Southern Africa HIV and AIDS Regional Exchange (SHARE) Research Digest, December 2017 – January 2018

The Southern Africa HIV and AIDS Regional Exchange (SHARE) is pleased to present the project's first bi-monthly research digest. The digest offers article abstracts from peer-reviewed literature related to HIV and AIDS in Southern Africa and is designed to keep you in touch with the rapidly expanding evidence base pertaining to HIV in the region.

Click on any of the links below to browse abstracts by audience group. For any abstract that contains open access text, we provide a link:

- **ADVOCATES** – 6 abstracts
  Research on human rights and HIV with recommendations for continued advocacy against stigma and discrimination.
- **HEALTH CARE PROVIDERS** – 34 abstracts
  Medical science and research findings that can be utilized by health care providers who serve people at risk for, or living with, HIV.
- **IMPLEMENTERS/PROGRAMMERS** – 62 abstracts
  Research and evidence to strengthen HIV programming, including implementation science.
- **LAY HEALTH WORKERS** – 11 abstracts
  All article abstracts related to lay health workers.
- **POLICYMAKERS/GOVERNMENT OFFICIALS** – 20 abstracts
  Policy briefs and research with implications around policy change or government involvement.
- **RESEARCHERS** - 28 abstracts
  Randomized controlled trials and other scientific studies and protocols related to HIV implemented in Southern Africa.

This edition features articles from Botswana (8), Lesotho (1), Malawi (19), Mozambique (9), Namibia (3), South Africa (82), Swaziland (10), Tanzania (2), Zambia (18) and Zimbabwe (19).

FEATURED ARTICLES

- A systematic review informing World Health Organization Guidelines with recommendations to train lay health workers for provision of HIV testing services to alleviate health worker shortages.

- A study in South Africa suggesting positive effects from laughter therapy to alleviate emotional distress among community care workers supporting people living with HIV.

- A study in Botswana on engaging community mobilizers and improving service delivery to overcome the cultural barriers to voluntary medical male circumcision (VMMC) uptake.

ADVOCATES - 6

1. **Individual and community-level risk factors for HIV stigma in 21 Zambian and South African communities: analysis of data from the HPTN071 (PopART) study**. Hargreaves, J. R., S. Krishnaratne, et al. Aids 2018.

   OBJECTIVES: Describe the prevalence and determinants of HIV stigma in 21 communities in Zambia and South Africa. DESIGN: Analysis of baseline data from the HPTN 071 (PopART) cluster-randomised trial. HIV stigma data came from a random sample of 3859 people living with HIV. Community-level exposures reflecting HIV fears and judgements and perceptions of HIV stigma came from a random sample of community members not living with HIV (n = 5088), and from health workers (n = 851).

   METHODS: We calculated the prevalence of internalised stigma, and stigma experienced in the community or in a healthcare setting in the past year. We conducted risk-factor analyses using logistic regression, adjusting for clustering.

   RESULTS: Internalised stigma (868/3859, prevalence 22.5%) was not associated with sociodemographic characteristics but was less common among those with a longer period since diagnosis ($p = 0.043$). Stigma experienced in the community (853/3859, 22.1%) was more common among women ($p = 0.016$), older ($p = 0.011$) and unmarried ($p = 0.009$) individuals, those who had disclosed to others ($p < 0.001$), and those with more lifetime sexual partners ($p < 0.001$). Stigma experienced in a healthcare setting (280/3859, 7.3%) was more common among women ($p = 0.019$) and those reporting more lifetime sexual partners ($p = 0.001$) and higher wealth ($p = 0.003$). Experienced stigma was more common in clusters where community members perceived higher levels of stigma, but was not associated with the beliefs of community members or health workers.

CONCLUSIONS: HIV stigma remains unacceptably high in South Africa and Zambia and may act as barrier to HIV prevention and treatment. Further research is needed to understand its determinants.

2. **The no-go zone: a qualitative study of access to sexual and reproductive health services for sexual and gender minority adolescents in Southern Africa**.
Muller, A., S. Spencer, et al. Reprod Health 2018 15(1): 12.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5784505/pdf/12978_2018_Article_462.pdf

BACKGROUND: Adolescents have significant sexual and reproductive health needs. However, complex legal frameworks, and social attitudes about adolescent sexuality, including the values of healthcare providers, govern adolescent access to sexual and reproductive health services. These laws and social attitudes are often antipathetic to sexual and gender minorities. Existing literature assumes that adolescents identify as heterosexual, and exclusively engage in (heteronormative) sexual activity with partners of the opposite sex/gender, so little is known about if and how the needs of sexual and gender minority adolescents are met.

METHODS: In this article, we have analysed data from fifty in-depth qualitative interviews with representatives of organisations working with adolescents, sexual and gender minorities, and/or sexual and reproductive health and rights in Malawi, Mozambique, Namibia, Zambia and Zimbabwe.

RESULTS: Sexual and gender minority adolescents in these countries experience double-marginalisation in pursuit of sexual and reproductive health services: as adolescents, they experience barriers to accessing LGBT organisations, who fear being painted as "homosexuality recruiters," whilst they are simultaneously excluded from heteronormative adolescent sexual and reproductive health services. Such barriers to services are equally attributable to the real and perceived criminalisation of consensual sexual behaviours between partners of the same sex/gender, regardless of their age.

DISCUSSION/CONCLUSION: The combination of laws which criminalise consensual same sex/gender activity and the social stigma towards sexual and gender minorities work to negate legal sexual and reproductive health services that may be provided. This is further compounded by age-related stigma regarding sexual activity amongst adolescents, effectively leaving sexual and gender minority adolescents without access to necessary information about their sexuality and sexual and reproductive health, and sexual and reproductive health services.

3. **"There is not a safe space where they can find themselves to be free": (Un)safe spaces and the promotion of queer visibilities among township males who have sex with males (MSM) in Cape Town, South Africa**.
Hassan, N. R., L. Swartz, et al. Health Place 2017 49: 93-100.

Males who have sex with males (MSM) are prioritised in the global fight against HIV/AIDS, as a key affected population to receive HIV prevention, treatment, and HIV-related care and support (WHO, 2016). There is, however, limited empirical research conducted on how to engage communities of South African MSM in clinical HIV prevention research programs. The development of LGBTIQ safe spaces may potentially be a viable option to promote community-based engagement by bridging the divides between HIV-prevention researchers, marginalised queer populations, and other HIV-prevention stakeholders located in heteronormative spaces (Molyneux et al., 2016). We conducted ten in-depth, qualitative interviews with MSM safe space members who have been involved in HIV prevention research programs. Data were analysed using a thematic analytic strategy (Braun and Clarke, 2006). Our results indicate that the "safe spaces" currently operational in Cape Town are not stable spaces nor are they always safe, but they form part of a broader and much more long-term political and geographical strategy of inclusion and emancipation.

4. **Problematizing official narratives of HIV and AIDS education in Scotland and Zimbabwe**.
Nyatsanza, T. and L. Wood. Sahara j 2017 14(1): 185-192.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5700494/pdf/rsah-14-1394908.pdf

When human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) are framed within an intersectional approach, they have the potential to transform understandings of social justice within the curriculum and education policy and practice in general. Yet, this transformative potential is often hampered by official narratives that fail to position HIV and AIDS as an integral component of overlapping systems of oppression, domination and discrimination. This article explores how official HIV and AIDS narratives tend to promote systemic injustice and inequality within education policy and practice in both Scotland and Zimbabwe, despite their good intents. We frame our argument within a transformative education discourse which seeks to create participatory and emancipatory HIV-related messages at school, tertiary and community levels. Using a narrative enquiry design, a Foucauldian theoretical lens was used to analyse the narratives derived from key informant responses, supplemented by analysis of key documents that deal with HIV and AIDS in both Scotland and Zimbabwe. Four broad narratives emerged: the 'Gay' Narrative; the Migration Narrative; the Conspiracy Narrative; and the Religious Narrative. We discuss how each of these narratives entrench stigma across both developed and developing world contexts, and propose how a more intersectional interpretation would contribute to a deeper and less stigmatizing understanding of HIV, thus offering more useful insights into related policy and educational practices. This article will thus contribute to the growing body of intersectional HIV and AIDS knowledge that is relevant for schools, teacher education, public health and community settings, not only in the countries studied, but the world over.

5. **Can mother-to-child transmission of HIV be eliminated without addressing the issue of stigma? Modeling the case for a setting in South Africa**.
Prudden, H. J., M. Hamilton, et al. PLoS One 2017 12(12): e0189079.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5722282/pdf/pone.0189079.pdf

BACKGROUND: Stigma and discrimination ontinue to undermine the effectiveness of the HIV response. Despite a growing body of evidence of the negative relationship between stigma and HIV outcomes, there is a paucity of data available on the prevalence of stigma and its impact. We present a probabilistic cascade model to estimate the magnitude of impact stigma has on mother-to-child-transmission (MTCT).

METHODS: The model was parameterized using 2010 data from Johannesburg, South Africa, from which loss-to-care at each stage of the antenatal cascade were available. Three scenarios were compared to assess the individual contributions of stigma, non-stigma related barriers, and drug ineffectiveness on the overall number of infant infections. Uncertainty analysis was used to estimate plausible ranges. The model follows the guidelines in place in 2010 when the data were extracted (WHO Option A), and compares this with model results had Option B+ been implemented at the time.

RESULTS: The model estimated under Option A, 35% of infant infections being attributed to stigma. This compares to 51% of total infections had Option B+ been implemented in 2010. Under Option B+, the model estimated fewer infections than Option A, due to the availability of more effective drugs. Only 8% (Option A) and 9% (Option B+) of infant infections were attributed to drug ineffectiveness, with the trade-off in the proportion of infections being between stigma and non-stigma-related barriers.

CONCLUSIONS: The model demonstrates that while the effect of stigma on retention of women at any given stage along the cascade can be relatively small, the cumulative effect can be large. Reducing stigma may be critical in reaching MTCT elimination targets, because as countries improve supply-side factors, the relative impact of stigma becomes greater. The cumulative nature of the PMTCT cascade results in stigma having a large effect, this feature may be harnessed for efficiency in investment by prioritizing interventions that can affect multiple stages of the cascade simultaneously.

6. **Gendered childcare norms - evidence from rural Swaziland to inform innovative structural HIV prevention approaches for young women**.
Shabangu, P. N. and M. R. Brear. Afr J AIDS Res 2017 16(4): 345-353.
http://www.tandfonline.com/doi/pdf/10.2989/16085906.2017.1387157?needAccess=true

Addressing discriminatory gender norms is a prerequisite for preventing HIV in women, including young women. However, the gendered expectation that women will perform unpaid childcare-related labour is rarely conceptualised as influencing their HIV risk. Our

aim was to learn from members of a rural Swazi community about how gendered childcare norms. We performed sequential, interpretive analysis of focus group discussion and demographic survey data, generated through participatory action research. The results showed that gendered childcare norms were firmly entrenched and intertwined with discriminatory norms regarding sexual behaviour. Participants perceived that caring for children constrained young women's educational opportunities and providing for children's material needs increased their economic requirements. Some young women were perceived to engage in "transactional sex" and depend financially on men, including "sugar daddies", to provide basic necessities like food for the children they cared for. Our results suggested that men were no longer fulfilling their traditional role of caring for children's material needs, despite women's traditional role of caring for their physical and emotional needs remaining firmly entrenched. The results indicate that innovative approaches to prevent HIV in young women should incorporate structural approaches that aim to transform gendered norms, economically empower women and implement policies guaranteeing women equal rights.

Back to top

HEALTH CARE PROVIDERS - 34

7. **Feasibility and Acceptability of a Task-Shifted Intervention to Enhance Adherence to HIV Medication and Improve Depression in People Living with HIV in Zimbabwe, a Low Income Country in Sub-Saharan Africa**.
Abas, M., P. Nyamayaro, et al. AIDS Behav 2018 22(1): 86-101.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5758696/pdf/10461_2016_Article_1659.pdf

   Using a pilot trial design in an HIV care clinic in Zimbabwe, we randomised 32 adults with poor adherence to antiretroviral therapy and at least mild depression to either six sessions of Problem-Solving Therapy for adherence and depression (PST-AD) delivered by an adherence counsellor, or to Enhanced Usual Care (Control). Acceptability of PST-AD was high, as indicated by frequency of session attendance and through qualitative analyses of exit interviews. Fidelity was >80% for the first two sessions of PST-AD but fidelity to the adherence component of PST-AD dropped by session 4. Contamination occurred, in that seven patients in the control arm received one or two PST-AD sessions before follow-up assessment. Routine health records proved unreliable for measuring HIV viral load at follow-up. Barriers to measuring adherence electronically included device failure and participant perception of being helped by the research device. The study was not powered to detect clinical differences, however, promising change at 6-months follow-up was seen in electronic adherence, viral load suppression (PST-AD arm 9/12 suppressed; control arm 4/8 suppressed) and depression (Patient Health Questionnaire-4.7 points in PST-AD arm vs. control, adjusted p value = 0.01). Results inform and justify a future randomised controlled trial of task-shifted PST-AD.

8. **Incidence of Tuberculosis Among HIV-Positive Individuals Initiating Antiretroviral Treatment at Higher CD4 Counts in the HPTN 071 (PopART) Trial in South Africa**.
Bock, P., K. Jennings, et al. J Acquir Immune Defic Syndr 2018 77(1): 93-101.

INTRODUCTION: Antiretroviral treatment (ART) guidelines recommend life-long ART for all HIV-positive individuals. This study evaluated tuberculosis (TB) incidence on ART in a cohort of HIV-positive individuals starting ART regardless of CD4 count in a programmatic setting at 3 clinics included in the HPTN 071 (PopART) trial in South Africa.

METHODS: A retrospective cohort analysis of HIV-positive individuals aged >/=18 years starting ART, between January 2014 and November 2015, was conducted. Follow-up was continued until 30 May 2016 or censored on the date of (1) incident TB, (2) loss to follow-up from HIV care or death, or (3) elective transfer out; whichever occurred first.

RESULTS: The study included 2423 individuals. Median baseline CD4 count was 328 cells/muL (interquartile range 195-468); TB incidence rate was 4.41/100 person-years (95% confidence interval [CI]: 3.62 to 5.39). The adjusted hazard ratio of incident TB was 0.27 (95% CI: 0.12 to 0.62) when comparing individuals with baseline CD4 >500 and </=500 cells/muL. Among individuals with baseline CD4 count >500 cells/muL, there were no incident TB cases in the first 3 months of follow-up. Adjusted hazard of incident TB was also higher among men (adjusted hazard ratio 2.16; 95% CI: 1.41 to 3.30).

CONCLUSIONS: TB incidence after ART initiation was significantly lower among individuals starting ART at CD4 counts above 500 cells/muL. Scale-up of ART, regardless of CD4 count, has the potential to significantly reduce TB incidence among HIV-positive individuals. However, this needs to be combined with strengthening of other TB prevention strategies that target both HIV-positive and HIV-negative individuals.

9. **Neuropsychological performance in African children with HIV enrolled in a multisite antiretroviral clinical trial**.
Boivin, M. J., L. Barlow-Mosha, et al. Aids 2018 32(2): 189-204.

OBJECTIVE AND DESIGN: Children with HIV infection (HIV+) are at neuropsychological risk, but few studies have evaluated this at multiple sites in low-income and middle-income countries. We compared neuropsychological outcomes at enrollment (>5 years age) among HIV+, HIV perinatally exposed uninfected (HEU), and HIV unexposed uninfected (HUU) children from four sub-Saharan countries.

METHODS: IMPAACT P1060 compared nevirapine versus lopinavir/ritonavir-based antiretroviral treatment (ART) in HIV-infected children 6-35 months of age. The present study (P1104s) enrolled P1060 children at 5-11 years of age and evaluated their neuropsychological performance over 2 years using the Kaufman Assessment Battery for Children, 2nd edition (KABC-II), Tests of Variables of Attention (TOVA), Bruininks-

Oseretsky Test, 2nd edition (BOT-2), and parent-reported Behavior Rating Inventory of Executive Function (BRIEF). Cohorts were compared using generalized estimating equations least-squares means adjusted for site, child age and sex, and personal and social characteristics for child and caregiver.

RESULTS: Six hundred and eleven (246 HIV+, 183 HEU, 182 HUU) of the 615 enrolled at six sites [South Africa (three), Zimbabwe, Malawi, Uganda] were available for analysis. Mean age was 7.2 years, 48% male, 69% in school. Unadjusted and adjusted comparisons were consistent. HIV+ children performed significantly worse than HEU and HUU cohorts on all KABC-II cognitive performance domains and on BOT-2 total motor proficiency ($P < 0.001$), but not on the BRIEF Global Executive Indices. HUU and HEU cohorts were comparable on cognitive outcomes. HIV+ children initiated on ART before 1 year of age had significantly better BRIEF evaluations (lower scores - fewer behavior problems), compared with those started after ($P = 0.03$).

CONCLUSION: Significant cognitive deficits were documented among HIV+ children at school age, even when started on ART at an early age. Earlier HIV treatment, neuropsychological monitoring, and rehabilitative interventions are all needed. Subsequent testing for 2 more years will help further evaluate how HIV infection and exposure affect the developmental trajectory.

10. **Emulating a target trial of antiretroviral therapy regimens started before conception and risk of adverse birth outcomes**.
Caniglia, E. C., R. Zash, et al. Aids 2018 32(1): 113-120.

OBJECTIVE: To compare the effect of preconception initiation of zidovudine, lamivudine, nevirapine (ZDV/3TC/NVP) versus tenofovir, emtricitabine, efavirenz (TDF/FTC/EFV) on adverse birth outcomes.

DESIGN: Emulation of a hypothetical (target) trial using a birth surveillance study in Botswana during an era of CD4-based antiretroviral therapy (ART) initiation.

METHODS: In women who initiated ART less than 3 years from HIV diagnosis, conceived 0.5-5 years after ART initiation, and delivered at least 24-week gestation, we estimated risk ratios for stillbirth, preterm delivery (<37 weeks), very preterm delivery (<32 weeks), small-for-gestational-age (SGA) (<10 percentile), very SGA (<3 percentile), and any adverse or severe birth outcome for first-line ZDV/3TC/NVP versus TDF/FTC/EFV. We conducted a historical comparison in women who initiated TDF/FTC/EFV in 2012-2015 and ZDV/3TC/NVP in 2004-2011, and a contemporaneous comparison in an era of overlapping use from 2009 to 2013.

RESULTS: In the historical comparison, 1108 women initiated TDF/FTC/EFV and 637 initiated ZDV/3TC/NVP. In the contemporaneous comparison, 1052 initiated TDF/FTC/EFV and 298 initiated ZDV/3TC/NVP. TDF/FTC/EFV initiators were younger and

more likely to be nulliparous than ZDV/3TC/NVP initiators in both comparisons. In the historical comparison, the adjusted risk ratios (95% confidence interval) comparing ZDV/3TC/NVP with TDF/FTC/EFV were 2.95 (1.76, 4.96) for stillbirth, 1.40 (1.17, 1.67) for preterm delivery, 2.58 (1.70, 3.91) for very preterm delivery, 1.96 (1.64, 2.34) for SGA, 2.32 (1.73, 3.09) for very SGA, 1.54 (1.38, 1.72) for any adverse birth outcome, and 2.20 (1.76, 2.75) for any severe birth outcome, and were similar in the contemporaneous comparison.

CONCLUSION: Preconception initiation of ZDV/3TC/NVP compared with TDF/FTC/EFV may increase the risk of adverse birth outcomes.

11. **First report of occult hepatitis B infection among ART naive HIV seropositive individuals in Maputo, Mozambique**.
Carimo, A. A., E. S. Gudo, et al. PLoS One 2018 13(1): e0190775.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5761887/pdf/pone.0190775.pdf

BACKGROUND: The prevalence of hepatitis B virus (HBV) infection and human immunodeficiency virus (HIV) infection in Mozambique is one of the highest in the world, though in spite of this the prevalence of occult hepatitis B infection (OBI) is unknown.

OBJECTIVES: This study was conducted with the aim to investigate the prevalence of OBI and frequency of isolated hepatitis B core antibody (anti-HBc alone) among antiretroviral (ART) naive HIV-positive patients in Mozambique.

METHODS: A cross-sectional study was conducted in two health facilities within Maputo city. All ART-naive HIV seropositive patients attending outpatient clinics between June and October 2012 were consecutively enrolled. Blood samples were drawn from each participant and used for serological measurement of HBV surface antigen (HBsAg), antibodies against HBV surface antigen (anti-HBs) and antibodies against core antigen (anti-HBc) using ELISA. Quantification of HBV DNA was performed by real time PCR. A questionnaire was used to obtain demographics and clinical data.

RESULTS: Of the 518 ART-naive HIV-positive subjects enrolled in the study, 90.9% (471/518) were HBsAg negative. Among HBsAg negative, 45.2% (213/471) had isolated anti-HBc antibodies, and the frequency of OBI among patients with anti-HBc alone was 8.3% (17/206). OBI was not correlated either with CD4+ T cells count or transaminases levels. A total of 11.8% of patients with OBI presented elevated HBV DNA level. Frequency of individuals with APRI score > 2 and FIB-4 score > 3.25 was higher in patients with OBI as compared not exposed, immune and anti-HBc alone patients.

CONCLUSION: Our data demonstrate for the first time that OBI is prevalent among HIV patients in Mozambique, and will be missed using the commonly available serological assays that measures HBsAg.

12. **Viraemia before, during and after pregnancy in HIV-infected women on antiretroviral therapy in rural KwaZulu-Natal, South Africa, 2010-2015**.
Chetty, T., M. L. Newell, et al. Trop Med Int Health 2018 23(1): 79-91.

OBJECTIVES: Pregnancy and post-partum viral load suppression is critical to prevent mother-to-child HIV transmission and ensure maternal health. We measured viraemia risk before, during and after pregnancy in HIV-infected women.

METHODS: Between 2010 and 2015, 1425 HIV-infected pregnant women on lifelong antiretroviral therapy (ART) for at least six months pre-pregnancy were enrolled in a cohort study in rural KwaZulu-Natal, South Africa. Odds ratios were estimated in multilevel logistic regression, with pregnancy period time-varying.

RESULTS: Over half of 1425 women received tenofovir-based regimens (n = 791). Median pre-pregnancy ART duration was 2.1 years. Of 988 women (69.3%) with pre-pregnancy viral loads, 82.0%, 6.8% and 11.2% had VL <50, 50-999 and >/=1000 copies/ml, respectively. During pregnancy and at six, 12 and 24 months, viral load was >/=1000 copies/ml in 15.2%, 15.7%, 17.8% and 16.6% respectively; viral load <50 was 76.9%, 77%, 75.5% and 75.8%, respectively. Adjusting for age, clinical and pregnancy factors, viraemia risk (viral load >/=50 copies/ml) was not significantly associated with pregnancy [adjusted OR (aOR) 1.31; 95% CI 0.90-1.92], six months (aOR 1.30; 95% CI 0.83-2.04), 12 months (aOR 0.96; 95% CI 0.58-1.58) and 24 months (aOR 1.40; 95% CI 0.89-2.22) post-partum. Adjusting for ART duration-pregnancy period interaction, viraemia risk was 1.8 during pregnancy and twofold higher post-partum.

CONCLUSIONS: While undetectable viral load before pregnancy through post-partum was common, the UNAIDS goal to suppress viraemia in 90% of women was not met. Women on preconception ART remain vulnerable to viraemia; additional support is required to prevent mother-to-child HIV transmission and maintain maternal health.

13. **Renal outcomes in patients initiated on tenofovir disoproxil fumarate-based antiretroviral therapy at a community health centre in Malawi**.
Chikwapulo, B., B. Ngwira, et al. Int J STD AIDS 2018: 956462417749733.

Tenofovir-based antiretroviral therapy (TDF ART) is the first-line regimen for human immunodeficiency virus (HIV) in Africa. However, contemporary data on nephrotoxicity are lacking. We determined the renal outcomes of patients commenced on TDF ART in Malawi. ART-naive patients initiated on TDF ART at a community health centre between 1 July 2013 and 31 December 2015 were included. The estimated glomerular filtration rate (eGFR, Cockcroft-Gault) was recorded at the initiation of therapy and over 18 months thereafter. The prevalence of renal impairment at ART initiation (eGFR < 60 ml/min) and the incidence of nephrotoxicity (eGFR < 50 ml/min) were determined. A total of 439 patients (median age: 32 years; 317 [72.2%] female) were included. Twenty-

one (4.8%) patients had renal impairment at ART initiation; eGFR improved in all during follow-up. Nephrotoxicity occurred in 17 (4.0%) patients with eGFR > 50 ml/min at baseline, predominantly within the first six months of therapy. Increasing age and diastolic hypertension (>100 mmHg) were independent risk factors for nephrotoxicity development. The prevalence of kidney disease at ART initiation was 4.8% and nephrotoxicity occurred in 4.0%. Some eGFR decline may have been due to weight gain. Targeted monitoring of kidney function six months after TDF initiation should be considered in Malawi.

14. **Field performance of the Determine HBsAg point-of-care test for diagnosis of hepatitis B virus co-infection among HIV patients in Zambia**.
Chisenga, C. C., K. Musukuma, et al. J Clin Virol 2018 98: 5-7.
http://www.journalofclinicalvirology.com/article/S1386-6532(17)30324-4/pdf

BACKGROUND: We evaluated the field performance of a rapid point-of-care (POC) test for hepatitis B surface antigen (HBsAg) that could support decentralization and scale-up of hepatitis B virus (HBV) diagnosis in Africa.

OBJECTIVE: To determine the field performance of the Determine HBsAg POC test for diagnosis of HBV co-infection among HIV patients in Zambia.

STUDY DESIGN: Between 2013-2014, we screened HIV-infected adults for HBsAg at two urban clinics in Zambia. A subset were tested with the POC Determine HBsAg (Alere, USA) by finger prick in the clinic and HBsAg serology (Access2Analyzer, Beckman Coulter) at a reference laboratory. If either test was reactive, we determined HBV viral load (VL) and genotype. We described patient demographic and clinical characteristics (including liver fibrosis) and assessed the sensitivity, specificity, positive and negative predictive values (PPV and NPV) of the Determine test. In secondary analyses, we assessed sensitivity among patients with replicating HBV (i.e., VL>20 IU/ml) and with high HBV VL (i.e.,>20,000IU/ml).

RESULTS: Among 412 participants with both HBsAg tests, median age was 34 years, 51% were women, and median CD4 was 208 cells/mm(3). By serology, 66 (16%) were HBsAg-positive. Overall Determine had 87.9% sensitivity, 99.7% specificity, 98.3% PPV, and 97.7% NPV. Six of 8 patients with false negative results had undetectable HBV VL and no evidence of significant liver fibrosis. Test sensitivity was 95.9% among the 51 with replicating HBV and 100% among the 28 with high HBV VL.

CONCLUSIONS: Determine HBsAg is a cheaper alternative HBV testing option compared to the gold standard ELISA and has high specificity and good sensitivity in the field among HIV-infected individuals.

15. **HIV-associated Kaposi's sarcoma in Maputo, Mozambique: outcomes in a specialized treatment center, 2010-2015**.

Fardhdiani, V., L. Molfino, et al. Infect Agent Cancer 2018 13: 5.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5775566/pdf/13027_2018_Article_177.pdf

Background: Kaposi's sarcoma (KS) is a common HIV-associated malignancy associated with disability, pain and poor outcomes. The cornerstone of its treatment is antiretroviral therapy, but advanced disease necessitates the addition of chemotherapy. In high-income settings, this often consists of liposomal anthracyclines, but in Mozambique, the first line includes conventional doxorubicin, bleomycin and vincristine, which is poorly-tolerated. Medecins Sans Frontieres supports the Ministry of Health (MOH) in a specialized HIV and KS treatment center at the Centro de Referencia de Alto Mae in Maputo. Methods: We performed a retrospective analysis of data collected on patients enrolled at the CRAM between 2010 and 2015, extracting routinely-collected clinical information from patient care databases. KS treatment followed national guidelines, and KS staging followed AIDS Clinical Trials Group and MOH criteria. Baseline description of the cohort and patient outcomes was performed. Risk factors for negative outcomes (death or loss to follow-up) were explored using Cox regression. Results: Between 2010 and 2015, 1573 patients were enrolled, and 1210 began chemotherapy. A majority were young adult males. At enrollment, CD4 was < 200 cells/mul in 45% of patients. Among patients receiving chemotherapy, 78% received combination doxorubicin-bleomycin-vincristine. Among patients receiving chemotherapy, 43% were lost to follow-up and 8% were known to have died. In multivariate regression, the only risk factors identified with poor outcomes were CD4 < 100 cells/mul at enrollment (Risk ratio 1.5, 95%CI 1.1-2.1, p = 0.02 and having S1 disease (RR 1.7, 95%CI 1.2-2.3, p = 0.001). Discussion: We describe a large cohort of patients receiving care for HIV-associated KS in a specialized clinic in an urban setting. Outcomes were nonetheless unsatisfactory. Efforts should be made to decrease late referrals and entry into care and to increase access to more effective and better-tolerated treatments like liposomal doxorubicin.

16. **Lopinavir plus nucleoside reverse-transcriptase inhibitors, lopinavir plus raltegravir, or lopinavir monotherapy for second-line treatment of HIV (EARNEST): 144-week follow-up results from a randomised controlled trial**.
Hakim, J. G., J. Thompson, et al. Lancet Infect Dis 2018 18(1): 47-57.

BACKGROUND: Millions of HIV-infected people worldwide receive antiretroviral therapy (ART) in programmes using WHO-recommended standardised regimens. Recent WHO guidelines recommend a boosted protease inhibitor plus raltegravir as an alternative second-line combination. We assessed whether this treatment option offers any advantage over the standard protease inhibitor plus two nucleoside reverse-transcriptase inhibitors (NRTIs) second-line combination after 144 weeks of follow-up in typical programme settings.

METHODS: We analysed the 144-week outcomes at the completion of the EARNEST trial, a randomised controlled trial done in HIV-infected adults or adolescents in 14 sites in five sub-Saharan African countries (Uganda, Zimbabwe, Malawi, Kenya, Zambia). Participants were those who were no longer responding to non-NRTI-based first-line ART, as assessed with WHO criteria, confirmed by viral-load testing. Participants were randomly assigned to receive a ritonavir-boosted protease inhibitor (lopinavir 400 mg with ritonavir 100 mg, twice per day) plus two or three clinician-selected NRTIs (protease inhibitor plus NRTI group), protease inhibitor plus raltegravir (400 mg twice per day; protease inhibitor plus raltegravir group), or protease inhibitor monotherapy (plus raltegravir induction for first 12 weeks, re-intensified to combination therapy after week 96; protease inhibitor monotherapy group). Randomisation was by computer-generated randomisation sequence, with variable block size. The primary outcome was viral load of less than 400 copies per mL at week 144, for which we assessed non-inferiority with a one-sided alpha of 0.025, and superiority with a two-sided alpha of 0.025. The EARNEST trial is registered with ISRCTN, number 37737787.

FINDINGS: Between April 12, 2010, and April 29, 2011, 1837 patients were screened for eligibility, of whom 1277 patients were randomly assigned to an intervention group. In the primary (complete-case) analysis at 144 weeks, 317 (86%) of 367 in the protease inhibitor plus NRTI group had viral loads of less than 400 copies per mL compared with 312 (81%) of 383 in the protease inhibitor plus raltegravir group (p=0.07; lower 95% confidence limit for difference 10.2% vs specified non-inferiority margin 10%). In the protease inhibitor monotherapy group, 292 (78%) of 375 had viral loads of less than 400 copies per mL; p=0.003 versus the protease inhibitor plus NRTI group at 144 weeks. There was no difference between groups in serious adverse events, grade 3 or 4 adverse events (total or ART-related), or events that resulted in treatment modification.

INTERPRETATION: Protease inhibitor plus raltegravir offered no advantage over protease inhibitor plus NRTI in virological efficacy or safety. In the primary analysis, protease inhibitor plus raltegravir did not meet non-inferiority criteria. A regimen of protease inhibitor with NRTIs remains the best standardised second-line regimen for use in programmes in resource-limited settings. FUNDING: European and Developing Countries Clinical Trials Partnership (EDCTP), UK Medical Research Council, Instituto de Salud Carlos III, Irish Aid, Swedish International Development Cooperation Agency, Instituto Superiore di Sanita, Merck, ViiV Healthcare, WHO.

17. **Dating Violence Against HIV-Infected Youth in South Africa: Associations With Sexual Risk Behavior, Medication Adherence, and Mental Health**.
Kidman, R. and A. Violari. J Acquir Immune Defic Syndr 2018 77(1): 64-71.

BACKGROUND: As perinatal HIV-infected youth become sexually active, the potential for onward transmission becomes an increasing concern. In other populations, intimate partner violence (IPV) is a risk factor for HIV acquisition. We build on this critical work by

studying the role of IPV in facilitating onward transmission among HIV-infected youth-an important step toward effective intervention. SETTING: Soweto, South Africa.

METHODS: Self-report surveys were completed by 129 perinatal HIV-infected female youth (aged 13-24 years). We calculated the IPV prevalence and used logistic models to capture the association between IPV and health outcomes known to facilitate onward HIV transmission (eg, risky sex, poor medication adherence, depression, and substance abuse).

RESULTS: A fifth of perinatal HIV-infected participants reported physical and/or sexual IPV in the past year; one-third reported lifetime IPV. Childhood adversity was common and positively associated with IPV. Past-year physical and/or sexual IPV was positively correlated with high-risk sex [odds ratio (OR) = 8.96; 95% confidence interval (CI): 2.78 to 28.90], pregnancy (OR = 6.56; 95% CI: 1.91 to 22.54), poor medication adherence to antiretroviral therapy (OR = 5.37; 95% CI: 1.37 to 21.08), depression (OR = 4.25; 95% CI: 1.64 to 11.00), and substance abuse (OR = 4.11; 95% CI: 1.42 to 11.86). Neither past-year nor lifetime IPV was associated with viral load or HIV status disclosure to a partner.

CONCLUSIONS: We find that IPV may increase risk for onward HIV transmission in perinatal HIV-infected youth by both increasing engagement in risky sexual behaviors and lowering medication adherence. HIV clinics should consider integrating primary IPV prevention interventions, instituting routine IPV screening, and collocating services for victims of violence.

18. **A Comparison of Adverse Drug Reaction Profiles in Patients on Antiretroviral and Antitubercular Treatment in Zimbabwe**.
Masuka, J. T., P. Chipangura, et al. Clin Drug Investig 2018 38(1): 9-17.

INTRODUCTION: Few studies describe the adverse drug event profiles in patients simultaneously receiving antiretroviral and anti-tubercular medicines in resource-limited countries. OBJECTIVES: To describe and compare the adverse drug reaction profiles in patients on highly active antiretroviral therapy only (HAART), HAART and isoniazid preventive therapy (HHART), and HAART and antitubercular treatment (ATTHAART).

METHODS: We analysed individual case safety reports (ICSRs) for patients on antiretroviral therapy and antitubercular treatment submitted to the national pharmacovigilance centre during the targeted spontaneous reporting (TSR) programme from 1 September 2012 through 31 August 2016. All reports considered certain, probable or possible were included in the analysis.

RESULTS: A total of 1076 ICSRs were included in the analysis. Most of the reports were from the HAART only group (n = 882; 82.0%), followed by patients on HHART (n = 132; 12.3%), and ATTHAART (n = 62; 5.7%). The ATTHAART (35.5%) and HHAART (34.1%) had a higher frequency of hepatic disorders than the HAART group (5.0%) ($p < 0.0001$). A

higher frequency of rash was reported in the HHAART (35.6%) and HAART groups (29.4%) than the ATTHAART group (14.5%) ($p = 0.011$). Peripheral neuropathy occurred more frequently in the ATTHAART group (19.3%) than other groups ($p = 0.001$) while Stevens-Johnson syndrome (14.7%; $p < 0.001$), gynaecomastia (18.2%; $p < 0.001$), and lipodystrophy (4.5%; $p = 0.012$) occurred more frequently in the HAART group. The HHAART group was associated with a higher frequency of psychosis (4.5%; $p = 0.002$).

