vaccine from placebo recipients was **Gag amino acid 84, a site encompassed by several epitopes contained in the vaccine and restricted by human leukocyte antigen (HLA) alleles common in the study cohort**. Moreover, the extended divergence was confined to the vaccine components of the virus (HIV-1 Gag, Pol and Nef) and not found in other HIV-1 proteins.
These results represent what is to our knowledge the first evidence of selective pressure from vaccine-induced T cell responses on HIV-1 infection in humans.


Editors’ note: These results contribute an important piece to the HIV vaccine puzzle as they reveal for the first time ever that an HIV vaccine candidate can influence our immune responses to HIV. The STEP trial Merck adenovirus-5 vaccine neither prevented HIV infection nor reduced viral load setpoint, and it increased risk of HIV acquisition in men with pre-existing exposure to adenovirus-5 (see http://hivthisweek.unaids.org/2010/01/19/basic-science-40). Now it has delivered information that will influence future HIV vaccine candidate design. The researchers performed a ‘sieve analysis’, meaning that they assessed whether the vaccine could have prevented HIV variants that were similar to the nef, pol, and gag constructs in the vaccine from establishing infection. They found that the vaccine left a genetic imprint on founder viral strains. Of the 68 individuals in both study arms who became infected, 75% had a single founder virus, 22% had two founder variants, and one person had four, with no evidence of multiple sources of infection. Viruses infecting vaccinees were more likely to encode epitopes (the part of an antigen’s surface that binds to antibody) that differed from those present in the vaccine. This study suggests that the vaccine may not have blocked infection at the time of transmission but that the immune response that it generated actually exerted pressure on the transmitted virus to accumulate mutations leading to the selective outgrowth of an escape mutant during acute infection. Now we need to find out whether such vaccine-mediated selection can be strengthened and broadened. Is it possible that vaccine-induced immune responses could have a sustained effect on the evolution of the virus and its replication capacity, impairing viral fitness and slowing disease progression?

9. Mental Health and HIV risk

Poor mental health and sexual risk behaviours in Uganda: A cross-sectional population-based study


Poor mental health predicts sexual risk behaviours in high-income countries, but little is known about this association in low-income settings in sub-Saharan Africa where HIV is prevalent. This study investigated whether depression, psychological distress and alcohol use are associated with sexual risk behaviours in young Ugandan adults. Household sampling was performed in two Ugandan districts, with 646 men and women aged 18-30 years recruited. Hopkins Symptoms Checklist-25 was used to assess the presence of depression and psychological distress. Alcohol use was assessed using a question about self-reported heavy-episodic drinking. Information on sexual risk behaviour was obtained concerning number of lifetime sexual partners, ongoing concurrent sexual relationships and condom use. Depression was associated with a greater number of lifetime partners and with having concurrent partners among women. Psychological distress was associated with a greater number of lifetime partners in both men and women and was marginally associated (p = 0.05) with having concurrent partners among women. Psychological distress was associated with inconsistent condom use among men. Alcohol use was associated with a greater number of lifetime partners and with having concurrent partners in both men and women, with particularly strong associations for both outcome measures found among women. Poor mental health is associated with sexual risk behaviours in a low-income sub-Saharan African setting. HIV preventive interventions should consider including mental health and alcohol use reduction components into their intervention packages, in settings where depression, psychological distress and alcohol use are common.


Editors’ note: In high-income countries poor mental health is closely linked to risky sexual behaviours, with depression, in particular, seemingly associated with low self-efficacy, poor coping strategies, and self-destructiveness. Studies in middle-income countries have found depressive symptoms associated with transactional sex and intimate partner violence for women and inconsistent condom use for men (South Africa) and with multiple partners for women and paying for sex in men (Botswana). This first
Mental health and HIV sexual risk behaviour among patrons of alcohol serving venues in Cape Town, South Africa


