

**12<sup>th</sup> International Workshop on HIV Treatment,  
Pathogenesis, and Prevention Research in  
Resource-limited Settings;**

**INTEREST**

**29 May – 1 June 2018,  
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**Abstracts  
Oral presentations**



## 1

## Facility-based HIV self-testing for outpatients dramatically increases HIV testing in Malawi: a cluster randomized trial

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**Background:** HIV self-testing (HIVST) increases testing coverage in community settings in sub-Saharan Africa, but scalability is a challenge due to resource constraints. Outpatient departments provide an ideal space to integrate HIVST into low-resource health systems due to high client volume and long wait-times. We evaluated an HIVST intervention in outpatient waiting-spaces of hospitals and health centres in Malawi.

**Methods:** A cluster randomized trial was conducted at 15 health facilities in Central/Southern Malawi between September 2017-January 2018. Facilities were randomized 1:1:1: (1) routine provider initiated testing and counseling (PITC); (2) Optimized PITC (additional provider trainings and job-aids); and (3) HIVST (including Oraquick HIV self-test<sup>®</sup> demonstration, distribution, and kit use in outpatient waiting-spaces, private spaces for interpretation, and optional post-test counseling). The primary outcome was HIV-testing among outpatients. Exit surveys were conducted with a random sample of outpatients.

**Results:** 5,675 outpatients completed an exit survey. There were no differences by arm (Table). 52% of outpatients in the HIVST arm tested for HIV compared to 14% in Optimized PITC (AOR:6.6 p< 0.001) and 12% in PITC (AOR:7.6 p< 0.001). For HIVST, 60% of outpatients in need of testing (defined as tested > 12 months ago and never tested HIV-positive) were tested compared to 18% in Optimized PITC and 16% in PITC. There was no significant difference in the proportion of clients tested who reported previously testing HIV-positive ( $\leq 1\%$  for all arms). Positivity rates did not differ by arm, however, HIVST was associated with a higher absolute number of new positives identified compared to Optimized PITC (AOR:2.9, p=0.01) and

PITC (AOR:4.1, p=0.002). Participants who were tested by HIVST were more likely to want to test again using the same method and more likely to recommend testing to others compared to those tested by Optimized PITC or PITC. No adverse events were reported in the HIVST arm.

**Conclusions:** Facility-based HIVST in outpatient waiting-spaces dramatically increased HIV testing and identification of HIV-infected persons among outpatients in Malawi, with minimal risk for loss of confidentiality or adverse events. Analyses for linkage to care are underway. Evaluations of routine program implementation are needed to determine best strategies to take facility-based HIVST to scale.

## 2

## Equity not equality of services: Case of HIV Differentiated Service Delivery Model (DSDM) in Rwanda

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**Background:** Rwanda is among few countries at the forefront of reaching the second 90 and achieving HIV epidemic control in the near future with more than 80% of treatment coverage.

The National roll out of Antiretroviral Treatment (ART) started in 2003, since then patients were initiated to ART progressively based on CD4 threshold up to 1st July 2016 when Rwanda started the implementation of “Treat All” HIV positive patients as per WHO recommendation. While this was another golden opportunity to increase the number of new patients on treatment and put the national HIV program in the right direction towards achievement of the 90-90-90 targets, there was a foreseeable burden to the existing health systems given the likelihood of a disproportionate increase in the number of clients versus the number of health care providers. Furthermore, given the extensive national treatment coverage and the duration of treatment programs to date, there is a cluster of patients in the HIV program who have been on treatment for a long time; some of whom are deemed stable on treatment as defined by their biological and clinical parameters with no need of monthly visit..

DSDM has been one of solutions to mitigate the burden of healthcare providers and to reduce the frequency of visits of the patients at health facility.

**Methods:** Since December 2016, patients were categorised into 2 groups: Stable and Unstable. Stable patients being all adult patients on ART for more than 18months with 2 recent consecutive undetectable VL (VL<20copies), those not fulfilling these criteria were classified as unstable.

Stable patients have been scheduled for 6 months clinical visit and 3 months pharmacy pick while unstable patients had clinical visit and pharmacy pick up of 3 and 1month respectively as routine. The implementation is progressive based on patient appointment and classification.

**Results:** By December 2017, 47.6% of adult patients on ART for more than 18months have been

classified as stable thus are coming to health facility for their drug refill on quarterly basis and clinical visit every 6months. The classification of patients is dynamic and the number of stable patients is increasing with the time. Based on the DSDM implementation, the definition of stable group is being revised to be more inclusive and target more people living with HIV.

**Conclusion:** The spacing of visits is one of strategies to mitigate health facilities workload but also patients ‘burden to visit clinics on monthly basis. This is also a motivation tool for patients with poor adherence for future VL suppression. An evaluation should be done to inform the program and ensure quality of services is not affected.

## 3

**PrEP uptake among pregnant and postpartum women: Results: from a large implementation program within routine maternal child health (MCH) clinics in Kenya**

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**Background:** Very few examples of PrEP delivery to pregnant and postpartum women have been reported. The PrEP Implementation for Young Women and Adolescents (PrIYA) Program provides real-world evidence on delivering PrEP to pregnant and postpartum women in Western Kenya.

**Methods:** PrIYA is part of the DREAMS Innovation Challenge funded by PEPFAR managed by JSI Research & Training Institute, Inc. We approached HIV-uninfected pregnant women seeking routine antenatal (ANC) and postnatal (PNC) services at 16 maternal and child health clinics in Kisumu County, Kenya from June to December 2017. At each patient encounter, screening for behavioral risk factors and willingness to consider PrEP was conducted per national PrEP guidelines. Those who were willing to consider PrEP were assessed for medical eligibility and those eligible were offered PrEP at the same visit. Logistic regression models determined correlates of PrEP initiation.

**Results:** In total, we conducted 9,704 assessments among pregnant and postpartum clients for behavioral risk factors and willingness to consider PrEP. The median age was 24 years (IQR 21-28); 31% did not know their male partner's HIV status and 84% were married. Overall, 1,856 (19%) of encounters led to PrEP initiation; only 6 women (<0.01%) were medically ineligible (creatinine clearance <50 mL/min). Frequency of PrEP initiation differed by male partner HIV status (HIV-negative 7%, unknown 43%, HIV-positive 79%,  $p<0.001$ ). PrEP initiation was more common in the postpartum period than during pregnancy (23% vs 16%,  $p<0.001$ ). Women younger than 24 years of age were more likely than older women to initiate PrEP (OR=1.18, 95% CI 1.08-1.28,  $p<0.001$ ). Initiating PrEP was also associated with having an

STI (OR=2.66, 95% CI 1.48-4.77,  $p=0.001$ ) and being forced to have sex in the last 6 months (OR=3.69, 95% CI 1.69-8.06,  $p=0.001$ ). The most frequently reported reasons for declining PrEP were the perception that HIV risk was low (46%) and the partner was HIV-negative (43%); few women accepting PrEP feared intimate partner violence as a result (2%).

**Conclusions:** In this pregnant and postpartum population, a substantial number of women desired and started PrEP. PrEP initiators were younger and more likely to have HIV risk factors than those who declined PrEP.

## 4

## Leave no stone unturned: multiple structural response for KP programming in Swaziland

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**Background:** In many countries, key populations (KPs), including female sex workers (FSWs), men who have sex with men (MSM), transgender people, and people who inject drugs, continue to experience a hostile environment that increases their vulnerability and limits their access to HIV services. We present our experience using a multi-strategy structural response among KPs within the USAID-and PEPFAR-funded LINKAGES Swaziland project.