CONCLUSION: Antiretroviral therapy was associated with a higher frequency of Stevens-Johnson syndrome, gynaecomastia, and lipodystrophy. Co-administration of antiretroviral and antitubercular medicines was associated with a higher frequency of drug-induced liver injury and peripheral neuropathy. Similarly, co-administration of isoniazid preventive therapy and antiretroviral drugs was associated with a higher risk for psychosis. There is a need to carefully manage TB/HIV co-infected patients, due to the higher risk of adverse drug reactions which may lead to poor treatment adherence and outcomes.

19. **High rates of hypertension, diabetes, elevated low-density lipoprotein cholesterol, and cardiovascular disease risk factors in HIV-infected patients in Malawi**. Mathabire Rucker, S. C., A. Tayea, et al. Aids 2018 32(2): 253-260. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5757671/pdf/aids-32-253.pdf

OBJECTIVES: Data on cardiovascular disease risks among HIV-infected patients taking antiretroviral therapy (ART) over long periods of time are lacking in Sub-Saharan Africa.

METHODS: A cross-sectional study was conducted in Chiradzulu, Malawi from December 2015 to June 2016. HIV-infected persons on ART for more than 10 years (patients) and HIV-negative individuals (controls) from selected clinics participated. Following informed consent, a standardized questionnaire, clinical and laboratory examinations were performed. The prevalence of cardiovascular disease risk factors was calculated and stratified by age group.

RESULTS: Overall, 379 HIV-infected patients and 356 controls participated. Median time on ART among patients was 11.6 years (interquartile range 10.6-12.4).Within the 30-44, 45-59, and at least 60-year age groups, respectively, the prevalence of hypertension was 10.8, 20.4, and 44.7% among patients and 6.1, 25.8, and 42.9% among controls. Hypertension was previously undiagnosed in 60.3% patients and 37.0% controls with elevated blood pressure. The prevalence of diabetes within the respective age groups was 5.0, 6.4, and 13.2% among patients, and 3.4, 4.2, and 1.7% among controls. HIV-infected patients were more likely to have an glycated hemoglobin at least 6.0% (adjusted odds ratio 1.9; 95% confidence interval 1.1-3.2, P = 0.02). Prevalence of low-density lipoprotein cholesterol more than 130 mg/dl within the respective age groups was 8.0, 15.4, and 23.7% among patients and 1.8, 12.5, and 11.8% among controls.

CONCLUSION: Noncommunicable diseases were a significant burden in Malawi, with high prevalence of hypercholesterolemia in all survey participants and an especially acute diabetes burden among older HIV infected. Hypertension screening and treatment services are needed among identified high-risk groups to cover unmet needs.

20. **Improved Retention With 6-Month Clinic Return Intervals for Stable Human Immunodeficiency Virus-Infected Patients in Zambia**.
Mody, A., M. Roy, et al. Clin Infect Dis 2018 66(2): 237-243.

BACKGROUND: Extending appointment intervals for stable HIV-infected patients in sub-Saharan Africa can reduce patient opportunity costs and decongest overcrowded facilities.

METHODS: We analyzed a cohort of stable HIV-infected adults (on treatment with CD4 >200 cells/muL for more than 6 months) who presented for clinic visits in Lusaka, Zambia. We used multilevel, mixed-effects logistic regression adjusting for patient characteristics, including prior retention, to assess the association between scheduled appointment intervals and subsequent missed visits (>14 days late to next visit), gaps in medication (>14 days late to next pharmacy refill), and loss to follow-up (LTFU; >90 days late to next visit).

RESULTS: A total of 62084 patients (66.6% female, median age 38, median CD4 438 cells/muL) made 501281 visits while stable on antiretroviral therapy. Most visits were scheduled around 1-month (25.0% clinical, 44.4% pharmacy) or 3-month intervals (49.8% clinical, 35.2% pharmacy), with fewer patients scheduled at 6-month intervals (10.3% clinical, 0.4% pharmacy). After adjustment and compared to patients scheduled to return in 1 month, patients with six-month clinic return intervals were the least likely to miss visits (adjusted odds ratio [aOR], 0.20; 95% confidence interval [CI], 0.17-0.24); miss medication pickups (aOR, 0.47; 95% CI 0.39-0.57), and become LTFU prior to the next visit (aOR, 0.41; 95% CI, 0.31-0.54).

CONCLUSIONS: Six-month clinic return intervals were associated with decreased lateness, gaps in medication, and LTFU in stable HIV-infected patients and may represent a promising strategy to reduce patient burdens and decongest clinics.

21. **HIV-Positive Kidney Donor Selection for HIV-Positive Transplant Recipients**.
Muller, E. and Z. Barday. J Am Soc Nephrol 2018.

The risks associated with transplanting HIV-positive kidneys into HIV-positive recipients have not been well studied. Since 2008, 43 kidneys from 25 HIV-positive deceased donors have been transplanted into patients who are HIV positive in Cape Town, South Africa. Among the donors, 19 (76%) died secondary to trauma. The average age for donors was 34 (interquartile range, 19-52) years old. In some donors, only one kidney was used because of a limited number of suitable recipients on the waiting list. Only two

donors had been previously exposed to antiretroviral triple therapy. In 23 of the deceased organ donors, the HIV status was not known before the time of death. Initial concerns about transplanting HIV-positive allografts into HIV-positive recipients in this clinic revolved around the possibility of HIV superinfection. However, all recipients remained virally suppressed several years after the transplant. Only one recipient experienced an increased viral load after the transplant, which was related to a period of noncompliance on her medication. After counseling and improved compliance, the viral load decreased and became suppressed again. Herein, we discuss the findings of this study and review the literature available on this crucial topic.

22. **Immunological non-response and low hemoglobin levels are predictors of incident tuberculosis among HIV-infected individuals on Truvada-based therapy in Botswana**.
Mupfumi, L., S. Moyo, et al. PLoS One 2018 13(1): e0192030.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5792012/pdf/pone.0192030.pdf

BACKGROUND: There is a high burden of tuberculosis (TB) in HIV antiretroviral programmes in Africa. However, few studies have looked at predictors of incident TB while on Truvada-based combination antiretroviral therapy (cART) regimens.

METHODS: We estimated TB incidence among individuals enrolled into an observational cohort evaluating the efficacy and tolerability of Truvada-based cART in Gaborone, Botswana between 2008 and 2011. We used Cox proportional hazards regressions to determine predictors of incident TB.

RESULTS: Of 300 participants enrolled, 45 (15%) had a diagnosis of TB at baseline. During 428 person-years (py) of follow-up, the incidence rate of TB was 3.04/100py (95% CI, 1.69-5.06), with 60% of the cases occurring within 3 months of ART initiation. Incident cases had low baseline CD4+ T cell counts (153cells/mm3 [Q1, Q3: 82, 242]; p = 0.69) and hemoglobin levels (9.2g/dl [Q1, Q3: 8.5,10.1]; p<0.01). In univariate analysis, low BMI (HR = 0.73; 95% CI 0.58-0.91; p = 0.01) and hemoglobin levels <8 g/dl (HR = 10.84; 95%CI: 2.99-40.06; p<0.01) were risk factors for TB. Time to incident TB diagnosis was significantly reduced in patients with poor immunological recovery (p = 0.04). There was no association between baseline viral load and risk of TB (HR = 1.75; 95%CI: 0.70-4.37).

CONCLUSION: Low hemoglobin levels prior to initiation of ART are significant predictors of incident tuberculosis. Therefore, there is potential utility of iron biomarkers to identify patients at risk of TB prior to initiation on ART. Furthermore, additional strategies are required for patients with poor immunological recovery to reduce excess risk of TB while on ART.

23. **Anemia in people on second line antiretroviral treatment in Lilongwe, Malawi: a cross-sectional study**.
Ngongondo, M., N. E. Rosenberg, et al. BMC Infect Dis 2018 18(1): 39.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5769314/pdf/12879_2018_Article_2952.pdf

BACKGROUND: Anemia is common among people living with HIV infection and is frequently associated with poor quality of life and poor prognosis. It has been well described in antiretroviral naive individuals and those on non-nucleoside reverse transcriptase inhibitor-based first line antiretroviral therapy (ART) regimens. However there is limited information on anemia for ART experienced individuals on protease inhibitor-based second line ART regimens in resource limited settings. Our objective was to describe the prevalence and risk factors of anemia in this ART experienced population in Malawi.

METHODS: We conducted a cross-sectional study using routine facility data at two HIV clinics in Lilongwe, Malawi. The analysis included individuals receiving protease inhibitor-based second line ART. Clinical and laboratory data were collected at routine clinic visits. We used descriptive statistics, two-sample t-tests and multivariate logistic regression for data analysis.

RESULTS: Three hundred seventy-seven records were included in this analysis (37% male, median age 41 years, median CD4 count 415 cells/muL). The prevalence of anemia was 125/377 (33.2%) - mild, moderate and severe anemia was 17.5%, 13.8%, and 1.9% respectively. Female participants had a higher prevalence than male participants (43.6% vs. 15.7%, $p < 0.001$). In multivariate logistic regression, female sex (adjusted odds ratio (aOR) 5.3; 95% CI 2.9-9.5) and a CD4 count <200 cell/ul (aOR 3.1; 95%CI 1.6-6.0) were associated with increased risk of having anemia while a BMI >/=30 kg/m2 (aOR 0.8; 95% CI 0.6-1.0) and being on ART for more than 10 years (aOR 0.4; 95% CI 0.2-0.9) were associated with reduced risk of anemia. Being on a zidovudine- containing ART regimen was not associated with anemia.

CONCLUSION: Anemia is common in people on second line ART in Lilongwe, Malawi. Screening for anemia in this population would be a useful strategy; especially for female patients, those who are underweight and have a low CD4 cell counts.

24. **High HIV-1 RNA Among Newly Diagnosed People in Botswana**.
Novitsky, V., M. Prague, et al. AIDS Res Hum Retroviruses 2018.

HIV-1 RNA level is strongly associated with HIV transmission risk. We sought to determine whether HIV-1 RNA level was associated with prior knowledge of HIV status among treatment-naive HIV-infected individuals in Botswana, a country with high rates of antiretroviral treatment (ART) coverage. This information may be helpful in targeting HIV diagnosis and treatment efforts in similar high HIV prevalence settings in a population-based survey. HIV-infected individuals were identified during a household survey performed in 30 communities across Botswana. ART-naive persons with detectable HIV-1 RNA (>400 copies/mL) were divided into two groups, newly diagnosed

and individuals tested in the past who knew about their HIV infection at the time of household visit, but had not taken ART. Levels of HIV-1 RNA were compared between groups, overall and by age and gender. Among 815 HIV-infected ART-naive persons with detectable virus, newly diagnosed individuals had higher levels of HIV-1 RNA (n = 490, median HIV-1 RNA 4.35, interquartile range (IQR) 3.79-4.91 log10 copies/mL) than those who knew about their HIV-positive status (n = 325, median HIV-1 RNA 4.10, IQR 3.55-4.68 log10 copies/mL; p values <.001, but p value = .011 after adjusting for age and gender). A nonsignificant trend for higher HIV-1 RNA was found among newly diagnosed men 30 years of age or older (median HIV-1 RNA 4.58, IQR 4.07-5.02 log10 copies/mL vs. 4.17, 3.61-4.71 log10 copies/mL). Newly diagnosed individuals have elevated levels of HIV-1 RNA. This study highlights the need for early diagnosis and treatment of HIV infection for purposes of HIV epidemic control, even in a setting with high ART coverage.

25. **Time-homogeneous Markov process for HIV/AIDS progression under a combination treatment therapy: cohort study, South Africa**.
Shoko, C. and D. Chikobvu. Theor Biol Med Model 2018 15(1): 3.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5773025/pdf/12976_2017_Article_75.pdf

BACKGROUND: As HIV enters the human body, its main target is the CD4 cell which it turns into a factory that produces millions of other HIV particles. These HIV particles target new CD4 cells resulting in the progression of HIV infection to AIDS. A continuous depletion of CD4 cells results in opportunistic infections, for example tuberculosis (TB). The purpose of this study is to model and describe the progression of HIV/AIDS disease in an individual on antiretroviral therapy (ART) follow up using a continuous time homogeneous Markov process. A cohort of 319 HIV infected patients on ART follow up at a Wellness Clinic in Bela Bela, South Africa is used in this study. Though Markov models based on CD4 cell counts is a common approach in HIV/AIDS modelling, this paper is unique clinically in that tuberculosis (TB) co-infection is included as a covariate.

METHODS: The method partitions the HIV infection period into five CD4-cell count intervals followed by the end points; death, and withdrawal from study. The effectiveness of treatment is analysed by comparing the forward transitions with the backward transitions. The effects of reaction to treatment, TB co-infection, gender and age on the transition rates are also examined. The developed models give very good fit to the data.

RESULTS: The results show that the strongest predictor of transition from a state of CD4 cell count greater than 750 to a state of CD4 between 500 and 750 is a negative reaction to drug therapy. Development of TB during the course of treatment is the greatest predictor of transitions to states of lower CD4 cell count. Transitions from good states to bad states are higher on male patients than their female counterparts. Patients in the cohort spend a greater proportion of their total follow-up time in higher CD4 states.

CONCLUSION: From some of these findings we conclude that there is need to monitor adverse reaction to drugs more frequently, screen HIV/AIDS patients for any signs and symptoms of TB and check for factors that may explain gender differences further.

26. **Substituting Abacavir for Stavudine in Children Who Are Virally Suppressed Without Lipodystrophy: Randomized Clinical Trial in Johannesburg, South Africa**.
Strehlau, R., S. Shiau, et al. J Pediatric Infect Dis Soc 2018.

OBJECTIVES: Abacavir has replaced stavudine in antiretroviral therapy (ART) regimens because it has largely been phased out as a result of toxicity concerns; this loss has reduced further the already-limited drug options for children. Few data regarding virologic and metabolic outcomes among children who undergo substitution of stavudine exist. We evaluated the effects of preemptive substitution of abacavir for stavudine in children initially without lipodystrophy and virally suppressed on a stavudine-containing regimen.

METHODS: At Rahima Moosa Mother and Child Hospital in Johannesburg, South Africa, virally suppressed human immunodeficiency virus (HIV)-infected children >/=36 months of age without lipodystrophy were randomly assigned to continue taking stavudine as part of their ART regimen (n = 106) or to have abacavir substituted for stavudine (n = 107). The children were followed for 56 weeks after randomization in the context of a larger trial of treatment options for ART-experienced children.

RESULTS: The mean age of the children was 4.3 years, and the mean duration of ART before random assignment was 3.5 years. No differences in virological outcomes, CD4 response, growth, or dyslipidemia were noted between the stavudine and abacavir groups. By 56 weeks, children in the abacavir group had less clinically detected lipodystrophy (4.7% vs 16%, respectively), a higher proportion of leg fat relative to total fat (0.243 vs 0.230, respectively; P = .006), and a lower trunk/leg-skinfold ratio (0.547 vs 0.569, respectively; P = .003) than the children in the stavudine group.

CONCLUSION: Substituting abacavir for stavudine did not compromise virological response to treatment and was associated with significantly less lipodystrophy. These results support recommendations that favor abacavir in this population.

27. **'These people who dig roots in the forests cannot treat HIV': Women and men in Durban, South Africa, reflect on traditional medicine and antiretroviral drugs**.
Weintraub, A., J. E. Mantell, et al. Glob Public Health 2018 13(1): 115-127.

Relatively few empirical investigations of the intersection of HIV biomedical and traditional medicine have been undertaken. As part of preliminary work for a longitudinal study investigating health-seeking behaviours among newly diagnosed individuals living with HIV, we conducted semi-structured interviews with 24 urban South Africans presenting for HIV testing or newly enrolled in HIV care; here we

explored participants' views on African traditional medicine (TM) and biomedical HIV treatment. Notions of acceptance/non-acceptance were more nuanced than dichotomous, with participants expressing views ranging from favourable to reproachful, often referring to stories they had heard from others rather than drawing from personal experience. Respect for antiretrovirals and biomedicine was evident, but indigenous beliefs, particularly about the role of ancestors in healing, were common. Many endorsed the use of herbal remedies, which often were not considered TM. Given people's diverse health-seeking practices, biomedical providers need to recognise the cultural importance of traditional health practices and routinely initiate respectful discussion of TM use with patients.

28. **Higher-than-expected prevalence of non-tuberculous mycobacteria in HIV setting in Botswana: Implications for diagnostic algorithms using Xpert MTB/RIF assay**. Agizew, T., J. Basotli, et al. PLoS One 2017 12(12): e0189981. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5741233/pdf/pone.0189981.pdf

BACKGROUND: Non-tuberculous mycobacteria (NTM) can cause pulmonary infection and disease especially among people living with HIV (PLHIV). PLHIV with NTM disease may clinically present with one of the four symptoms consistent with tuberculosis (TB). We describe the prevalence of NTM and Mycobacterium tuberculosis complex (MTBC) isolated among PLHIV who presented for HIV care and treatment.

METHODS: All PLHIV patients presenting for HIV care and treatment services at 22 clinical sites in Botswana were offered screening for TB and were recruited. Patients who had >/=1 TB symptom were asked to submit sputa for Xpert MTB/RIF and culture. Culture growth was identified as NTM and MTBC using the SD-Bioline TB Ag MPT64 Kit and Ziehl Neelsen microscopy. NTM and MTBC isolates underwent species identification by the Hain GenoType CM and AS line probe assays.

RESULTS: Among 16, 259 PLHIV enrolled 3068 screened positive for at least one TB symptom. Of these, 1940 submitted >/=1 sputum specimen, 427 (22%) patients had >/=1 positive-culture result identified phenotypically for mycobacterial growth. Of these 247 and 180 patients were identified as having isolates were NTM and MTBC, respectively. Of the 247 patients identified with isolates containing NTM; 19 were later excluded as not having NTM based on additional genotypic testing. Among the remaining 408 patients 228 (56%, 95% confidence interval, 46-66%) with NTM. M. intracellulare was the most common isolated (47.8%). Other NTMs commonly associated with pulmonary disease included M. malmoense (3.9%), M. avium (2.2%), M. abscessus (0.9%) and M. kansasii (0.4%). After excluding NTM isolates that were non-speciated and M. gordonae 154 (67.5%) of the NTM isolates were potential pathogens.

CONCLUSIONS: In the setting of HIV care and treatment, over-half (56%) of a positive sputum culture among PLHIV with TB symptoms was NTM. Though we were not able to distinguish in our study NTM disease and colonization, the study suggests culture and

species identification for PLHIV presenting with TB symptoms remains important to facilitate NTM diagnosis and hasten time to appropriate treatment.

29. **Prevalence of intimate partner violence and associated factors amongst women attending antenatal care at Outapi clinic, Namibia: A descriptive survey**.
Bikinesi, L. T., R. Mash, et al. Afr J Prim Health Care Fam Med 2017 9(1): e1-e6.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5803512/pdf/PHCFM-9-1512.pdf

BACKGROUND: Intimate partner violence (IPV) is a significant and largely hidden public health problem for all women and, during pregnancy, can have significant effects on the health of both mother and the unborn baby. Previous Namibian studies suggest rates of IPV as high as 36%, although few studies have been conducted in primary care. AIM: To determine the prevalence of IPV amongst women attending antenatal care.

SETTING: Outapi primary care clinic, Namibia.

METHODS: A descriptive survey administering a validated questionnaire to 386 consecutive participants.

RESULTS: The mean age of the participants was 27.5 years (standard deviation = 6.8), 335 (86.8%) were unmarried, 215 (55.7%) had only primary school education and 237 (61.4%) were in their third trimester. Overall, 51 participants (13.2%) had HIV and 44 (11.4%) had teenage pregnancies. The reported lifetime prevalence of IPV was 39 (10.1%), the 12-month prevalence was 35 (9.1%) and the prevalence during pregnancy was 31 (8.0%). Emotional abuse was the commonest type of abuse in 27 (7.0%). The commonest specific abusive behaviour was refusing to provide money to run the house or look after the children whilst the partner spent money on his priorities (4.9%). Increased maternal age was associated with an increase in the occurrence of IPV.

CONCLUSION: The reported lifetime prevalence of IPV was 10.1%, with emotional abuse being the commonest type of abuse. Increased age was associated with an increase in reported IPV. IPV is significant enough to warrant that healthcare providers develop guidelines to assist women affected by IPV in Namibia.

30. **Improved survival and cure rates with concurrent treatment for MDR-TB/HIV co-infection in South Africa**.
Brust, J. C. M., N. S. Shah, et al. Clin Infect Dis 2017.

BACKGROUND: The global epidemic of multidrug-resistant tuberculosis (MDR-TB) threatens gains in TB and HIV outcomes over the past two decades. Mortality in MDR-TB/HIV co-infection has historically been high, but most studies predated the availability of antiretroviral therapy (ART). We prospectively compared survival and treatment outcomes in MDR-TB/HIV co-infected patients on ART to those in patients with MDR-TB alone.

METHODS: This prospective, observational study enrolled culture-confirmed MDR-TB patients, with and without HIV co-infection, in South Africa between 2011-2013. Participants received standardized MDR-TB and HIV regimens and were followed monthly for treatment response, adverse events, and adherence. The primary outcome was survival.

RESULTS: Among 206 participants, 150 were HIV-infected, 131 (64%) were female, and the median age was 33 years (IQR 26-41). Of the 191 participants with a final MDR-TB outcome, 130 (73%) were cured or successfully completed treatment, which did not differ by HIV status (p=0.50). After two years, the median CD4 count was 386 cells/mm3 (IQR 219-510), an increase of 140 cells/mm3 from baseline (p=0.005), and 64% had an undetectable HIV viral load. HIV-infected and HIV-uninfected participants had high rates of survival (86% and 94%, respectively; p=0.34). The strongest risk factor for mortality was having a CD4 count </=100 cells/mm3 (aHR 15.6, 95%CI 4.4-55.6).

CONCLUSIONS: Survival and treatment outcomes among MDR-TB/HIV individuals receiving concurrent ART were improved, approaching those of HIV-uninfected MDR-TB patients. The greatest risk of death was among HIV-infected individuals with CD4 counts </=100 cells/mm3. These findings provide critical evidence to support concurrent treatment of MDR-TB and HIV.

31. **HIV-1 viraemia and drug resistance amongst female sex workers in Soweto, South Africa: A cross sectional study**.
Coetzee, J., G. Hunt, et al. PLoS One 2017 12(12): e0188606.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5731765/pdf/pone.0188606.pdf

BACKGROUND: HIV drug resistance (HIVDR) poses a threat to future antiretroviral therapy success. Monitoring HIVDR patterns is of particular importance in populations such as sex workers (SWs), where documented HIV prevalence is between 34-89%, and in countries with limited therapeutic options. Currently in South Africa, there is a dearth in evidence and no ongoing surveillance of HIVDR amongst sex work populations. This study aims to describe the prevalence of HIVDR amongst a sample of female sex workers (FSWs) from Soweto, South Africa.

METHODOLOGY: A cross-sectional, respondent driven sampling (RDS) recruitment methodology was used to enrol FSWs based in Soweto. Participants were tested for HIV and undertook a survey that included HIV knowledge and treatment status. Whole blood specimens were collected from HIV positive FSWs to measure for CD4 counts, viral load (VL) and perform HIVDR genotyping. Frequencies were determined for categorical variables and medians and interquartile ranges (IQR) for the continuous.

RESULTS: Of the 508 enrolled participants, 55% (n = 280) were HIV positive and of median age 32 (IQR: 20-51) years. Among the HIV positive, 51.8% (132/269) were

defined as virologically suppressed (VL < 400 copies/ml). Of the 119 individuals with unsuppressed viral loads who were successfully genotyped for resistance testing 37.8% (45/119) had detectable drug resistance. In this group, HIVDR mutations were found amongst 73.7% (14/19) of individuals on treatment, 27.4% (26/95) of individuals who were treatment naive, and 100% (5/5) of defaulters. One phylogenetic cluster was found amongst treatment naive FSWs. The K103N mutation was detected most commonly in 68.9% (31/45) individuals with HIVDR mutations, with 20/26 (76.9%) of treatment naive FSW with detectable resistance having this mutation. The M184V mutation was found in both FSWs on treatment (12/14, 85.7%) and those defaulting (1/5, 20.0%).

DISCUSSION: More than one third (45/119) of the genotyped sample had HIVDR, with resistance to the NNRTI class being the most common. Almost half of HIV positive FSWs had unsuppressed viral loads, increasing the likelihood for onward transmission of HIV. Disturbingly, more than 1:4 treatment naive women with unsuppressed viral loads had HIVDR suggesting that possible sexual transmission of drug resistance is occurring in this high-risk population. Given the high burden of HIVDR in a population with a high background prevalence of HIV, it is imperative that routine monitoring of HIVDR be implemented. Understanding transmission dynamics of HIVDR in FSW and its impact on treatment success should be urgently elucidated.

32. **Field evaluation of HIV point-of-care testing for early infant diagnosis in Cape Town, South Africa**.
Dunning, L., M. Kroon, et al. PLoS One 2017 12(12): e0189226.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5738050/pdf/pone.0189226.pdf

BACKGROUND: Early infant HIV diagnosis (EID) coverage and uptake remains challenging. Point-of-care (POC) testing may improve access and turn-around-times, but, while several POC technologies are in development there are few data on their implementation in the field.

METHODS: We conducted an implementation study of the Alere q Detect POC system for EID at two public sector health facilities in Cape Town. HIV-exposed neonates undergoing routine EID testing at a large maternity hospital and a primary care clinic received both laboratory-based HIV PCR testing per local protocols and a POC test. We analysed the performance of POC versus laboratory testing, and conducted semi-structured interviews with providers to assess acceptability and implementation issues.

RESULTS: Overall 478 specimens were taken: 311 tests were performed at the obstetric hospital (median child age, 1 days) and 167 six-week tests in primary care (median child age, 42 days). 9.0% of all tests resulted in an error with no differences by site; most errors resolved with retesting. POC was more sensitive (100%; lower 95% CI, 39.8%) and specific (100%, lower 95% CI, 98%) among older children tested in primary care compared with birth testing in hospital (90.0%, 95% CI, 55.5-99.8% and 100.0%, lower

95% CI, 98.4%, respectively). Negative predictive value was high (>99%) at both sites. In interviews, providers felt the device was simple to use and facilitated decision-making in the management of infants. However, many wanted clarity on the cause of errors on the POC device to help guide repeat testing.

CONCLUSIONS: POC EID testing performs well in field implementation in health care facilities and appears highly acceptable to health care providers.

33. **"It was pain. That's it. It was pain." Lack of oral health care among otherwise healthy young adults living with HIV in South Africa: A qualitative study**.
Lambert, R. F., C. Orrell, et al. PLoS One 2017 12(12): e0188353.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5741215/pdf/pone.0188353.pdf

INTRODUCTION: The purpose of this study is to understand engagement with and availability of dental services among people living with HIV in a low-income community of South Africa.

METHODS: In depth qualitative interviewing was used to collect data, which was analyzed using an inductive content analytical approach. The study was conducted in Gugulethu, a township community located outside of Cape Town, South Africa. Local public sector health services provided free of charge are the main source of primary health and dental care for this population. Participants included South African adults (age 18-35) recently diagnosed with HIV who had a CD4 count >350 cells/mm3.

RESULTS: Many participants had little to no experience with dental care, did not know which health care providers are appropriate to address oral health concerns, were not aware of available dental services, utilized home remedies to treat oral health problems, harbored many misperceptions of dental care, avoided dental services due to fear, and experienced poverty as a barrier to dental services.

CONCLUSIONS: Our findings suggest that integration of oral healthcare into medical care may increase patient knowledge about oral health and access to care. Leveraging the relatively robust HIV infrastructure to address oral disease may also be an effective approach to reaching these participants and those living in resource poor communities generally.

34. **Uptake and predictors of early postnatal follow-up care amongst mother-baby pairs in South Africa: Results from three population-based surveys, 2010-2013**.
Larsen, A., M. Cheyip, et al. J Glob Health 2017 7(2): 021001.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5735783/pdf/jogh-07-021001.pdf

BACKGROUND: Achieving World Health Organization (WHO) recommendations for postnatal care (PNC) within the first few weeks of life is vital to eliminating early mother-to-child transmission of HIV (MTCT) and improving infant health. Almost half of

the annual global deaths among children under five occur during the first six weeks of life. This study aims to identify uptake of three PNC visits within the first six weeks of life as recommended by WHO among South African mother-infant pairs, and factors associated with uptake.

METHODS: We analyzed data from three facility-based, nationally representative surveys (2010, 2011/12 and 2012/13) primarily designed to determine the effectiveness of the South African program to prevent MTCT. This analysis describes the proportion of infants achieving the WHO recommendation of at least 3 PNC visits. Interviews from 27 699 HIV-negative and HIV-positive mothers of infants aged 4-8 weeks receiving their six week immunization were included in analysis. Data were analyzed using STATA 13.0 and weighted for sample ascertainment and South African live births. We fitted a multivariable logistic regression model to estimate factors associated with early PNC uptake.

RESULTS: Over half (59.6%, 95% confidence interval (CI) = 59.0-60.3) of mother-infant pairs received the recommended three PNC visits during the first 6 weeks; uptake was 63.1% (95% CI = 61.9-64.3) amongst HIV exposed infants and 58.1% (95% CI = 57.3-58.9) amongst HIV unexposed infants. Uptake of early PNC improved significantly with each survey, but varied significantly by province. Multivariable analysis of the pooled data, controlling for survey year, demonstrated that number of antenatal visits (4+ vs <4 Adjusted odds ratio (aOR) = 1.13, 95% CI = 1.04-1.23), timing of initial antenatal visits (</=12 weeks vs >12 weeks, aOR = 1.13, 95% CI = 1.04-1.23), place of delivery (clinic vs hospital aOR = 1.5, 1.3-1.6), and infant HIV exposure (exposed vs unexposed aOR = 1.2, 95% CI = 1.1-1.2) were the key factors associated with receiving recommended PNC visits.

CONCLUSIONS: Approximately 40% of neonates did not receive three or more postnatal care visits in the first 6 weeks of life from 2010-2013. To improve uptake of early PNC, early antenatal booking, more frequent antenatal care attendance, and attention to HIV negative women is needed.

35. **Factors influencing the experience of sexual and reproductive healthcare for female adolescents with perinatally-acquired HIV: a qualitative case study**.
Mwalabu, G., C. Evans, et al. BMC Womens Health 2017 17(1): 125.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5721479/pdf/12905_2017_Article_485.pdf

BACKGROUND: Young people living with perinatally-acquired HIV require age-appropriate support regarding sex and relationships as they progress towards adulthood. HIV affects both genders but evidence suggests that young women are particularly vulnerable to sexual abuse and more prone to engaging in sexual behaviours to meet their daily survival needs. This can result in poor sexual and reproductive health (SRH) outcomes. HIV services in Malawi provide support for young women's HIV-related

clinical needs, but it is unclear whether there is sufficient provision for their SRH needs as they become adults. This paper explores the sex and relationship experiences of young women growing up with perinatally-acquired HIV in order to understand how to improve SRH care and associated outcomes.

METHODS: A qualitative case study approach was adopted in which each 'case' comprised a young woman (15-19 years) with perinatally acquired HIV, a nominated caregiver and service provider. Participants were purposively selected from three multidisciplinary centres providing specialised paediatric/adolescent HIV care in Malawi. Data was collected for 14 cases through in-depth interviews (i.e. a total of 42 participants) and analysed using within-case and cross-case approaches. The interviews with adolescents were based on an innovative visual method known as 'my story book' which encouraged open discussion on sensitive topics.

RESULTS: Young women reported becoming sexually active at an early age for different reasons. Some sought a sense of intimacy, love, acceptance and belonging in these relationships, noting that they lacked this at home and/or within their peer groups. For others, their sexual activity was more functional - related to meeting survival needs. Young women reported having little control over negotiating safer sex or contraception. Their priority was preventing unwanted pregnancies yet several of the sample already had babies, and transfer to antenatal services created major disruptions in their HIV care. In contrast, caregivers and nurses regarded sexual activity from a clinical perspective, fearing onward transmission of HIV and advocating abstinence or condoms where possible. In addition, a cultural silence rooted in dominant religious and traditional norms closed down possibilities for discussion about sexual matters and prevented young women from accessing contraception.

CONCLUSION: The study has shown how young women, caregivers and service providers have contrasting perspectives and priorities around SRH care. Illumination of these differences highlights a need for service improvement. It is suggested that young women themselves are involved in future service improvement initiatives to encourage the development of culturally and socially acceptable pathways of care.

36. **Dynamics of CD4 and CD8 T-Cell Subsets and Inflammatory Biomarkers during Early and Chronic HIV Infection in Mozambican Adults**.
Pastor, L., V. Urrea, et al. Front Immunol 2017 8: 1925.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5760549/pdf/fimmu-08-01925.pdf

During primary HIV infection (PHI), there is a striking cascade response of inflammatory cytokines and many cells of the immune system show altered frequencies and signs of extensive activation. These changes have been shown to have a relevant role in predicting disease progression; however, the challenges of identifying PHI have resulted in a lack of critical information about the dynamics of early pathogenic events. We studied soluble inflammatory biomarkers and changes in T-cell subsets in individuals at

PHI (n = 40), chronic HIV infection (CHI, n = 56), and HIV-uninfected (n = 58) recruited at the Manhica District Hospital in Mozambique. Plasma levels of 49 biomarkers were determined by Luminex and ELISA. T-cell immunophenotyping was performed by multicolor flow cytometry. Plasma HIV viremia, CD4, and CD8 T cell counts underwent rapid stabilization after PHI. However, several immunological parameters, including Th1-Th17 CD4 T cells and activation or exhaustion of CD8 T cells continued decreasing until more than 9 months postinfection. Importantly, no sign of immunosenescence was observed over the first year of HIV infection. Levels of IP-10, MCP-1, BAFF, sCD14, tumor necrosis factor receptor-2, and TRAIL were significantly overexpressed at the first month of infection and underwent a prompt decrease in the subsequent months while, MIG and CD27 levels began to increase 1 month after infection and remained overexpressed for almost 1 year postinfection. Early levels of soluble biomarkers were significantly associated with subsequently exhausted CD4 T-cells or with CD8 T-cell activation. Despite rapid immune control of virus replication, the stabilization of the T-cell subsets occurs months after viremia and CD4 count plateau, suggesting persistent immune dysfunction and highlighting the potential benefit of early treatment initiation that could limit immunological damage.

37. **Assessing the association between changing NRTIs when initiating second-line ART and treatment outcomes**.
Rohr, J. K., P. Ive, et al. J Acquir Immune Defic Syndr 2017.

BACKGROUND: After first-line antiretroviral therapy (ART) failure, the importance of change in nucleoside reverse transcriptase inhibitor (NRTI) in second-line is uncertain due to the high potency of protease inhibitors used in second-line.

SETTING: We used clinical data from 6,290 adult patients in South Africa and Zambia from the International Epidemiologic Databases to Evaluate AIDS-Southern Africa cohort.

METHODS: We included patients who initiated on standard first-line ART and had evidence of first-line failure. We used propensity score-adjusted Cox proportional hazards models to evaluate the impact of change in NRTI on second-line failure compared to remaining on the same NRTI in second-line. In South Africa, where viral load monitoring was available, treatment failure was defined as two consecutive viral loads >1,000 copies/mL. In Zambia, it was defined as two consecutive CD4 counts <100 cells/mm.

RESULTS: Among patients in South Africa initiated on zidovudine, the adjusted hazard ratio for second-line virologic failure was 0.25 (95% CI: 0.11, 0.57) for those switching to tenofovir vs. remaining on zidovudine. Among patients in South Africa initiated on tenofovir, switching to zidovudine in second-line was associated with reduced second-line failure (adjusted hazard ratio = 0.35 [95% CI: 0.13, 0.96]). In Zambia where viral load monitoring was not available, results were less conclusive.