Alcohol-serving venues in South Africa provide a location for HIV prevention interventions due to risk factors of patrons in these establishments. Understanding the association between mental health and risk behaviours in these settings may inform interventions that address alcohol use and HIV prevention. Participants (N=738) were surveyed in six alcohol-serving venues in Cape Town to assess post-traumatic stress disorder and depression symptoms, traumatic experiences, sexual behaviour and substance use. Logistic regression models examined whether traumatic experiences predicted post-traumatic stress disorder and depression. Generalized linear models examined whether substance use, post-traumatic stress disorder, and depressive symptoms, predicted unprotected sexual intercourse. Men and women were analyzed separately. Participants exhibited high rates of traumatic experiences, post-traumatic stress disorder, depression, alcohol consumption, and HIV risk behaviours. For men, post-traumatic stress disorder was associated with being hit by a sex partner, physical child abuse, sexual child abuse and HIV diagnosis; depression was associated with being hit by a sex partner, forced sex and physical child abuse. For women, both post-traumatic stress disorder and depression were associated with being hit by a sex partner, forced sex and physical child abuse. Unprotected sexual intercourse was associated with age, frequency and quantity of alcohol use, drug use, and post-traumatic stress disorder for men and frequency and quantity of alcohol use, depression, and post-traumatic stress disorder for women. Mental health in this setting was poor and was associated with sexual risk behaviour. Treating mental health and substance use problems may aid in reducing HIV infection. Sexual assault prevention and treatment following sexual assault may strengthen HIV prevention efforts.


Editors’ note: This study set out to assess the extent to which risky sexual behaviour in a high HIV prevalence setting occurs as the result of a ‘syndemic’ in which social context interacts with co-occurring and interacting psychosocial health conditions to create vulnerabilities and synergies that increase HIV risk. Research sites included shebeens, small unlicensed venues, and taverns, larger licensed venues, in a peri-urban township in Cape Town. Of the 6 sites selected, 3 were predominantly Xhosa-speaking and 3 were predominantly Afrikaans-speaking. Of people approached as they entered the establishment, 84% consented to participate and of these 94% used the self-administered questionnaire. Not surprisingly given the recruitment sites, nearly all the participants met the traditional definition of hazardous drinking and 70% reported problem drinking with alcohol dependence. After accounting for alcohol and drug use, mental health distress was predictive of the frequency of unsafe sex as was presence of post-traumatic stress disorder for both men and women, while depression was a predictor in women. In this ‘syndemic’, psychological distress, alcohol use, and traumatic life experiences act synergistically to increase HIV sexual risk. This provides a clear rationale for venue-based interventions to reach this population as well as for strategies upstream to alter the predictors of mental health distress, including intimate partner violence and rape.
10. Epidemiology

A surprising prevention success: why did the HIV epidemic decline in Zimbabwe?


There is growing recognition that primary prevention, including behaviour change, must be central in the fight against AIDS. The earlier successes in Thailand and Uganda may not be fully relevant to the severely affected countries of southern Africa. Halperin and authors conducted an extensive multi-disciplinary synthesis of the available data on the causes of the remarkable HIV decline that has occurred in Zimbabwe (29% estimated adult prevalence in 1997 to 16% in 2007), in the context of severe social, political, and economic disruption. The behavioural changes associated with HIV reduction—mainly reductions in extramarital, commercial, and casual sexual relations, and associated reductions in partner concurrency—appear to have been stimulated primarily by increased awareness of AIDS deaths and secondarily by the country’s economic deterioration. These changes were probably aided by prevention programmes utilizing both mass media and church-based, workplace-based, and other inter-personal communication activities. Focusing on partner reduction, in addition to promoting condom use for casual sex and other evidence-based approaches, is crucial for developing more effective prevention programmes, especially in regions with generalized HIV epidemics.