**Description:** The multi-strategy response is a KP stakeholder framework spearheaded by Swaziland National AIDS Programme (SNAP) to respond to structural issues preventing KPs from accessing HIV services. We are working with multiple stakeholders on a structural response, including the Royal Swaziland Police (RSP) and KP outreach workers (ORWs). First, we rolled out a training of trainers on KP rights to care by training 42 RSP and 58 ORWs. The trained RSP in turn trained a lower cadre of frontline officers who are involved in arbitrary arresting of KP individuals. The ORWs were trained on how to screen for violence, provide immediate remedial action, refer their peers to health facilities, report to the police, and provide peer sensitization on human rights. Second, we provided comprehensive HIV services to KPs in places where they meet their clients, including hot spots. Third, qualitative data were obtained on lessons learned using program tools.

**Lesson Learned:** As the result of the response, RSP commanders have established a position for a contact person for KP victims in police stations, and the number of reported cases of violence has increased. Six orientation meetings were held with lower ranking officers to sensitize them on observing individual rights in arresting people, including KP individuals, as outlined in the Swaziland Constitution. LINKAGES and SNAP are

also supporting the RSP and ORWs to develop pocket-sized teaching aides on KP human rights to guide them in dealing with violence cases and navigating peer victim survivors.

**Conclusions:** A collaborative response to structural barriers is essential to guide effective KP program implementation. Multi-strategy response appears to effectively inform KP programming, as partners benefit from varying synergies in addressing structural barriers in the hostile KP environment in Swaziland.

**Key words:** Collaboration, key population, Royal Swaziland Police Service, violence, HIV services

## 5

## Pilot implementation of point of care early infant HIV diagnosis in Kenya.

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**Background:** In 2016, it was estimated that 1.5 million persons were living with HIV in Kenya including 98,000 children aged 0-14 years. About 72% of these children were receiving antiretroviral treatment (ART). Kenya has one of the most advanced conventional EID systems in sub-Saharan Africa, benefiting from a huge investment in an electronic results database (with results readily available immediately after testing), an electronic health record system and an extensive sample referral network in a hub and spoke model (average 20 spokes/hub). Despite this investment, only 46% of an expected 79,475 HIV-exposed infants accessed HIV testing by two months of age through DNA PCR. Moreover, ART initiation among those testing stood at 80% (2257 infants) with 20% mostly lost to follow up or dead possibly due to delays in return of Results to caregivers among other reasons. This is partly because EID specimen must be transported to eight conventional laboratories which are few and far apart. Point-of-care (POC) diagnosis equipment placed at health facilities may provide an opportunity to reduce turnaround time (TAT) of EID results by eliminating the need to transport samples over long distances. Unitaid/EGPAF POC EID project (2015-2019) aims at reducing HIV-related mortality by increasing the number of HIV-positive infants whose HIV status is known by facilitating early return of results and ART initiation through introduction and scale-up of POC EID.

**Methods:** We conducted an evaluation to determine effect of POC EID on key service delivery indicators compared to conventional EID in project sites. Pre-intervention conventional EID data were collected retrospectively from registers across a purposively sampled sub-set of sites. Post-intervention data for specimens processed from August 2017 to January 2018 were collected prospectively using a POC EID testing form. POC EID equipment were placed in existing sample referral

hubs with spokes leveraging on the existing sample transport network to refer samples for testing. This model allowed for increased efficiency and coverage of POC EID testing across high- and low-volume facilities. Median TAT, percentage of results received by caregiver, and HIV-infected infants initiated on ART were compared between conventional and POC EID.

**Results:** Retrospective pre-intervention data on 540 conventional EID tests from 18 sites and POC EID data on 778 tests in 3 hubs and 32 spokes were available. With POC EID, 99% of caregivers received their test results within 30 days compared to 19% with conventional EID. The median TAT from sample collection to result return to caregivers decreased from 52 days with conventional EID to two days with POC EID. All (100%) HIV-infected infants at POC EID sites were initiated on ART compared to 71% under conventional EID. Among POC EID testing sites, the median TAT for result return to caregiver was same day at hub sites while it was four days at spoke sites.

**Conclusions:** POC EID has led to increased ART initiation rates which may lead to improved survival. A hub and spoke model can expand access to POC EID, with minimal investment compared to conventional network.

## 6

## A cross-country unit cost analysis of community-based HIV self-test kit distribution in Malawi, Zambia and Zimbabwe

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**Background:** WHO recommends HIV self-testing (HIVST) as an additional strategy for bridging the testing gap, with potential to contribute to UNAIDS 90-90-90 targets by 2020. As promotion of sustainable HIV-testing service (HTS) strategies requires in-depth understanding of attendant costs and cost implications we assessed unit costs of door-to-door distribution of HIVST in Malawi, Zambia and Zimbabwe.

**Methods:** Detailed micro-costing was conducted in 11, 16 and 44 community sites in Malawi, Zambia and Zimbabwe (2016-17), respectively, alongside cluster-randomised trials that evaluated population-level impact of HIV testing and demand for antiretroviral therapy from distribution of oral-fluid HIVST kits by trained community-based distribution agents. Guided by Global Health Cost Consortium principles top-down costing was supplemented by bottom-up observations of distribution to generate total and unit economic costs, and variation by site. Costing (2016 US\$), used the provider perspective for start-up, capital and recurrent costs, reflecting actual expenses and resource usage. During this study HIVST unit price dropped from \$3.50 to \$3.00 and then \$2. We have

not modelled the effect of those recent reductions in price per kit.

**Results:** 163,300 HIVST kits were distributed in Malawi, 140,024 in Zambia and 93,459 in Zimbabwe. In comparison, facilities HTS numbers were 16,921, 27,888 and 44,727 within the same communities respectively. Men reached represented 49%, 51% and 43% of total recipients, compared to 34%, 37% and 26% respectively. Total intervention costs were \$1,141,918 (Malawi), \$1,613,304 (Zambia) and \$1,416,630 (Zimbabwe). Costs per kit distributed were \$8.28 (range in 11 clusters: \$6.38-\$19.59) for Malawi, \$17.36 (range in 16 clusters: \$5.76-\$40.84) for Zambia and \$15.16 (range in 43 clusters: \$11.51-\$56.14) in Zimbabwe. This was higher than facility-HTS costs, at \$5.03 (\$2.95-\$8.33), \$4.24 (\$2.49-\$6.24), and \$8.79 (\$3.38-\$21.51), for the same communities. Key cost drivers were personnel, test kits, and other supplies.

**Conclusion:** Costs per kit distributed were higher than facility-HTS in same communities. This was expected however as results show community-based HIVST not only attracted higher absolute numbers but a higher proportion of harder to reach men, rather than easy to reach testers at facilities serving same communities. As costs are mainly driven by personnel and HIVST kits however, potential exists for cost reductions resulting from economies of scale, and lower unit prices of HIVST kits as programmes scale up.



## 7

**Secondary distribution of HIV self-tests as a way to promote HIV testing among male partners of young women: subgroup analysis from a randomized trial**

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**Background:** HIV risk among young women in eastern and southern Africa remains extremely high and age-disparate sexual relationships are widely believed to be a contributing factor. Interventions that promote HIV testing among male partners of young women are essential for reducing HIV risk. Given compelling evidence on the acceptability of HIV self-testing (HIVST), we assessed whether provision of multiple self-tests to young women can result in higher male partner testing.