CONCLUSION: Changing NRTI in second-line was associated with better clinical outcomes in South Africa. Additional clinical trial research regarding second-line NRTI choices for patients initiated on tenofovir or with contraindications to specific NRTIs is needed.

38. **Predictors of survival among HIV-positive children on ART in Swaziland**.
Shabangu, P., A. Beke, et al. Afr J AIDS Res 2017 16(4): 335-343.
http://www.tandfonline.com/doi/pdf/10.2989/16085906.2017.1386219?needAccess=true

The objective of the study was to determine predictors of survival among HIV-positive children (<15 years) in Swaziland. A retrospective cohort analysis of medical records for 4 167 children living with HIV who were initiated on antiretroviral therapy (ART) between 2004 and 2008, and followed up until 2014 was conducted in clinical settings at 36 health facilities. The Kaplan Meier Estimator, signed-ranks test, and the Cox proportional hazards regression model were applied to determine survival probabilities, significant difference among stratified survival functions and adjusted hazard ratios respectively. The results reveal that the median survival time for children was 78 months (95% CI: 77-79). Children who were initiated early on ART had higher survival probability over time (HR: 0.35 [95% CI: 0.21-0.57], p < 0.001) compared to those whose ART initiation was delayed. Children within the age group of <1 years had higher hazard (HR = 1.55 [95% CI: 1.16-2.08], p < 0.001) of death than children within the age group of 1-14 years. Children who were nourished had 88% lower hazard of death (HR: 0.12 [95% CI: 0.07-0.19], p < 0.001) than severely malnourished children. The study demonstrates that ART paediatric services are effective in increasing survival among HIV infected children and early initiated children have high survival probability. Active tuberculosis (TB), malnutrition, and delayed ART initiation remain predictors of poor survival among children living with HIV.

39. **Safety and efficacy of the PrePex device in HIV-positive men: A single-arm study in Zimbabwe**.
Tshimanga, M., B. Makunike-Chikwinya, et al. PLoS One 2017 12(12): e0189146.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5722373/pdf/pone.0189146.pdf

METHODS: We aimed to determine if the adverse event (AE) rate was non-inferior to an AE rate of 2%, a rate considered the global standard of MC safety. Study procedures, AE definitions, and study staff were unchanged from previous PrePex Zimbabwe trials. After PrePex placement and removal, weekly visits assessed wound healing. Men returned on Day 90. Safety was defined as occurrence of moderate and serious clinical AEs. Efficacy was defined as ability to reach the endpoint of complete circumcision.

RESULTS: Among 400 healthy, HIV-positive, consenting adults, median age was 40 years (IQR: 34, 46); 79.5% in WHO stage 2; median CD4 was 336.5c/mul (IQR: 232, 459); 337

(85%) on anti-retroviral therapy. Among 385 (96%) observed completely healed, median days to complete healing was 42 (IQR: 35-49). There was no association between time to healing and CD4 (p = 0.66). Four study-related severe AEs and no moderate AEs were reported: severe/moderate AE rate of 1.0% (95% CI: 0.27% to 2.5). This was non-inferior to 2% AEs (p = 0.0003). All AEs were device displacements resulting in surgical MC and, subsequently, complete healing.
CONCLUSION: Male circumcision among healthy, HIV-positive men using PrePex is safe and effective. Reducing the barrier of HIV testing while improving counseling for safer sex practices among all MC clients could increase MC uptake and avert more HIV infections.

40. **Impact of SMS/GPRS Printers in Reducing Time to Early Infant Diagnosis Compared With Routine Result Reporting: A Systematic Review and Meta-Analysis**.
Vojnov, L., J. Markby, et al. J Acquir Immune Defic Syndr 2017 76(5): 522-526.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5690299/pdf/qai-76-522.pdf

BACKGROUND: Despite significant gains made toward improving access, early infant diagnosis (EID) testing programs suffer from long test turnaround times that result in substantial loss to follow-up and mortality associated with delays in antiretroviral therapy initiation. These delays in treatment initiation are particularly impactful because of significant HIV-related infant mortality observed by 2-3 months of age. Short message service (SMS) and general packet radio service (GPRS) printers allow test results to be transmitted immediately to health care facilities on completion of testing in the laboratory.

METHODS: We conducted a systematic review and meta-analysis to assess the benefit of using SMS/GPRS printers to increase the efficiency of EID test result delivery compared with traditional courier paper-based results delivery methods.

RESULTS: We identified 11 studies contributing data for over 16,000 patients from East and Southern Africa. The test turnaround time from specimen collection to result received at the health care facility with courier paper-based methods was 68.0 days (n = 6835), whereas the test turnaround time with SMS/GPRS printers was 51.1 days (n = 6711), resulting in a 2.5-week (25%) reduction in the turnaround time.

CONCLUSIONS: Courier paper-based EID test result delivery methods are estimated to add 2.5 weeks to EID test turnaround times in low resource settings and increase the risk that infants receive test results during or after the early peak of infant mortality. SMS/GPRS result delivery to health care facility printers significantly reduced test turnaround time and may reduce this risk. SMS/GPRS printers should be considered for expedited delivery of EID and other centralized laboratory test results.

Back to top

IMPLEMENTERS/PROGRAMMERS - 62

41. **Status of HIV Epidemic Control Among Adolescent Girls and Young Women Aged 15-24 Years - Seven African Countries, 2015-2017**.
Brown, K., D. B. Williams, et al. MMWR Morb Mortal Wkly Rep 2018 67(1): 29-32.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5769792/pdf/mm6701a6.pdf

    In 2016, an estimated 1.5 million females aged 15-24 years were living with human immunodeficiency virus (HIV) infection in Eastern and Southern Africa, where the prevalence of HIV infection among adolescent girls and young women (3.4%) is more than double that for males in the same age range (1.6%) (1). Progress was assessed toward the Joint United Nations Programme on HIV/AIDS (UNAIDS) 2020 targets for adolescent girls and young women in sub-Saharan Africa (90% of those with HIV infection aware of their status, 90% of HIV-infected persons aware of their status on antiretroviral treatment [ART], and 90% of those on treatment virally suppressed [HIV viral load <1,000 HIV RNA copies/mL]) (2) using data from recent Population-based HIV Impact Assessment (PHIA) surveys in seven countries. The national prevalence of HIV infection in adolescent girls and young women aged 15-24 years, the percentage who were aware of their status, and among those persons who were aware, the percentage who had achieved viral suppression were calculated. The target for viral suppression among all persons with HIV infection is 73% (the product of 90% x 90% x 90%). Among all seven countries, the prevalence of HIV infection among adolescent girls and young women was 3.6%; among those in this group, 46.3% reported being aware of their HIV-positive status, and 45.0% were virally suppressed. Sustained efforts by national HIV and public health programs to diagnose HIV infection in adolescent girls and young women as early as possible to ensure rapid initiation of ART should help achieve epidemic control among adolescent girls and young women.

42. **Failure to initiate HIV treatment in patients with high CD4 counts: evidence from demographic surveillance in rural South Africa**.
Bor, J., C. Chiu, et al. Trop Med Int Health 2018 23(2): 206-220.

    OBJECTIVES: To assess the relationship between CD4 count at presentation and ART uptake and assess predictors of timely treatment initiation in rural KwaZulu-Natal, South Africa.

    METHODS: We used Kaplan-Meier and Cox proportional hazards models to assess the association between first CD4 count and time from first CD4 to ART initiation among all adults presenting to the Hlabisa HIV Treatment and Care Programme between August 2011 and December 2012 with treatment-eligible CD4 counts (</= 350 cells/mm(3)). For a subset of healthier patients (200 < CD4 </= 350 cells) residing within the population surveillance of the Africa Health Research Institute, we assessed

sociodemographic, economic and geographic predictors hypothesised to influence ART uptake.

RESULTS: A total of 4739 patients presented for care with eligible CD4 counts. The proportion initiating ART within six months of diagnosis was 67% (95% CI 63, 71) in patients with CD4 </= 50, 59% (0.55, 0.63) in patients with CD4 151-200 and 48% (95% CI 44, 51) in patients with CD4 301-350. The hazard of starting ART fell by 17% (95% CI 14, 20) for every 100-cell increase in baseline CD4 count. Among healthier patients under demographic surveillance (n = 193), observable sociodemographic, economic and geographic predictors did not add discriminatory power beyond CD4 count, age and sex to identify patients at high risk of non-initiation.

CONCLUSIONS: Individuals presenting for HIV care at higher CD4 counts were less likely to initiate ART than patients presenting at low CD4 counts. Overall, ART uptake was low. Under new guidelines that establish ART eligibility regardless of CD4 count, patients with high CD4 counts may require additional interventions to encourage treatment initiation.

43. **A Bayesian Analysis of Prenatal Maternal Factors Predicting Nonadherence to Infant HIV Medication in South Africa**.
Cook, R. R., K. Peltzer, et al. AIDS Behav 2018.

While efforts to prevent mother-to-child transmission of HIV been successful in some districts in South Africa, rates remain unacceptably high in others. This study utilized Bayesian logistic regression to examine maternal-level predictors of adherence to infant nevirapine prophylaxis, including intimate partner violence, maternal adherence, HIV serostatus disclosure reaction, recency of HIV diagnosis, and depression. Women (N = 303) were assessed during pregnancy and 6 weeks postpartum. Maternal adherence to antiretroviral therapy during pregnancy predicted an 80% reduction in the odds of infant nonadherence [OR 0.20, 95% posterior credible interval (.11, .38)], and maternal prenatal depression predicted an increase [OR 1.04, 95% PCI (1.01, 1.08)]. Results suggest that in rural South Africa, failure to provide medication to infants may arise from shared risk factors with maternal nonadherence. Intervening to increase maternal adherence and reduce depression may improve adherence to infant prophylaxis and ultimately reduce vertical transmission rates.

44. **HIV-positive Malawian women with young children prefer overweight body sizes and link underweight body size with inability to exclusively breastfeed**.
Croffut, S. E., G. Hamela, et al. Matern Child Nutr 2018 14(1).
http://onlinelibrary.wiley.com/doi/10.1111/mcn.12446/pdf

Before the prevention of mother-to-child transmission (PMTCT) program was widely implemented in Malawi, HIV-positive women associated exclusive breastfeeding with accelerated disease progression and felt that an HIV-positive woman could more

successfully breastfeed if she had a larger body size. The relationship between breastfeeding practices and body image perceptions has not been explored in the context of the Option B+ PMTCT program, which offers lifelong antiretroviral therapy. We conducted in-depth interviews with 64 HIV-positive women in Lilongwe District, Malawi to investigate body size perceptions, how perceptions of HIV and body size influence infant feeding practices, and differences in perceptions among women in PMTCT and those lost to follow-up. Women were asked about current, preferred, and healthy body size perceptions using nine body image silhouettes of varying sizes, and vignettes about underweight and overweight HIV-positive characters were used to elicit discussion of breastfeeding practices. More than 80% of women preferred an overweight, obese, or morbidly obese silhouette, and most women (83%) believed that an obese or morbidly obese silhouette was healthy. Although nearly all women believed that an HIV-positive overweight woman could exclusively breastfeed, only about half of women thought that an HIV-positive underweight woman could exclusively breastfeed. These results suggest that perceptions of body size may influence beliefs about a woman's ability to breastfeed. Given the preference for large body sizes and the association between obesity and risk of noncommunicable diseases, we recommend that counseling and health education for HIV-positive Malawian women focus on culturally sensitive healthy weight messaging and its relationship with breastfeeding practices.

45. **The effectiveness and cost-effectiveness of 3- vs. 6-monthly dispensing of antiretroviral treatment (ART) for stable HIV patients in community ART-refill groups in Zimbabwe: study protocol for a pragmatic, cluster-randomized trial**.
Fatti, G., N. Ngorima-Mabhena, et al. Trials 2018 19(1): 79.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5789674/pdf/13063_2018_Article_2469.pdf

BACKGROUND: Sub-Saharan Africa is the world region with the greatest number of people eligible to receive antiretroviral treatment (ART). Less frequent dispensing of ART and community-based ART-delivery models are potential strategies to reduce the load on overburdened healthcare facilities and reduce the barriers for patients to access treatment. However, no large-scale trials have been conducted investigating patient outcomes or evaluating the cost-effectiveness of extended ART-dispensing intervals within community ART-delivery models. This trial will assess the clinical effectiveness, cost-effectiveness and acceptability of providing ART refills on a 3 vs. a 6-monthly basis within community ART-refill groups (CARGs) for stable patients in Zimbabwe.

METHODS: In this pragmatic, three-arm, parallel, unblinded, cluster-randomized non-inferiority trial, 30 clusters (healthcare facilities and associated CARGs) are allocated using stratified randomization in a 1:1:1 ratio to either (1) ART refills supplied 3-monthly from the health facility (control arm), (2) ART refills supplied 3-monthly within CARGs, or (3) ART refills supplied 6-monthly within CARGs. A CARG consists of 6-12 stable patients who meet in the community to receive ART refills and who provide support to one

another. Stable adult ART patients with a baseline viral load < 1000 copies/ml will be invited to participate (1920 participants per arm). The primary outcome is the proportion of participants alive and retained in care 12 months after enrollment. Secondary outcomes (measured at 12 and 24 months) are the proportions achieving virological suppression, average provider cost per participant, provider cost per participant retained, cost per participant retained with virological suppression, and average patient-level costs to access treatment. Qualitative research will assess the acceptability of extended ART-dispensing intervals within CARGs to both providers and patients, and indicators of potential facility-level decongestion due to the interventions will be assessed.

DISCUSSION: Cost-effective health system models that sustain high levels of patient retention are urgently needed to accommodate the large numbers of stable ART patients in sub-Saharan Africa. This will be the first trial to evaluate extended ART-dispensing intervals within a community-based ART distribution model, and results are intended to inform national and regional policy regarding their potential benefits to both the healthcare system and patients.

46. **Implementing voluntary medical male circumcision using an innovative, integrated, health systems approach: experiences from 21 districts in Zimbabwe**.
Feldacker, C., B. Makunike-Chikwinya, et al. Glob Health Action 2018 11(1): 1414997.
http://www.tandfonline.com/doi/pdf/10.1080/16549716.2017.1414997?needAccess=true

BACKGROUND: Despite increased support for voluntary medical male circumcision (VMMC) to reduce HIV incidence, current VMMC progress falls short. Slow progress in VMMC expansion may be partially attributed to emphasis on vertical (stand-alone) over more integrated implementation models that are more responsive to local needs. In 2013, the ZAZIC consortium began implementation of a 5-year, integrated VMMC program jointly with Ministry of Health and Child Care (MoHCC) in Zimbabwe. OBJECTIVE: To explore ZAZIC's approach emphasizing existing healthcare workers and infrastructure, increasing program sustainability and resilience.

METHODS: A process evaluation utilizing routine quantitative data. Interviews with key MoHCC informants illuminate program strengths and weaknesses. METHODS: A process evaluation utilizing routine quantitative data. Interviews with key MoHCC informants illuminate program strengths and weaknesses.

RESULTS: In start-up and year 1 (March 2013-September, 2014), ZAZIC expanded from two to 36 static VMMC sites and conducted 46,011 VMMCs; 39,840 completed from October 2013 to September 2014. From October 2014 to September 2015, 44,868 VMMCs demonstrated 13% increased productivity. In October, 2015, ZAZIC was required by its donor to consolidate service provision from 21 to 10 districts over a 3-month period. Despite this shock, 57,282 VMMCs were completed from October 2015

to September 2016 followed by 44,414 VMMCs in only 6 months, from October 2016 to March 2017. Overall, ZAZIC performed 192,575 VMMCs from March 2013 to March, 2017. The vast majority of VMMCs were completed safely by MoHCC staff with a reported moderate and severe adverse event rate of 0.3%.

CONCLUSION: The safety, flexibility, and pace of scale-up associated with the integrated VMMC model appears similar to vertical delivery with potential benefits of capacity building, sustainability and health system strengthening. These models also appear more adaptable to local contexts. Although more complicated than traditional approaches to program implementation, attention should be given to this country-led approach for its potential to spur positive health system changes, including building local ownership, capacity, and infrastructure for future public health programming.

47. **Factors associated with recent unsuppressed viral load in HIV-1-infected patients in care on first-line antiretroviral therapy in South Africa**.
Joseph Davey, D., Z. Abrahams, et al. Int J STD AIDS 2018: 956462417748859.

Unsuppressed viral load (VL) in patients on antiretroviral therapy (ART) occurs when treatment fails to suppress a person's VL and is associated with decreased survival and increased HIV transmission. The objective of this study was to evaluate factors associated with unsuppressed VL (VL > 400 copies/ml) in patients currently in care on first-line ART for >/= 6 months attending South African public healthcare facilities. We analysed electronic medical records of ART patients with a VL result on record who started ART between January 2004 and April 2016 from 271 public health facilities. We present descriptive and multivariable logistic regression for unsuppressed VL at last visit using a priori variables. We included 244,370 patients (69% female) on first-line ART in April 2016 for >/= 6 months. Median age at ART start was 33 years (7% were < 15 years old). Median duration on ART was 3.7 years. Adjusting for other variables, factors associated with having an unsuppressed VL at the most recent visit among patients in care included: (1) < 15 years old at ART start (adjusted odds ratio [aOR]=2.58; 95% CI = 2.37, 2.81) versus 15-49 years at ART start, (2) male gender (aOR = 1.29; 95% CI = 1.25, 1.35), (3) 6-12 months on ART versus longer (aOR = 1.34; 95% CI = 1.29, 1.40), (4) on tuberculosis (TB) treatment (aOR = 1.78; 95% CI = 1.48, 2.13), and (5) prior ART exposure versus none (aOR = 1.20; 95% CI = 1.08, 1.32). Approximately 85% of the ART cohort who were in care had achieved viral suppression, though men, youth/adolescents, patients with prior ART exposure, those with short duration of ART, and patients on TB treatment had increased odds of not achieving viral suppression. There is a need to develop and evaluate targeted interventions for ART patients in care who are at high risk of unsuppressed VL.

48. **Male circumcision for HIV prevention: Awareness, risk compensation, and risk perceptions among South African women**.
Kalichman, S., C. Mathews, et al. Glob Public Health 2018: 1-9.

Medical male circumcision (MMC) is a proven method of HIV risk reduction for men in southern Africa. MMC promotion campaigns and scale-up programmes are widely implemented throughout the Republic of South Africa. However, the impact of promoting MMC on women's awareness, beliefs, and behaviours has been understudied. We conducted a self-administered anonymous survey of 279 women receiving health services in an impoverished township located in Cape Town, South Africa. Results showed that two in three women were unaware that male circumcision partially protects men from contracting HIV. Women who were aware of MMC for HIV prevention also endorsed beliefs that male circumcision reduces the need for men to worry about HIV and reduces the need for men to use condoms. Male circumcision awareness was also related to reduced perceptions of HIV risk among women. Multivariable models showed that women's MMC awareness, circumcision risk compensation beliefs, and risk perceptions were associated with decreased condom use and higher HIV risk index scores defined as number of condomless vaginal intercourse X number of sex partners. These results suggest a need for MMC education efforts tailored for women living in communities with high-HIV prevalence where men are targeted for MMC.

49. **Cash transfer interventions for sexual health: meanings and experiences of adolescent males and females in inner-city Johannesburg**.
Khoza, N., J. Stadler, et al. BMC Public Health 2018 18(1): 120.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5761158/pdf/12889_2018_Article_5027.pdf

BACKGROUND: In sub-Saharan Africa, there is growing interest in the use of cash transfer (CT) programs for HIV treatment and prevention. However, there is limited evidence of the consequences related to CT provision to adolescents in low-resourced urban settings. We explored the experiences of adolescents receiving CTs to assess the acceptability and unintended consequences of CT strategies in urban Johannesburg, South Africa.

METHODS: We collected qualitative data during a pilot randomized controlled trial of three CT strategies (monthly payments unconditional vs. conditional on school attendance vs. a once-off payment conditional on a clinic visit) involving 120 adolescents aged 16-18 years old in the inner city of Johannesburg. Interviews were conducted in isiZulu, Sesotho or English with a sub-sample of 49 participants who adhered to study conditions, 6 months after receiving CT (280 ZAR/ 20 USD) and up to 12 months after the program had ended. Interviews were transcribed and translated by three fieldworkers. Codes were generated using an inductive approach; transcripts were initially coded based on emerging issues and subsequently coded deductively using Atlas.ti 7.4.

RESULTS: CTs promoted a sense of independence and an adult social identity amongst recipients. CTs were used to purchase personal and household items; however, there were gender differences in spending and saving behaviours. Male participants' spending reflected their preoccupation with maintaining a public social status through which they asserted an image of the responsible adult. In contrast, female participants' expenditure reflected assumption of domestic responsibilities and independence from older men, with the latter highlighting CTs' potential to reduce transactional sexual partnerships. Cash benefits were short-lived, as adolescents reverted to previous behavior after the program's cessation.

CONCLUSION: CT programs offer adolescent males and females in low-income urban settings a sense of agency, which is vital for their transition to adulthood. However, gender differences in the expenditure of CTs and the effects of ending CT programs must be noted, as these may present potential unintended risks.

50. **Determinants of HIV infection among adolescent girls and young women aged 15-24 years in South Africa: a 2012 population-based national household survey**.
Mabaso, M., Z. Sokhela, et al. BMC Public Health 2018 18(1): 183.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5787232/pdf/12889_2018_Article_5051.pdf

BACKGROUND: South Africa is making tremendous progress in the fight against HIV, however, adolescent girls and young women aged 15-24 years (AGYW) remain at higher risk of new HIV infections. This paper investigates socio-demographic and behavioural determinants of HIV infection among AGYW in South Africa.

METHODS: A secondary data analysis was undertaken based on the 2012 population-based nationally representative multi-stage stratified cluster random household sample. Multivariate stepwise backward and forward regression modelling was used to determine factors independently associated with HIV prevalence.

RESULTS: Out of 3092 interviewed and tested AGYW 11.4% were HIV positive. Overall HIV prevalence was significantly higher among young women (17.4%) compared to adolescent girls (5.6%). In the AGYW model increased risk of HIV infection was associated with being young women aged 20-24 years (OR = 2.30, p = 0.006), and condom use at last sex (OR = 1.91, p = 0.010), and decreased likelihood was associated with other race groups (OR = 0.06, p < 0.001), sexual partner within 5 years of age (OR = 0.53, p = 0.012), tertiary level education (OR = 0.11, p = 0.002), low risk alcohol use (OR = 0.19, p = 0.022) and having one sexual partner (OR = 0.43, p = 0.028). In the adolescent girls model decreased risk of HIV infection was associated with other race groups (OR = 0.01, p < 0.001), being married (OR = 0.07), p = 0.016], and living in less poor household (OR = 0.08, p = 0.002). In the young women's models increased risk of HIV infection was associated with condom use at last sex (OR = 2.09, p = 0.013), and decreased likelihood was associated with other race groups (OR = 0.17, p < 0.001), one

sexual partner (OR = 0.6, p = 0.014), low risk alcohol use (OR = 0.17, p < 0.001), having a sexual partner within 5 years of age (OR = 0.29, p = 0.022), and having tertiary education (OR = 0.29, p = 0.022).

CONCLUSION: These findings support the need to design combination prevention interventions which simultaneously address socio-economic drivers of the HIV epidemic, promote education, equity and access to schooling, and target age-disparate partnerships, inconsistent condom use and risky alcohol consumption.

51. **Determinants of excellent/good self-rated health among HIV positive individuals in South Africa: evidence from a 2012 nationally representative household survey**. Mabaso, M. L. H., N. P. Zungu, et al. BMC Public Health 2018 18(1): 198. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5789546/pdf/12889_2018_Article_5102.pdf

BACKGROUND: In South Africa, HIV is increasingly becoming a chronic disease as a result of advances in HIV treatment and prevention in the last three decades. This has changed the perception from a life threating to a potentially manageable disease. However, little is known about self-perceived health status of HIV-infected individuals. Self-rated health (SRH) has been shown to be a sensitive indicator of health-relatedchanges directly linked to HIV, but can also be influenced by differences in social and material conditions. The aim of this paper was to identify determinants of excellent/good SRH among HIV-infected individuals using socio-demographic, life style and health related data.

METHODS: The study used data from the nationally representative 2012 South African population-based household survey on HIV prevalence, incidence and behaviour conducted using multi-stage stratified cluster sampling design. Bivariate and multivariate logistic regression models were used to identify determinants of SRH among HIV-infected individuals.

RESULTS: Out of a total of 2632 HIV positive participants 74.1% (95% CI: 68.4-74.2) reported excellent/good SRH. Increased likelihood of reporting excellent/good SRH was significantly associated with being Black African [OR= 1.97 (95%CI: 1.12-3.46), p = 0.019] and belonging to least poor household [OR= 3.13 (95%CI: 1.26-7.78), p = 0.014]. Decreased likelihood of reporting excellent/good SRH was significantly associated with those aged 25 to 34 years [OR= 0.49 (95% CI: 0.31-0.78), p = 0.003], 35 to 44 years[OR= 0.27 (95% CI: 0.17-0.44), p < 0.001], 45 to 54 years [OR= 0.20 (95% CI: 0.12-0.34), p < 0.001], and those 55 years and older [OR= 0.15 (95% CI: 0.09-0.26), p < 0.001], hospitalization in the past twelve months [OR= 0.40 (95% CI: 0.26-0.60), p < 0.001].

CONCLUSION: To have positive health effects and improve the perceived health status for PLWH social interventions should seek to enhance to support for the elderly HIV-

positive individuals, and address the challenge of socio-economic inequalities and underlying comorbid conditions resulting in hospitalization.

52. **Scaling up Pediatric HIV Testing by Incorporating Provider-Initiated HIV Testing Into all Child Health Services in Hurungwe District, Zimbabwe**.
Musarandega, R., B. Mutede, et al. J Acquir Immune Defic Syndr 2018 77(1): 78-85.

BACKGROUND: Practical ways are needed to scale-up pediatric HIV testing in sub-Saharan Africa, where testing is usually limited to HIV-exposed children in maternal and child health clinics.

METHODS: We implemented an enhanced pediatric HIV testing program in 33 health facilities in Zimbabwe by integrating HIV testing into all pediatric health services. We collected individual data on children tested by having health care workers complete a program-specific child health booklet. We compared numbers of children tested before and during the program using routinely collected aggregate program data reported by health facilities.

RESULTS: A total of 12,556 children aged 0-5 years were recorded in child health booklets; 9431 (75.1%) had information on HIV testing, of whom 7326 (77.7%) were tested; 7167 had test results of whom 122 (1.7%) were HIV-infected. Among children seen in outpatient clinics, 82.1% were tested compared with 66.5% tested among children seen in maternal/child health clinics. Of the 122 HIV-infected children identified, 77 (63.1%) could be missed under existing pediatric testing guidelines. The number of HIV-infected children identified during the 6-month program increased by 55% compared with the prior 6-month period (RR = 1.55, 95% CI: 1.22 to 1.96). Factors independently associated with HIV infection included being malnourished (adjusted odds ratio [AOR] = 7.7, 95% CI: 2.1 to 28.6), being exposed to TB (AOR = 8.1, 95% CI: 2.0 to 32.2), and having an HIV-infected mother (AOR = 41.6, 95% CI: 15.9 to 108.8).

CONCLUSIONS: Integrating HIV testing into all pediatric health services is feasible and can assist in identifying HIV-infected children who could be missed in current testing guidelines.

53. **Effect of HIV self-testing on the number of sexual partners among female sex workers in Zambia: A randomized controlled trial**.
Oldenburg, C., M. M. Chanda, et al. Aids 2018.

OBJECTIVES: To assess the effect of two health systems approaches to distribute HIV self-tests on the number of female sex workers' client and non-client sexual partners in a randomized controlled trial of HIV self-testing among female sex workers (FSW) in Zambia. DESIGN: Cluster randomized controlled trial.

METHODS: Peer educators recruited 965 participants. Peer educator-participant groups were randomized 1:1:1 to one of three arms: 1) delivery of HIV self-tests directly from a peer educator, 2) free facility-based delivery of HIV-self tests in exchange for coupons, or 3) referral to standard HIV testing (standard of care). Participants in all three arms completed four peer educator intervention sessions, which included counseling and condom distribution. Participants were asked the average number of client partners they had per night at baseline, one and four months, and the number of non-client partners they had in the past 12 months (at baseline) and in the past month (at one month and four months).

RESULTS: At four months, participants reported significantly fewer clients per night in the delivery arm (mean difference -0.78 clients, 95% CI -1.28 to -0.28, P = 0.002) and the coupon arm (-0.71, 95% CI -1.21 to -0.21, P = 0.005) compared to standard-of-care. Similarly, they reported fewer non-client partners in the delivery (-3.19, 95% CI -5.18 to -1.21, P = 0.002) and in the coupon arm (-1.84, 95% CI -3.81 to 0.14, P = 0.07) arm compared to standard-of-care.

CONCLUSIONS: Expansion of HIV self-testing may have positive spillover effects on HIV prevention efforts among FSW in Zambia.

54. **False starts in 'test and start': a qualitative study of reasons for delayed antiretroviral therapy in Swaziland**.
Pell, C., E. Vernooij, et al. Int Health 2018.

BACKGROUND: Test and start, antiretroviral therapy (ART) for all HIV-positive individuals, is a WHO-recommended treatment guideline. In Swaziland, test and start has been evaluated through the MaxART implementation study. This article examines why, in MaxART, some newly diagnosed HIV-positive clients delayed initiating ART.

METHODS: Thirteen HIV-positive clients who delayed ART for >/=90 d after testing were identified from the MaxART study database and interviewed. Interviews were audio recorded, transcribed and translated into English for qualitative content analysis.

RESULTS: Respondents had often tested positive several times before initiating ART, with the initial diagnosis sometimes completely unexpected. Repeat testing-and delayed ART-was linked to a desire to come to terms with their diagnosis and prepare for a lifelong treatment course. Clients previously enrolled in pre-ART, particularly with high CD4 counts, had internalized past messages about ART as being non-essential and taking care of oneself through other means. Concerns about ART-related adverse events were weighed against these messages. Worries about inadvertent disclosure and its impact on social and economic relationships also discouraged initiation.

CONCLUSION: Although potentially reducing logistical barriers, expedited ART initiation does not necessarily accommodate some clients' need for time to come to terms with the diagnosis and the prospect of lifelong treatment.

55. **Predictors of HIV, HIV Risk Perception, and HIV Worry Among Adolescent Girls and Young Women in Lilongwe, Malawi**.
Price, J. T., N. E. Rosenberg, et al. J Acquir Immune Defic Syndr 2018 77(1): 53-63.

BACKGROUND: Adolescent girls and young women (AGYW) in sub-Saharan Africa have high HIV prevalence and incidence. We sought to understand which HIV risk factors individually and in combination contribute to risk, and whether these factors are associated with HIV worry and risk perception. SETTING: This study is ongoing at 4 public health centers in Lilongwe, Malawi (2016-2017).

METHODS: AGYW of 15-24 years old were recruited to participate in a study assessing 4 models of service delivery. At each health center, participants completed a baseline survey assessing socioeconomic, behavioral, biomedical, and partnership characteristics; self-reported HIV status; and, if HIV-uninfected, HIV risk perception (high versus low or none) and HIV worry (any versus none). We analyzed associations between baseline characteristics and HIV prevalence, risk perception, and worry.

RESULTS: Among 1000 AGYW, median age was 19 years (IQR: 17-21). Thirty-three participants reported being HIV-infected. Fifteen characteristics were associated with HIV infection. Having more risk factors was associated with higher HIV prevalence (</=4 factors, 0.5%; 5-8 factors, 6%; >8 factors, 21%). Having more risk factors was also associated with higher risk perception ($P < 0.001$) and higher worry ($P < 0.001$). However, among those with >/=8 risk factors, 52% did not consider themselves to be at high risk and 21% did not report any HIV worry.

CONCLUSIONS: Most AGYW perceive little risk of HIV acquisition, even those at highest risk. As a critical gap in the HIV prevention cascade, accurate risk perception is needed to tailor effective and sustained combination prevention strategies for this vulnerable population.

56. **Divergent Preferences for HIV Prevention: A Discrete Choice Experiment for Multipurpose HIV Prevention Products in South Africa**.
Quaife, M., R. Eakle, et al. Med Decis Making 2018 38(1): 120-133.

BACKGROUND: The development of antiretroviral (ARV)-based prevention products has the potential to substantially change the HIV prevention landscape; yet, little is known about how appealing these products will be outside of clinical trials, as compared with the existing options.

METHODS: We conducted a discrete choice experiment (DCE) to measure preferences for 5 new products among 4 important populations in the HIV response: adult men and women in the general population (aged 18 to 49 y), adolescent girls (aged 16 to 17 y), and self-identifying female sex workers (aged 18 to 49 y). We interviewed 661 self-reported HIV-negative participants in peri-urban South Africa, who were asked to choose between 3 unique, hypothetical products over 10 choice sets. Data were analyzed using multinomial, latent class and mixed multinomial logit models.

RESULTS: HIV protection was the most important attribute to respondents; however, results indicate significant demand among all groups for multipurpose prevention products that offer protection from HIV infection, other STIs, and unwanted pregnancy. All groups demonstrated a strong preference for long-lasting injectable products. There was substantial heterogeneity in preferences within and across population groups. **LIMITATIONS:** Hypothetical DCE data may not mirror real-world choices, and products will have more attributes in reality than represented in choice tasks. Background data on participants, including sensitive areas of HIV status and condom use, was self-reported.

CONCLUSIONS: These results suggest that stimulating demand for new HIV prevention products may require a more a nuanced approach than simply developing highly effective products. No single product is likely to be equally attractive or acceptable across different groups. This study strengthens the call for effective and attractive multipurpose prevention products to be deployed as part of a comprehensive combination prevention strategy.

57. **Prevalence and Factors Associated with Fixed-Dose Combination Antiretroviral Drugs Adherence among HIV-Positive Pregnant Women on Option B Treatment in Mpumalanga Province, South Africa**.
Ramlagan, S., K. Peltzer, et al. Int J Environ Res Public Health 2018 15(1).
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5800260/pdf/ijerph-15-00161.pdf

The possibility for all babies to be born and remain HIV-negative for the first year of life is achievable in South Africa. HIV-positive mothers' adherence to their antiretroviral medication is one of the crucial factors to achieve this target. Cross-sectional data were collected at 12 community health centres, over 12 months (2014-2015), from 673 HIV-positive women, less than 6 months pregnant, attending antenatal care, and on Option B treatment. Adherence measures included the Adults AIDS Clinical Trials Group (AACTG) four-day measure, as well as the Visual Analog Scale (VAS) seven-day measure. Bivariate analyses and multivariate logistic regressions are presented. 78.8% of respondents were adherent on AACTG, while 68.8% reported VAS adherence. Bivariate analyses for increased adherence show significant associations with older age, less/no alcohol usage, disclosure of HIV status, higher HIV knowledge, no desire to avoid ARV side effects, low stigma, and low depression. AACTG showed a negative association with intimate partner violence. Multivariable logistic regression on AACTG and VAS

adherence rates resulted in unique contributions to increased adherence of older age, less/no alcohol usage, higher HIV knowledge, lack of depression, and non-disclosure. Programs targeting closer side effect monitoring, HIV disclosure, pre-natal depression, alcohol intake, and HIV knowledge need consideration.

58. **A Cluster Randomised Trial to Determine the Efficacy of the "Feeding Buddies" Programme in Improving Exclusive Breastfeeding Rates Among HIV-Infected Women in Rural KwaZulu-Natal, South Africa**.
Reimers, P., K. Israel-Ballard, et al. AIDS Behav 2018 22(1): 212-223.