Editors' note: These authors take up the challenge of trying to explain the findings published last year on the prevalence and incidence declines in Zimbabwe by Gregson et al (covered in Issue 83 of HIV This Week http://hivthisweek.unaids.org/post/epidemiology-2). They synthesise data from a number of sources and their hypotheses do seem explanatory. HIV incidence peaked in Zimbabwe in 1991 while HIV prevalence peaked in 1997. HIV incidence declined initially after 1991, as a result of saturation of sub-populations of people at higher risk of HIV exposure, and then the pace of the decline accelerated after 1999. Reported condom use increased steadily during the 1990s reaching a level of 59% in non-marital sexual encounters by 1994 and the consistency of condom use improved among women in casual partnerships. AIDS deaths increased dramatically during the mid- to-late 1990s and the government policy of home-based care brought AIDS mortality into the lived experiences of Zimbabweans across the country. Focus groups and interviews repeatedly underscore the role that mortality played in reducing casual sex and other multiple sexual partnerships. The severe economic declines of the last 1990s and early 2000s amplified the trend to partner reduction as Zimbabwe’s gross domestic product (GDP) fell 40%, average real earnings declined 90%, and men’s ability to purchase sexual services or maintain multiple partnerships fell. The lessons for other countries in southern Africa are unclear since one would wish neither economic decline nor high AIDS mortality for them. However, Zimbabwe had high secondary education levels, particularly in urban men, which facilitated personal integration of AIDS awareness messages. More importantly, the national response saw broad-based community engagement strategies deployed that set the stage for influential interpersonal communication arising from within the population to change sexual norms.

11. Basic science

Identification of personal lubricants that can cause rectal epithelial cell damage and enhance HIV Type 1 replication in vitro


Over-the-counter personal lubricants are used frequently during vaginal and anal intercourse, but they have not been extensively tested for biological effects that might influence HIV transmission. Begay and colleagues evaluated the in vitro toxicity, anti-HIV-1 activity, and osmolality of popular lubricants. A total of 41 lubricants were examined and compared to Gynol II and Carraguard as positive and negative controls for toxicity, respectively. Cytotoxicity was assessed using the XTT assay. The MAGI assay with R5 and X4 HIV-1 laboratory strains was used to evaluate antiviral activity. The effect of the lubricants on
differentiated Caco-2 cell monolayers (transepithelial electrical resistance, TEER) was also measured. None of the lubricants tested showed significant activity against HIV-1. Surprisingly, four of them, Astroglide Liquid, Astroglide Warming Liquid, Astroglide Glycerin & Paraben-Free Liquid, and Astroglide Silken Secret, significantly enhanced HIV-1 replication (p<0.0001). A common ingredient in three of these preparations is polyquaternium-15. In vitro testing of a chemically related compound (MADQUAT) confirmed that this similarly augmented HIV-1 replication. Most of the lubricants were found to be hyperosmolar and the TEER value dropped approximately 60% 2h after exposure to all lubricants tested. Cells treated with Carraguard, saline, and cell controls maintained about 100% initial TEER value after 2-6h. The authors have identified four lubricants that significantly increase HIV-1 replication in vitro. In addition, the epithelial damage caused by these and many other lubricants may have implications for enhancing HIV transmission in vivo. These data emphasize the importance of performing more rigorous safety testing on these products.


Editors' note: The first thing that is surprising about this study is that personal sexual lubricants have been available for decades and no testing of the effects of their repeated use on the risk of acquiring HIV or sexually transmitted infections has been done—not even after the nonoxynol-9 microbicide candidate was found to increase HIV acquisition. The second surprising thing about this study are the results: 4 of the 41 water-based lubricants tested were found to dramatically amplify replication of both CCR5 and CXCR4 HIV viruses, possibly as a result of an ingredient that they all contained that is a form of polyquaternium. Furthermore, many of the lubricants actually reduced epithelial cell integrity rather than protecting the mucosa that lies right above HIV target cells (lymphocytes, macrophages, and dendritic cells) in the genital tract. There is clearly an urgent need to pursue rigorous testing of personal sexual lubricants to ensure that the products that people use to reduce the likelihood of genital abrasions actually do not increase the risk of HIV acquisition if HIV is present. In the meantime, if you are going to use a sexual lubricant make sure you use a condom correctly and consistently.