**Methods:** This sub-study analyzed data among a subgroup of young women aged 18-24 years who participated in a larger randomized trial conducted at clinics in Kisumu, Kenya (NCT02386215). The trial enrolled women seeking antenatal and postpartum care and randomized them to receive two HIV self-tests (HIVST group) or a comparison group in which invitation cards were given to encourage clinic-based HIV testing. Women in the HIVST group also received a brief demonstration of how to use self-tests along with pictorial use instructions. Follow-up interviews were conducted with women at 3 months to assess whether partner and couples testing occurred. The primary outcome was partner testing and the secondary outcome was couples testing. Logistic regression analyses were used to compare outcomes in the two study groups.

**Results:** Of 599 women enrolled in the trial in 2015, 367 (61.2%) were aged 18-24 years. Eighty-eight percent of the young women were married. A total of 179 and 188 women were randomized to the HIVST and comparison groups, respectively. Follow-up interviews were completed by 347 women (94.5%). Male partner testing uptake was 92.4% in the HIVST group and 55.7% in the comparison group (odds ratio 9.7, 95% CI 5.1-18.3). Couples testing was also significantly more likely in the HIVST group

than the comparison group (77.8% vs. 38.1%, odds ratio 5.7, 95% CI 3.6-9.1).

**Conclusions:** Provision of multiple HIV self-tests to young women seeking pregnant and postpartum care was very effective in increasing male partner and couples testing. Although not generalizable to unmarried young women, the findings suggest that HIVST can play a prominent role in facilitating testing among their male partners. As countries begin to scale-up HIVST, further investigation of secondary distribution interventions among young women is warranted.

## 8

## School health nursing programme for adolescents

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**Background:** Adolescents need appropriate and accessible services that recognise and support their needs as they transition from childhood to adulthood. While school health nurses exist, they are lacking in secondary schools. It is during this time that issues around sexual and psychological health are more pressing as adolescents develop, including HIV, sexual and reproductive health (SRH) and mental health. Without easily accessible pathways to adolescent youth friendly services (AYFS) that do not take them out of the learning environment for longer than needed, the impact on health can be at a significant personal cost, lasting long into the future. We aimed to offer AYFS as a school health nursing programme in secondary schools in Cape Town, South Africa.

**Materials & Methods:** Secondary schools in the Klipfontein and Mitchell's Plain sub-district were selected in collaboration with the provincial departments of education. Schools were selected based on location within the sub-district, having females in Grades 8-12, and student pregnancy data for the preceding three years. Stakeholder relationships were developed with schools, and the school health nursing programme was offered, with permission for a registered nurse to attend weekly to fortnightly offering a range of healthcare services to school learners. Emergency advice was also available within school hours.

**Results:** 30/45 schools gave permission for the programme. 143 students have been seen since the programme started in February 2018, of whom the majority were female (n=107), median age of 16 years (range 8-21). Reasons for review included SRH (n=27), contraception (n=20), gastrointestinal (n=8), general check-up (n=7), musculoskeletal (n=6), eyes/ear/nose/throat (n=7), skin (n=4), abuse (n=4), respiratory (n=3), neurological (n=3), cardiac (n=2), social issues (n=1) and mental health (n=1). 71 requested HIV tests of whom all were negative and 2 known positive; the most common risk factor was not knowing their partner's status. 66 requested pregnancy tests of whom 4 were positive; 2

requested terminations, 1 wanted to discuss the result with a parent and 1 referred to antenatal services. 12 males enquired about circumcisions. A total of 45 referrals were required; hospital (n=13), social worker (n=6), local healthcare facilities (n=25).

**Conclusions:** The majority of students requiring healthcare were female with 44% requesting SRH, reflecting current data on adolescent healthcare needs and stressing the importance of providing services that support these issues. Referrals were needed for approximately one third. Developing AYFS within schools brings healthcare direct to adolescents, enabling healthcare providers to reach them at a time and place more conducive to their daily life; facilitating their needs, preventing them from missing school, and furthering their education and future possibilities. Enhancing this programme with the ability for more on-site treatment including HIV and SRH management would facilitate the healthcare of adolescents further by reducing the need for clinic attendance and referrals, thereby reducing the burden on current existing health services. Intervening early with preventative measures can facilitate promoting positive health and well being of adolescents and youth, with implications on health economics too.

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9

## Delivering high-quality comprehensive package of HIV prevention, care, and treatment for key populations is possible: Experience from two years of the FHI 360 LINKAGES Malawi project

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**Background:** In Malawi, HIV prevalence is 8.8 percent among the general population but higher among key populations (KPs): 62.7 percent among female sex workers (FSW) and 17.5 percent among men who have sex with men (MSM). FHI 360, through the USAID/PEPFAR-funded LINKAGES project, provides comprehensive HIV prevention, care, and treatment services for KPs. We present our experience implementing this project over a two-year period.

**Description:** We engaged government structures at all levels, KPs, and civil society organizations (CSOs) to get the project running. Programmatic mapping of hot spots and size estimation were conducted through engagement of KPs. Using a peer-led model, KPs were recruited to support others with HIV prevention services, linkage to care, antiretroviral therapy (ART), and retention. We built the capacity of peer leaders through trainings and microplanning, created safe spaces, and trained health care workers to mitigate stigma and discrimination.

**Lessons learned:** From October 2016 to June 2017, the project reached 9,601 FSWs, 3,609 (38 percent) of whom were already HIV positive, and 5,136 of whom were eligible for HIV testing; of the latter, 2,068 (40 percent) tested HIV positive and 1,862 (90 percent) were initiated on ART. The total number of HIV-positive cases detected, 5,677/9601 (59.1 percent), is close to the 62.7 percent estimated HIV prevalence among FSWs in Malawi. A total of 3,025 HIV-positive FSWs were enrolled in community care. We screened 13,827 FSWs for STIs, diagnosed 5,119 (37 percent) cases, and treated 5,108. Of 2,696 MSM reached with services, 2,561 were tested for HIV, 188 (7 percent) tested HIV positive, and 114 (61 percent) were initiated on ART. We

screened 4,726 MSM for sexually transmitted infections, diagnosed 1,585 (34 percent) cases, and treated 1,507. Eighty-seven FSW and 39 MSM reported gender-based violence and received services. We identified 239 transgender women and are now receiving HIV prevention, care, and treatment.

**Conclusions:** Empowered KP members positively contribute to their health. In addition, engagement with government, health care workers, and peer leaders is key to ensuring a successful KP program. Efforts are ongoing to document and scale up some of the best practices emanating from the program.

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## Clients of Female Sex Workers: Recruitment and HIV prevalence in Rwanda

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**Background:** High HIV prevalence among female sex workers (FSW) in Sub-Saharan Africa is well-documented and in Rwanda strong HIV prevention programs exist to provide services and support for these women. Projet San Francisco (PSF) sought out clients of FSWs to provide HIV testing services.

**Methods:** PSF in partnership with government health facilities began providing services to FSW in November 2015. In March of 2016, PSF expanded services to include a one-time visit for clients of FSWs. Clients of FSWs were recruited using two strategies; first, FSWs invited their clients and partners to come for services, second; PSF used former FSWs to go into neighborhoods and hotspots to invite men known to be clients of FSWs. PSF received clients of FSWs at partner government health facilities, services included HIV testing and counseling, linkage to HIV care and treatment,

syphilis testing and treatment, STI screening and treatment using syndromic management and condom distribution.