This cluster randomised trial in KwaZulu-Natal South Africa, evaluated the implementation of a Feeding Buddies (FB) programme to improve exclusive breastfeeding (EBF) amongst human immunodeficiency virus infected mothers. Eight clinics were randomly allocated to intervention and control arms respectively. Pregnant women attending the prevention of mother-to-child transmission program and intending to EBF were enrolled: control (n = 326), intervention (n = 299). Intervention mothers selected FBs to support them and they were trained together (four sessions). Interviews of mothers occurred prenatally and at post-natal visits (day 3, weeks 6, 14 and 22). Breastfeeding results were analysed (Stata) as interval-censored time-to-event data, with up to four time intervals per mother. EBF rates at the final interview were similar for control and intervention groups: 44.68% (105/235) and 42.75% (109/255) respectively (p = 0.67). In Cox regression analysis better EBF rates were observed in mothers who received the appropriate training (p = 0.036), had a community care giver visit (p = 0.044), while controlling for other factors. Implementation realities reduced the potential effectiveness of the FBs.

59. **Disability, social functioning and school inclusion among older children and adolescents living with HIV in Zimbabwe**.
Rukuni, R., G. McHugh, et al. Trop Med Int Health 2018 23(2): 149-155.
http://onlinelibrary.wiley.com/doi/10.1111/tmi.13012/pdf

OBJECTIVE: Increasing numbers of children with HIV are surviving to adolescence and encountering multiple clinical and social consequences of long-standing HIV infection. We aimed to investigate the association between HIV and disability, social functioning and school inclusion among 6- to 16-year-olds in Zimbabwe.

METHODS: HIV-infected children receiving antiretroviral therapy from a public-sector HIV clinic and HIV-uninfected children attending primary care clinics in the same catchment area were recruited. Standardised questionnaires were used to collect socio-demographic, social functioning and disability data. Multivariable logistic regression was used to assess the relationship between HIV status and disability and functioning.

RESULTS: We recruited 202 HIV-infected and 285 HIV-uninfected children. There was no difference in age and gender between the two groups, but a higher proportion of HIV-

infected children were orphaned. The prevalence of any disability was higher in HIV-infected than uninfected children (37.6% vs. 18.5%, P < 0.001). HIV-infected children were more likely to report anxiety (adjusted odds ratio (aOR) 4.4; 95% CI 2.4, 8.1), low mood (aOR 4.2; 2.1, 8.4) and difficulty forming friendships (aOR 14.8; 1.9, 116.6) than uninfected children. Children with HIV also reported more missed school days, repeating a school year and social exclusion in class. These associations remained apparent when comparing children with HIV and disability to those with HIV but no disabilities.

CONCLUSIONS: Children with HIV commonly experience disabilities, and this is associated with social and educational exclusion. Rehabilitation and support services are needed to facilitate educational attainment and social participation in this group.

60. **How to "Live a Good Life": Aging and HIV Testing in Rural South Africa**.
Schatz, E., B. Houle, et al. J Aging Health 2018: 898264317751945.

OBJECTIVE: The African HIV epidemic is aging, yet HIV testing behavior studies either exclude older persons or include too few to say much about age differences.

METHOD: Strategically combining focus group interviews (participants in 40s/50s/60s-plus age groups) and survey data from rural South Africa (where HIV prevalence peaks in the late 30s, but continues to be over 10% into the late 60s), we examine gender and life course variation, motivations, and barriers in HIV testing.

RESULTS: We find significant gender differences-Women test at higher rates at younger ages, men at older ages. Our qualitative data not only highlight recognition of testing importance but also suggest gendered motivations and perceptions of testing. Men and women report similar barriers, however, including fear of finding out their (positive) HIV status, limited confidentiality, and partner nondisclosure.

DISCUSSION: We conclude with recommendations to increase HIV testing uptake among older adults including home testing, couples testing, and HIV testing concurrently with noncommunicable diseases.

61. **Completion of the tuberculosis care cascade in a community-based HIV linkage-to-care study in South Africa and Uganda**.
Shapiro, A. E., A. van Heerden, et al. J Int AIDS Soc 2018 21(1).
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5810338/pdf/JIA2-21-e25065.pdf

INTRODUCTION: Tuberculosis (TB) is the leading cause of HIV-associated mortality in Africa. As HIV testing, linkage to care and antiretroviral treatment initiation intensify to meet UNAIDS targets, it is not known what effect these efforts will have on TB detection and prevention. We aimed to characterize the TB care cascade of screening, diagnostic testing, treatment and provision of isoniazid preventive therapy (IPT) in a study of

community-based HIV screening and linkage to care and determine whether symptom screening results affected progress along the cascade.

METHODS: Between June 2013 and March 2015, HIV-infected adults enrolled in the Linkages study, a multi-site, community-based, randomized HIV screening and linkage-to-care study in South Africa and Uganda. All participants were screened for TB symptoms at entry after testing positive for HIV and referred to local clinics for care. During the 9 month follow-up, participants were periodically surveyed about clinic linkage and initiation of HIV care as well as subsequent TB testing, treatment, or IPT. We compared outcomes between persons with and without a positive symptom screen at baseline using descriptive statistics and Poisson regression to calculate relative risks of outcomes along the care cascade.

RESULTS AND DISCUSSION: Of the 1,325 HIV-infected adults enrolled, 26% reported at least one TB symptom at the time of HIV diagnosis. Loss of appetite and fever were the most commonly reported symptoms on a TB symptom screen. Despite 92% HIV linkage success, corresponding TB linkage was incomplete. Baseline TB symptoms were associated with an increased risk of a TB diagnosis (relative risk 3.23, 95% CI 1.51 to 6.91), but only 34% of symptomatic persons had sputum TB testing. Fifty-five percent of participants diagnosed with TB started TB treatment. In South Africa, only 18% of asymptomatic participants initiated IPT after linkage to HIV care, and presence of symptoms was not associated with IPT initiation (relative risk 0.86 95% CI 0.6 to 1.23).

CONCLUSIONS: HIV linkage to care interventions provide an opportunity to improve completion of the TB care cascade, but will require additional support to realize full benefits.

62. **Cognitive and physical development in HIV-positive children in South Africa and Malawi: A community-based follow-up comparison study**.
Sherr, L., I. S. Hensels, et al. Child Care Health Dev 2018 44(1): 89-98.
http://onlinelibrary.wiley.com/doi/10.1111/cch.12533/pdf

BACKGROUND: Child development is negatively impacted by HIV with children that are infected and affected by HIV performing worse than their peers in cognitive assessments.

METHODS: We conducted a descriptive follow-up comparison study (n=989) in South Africa and Malawi. We tracked child development in 135 HIV-positive children compared to 854 uninfected children aged 4-13 years attending community-based organizations at baseline and again 12-15 months later.

RESULTS: Children with HIV were more often stunted (58.8% vs. 27.4%) and underweight (18.7% vs. 7.1%). They also had significantly poorer general physical

functioning (M=93.37 vs. M=97.00). HIV-positive children scored significantly lower on digit span and the draw-a-person task.

CONCLUSIONS: These data clearly show that HIV infection poses a serious risk for child development and that there is a need for scaled up interventions. Community-based services may be ideally placed to accommodate such provision and deliver urgently needed support to these children.

63. **The growing burden of non-communicable disease among persons living with HIV in Zimbabwe**.
Smit, M., J. Olney, et al. Aids 2018.
https://insights.ovid.com/crossref?an=00002030-900000000-97303

OBJECTIVES: We aim to characterise the future noncommunicable disease (NCD) burden in Zimbabwe to identify future health system priorities.

METHODS: We developed an individual-based multidisease model for Zimbabwe, simulating births, deaths, infection with HIV and progression, and key NCD (asthma, chronic kidney disease (CKD), depression, diabetes, hypertension, stroke, breast, cervical, colorectal, liver, oesophageal, prostate and all other cancers). The model was parameterised using national and regional surveillance and epidemiological data. Demographic and NCD burden projections were generated for 2015 to 2035.

RESULTS: The model predicts that mean age of PLHIV will increase from 31 to 45 years between 2015 and 2035 (compared to 20 to 26 in uninfected individuals). Consequently, the proportion suffering from >/=1 key NCD in 2035 will increase by 26% in PLHIV and 6% in uninfected. Adult PLHIV will be twice as likely to suffer from >/=1 key NCD in 2035 compared to uninfected adults; with 15.2% of all key NCDs diagnosed in adult PLHIV, while contributing only 5% of the Zimbabwean population. The most prevalent NCDs will be hypertension, CKD, depression, and cancers. This demographic and disease shift in PLHIV is mainly due to reductions in incidence and the success of ART scale-up leading to longer life-expectancy and, to a lesser extent, the cumulative exposure to HIV and ART.

CONCLUSIONS: NCDs services will need to be expanded in Zimbabwe. They will need to be integrated into HIV care programmes, although the growing NCD burden amongst uninfected individuals presenting opportunities for additional services developed within HIV care to benefit HIV-negative persons.

64. **Determining Preferences Related to HIV Counselling and Testing Services Among High School Learners in KwaZulu-Natal: A Discrete Choice Experiment**.
Strauss, M., G. L. George, et al. AIDS Behav 2018 22(1): 64-76.

A key strategy of the South African national response to HIV is the scale-up of HIV counselling and testing (HCT) in the 15-49 years age group. The integrated school health policy aims to guide the roll out of youth-friendly health services including the provision of HCT in schools. Using a discrete choice experiment to examine preferences regarding the attributes of HCT service packages, this study identifies barriers to and facilitators of HCT among high school learners. Monetary considerations were found to have the strongest effect of any attribute on choice, whilst confidentiality was found to be a primary concern for learners considering HCT. Policy makers and service providers must ensure that confidentiality is maintained, and could consider using monetary incentives as a way of increasing uptake of HCT. Programmes designed to reduce social stigma and improve education and knowledge dissemination around HCT and HIV, are vital in creating demand for HCT and changing attitudes among young people.

65. **Loss to follow-up before and after initiation of antiretroviral therapy in HIV facilities in Lilongwe, Malawi**.
Tweya, H., I. K. Oboho, et al. PLoS One 2018 13(1): e0188488.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5786288/pdf/pone.0188488.pdf

INTRODUCTION: Although several studies have explored factors associated with loss to follow-up (LTFU) from HIV care, there remains a gap in understanding how these factors vary by setting, volume of patient and patients' demographic and clinical characteristics. We determined rates and factors associated with LTFU in HIV care Lilongwe, Malawi.

METHODS: We conducted a retrospective cohort study of HIV-infected individuals aged 15 years or older at the time of registration for HIV care in 12 ART facilities, between April 2012 and March 2013. HIV-positive individuals who had not started ART (pre-ART patients) were clinically assessed to determine ART eligibility at registration and during clinic follow-up visits. ART-eligible patients were initiated on triple antiretroviral combination. Study data were abstracted from patients' cards, facility ART registers or electronic medical record system from the date of registration for HIV care to a maximum follow-up period of 24 months. Descriptive statistics were undertaken to summarize characteristics of the study patients. Separate univariable and multivariable poisson regression models were used to explore factors associated with LTFU in pre-ART and ART care.

RESULTS: A total of 10,812 HIV-infected individuals registered for HIV care. Of these patients, 1,907 (18%) and 8,905 (82%) enrolled in pre-ART and ART care, respectively. Of the 1,907 pre-ART patients, 490 (26%) subsequently initiated ART and were included in both the pre-ART and ART analyses. The LTFU rates among patients in pre-ART and ART care were 48 and 26 per 100 person-years, respectively. Of the 9,105 ART patients with

reasons for starting ART, 2,451 (27%) were initiated on ART because of pregnancy or breastfeeding (Option B+) status. Multivariable analysis showed that being >/=35 years and female were associated with decreased risk of LTFU in the pre-ART and ART phases of HIV care. However, being in WHO clinical stage 3 (adjusted risk ratio (aRR) 1.35, 95% confidence interval (CI): 1.20-1.51) and stage 4 (aRR 1.87, 95% CI: 1.62-2.18), body mass index </= 18.4 (aRR 1.24, 95% CI: 1.11-1.39) at ART initiation, poor adherence to clinic appointments (aRR 4.55, 95% CI: 4.16-4.97) and receiving HIV care in rural facilities (aRR 2.32, 95% CI: 1.94-2.87) were associated with increased risk of LTFU among ART patients. Being re-initiated on ART once (aRR 0.20, 95% CI: 0.17-0.22), more than once (aRR 0.06, 95% CI: 0.05-0.07), and being enrolled at a low-volume facility (aRR 0.25, 95% CI: 0.20-0.30) were associated with decreased risk of LTFU from ART care.

CONCLUSION: A sizeable proportion of ART LTFU occurred among women enrolled during pregnancy or breast-feeding. Non- compliance to clinic and receiving ART in a rural facility or high-volume facility were associated with increased risk of LTFU from ART care. Developing effective interventions that target high-risk subgroups and contexts may help reduce LTFU from HIV care.

66. **Pre-exposure prophylaxis for HIV prevention in East and Southern Africa**.
Van der Wal, R. and D. Loutfi. Can J Public Health 2018 108(5-6): e643-e645.

Pre-exposure prophylaxis (PrEP) has proven to be highly effective in preventing HIV in uninfected persons when properly adhered to. East and Southern African countries that suffer from high HIV prevalence and incidence are increasingly adopting PrEP as an HIV prevention strategy for their high-risk populations, including for young women. Structural factors such as poverty, lack of education, and gender-based violence may compromise their PrEP uptake and adherence, however. Choice-disabled young women are most at risk of HIV infection and least able to apply HIV prevention choices. For successful rollout of this biomedical solution, we need structural interventions that address these underlying drivers of the HIV epidemic.

67. **Change in HIV-related stigma in South Africa between 2004 and 2016: a cross-sectional community study**.
Visser, M. J. AIDS Care 2018: 1-5.

A critical component of an AIDS-free generation is to reduce HIV-related stigma. Previous research predicted that stigma would decline over time with increased contact with PLWH, understanding of the disease and availability of treatment. The aim of the research was to explore change in stigma over a 12-year period, by comparing data collected from two large cross-sectional samples from South African communities in 2004 (before the roll-out of antiretroviral treatment (ART)) and in 2016. Students recruited respondents according to criteria related to age, gender, race and area of living. A survey assessing moral judgement and interpersonal distance was used to assess personal and perceived community stigma. Responses to ten identical items used

in the 2004 and 2016 data collection were compared. Personal stigma attached to HIV decreased significantly over time, except in respect of having close contact with PLWH, such as dating and befriending. Perceived community stigma remained high in all subgroups. It is argued that perceived community stigma contributes to high levels of internalised stigma among PLWH. Interventions should focus on helping PLWH to cope with perceived stigma and strategies to address stereotyping, which contributes to perceived community stigma.

68. **A comparative study of the psychological problems of HIV-infected and HIV-uninfected children in a South African sample**.
Visser, M. J., H. E. Hecker, et al. AIDS Care 2018: 1-8.

According to research children living with HIV experience elevated levels of depression, anxiety, ADHD and disruptive behavioural disorders. Although South Africa's paediatric population that is infected with the human immunodeficiency virus (HIV) is the largest worldwide, little research has been conducted on their mental health challenges. However, attributing high levels of mental health problems solely to their HIV status can be problematic as there may be other contributory factors. This research explored the mental health problems of HIV-infected children and compared these to the mental health problems of their HIV-unaffected peers from similar backgrounds. Data was gathered from two samples of child and caregiver pairs. HIV-infected children (aged 6-12 years) and their caregivers/mothers (n = 54) were recruited from the Kalafong paediatric clinic where they received medical treatment and routine ART. A comparison group of 113 HIV-uninfected children and their uninfected mothers were recruited from primary care clinics in the same community. Caregivers completed the Child Behaviour Checklist (CBCL) to assess children's mental health. Children completed the Self-Description Questionnaire (SDQ-I) and the Revised Children's Manifest Anxiety Scale (RCMAS). The scores of the psychometric sub-scales of the two groups were compared using parametric and non-parametric statistics. HIV-infected children experienced more somatic and affective problems, physiological anxiety, less ADHD and lower self-esteem than HIV-uninfected children in the comparison group, while controlling for age differences. The high levels of mental health problems of both groups of children may be attributed to similar difficult socio-economic circumstances. The fact that most infected children were not aware of their HIV-status could have influenced the results. Mental health services should not be limited to HIV-infected children but should form part of all health care services.

69. **A Simple Risk Prediction Algorithm for HIV Transmission: Results from HIV Prevention Trials in KwaZulu Natal, South Africa (2002-2012)**.
Wand, H., T. Reddy, et al. AIDS Behav 2018 22(1): 325-336.

We aimed to develop a HIV risk scoring algorithm for targeted screening among women in South Africa. We used data from five biomedical intervention trials (N = 8982 Cox regression models were used to create a risk prediction algorithm and it was internally

and externally validated using standard statistical measures; 7-factors were identified as significant predictors of HIV infection: <25 years old, being single/not cohabiting, parity (<3), age at sexual debut (<16), 3+ sexual partners, using injectables and diagnosis with a sexually transmitted infection(s). A score of >/=25 (out of 50) was the optimum cut point with 83% (80%) sensitivity in the development (validation) dataset. Our tool can be used in designing future HIV prevention research and guiding recruitment strategies as well as in health care settings. Identifying, targeting and prioritising women at highest risk will have significant impact on preventing new HIV infections by scaling up testing and pre-exposure prophylaxis in conjunction with other HIV prevention modalities.

70. **Understanding the experience and manifestation of depression in adolescents living with HIV in Harare, Zimbabwe**.
Willis, N., W. Mavhu, et al. PLoS One 2018 13(1): e0190423.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5752002/pdf/pone.0190423.pdf

BACKGROUND: Studies have found that adolescents living with HIV are at risk of depression, which in turn affects adherence to medication. This study explored the experience and manifestation of depression in adolescents living with HIV in Zimbabwe in order to inform intervention development.

METHODS: We conducted a body mapping exercise with 21 HIV positive 15-19 years olds who had been diagnosed with major depressive disorder. Participants created a painted map of their body to assist them in expressing their somatic and emotional experiences in qualitative interviews. The interviews were transcribed and thematically coded using NVivo 10.

RESULTS: Participants attributed their experiences of depression to their relationships and interactions with significant people in their lives, primarily family members and peers. A sense of being different from others was common among participants, both due to their HIV status and the impact HIV has had on their life circumstances. Participants described a longing to be important or to matter to the people in their lives. A sense of isolation and rejection was common, as well as grief and loss, including ambiguous and anticipated loss. Participants' idioms of distress included 'thinking deeply' ('kufungisisa'), 'pain', darkness, 'stress' or a lack of hope and ambiguity for the future. Suicidal ideation was described, including slow suicide through poor adherence. Supportive factors were also relational, including the importance of supportive relatives and peers, clinic staff and psychosocial support programmes.

CONCLUSIONS: An understanding of HIV positive adolescents' own narratives around depression can inform the development and integration of appropriate mental health interventions within HIV care and treatment programmes. Study findings suggest that family and peer-led interventions are potentially useful in the prevention and management of depression in adolescents living with HIV.

71. **"I will take ARVs once my body deteriorates": an analysis of Swazi men's perceptions and acceptability of Test and Start**.
Adams, A. K. and A. M. Zamberia. Afr J AIDS Res 2017 16(4): 295-303.
http://www.tandfonline.com/doi/pdf/10.2989/16085906.2017.1362015?needAccess=true

Swaziland has the highest HIV prevalence in the world. To mitigate the spread and devastation caused by HIV and to improve the wellbeing of people living with HIV, the country has adopted the latest available HIV prevention campaigns, including "Test and Start". Because evidence from randomised controlled trials has demonstrated a significant risk reduction in HIV transmission when HIV-positive people start antiretroviral therapy (ART) early, Swaziland aims to find these people and link them to treatment. This study presents findings regarding the perceptions of this promising HIV-prevention intervention among men aged 17-69 years. A combination of qualitative methods including focus group discussions (12), in-depth interviews (17), informal conversations and participant observation (21) were used to collect data in two peri-urban communities in 2013-2014. Findings illustrate that men still fear taking an HIV test because of a relatively high probability of a positive test which some still interpret as a death sentence. Other potential barriers to the effectiveness of Test and Start programmes include lack of hospitality in hospitals, fear of starting treatment early related to side effects of ART, poverty, and lack of trust in the financial stability of the Swazi government. We argue that several social factors need to be considered for the Test and Start programme to be more effective.

72. **Association of Adolescent- and Caregiver-Reported Antiretroviral Therapy Adherence with HIV Viral Load Among Perinatally-infected South African Adolescents**.
Brittain, K., N. A. Asafu-Agyei, et al. AIDS Behav 2017.

Accurate measurement of antiretroviral therapy (ART) adherence remains challenging and there are few data assessing the validity of self-reported adherence among perinatally HIV-infected adolescents. We examined adolescent and caregiver reports of adolescent adherence among perinatally-infected adolescents aged 9-14 years in Cape Town, South Africa, and explored factors that may modify associations between reported adherence and elevated viral load (VL). Among 474 adolescents (median age 12.0 years; median duration of ART use 7.5 years), elevated VL and caregiver- and adolescent-report of missed ART doses were common. Elevated VL was particularly prevalent among older, male adolescents. Low-moderate concordance was observed between caregiver and adolescent report. Among adolescents aged >/= 12 years, caregiver- and adolescent-reported adherence was associated with elevated VL across most items assessed, but few significant associations were observed among adolescents < 12 years of age. Refined adherence measures and tools to identify adolescents who require adherence interventions are needed in this context.

73. **Community Based Antiretroviral Treatment in Rural Zimbabwe**.

Chimukangara, B., J. Manasa, et al. AIDS Res Hum Retroviruses 2017 33(12): 1185-1191.

Treatment of HIV has reduced HIV/AIDS-related mortality. Sustaining >90% virologic suppression in sub-Saharan Africa requires decentralized care and prevention services to rural communities. In Zimbabwe, the number of people receiving antiretroviral treatment (ART) has increased rapidly. However, access to treatment monitoring tools such as viral load and drug resistance testing is limited. We assessed virologic treatment outcomes among ART recipients in Nyamutora, a rural community receiving bimonthly ART and prevention services. We enrolled all ART recipients (143) at 6-monthly visits in the Nyamutora community in 2014 and 2015. Whole blood samples were collected in K-EDTA tubes, transported to Harare for CD4 counts and viral load testing, and genotype was obtained in participants with viral loads >1,000 copies/ml. Ages ranged from 2 to 75 years (median 43 years) with a median 42 months on ART at follow-up. Eight of 143 (6%) had viral loads >1,000 copies/ml at one of the 3 visits, 7 on first-line nevirapine (NVP)-based ART and 1 on second-line LPV/r-based ART. Seven participants had sequence data available, and five had drug resistance mutations, K65R, T69N, K101E, K103N, Y181C/I, M184V, and G190A. Virologic failure (p = .001) and drug resistance mutations (p = .01) on first-line NVP-based ART were associated with younger age by univariate exact logistic regression. The participants had high viral suppression (94%) despite less than optimal (NVP based) ART regimens without laboratory monitoring. Virologic failure and drug resistance were higher among children and adolescents. Effective ART delivery to the community achieved high rates of virologic suppression and minimal drug resistance.

74. **Depression and alcohol use disorder at antiretroviral therapy initiation led to disengagement from care in South Africa**.
Cichowitz, C., N. Maraba, et al. PLoS One 2017 12(12): e0189820.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5744960/pdf/pone.0189820.pdf

We sought to assess mental health at the time of antiretroviral therapy (ART) initiation and subsequent retention in care over a six-month follow-up period. A total of 136 people living with HIV in South Africa were administered surveys measuring demographic information and mental health indicators at the time of ART initiation. Follow-up was completed via chart abstraction to assess for six-month outcomes of retention in care and viral suppression. At enrollment, 45/136 (33%), 67/136 (49%), and 45/136 (33%) participants screened positive for depression, anxiety, and alcohol use disorder, respectively. After six months of follow-up, 96/136 (71%) participants remained in care; 35/87 (40.2%) participants who remained in care had a level <50 copies/mL. Those with depression (49% vs. 77% retained; $p < 0.01$) and those with alcohol use disorder (52% vs. 76% retained; $p < 0.01$) were less likely to be retained in care. In multivariable logistic regression, depression OR 3.46 (95% CI: 1.33, 7.97; $p < 0.01$) and alcohol abuse OR 3.89 (95% CI: 1.70, 8.97; $p < 0.01$) were independently associated with loss from care. These results emphasize the importance of mental health on early ART outcomes and the HIV care continuum.

75. **Learners' perspectives on the provision of condoms in South African public schools**.
de Bruin, W. E. and S. Panday-Soobrayan. AIDS Care 2017 29(12): 1529-1532.
http://www.tandfonline.com/doi/pdf/10.1080/09540121.2017.1327647?needAccess=true

A stubborn health challenge for learners in South African public schools concerns sexual and reproductive health and rights (SRHR). In 2015, the Department of Basic Education (DBE) proposed the provision of condoms and SRHR-services to learners in schools. This study aimed to contribute to the finalisation and implementation of DBE's policy by exploring learners' perspectives on the provision of condoms and SRHR-services in schools. Sixteen focus group discussions were conducted with learners (n = 116) from 33 public schools, to assess their attitudes, social influences, and needs and desires regarding condom provision and SRHR-services in schools. The majority of learners did not support condom provision in schools as they feared that it may increase sexual activity. Contrarily, they supported the provision of other SRHR-services as clinics fail to offer youth-friendly services. Learners' sexual behaviour and access to SRHR-services are strongly determined by their social environment, including traditional norms and values, and social-pressure from peers and adults. Learners' most pressing needs and desires to access condoms and SRHR-services in school concerned respect, privacy and confidentiality of such service provision. Implementation of DBE's policy must be preceded by an evidence-informed advocacy campaign to debunk myths about the risk of increased sexual activity, to advocate for why such services are needed, to shift societal norms towards open discussion of adolescent SRHR and to grapple with the juxtaposition of being legally empowered but socially inhibited to protect oneself from HIV, STIs and early pregnancy. Provision of condoms and other SRHR-services in schools must be sensitive to learners' privacy and confidentiality to minimise stigma and discrimination.

76. **Factors Associated With Poor Linkage to HIV Care in South Africa: Secondary Analysis of Data From the Thol'impilo Trial**.
Dorward, J., T. Mabuto, et al. J Acquir Immune Defic Syndr 2017 76(5): 453-460.

BACKGROUND: Poor linkage to HIV care is impeding achievement of the Joint United Nations Programme on HIV and AIDS (UNAIDS) 90-90-90 targets. This study aims to identify risk factors for poor linkage-to-care after HIV counseling and testing, thereby informing strategies to achieve 90-90-90.

SETTING: The Thol'impilo trial was a large randomized controlled trial performed between 2012 and 2015 in South Africa, comparing different strategies to improve linkage-to-care among adults aged >/=18 years who tested HIV-positive at mobile clinic HIV counseling and testing.

METHODS: In this secondary analysis, sociodemographic factors associated with time to linkage-to-care were identified using Cox regression.

RESULTS: Of 2398 participants, 61% were female, with median age 33 years (interquartile range: 27-41) and median CD4 count 427 cells/mm (interquartile range: 287-595). One thousand one hundred one participants (46%) had clinic verified linkage-to-care within 365 days of testing HIV-positive. In adjusted analysis, younger age [</=30 vs >40 years: adjusted hazard ratio (aHR): 0.58, 95% CI: 0.50 to 0.68; 31-40 vs >40 years: aHR: 0.81, 95% CI: 0.70 to 0.94, test for trend P < 0.001], being male (aHR: 0.86, 95% CI: 0.76 to 0.98, P = 0.028), not being South African (aHR: 0.79, 95% CI: 0.66 to 0.96, P = 0.014), urban district (aHR: 0.82, 95% CI: 0.73 to 0.93, P = 0.002), being employed (aHR: 0.81, 95% CI: 0.72 to 0.92, P = 0.001), nondisclosure of HIV (aHR: 0.63, 95% CI: 0.56 to 0.72, P < 0.001), and having higher CD4 counts (test for trend P < 0.001) were all associated with decreased hazard of linkage-to-care.

CONCLUSION: Linkage-to-care was low in this relatively large cohort. Increasing linkage-to-care requires innovative, evidence-based interventions particularly targeting individuals who are younger, male, immigrant, urban, employed, and reluctant to disclose their HIV status.

77. **Impact of Birth HIV-PCR Testing on the Uptake of Follow-up Early Infant Diagnosis Services in Cape Town, South Africa**.
Dunning, L., M. Kroon, et al. Pediatr Infect Dis J 2017 36(12): 1159-1164.

INTRODUCTION: Polymerase chain reaction testing at birth ("birth-testing") is suggested by new World Health Organization guidelines for rapid diagnosis of infants infected with HIV in utero. However, there are few data on the implementation of this approach in sub-Saharan Africa, and whether birth testing affects uptake of subsequent routine early infant diagnosis (EID) testing at 6-10 weeks of age is unknown.

METHODS: We reviewed 575 consecutive infants undergoing targeted high-risk birth testing in Cape Town, South Africa, and matched those testing HIV negative at birth (n = 551) to HIV-exposed infants who did not receive birth testing (n = 551). Maternal and infant clinical and demographic data, including EID testing uptake, were abstracted from routine records.

RESULTS: Overall, 3.8% of all birth tests conducted were positive while later EID testing positivity rates were 0.5% for those infants testing HIV negative at birth and 0.4% for those without birth testing. Infants who underwent birth testing were less likely to present for later EID compared with those without a birth test (73% vs. 85%; P < 0.001). This difference persisted after adjusting for maternal and infant characteristics (adjusted odds ratio, 0.60; 95% confidence interval: 0.41-0.86) and across demographic and clinical subgroups. Infants undergoing birth testing also presented for later EID at a significantly older age (mean age, 60 vs. 50 days; P < 0.001).

CONCLUSIONS: While the yield of targeted high-risk birth testing in this setting appears high, neonates testing HIV negative at birth may be less likely to present for subsequent EID testing. For birth testing implementation to contribute to overall EID program goals, structured interventions are required to support follow-up EID services after negative birth test results.

78. **Willingness to use short-term oral pre-exposure prophylaxis (PrEP) by migrant miners and female partners of migrant miners in Mozambique**.
Falcao, J., L. Ahoua, et al. Cult Health Sex 2017 19(12): 1389-1403.

Migrant miners from Mozambique who work in South Africa and their partners are at substantial risk for HIV infection. We conducted a cross-sectional study to assess the willingness of migrant miners and female partners of miners to take short-term pre-exposure prophylaxis (PrEP) for prevention of HIV acquisition. The study was conducted in Gaza Province, Mozambique, between September and October 2015. A total of 131 male miners and female partners of male miners completed a questionnaire. Subsequently, 48 in-depth interviews among male miners and female partners of miners and 3 focus-group discussions (6 participants each) among female partners of miners were conducted. Quantitative data were tabulated using Stata. A structured coding scheme was developed and qualitative data were analysed using Atlas.ti. Most participants (94%) were willing to take PrEP for short-term use. Facilitating factors for willingness to use PrEP were concerns about partner's sexual behaviour, desire for pregnancy and one's own sexual behaviour. The main barriers to PrEP use were concerns regarding side-effects, perceived difficulty adhering to daily pill taking and concern about partner/family disapproval. Overall, participants saw potential barriers for PrEP as minor obstacles that could be overcome. The male partner's influence on PrEP use was significant.

79. **Factors Associated with Use of Short-Term Pre-Exposure Prophylaxis for HIV Among Female Partners of Migrant Miners in Mozambique**.
Falcao, J., A. Zerbe, et al. AIDS Patient Care STDS 2017 31(12): 528-534.

Effective interventions tailored to specific types of behaviors and contexts are needed for women at risk for HIV acquisition. Oral pre-exposure prophylaxis (PrEP) is an efficacious HIV prevention intervention that uses antiretroviral drugs to reduce the risk of acquiring HIV infection. In Mozambique, HIV remains a major public health concern, with a national prevalence of 13%. Studies have demonstrated that the migration of male miners between southern provinces of Mozambique and South Africa is contributing to the HIV epidemic in Mozambique. This increased risk is associated with the engagement of male miners, while separated from their partners, in sexual relationships with other women, including transactional sex workers, in a hyperendemic setting in South Africa. We conducted 25 in-depth interviews with a subset of female partners in a stable relationship with migrant miners participating in a prospective

cohort study to assess the feasibility, acceptability, and adherence to daily oral short-term PrEP. Drug levels were available for the participants, as reported in an earlier study. Interviews were recorded, transcribed, and submitted for qualitative thematic analysis. The major themes identified were the benefits of taking PrEP, the ease of taking daily PrEP, the reluctance to disclose PrEP use to partners, the lack of changes in sexual behavior, and prevailing gender dynamics and how they impact women's ability to access PrEP and other HIV prevention interventions.

80. **The lived experiences of rural women diagnosed with the human immunodeficiency virus in the antenatal period**.
Fords, G. M., T. Crowley, et al. Sahara j 2017 14(1): 85-92.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5639609/pdf/rsah-14-1379430.pdf

BACKGROUND: In South Africa, pregnant women are diagnosed with human immunodeficiency virus (HIV) at antenatal clinics and simultaneously initiated on antiretroviral treatment (ART). An HIV diagnosis together with the initiation of ART has an emotional impact that may influence how pregnant women cope with pregnancy and their adherence to a treatment plan. The aim of the study was to explore the lived experiences of women diagnosed with HIV in the antenatal period in a rural area in the Eastern Cape province of South Africa.

METHODS: A qualitative approach with a descriptive phenomenological design was utilised. The study applied purposive sampling to select participants from a local community clinic in the Eastern Cape. Ten semistructured interviews were conducted, transcribed and analysed using Colaizzi's framework.

RESULTS: Four themes formed the essential structure of the phenomenon being investigated: a reality that hits raw, a loneliness that hurts, hope for a fractured tomorrow and support of a few. Although the participants had to accept the harsh reality of being diagnosed with HIV and experienced loneliness and the support of only a few people, they had hope to live and see the future of their children.

CONCLUSION: Women diagnosed with HIV during pregnancy are ultimately concerned with the well-being of their unborn children, and this concern motivates their adherence to ART. Women's lived experiences are situated in their unique sociocultural context, and although some known challenges remain, counselling and support strategies need to be informed by exploring context-specific issues and involving the local community.

81. **Factors associated with condom use among men and women living with HIV in Lilongwe, Malawi: a cross-sectional study**.
Haddad, L. B., J. H. Tang, et al. J Fam Plann Reprod Health Care 2017.
http://srh.bmj.com/content/familyplanning/44/1/1.2.full.pdf

BACKGROUND: Understanding the influences on condom use among men and women living with HIV is critical to tailoring sexually transmitted infection/HIV prevention efforts.

METHODS: This is a sub-analysis of a cross-sectional survey including 255 women and 220 men who were sexually active, HIV-positive, and attending HIV care visits in Lilongwe, Malawi. We estimated adjusted prevalence ratios (aPRs) to evaluate for factors associated with consistent condom use (always using condoms in the past month) and use at last coitus for men and women in separate models.

RESULTS: Among women: 38% and 55% reported consistent condom use and condom use at last coitus, respectively. For women, consistent use and use at last coitus were positively associated with the ability to refuse sex without condoms and shared decision-making compared with making the decision alone regarding condom use, and negatively associated with desire for children in the future. Consistent use also increased with longer antiretroviral therapy (ART) use (>/=1 year compared with no ART use). Among men: 51% and 69% reported consistent condom use and condom use at last coitus, respectively. For men, the ability to refuse sex without condoms was associated with consistent use and use at last coitus, and believing that condoms should be used with other contraception was associated with consistent use.

CONCLUSIONS: Our findings demonstrate ongoing low condom utilisation among HIV-positive individuals, and highlight that ART and contraceptive use do not deter condom use. Efforts to increase condom utilisation must recognise individual-level factors that influence use and should focus on relationship dynamics and promotion of empowerment and self-efficacy.

82. **Understanding men's networks and perceptions of leadership to promote HIV testing and treatment in Agincourt, South Africa**.
Hill, L. M., A. Gottert, et al. Glob Public Health 2017: 1-11.