12. HIV and health care delivery

Implementation of the Zambia electronic perinatal record system for comprehensive prenatal and delivery care


This study aimed to characterize prenatal and delivery care in an urban African setting. The Zambia Electronic Perinatal Record System (ZEPRS) was implemented to record demographic characteristics, past medical and obstetric history, prenatal care, and delivery and newborn care for pregnant women across 25 facilities in the Lusaka public health sector. From 1 June 2007 to 31 January 2010, 115,552 pregnant women had prenatal and delivery information recorded in ZEPRS. Median gestation age at first prenatal visit was 23 weeks (interquartile range [IQR] 19-26). Syphilis screening was documented in 95,663 (83%) pregnancies: 2449 (2.6%) women tested positive, of whom 1589 (64.9%) were treated appropriately. 111,108 (96%) women agreed to HIV testing, of whom 22% were diagnosed with HIV. Overall, 112,813 (98%) of recorded pregnancies resulted in a live birth, and 2739 (2%) in a stillbirth. The median gestational age was 38 weeks (IQR 35-40) at delivery; the median birth weight of newborns was 3000g (IQR 2700-3300g). The results demonstrate the feasibility of using a comprehensive electronic medical record in an urban African setting, and highlight its important role in ongoing efforts to improve clinical care.


Editors’ note: This is an exciting article to read for anyone interested in improving health outcomes, particularly with respect to maternal health. Standard practice includes perinatal audits done of antenatal clinic registers to identify adverse outcomes and implement changes to address them. The data recorded may be very basic and errors in data collation may occur leading to misrepresentations of how well a site is performing. Furthermore, in much of Africa it is often difficult to determine valid estimates of
facility-based outcomes because patients generally carry their own medical records. The Zambian Electronic Perinatal Record System set up in Lusaka, Zambia and fully active from June 2007 is an excellent example of a functioning electronic medical record system that is generating evidence for action. Registered, trained users (nurses, midwives, clerical staff) enter data in 'real-time' from each patient at the point of care. Unique identification numbers are linked to the patient, not to the individual pregnancy, permitting tracking of women over time and across any one of the 25 participating prenatal care clinics in Lusaka. Automated programmes generate pre-programmed prenatal records, registers, and reports. Data quality is assessed regularly with duplicate entries and inconsistencies flagged monthly. Off-line systems are being developed for periods of prolonged power outages, with uploading once power resumes. The system has shown that although four out of five pregnant women underwent syphilis screening, less than two-thirds of those found to have syphilis were treated—an obvious area for improvement, with facility-specific and provider-specific information capable of spurring on competition to rectify this. With half of the women diagnosed with HIV infection having CD4 counts under 350 cells/µL, it will be important to link up ZEPRS with antiretroviral treatment monitoring systems to evaluate how many women start therapy—or better yet, integrate antiretroviral treatment into antenatal care.

13. Positive health, dignity, and prevention

ABC for people with HIV: responses to sexual behaviour recommendations among people receiving antiretroviral therapy in Jinja, Uganda


People living with HIV who are taking antiretroviral therapy are increasingly involved in 'positive prevention' initiatives. These are generally oriented to promoting abstinence, 'being faithful' (partner reduction) and condom use (ABC). Allen and colleagues conducted a longitudinal qualitative study with people living with HIV using antiretroviral therapy, who were provided with adherence education and counselling support by a Ugandan non-governmental organisation, The AIDS Support Organisation (TASO). Forty people were selected sequentially as they started antiretroviral therapy, stratified by sex, antiretroviral therapy delivery mode (clinic- or home-based) and HIV progression stage (early or advanced) and interviewed at enrolment and at 3, 6, 18 and 30 months. At initiation of antiretroviral therapy, participants agreed to follow TASO's positive-living recommendations. Initially poor health prevented sexual activity. As health improved, participants prioritised resuming economic production and support for their children. With further improvements, sexual desire resurfaced and people in relationships cemented these via sex. The findings highlight the limitations of HIV prevention based on medical care/personal counselling. As antiretroviral therapy leads to health improvements, social norms, economic needs and sexual desires increasingly influence sexual behaviour. Positive prevention interventions need to seek to modify normative and economic influences on sexual behaviour, as well as to provide alternatives to condoms.