**Results:** From March 2016 through December 2017, PSF received 7,451 clients of FSWs for services at 39 government health facilities in 12 districts in Rwanda. Client of FSWs had an average age of 34 years and 46.0% of the men were married at the time of services. From the 7,451 men received, 614 were found to be HIV positive on the day of service (75.1% previously known positive, 24.5% newly identified as HIV positive, seroprevalence: 8.2%). For men receiving services, 93.1% previously known positive self-reported to be on ART treatment at time of service provision. Syphilis (RPR) testing occurred in 7,224, of whom 496 (6.9%) received a positive result and received treatment according to national guidelines. Of the HIV positive men 126 (20.5%) had concurrent syphilis, while 1768 men (23.7%) reported one or more STI symptoms (genital itching, genital ulcer, burning when urinating etc.) and received treatment according to national guidelines.

**Conclusion:** These data show the HIV prevalence among clients of FSWs (8.2%) is higher than the national prevalence in Rwanda (3%). Additionally, clients of FSW have higher self-reported STI symptoms (23.7%) compared to the male general population (2%) in Rwanda. results from this program can be used to inform further interventions for clients of sex workers.

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## Post-Exposure Prophylaxis and Ongoing HIV Risk in Rwanda: Potential for PEP-to-PrEP Transition Programs

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**Background:** Rwanda and other African countries provide Post-Exposure Prophylaxis (PEP) at health facilities for HIV-negative persons with recent exposure to HIV. The country seeks to eliminate new HIV infections using a combination of strategies, and is currently considering the provision of Pre-Exposure Prophylaxis (PrEP) following WHO guidelines, but seeks to first identify the optimal populations for PrEP implementation in the Rwandan context. PEP programs represent an important and unappreciated opportunity to recognize and address HIV risk, both retrospectively relative to a suspected recent HIV exposure, and prospectively in the form of possible PrEP. Women and girls may disproportionately seek PEP more often than men, often in response to gender-based violence and/or sexual assault. In addition, anecdotal evidence in Sub-Saharan African countries suggests that some persons are seeking PEP repeatedly, and may be stigmatized or required to pay in efforts to discourage repeated uptake of PEP. We sought to analyze existing PEP data from Rwanda to determine whether PEP recipients (who were by definition HIV negative at the time of PEP services) had a higher burden of subsequent HIV, and might benefit from PrEP.

**Methods:** We performed a secondary analysis from the Rwanda AIDS Indicator and HIV Incidence Survey 2013-2015. All analyses accounted for the complex survey design. Logistic regression models were used to assess factors associated with HIV infection. All analyses were conducted in STATA software Version 13.

**Results:** A total of 101/13,893 respondents ages 15-56 reported receiving Post-Exposure Prophylaxis in the prior 12 months, including 40 males and 61 females. Recent PEP recipients had 6.5 times higher odds of being HIV positive (unadjusted Odds Ratio [uOR] 6.5; 95% CI 3.8-11.2). This effect was seen across age and sex disaggregation, and was exaggerated among the young, with persons under 25 years having >9 times higher odds of being HIV positive (uOR 9.1; 95% CI 2.1-39.4). The subgroup with the strongest association was adolescent girls/young women 15-24 years old; those with recent PEP exposure had more than 10 times higher odds of being HIV positive (uOR 10.1; 95% CI 2.26-45.14).

**Discussion:** Rwandan PEP recipients are at substantially increased risk of acquiring HIV, suggesting that existing prevention efforts are failing them. PEP programs should be re-emphasized and strengthened, and recipients should be provided effective ongoing prevention

services including transition to PrEP for those with ongoing substantial HIV risk. Creation of PEP-to-PrEP transition programs would leverage the existence of PEP clients, who are already seeking HIV prevention services at health facilities because they recognize their own elevated HIV risk. Successful PrEP implementation will also require risk reduction and adherence support, and consideration of PrEP cessation when risk has reduced.

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## Who wants PrEP? Baseline characteristics of clients initiating PrEP when offered to the general population in Swaziland.

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**Background:** Since 2015, the World Health Organization recommends oral HIV pre-exposure prophylaxis (PrEP) as a prevention method for populations and individuals at substantial risk for HIV. In response, the Swaziland Ministry of Health (MoH) developed a National PrEP Framework for demonstration studies to test PrEP provision in Swaziland. The framework emphasizes PrEP for any person at high HIV acquisition risk in addition to offering PrEP to six target populations.

**Methods:** Clients attending one of six public-sector primary-care clinics participating in this PrEP demonstration study between 1 August 2017 and 31 January 2018 were sensitized about PrEP. Clients who expressed interest in PrEP were verbally consented and then received an HIV risk assessment based primarily on sexual behaviour in the preceding six months. If at risk, interested in PrEP and deemed clinically eligible, clients were offered to start PrEP the same day. Reasons for PrEP interest were routinely documented. Baseline data were extracted from MoH client files and analysed

using descriptive statistics with standard errors adjusted for clustering at the clinic level.

**Results:** 246 clients initiated PrEP and the majority were women (76%, 95%CI: 63-89), reflecting the gender distribution of clinic clients. Most PrEP clients were under the age of 25 years (37%, 95%CI 25-48) or between 26-35 years (40%, 95%CI 29-51). Common reasons for being at risk for HIV were unprotected sex (80%, 95%CI 74-87) and sex with an HIV-positive partner or a partner with unknown HIV status (80%, 95%CI 71-90). About two-thirds (68%, 95%CI 54-83) of clients initiating PrEP belonged to one or more target populations identified in the National PrEP Framework: HIV-negative partners in sero-discordant relationships (35%, 95%CI 19-51), adolescent girls and young women (31%, 95%CI 20-42), pregnant women (20%, 95%CI 11-29) and lactating women (27%, 95%CI 18-36). Few clients with STIs started PrEP (4%, 95%CI 0-7) and no clients reported belonging to the target populations of female sex workers (FSW) or men-who-have-sex-with-men (MSM). Common reasons for wanting PrEP included: "being scared of HIV" (67%, 95%CI 39-94), "unable to negotiate condom use" (19%, 95%CI 1-37), "having multiple partners" (10%, 95%CI 0-23), and "my partner has multiple partners" (15%, 95%CI 5-26).

**Conclusion:** In this study, not a single client enrolled because s/he belonged to one of the two key populations that many PrEP programs have focused on: FSW and MSM. Furthermore, a large proportion of clients did not belong to any of the other target populations identified by the government to be at particularly high HIV risk. Young, pregnant and lactating women were other large groups of PrEP clients. Most PrEP clients reported that they had risky sex and therefore, feared HIV infection. In high HIV incidence settings, PrEP programs that are open to everyone at high risk of HIV infection may reach more people who can benefit from PrEP than programs focused exclusively on target populations. However, the fact that most clients in this study were women indicates that additional strategies are needed to reach men who can benefit from PrEP.