Understanding informal leadership in high HIV prevalence settings is important for the success of popular opinion leader (POL) and other HIV testing and treatment promotion strategies which aim to leverage the influence of these leaders. We conducted a study in Mpumalanga province, South Africa, in which we aimed to: (1) describe men's personal networks and key social relationships; and (2) describe the types of individuals men identify as leaders. We administered a structured questionnaire with 45 men (15 HIV-positive and 30 HIV-negative) in which men enumerated and described characteristics of individuals they share personal matters with, and people they considered as leaders. We further conducted in-depth interviews with 25 of these men to better understand men's conceptualisation of leadership in their community. Family members were prominent in men's personal networks and among the leaders they nominated. Men living with HIV were much more likely to know others living with HIV, and described friendships on the basis of the shared experience of HIV treatment. Future POL interventions aiming to

promote HIV testing and care among men in rural South Africa should consider the importance of family in community leadership, and seek to leverage the influence of connections between men living with HIV.

83. **Feasibility, Acceptability, and Adherence with Short-Term HIV Preexposure Prophylaxis in Female Sexual Partners of Migrant Miners in Mozambique**.
Lahuerta, M., A. Zerbe, et al. J Acquir Immune Defic Syndr 2017 76(4): 343-347.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5662163/pdf/qai-76-343.pdf

BACKGROUND: Preexposure prophylaxis (PrEP) offers protection from HIV acquisition if taken as prescribed. We evaluated the feasibility, acceptability, and adherence with short-term PrEP among female sexual partners of migrant miners in Mozambique.

METHODS: HIV-negative female sexual partners of migrant miners were offered daily tenofovir/emtricitabine (TDF/FTC) for 6 weeks concurrent with miners' return home. Study visits occurred at baseline, week 4, 6, and 8. Dried blood spots (DBSs) were collected at week 4 and 6.

RESULTS: Seventy-four women (median age: 42 years) were enrolled, 95% reported having 1 sexual partner and 80% reported never or rarely using condoms. At baseline, 41% had never tested for HIV; 65% were unaware of partners' HIV status. Of all women, 72 (97%) initiated PrEP, 7 (9%) discontinued PrEP before week 6; only 1 due to adverse events. Missed doses in the last week were self-reported by 8% and 3% of women at week 4 and 6, respectively. Of 66 (89%) women with DBS at week 4, 79% had detectable tenofovir diphosphate (TFV-DP) and 44% had levels consistent with >/=4 pills/wk (>/=700 fmol/punch). Of 63 (88%) women with DBS at week 6, 76% had detectable TFV-DP and 42% had levels consistent with >/=4 pills/wk.

CONCLUSIONS: In this first study assessing the use of short-term PrEP, a high percent of female partners of migrant workers initiated PrEP and had detectable DP levels during follow-up. Further efforts are needed to enhance adherence to ensure protection from HIV acquisition. Short-term PrEP offers promise for populations who are at high risk of HIV during specific periods of time.

84. **The impact of HIV antiretroviral treatment perception on risky sexual behaviour in Botswana: a short report**.
Letamo, G., M. Keetile, et al. AIDS Care 2017 29(12): 1589-1593.

The aim of this article is to investigate the impact of ART perception on risky sexual behaviours in Botswana. Using binary logistic regression analysis controlling for individual characteristics, the results tend to support the hypothesis that ART misconceptions do not necessarily increase risky sexual behaviours. In particular, the study findings suggest the belief that ARVs cure HIV and AIDS and that people on ARVs should not always use condoms do not necessarily lead to increased risky sexual

behaviours, particularly among women. Gender differentials exist in the perceived sexual risk resulting from the use of ART. Risky sexual behaviours increase for women who, wrongly, believed that ARVs cure HIV and AIDS and people on ARVs should not always use condoms. Although there is evidence to suggest ART perceptions do not necessarily lead to increased risky sexual behaviours, HIV and AIDS prevention programmes are needed to strengthen their information, education and communication intervention component that can address misconceptions about ART treatment and provide correct information that is gender-appropriate.

85. **"My mother told me that I should not": a qualitative study exploring the restrictions placed on adolescent girls living with HIV in Zambia**.
Mackworth-Young, C. R., V. Bond, et al. J Int AIDS Soc 2017 20(4).
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5810345/pdf/JIA2-20-e25035.pdf

INTRODUCTION: Adolescent girls in sub-Saharan Africa are disproportionately affected by HIV due to a range of social and structural factors. As they transition to adulthood, they are recipients of increasing blame for HIV infection and 'improper' sex, as well as increasing scrutiny, restrictions and surveillance. This study used a qualitative and participatory approach to explore the messaging and restrictions imposed on adolescent girls living with HIV in Zambia.

METHODS: Thirty-four in-depth interviews and four participatory workshops were carried out with 24 adolescent girls aged 15 to 19 years old living with HIV in Lusaka, Zambia. Key themes explored included experiences living with HIV, finding out about HIV status, disclosure, experiences with antiretroviral treatment, and support needs. Data were organized, coded and analysed using a grounded theory approach to thematic analysis. This analysis uses data on participants' experiences of living with HIV and their interactions with their parents, guardians and healthcare providers.

RESULTS: Family and healthcare providers, partly in a quest to protect both the health of adolescent girls living with HIV and also to protect them from blaming discourse, imposed restrictions on their behaviour around three main topics: don't disclose your HIV status, don't have sex, and don't miss your medicines. These restrictions were often delivered using tactics of fear, and usually disconnected from other options. Participants responded to these messages in several ways, including internalizing the messages, changing their behaviour either to comply with or resist the restrictions, by remaining silent and anxious when restrictions were broken, and developing concerns around their own health and sexual and reproductive aspirations. Participants also sometimes experiencing stigma when restrictions could not be maintained.

CONCLUSIONS: Restrictive messages were delivered to adolescent girls living with HIV through the broader social discourses of stigma, religion, and global and local narratives about HIV. Programmes aiming to support adolescent girls living with HIV need to work together with parents and healthcare providers to reflect on the impact of sanctioning

messages, and to encourage more enabling and empowering messaging for adolescent girls living with HIV.

86. **Cost analysis of two community-based HIV testing service modalities led by a Non-Governmental Organization in Cape Town, South Africa**.
Meehan, S. A., N. Beyers, et al. BMC Health Serv Res 2017 17(1): 801.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5712171/pdf/12913_2017_Article_2760.pdf

BACKGROUND: In South Africa, the financing and sustainability of HIV services is a priority. Community-based HIV testing services (CB-HTS) play a vital role in diagnosis and linkage to HIV care for those least likely to utilise government health services. With insufficient estimates of the costs associated with CB-HTS provided by NGOs in South Africa, this cost analysis explored the cost to implement and provide services at two NGO-led CB-HTS modalities and calculated the costs associated with realizing key HIV outputs for each CB-HTS modality.

METHODS: The study took place in a peri-urban area where CB-HTS were provided from a stand-alone centre and mobile service. Using a service provider (NGO) perspective, all inputs were allocated by HTS modality with shared costs apportioned according to client volume or personnel time. We calculated the total cost of each HTS modality and the cost categories (personnel, capital and recurring goods/services) across each HTS modality. Costs were divided into seven pre-determined project components, used to examine cost drivers. HIV outputs were analysed for each HTS modality and the mean cost for each HIV output was calculated per HTS modality.

RESULTS: The annual cost of the stand-alone and mobile modalities was $96,616 and $77,764 respectively, with personnel costs accounting for 54% of the total costs at the stand-alone. For project components, overheads and service provision made up the majority of the costs. The mean cost per person tested at stand-alone ($51) was higher than at the mobile ($25). Linkage to care cost at the stand-alone ($1039) was lower than the mobile ($2102).

CONCLUSIONS: This study provides insight into the cost of an NGO led CB-HTS project providing HIV testing and linkage to care through two CB-HIV testing modalities. The study highlights; (1) the importance of including all applicable costs (including overheads) to ensure an accurate cost estimate that is representative of the full service implementation cost, (2) the direct link between test uptake and mean cost per person tested, and (3) the need for effective linkage to care strategies to increase linkage and thereby reduce the mean cost per person linked to HIV care.

87. **Life skills as a behaviour change strategy in the prevention of HIV and AIDS: Perceptions of students in an open and distance learning institution**.
Mohapi, B. J. and E. M. Pitsoane. Sahara j 2017 14(1): 77-84.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5639614/pdf/rsah-14-1374878.pdf

The prevention of HIV and AIDS, especially amongst young people, is very important, as they are the future leaders. South Africa carries a high burden of the HIV and AIDS disease, and efforts at the prevention of the disease need to be intensified. University students are also at risk, and prevention efforts need to be intensified to ensure that students graduate and enter the world of work to become productive citizens. Failure to pay attention to preventative behaviour amongst university students may have negative socio-economic consequences for the country. The paper presents a quantitative study undertaken amongst students at the University of South Africa, an Open and Distance Learning Institution in South Africa. The aim of the study was to explore the perceptions of students regarding life skills as a behaviour change strategy at Unisa. The study was conducted in the three regions of the University: Midlands region, Gautengregion and Limpopo region. Data were collected by means of self-administered questionnaires and were analysed by using the Statistical Programme for Social Sciences. The findings revealed that students have a need to attend life skills workshops, which are facilitated by trained student counsellors since they believe that the life skills training will assist them to be assertive and practise behaviours which will not make them vulnerable to the HIV and AIDS infection**.**

88. **Prevalence of psychological distress and its association with socio-demographic and HIV-risk factors in South Africa: Findings of the 2012 HIV prevalence, incidence and behaviour survey**.
Mthembu, J. C., M. L. H. Mabaso, et al. SSM Popul Health 2017 3: 658-662.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5769074/pdf/main.pdf

BACKGROUND: In South Africa, there are limited nationally representative data on the prevalence and factors associated with psychological distress. This study used a 2012 nationally representative population-based household survey to investigate factors associated with psychological distress in South Africa.

METHODS: The survey is based on a multistage stratified cross-sectional design. Univariate and multivariate logistic regression models were fitted to identify factors associated with psychological distress.

RESULTS: Out of a total 25860 participants, 23.9% reported psychological distress. Higher likelihood of reporting psychological distress was significantly associated with being female [OR = 1.68 (95% CI: 1.34-2.10), p < 0.001], aged 25 to 49 years [OR = 1.35 (95% CI: 1.08-1.70), p = 0.010] and 50 years and older [OR = 1.44 (95% CI: 1.06-1.97), p = 0.023)], Black Africans [OR = 1.61 (95% CI: 1.24-2.10), p < 0.001)], a high risk drinker [OR = 1.37 (95% CI: 1.02-1.83), p = 0.037], a hazardous drinker [OR = 4.76 (95% CI: 2.69-8.42), p < 0.001] and HIV positive, [OR = 1.79 (95% CI:1.55-2.08) p < 0.001], while lower likelihood of reporting psychological distress was significantly associated with being married [OR = 0.78 (95% CI: 0.62-0.98), p = 0.031), employed [OR = 0.71 (95% CI: 0.57-

0.88), p = 0.002], and living in a rural formal area [OR = 0.73 (95% CI: 0.55-0.97), p = 0.033].

CONCLUSION: There is a need to develop strategies to alleviate psychological distress in the general population, with a particular focus on those who may be more vulnerable to distress such as females, the aged, excessive alcohol users, the unemployed, people living with HIV and those residing in urban areas as identified in the current findings.

89. **Perceptions about data-informed decisions: an assessment of information-use in high HIV-prevalence settings in South Africa**.
Nicol, E., D. Bradshaw, et al. BMC Health Serv Res 2017 17(Suppl 2): 765.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5773892/pdf/12913_2017_Article_2641.pdf

BACKGROUND: Information-use is an integral component of a routine health information system and essential to influence policy-making, program actions and research. Despite an increased amount of routine data collected, planning and resource-allocation decisions made by health managers for managing HIV programs are often not based on data. This study investigated the use of information, and barriers to using routine data for monitoring the prevention of mother-to-child transmission of HIV (PMTCT) programs in two high HIV-prevalence districts in South Africa.

METHODS: We undertook an observational study using a multi-method approach, including an inventory of facility records and reports. The performance of routine information systems management (PRISM) diagnostic 'Use of Information' tool was used to assess the PMTCT information system for evidence of data use in 57 health facilities in two districts. Twenty-two in-depth interviews were conducted with key informants to investigate barriers to information use in decision-making. Participants were purposively selected based on their positions and experience with either producing PMTCT data and/or using data for management purposes. We computed descriptive statistics and used a general inductive approach to analyze the qualitative data.

RESULTS: Despite the availability of mechanisms and processes to facilitate information-use in about two-thirds of the facilities, evidence of information-use (i.e., indication of some form of information-use in available RHIS reports) was demonstrated in 53% of the facilities. Information was inadequately used at district and facility levels to inform decisions and planning, but was selectively used for reporting and monitoring program outputs at the provincial level. The inadequate use of information stemmed from organizational issues such as the lack of a culture of information-use, lack of trust in the data, and the inability of program and facility managers to analyze, interpret and use information.

CONCLUSIONS: Managers' inability to use information implied that decisions for program implementation and improving service delivery were not always based on data.

This lack of data use could influence the delivery of health care services negatively. Facility and program managers should be provided with opportunities for capacity development as well as practice-based, in-service training, and be supported to use information for planning, management and decision-making.

90. **Reducing substance use and risky sexual behaviour among drug users in Durban, South Africa: Assessing the impact of community-level risk-reduction interventions**. Parry, C. D. H., T. Carney, et al. Sahara j 2017 14(1): 110-117. http://www.tandfonline.com/doi/pdf/10.1080/17290376.2017.1381640?needAccess=true

Alcohol and other drug (AOD) use is increasingly recognised as having a direct and indirect effect on the transmission of human immunodeficiency virus (HIV). However, there is evidence to suggest that drug- and sex-related HIV risk-reduction interventions targeted at drug users within drug treatment centres or via community outreach efforts can lead to positive health outcomes. This study aimed to test whether a community-level intervention aimed at AOD users has an impact on risky AOD use and sexual risk behaviour. In 2007, in collaboration with a local non-governmental organisation (NGO) in Durban, an initiative was begun to implement a number of harm reduction strategies for injection and non-injection drug users. The NGO recruited peer outreach workers who received intensive initial training, which was followed by six-monthly monitoring and evaluation of their performance. Participants had to be 16 years of age or older, and self-reported alcohol and/or drug users. Peer outreach workers completed a face-to-face baseline questionnaire with participants which recorded risk behaviours and a risk-reduction plan was developed with participants which consisted of reducing injection (if applicable) and non-injection drug use and sex-related risks. Other components of the intervention included distribution of condoms, risk-reduction counselling, expanded access to HIV Testing Services, HIV/sexually transmitted infection care and treatment, and referrals to substance abuse treatment and social services. At follow-up, the baseline questionnaire was completed again and participants were also asked the frequency of reducing identified risk behaviours. Baseline information was collected from 138 drug users recruited into the study through community-based outreach, and who were subsequently followed up between 2010 and 2012. No injection drug users were reached. The data presented here are for first contact (baseline) and the final follow-up contact with the participants. There were no decreases in drug use practices such as use of cannabis, heroin, cocaine and Ecstasy after the intervention with drug users; however, there was a significant reduction in alcohol use following the intervention. While there was a substantial increase in the proportion of participants using drugs daily as opposed to more often, the reduction in the frequency of drug use was not statistically significant. Following the intervention, drug users had significantly fewer sexual partners, but there were no significant differences following the intervention with regard to frequency of sex or use of condoms. Substance use in general and during sex was, however, decreased. While the findings were mixed, the study shows that it is possible to provide HIV risk-reduction services to a population of

substance users who are less likely to receive services through community outreach, and provide risk-reduction information, condoms and condom demonstration and other services. More intensive interventions might be needed to have a substantial impact on substance use and substance use-related HIV risk behaviours.

91. **Socio-demographic, Marital, and Psychosocial Factors Associated with Condom Use Negotiation Self-Efficacy Among Mozambican Women at Risk for HIV Infection**. Patrao, A. L. and T. M. McIntyre. Int J Behav Med 2017 24(6): 846-855.

    PURPOSE: In Mozambique, women are the most affected by HIV/AIDS. Self-efficacy is one of the main predictors of effective use of a condom. Therefore, it is essential to identify the factors that influence condom-use negotiation self-efficacy in vulnerable women. The aim of this paper is to identify socio-demographic, marital, and psychosocial factors associated with condom-use negotiation self-efficacy among Mozambican women at risk for HIV infection.

    METHODS: Participants were women (173) who were patients at the Gynecology Department of the Central Hospital of Beira, Mozambique, and at risk for HIV infection. Women completed measures of condom-use negotiation self-efficacy, HIV prevention knowledge, and perceived barriers against safer sex.

    RESULTS: The results showed that demographic and marital variables are associated with condom-use negotiation self-efficacy, namely, those having more than 9 years of education, who are younger and not living with a partner, and who talk about AIDS with partners report higher condom-use negotiation self-efficacy. Regarding psychosocial factors, higher HIV prevention knowledge and fewer perceived barriers to safer sex predict higher condom-use negotiation self-efficacy.

    CONCLUSION: These results can contribute to sexual health promotion and HIV/AIDS prevention in Mozambican women because they identify at-risk groups and marital and psychosocial malleable factors that can be targeted in AIDS prevention among at-risk Mozambican women.

92. **Adolescent Access to Care and Risk of Early Mother-to-Child HIV Transmission**. Ramraj, T., D. Jackson, et al. J Adolesc Health 2017. http://www.jahonline.org/article/S1054-139X(17)30504-9/pdf

    PURPOSE: Adolescent females aged 15-19 account for 62% of new HIV infections and give birth to 16 million infants annually. We quantify the risk of early mother-to-child transmission (MTCT) of HIV among adolescents enrolled in nationally representative MTCT surveillance studies in South Africa.

    METHODS: Data from 4,814 adolescent (</=19 years) and 25,453 adult (>/=20 years) mothers and their infants aged 4-8 weeks were analyzed. These data were gathered

during three nationally representative, cross-sectional, facility-based surveys, conducted in 2010, 2011-2012, and 2012-2013. All infants were tested for HIV antibody (enzyme immunoassay), to determine HIV exposure. Enzyme immunoassay-positive infants or those born to self-reported HIV-positive mothers were tested for HIV infection (total nucleic acid polymerase chain reaction). Maternal HIV positivity was inferred from infant HIV antibody positivity. All analyses were weighted for sample realization and population live births.

RESULTS: Adolescent mothers, compared with adult mothers, have almost three times less planned pregnancies 14.4% (95% confidence interval [CI]: 12.5-16.5) versus 43.9% (95% CI: 42.0-45.9) in 2010 and 15.2% (95% CI: 13.0-17.9) versus 42.8% (95% CI: 40.9-44.6) in 2012-2013 ($p < .0001$), less prevention of MTCT uptake (odds ratio [OR] in favor of adult mothers = 3.36, 95% CI: 2.95-3.83), and higher early MTCT (adjusted OR = 3.0, 95% CI: 1.1-8.0), respectively. Gestational age at first antenatal care booking was the only significant predictor of early MTCT among adolescents.

CONCLUSIONS: Interventions that appeal to adolescents and initiate sexual and reproductive health care early should be tested in low- and middle-income settings to reduce differential service uptake and infant outcomes between adolescent and adult mothers.

93. **Utilization of Sexually Transmitted Infection Services at 2 Health Facilities Targeting Men Who Have Sex With Men in South Africa: A Retrospective Analysis of Operational Data**.
Rees, K., O. Radebe, et al. Sex Transm Dis 2017 44(12): 768-773.

BACKGROUND: Men who have sex with men (MSM) are a key population, particularly vulnerable to sexually transmitted infections (STIs) and HIV, but there are limited data on health programs targeting MSM in Africa. This study aims to describe the utilization of nongovernmental organization-supported sexual health services for MSM at 2 public sector health facilities in Johannesburg, South Africa.

METHODS: We retrospectively analyzed routine data over the period of January 2014 to June 2016. We report on service utilization for STI syndromes, HIV testing, and the antiretroviral therapy (ART) program.

RESULTS: Some 5796 men visited the facilities. Seven thousand one hundred eighty-eight STI episodes were managed, 68.2% (4903 episodes) of which were classified as male urethritis and 9.8% (704 episodes) as genital ulcers. Positivity yield for first-time HIV tests was 38.0% (205 positive test results) in MSM, compared with 14.1% (471 positive test results) in other men. At the end of the study, there were 1090 clients on ART, and 2-year retention was 82% (95% confidence interval, 78%-85%). There was no difference in retention between MSM and other men ($P = 0.49$).

CONCLUSIONS: This study is the first to show that sexual health services targeting MSM in Africa have managed to attract MSM and other men in need of STI and HIV care. The observed high HIV testing yield among MSM illustrates the relevance of MSM-focused services in the South African public health sector, and the good retention on ART demonstrates that high-quality care can be provided to MSM in our setting.

94. **The Achilles' heel of prevention to mother-to-child transmission of HIV: Protocol implementation, uptake, and sustainability**.
Rodriguez, V. J., R. P. LaCabe, et al. Sahara j 2017 14(1): 38-52.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5638135/pdf/rsah-14-1375425.pdf

    The Joint United Nations Programme on HIV and AIDS proposed to reduce the vertical transmission of HIV from approximately 72,200 to approximately 8300 newly infected children by 2015 in South Africa (SA). However, cultural, infrastructural, and socio-economic barriers hinder the implementation of the prevention of mother-to-child transmission (PMTCT) protocol, and research on potential solutions to address these barriers in rural areas is particularly limited. This study sought to identify challenges and solutions to the implementation, uptake, and sustainability of the PMTCT protocol in rural SA. Forty-eight qualitative interviews, 12 focus groups discussions (n = 75), and one two-day workshop (n = 32 participants) were conducted with district directors, clinic leaders, staff, and patients from 12 rural clinics. The delivery and uptake of the PMTCT protocol was evaluated using the Consolidated Framework for Implementation Research (CFIR); 15 themes associated with challenges and solutions emerged. Intervention characteristics themes included PMTCT training and HIV serostatus disclosure. Outer-setting themes included facility space, health record management, and staff shortage; inner-setting themes included supply use and availability, staff-patient relationship, and transportation and scheduling. Themes related to characteristics of individuals included staff relationships, initial antenatal care visit, adherence, and culture and stigma. Implementation process themes included patient education, test results delivery, and male involvement. Significant gaps in care were identified in rural areas. Information obtained from participants using the CFIR framework provided valuable insights into solutions to barriers to PMTCT implementation. Continuously assessing and correcting PMTCT protocol implementation, uptake and sustainability appear merited to maximize HIV prevention.

95. **Predictors of timely linkage-to-ART within universal test and treat in the HPTN 071 (PopART) trial in Zambia and South Africa: findings from a nested case-control study**.
Sabapathy, K., C. Mubekapi-Musadaidzwa, et al. J Int AIDS Soc 2017 20(4).
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5810326/pdf/JIA2-20-e25037.pdf

    INTRODUCTION: HPTN 071 (PopART) is a three-arm community randomized trial in Zambia and South Africa evaluating the impact of a combination HIV prevention package, including universal test and treat (UTT), on HIV incidence. This nested study examined factors associated with timely linkage-to-care and ART initiation (TLA) (i.e.

within six-months of referral) in the context of UTT within the intervention communities of the HPTN 071 (PopART) trial.

METHODS: Of the 7572 individuals identified as persons living with HIV (PLWH) (and not on antiretroviral treatment (ART)) during the first year of the PopART intervention provided by Community HIV-care Providers (CHiPs) through door-to-door household visits, individuals who achieved TLA (controls) and those who did not (cases), stratified by gender and community, were randomly selected to be re-contacted for interview. Standardized questionnaires were administered to explore factors potentially associated with TLA, including demographic and behavioural characteristics, and participants' opinions on HIV and related services. Odds ratios comparing cases and controls were estimated using a multi-variable logistic regression.

RESULTS: Data from 705 participants (333 cases/372 controls) were analysed. There were negligible differences between cases and controls by demographic characteristics including age, marital or socio-economic position. Prior familiarity with the CHiPs encouraged TLA (aOR of being a case: 0.58, 95% CI: 0.39 to 0.86, p = 0.006). Participants who found clinics overcrowded (aOR: 1.51, 95% CI: 1.08 to 2.12, p = 0.006) or opening hours inconvenient (aOR: 1.63, 95% CI: 1.06 to 2.51, p = 0.02) were less likely to achieve TLA, as were those expressing stronger feelings of shame about having HIV (ptrend = 0.007). Expressing "not feeling ready" (aOR: 2.75, 95% CI: 1.89 to 4.01, p < 0.001) and preferring to wait until they felt sick (aOR: 2.00, 95% CI: 1.27 to 3.14, p = 0.02) were similarly indicative of being a case. Worrying about being seen in the clinic or about how staff treated patients was not associated with TLA. While the association was not strong, we found that the greater the number of self-reported lifetime sexual partners the more likely participants were to achieve TLA (ptrend = 0.06). There was some evidence that participants with HIV-positive partners on ART were less likely to be cases (aOR: 0.75, 95% CI: 0.53 to 1.06, p = 0.07).

DISCUSSION: The lack of socio-demographic differences between cases and controls is encouraging for a "universal" intervention that seeks to ensure high coverage across whole communities. Making clinics more "patient-friendly" could enhance treatment uptake further. The finding that those with higher risk behaviour are more actively engaging with UTT holds promise for treatment-as-prevention.

96. **Can cash break the cycle of educational risks for young children in high HIV-affected communities? A cross-sectional study in South Africa and Malawi**.
Sherr, L., M. Tomlinson, et al. J Glob Health 2017 7(2): 020409.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5735773/pdf/jogh-07-020409.pdf

BACKGROUND: Household cash grants are associated with beneficial outcomes; enhanced if provided in combination with care.

OBJECTIVES: This study describes the impact of cash grants and parenting quality on 854 children aged 5-15 (South African and Malawi) on educational outcomes including enrolment, regular attendance, correct class for age and school progress (controlling for cognitive performance). Consecutive attenders at randomly selected Community based organisations were recruited. The effects of cash plus good parenting, HIV status and gender were examined.

RESULTS: Overall 73.1% received a grant - significantly less children with HIV (57.3% vs 75.6% (chi(2) = 17.21, P < 0.001). Controlling for cognitive ability, grant receipt was associated with higher odds of being in the correct grade (odds ratio (OR) = 2.00; 95% confidence interval (CI) = 1.36, 2.95), higher odds of attending school regularly (OR = 3.62; 95% CI = 1.77, 7.40), and much higher odds of having missed less than a week of school recently (OR = 8.95; 95% CI = 2.27, 35.23). Grant receipt was not associated with how well children performed in school compared to their classmates or with school enrolment. Linear regression revealed that grant receipt was associated with a significant reduction in educational risk (B = -0.32, t(420) = 2.84, P = 0.005) for girls.

CONCLUSION: Cash plus good parenting affected some educational outcomes in a stepwise manner, but did not provide additive protection.

97. **Identifying 'corridors of HIV transmission' in a severely affected rural South African population: a case for a shift toward targeted prevention strategies**.
Tanser, F., T. Barnighausen, et al. Int J Epidemiol 2017.

BACKGROUND: In the context of a severe generalized African HIV epidemic, the value of geographically targeted prevention interventions has only recently been given serious consideration. However, to date no study has performed a population-based analysis of the micro-geographical clustering of HIV incident infections, limiting the evidential support for such a strategy.

METHODS: We followed 17 984 HIV-uninfected individuals aged 15-54 in a population-based cohort in rural KwaZulu-Natal, South Africa, and observed individual HIV sero-conversions between 2004 and 2014. We geo-located all individuals to an exact homestead of residence (accuracy <2 m). We then employed a two-dimensional Gaussian kernel of radius 3 km to produce robust estimates of HIV incidence which vary across continuous geographical space. We also applied Tango's flexibly shaped spatial scan statistic to identify irregularly shaped clusters of high HIV incidence.

RESULTS: Between 2004 and 2014, we observed a total of 2 311 HIV sero-conversions over 70 534 person-years of observation, at an overall incidence of 3.3 [95% confidence interval (CI), 3.1-3.4] per 100 person-years. Three large irregularly-shaped clusters of new HIV infections (relative risk = 1.6, 1.7 and 2.3) were identified in two adjacent peri-urban communities near the National Road (P = 0.001, 0.015) as well as in a rural node bordering a recent coal mine development (P = 0.020), respectively. Together the

clusters had a significantly higher age-sex standardized incidence of 5.1 (95% CI, 4.7-5.6) per 100 person-years compared with a standardized incidence of 3.0 per 100 person-years (95% CI, 2.9-3.2) in the remainder of the study area. Though these clusters comprise just 6.8% of the study area, they account for one out of every four sero-conversions observed over the study period.

CONCLUSIONS: Our study has revealed clear 'corridors of transmission' in this typical rural, hyper-endemic population. Even in a severely affected rural African population, an approach that seeks to provide preventive interventions to the most vulnerable geographies could be more effective and cost-effective in reducing the overall rate of new HIV infections. There is an urgent need to develop and test such interventions as part of an overall combination prevention approach.

98. **Effect of population viral load on prospective HIV incidence in a hyperendemic rural African community**.
Tanser, F., A. Vandormael, et al. Sci Transl Med 2017 9(420).

Monitoring HIV population viral load (PVL) has been advocated as an important means of inferring HIV transmission potential and predicting the future rate of new HIV infections (HIV incidence) in a particular community. However, the relationship between PVL measures and directly measured HIV incidence has not been quantified in any setting and, most importantly, in a hyperendemic sub-Saharan African setting. We assessed this relationship using one of Africa's largest population-based prospective population cohorts in rural KwaZulu-Natal, South Africa in which we followed 8732 HIV-uninfected participants between 2011 and 2015. Despite clear evidence of spatial clustering of high viral loads in some communities, our results demonstrate that PVL metrics derived from aggregation of viral load data only from the HIV-positive members of a particular community did not predict HIV incidence in this typical hyperendemic, rural African population. Only once we used modified PVL measures, which combined viral load information with the underlying spatial variation in the proportion of the population infected (HIV prevalence), did we find a consistently strong relationship with future risk of HIV acquisition. For example, every 1% increase in the overall proportion of a population having detectable virus (PDV P) was independently associated with a 6.3% increase in an individual's risk of HIV acquisition (P = 0.001). In hyperendemic African populations, these modified PVL indices could play a key role in targeting and monitoring interventions in the most vulnerable communities where the future rate of new HIV infections is likely to be highest.

99. **Does integrating AIDS treatment with food assistance affect labor supply? Evidence from Zambia**.
Tirivayi, N. and W. Groot. Econ Hum Biol 2017 28: 79-91.

In low income settings, food assistance is increasingly becoming part of AIDS treatment and care programs with the aim of improving adherence to AIDS treatment, enhancing

household food security and strengthening economic wellbeing. Yet, evidence of its economic impact is sparse. This paper uses primary data to examine the short term impact of a food assistance program on labor supply as measured by the hours worked, labor market participation rates and transitions to employment within HIV/AIDS affected households in Zambia. We find that food assistance is generally a labor supply disincentive to HIV-infected patients receiving treatment as it reduced their hours worked by up to 54%, transitions to employment by up to 70% and also reduced the labor market participation rates of male patients by 72%. Among non-infected adult family members, there were no significant effects on labor market participation. However, propensity score estimates show that food assistance generally increased the intensity of work by males regardless of the length of AIDS treatment, but for females there was a disincentive effect that disappeared when the patient had spent a longer time on AIDS treatment and was therefore healthier and less likely to be cared for. These findings suggest that food assistance can inadvertently reduce the labor supply of HIV-infected individuals, but this is compensated for by the increased labor supply among other family members.

100. **The Impact of Food Assistance on Dietary Diversity and Food Consumption among People Living with HIV/AIDS**.
Tirivayi, N. and W. Groot. AIDS Behav 2017 21(12): 3515-3526.

Little is known about the outcomes of food assistance targeted to food insecure people living with HIV/AIDS. Using primary data from Zambia, we estimated the impact of food assistance on the dietary diversity and consumption expenditures of households with HIV infected members receiving antiretroviral therapy. Propensity score matching estimates show that food assistance increased dietary diversity by 9.8 points (23%) mainly through the consumption of food items provided in the ration. Food assistance recipients were 20% points more likely to have acceptable food consumption and 15% points less likely to have poor food consumption than non-recipients. Food assistance also increased food consumption expenditures but had no significant impact on food purchases and total consumption expenditures. Overall, our findings demonstrate that food assistance can be an effective instrument for improving diets and enhancing the food security of people living with HIV/AIDS.

101. **Negotiations of Blame and Care among HIV-positive Mothers and Daughters in South Africa's Eastern Cape**.
Vale, B., R. Hodes, et al. Med Anthropol Q 2017 31(4): 519-536.

Research delineates two epidemiological categories among HIV-positive adolescents: those who contract the virus sexually and those who inherit it as infants. In this article, we are interested in how tacit inferences about adolescents' mode of infection contribute to their experiences of HIV-related blame, and their ability to achieve care, in their intimate, everyday settings. The analysis arises from ethnographic research with 23 HIV-positive adolescents living in South Africa's Eastern Cape. From these, we draw

particularly on the narratives of four HIV-positive teenage girls and their HIV-positive mothers. The article explores the social stakes entailed in ascriptions of adolescents' mode of infection, particularly in terms of how blame was allocated between mothers and daughters. It further considers how these families have sought to negotiate repudiation and thereby sustain intergenerational care. The article furthers limited research on the life projects and dilemmas of this HIV-positive adolescent cohort.

102. **Rethinking HIV-prevention for school-going young people based on current behaviour patterns**.
Visser, M. Sahara j 2017 14(1): 64-76.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5639610/pdf/rsah-14-1376704.pdf

The aim of the research was to gain increased knowledge regarding the sexual risk behaviour of school-going young people in South Africa after two decades of HIV-education in schools, to contribute to the development of improved HIV prevention strategies. In collaboration with the Department of Education, a sample of 5305 learners (between 10 and 18 years in Grades 5-12) from high-risk communities were identified. They completed a survey that assessed self-reported sexual risk behaviour and variables that potentially underlie sexual risk, such as attitudes towards preventive behaviour, perceived social norms and self-efficacy (based on the theory of planned behaviour [TPB]) and social factors like caregiver relationships and gender norms (based on the social ecological theory). Lifetime sex was reported by 49.4% of boys and 30.5% of girls in Grades 8-12, while 56% of the sexually active young people reported consistent condom use. Accurate knowledge about HIV transmission was low (37.8%). Regression analysis showed that risk behaviour was more prominent among older male youths, who perceived social norms as encouraging sexual activity, who use alcohol excessively, and who have negative attitudes towards abstinence. Perceived traditional community gender norms and negative relationships with caregivers were also associated with sexual risk behaviour. This research showed that the TPB can be used in planning HIV prevention interventions for young people. It also revealed that HIV-prevention strategies should focus beyond educating the individual, to address community factors such as improving caregiver relationships, the culture of substance abuse, peer group norms and inequality in community gender norms. These community processes influence young people's behaviour and need to be addressed to allow the youth to make healthy behavioural choices.

LAY HEALTH WORKERS - 11

103. **Discordant rapid HIV tests: lessons from a low-resource community**.
Adetunji, A. A., M. A. Kuti, et al. HIV Med 2018 19(1): 72-76.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5807078/pdf/nihms939773.pdf

OBJECTIVES: HIV rapid antibody tests are widely used in Africa, but dual testing sometimes produces discordant results. It is not clear if discordant rapid HIV tests

should always heighten suspicion by frontline health workers that early HIV infection is present. Some studies have reported that discordant rapid tests have value for identifying early HIV infection in high HIV prevalence populations. It is not known if rapid test performance influenced this conclusion, or if this observation will hold true for low HIV prevalence populations. We therefore explored the occurrence of discordant rapid HIV tests in a low-resource community.

METHODS: A cross-sectional sample of HIV status-unaware adults with recent exposure to unsafe sex was assessed using a validated risk-based tool (University of North Carolina (UNC)-Malawi Risk Screening Score) for acute HIV infection. Participants received rapid testing with Determine HIV 1/2 and Uni-Gold HIV assays, plus plasma HIV-1 antigen testing with the COBAS((R)) Ampliprep/COBAS((R)) Taqman((R)) HIV-1 assay, followed by western blot in those with detected HIV-1 antigen.