Editors’ note: This qualitative study of patient perspectives on life changes, relationships, and adherence challenges was nested in a trial of 1453 people living with HIV who were randomised to receive home-based care employing lay workers or standard clinic care in Jinja, Uganda provided by TASO. The results call into question standard ABC (abstinence, be faithful, condomise) counselling in the context of evolving sexuality as health improves on antiretroviral therapy and people attempt to re-establish their social position and feel 'normal' again. Social norms dictating that married people have sex with their spouses when they are well enough, that childless couples have a child, or that condom use should cease when a relationship transitions from a casual to a regular and committed partnership have to be navigated by people living with HIV as they regain their health. Protection from reinfection with a different HIV strain or from other sexually transmitted diseases is one aspect but the overarching objective of ‘positive health, dignity, and prevention’ strategies is to enable and empower people living with HIV to lead emotionally healthy lives with dignity. As the authors suggest, male circumcision for HIV-negative men in discordant couples and antiretroviral microbicides (when they are licensed) for HIV-negative women in discordant couples can play an important role in the future. They wrote this before HPTN 052 announced treatment for prevention.
14. Health education
An illustrated leaflet containing antiretroviral information targeted for low-literate readers: development and evaluation


The objective of this study was to apply a dual visual/textual modal approach in developing and evaluating a medicine information leaflet with pictograms suitable for low-literate HIV patients and to identify and recommend best practices in this type of information design. A simple leaflet incorporating pictograms was designed for an antiretroviral regimen. Cognitive testing for understanding was conducted in 39 low-literate, South African, antiretroviral-naive adults. Participants were required to locate and explain the information, and were questioned on their opinion of leaflet layout and contents. Average understanding of the leaflet was 60%. Basic medication information was the best understood. An overall lack of knowledge of AIDS and its core concepts was found. Only half the participants considered this simple leaflet "easy" to read. All endorsed the inclusion of pictograms.

This testing method used in antiretroviral therapy-naive individuals was invaluable in identifying areas needing modification before its use in patients. Text associated with pictograms was more noticeable and better understood, but only if they were closely juxtaposed. Leaflet design should consider culture and literacy skills, be informed by learning theory and design principles, include visuals to enhance appeal and improve understanding, and involve end-users. Verbal counselling should accompany written information.

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Editors' note: To ensure informed participation and shared decision making, patients need accessible information. Much of what has been produced as patient information leaflets is not readable or useful to low literate patients. The authors assessed current information formats, keeping in mind regulatory requirements for medicine information for patients, and developed an illustrated leaflet, anchoring the design in cognitive theory principles. They then tested the effectiveness of the leaflet through focus groups and interviews with low literate end-user patients. Patients chose the leaflet language (English, isiXhosa) and were given as much time as they desired to read the leaflet. They were then asked to locate specific information on the leaflet and explain the information in their own words. This precluded them answering from previous acquired knowledge. Unskilled readers often decode one word at a time, read slowly, forget previous words, skip over uncommon words, and tire easily, making it difficult to derive meaning from the text. Removing unneeded words, optimal positioning of white spaces, and pictograms facilitate learning and enhance recall. Careful testing with the intended audience is essential as interpretations, particularly of pictograms, can be very unexpected. This article finishes with useful design guidelines for developing written information for patients with limited reading skills.

That was HIV this week, signing off.
Editors’ notes on journal access

For readers in all countries:
All abstracts in HIV This Week are freely available on the Web. You can access many scientific journals free of charge no matter where you are located, but for some journals you do need a subscription to access the full text of an article. Other journals offer free access to full-text articles after a certain period of time - see lists at Pubmed Central (click here) (and High Wire Press (click here)).
A number of journals are free to readers in all countries through ScienceDirect (click here). Examples of open access journals are BioMed Central journals (click here) and Public Library of Science (PLoS) journals (click here).
Open Science Directory (click here) is a global search tool open access journals and journals in special programmes for developing countries.

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There is also free access to journals published online with the assistance of HighWire Press. This link: Clicking here will automatically detect if your internet connection is from a developing country and give you free access to their journals.

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If you work for WHO or UNAIDS in Geneva, you can access a number of journals available from the WHO library by going to the WHO intranet (click here). If you work for UNAIDS outside Geneva you can access the WHO intranet through the following link: remote. When you have entered your UNAIDS username and password, click on “intranet” – “WHO”. On the WHO intranet homepage, click on “information resources” - “WHO library” – “online information resources” – “online journals (GIFT)” - “A to Z list” and you will see the list of accessible journals.