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## Rwanda's Reduction of HIV Vulnerability Among Women through Integrating Female Empowerment Strategy into National, Cross-Sector Law and Policy

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**Background:** Due to strong political will and continued efforts to increase availability of HIV prevention, voluntary counseling, testing, treatment and care in Rwanda, the country has led East Africa in controlling the life-threatening infectious disease and kept its prevalence stable at 3% during the last ten years. Today, 96% of these health facilities in Rwanda provide a complete package of HIV services. Yet prevalence rates disaggregated by gender show that women still remain more vulnerable than men, with 3.6% of women testing positive as opposed to 2.2% of men. A complex web of risk factors has produced this female HIV vulnerability, including gender-based violence, high-risk behaviors such as transactional sex, and STI transmission. To combat these risk factors, female empowerment intervention must occur throughout all sectors within society.

**Methods:** A comprehensive, qualitative desk review was conducted of Rwandan law, gender and health policy, and Demographic and Health Surveys from 2010 to 2015 and the presence of female empowerment strategy was analyzed. Cross-sector female empowerment establishments and their strategies for integrating female empowerment language and policy into practice were also analyzed.

**Results:** Providing a strong legal foundation and voicing the country's political will to promote and protect the rights of women and girls, the 2003 Rwandan Constitution, revised in 2015, establishes equal rights for all citizens and prohibits discrimination of any kind. A number of national bodies and institutions within Rwanda promote the engagement of women in economic and political life, including: The Ministry of Gender and Family Promotion; the National Women's Council; the National Youth Council; the National Human Rights

Commission; and the Forum for Women Parliamentarians. Cross-cutting national policy, including national overarching poverty reduction policies, highlight gender equality a crosscutting area of priority. In both the National HIV Strategic Plans, gender equality has been upheld as a key priority of the national HIV response. In 2010, Rwanda adopted its first gender-based HIV strategy, the 2010-2014 National Accelerated Plan for Women, Girls, Gender Equality and HIV. Most recently the 2015-2016 Rwanda National HIV Annual Report established a strong policy, legal and institutional framework to promote gender equality and address and prevent violence against women and children. Looking at Demographic and Health Survey reporting, a correlation can be seen in decreased female HIV prevalence in the years since this dedicated female empowerment integration began, with prevalence in women ages 25-29 decreasing from 4.2% in 2010 to 3.9% in 2015 and from 7.8% in 2010 to 6.1% in 2015 for middle-aged women ages 40-44.

**Conclusions:** Recognized internationally for its dedication to women empowerment across sectors, from governance to business to health, Rwanda is using its national, cross-sector legal and policy frameworks to diminish this gender bias and ensure that women are empowered to gain the equal access. Though advanced study is needed, there is great promise in the protective impact of legal and policy frameworks that seek to empower women, creating a ripple effect and decreasing their vulnerability to risk factors and increasing their access to HIV prevention, testing, treatment and care.

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## Partner-delivered HIV self-testing increases the perceived acceptability of index partner testing among HIV-positive clients in Malawi

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**Background:** Index partner testing is critical for reaching UN 90-90-90 goals. Partner referral slip (PRS) is the primary strategy for testing partners throughout sub-Saharan Africa, however, index testing remains low. HIV self-testing (HIVST) may overcome barriers to testing, however, there are no data on whether HIV-positive clients would be comfortable delivering HIVST kits to their partners. We examined HIV-positive clients' perceived acceptability of HIVST as a strategy for index partner testing in Malawi.

**Materials & Methods:** The study was nested within a cluster randomized trial examining HIVST distribution to outpatient clients within health facilities. Exit surveys were conducted with outpatient clients  $\geq 15$  years of age at 15 facilities in Central/Southern Malawi. Clients who self-reported previously testing HIV-positive and having a sexual partner in the past 12-months completed a separate survey module on client perceptions of index partner testing strategies. Adjusted odds ratios were calculated using multivariate logistic regression models.

**Results:** 452 clients (8% of RCT participants) completed the index testing module. Clients' willingness to deliver index testing materials to partners increased by 11% when presented with the option to deliver HIVST kits over PRS. Overall, 65% of clients preferred delivering HIVST kits over PRS. Among those uncomfortable to deliver HIVST, common reasons include fear of partner responses (men:62%, women:60%) and feeling uncomfortable explaining HIVST to partners (men:24%, women:33%). When asked whether clients believed their partner would actually test for HIV through index testing, HIVST was associated with an 18% increase in anticipated testing compared to PRS. Overall, 69% of clients believed their partner would prefer testing with HIVST over PRS. HIVST was believed to decrease disparities in testing for male partners. HIV-positive women were less comfortable delivering PRS to their partners than HIV-positive men (AOR:1.86,  $p=0.03$ ), however this gender-difference becomes insignificant when introducing HIVST (AOR:1.72,  $p=0.14$ ). Similarly, male partners were believed to be less likely than female partners to actually test through PRS (AOR:1.60,  $p=0.04$ ), and again, this gender-difference becomes insignificant when introducing HIVST (AOR:1.23,  $p=0.41$ ).

**Conclusions:** Delivery of HIVST kits to sexual partners was perceived as acceptable among HIV-positive clients in Malawi. Importantly, HIVST may close gender-specific gaps in male partner testing.

Additional studies are needed to assess actual use and linkage to care.

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### Increasing Male Partners Involvement in PMTCT Services in Zanzibar, United Republic of Tanzania

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**Background:** Tanzania Health Promotion Support started (THPS) supporting PMTCT services in Zanzibar through PEPFAR in October 2016. Prior to this, the program was managed by Zanzibar Integrated HIV TB and Leprosy Program (ZIHTLP) through PEPFAR support commencement in Tanzania in 2004. Among the challenges noted by THPS were lower HIV testing among pregnant women attending antenatal clinic (ANC) i.e. 81% compared to other THPS supported regions of Kigoma (97%) and Pwani (95%); low male partner involvement at 5% (Kigoma 87%, Pwani 79%), and high numbers of women coming to labor and delivery with unknown HIV status. These challenges were barriers towards eliminating mother to child transmission.

**Materials & Methods:** To improve the situation; THPS in collaboration with ZIHTLP implemented the following: a) Sensitization of Facility in charges and health care providers (HCPs) at RCH and other unit on the importance of comprehensive ANC HIV testing, male involvement in PMTCT services, improved documentation and making their clinics friendly for male partners. It was agreed that couples would be prioritized; and the male partner will be offered other services i.e. weight and Blood Pressure and sugar measurements. b) Sensitization of Religious and Community leaders: Realizing that Zanzibar community is dominantly Muslim (99%); THPS facilitated a meeting of religious leaders inviting the Mufti and his management team to advocate for uptake of PMTCT and male



involvement in the services. This was followed by countrywide sensitization, meetings in Unguja and Pemba, each meeting with an average of 50 participants including local government, politicians (District Commissioner, District Sheikh, Sheikhs of all mosques in the district and ward leaders) and other influential people in the area. The meetings were organized and facilitated by Office of Mufti who were also the main speakers. THPS/ZIHTLP role was to address technical aspects of PMTCT. c) Incentives to Couples: Pregnant women coming with their male partners to ANC services received 'Mama Pack Kit' (Khangas, sanitary pads, surgical gloves) as motivation. d) Equipping Health Facilities with BP machines, Glucometers to facilitate weight, Blood Pressure and sugar measurement for male partners. e) Invitation letters to all pregnant women attending ANC services without their partners aiming to invite them. f) Supportive supervision and Mentorship: THPS and ZIHTLP conducted ongoing supportive supervision checking on the availability of ARVs and supplies including HIV test kits, ME tools and assessing quality of documentation.