RESULTS: Of 408 participants, 1.0% were confirmed to have established HIV infection. The discordance between rapid tests at initial screening was 2.45 and 2.94% when the two assays were used sequentially and simultaneously, respectively. Discordant rapid tests were strongly associated with risk scores > 2 [odds ratio (OR) 10.88; 95% confidence interval (CI) 2.35-50.43], and with detected HIV-1 RNA (OR 26.06; 95% CI 3.91-173.60).

CONCLUSIONS: When the sample occurrence of discordance between the first and second tests is below 5%, discordant rapid tests in an adult with sexual risk behaviour should trigger strong suspicion of early HIV infection in low HIV prevalence populations.

104. **The role of community health workers in improving HIV treatment outcomes in children: lessons learned from the ZENITH trial in Zimbabwe**.
Busza, J., E. Dauya, et al. Health Policy Plan 2018.

Reliance on community health workers (CHWs) for HIV care continues to increase, particularly in resource-limited settings. CHWs can improve HIV service use and adherence to treatment, but effectiveness of these programmes relies on providing an enabling work environment for CHWs, including reasonable workload, supportive supervision and adequate training and supplies. Although criteria for effective CHW programmes have been identified, these have rarely been prospectively applied to design and evaluation of new interventions. For the Zimbabwe study for Enhancing Testing and Improving Treatment of HIV in Children (ZENITH) randomized controlled trial, we based our intervention on an existing evidence-based framework for successful CHW programmes. To assess CHWs' experiences delivering the intervention, we conducted longitudinal, qualitative semi-structured interviews with all 19 CHWs at three times during implementation. The study aimed to explore CHWs' perceptions of how the intervention's structure and management affected their performance, and consider implications for the programme's future scale-up and adoption in other settings. CHWs expressed strong motivation, commitment and job satisfaction. They considered the

intervention acceptable and feasible to deliver, and levels of satisfaction rose over interview rounds. Intensive supervision and mentoring emerged as critical to ensuring CHWs' long-term satisfaction. Provision of job aids, standardized manuals and refresher training were also important, as were formalized links between clinics and CHWs. Concerns raised by CHWs included poor remuneration, their reluctance to stop providing support to individual families following the requisite number of home visits, and disappointment at the lack of programme sustainability following completion of the trial. Furthermore, intensive supervision and integration with clinical services may be difficult to replicate outside a trial setting. This study shows that existing criteria for designing successful CHW programmes are useful for maximizing effectiveness, but challenges remain for ensuring long-term sustainability of 'task shifting' strategies.

105. **Burden of Care among Caregivers of Persons Living with HIV/AIDS in Rural Namibia: Correlates and Outcomes**.
Kalomo, E. N. and M. Liao. Soc Work Public Health 2018 33(1): 70-84.

This study examined the correlates of burden of caregivers providing care to people living with HIV/AIDS in rural northern Namibia and the consequences of caregivers' burden on their physical health and mental health. A purposive sampling method was used to recruit a total of 97 primary caregivers (N = 97) in rural Namibia. We found that hunger and HIV stigma were both positively associated with caregiver burden. Caregiver burden was positively related to depression and negatively related to quality of life. The findings underscore the complex relationships between food insecurity and HIV stigma on caregiver burden and the outcomes of burden on quality of life and depressive symptoms. Policy and practice implications are also discussed.

106. **Psychological well-being and adherence to antiretroviral therapy among adolescents living with HIV in Zambia**.
Okawa, S., S. Mwanza Kabaghe, et al. AIDS Care 2018: 1-9.

Physical and psychosocial changes during adolescence could influence the psychological well-being and adherence to antiretroviral therapy (ART) of adolescents living with HIV. However, few studies have assessed these two important issues in Zambia. This study aimed at addressing this gap by examining adolescents' depressive symptoms and ART adherence. This was a mixed-methods study conducted from April to July 2014. We recruited 200 adolescents, ages 15 to 19, who were already aware of their HIV status. We measured depressive symptoms using the short form of the Center for Epidemiologic Studies Depression Scale, and self-reported three-day adherence to ART. We performed logistic regression analysis to identify factors associated with depressive symptoms and non-adherence to ART. For qualitative data, we examined challenges over ART adherence using thematic analysis. Out of 190 adolescents, 25.3% showed high scores of depressive symptoms. Factors associated with depressive symptoms were unsatisfactory relationships with family (Adjusted Odds Ratio [AOR] 3.01; 95% Confidence Interval [CI] 1.20-7.56); unsatisfactory relationships with health workers

(AOR 2.68; 95% CI 1.04-6.93); and experience of stigma (AOR 2.99; 95% CI 1.07-8.41). Of all participants, 94.2% were taking ART, but 28.3% were non-adherent. Factors associated with non-adherence to ART were loss of a mother (AOR 3.00; 95% CI 1.05-8.58) and lack of basic knowledge about HIV (AOR 3.25; 95% CI 1.43-7.40). Qualitative data identified the following challenges to ART adherence: management of medication, physical reactions to medicine, and psychosocial distress. The evidence suggests that depressive symptoms and non-adherence to ART were priority issues in late adolescence in Zambia. Health workers should be aware of these issues, and the care and treatment services should be tailored to respond to age-specific needs.

107. **A qualitative analysis of the barriers to antiretroviral therapy initiation among children 2 to 18 months of age in Swaziland**.
Ahmed, C. V., P. Jolly, et al. Afr J AIDS Res 2017 16(4): 321-328.
http://www.tandfonline.com/doi/pdf/10.2989/16085906.2017.1380677?needAccess=true

HIV/AIDS remains one of the leading causes of death among children under 5 years old in Swaziland. Although studies have shown that early initiation of infants and children diagnosed with HIV on antiretroviral therapy (ART) significantly reduces mortality, many children do not initiate ART until the later stages of disease. This study was designed to collect qualitative data from mothers and caregivers of HIV-positive children to identify the barriers to ART initiation. Focus group discussion (FGD) sessions were conducted in siSwati between July and September 2014 among caregivers of aged children 2-18 months in Swaziland who did or did not initiate ART between January 2011 and December 2012 after HIV DNA PCR-positive diagnosis of the infants. Denial, guilt, lack of knowledge, tuberculosis (TB)/HIV co-infection, HIV-related stigma, lack of money, and distance to clinics were reported by the participants as barriers to ART initiation. The findings further revealed that non-initiation on ART was not linked to a negative perception of the treatment. Findings suggest a need to improve sensitivity among healthcare workers as well as education and counselling services that will facilitate the ART initiation process.

108. **Laughter therapy as an intervention to promote psychological well-being of volunteer community care workers working with HIV-affected families**.
Hatzipapas, I., M. J. Visser, et al. Sahara j 2017 14(1): 202-212.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5706473/pdf/rsah-14-1402696.pdf

The study explores the experiences of volunteer community care workers working with HIV-affected families, participating in laughter therapy. Laughter therapy is being used as an intervention to positively influence individuals experiencing various forms of emotional distress. Community care workers play a vital role in the support of the HIV/AIDS-infected and -affected members in communities. The nature of this type of work and their limited training contributes to high levels of secondary trauma and emotional exhaustion. The purpose of the study was firstly, to explore the effects of

working with orphans and vulnerable children (OVC) on the community care workers and secondly, to establish the impact that laughter therapy has to positively combat stresses of working within the care workers' environment. All the community care workers from a community-based organisation that provides care for HIV/AIDS-infected and -affected OVC and their families in the greater region of Soweto, South Africa, took part in daily laughter therapy sessions for one month. To assess the experiences of participants of laughter therapy, seven community care workers agreed to participate in a mixed method assessment. Interviews were conducted before and after the intervention using the Interpretative Phenomenological Analysis as framework. As supportive data, a stress and anxiety and depression scale were added in the interview. Participants reported more positive emotions, positive coping, improved interpersonal relationships and improvement in their care work after exposure to laughter therapy. Quantitative results on stress, anxiety and depression for each participant confirmed observed changes. Laughter therapy as a self-care technique has potential as a low-cost intervention strategy to reduce stress and counteract negative emotions among people working in highly emotional environments.

109. **Should trained lay providers perform HIV testing? A systematic review to inform World Health Organization guidelines**.
Kennedy, C. E., P. T. Yeh, et al. AIDS Care 2017 29(12): 1473-1479.

New strategies for HIV testing services (HTS) are needed to achieve UN 90-90-90 targets, including diagnosis of 90% of people living with HIV. Task-sharing HTS to trained lay providers may alleviate health worker shortages and better reach target groups. We conducted a systematic review of studies evaluating HTS by lay providers using rapid diagnostic tests (RDTs). Peer-reviewed articles were included if they compared HTS using RDTs performed by trained lay providers to HTS by health professionals, or to no intervention. We also reviewed data on end-users' values and preferences around lay providers preforming HTS. Searching was conducted through 10 online databases, reviewing reference lists, and contacting experts. Screening and data abstraction were conducted in duplicate using systematic methods. Of 6113 unique citations identified, 5 studies were included in the effectiveness review and 6 in the values and preferences review. One US-based randomized trial found patients' uptake of HTS doubled with lay providers (57% vs. 27%, percent difference: 30, 95% confidence interval: 27-32, $p < 0.001$). In Malawi, a pre/post study showed increases in HTS sites and tests after delegation to lay providers. Studies from Cambodia, Malawi, and South Africa comparing testing quality between lay providers and laboratory staff found little discordance and high sensitivity and specificity (>/=98%). Values and preferences studies generally found support for lay providers conducting HTS, particularly in non-hypothetical scenarios. Based on evidence supporting using trained lay providers, a WHO expert panel recommended lay providers be allowed to conduct HTS using HIV RDTs. Uptake of this recommendation could expand HIV testing to more people globally.

110. **On the periphery of HIV and AIDS: Reflections on stress as experienced by caregivers in a child residential care facility in South Africa**.
Mohangi, K. and C. Pretorius. Sahara j 2017 14(1): 153-161.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5678504/pdf/rsah-14-1389300.pdf

Few researchers have investigated how female caregivers of institutionalised children, especially those affected by HIV and AIDS, experience stress. The role played by caregivers cannot be overemphasised; yet caregivers who work in institutions caring for orphaned and/or abandoned children affected by HIV and AIDS, are often marginalised and on the periphery of the HIV and AIDS pandemic. The implication is that insufficient attention or consideration is given to the importance of the role they play in these children's lives. The objective of the study was to explore how female caregivers of institutionalised children affected by HIV and AIDS experience stress. A qualitative research project with a case study design was conducted. The purposively selected participants from a previously identified care facility were seven females in the age ranges of 35-59. Data was gathered during individual interviews and focus group discussions. Thematic content analysis of the data yielded the following themes: (1) contextualising caregiving as 'work'; (2) stresses linked to caregiving; and (3) coping with stress. Findings from this study indicated that participants experienced caregiving in an institution as stressful, demotivating, and emotionally burdensome. Moreover, caregivers working in an environment of HIV and AIDS experienced additional stress related to organisational and management impediments, lack of emotional and practical support, inadequate training, discipline difficulties, and lack of respect and appreciation from the children in their care. It is recommended that training and management support as well as personal support and counselling for caregivers in the institutional context could help them to cope better, feel empowered and to potentially elevate their status as valued members of society.

111. **Adolescents' Experiences and Their Suggestions for HIV Serostatus Disclosure in Zambia: A Mixed-Methods Study**.
Okawa, S., S. Mwanza-Kabaghe, et al. Front Public Health 2017 5: 326.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5736526/pdf/fpubh-05-00326.pdf

BACKGROUND: HIV serostatus disclosure is an immense challenge for adolescents living with HIV, their caregivers, and health workers. In Zambia, however, little guidance is available from the adolescents' point of view on the HIV disclosure process. Objective: This study aimed to examine the setting of HIV serostatus disclosure for adolescents, its impacts on them, and their suggestions on the best practice of HIV disclosure.

METHODS: We conducted a mixed-methods study at the University Teaching Hospital in Zambia from April to July 2014. We recruited 200 adolescents living with HIV, aged 15-19 years. We collected data using a structured questionnaire including two open-ended questions. We excluded two adolescents due to withdrawal during the survey, and eight from the data set due to out-of-eligibility criteria in age. Eventually, we included 190 in

the analysis. We performed descriptive analysis to calculate the distributions of basic characteristics of the adolescents, their experience and preference on HIV serostatus disclosure, its emotional and behavioral impacts, and health education topics they had ever learned at hospital. We performed thematic analysis with open-ended data to explain first impressions upon disclosure in detail and to determine perceived advantages of HIV serostatus disclosure.

RESULTS: The majority of adolescents recommended the age of 12 as appropriate for adolescents to learn about their HIV serostatus and preferred disclosure by both parents. Out of 190 adolescents, 73.2% had negative or mixed feelings about HIV serostatus disclosure, while 86.2% reported that disclosure was beneficial. Thematic analyses showed that the adolescents reacted emotionally due to an unexpected disclosure and a belief of imminent death from HIV. However, they improved adherence to treatment (84.7%), limited self-disclosure of their HIV serostatus to others (81.1%), and felt more comfortable in talking about HIV with their caregivers (54.2%). Thematic analysis identified perceived benefits of disclosure as follows: better understanding of their sickness and treatment, and improved self-care and treatment adherence. Lower percentage of the adolescents have learned about psychosocial well-being, compared to facts about HIV and treatment.

CONCLUSION: Despite initial emotional distress experienced after the disclosure, knowing one's own HIV serostatus was found to be a crucial turning point for adolescents to improve motivation for self-care. HIV serostatus disclosure to adolescents requires follow-up support involving parents/primary caregivers, health workers, and peers.

112. **A cluster randomized controlled trial of lay health worker support for prevention of mother to child transmission of HIV (PMTCT) in South Africa**.
Peltzer, K., S. M. Weiss, et al. AIDS Res Ther 2017 14(1): 61.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5732507/pdf/12981_2017_Article_187.pdf

BACKGROUND: We evaluate the impact of clinic-based PMTCT community support by trained lay health workers in addition to standard clinical care on PMTCT infant outcomes.

METHODS: In a cluster randomized controlled trial, twelve community health centers (CHCs) in Mpumalanga Province, South Africa, were randomized to have pregnant women living with HIV receive either: a standard care (SC) condition plus time-equivalent attention-control on disease prevention (SC; 6 CHCs; n = 357), or an enhanced intervention (EI) condition of SC PMTCT plus the "Protect Your Family" intervention (EI; 6 CHCs; n = 342). HIV-infected pregnant women in the SC attended four antenatal and two postnatal video sessions and those in the EI, four antenatal and two postnatal PMTCT plus "Protect Your Family" sessions led by trained lay health workers.

Maternal PMTCT and HIV knowledge were assessed. Infant HIV status at 6 weeks postnatal was drawn from clinic PCR records; at 12 months, HIV status was assessed by study administered DNA PCR. Maternal adherence was assessed by dried blood spot at 32 weeks, and infant adherence was assessed by maternal report at 6 weeks. The impact of the EI was ascertained on primary outcomes (infant HIV status at 6 weeks and 12 months and ART adherence for mothers and infants), and secondary outcomes (HIV and PMTCT knowledge and HIV transmission related behaviours). A series of logistic regression and latent growth curve models were developed to test the impact of the intervention on study outcomes.

RESULTS: In all, 699 women living with HIV were recruited during pregnancy (8-24 weeks), and assessments were completed at baseline, at 32 weeks pregnant (61.7%), and at 6 weeks (47.6%), 6 months (50.6%) and 12 months (59.5%) postnatally. Infants were tested for HIV at 6 weeks and 12 months, 73.5% living infants were tested at 6 weeks and 56.7% at 12 months. There were no significant differences between SC and EI on infant HIV status at 6 weeks and at 12 months, and no differences in maternal adherence at 32 weeks, reported infant adherence at 6 weeks, or PMTCT and HIV knowledge by study condition over time.

CONCLUSION: The enhanced intervention administered by trained lay health workers did not have any salutary impact on HIV infant status, ART adherence, HIV and PMTCT knowledge.

113. **The Amagugu intervention for disclosure of maternal HIV to uninfected primary school-aged children in South Africa: a randomised controlled trial**.
Rochat, T. J., A. Stein, et al. Lancet HIV 2017 4(12): e566-e576.

BACKGROUND: Increasing populations of children who are HIV-exposed but uninfected will face the challenge of disclosure of parental HIV infection status. We aimed to test the efficacy of an intervention to increase maternal HIV-disclosure to primary school-aged HIV-uninfected children.

METHODS: This randomised controlled trial was done at the Africa Health Research Institute in KwaZulu-Natal, South Africa. Women who had tested HIV positive at least 6 months prior, had initiated HIV treatment or been enrolled in pretreatment HIV care, and had an HIV-uninfected child (aged 6-10 years) were randomly allocated to either the Amagugu intervention or enhanced standard of care, using a computerised algorithm based on simple randomisation and equal probabilities of being assigned to each group. Lay counsellors delivered the Amagugu intervention, which included six home-based counselling sessions of 1-2 h and materials and activities to support HIV disclosure and parent-led health promotion. The enhanced standard of care included one clinic-based counselling session. Outcome measures at 3 months, 6 months, and 9 months post baseline were done by follow-up assessors who were masked to participants' group and counsellor allocation. The primary outcome was maternal HIV disclosure (full [using the

word HIV], partial [using the word virus], or none) at 9 months post baseline. We did the analysis in the intention-to-treat population. This study is registered with ClinicalTrials.gov (NCT01922882).

FINDINGS: Between July 1, 2013, and Dec 31, 2014, we randomly assigned 464 participants to the Amagugu intervention (n=235) or enhanced standard of care (n=229). 428 (92%) participants completed the 9 month assessment by Sept 3, 2015. Disclosure at any level was more common in the Amagugu intervention group (n=204 [87%]) than in the enhanced standard-of-care group (n=128 [56%]; adjusted odds ratio 9.88, 95% CI 5.55-17.57; p<0.0001). Full disclosure was also more common in the Amagugu intervention group (n=150 [64%]) than in the enhanced standard-of-care group (n=98 [43%]; 4.13, 2.80-6.11; p<0.0001). Treatment-unrelated adverse effects were reported for 17 participants in the Amagugu intervention group versus six in the enhanced standard-of-care group; adverse effects included domestic violence (five [2%] in the Amagugu intervention group vs one [<1%] in the enhanced standard-of-care group), sexual assault (four [2%] vs one [<1%]), participant illness or death (four [2%] vs four [2%]), and family member illness or death (four [2%] vs none). No treatment-related deaths occurred.

INTERPRETATION: The lay-counsellor-driven Amagugu intervention to aid parental disclosure has potential for wide-scale implementation after further effectiveness research and could be adapted to other target populations and other diseases. Further follow-up and effectiveness research is required.

Back to top

POLICYMAKERS/GOVERNMENT OFFICIALS - 20

114. **Patient-level benefits associated with decentralization of antiretroviral therapy services to primary health facilities in Malawi and Uganda**.
Abongomera, G., L. Chiwaula, et al. Int Health 2018.

BACKGROUND: The Lablite project captured information on access to antiretroviral therapy (ART) at larger health facilities ('hubs') and lower-level health facilities ('spokes') in Phalombe district, Malawi and in Kalungu district, Uganda.

METHODS: We conducted a cross-sectional survey among patients who had transferred to a spoke after treatment initiation (Malawi, n=54; Uganda, n=33), patients who initiated treatment at a spoke (Malawi, n=50; Uganda, n=44) and patients receiving treatment at a hub (Malawi, n=44; Uganda, n=46).

RESULTS: In Malawi, 47% of patients mapped to the two lowest wealth quintiles (Q1-Q2); patients at spokes were poorer than at a hub (57% vs 23% in Q1-Q2; p<0.001). In Uganda, 7% of patients mapped to Q1-Q2; patients at the rural spoke were poorer than at the two peri-urban facilities (15% vs 4% in Q1-Q2; p<0.001). The median travel time one way to a current ART facility was 60 min (IQR 30-120) in Malawi and 30 min (IQR 20-60) in Uganda. Patients who had transferred to the spokes reported a median reduction in travel time of 90 min in Malawi and 30 min in Uganda, with reductions in distance and food costs.

CONCLUSIONS: Decentralizing ART improves access to treatment. Community-level access to treatment should be considered to further minimize costs and time.

115. **HIV/AIDS workplace policy addressing epidemic drivers through workplace programs**. Chatora, B., H. Chibanda, et al. BMC Public Health 2018 18(1): 180. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5785818/pdf/12889_2018_Article_5072.pdf

BACKGROUND: HIV workplace policies have become an important tool in addressing the HIV Pandemic in Sub-Saharan Africa. In Zambia, the National AIDS Council has been advocating for establishing of HIV/AIDS workplace policies to interested companies, however no formal evaluation has been done to assess uptake and implementation. The study aimed to establish the existence of HIV/AIDS policies and programs in the private sector and to understand implementation factors and experiences in addressing HIV epidemic drivers through these programs.

METHODS: A mixed method assessment of the availability of policies was conducted in 128 randomly selected member companies of Zambia Federation of Employers in Lusaka. Categorized variables were analysed on Policy and programs using Stata version 12.0 for associations: Concurrently, 28 in-depth interviews were conducted on purposively sampled implementers. Qualitative results were analysed thematically before integrating them with qualitative findings.

RESULTS: Policies were found in 47/128 (36.72%) workplaces and the private sector accounted for 34/47 (72.34%) of all workplaces with a policy. Programs were available in 56/128 (43.75%) workplaces. The availability of policy was 2.7 times more likely to occur with increased size of a workplace, P value = 0.0001, (P < 0.05). Management support was 0.253 times more likely to occur in workplaces with policy, P value = 0.013, (P < 0.05) compared to those without. Having a specific budget for programs was 0.23 times more likely to occur in workplaces with a policy (P < 0.05) than those without a policy. Implementation was hindered by reduced funding, lack of time, sensitisation and lack of monitoring/evaluation systems. HIV awareness (56/56, 100%) and HIV/AIDS/Stigma (47/56, 83.93%) were the most addressed epidemic drivers through programs while Mother to Child Transmission (30/56 53.57%) and Males having sex with males were the least addressed (18/56, 32.14%).

CONCLUSION: HIV/AIDS policies exist in the private sector at a very low proportion but policy translation was very high suggesting that workplaces with polices are likely to implement programs. The eradication of HIV/AIDS by 2030, requires addressing epidemic drivers with a focus on marginalised populations, gender integration, a wellness and rights based approach within the context of the legal framework.

116. **Implementing voluntary medical male circumcision using an innovative, integrated, health systems approach: experiences from 21 districts in Zimbabwe**.
Feldacker, C., B. Makunike-Chikwinya, et al. Glob Health Action 2018 11(1): 1414997.
http://www.tandfonline.com/doi/pdf/10.1080/16549716.2017.1414997?needAccess=true

BACKGROUND: Despite increased support for voluntary medical male circumcision (VMMC) to reduce HIV incidence, current VMMC progress falls short. Slow progress in VMMC expansion may be partially attributed to emphasis on vertical (stand-alone) over more integrated implementation models that are more responsive to local needs. In 2013, the ZAZIC consortium began implementation of a 5-year, integrated VMMC program jointly with Ministry of Health and Child Care (MoHCC) in Zimbabwe. OBJECTIVE: To explore ZAZIC's approach emphasizing existing healthcare workers and infrastructure, increasing program sustainability and resilience.

METHODS: A process evaluation utilizing routine quantitative data. Interviews with key MoHCC informants illuminate program strengths and weaknesses. METHODS: A process evaluation utilizing routine quantitative data. Interviews with key MoHCC informants illuminate program strengths and weaknesses.

RESULTS: In start-up and year 1 (March 2013-September, 2014), ZAZIC expanded from two to 36 static VMMC sites and conducted 46,011 VMMCs; 39,840 completed from October 2013 to September 2014. From October 2014 to September 2015, 44,868 VMMCs demonstrated 13% increased productivity. In October, 2015, ZAZIC was required by its donor to consolidate service provision from 21 to 10 districts over a 3-month period. Despite this shock, 57,282 VMMCs were completed from October 2015 to September 2016 followed by 44,414 VMMCs in only 6 months, from October 2016 to March 2017. Overall, ZAZIC performed 192,575 VMMCs from March 2013 to March, 2017. The vast majority of VMMCs were completed safely by MoHCC staff with a reported moderate and severe adverse event rate of 0.3%.

CONCLUSION: The safety, flexibility, and pace of scale-up associated with the integrated VMMC model appears similar to vertical delivery with potential benefits of capacity building, sustainability and health system strengthening. These models also appear more adaptable to local contexts. Although more complicated than traditional approaches to program implementation, attention should be given to this country-led

approach for its potential to spur positive health system changes, including building local ownership, capacity, and infrastructure for future public health programming.

117. **Assessing the impact of the National Department of Health's National Adherence Guidelines for Chronic Diseases in South Africa using routinely collected data: a cluster-randomised evaluation**.
Fox, M. P., S. J. Pascoe, et al. BMJ Open 2018 8(1): e019680.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5781226/pdf/bmjopen-2017-019680.pdf

INTRODUCTION: In 2016, South Africa's National Department of Health (NDOH) launched the National Adherence Guidelines for Chronic Diseases for phased implementation throughout South Africa. Early implementation of a 'minimum package' of eight interventions in the Adherence Guidelines for patients with HIV is being undertaken at 12 primary health clinics and community health centres in four provinces. NDOH and its partners are evaluating the impact of five of the interventions in four provinces in South Africa.

METHODS AND ANALYSIS: The minimum package is being delivered at the 12 health facilities under NDOH guidance and through local health authorities. The five evaluation interventions are: (1) fast track initiation counselling for patients eligible for antiretroviral therapy (ART); (2) adherence clubs for stable ART patients; (3) decentralised medication delivery for stable ART patients; (4) enhanced adherence counselling for unstable ART patients; and (5) early tracing of patients who miss an appointment by >/=5 days. For evaluation, NDOH matched the 12 intervention clinics with 12 comparison clinics and randomly allocated one member of each pair to intervention or comparison (standard of care) status within pairs, allowing evaluation of the interventions using a matched cluster-randomised design. The evaluation uses data routinely collected by the clinics, with no study interaction with subjects to prevent influencing the primary outcomes. Enrolment began on 20 June 2016 and was completed on 16 December 2016. A total of 3456 patients were enrolled and will now be followed for 14 months to estimate effects on short-term and final outcomes. Primary outcomes include viral suppression, retention and medication pickups, evaluated at two time points during follow-up.

118. **Estimated mortality on HIV treatment among active patients and patients lost to follow-up in 4 provinces of Zambia: Findings from a multistage sampling-based survey**.
Holmes, C. B., I. Sikazwe, et al. PLoS Med 2018 15(1): e1002489.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5766235/pdf/pmed.1002489.pdf

BACKGROUND: Survival represents the single most important indicator of successful HIV treatment. Routine monitoring fails to capture most deaths. As a result, both regional assessments of the impact of HIV services and identification of hotspots for improvement efforts are limited. We sought to assess true mortality on treatment,

characterize the extent under-reporting of mortality in routine health information systems in Zambia, and identify drivers of mortality across sites and over time using a multistage, regionally representative sampling approach.

METHODS AND FINDINGS: We enumerated all HIV infected adults on antiretroviral therapy (ART) who visited any one of 64 facilities across 4 provinces in Zambia during the 24-month period from 1 August 2013 to 31 July 2015. We identified a probability sample of patients who were lost to follow-up through selecting facilities probability proportional to size and then a simple random sample of lost patients. Outcomes among patients lost to follow-up were incorporated into survival analysis and multivariate regression through probability weights. Of 165,464 individuals (64% female, median age 39 years (IQR 33-46), median CD4 201 cells/mm3 (IQR 111-312), the 2-year cumulative incidence of mortality increased from 1.9% (95% CI 1.7%-2.0%) to a corrected rate of 7.0% (95% CI 5.7%-8.4%) (all ART users) and from 2.1% (95% CI 1.8%-2.4%) to 8.3% (95% CI 6.1%-10.7%) (new ART users). Revised provincial mortality rates ranged from 3-9 times higher than naive rates for new ART users and were lowest in Lusaka Province (4.6 per 100 person-years) and highest in Western Province (8.7 per 100 person-years) after correction. Corrected mortality rates varied markedly by clinic, with an IQR of 3.5 to 7.5 deaths per 100 person-years and a high of 13.4 deaths per 100 person-years among new ART users, even after adjustment for clinical (e.g., pretherapy CD4) and contextual (e.g., province and clinic size) factors. Mortality rates (all ART users) were highest year 1 after treatment at 4.6/100 person-years (95% CI 3.9-5.5), 2.9/100 person-years (95% CI 2.1-3.9) in year 2, and approximately 1.6% per year through 8 years on treatment. In multivariate analysis, patient-level factors including male sex and pretherapy CD4 levels and WHO stage were associated with higher mortality among new ART users, while male sex and HIV disclosure were associated with mortality among all ART users. In both cases, being late (>14 days late for appointment) or lost (>90 days late for an appointment) was associated with deaths. We were unable to ascertain the vital status of about one-quarter of those lost and selected for tracing and did not adjudicate causes of death.

CONCLUSIONS: HIV treatment in Zambia is not optimally effective. The high and sustained mortality rates and marked under-reporting of mortality at the provincial-level and unexplained heterogeneity between regions and sites suggest opportunities for the use of corrected mortality rates for quality improvement. A regionally representative sampling-based approach can bring gaps and opportunities for programs into clear epidemiological focus for local and global decision makers.

119. **Temporal Improvements in Long-Term Outcome in Care Among HIV Infected Children Enrolled in Public ART Care: An Analysis of Outcomes From 2004-2012 in Zimbabwe**. Makadzange, A. T., L. Dougherty, et al. Pediatr Infect Dis J 2018.

INTRODUCTION: Increasing numbers of children are requiring long-term HIV care and antiretroviral treatment (ART) in public ART programs in Africa but temporal trends and long-term outcomes in care remain poorly understood.

METHODS: We analyzed outcomes in a longitudinal cohort of infants (<2 years) and children (2-10 years) enrolling in a public tertiary ART center in Zimbabwe over an eight-year period (2004-2012).

RESULTS: The clinic enrolled 1644 infants and children; the median age at enrollment was 39 months (IQR 14-79), with a median CD4% of 17.0 (IQR 11, 24) in infants and 15.0 (9, 23% in children (p=0.0007). Among those linked to care 33.5% dropped out of care within the first 3-months of enrollment. Following implementation of revised guidelines in 2009, decentralization of care and increased access to PMTCT services, we observed an increase in infants (48.9% to 68.3%, p<0.0001) and children (48.9% to 68.3%, p<0.0001) remaining in care for more than 3-months. Children enrolled from 2009 were younger, had lower WHO clinical stage, improved baseline CD4 counts than those who enrolled in 2004-2008. Long-term retention in care also improved with decreasing risk of loss from care at 36-months for infants enrolled from 2009 (aHR 0.57 (95%CI: 0.34-0.95), p=0.031). ART eligibility at enrollment was a significant predictor of long-term retention in care while delayed ART initiation after age 5 years resulted in failure to fully reconstitute CD4 counts to age-appropriate levels despite prolonged ART.

CONCLUSION: Significant improvements have been made in engaging and retaining children in care in public ART programs in Zimbabwe. Guideline and policy changes that increase access and eligibility will likely to continue to support improvement in pediatric HIV outcomes.

120. **Impact of early antiretroviral therapy eligibility on HIV acquisition: Household-level evidence from rural South Africa**.
Oldenburg, C. E., J. Bor, et al. Aids 2018.

OBJECTIVES: We investigate the effect of immediate ART eligibility on HIV incidence among HIV-uninfected household members. DESIGN: Regression discontinuity study arising from a population-based cohort.

METHODS: Household members of patients seeking care at the Hlabisa HIV Treatment and Care Programme in rural KwaZulu-Natal South Africa between January 2007 and August 2011 with CD4 counts up to 350 cells/mul were eligible for inclusion if they had at least two HIV tests and were HIV-uninfected at the time the index patient linked to care (N = 4,115). A regression discontinuity design was used to assess the intention-to-treat effect of immediate versus delayed ART eligibility on HIV incidence among household members. Exploiting the CD4-count based threshold rule for ART initiation (CD4 < 200 cells/mul until August 2011), we used Cox proportional hazards models to

compare outcomes for household members of patients who presented for care with CD4 counts just above versus just below the ART initiation threshold.

RESULTS: Characteristics of household members of index patients initiating HIV care were balanced between those with an index patient immediately eligible for ART (N = 2,489) versus delayed for ART (N = 1,626). There were 337 incident HIV infections among household members, corresponding to an HIV incidence of 2.4 infections per 100 person-years (95% CI 2.5 to 3.1). Immediate eligibility for treatment reduced HIV incidence in households by 47% in our optimal estimate (HR = 0.53, 95% CI 0.30 to 0.96), and by 32-60% in alternate specifications of the model.

CONCLUSIONS: Immediate eligibility of ART led to substantial reductions in household-level HIV incidence.

121. **Modifying the health system to maximize voluntary medical male circumcision uptake: a qualitative study in Botswana**.
Semo, B. W., K. E. Wirth, et al. HIV AIDS (Auckl) 2018 10: 1-8.
https://www.dovepress.com/getfile.php?fileID=39767

BACKGROUND: In 2007, the World Health Organization and the Joint United Nations Programme on HIV/AIDS endorsed voluntary medical male circumcision (VMMC) as an add-on HIV-prevention strategy. Similar to many other sub-Saharan countries, VMMC uptake in Botswana has been low; as of February 2016, only 42.7% of the program target had been achieved. Previous work has examined how individual-level factors, such as knowledge and attitudes, influence the update of VMMC. This paper examines how factors related to the health system can be leveraged to maximize uptake of circumcision services, with a focus on demand creation, access to services, and service delivery.

METHODS: Twenty-seven focus group discussions with 238 participants were conducted in four communities in Botswana among men (stratified by circumcision status and age), women (stratified by age), and community leaders. A semi-structured guide was used by a trained same-gender interviewer to facilitate discussions, which were audio recorded, transcribed, translated to English, and analyzed using an inductive analytic approach.

RESULTS: Participants felt demand creation activities utilizing age- and gender-appropriate mobilizers and community leaders were more effective than mass media campaigns. Participants felt improved access to VMMC clinics would facilitate service uptake, as would designated men's clinics with male-friendly providers for VMMC service delivery. Additionally, providing comprehensive pre-procedure counseling and education, outlining the benefits and disadvantages of the surgical procedure, and

explaining the differences between the surgical and non-surgical procedures, were suggested by participants to increase understanding and uptake of VMMC.

CONCLUSION: Cultural acceptability of circumcision services can be improved by engaging age- and gender-appropriate community mobilizers. Involving influential community leaders, providing a forum for men to discuss health issues, and bringing services closer to people can increase VMMC utilization. Service delivery can be improved by communicating the pros and cons of the procedure to the clients for informed decision-making.

122. **"I did not see a need to get tested before, everything was going well with my health": a qualitative study of HIV-testing decision-making in KwaZulu-Natal, South Africa**.
Tariq, S., S. Hoffman, et al. AIDS Care 2018 30(1): 32-39.

Few studies have examined HIV-testing decision-making since the South African national HIV counseling and testing campaign in 2010-2011 and subsequent expansion in antiretroviral therapy (ART) eligibility in 2012. We describe HIV-testing decision-making and pathways to testing among participants in Pathways to Care, a cohort study of newly-diagnosed HIV-positive adults in KwaZulu-Natal. Our analysis is embedded within a theoretical framework informed by Arthur Kleinman's work on pluralistic healthcare systems, and the concept of diagnostic itineraries (i.e., the route taken to HIV testing). We conducted 26 semi-structured interviews in 2012, within one month of participants' diagnosis. Most (n = 22) deferred testing until they had developed symptoms, and then often sought recourse in non-biomedical settings. Of the eleven symptomatic participants who accessed professional medical services prior to testing, only three reported that a healthcare professional had offered or recommended an HIV test. Although ART emerged as an important motivator, offering hope of health and normalcy, fear of death and HIV-related stigma remained key barriers. Despite national policy changes in testing and treatment, health system and individual factors contributed to ongoing high levels of late diagnosis of HIV in this study population. Encouraging local health systems to direct clients toward HIV testing, and continuing to raise awareness of the benefits of routine testing remain important strategies to reduce delayed diagnoses.