**Results:** There was an increased ANC attendance, reduced rates of unknown L&D and improved male involvement, from 5% in October – December 2016 quarter to 62% in July- September 2017 quarter.

**Conclusions:** As male health seeking behaviour is lower, multiple strategies for programs that provide opportunities for men to access health services can be used to improve their uptake. These strategies are simple and can be scaled up in other areas.

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## HIV treatment outcomes among female sex workers and men who have sex with men in Cameroon

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**Background:** In Cameroon, there are significant numbers of female sex workers (FSW) and men who have sex with men (MSM) living with HIV. Specific strategies to diagnose and initiate treatment are integral to optimize health outcomes and decrease onward HIV transmission.

**Materials & Methods:** In 2016, FSW (sex work as principal source of income in past year) and MSM (anal sex with man in past year) aged 18+ years were recruited via respondent-driven sampling from five cities of Cameroon for a biobehavioral survey including HIV and viral load (VL) testing. Among participants living with HIV, indicators of the HIV treatment cascade were compared between FSW and MSM using  $\chi^2$ -test-of-proportions ( $p < 0.05$  significance); viral suppression (VS) was defined as  $< 1000$  copies/ml. Association between population and VS was assessed using Poisson regression, controlling for clustering by site and time since initiating ART.

**Results:** Overall, 2,255 FSW (median age: 28; IQR: 23-36) and 1,322 MSM (median age: 23; IQR: 21-26) were recruited. Prior HIV testing was reported by 2,029 (90.1%) FSW and 958 (72.5%) MSM ( $p < 0.01$ ), and in the past year by 1,329 (59.1%) FSW and 728 (55.1%) MSM ( $p = 0.02$ ). Unadjusted-HIV prevalence was 24.5% among FSW and 20.7% among MSM ( $p = 0.01$ ); 290 (52.7%) FSW and 115 (42.8%) MSM were previously diagnosed ( $p < 0.01$ ). Of these, 238 (82.1%) FSW and 76 (66.1%) MSM reported initiating antiretroviral therapy (ART) ( $p < 0.01$ ). The median time since initiating ART was 51.5 months (IQR: 15.7-98.4) among FSW and 8.0 months (IQR: 3.9-27.9) among MSM. After initiation, 37 (15.6%) FSW and 21 (28.0%) MSM reported any treatment interruption ( $p = 0.02$ ), but the majority (99% and 97%, respectively) self-reported currently on ART. Among individuals who had initiated ART at least 6-months prior to survey and with VL result available, 81.1% (159/196) of FSW and 92.5% (37/40) MSM were virally suppressed ( $p = 0.08$ ). When controlling for years since initiating ART, there was no statistical difference in viral suppression among MSM compared to FSW (PR 1.08; 95%CI:0.95-1.24;  $p = 0.25$ ).

**Conclusions:** Once diagnosed and enrolled into treatment services, both populations reported engaging in sustained treatment, but there were notable gaps and disparities in testing/treatment

uptake. There is evident need to rapidly expand testing modalities—including HIV self-testing, consider novel strategies for ART delivery, and evaluate PrEP as a means of reducing new diagnoses among key populations in Cameroon.

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### The Sex Worker Virtual Currency: Incentivizing Peer Educators to Expand Peer Mobilization among Female Sex Workers in Kisumu County, Kenya

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**Background:** Though peer education has proven effective in promoting behaviour change among key populations (KPs), gaps remain in mobilizing KPs in Kenya to access HIV prevention interventions, a situation compounded by the decrease in global funding for HIV programming. We implemented a non-monetary incentive-based intervention—Sex Worker Virtual Currency (SWVC)—to motivate peer educators (PEs) to reach all peers in their cohort every quarter.

**Methods:** SWVC is a redeemable points system involving female sex worker (FSW) PEs at the Keeping Alive Societies' Hope (KASH) drop-in centre (DIC) in Kisumu, Kenya. PEs were oriented on SWVC, and an outreach worker appointed as the SWVC manager. Redeemable points were awarded based on the number of educators' peers who (i) registered their mobile numbers with the DIC to receive programmed health information messages via a bulk SMS platform, (ii) took an initial and repeat HIV test at the DIC, and (iii) enrolled in national health insurance. Uptake within the intervention was entirely voluntary. The SWVC manager awarded points daily based on uptake of services. At the end of the intervention, the three highest-scoring PEs redeemed their points for exchange visits to tourist beaches, shopping vouchers, and mobile phone airtime. Awards were based on discussions held with PEs. We used descriptive statistics to summarize SWVC outcomes.

**Results:** Twenty-one FSW PEs participated in SWVC from April to September 2017. Of the 1,748 FSW peers within their cohorts, 1,487 (85%) were enrolled into the bulk SMS system and thus received health information and communication from the DIC. A total of 1,099 (62%) tested for HIV for the first time within the year. Only 19 (<1%) registered for the national health insurance program; the most commonly cited reason for poor uptake was the monthly insurance premium (\$5). There was a 14% increase of FSWs reached with HIV prevention services by PEs during the SWVC compared to a similar time period the previous year.

**Conclusion:** Non-financial incentives to PEs improve their mobilization of hard-to-reach peers for uptake of HIV prevention services. Further education on benefits of insurance coverage for FSWs may increase uptake of enrollment into the national health program.

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### Characterizing the Influence of Structural Determinants of Risk on Consistent Condom Use among female sex workers in Senegal.

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**Background:** Female Sex Workers(FSW) are disproportionately affected by HIV, even in the most generalized HIV epidemics. While structural HIV risks have been understood to mediate condom negotiation among FSW globally, there remains limited data on the relationship between structural determinants of HIV risk including violence and socioeconomic-status and condom use among sex workers across Sub-Saharan Africa. Here, we describe the prevalence of structural determinants

and their associations with condom use among FSW in Senegal.

**Methods:** In 2016, 758 FSW >18 years of age were recruited by Respondent Driven Sampling (RDS) in Senegal. Information on individual, community, and network-level risks were collected through an interviewer-administered questionnaire. Poisson regression with robust variance estimation was used to model the associations of consistent condom use (CCU) and selected structural determinants.

**Results:** The RDS-adjusted prevalence of CCU in the last 10 sexual acts was 76.8% (95% CI: 70.8–82.8). In the bivariate analysis, CCU was associated with being legally registered as FSW prevalence ratio PR:1.13 (95% CI:1.05–1.21), stigma PR: 0.98 (95% CI:0.97–0.99), participation in HIV prevention organization PR: 1.08 (95% CI:1 –1.16), being offered more money for condomless sex PR: 0.82 (95% CI: 0.73–0.93), recent drug use PR: 0.87 (95% CI: 0.75–1.0) and STI symptoms in the 12 months preceding the study PR:0.89 (95% CI: 0.83–0.88). In the multivariable RDS adjusted analysis, structural determinants that remained significantly associated with lower CCU were: sexual violence adjusted prevalence ratio aPR: 0.67 (95% CI: 0.44–1.0), physical violence aPR: 0.73 (95% CI: 0.53–0.99) and difficulty to access condom aPR: 0.45 (95% CI: 0.23–0.87). High income from sex work was associated with higher CCU aPR:1.22 (95% CI:1.03–1.45) after adjusting for demographic characteristics and other determinants.