123. **A systems-based assessment of the PrePex device adverse events active surveillance system in Zimbabwe**.
Adamson, P. C., T. A. Tafuma, et al. PLoS One 2017 12(12): e0190055.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5741245/pdf/pone.0190055.pdf

BACKGROUND: Voluntary Medical Male Circumcision (VMMC) is an effective method for HIV prevention and the World Health Organization (WHO) has recommended its expansion in 14 African countries with a high prevalence of HIV and low prevalence of male circumcision. The WHO has recently pre-qualified the PrePex device, a non-surgical male circumcision device, which reduces procedure time, can increase acceptability of

VMMC, and can expand the set of potential provider cadres. The PrePex device was introduced in Zimbabwe as a way to scale-up VMMC services in the country. With the rapid scale-up of the PrePex device, as well as other similar devices, a strong surveillance system to detect adverse events (AE) is needed to monitor the safety profile of these devices. We performed a systems-based evaluation of the PrePex device AE active surveillance system in Zimbabwe.

METHODS: The evaluation was based on the Centers for Disease Control and Prevention's Updated Guidelines for Evaluating Public Health Surveillance Systems. We adapted these guidelines to fit our local context. The evaluation incorporated the review of the standard operating procedures and surveillance system documents. Additionally, structured, in-person interviews were performed with key stakeholders who were users of the surveillance system at various levels. These key stakeholders were from the Ministry of Health, implementing partners, and health facilities in Harare.

RESULTS: Clients were requested to return to the facility for follow-up on days 7, 14 and 49 after placement of the device. In the event of a severe AE, a standard report was generated by the health facility and relayed to the Ministry of Health Child and Care and donor agencies through predefined channels within 24 hours of diagnosis. Clinic staff reported difficulties with the amount of documentation required to follow up with clients and to report AEs. The surveillance system's acceptability among users interviewed was high, and users were motivated to identify all possible AEs related to this device. The surveillance system was purely paper-based and both duplicate and discrepant reporting forms between sites were identified.

CONCLUSION: The PrePex AE active surveillance system was well accepted among participants in the health system. However, the amount of documentation which was required to follow-up with patients was a major barrier within the system, and might lead to decreased timeliness and quality of reporting. A passive surveillance system supported by electronic reporting would improve acceptance of the program.

124. **Results of an Integrative Analysis: A Call for Contextualizing HIV and AIDS Clinical Practice Guidelines to Support Evidence-Based Practice**.
Edwards, N., E. Kahwa, et al. Worldviews Evid Based Nurs 2017 14(6): 492-498.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5763348/pdf/WVN-14-492.pdf

BACKGROUND: Practice guidelines aim to improve the standard of care for people living with HIV/AIDS. Successfully implementing guidelines requires tailoring them to populations served and to social and organizational influences on care. AIMS: To examine dimensions of context, which nurses and midwives described as having a significant impact on their care of patients living with HIV/AIDS in Kenya, Uganda, South Africa, and Jamaica and to determine whether HIV/AIDS guidelines include adaptations congruent with these dimensions of context.

METHODS: Two sets of data were used. The first came from a qualitative study. In-depth interviews were conducted with purposively selected nurses, midwives, and nurse managers from 21 districts in four study countries. A coding framework was iteratively developed and themes inductively identified. Context dimensions were derived from these themes. A second data set of published guidelines for HIV/AIDS care was then assembled. Guidelines were identified through Google and PubMed searches. Using a deductive integrative analysis approach, text related to context dimensions was extracted from guidelines and categorized into problem and strategy statements.

RESULTS: Ninety-six individuals participated in qualitative interviews. Four discrete dimensions of context were identified: health workforce adequacy, workplace exposure risk, workplace consequences for nurses living with HIV/AIDS, and the intersection of work and family life. Guidelines most often acknowledged health human resource constraints and presented mitigation strategies to offset them, and least often discussed workplace consequences and the intersections of family and work life.

LINKING EVIDENCE TO ACTION: Guidelines should more consistently acknowledge diverse implementation contexts, propose how recommendations can be adapted to these realities, and suggest what role frontline healthcare providers have in realizing the structural changes necessary for healthier work environments and better patient care. Guideline recommendations should include more explicit advice on adapting their recommendations to different care conditions.

125. **HIV-1 drug resistance before initiation or re-initiation of first-line antiretroviral therapy in low-income and middle-income countries: a systematic review and meta-regression analysis**.
Gupta, R. K., J. Gregson, et al. Lancet Infect Dis 2017.

BACKGROUND: Pretreatment drug resistance in people initiating or re-initiating antiretroviral therapy (ART) containing non-nucleoside reverse transcriptase inhibitors (NNRTIs) might compromise HIV control in low-income and middle-income countries (LMICs). We aimed to assess the scale of this problem and whether it is associated with the intiation or re-initiation of ART in people who have had previous exposure to antiretroviral drugs.

METHODS: This study was a systematic review and meta-regression analysis. We assessed regional prevalence of pretreatment drug resistance and risk of pretreatment drug resistance in people initiating ART who reported previous ART exposure. We systematically screened publications and unpublished datasets for pretreatment drug-resistance data in individuals in LMICs initiating or re-initiating first-line ART from LMICs. We searched for studies in PubMed and Embase and conference abstracts and presentations from the Conference on Retroviruses and Opportunistic Infections, the International AIDS Society Conference, and the International Drug Resistance Workshop for the period Jan 1, 2001, to Dec 31, 2016. To assess the prevalence of drug resistance

within a specified region at any specific timepoint, we extracted study level data and pooled prevalence estimates within the region using an empty logistic regression model with a random effect at the study level. We used random effects meta-regression to relate sampling year to prevalence of pretreatment drug resistance within geographical regions.

FINDINGS: We identified 358 datasets that contributed data to our analyses, representing 56 044 adults in 63 countries. Prevalence estimates of pretreatment NNRTI resistance in 2016 were 11.0% (7.5-15.9) in southern Africa, 10.1% (5.1-19.4) in eastern Africa, 7.2% (2.9-16.5) in western and central Africa, and 9.4% (6.6-13.2) in Latin America and the Caribbean. There were substantial increases in pretreatment NNRTI resistance per year in all regions. The yearly increases in the odds of pretreatment drug resistance were 23% (95% CI 16-29) in southern Africa, 17% (5-30) in eastern Africa, 17% (6-29) in western and central Africa, 11% (5-18) in Latin America and the Caribbean, and 11% (2-20) in Asia. Estimated increases in the absolute prevalence of pretreatment drug resistance between 2015 and 2016 ranged from 0.3% in Asia to 1.8% in southern Africa.

INTERPRETATION: Pretreatment drug resistance is increasing at substantial rate in LMICs, especially in sub-Saharan Africa. In 2016, the prevalence of pretreatment NNRTI resistance was near WHO's 10% threshold for changing first-line ART in southern and eastern Africa and Latin America, underscoring the need for routine national HIV drug-resistance surveillance and review of national policies for first-line ART regimen composition. FUNDING: Bill & Melinda Gates Foundation and World Health Organization.

126. **Assessing stakeholder perceptions of the acceptability and feasibility of national scale-up for a dual HIV/syphilis rapid diagnostic test in Malawi**.
Maddox, B. L. P., S. S. Wright, et al. Sex Transm Infect 2017 93(S4): S59-s64.

OBJECTIVES: The WHO recommends pregnant women receive both HIV and syphilis testing at their first antenatal care visit, as untreated maternal infections can lead to severe, adverse pregnancy outcomes. One strategy for increasing testing for both HIV and syphilis is the use of point-of-care (rapid) diagnostic tests that are simple, proven effective and inexpensive. In Malawi, pregnant women routinely receive HIV testing, but only 10% are tested for syphilis at their first antenatal care visit. This evaluation explores stakeholder perceptions of a novel, dual HIV/syphilis rapid diagnostic test and potential barriers to national scale-up of the dual test in Malawi.

METHODS: During June and July 2015, we conducted 15 semistructured interviews with 25 healthcare workers, laboratorians, Ministry of Health leaders and partner agency representatives working in prevention of mother-to-child transmission in Malawi. We asked stakeholders about the importance of a dual rapid diagnostic test, concerns using and procuring the dual test and recommendations for national expansion.

RESULTS: Stakeholders viewed the test favourably, citing the importance of a dual rapid test in preventing missed opportunities for syphilis diagnosis and treatment, improving infant outcomes and increasing syphilis testing coverage. Primary technical concerns were about the additional procedural steps needed to perform the test, the possibility that testers may not adhere to required waiting times before interpreting results and difficulty reading and interpreting test results. Stakeholders thought national scale-up would require demonstration of cost-savings, uniform coordination, revisions to testing guidelines and algorithms, training of testers and a reliable supply chain.

CONCLUSIONS: Stakeholders largely support implementation of a dual HIV/syphilis rapid diagnostic test as a feasible alternative to current antenatal testing. Scale-up will require addressing perceived barriers; negotiating changes to existing algorithms and guidelines; and Ministry of Health approval and funding to support training of staff and procurement of supplies.

127. **Monitoring and evaluation of sport-based HIV/AIDS awareness programmes: Strengthening outcome indicators**.
Maleka, E. N. Sahara j 2017 14(1): 1-21.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5639615/pdf/rsah-14-1266506.pdf

There are number of Non-Governmental Organisations (NGOs) in South Africa that use sport as a tool to respond to Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS), however, little is reported about the outcomes and impact of these programmes. The aim of this study is to contribute to a generic monitoring and evaluation framework by improving the options for the use of outcome indicators of sport-based HIV/AIDS awareness programmes of selected NGOs in South Africa. A qualitative method study was carried out with seven employees of five selected NGOs that integrate sport to deliver HIV/AIDS programmes in South Africa. The study further involved six specialists/experts involved in the field of HIV/AIDS and an official from Sport Recreation South Africa (SRSA). Multiple data collection instruments including desktop review, narrative systematic review, document analysis, one-on-one interviews and focus group interview were used to collect information on outcomes and indicators for sport-based HIV/AIDS awareness programmes. The information was classified according to the determinants of HIV/AIDS. The overall findings revealed that the sport-based HIV/AIDS awareness programmes of five selected NGOs examined in this study focus on similar HIV prevention messages within the key priorities highlighted in the current National Strategic Plan for HIV/AIDS, STIs and TB of South Africa. However, monitoring and evaluating outcomes of sport-based HIV/AIDS programmes of the selected NGOs remains a challenge. A need exists for the improvement of the outcome statements and indicators for their sport-based HIV/AIDS awareness programmes. This study proposed a total of 51 generic outcome indicators focusing on measuring change in the knowledge of HIV/AIDS and change in attitude and intention towards HIV risk behaviours. In addition, this study further proposed a total of eight generic outcome indicators to measure predictors of HIV risk behaviour. The selected

NGOs can adapt the proposed generic outcomes and indicators based on the settings of their programmes. A collaborative approach by all stakeholders is required, from international organisations, funders, governments, NGOs and communities to strengthening monitoring and evaluation of sport-based HIV/AIDS awareness programmes including other development programmes. This will assist the NGOs that use sport for development to be able to reflect accurately the information about their HIV/AIDS activities and also be able to contribute to on-going monitoring activities at a national and global level as well as to the Sustainable Development Goals.

128. **Policy-maker attitudes to the ageing of the HIV cohort in Botswana**.
Matlho, K., R. Lebelonyane, et al. Sahara j 2017 14(1): 31-37.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5639611/pdf/rsah-14-1374879.pdf

BACKGROUND: The roll out of antiretroviral therapy in Botswana, as in many countries with near universal access to treatment, has transformed HIV into a complex yet manageable chronic condition and has led to the emergence of a population aging with HIV. Although there has been some realization of this development at international level, no clear defined intervention strategy has been established in many highly affected countries. Therefore we explored attitudes of policy-makers and service providers towards HIV among older adults (50 years or older) in Botswana.

METHODS: We conducted qualitative face-to-face interviews with 15 consenting personnel from the Ministry of Health, medical practitioners and non-governmental organizations involved in the administration of medical services, planning, strategies and policies that govern social, physical and medical intervention aimed at people living with HIV and health in general. The Shiffman and Smith Framework of how health issues become a priority was used as a guide for our analysis.

RESULTS: Amidst an HIV prevalence of 25% among those aged 50-64 years, the respondents passively recognized the predicament posed by a population aging with HIV but exhibited a lack of comprehension and acknowledgement of the extent of the issue. An underlying persistent ageist stigma regarding sexual behaviour existed among a number of interviewees. Respondents also noted the lack of defined geriatric care within the provision of the national health care system. There seemed, however, to be a debate among the policy strategists and care providers as to whether the appropriate response should be specifically towards older adults living with HIV or rather to improve health services for older adults more generally. Respondents acknowledged that health systems in Botswana are still configured for individual diseases rather than coexisting chronic diseases even though it has become increasingly common for patients, particularly the aged, to have two or more medical conditions at the same time.

CONCLUSIONS: HIV among older adults remains a low priority among policy-makers in Botswana but is at least now on the agenda. Action will require more concerted efforts

to recognize HIV as a lifelong infection and putting greater emphasis on targeted care for older adults, focussing on multimorbidity.

129. **Registered nurses' perceptions regarding nurse-led antiretroviral therapy initiation in Hhohho region, Swaziland**.
Mavhandu-Mudzusi, A. H., P. T. Sandy, et al. Int Nurs Rev 2017 64(4): 552-560.

BACKGROUND: Swaziland has the highest HIV prevalence globally. It faces a critical shortage of health workers for addressing the HIV pandemic. To curb this human resource challenge, Swaziland adopted a nurse-driven model for antiretroviral therapy delivery in line with the recommendations of the World Health Organization on task shifting.

OBJECTIVE: The study explored the perceptions of registered nurses on the nurse-led antiretroviral therapy initiation programme in the Hhohho region of Swaziland (NARTIS).

DESIGN: The study utilized a phenomenological design, specifically a phenomenographic design.

SETTING: The study was conducted in ten health facilities in the Hhohho region of Swaziland. These facilities comprised eight clinics, a hospital and a health centre.

PARTICIPANTS: These were registered nurses, trained and certified in the nurse-led antiretroviral therapy initiation programme. The nurses also had experience of working in a nurse-led antiretroviral therapy initiation programme. Eighteen (18) nurses were purposively selected and recruited to participate in the study.

METHODS: Data were collected through open and deep individual interviews guided by a semi-structured interview schedule. The audio-recorded interviews were transcribed and analysed thematically using Sjostrom and Dahlgren's approach to data analysis.

RESULTS: Three major themes emerged from the study data: nurses' emotional reactions to the implementation of the NARTIS programme, and influences and overcoming barriers to the programme.

CONCLUSIONS: The study findings have generated insights into this program which is useful for the provision of care to people living with HIV/AIDS in Swaziland. But nurses need support to ensure effective implementation.

IMPLICATION FOR NURSING AND HEALTH POLICY: The study findings have implications for both the practice of the NARTIS programme and health policy development. The development of a health policy that alleviates the barriers to the NARTIS programme can enhance nurses' role and make care provision to people living with HIV/AIDS more effective.

130. **Collaborative HIV care in primary health care: nurses' views**.
Ngunyulu, R. N., M. D. Peu, et al. Int Nurs Rev 2017 64(4): 561-567.

BACKGROUND: Collaborative HIV care between the nurses and traditional health practitioners is an important strategy to improve health care of people living with HIV. AIM: To explore and describe the views of nurses regarding collaborative HIV care in primary healthcare services in the City of Tshwane, South Africa.

METHOD: A qualitative, descriptive design was used to explore and describe the views of nurses who met the study's inclusion criteria. In-depth individual interviews were conducted to collect data from purposively selected nurses. Content analysis was used to analyse data. RESULTS: Two main categories were developed during the data analysis stage. The views of nurses and health system challenges regarding collaborative HIV care.

DISCUSSION: The study findings revealed that there was inadequate collaborative HIV care between the nurses and the traditional health practitioners.

CONCLUSION: It is evident that there is inadequate policy implementation, monitoring and evaluation regarding collaboration in HIV care. The study findings might influence policymakers to consider the importance of collaborative HIV care, and improve the quality of care by strengthening the referral system and follow-up of people living with HIV and AIDS, as a result the health outcomes as implied in the Sustainable Development Goals 2030 might be improved.

IMPLICATIONS FOR NURSING AND HEALTH POLICY: Training and involvement of traditional health practitioners in the nursing and health policy should be considered to enhance and build a trustworthy working relationship between the nurses and the traditional health practitioners in HIV care.

131. **The effect of a performance-based financing program on HIV and maternal/child health services in Mozambique-an impact evaluation**.
Rajkotia, Y., O. Zang, et al. Health Policy Plan 2017 32(10): 1386-1396.

Performance-based financing (PBF) is a mechanism by which health providers are paid on the basis of outputs or results delivered. A PBF program was implemented on the provision of HIV, prevention of mother-to child HIV transmission (PMTCT), and maternal/child health (MCH) services in two provinces of Mozambique. A retrospective case-control study design was used in which PBF provinces were matched with control provinces to evaluate the impact of PBF on 18 indicators. Due to regional heterogeneity, we evaluated the intervention sites (North and South) separately. Beginning January 2011, 11 quarters (33 months or 2.75 years) of data from 134 facilities after matching (84 in the North and 50 in the South) were used. Our econometric framework employed

a multi-period, multi-group difference-in-differences model on data that was matched using propensity scoring. The regression design employed a generalized linear mixed model with both fixed and random effects, fitted using the seemingly unrelated regression technique. PBF resulted in positive impacts on MCH, PMTCT and paediatric HIV program outcomes. The majority of the 18 indicators responded to PBF (77% in the North and 66% in the South), with at least half of the indicators demonstrating a statistically significant increase in average output of more than 50% relative to baseline. Excluding pregnant women, the majority of adult HIV treatment indicators did not respond to PBF. On average, it took 18 months (six quarters) of implementation for PBF to take effect, and impact was generally sustained thereafter. Indicators were not sensitive to price, but were inversely correlated to the level of effort associated with marginal output. No negative impacts on incentivized indicators nor spill-over effects on non-incentivized indicators were observed. The PBF program in Mozambique has produced large, sustained increases in the provision of PMTCT, paediatric HIV and MCH services. Our results demonstrate that PBF is an effective strategy for driving down the HIV epidemic and advancing MCH care service delivery as compared with input financing alone.

132. **Antiretroviral therapy and population mortality: Leveraging routine national data to advance policy**.
Suthar, A. B. and T. Barnighausen. PLoS Med 2017 14(12): e1002469.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5726612/pdf/pmed.1002469.pdf

In a Perspective, Amitabh Suthar and Till Barnighausen discuss progress made so far in reducing HIV-related mortality in South Africa and keys towards further population mortality reductions going forward.

133. **Identifying models of HIV care and treatment service delivery in Tanzania, Uganda, and Zambia using cluster analysis and Delphi survey**.
Tsui, S., J. A. Denison, et al. BMC Health Serv Res 2017 17(1): 811.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5717830/pdf/12913_2017_Article_2772.pdf

BACKGROUND: Organization of HIV care and treatment services, including clinic staffing and services, may shape clinical and financial outcomes, yet there has been little attempt to describe different models of HIV care in sub-Saharan Africa (SSA). Information about the relative benefits and drawbacks of different models could inform the scale-up of antiretroviral therapy (ART) and associated services in resource-limited settings (RLS), especially in light of expanded client populations with country adoption of WHO's test and treat recommendation.

METHODS: We characterized task-shifting/task-sharing practices in 19 diverse ART clinics in Tanzania, Uganda, and Zambia and used cluster analysis to identify unique models of service provision. We ran descriptive statistics to explore how the clusters

varied by environmental factors and programmatic characteristics. Finally, we employed the Delphi Method to make systematic use of expert opinions to ensure that the cluster variables were meaningful in the context of actual task-shifting of ART services in SSA.

RESULTS: The cluster analysis identified three task-shifting/task-sharing models. The main differences across models were the availability of medical doctors, the scope of clinical responsibility assigned to nurses, and the use of lay health care workers. Patterns of healthcare staffing in HIV service delivery were associated with different environmental factors (e.g., health facility levels, urban vs. rural settings) and programme characteristics (e.g., community ART distribution or integrated tuberculosis treatment on-site).

CONCLUSIONS: Understanding the relative advantages and disadvantages of different models of care can help national programmes adapt to increased client load, select optimal adherence strategies within decentralized models of care, and identify differentiated models of care for clients to meet the growing needs of long-term ART patients who require more complicated treatment management.

Back to top

RESEARCHERS - 28

134. **Mitigating intimate partner violence among South African women testing HIV positive during mobile counseling and testing**.
Brown, L. L. and M. A. R. Van Zyl. AIDS Care 2018 30(1): 65-71.

South African women continue to suffer disproportionately from the interlinked epidemics of HIV and intimate partner violence (IPV). Effective strategies are needed to mitigate HIV-related IPV, which often creates barriers to successful engagement along the HIV continuum of care. More information is needed on how IPV impacts women's safety following mobile HCT diagnosis, and the HIV IPV Risk Assessment & Safety-planning (HIRS) protocol was developed to address several related gaps in knowledge. The sample included 255 black South African women experiencing IPV and testing HIV+ during mobile HCT in Gauteng province. Outcomes were compared between a standard of care (SOC) group and an Experimental group with two dosage levels (D1, D2). Of the total sample and in the last year, 99.2% had experienced non-violent control, 40.7% physical abuse, 44.8% sexual abuse, and 67.3% physical or sexual abuse. There were no significant differences in pre/post safety scores, or for satisfaction or acceptability items. The overall linkage rate was 45.8% (M = 12.97 days), and the Experimental group had more links to care in certain age groups-the highest in those aged </=23 years in D1 (70%). The lowest linkage rate was for those aged 33-43 years in the SOC (22.2%).

Almost two thirds of participants reported using the safety plan (61.9%), with 80% reporting it was helpful, and 80% using >/=1 safety strategy. The Experimental group reported significantly less violence upon partner notification of serostatus, but all groups felt significantly less safe getting to medical appointments by post-test. Overall, the study indicates the HIRS protocol is safe and helpful, brief to administer, and may mitigate violence during partner notification of serostatus, but further investigation is needed before implementing it as a standard of care.

135. **"cART intensification by the HIV-1 Tat B clade vaccine: progress to phase III efficacy studies"**.
Cafaro, A., C. Sgadari, et al. Expert Rev Vaccines 2018 17(2): 115-126.

INTRODUCTION: In spite of its success at suppressing HIV replication, combination antiretroviral therapy (cART) only partially reduces immune dysregulation and loss of immune functions. These cART-unmet needs appear to be due to persistent virus replication and cell-to-cell transmission in reservoirs, and are causes of increased patients' morbidity and mortality. Up to now, therapeutic interventions aimed at cART-intensification by attacking the virus reservoir have failed.

AREAS COVERED: We briefly review the rationale and clinical development of Tat therapeutic vaccine in cART-treated subjects in Italy and South Africa (SA). Vaccination with clade-B Tat induced cross-clade neutralizing antibodies, immune restoration, including CD4(+) T cell increase particularly in low immunological responders, and reduction of proviral DNA. Phase III efficacy trials in SA are planned both in adult and pediatric populations.

EXPERT COMMENTARY: We propose the Tat therapeutic vaccine as a pathogenesis-driven intervention that effectively intensifies cART and may lead to a functional cure and provide new perspectives for prevention and virus eradication strategies.

136. **Detection and treatment of Fiebig stage I HIV-1 infection in young at-risk women in South Africa: a prospective cohort study**.
Dong, K. L., A. Moodley, et al. Lancet HIV 2018 5(1): e35-e44.

BACKGROUND: HIV incidence among young women in sub-Saharan Africa remains high and their inclusion in vaccine and cure efforts is crucial. We aimed to establish a cohort of young women detected during Fiebig stage I acute HIV infection in whom treatment was initiated immediately after diagnosis to advance research in this high-risk group.

METHODS: 945 women aged 18-23 years in KwaZulu-Natal, South Africa, who were HIV uninfected and sexually active consented to HIV-1 RNA testing twice a week and biological sampling and risk assessment every 3 months during participation in a 48-96 week life-skills and job-readiness programme. We analysed the effect of immediate

combination antiretroviral therapy (ART) on viraemia and immune responses, sexual risk behaviour, and the effect of the socioeconomic intervention.

FINDINGS: 42 women were diagnosed with acute HIV infection between Dec 1, 2012, and June 30, 2016, (incidence 8.2 per 100 person-years, 95% CI 5.9-11.1), of whom 36 (86%) were diagnosed in Fiebig stage I infection with a median initial viral load of 2.97 log10 copies per mL (IQR 2.42-3.85). 23 of these 36 women started ART at a median of 1 day (1-1) after detection, which limited the median peak viral load to 4.22 log10 copies per mL (3.27-4.83) and the CD4 nadir to 685 cells per muL (561-802). ART also suppressed viral load (to <20 copies per mL) within a median of 16 days (12-26) and, in 20 (87%) of 23 women, prevented seroconversion, as shown with western blotting. 385 women completed the 48 week socioeconomic intervention, of whom 231 were followed up for 1 year. 202 (87%) of these 231 women were placed in jobs, returned to school, or started a business.

INTERPRETATION: Frequent HIV screening combined with a socioeconomic intervention facilitated sampling and risk assessment before and after infection. In addition to detection of acute infection and immediate treatment, we established a cohort optimised for prevention and cure research. FUNDING: Bill & Melinda Gates Foundation, National Institute of Allergy and Infectious Diseases, International AIDS Vaccine Initiative, Wellcome Trust, Howard Hughes Medical Institute.

137. **Bacterial vaginosis modifies the association between hormonal contraception and HIV acquisition**.

Haddad, L., K. M. Wall, et al. Aids 2018.

OBJECTIVE: To examine BV as an effect modifier for the association between hormonal contraception (HC) and incident HIV infection DESIGN:: Serodiscordant couples enrolled in an open longitudinal cohort in Lusaka, Zambia from 1994-2012. This analysis was restricted to couples with an HIV-positive man enrolled between1994-2002 when a quarterly genital tract examination and HIV testing was performed. METHODS: Multivariate Cox models evaluated the association between contraceptive method and HIV-acquisition, stratified by time-varying BV status.

RESULTS: Among 564 couples contributing 1137.2 couple-years of observation, BV was detected at 15.5% of study visits. 22 of 106 seroconversions occurred during intervals after BV was detected (12 on no method/non-hormonal method (non-HC), 2 on injectables, 8 on oral contraceptive pills, (OCPs)). Unadjusted seroincidence rates per 100-couple-years for non-HC, injectable, and OCP users, respectively, during intervals with BV were 8.3, 20.8 and 31.0 and during intervals without BV were 8.2, 9.7 and 12.3. In the BV-positive model, there was a significant increase in incident HIV among those using injectables (adjusted hazard ratio, aHR 6.55, 95% CI 1.14-37.77) and OCPs (aHR 5.20, 95% CI 1.68-16.06) compared to non-HC. HC did not increase the hazard of HIV

acquisition in BV-negative models. These findings persisted in sensitivity analyses when all covariates from the nonstratified model previously published were included, when other genital tract findings were excluded from the model and with the addition of condom-less sex and sperm on wet-prep.

CONCLUSIONS: Future research should consider a potential interaction with BV when evaluating the impact of HC on HIV acquisition.

138. **Evaluating the impact of DREAMS on HIV incidence among young women who sell sex: protocol for a non-randomised study in Zimbabwe**.
Hensen, B., J. R. Hargreaves, et al. BMC Public Health 2018 18(1): 203.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5793424/pdf/12889_2018_Article_5085.pdf

BACKGROUND: "Determined, Resilient, AIDS-free, Mentored and Safe" (DREAMS) is a package of biomedical, social and economic interventions offered to adolescent girls and young women aged 10-24 years with the aim of reducing HIV incidence. In four of the six DREAMS districts in Zimbabwe, DREAMS includes an offer of oral pre-exposure prophylaxis (DREAMS+PrEP), alongside interventions to support demand and adherence, to women aged 18-24 who are at highest risk of HIV infection, including young women who sell sex (YWSS). This evaluation study addresses the question: does the delivery of DREAMS+PrEP through various providers reduce HIV incidence among YWSS Zimbabwe? We describe our approach to designing a rigorous study to assess whether DREAMS+PrEP had an impact on HIV incidence.

METHODS: The study design needed to account for the fact that: 1) DREAMS+PrEP was non-randomly allocated; 2) there is no sampling frame for the target population for the evaluation; 3) there are a small number of DREAMS districts (N = 6), and 4) DREAMS+PrEP is being implemented by various providers. The study will use a cohort analysis approach to compare HIV incidence among YWSS in two DREAMS+PrEP districts to HIV incidence among YWSS in non-DREAMS comparison sites. YWSS will be referred to services and recruited into the cohort through a network-based (respondent-driven) recruitment strategy, and followed-up 12- and 24-months after enrolment. Women will be asked to complete a questionnaire and offered HIV testing. Additional complications of this study include identifying comparable populations of YWSS in the DREAMS+PrEP and non-DREAMS comparison sites, and retention of YWSS over the 24-month period. The primary outcome is HIV incidence among YWSS HIV-negative at study enrolment measured by repeat, rapid HIV testing over 24-months. Inference will be based on plausibility that DREAMS+PrEP had an impact on HIV incidence. A process evaluation will be conducted to understand intervention implementation, and document any contextual factors determining the success or failure of intervention delivery.

DISCUSSION: HIV prevention products of known efficacy are available. Innovative studies are needed to provide evidence of how to optimise product use through

combination interventions to achieve population impact within different contexts. We describe the design of such a study.

139. **HIV population-level adaptation can rapidly diminish the impact of a partially effective vaccine**.
Herbeck, J. T., K. Peebles, et al. Vaccine 2018 36(4): 514-520.

BACKGROUND: Development of an HIV vaccine might be essential to ending the HIV/AIDS pandemic. However, vaccines can result in the emergence and spread of vaccine-resistant strains. Indeed, analyses of breakthrough infections in the HIV phase 3 vaccine trial RV144 identified HIV genotypes with differential rates of transmission in vaccine and placebo recipients. We hypothesized that, for HIV vaccination programs based on partially effective vaccines similar to RV144, HIV adaptation will rapidly diminish the expected vaccine impact.

METHODS AND FINDINGS: Using two HIV epidemic models, we simulated large-scale vaccination programs and, critically, included HIV strain diversity with respect to the vaccine response. We show here that rapid population-level viral adaptation can lead to decreased overall vaccine efficacy and substantially fewer infections averted by vaccination, when comparing scenarios with and without viral evolution (with outcomes depending on vaccination coverage, vaccine efficacy against the sensitive allele, and the initial resistant allele frequency). Translating this to the epidemic in South Africa, a scenario with 70% vaccination coverage may result in 250,000 infections (non-averted by vaccination) within 10years of vaccine rollout that are due solely to HIV adaptation, all else being equal.

CONCLUSIONS: These findings suggest that approaches to HIV vaccine development, program implementation, and epidemic modeling may require attention to viral adaptation in response to vaccination.

140. **The right combination - treatment outcomes among HIV-positive patients initiating first-line fixed-dose antiretroviral therapy in a public sector HIV clinic in Johannesburg, South Africa**.
Hirasen, K., D. Evans, et al. Clin Epidemiol 2018 10: 17-29.
https://www.dovepress.com/getfile.php?fileID=39777

BACKGROUND: Long-term antiretroviral therapy (ART) adherence is critical for achieving optimal HIV treatment outcomes. Fixed-dose combination (FDC) single-pill regimens, introduced in South Africa in April 2013, has simplified pill taking. We evaluated treatment outcomes among patients initiated on a FDC compared to a similar multi-pill ART regimen in Johannesburg, South Africa.

METHODS: We conducted a retrospective cohort study of ART-naive HIV-positive non-pregnant adult (>/=18 years) patients without tuberculosis who initiated first-line ART on tenofovir and emtricitabine or lamivudine with efavirenz at Themba Lethu Clinic in Johannesburg, South Africa. We compared those initiated on a multi-pill ART regimen (3-5 pills/day; September 1, 2011-August 31, 2012) to those initiated on a FDC ART regimen (one pill/day; September 1, 2013-August 31, 2014). Treatment outcomes included attrition (combination of lost to follow-up and mortality), missed medical visits, and virologic suppression (viral load <400 copies/mL) by 12 months post-ART initiation. Cox proportional hazards models and Poisson regression were used to estimate the association between FDCs vs multiple pills and treatment outcomes.

RESULTS: We included 3151 patients in our analysis; 2230 (70.8%) patients initiated multi-pill ART and 921 (29.2%) patients initiated on a FDC. By 12 months post-initiation, attrition (adjusted hazard ratio: 0.98; 95% CI: 0.77-1.24) was similar across regimen types (FDC vs multi-pill). Although not significant, patients on a FDC were marginally more likely to achieve viral suppression by 6 (adjusted relative rate [aRR]: 1.10; 95% CI: 0.99-1.23) and 12 months (aRR: 1.12; 95% CI: 0.92-1.36) on ART. Patients initiated on a FDC were significantly less likely to miss medical visits during the first 12 months of treatment (aRR: 0.66; 95% CI: 0.52-0.83).

CONCLUSION: Our results suggest FDCs may have a role to play in supporting patient adherence and medical monitoring through improved medical visit attendance. This may potentially improve treatment outcomes later on in treatment.

141. **Prevalence of Asymptomatic Parasitemia and Gametocytemia in HIV-Infected Children on Differing Antiretroviral Therapy**.
Hobbs, C. V., E. E. Gabriel, et al. Am J Trop Med Hyg 2018 98(1): 67-70.

Laboratory data and prior pediatric reports indicate that HIV protease inhibitor (PI)-based antiretroviral therapy (ARV) kills gametocytes and reduces rates of gametocytemia, but not asymptomatic parasitemia, in a high malaria-transmission area. To determine whether ARV regimen impacts these rates in areas with less-intense malaria transmission, we compared asymptomatic parasitemia and gametocytemia rates in HIV-infected children by ARV regimen in Lilongwe, Malawi, an area of low-to-moderate transmission intensity. HIV PI lopinavir-ritonavir (LPV-rtv) ARV- or non-nucleoside reverse transcriptase inhibitor nevirapine ARV-treated children did not differ in the rates of polymerase chain reaction-detected asymptomatic parasitemia (relative risk [RR] 0.43 95% confidence interval [CI] [0.16, 1.18], P value 0.10) or microscopically detected gametocytemia with LPV-rtv ARV during symptomatic malaria (RR 0.48 95% CI [0.22,1.04] P value 0.06). LPV-rtv ARV was not associated with reduced rates of asymptomatic parasitemia, or gametocytemia on days of symptomatic malaria episodes, in HIV-infected children. Larger studies should evaluate whether ARV impacts transmission.

142. **Vestibular Function in a Group of Adults with HIV/AIDS on HAART.**
Khoza-Shangase, K. Afr J Infect Dis 2018 12(1): 7-14.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5733256/pdf/AJID-12-7.pdf

BACKGROUND: The high prevalence of HIV/AIDS and the established otological manifestations of the disease have important implications for research into vestibular function in this population. Materials and

METHODS: The main aim of the current study was to investigate and monitor the vestibular status in a group of adult patients with AIDS receiving Highly Active Antiretroviral Therapy (HAART) and other therapies in a hospital outpatient clinic in Gauteng, South Africa. The study was exploratory and observational in nature, with repeated measures in the form of pre- and post-treatment survey; and a control group. The measures were taken before commencement of antiretroviral therapy (ARVs), three months after initiation of treatment and six months into therapy. A comparison of results of the control group and treatment group was done for all objectives. A total of 150 (104 in the treatment group and 46 in the control group) participants who were recruited through a nonprobability convenience sampling technique were included in the study. All participants were at stage three of HIV/AIDS according to their CD4+ T-cell counts at baseline. Data were analysed through descriptive statistics.