**Conclusion:** Taken together, these data highlight the role of structural risk determinants on condom use among FSW in Senegal. Moreover, these results highlight the importance of structural interventions including safe working spaces and violence mitigation programs to support condom negotiation in addition to condom distribution programs to ultimately increase condom use among FSW with their clients and other sexual partners in Senegal.

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### Trends in HIV prevalence among adolescents and adults accessing HIV testing services in four regions in Kenya between 2012 and 2017

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**Background:** Progress towards identification of people living with HIV, the first 90 in the 90-90-90 UNAIDS targets, has been slow in East and southern Africa. Between 2015 and 2016, awareness of HIV status increased from 66% to just 70% in these regions. Data are needed to better inform efforts to increase awareness of HIV status among those most-at-risk for acquiring HIV. We aimed to determine the prevalence of HIV among adolescents and adults accessing HIV testing services in four regions in Kenya from 2012 through 2017.

**Methods:** Impact Research and Development Organization (IRDO) provided community and facility HIV testing services in Nyanza, Western, Rift Valley and Nairobi regions of Kenya from 2012 through 2017. We used standardized Kenya Ministry of Health tools to collect data on HIV test date and result, sexual behaviour and demographic information from all clients who consented to HIV testing. Data from clients aged 10–64 years who accessed HIV testing services at IRDO-supported sites in 2012–2017, and for whom an HIV test result was recorded, were included in the analysis. The HIV prevalence was calculated and compared across calendar year, testing strategy, geographic location and demographic characteristics using proportions and Chi-square test for trend.

**Results:** A total of 951,177 out of 956,084 (99.5%) clients tested for HIV during the study period met criteria for inclusion in the analysis. Overall, 1.9% of the clients had a positive HIV test result. The prevalence decreased from 4.6% in 2012 to 1.3% in 2017 ( $p<0.001$ ). Across calendar years, females had a higher (2.8%) prevalence compared to males (1.4%) ( $p<0.001$ ).

The HIV prevalence decreased between 2012 and 2017 from 3.7% to 1.1% ( $p<0.001$ ) in males and 7.9% to 1.5% ( $p<0.001$ ) in females. In 2012, females

aged 35-39 years had the highest HIV prevalence (14.3%) which decreased to 2.8% in 2017 ( $p<0.001$ ). Similarly, males aged 35-39 years had the highest HIV prevalence (11.1%) in 2012 which decreased to 2.6% in 2017 ( $p<0.001$ ).

HIV prevalence in Nyanza region decreased from 4.8% in 2012 to 1.3% in 2017 ( $p<0.001$ ) while in Rift Valley region it decreased from 0.8% in 2013 to 0.2% in 2016 ( $p<0.001$ ) and in Western Region it decreased from 0.5% in 2013 to 0.2% in 2016 ( $p<0.001$ ). Between 2012 and 2017, the HIV positivity decreased from 6.4% to 1.0% ( $p<0.001$ ) in static HIV testing centres, 4.4% to 1.4% ( $p<0.001$ ) in home-based testing, and 4.1% to 1.2% ( $p<0.001$ ) in mobile testing.

**Conclusion:** The past five years saw a substantial decline in HIV prevalence in the four geographical regions and among adolescents and adults accessing HIV testing services in Kenya. In addition, by 2017 the different testing strategies yielded comparable HIV-positivity rates. Even though these data could be biased due to self-selection of testers, they demonstrate that HIV testing programs should shift focus from testing in the general population to more targeted testing of historically known high-risk populations in each region.

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## Adolescent HIV services: Implementing universal antiretroviral treatment for 10-19 year olds living with HIV in eight African countries

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**Background:** The Elizabeth Glaser Pediatric AIDS Foundation (EGPAF) supports treatment access in

eight countries for >500,000 PLWH, in collaboration with Ministries of Health and various donors.

HIV identification, treatment, retention and viral suppression has generally been lower among adolescents living with HIV (ALHIV) than in adults or younger children. We utilize disaggregated data to describe provision of HIV services to ALHIV in eight countries over a 12 month period, and identify remaining challenges.

From October 2016 –September 2017, EGPAF supported adolescent's care by providing youth-friendly services, peer support, and building provider capacity in Cameroon, Democratic Republic of the Congo, Lesotho, Malawi, Kenya, Swaziland, Tanzania, and Zimbabwe. A total of 40,098 adolescents living with HIV (ALHIV) accessed treatment across 841 sites. Client volume by country varies from 1,057 ALHIV in DRC to 11,050 ALHIV in Malawi. Only 18,630 viral load tests were completed for adolescent clients. During this period, 7,574 adolescents were newly initiated on treatment, with surges around testing campaigns; 3,291 providers were trained in youth-friendly reproductive health, and HIV services and 486 psychosocial and peer support groups were attended by 9,268 ALHIV. Country specific data disaggregated by sex and age cohort (10-14 and 15-19 years) are available. All countries except Cameroon and the Democratic Republic of the Congo developed strategies and supported new country-specific adolescent HIV guidelines in 2017.

**Lessons learned:** Adolescents represent just 4-10% of the total population in HIV care but have more intensive treatment, adherence counselling, and psychological social support needs. Services are designed according to patient needs and volumes. Clubs and peer support groups are important supplements to clinical care but are not available to all adolescent clients. In one year, new patients represented 10-27% of the total ALHIV population. More providers can be trained at facility level compared to off site, which can build capacity using short courses and to empower multidisciplinary care cadres (clinicians, counsellors, social workers, and lay peer educators). Viral load testing is critical, but not yet accessible to most ALHIV.

**Conclusions/next steps:** The rapid pace of providing universal treatment will need to anticipate care challenges of unique adolescent patients alongside workforce capacity and resources. Global guidance for universal treatment has catalyzed access to ART for ALHIV across all eight countries, but access to viral load remains limited, making it difficult to

assess the impact of ART on early and sustained viral suppression.

## 21

### Reaching 90-90-90 targets amongst adolescents and young people in South Africa: A model of integrated adolescent care

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**Background:** Wits RHI's USAID funded Adolescent Innovations Project (AIP) is focused on achieving the UNAIDS 90-90-90 targets for adolescents and young people. We describe a model of adolescent care implemented in primary care facilities in two health sub-districts in South Africa, and the progress made towards achieving the second and third 90 targets in this population.

**Methods:** The AIP, in collaboration with the Department of Health, has developed and implemented an integrated model of care for adolescents living with HIV (ALHIV), comprising: (1) Adolescent and Youth Friendly Services implemented through regular assessment and quality improvement initiatives; (2) Targeted HIV testing services focusing on out of facility testing and leveraging facility service entry points; (3) Active linkage and return to care through peer navigator/linkage officer Health Connectors; and (4) an adherence and retention intervention, integrating psychosocial and clinical care and streamlining clinical visits, the Youth Care Clubs. National policy enabled the implementation of Universal Test and Treat (UTT) from September 2016, and the AIP model was piloted in 13 health facilities from March 2017. Utilising routinely collected data extracted from TIER.net for ALHIV aged 10-24 years we reviewed: (1) the number of new ART initiations over a 12month period (2) the number of ALHIV active on ART (having received ART within the last 3-months) (3) the number of ALHIV with a viral load (VL) documented in the last 12-months and (4) the number of ALHIV with suppressed VLs (<1000copies/ml). We compared

data at a time point 1 month after the implementation of UTT and before piloting of the AIP model (October 2016) and at 9-months after the AIP model was piloted (December 2017).