RESULTS: Findings from the current study revealed occurrence of acute vertigo which spontaneously resolved in adults with AIDS on HAART over a monitoring period of six months; with this occurrence being higher in participants on HAART than in the control group. The symptoms occurred after diagnosis with HIV and mostly after HAART initiation; and participants who experienced vertigo did not report this to their attending doctor. Furthermore, there was a lack of a relationship between the increasing occurrences of hearing loss in the group to the presentation of vertigo over the six months of monitoring.

CONCLUSION: Findings from the present study which revealed occurrence of possible acute vertigo that spontaneously resolves in adults with AIDS on HAART, over a monitoring period of six months, add to the existing literature on vestibular function in this population. These findings raise important research as well as clinical assessment and management implications in this population.

143. **Case report: mechanisms of HIV elite control in two African women**.
Moosa, Y., R. F. Tanko, et al. BMC Infect Dis 2018 18(1): 54.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5785875/pdf/12879_2018_Article_2961.pdf

BACKGROUND: The majority of people living with HIV require antiretroviral therapy (ART) for controlling viral replication, however there are rare HIV controllers who spontaneously and durably control HIV in the absence of treatment. Understanding

what mediates viral control in these individuals has provided us with insights into the immune mechanisms that may be important to induce for a vaccine or functional cure for HIV. To date, few African elite controllers from high incidence settings have been described. We identified virological controllers from the CAPRISA 002 cohort of HIV-1 subtype C infected women in KwaZulu Natal, South Africa, two (1%) of whom were elite controllers. We examined the genetic, clinical, immunological and virological characteristics of these two elite HIV controllers in detail, to determine whether they exhibit features of putative viral control similar to those described for elite controllers reported in the literature.

CASE PRESENTATION: In this case report, we present clinical features, CD4(+) T cell and viral load trajectories for two African women over 7 years of HIV infection. Viral load became undetectable 10 months after HIV infection in Elite Controller 1 (EC1), and after 6 weeks in Elite Controller 2 (EC2), and remained undetectable for the duration of follow-up, in the absence of ART. Both elite controllers expressed multiple HLA Class I and II haplotypes previously associated with slower disease progression (HLA-A*74:01, HLA-B*44:03, HLA-B*81:01, HLA-B*57:03, HLA-DRB1*13). Fitness assays revealed that both women were infected with replication competent viruses, and both expressed higher mRNA levels of p21, a host restriction factor associated with viral control. HIV-specific T cell responses were examined using flow cytometry. EC1 mounted high frequency HIV-specific CD8+ T cell responses, including a B*81:01-restricted Gag TL9 response. Unusually, EC2 had evidence of pre-infection HIV-specific CD4+ T cell responses.

CONCLUSION: We identified some features typical of elite controllers, including high magnitude HIV-specific responses and beneficial HLA. In addition, we made the atypical finding of pre-infection HIV-specific immunity in one elite controller, that may have contributed to very early viral control. This report highlights the importance of studying HIV controllers in high incidence settings.

144. **Comparative assessment of five trials of universal HIV testing and treatment in sub-Saharan Africa**.
Perriat, D., L. Balzer, et al. J Int AIDS Soc 2018 21(1).
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5810333/pdf/JIA2-21-e25048.pdf

DESIGN: Universal voluntary HIV counselling and testing followed by prompt initiation of antiretroviral therapy (ART) for all those diagnosed HIV-infected (universal test and treat, UTT) is now a global health standard. However, its population-level impact, feasibility and cost remain unknown. Five community-based trials have been implemented in sub-Saharan Africa to measure the effects of various UTT strategies at population level: BCPP/YaTsie in Botswana, MaxART in Swaziland, HPTN 071 (PopART) in South Africa and Zambia, SEARCH in Uganda and Kenya and ANRS 12249 TasP in South Africa. This report describes and contrasts the contexts, research methodologies,

intervention packages, themes explored, evolution of study designs and interventions related to each of these five UTT trials.

METHODS: We conducted a comparative assessment of the five trials using data extracted from study protocols and collected during baseline studies, with additional input from study investigators. We organized differences and commonalities across the trials in five categories: trial contexts, research designs, intervention packages, trial themes and adaptations.

RESULTS: All performed in the context of generalized HIV epidemics, the trials highly differ in their social, demographic, economic, political and health systems settings. They share the common aim of assessing the impact of UTT on the HIV epidemic but differ in methodological aspects such as study design and eligibility criteria for trial populations. In addition to universal ART initiation, the trials deliver a wide range of biomedical, behavioural and structural interventions as part of their UTT strategies. The five studies explore common issues, including the uptake rates of the trial services and individual health outcomes. All trials have adapted since their initiation to the evolving political, economic and public health contexts, including adopting the successive national recommendations for ART initiation.

CONCLUSIONS: We found substantial commonalities but also differences between the five UTT trials in their design, conduct and multidisciplinary outputs. As empirical literature on how UTT may improve efficiency and quality of HIV care at population level is still scarce, this article provides a foundation for more collaborative research on UTT and supports evidence-based decision making for HIV care in country and internationally.

145. **Vaginal progesterone to reduce preterm birth among HIV-infected pregnant women in Zambia: a feasibility study protocol**.
Price, J. T., K. R. Mollan, et al. Pilot Feasibility Stud 2018 4: 21.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5516378/pdf/40814_2017_Article_170.pdf

BACKGROUND: Women infected with HIV have a risk of preterm birth (PTB) that is twice that among uninfected women, and treatment with antiretroviral therapy (ART) may further increase this risk. Progesterone supplementation reduces the risk of preterm delivery in women who have a shortened cervix in the midtrimester. We propose to study the feasibility of a trial of vaginal progesterone (VP) to prevent PTB among HIV-infected women receiving ART in pregnancy. Given low adherence among women self-administering vaginal study product in recent microbicide trials, we plan to investigate whether adequate adherence to VP can be achieved prior to launching a full-scale efficacy trial.

METHODS AND DESIGN: One hundred forty HIV-infected pregnant women in Lusaka, Zambia, will be randomly allocated to daily self-administration of either VP or matched placebo, starting between 20 and 24 gestational weeks. The primary outcome will be adherence, defined as the proportion of participants who achieve at least 80% use of study product, assessed objectively with a validated dye stain assay that confirms vaginal insertion of returned single-use applicators. Secondary outcomes will be study uptake, retention, and preliminary efficacy. We will concurrently perform semi-structured interviews with participants enrolled in the study and with women who decline enrollment to assess the acceptability of VP to prevent PTB and of enrollment to a randomized controlled trial.

DISCUSSION: We hypothesize that VP could prevent PTB among women receiving ART in pregnancy. In preparation for a trial to test this hypothesis, we plan to assess whether participants will be adherent to study product and protocol.

146. **Integrated Hiv-Care into Primary Care Clinics and the Influence on Diabetes and Hypertension Care: An Interrupted Time Series Analysis in Free State, South Africa Over Four Years**.
Rawat, A., K. Uebel, et al. J Acquir Immune Defic Syndr 2018.

BACKGROUND: Non-communicable diseases (NCDs), specifically diabetes and hypertension, are rising in high-HIV burdened countries like South Africa. How integrated HIV-care into primary health care (PHC) influences NCD care is unknown. We aimed to understand whether differences existed in NCD care (pre versus post-integration) and how changes may relate to HIV patient numbers. SETTING: Public-sector PHC clinics in Free State, South Africa

METHODS: Using a quasi-experimental design, we analysed monthly administrative data on four indicators for diabetes and hypertension (clinic and population levels) during four years as HIV-integration was implemented in PHC. Data represented 131 PHC clinics (PHCCs) with a catchment population of 1.5 million. We utilised interrupted time series analysis at +/-18 and +/-30 months from HIV integration in each clinic to identify changes in trends post-integration compared to pre-integration. We utilised linear mixed effect models to study relationships between HIV and NCD indicators.

RESULTS: Patients receiving ART in the 131 PHC clinics studied increased from 1614 (April 2009) to 57, 958 (April 2013). Trends in new diabetes patients on treatment remained unchanged. However, population level new hypertensives on treatment decreased at +/-30 months from integration by 6/100, 000 (SE=3,$p<0.02$) and was associated with the number of new HIV patients on treatment at the clinics.

CONCLUSION: Our findings suggest that during the implementation of integrated HIV-care into PHCCs care for hypertensive patients could be compromised. Further research

is needed to understand determinants NCD care in South Africa and other high HIV-burdened settings to ensure patient-centred PHC.

147. **A Mobile App to Screen for Neurocognitive Impairment: Preliminary Validation of NeuroScreen Among HIV-Infected South African Adults**.
Robbins, R. N., H. Gouse, et al. JMIR Mhealth Uhealth 2018 6(1): e5.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5775487/

BACKGROUND: Neurocognitive impairment (NCI) is one of the most common complications of HIV infection, and has serious medical and functional consequences. South Africa has 7 million people living with HIV (PLHIV) with up to three-quarters of antiretroviral therapy (ART)-naive individuals having NCI. South Africa's health system struggles to meet the care needs of its millions of PLHIV; screening for NCI is typically neglected due to limited clinical staff trained to administer, score, and interpret neuropsychological tests, as well as long test batteries and limited screening tools for South African populations. Without accurate, clinically useful, and relatively brief NCI screening tests that can be administered by all levels of clinical staff, critical opportunities to provide psychoeducation, behavioral planning, additional ART adherence support, and adjuvant therapies for NCI (when they become available) are missed. To address these challenges and gap in care, we developed an mHealth app screening tool, NeuroScreen, to detect NCI that can be administered by all levels of clinical staff, including lay health workers.

OBJECTIVE: The purpose of this study was to examine sensitivity and specificity of an adapted version of NeuroScreen to detect NCI (as determined by a gold standard neuropsychological test battery administered by a trained research psychometrist) among HIV-infected South Africans when administered by a lay health worker. METHODS: A total of 102 HIV-infected black South African adults who had initiated ART at least 12 months prior were administered NeuroScreen and a gold standard neuropsychological test battery in the participants' choice of language (ie, English or isiXhosa). Three composite z scores were calculated for NeuroScreen: (1) sum of all individual test scores, (2) sum of all individual test scores and error scores from four tests, and (3) sum of four tests (abbreviated version). Global deficit scores were calculated for the gold standard battery where a score of 0.5 or greater indicated the presence of NCI.

RESULTS: The mean age of participants was 33.31 (SD 7.46) years, most (59.8%, 61/102) had at least 12 years of education, and 81.4% (83/102) of the sample was female. Gold standard test battery results indicated that 26.5% (27/102) of the sample had NCI. Sensitivity and specificity of age-, education-, and sex-adjusted NeuroScreen scores were 81.48% and 74.67% for composite score 1, 81.48% and 81.33% for composite score 2, and 92.59% and 70.67% for composite score 3, respectively.

CONCLUSIONS: NeuroScreen, a highly automated, easy-to-use, tablet-based screening test to detect NCI among English- and isiXhosa-speaking South African HIV patients demonstrated robust sensitivity and specificity to detect NCI when administered by lay health workers. NeuroScreen could help make screening for NCI more feasible. However, additional research is needed with larger samples and normative test performance data are needed.

148. **Evidence for sample selection effect and Hawthorne effect in behavioural HIV prevention trial among young women in a rural South African community**. Rosenberg, M., A. Pettifor, et al. BMJ Open 2018 8(1): e019167. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5781067/pdf/bmjopen-2017-019167.pdf

OBJECTIVES: We examined the potential influence of both sample selection effects and Hawthorne effects in the behavioural HIV Prevention Trial Network 068 study, designed to examine whether cash transfers conditional on school attendance reduce HIV acquisition in young South African women. We explored whether school enrolment among study participants differed from the underlying population, and whether differences existed at baseline (sample selection effect) or arose during study participation (Hawthorne effect).

METHODS: We constructed a cohort of 3889 young women aged 11-20 years using data from the Agincourt Health and socio-Demographic Surveillance System. We compared school enrolment in 2011 (trial start) and 2015 (trial end) between those who did (n=1720) and did not (n=2169) enrol in the trial. To isolate the Hawthorne effect, we restricted the cohort to those enrolled in school in 2011.

RESULTS: In 2011, trial participants were already more likely to be enrolled in school (99%) compared with non-participants (93%). However, this association was attenuated with covariate adjustment (adjusted risk difference (aRD) (95% CI): 2.9 (- 0.7 to 6.5)). Restricting to those enrolled in school in 2011, trial participants were also more likely to be enrolled in school in 2015 (aRD (95% CI): 4.9 (1.5 to 8.3)). The strength of associations increased with age.

CONCLUSIONS: Trial participants across both study arms were more likely to be enrolled in school than non-participants. Our findings suggest that both sample selection and Hawthorne effects may have diminished the differences in school enrolment between study arms, a plausible explanation for the null trial findings. The Hawthorne-specific findings generate hypotheses for how to structure school retention interventions to prevent HIV.

149. **The Croton megalobotrys Mull Arg. traditional medicine in HIV/AIDS management: Documentation of patient use, in vitro activation of latent HIV-1 provirus, and isolation of active phorbol esters**.

Tietjen, I., B. N. Ngwenya, et al. J Ethnopharmacol 2018 211: 267-277.

ETHNOPHARMACOLOGICAL RELEVANCE: Current HIV therapies do not act on latent cellular HIV reservoirs; hence they are not curative. While experimental latency reversal agents (LRAs) can promote HIV expression in these cells, thereby exposing them to immune recognition, existing LRAs exhibit limited clinical efficacy and high toxicity. We previously described a traditional 3-step medicinal plant regimen used for HIV/AIDS management in Northern Botswana that inhibits HIV replication in vitro. Here we describe use of one component of the regimen that additionally contains novel phorbol esters possessing HIV latency-reversal properties.

AIM OF THE STUDY: We sought to document experiences of traditional medicine users, assess the ability of traditional medicine components to reverse HIV latency in vitro, and identify pure compounds that conferred these activities.

MATERIALS AND METHODS: Experiences of two HIV-positive traditional medicine users (patients) were documented using qualitative interview techniques. Latency reversal activity was assessed using a cell-based model (J-Lat, clone 9.2). Crude plant extracts were fractionated by open column chromatography and reverse-phase HPLC. Compound structures were elucidated using NMR spectroscopy and mass spectrometry.

RESULTS: Patients using the 3-step regimen reported improved health over several years despite no reported use of standard HIV therapies. Crude extracts from Croton megalobotrys Mull Arg. ("Mukungulu"), the third component of the 3-step regimen, induced HIV expression in J-lat cells to levels comparable to the known LRA prostratin. Co-incubation with known LRAs and pharmacological inhibitors indicated that the active agent(s) in C. megalobotrys were likely to be protein kinase C (PKC) activator(s). Consistent with these results, two novel phorbol esters (Namushen 1 and 2) were isolated as abundant components of C. megalobotrys and were sufficient to confer HIV latency reversal in vitro.

CONCLUSION: We have identified novel LRAs of the phorbol ester class from a medicinal plant used in HIV/AIDS management. These data, combined with self-reported health effects and previously-described in vitro anti-HIV activities of this traditional 3-step regimen, support the utility of longitudinal observational studies of patients undergoing this regimen to quantify its effects on plasma viral loads and HIV reservoir size in vivo.

150. **End-Users' Product Preference Across Three Multipurpose Prevention Technology Delivery Forms: Baseline Results from Young Women in Kenya and South Africa**. Weinrib, R., A. Minnis, et al. AIDS Behav 2018 22(1): 133-145.

A multipurpose prevention technology (MPT) that combines HIV and pregnancy prevention is a promising women's health intervention, particularly for young women. However, little is known about the drivers of acceptability and product choice for MPTs

in this population. This paper explores approval ratings and stated choice across three different MPT delivery forms among potential end-users. The Trio Study was a mixed-methods study in women ages 18-30 that examined acceptability of three MPT delivery forms: oral tablets, injections, and vaginal ring. Approval ratings and stated choice among the products was collected at baseline. Factors influencing stated product choice were explored using multivariable multinomial logistic regression. The majority (62%) of women in Trio stated they would choose injections, 27% would choose tablets and 11% would choose the ring. Significant predictors of choice included past experience with similar contraceptive delivery forms, age, and citing frequency of use as important. Ring choice was higher for older (25-30) women than for younger (18-24) women (aRR = 3.1; $p < 0.05$). These results highlight the importance of familiarity in MPT product choice of potential for variations in MPT preference by age.

151. **Factors for incomplete adherence to antiretroviral therapy including drug refill and clinic visits among older adults living with human immunodeficiency virus - cross-sectional study in South Africa**.
Barry, A., N. Ford, et al. Trop Med Int Health 2017.

OBJECTIVES: To assess adherence outcomes to antiretroviral therapy (ART) of recipients >/=50 years in Soweto, South Africa.

METHODS: This was a secondary data analysis for a cross-sectional study at two HIV clinics in Soweto. Data on ART adherence and covariates were gathered through structured interviews with HIV 878 persons living with HIV (PLHIV) receiving ART. Logistic regression analysis was used to assess associations.

RESULTS: PLHIV >/=50 years (n = 103) were more likely to miss clinic visits during the last six months than PLHIV aged 25-49 (OR 2.15; 95%CI 1.10-4.18). PLHIV >/=50 years with no or primary-level education were less likely to have missed a clinic visit during the last six months than PLHIV with secondary- or tertiary-level education in the same age category (OR 0.3; 95%CI 0.1-1.1), as were PLHIV who did not disclose their status (OR 0.2; 95%CI 0-1.1). There was no evidence of increased risk for non-adherence to ART pills and drug refill visits among older PLHIV.

CONCLUSION: Missing a clinic visit was more common among older PLHIV who were more financially vulnerable. Further studies are needed to verify these findings and identify new risk factors associated with ART adherence.

152. **The relationship between immunogenic red blood cell antigens and Human Immunodeficiency Virus infection**.
Davison, G. M., H. L. Hendrickse, et al. Transfus Apher Sci 2017.

INTRODUCTION: Evidence suggests that red cell antigens may act as receptors for viruses and bacteria and therefore could be associated with HIV infection. Previous

studies have been controversial and therefore the aim of this exploratory study was to analyse the expression of immunogenic red cell antigens in HIV-seropositive individuals and to compare the results to negative donors from South Africa.

METHODS: The expression of ABO, Rh, Kell and Duffy antigens from 119 HIV-seropositive patients was compared to 317 HIV-seronegative blood donors. Nucleic acid amplification testing and PCR were used to determine the HIV status and the ID-Gel Card Technology was used to determine the blood group antigen profile.

RESULTS: There was no significant difference in the expression of A, B, AB, Duffy or Kel antigens between the two groups but significantly lower numbers of HIV+ individuals were O Rh Negative (p=,0.0001). Analysis of those with a Duffy null phenotype revealed a significantly higher incidence of blood type A RH1-Positive, Dce/R(0)r and B RH1-Positive, DcEe/R(2)r within the HIV-seropositive group (p=<0.05). None of the HIV-seropositive individuals were O RH1-Negative, dce/rr.

CONCLUSION: In conclusion these initial findings have demonstrated a decreased incidence of blood type O Rh1-negative in HIV+individuals which suggests that red blood cell antigens may play an important role in susceptibility to HIV infection. The relationship between red cell antigens and HIV infection however remains complex and therefore larger studies are required to confirm these results.

153. **Rationale and design of a multi-center, open-label, randomised clinical trial comparing HIV incidence and contraceptive benefits in women using three commonly-used contraceptive methods (the ECHO study)**.
Hofmeyr, G. J., C. S. Morrison, et al. Gates Open Res 2017 1: 17.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5771152/

BACKGROUND: In vitro, animal, biological and observational clinical studies suggest that some hormonal methods, particularly depot medroxyprogesterone acetate - DMPA, may increase women's risk of HIV acquisition. DMPA is the most common contraceptive used in many countries worst affected by the HIV epidemic. To provide robust evidence for contraceptive decision-making among women, clinicians and planners, we are conducting the Evidence for Contraceptive Options and HIV Outcomes (ECHO) study in four countries with high HIV incidence and DMPA use: Kenya, South Africa, Swaziland, and Zambia (Clinical Trials.gov identifier NCT02550067).

STUDY DESIGN: We randomized HIV negative, sexually active women 16-35 years old requesting effective contraception and agreeing to participate to either DMPA, the copper T 380A intrauterine device or levonorgestrel implant. Participants attend a contraception support visit after 1 month and quarterly visits thereafter for 12 to 18 months. Participants receive a standard HIV prevention package and contraceptive side-effect management at each visit. The primary outcome is HIV seroconversion. Secondary outcomes include pregnancy, serious adverse events and method discontinuation. The

sample size of 7800 women provides 80% power to detect a 50% difference in HIV risk between any of the three method pairs, assuming 250 incident infections per comparison. Ethical considerations: Several WHO consultations have concluded that current evidence on HIV risk associated with DMPA is inconclusive and that a randomized trial is needed to guide policy, counselling and choice. Previous studies suggest that women without a specific contraceptive preference are willing to accept randomization to different contraceptive methods. Stringent performance standards are monitored by an independent data and safety monitoring board approximately every 6 months. The study has been conducted with extensive stakeholder engagement.

CONCLUSIONS: The ECHO study is designed to provide robust evidence on the relative risks (HIV acquisition) and benefits (pregnancy prevention) between three effective contraceptive methods.

154. **Estimating the impact of antiretroviral treatment on adult mortality trends in South Africa: A mathematical modelling study**.
Johnson, L. F., M. T. May, et al. PLoS Med 2017 14(12): e1002468.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5726614/pdf/pmed.1002468.pdf

BACKGROUND: Substantial reductions in adult mortality have been observed in South Africa since the mid-2000s, but there has been no formal evaluation of how much of this decline is attributable to the scale-up of antiretroviral treatment (ART), as previous models have not been calibrated to vital registration data. We developed a deterministic mathematical model to simulate the mortality trends that would have been expected in the absence of ART, and with earlier introduction of ART.

METHODS AND FINDINGS: Model estimates of mortality rates in ART patients were obtained from the International Epidemiology Databases to Evaluate AIDS-Southern Africa (IeDEA-SA) collaboration. The model was calibrated to HIV prevalence data (1997-2013) and mortality data from the South African vital registration system (1997-2014), using a Bayesian approach. In the 1985-2014 period, 2.70 million adult HIV-related deaths occurred in South Africa. Adult HIV deaths peaked at 231,000 per annum in 2006 and declined to 95,000 in 2014, a reduction of 74.7% (95% CI: 73.3%-76.1%) compared to the scenario without ART. However, HIV mortality in 2014 was estimated to be 69% (95% CI: 46%-97%) higher in 2014 (161,000) if the model was calibrated only to HIV prevalence data. In the 2000-2014 period, the South African ART programme is estimated to have reduced the cumulative number of HIV deaths in adults by 1.72 million (95% CI: 1.58 million-1.84 million) and to have saved 6.15 million life years in adults (95% CI: 5.52 million-6.69 million). This compares with a potential saving of 8.80 million (95% CI: 7.90 million-9.59 million) life years that might have been achieved if South Africa had moved swiftly to implement WHO guidelines (2004-2013) and had achieved high levels of ART uptake in HIV-diagnosed individuals from 2004 onwards. The model is limited by its reliance on all-cause mortality data, given the lack of reliable

cause-of-death reporting, and also does not allow for changes over time in tuberculosis control programmes and ART effectiveness.

CONCLUSIONS: ART has had a dramatic impact on adult mortality in South Africa, but delays in the rollout of ART, especially in the early stages of the ART programme, have contributed to substantial loss of life. This is the first study to our knowledge to calibrate a model of ART impact to population-level recorded death data in Africa; models that are not calibrated to population-level death data may overestimate HIV-related mortality.

155. **Migration and health at older age in rural Malawi**.
Kendall, J. and P. Anglewicz. Glob Public Health 2017: 1-13.

The connection between migration and health has long been established, but relatively little is known about this relationship for older persons, particularly in sub-Saharan Africa (SSA). In this paper, we examine migration selection with regards to health status among older individuals in Malawi, by testing whether older migrants differ from non-migrants in health status before migration. To do so, we use data from the Malawi Longitudinal Study of Families and Health, a longitudinal panel dataset that includes a relatively large number of individuals at older ages. We focus on three measures: mental health, physical health, and HIV status. We find that the relationship between migration and health selection differs by gender. Older women who are HIV-positive are nearly 10 times more likely to migrate compared to their HIV-negative counterparts. For men, those with better mental health are less likely to migrate in the future. These results suggest that, although research in some settings shows that migrants have better health before moving, some older migrants have worse health than their non-migrant peers, and may, therefore, add to the already-heavy burden on rural health centres in Africa.

156. **The relationship between HIV and fertility in the era of antiretroviral therapy in sub-Saharan Africa: evidence from 49 Demographic and Health Surveys**.
Marston, M., B. Zaba, et al. Trop Med Int Health 2017 22(12): 1542-1550.

OBJECTIVES: To describe regional differences in the relative fertility of HIV-positive vs. HIV-negative women and changes as antiretroviral treatment (ART) is scaled up, to improve estimates of predicted need for and coverage of prevention of mother-to-child transmission services at national and subnational levels.

METHODS: We analysed 49 nationally representative household surveys in sub-Saharan Africa between 2003 and 2016 to estimate fertility rate ratios of HIV-positive and HIV-negative women by age using exponential regression and test for regional and urban/rural differences. We estimated the association between national ART coverage and the relationship between HIV and fertility.

RESULTS: Significant regional differences exist in HIV and fertility relationships, with less HIV-associated subfertility in Southern Africa. Age patterns of relative fertility are similar. HIV impact on fertility is weaker in urban than rural areas. For women below age 30, regional and urban/rural differences are largely explained by differences in age at sexual debut. Higher levels of national ART coverage were associated with slight attenuation of the relationship between HIV and fertility.

CONCLUSIONS: Regional differences in HIV-associated subfertility and urban-rural differences in age patterns of relative fertility should be accounted for when predicting need for and coverage of PMTCT services at national and subnational level. Although HIV impacts on fertility are somewhat reduced at higher levels of national ART coverage, differences in fertility between HIV positive and negative remain, and fertility of women on ART should not be assumed to be the same as HIV-negative women. There were few data in recent years, when ART has reached high levels, and this relationship should continue to be assessed as further evidence becomes available.

157. **Re-Evaluating the Possible Increased Risk of HIV Acquisition With Progestin-Only Injectables Versus Maternal Mortality and Life Expectancy in Africa: A Decision Analysis**.
Rodriguez, M. I., M. E. Gaffield, et al. Glob Health Sci Pract 2017 5(4): 581-591.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5752605/pdf/581.pdf

OBJECTIVE: The association between increased risk of HIV acquisition and use of progestin-only injectables (POIs) is controversial. We sought to compare the competing risks of maternal mortality and HIV acquisition with use of POIs using updated data on this association and considering an expanded number of African countries.

METHODS: We designed a decision-analytic model to compare the benefits and risks of POIs on the competing risks of maternal mortality and HIV acquisition on life expectancy for women in 9 African countries. For the purposes of this analysis, we assumed that POIs were associated with an increased risk of HIV acquisition (hazards ratio of 1.4). Our primary outcome was life-years and the population was women of reproductive age (15-49 years) in these countries, who did not have HIV infection and were not currently planning a pregnancy. Probabilities for each variable included in the model, such as HIV incidence, access to antiretroviral therapy, and contraceptive prevalence, were obtained from the literature. Univariate and multivariate sensitivity analyses were performed to check model assumptions and explore how uncertainty in estimates would affect the model results.

RESULTS: In all countries, discontinuation of POIs without replacement with an equally effective contraceptive method would result in decreased life expectancy due to a significant increase in maternal deaths. While the removal of POIs from the market would result in the prevention of some new cases of HIV, the life-years gained from this are mitigated due to the marked increase in neonatal HIV cases and maternal mortality

with associated life-years lost. In all countries, except South Africa, typical-use contraceptive failure rates with POIs would need to exceed 39%, and more than half of women currently using POIs would have to switch to another effective method, for the removal of POIs to demonstrate an increase in total life-years.

CONCLUSION: Women living in sub-Saharan Africa cope with both high rates of HIV infection and high rates of pregnancy-related maternal death relative to the rest of the world. Based on the most current estimates, our model suggests that removal of POI contraception from the market without effective and acceptable contraception replacement would have a net negative effect on maternal health, life expectancy, and mortality under a variety of scenarios.

158. **Comparing four service delivery models for adolescent girls and young women through the 'Girl Power' study: protocol for a multisite quasi-experimental cohort study**.
Rosenberg, N. E., A. E. Pettifor, et al. BMJ Open 2017 7(12): e018480.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5735401/pdf/bmjopen-2017-018480.pdf

INTRODUCTION: In sub-Saharan Africa, adolescent girls and young women (AGYW) face a range of sexual and reproductive health (SRH) challenges. Clinical, behavioural and structural interventions have each reduced these risks and improved health outcomes. However, combinations of these interventions have not been compared with each other or with no intervention at all. The 'Girl Power' study is designed to systematically make these comparisons.

METHODS AND ANALYSIS: Four comparable health facilities in Malawi and South Africa (n=8) were selected and assigned to one of the following models of care: (1) Standard of care: AGYW can receive family planning, HIV testing and counselling (HTC), and sexually transmitted infection (STI) syndromic management in three separate locations with three separate queues with the general population. No youth-friendly spaces, clinical modifications or trainings are offered, (2) Youth-Friendly Health Services (YFHS): AGYW are meant to receive integrated family planning, HTC and STI services in dedicated youth spaces with youth-friendly modifications and providers trained in YFHS, (3) YFHS+behavioural intervention (BI): In addition to YFHS, AGYW can attend 12 monthly theory-driven, facilitator-led, interactive sessions on health, finance and relationships, (4) YFHS+BI+conditional cash transfer (CCT): in addition to YFHS and BI, AGYW receive up to 12 CCTs conditional on monthly BI session attendance.At each clinic, 250 AGYW 15-24 years old (n=2000 total) will be consented, enrolled and followed for 1 year. Each participant will complete a behavioural survey at enrolment, 6 months and 12 months . All clinical, behavioural and CCT services will be captured. Outcomes of interest include uptake of each package element and reduction in HIV risk behaviours. A qualitative substudy will be conducted.

ETHICS/DISSEMINATION: This study has received ethical approval from the University of North Carolina Institutional Review Board, the University of Cape Town Human Research Ethics Committee and Malawi's National Health Sciences Research Committee. Study plans, processes and findings will be disseminated to stakeholders, in peer-reviewed journals and at conferences.

159. **Improving AIDS Care After Trauma (ImpACT): Pilot Outcomes of a Coping intervention Among HIV-Infected Women with Sexual Trauma in South Africa**.
Sikkema, K. J., M. I. Mulawa, et al. AIDS Behav 2017.

Improving AIDS Care after Trauma (ImpACT), a coping intervention for HIV-infected women with sexual abuse histories, was evaluated for feasibility and potential efficacy in a public clinic in Cape Town, South Africa. Sixty-four participants were enrolled prior to starting antiretroviral therapy (ART). After completing baseline assessments, participants were randomly assigned to standard of care (SoC: three adherence counseling sessions) or ImpACT (SoC plus four individual and three group sessions). Participants completed assessments at 3 months (after individual sessions) and 6 months post-baseline. In exploratory analysis of primary outcomes, ImpACT participants, compared to SoC, reported greater reductions in avoidance and arousal symptoms of PTSD and greater increases in ART adherence motivation at 3 months. Clinically significant decreases in overall PTSD symptoms were also demonstrated at 3 months. These effects continued as trends at the 6-month assessment, in addition to increases in social/spiritual coping. In analysis of secondary outcomes, high levels of non-adherence to ART and poor care engagement were evident at 6 months, with no differences between study arms. A trauma-focused, culturally-adapted individual intervention delivered by a non-specialist in the HIV care setting is feasible and acceptable. Preliminary findings suggest ImpACT has potential to reduce PTSD symptoms and increase ART adherence motivation, but a more intensive intervention may be needed to improve and maintain care engagement among this population.

160. **HIV prevention needs for men who have sex with men in Swaziland**.
Sithole, B. Afr J AIDS Res 2017 16(4): 315-320.
http://www.tandfonline.com/doi/pdf/10.2989/16085906.2017.1379420?needAccess=true

Men who have sex with men (MSM) have a high HIV burden and also often face multiple other challenges accessing HIV services, including legal and social issues. Although Swaziland recently started responding with interventions for MSM, significant gaps still exist both in information and programming. This study aimed to explore the HIV prevention needs of MSM in Swaziland, including factors elevating their risks and vulnerabilities to HIV infection; to find out what HIV prevention strategies exist; and to determine how best to meet the prevention needs of MSM. A total of 50 men who reported anal sex with other men in the past 12 months were recruited through simple respondent driven sampling. They completed either a structured quantitative survey (n

= 35) or participated in a semi-structured qualitative interview (n = 15). Both quantitative and qualitative findings indicated perceived and experienced stigma among MSM. This predominantly manifested as internalised stigma, which may lead to alcohol abuse and sexual risky behaviours. At least 83% (29/35) of the quantitative sample had been labelled with derogatory terms because of their sexual orientation, while 66% (23/35) had experienced being avoided. There was limited knowledge of risk practices: When asked, 54% (19/35) of quantitative respondents reported that vaginal and anal sex carry an equal risk of HIV infection. Participants also had little knowledge on new HIV prevention methods such as pre-exposure prophylaxis (PrEP) and rectal microbicides. MSM needs included safe spaces in form of drop-in centres and non-hostile HIV services. Although Swaziland recently started interventions for key populations, including MSM, there is still a general lack on information to inform managers and implementers on the HIV prevention needs of MSM in Swaziland. Such information is crucial for designers of official and HIV programmes. Research is needed to increase knowledge on the HIV prevention needs for key populations, including MSM.

161. **Higher retention and viral suppression with adolescent-focused HIV clinic in South Africa**.
Zanoni, B. C., T. Sibaya, et al. PLoS One 2017 12(12): e0190260.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5747481/pdf/pone.0190260.pdf

OBJECTIVE: To determine retention in care and virologic suppression among HIV-infected adolescents and young adults attending an adolescent-friendly clinic compared to those attending the standard pediatric clinic at the same site. DESIGN: Retrospective cohort analysis.

SETTING: Government supported, hospital-based antiretroviral clinic in KwaZulu-Natal, South Africa.

PARTICIPANTS: Two hundred forty-one perinatally HIV-infected adolescents and young adults aged 13 to 24 years attending an adolescent-friendly clinic or the standard pediatric clinic from April 2007 to November 2015.

INTERVENTION: Attendance in an adolescent-friendly clinic compared to a standard pediatric clinic.

OUTCOMES MEASURES: Retention in care defined as one clinic visit or pharmacy refill in the prior 6 months; HIV-1 viral suppression defined as < 400 copies/ml.

RESULTS: Overall, among 241 adolescents and young adults, retention was 89% (214/241) and viral suppression was 81% (196/241). Retention was higher among those attending adolescent clinic (95%) versus standard pediatric clinic (85%; OR 3.7; 95% confidence interval (CI) 1.2-11.1; p = 0.018). Multivariable logistic regression adjusted for age at ART initiation, gender, pre-ART CD4 count, months on ART, and tuberculosis

history indicated higher odds of retention in adolescents and young adults attending adolescent compared to standard clinic (AOR = 8.5; 95% CI 2.3-32.4; p = 0.002). Viral suppression was higher among adolescents and young adults attending adolescent (91%) versus standard pediatric clinic (80%; OR 2.5; 95% CI 1.1-5.8; p = 0.028). A similar multivariable logistic regression model indicated higher odds of viral suppression in adolescents and young adults attending adolescent versus standard pediatric clinic (AOR = 3.8; 95% CI 1.5-9.7; p = 0.005).

CONCLUSION: Adolescents and young adults attending an adolescent-friendly clinic had higher retention in care and viral suppression compared to adolescents attending the standard pediatric clinic. Further studies are needed to prospectively assess the impact of adolescent-friendly services on these outcomes.

Back to top