**Results:** There was a 52% increase in the number of ALHIV newly initiated on ART in the 12months prior to each of the measurement points (955 for Nov 2015 – Oct 2016 and 1450 for Jan – Dec 2017), and a 10% increase in the number of ALHIV actively receiving ART (2421 in October 2016 and 2658 in December 2017). VL monitoring in the preceding 12months amongst ALHIV receiving ART and eligible for VL monitoring improved significantly from 64% to 79%, and VL suppression of those with VL **Results:** increased significantly from 80% to 86%. Amongst all ALHIV active in care and receiving ART, there was a significant improvement in overall VL suppression from 44% to 57% between the measurement points.

**Conclusion:** The 13 clinics in which the AIP model was implemented have progressed towards achieving the third 90 target by improving VL monitoring and VL suppression rates in ALHIV on ART. The implementation of this model, combined with UTT, has shown a further significant improvement in new ART initiations. However, due to persistently high rates of treatment defaulting, the improvement towards the second, the number of ALHIV active on ART, has been less substantial. Additional evaluation of the model is recommended, as with further scale-up more ALHIV in these facilities will benefit from retention strategies and same day ART initiation.

## 22

### Differentiated Service Delivery to HIV infected children and young adults in rural Zimbabwe -- a role for near point-of-care diagnostic testing.

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**Introduction:** Implementation of new Differentiated Service Delivery models are urgently needed for ART among children and adolescents in rural Africa. We assessed 300 children and adolescents receiving Community Based Antiretroviral Treatment (CBART) to investigate the frequency of virologic suppression, low level viremia (LLV) and Virologic failure in rural Hurungwe, Zimbabwe at Chidamoyo Christian Hospital.

**Methods:** 307 children and adolescents on CBART for > 12 months were tested for HIV viral load (VL) (WHO and MOHCW 2017 guidelines) at 8 rural sites between 5 May and 10 October 2016 by Roche Cobas ampliprep/Taqman v 2.0. In February 2018 we consented and enrolled 150 of these children to compare near point of care semi-quantitative VL by SAMBA, (Diagnostic for the Real World), HIV-Quant GeneXpert (Cepheid) and Roche amplicor 2.0 to identify Virologic failure (VF) as > 1,000 copies/ml (WHO), low level viremia (LLV) > 50 to 1,000 copies/ml, and virologic suppression < 50 copies/ml, respectively. VL for those with VF was expressed as log<sub>10</sub> copies/ml. Genotypes were obtained by Sanger Sequencing at the drug resistance laboratory of the Biomedical Research and Training Institute (BRTI) Laboratory at Newlands Clinic from provider requested samples. Statistical analysis by t-test, multivariate and logistic regression was performed using Stata.

**Results:** 307 children and adolescents were tested for VL, 169 (55%) were females. Median age was 12 years (IQR: 8-15) and mean duration of ART was 4.5 years SD (±0.13). Two hundred ninety-six (97%) were on 1st line; 113 (38%) on Nevirapine (NVP), 183 (62%) on Efavirenz (EFV), 181 on Tenofovir Disoproxil Fumarate (TDF) (61%), and 108 (36%) on Zidovudine (AZT). VF was present in 97 children (32%) and LLV in 25 participants (8%). Genotyping VF demonstrated K65R in 3 of 8 on TDF. Among 108 with VF, VL as geometric means (GM) were significantly greater among 49 boys (GM 4.11 copies/ml) compared to 59 girls (GM 3.57 copies/ml)  $P < 0.006$ , Student's t-test. Double orphans had a modestly higher virus load compared to those with a living parent ( $p < 0.06$ ). No significant differences in VF rates or mean log VL were observed with age, duration of therapy or use of EFV, NVP, TDF or AZT containing regimens.

**Conclusion:** Double orphans and boys with ART failure had higher VL suggesting behavioral, gender and family context may reduce adherence. Community Based ART represents a promising differentiated service delivery model for timely

switching in response to virologic failure in vulnerable populations. Ongoing operational research initiatives will identify more effective delivery of care to young people living with HIV in rural Africa.

## 23

### Progress Towards the 90-90-90 Targets among HIV-infected Pregnant Mothers: Experience from Uganda.

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**Background:** Uganda is one of the few countries in sub-Saharan Africa selected for “accelerated implementation of efforts to end the AIDS epidemic by 2020”. In an endeavour to improve maternal health and reduce vertical transmission of HIV, the National guidelines underscore early HIV testing for all pregnant women, provision of antiretroviral therapy (ART) and viral load monitoring among those found to be HIV-infected. With support from the Center for Disease Control and Prevention and Makerere University School of Public Health, the Ministry of Health (MoH) established a weekly reporting platform (Option B+ reporting system) based on short message services (SMS) of data on a set of 9 critical HIV indicators which are sent by health workers through their mobile phones to a central server at MoH. The main purpose of the Option B+ reporting system is to provide real-time data for closely monitoring the National program for HIV-infected pregnant women and to provide prompt action for addressing critical gaps. We evaluated progress towards attainment of the 90-90-90 targets among this group.

**Materials & Methods:** We performed a retrospective cohort analysis of data of pregnant women from 1,715 health facilities across the country who attended their 1st antenatal care (ANC) visit between January-December 2017. Data were extracted from the Option+ reporting system and the national viral load monitoring dashboard.

We calculated the percentage of pregnant women who received HIV testing services at their 1st ANC visit; those identified as HIV positive and initiated on ART and those who attained viral load suppression.

**Results:** Overall, 1,714,337 pregnant women attended their 1st ANC visit during the review period. A total of 1,541,708 (90.0%) received HIV testing services: Of these 98,887 (6.4%) were identified as HIV positive: Of the 63,921 who knew their HIV positive status before their 1st ANC visit, 62,399 (97.6%) were already on ART. Of the 34,966 who tested HIV positive for the first time, 28,362 (81.1%) were newly initiated on ART giving an overall 91.7% of HIV positive pregnant women on ART. Viral load testing was done for 11,080 eligible women of whom, 9,825 (88.7%) attained viral suppression

**Conclusion:** The country is on the right track towards attainment of the 90-90-90 targets. The Option B+ reporting system should be adopted by other countries in sub Saharan Africa for effective monitoring of National HIV programs for pregnant women

## 24

### Incidence and progression of echocardiographic abnormalities in HIV-infected older children and adolescents taking antiretroviral therapy: A prospective cohort study

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**Background:** There is a high burden of cardiac abnormalities in HIV-infected children despite good control of HIV-infection with antiretroviral therapy (ART). The aim of this study was to describe the

incidence and progression of cardiac abnormalities in HIV-infected children on ART in Harare, Zimbabwe.

**Methods:** HIV-infected children aged between 6 and 16 years, taking ART for at least 6 months and clinically stable, underwent 12-lead electrocardiograph (ECG) and transthoracic echocardiography at baseline and at 18 months follow-up. Local reference ranges were used to define cardiac abnormalities.

**Results:** Echocardiograms for 197 children (median age 11 (IQR 9-12) years and 52% male) were available at baseline; median CD4 count was 727 cell/ $\mu$ l (IQR, 473-935) and 154 (78%) had viral load <400 copies/ml. Left heart abnormalities were found in 60 (30%) and right heart abnormalities in 15 (8%). The spectrum of abnormalities included LV hypertrophy and dilatation, LV systolic and diastolic dysfunction, LA dilatation, RV dilatation and systolic dysfunction. Prolonged corrected QT interval was the commonest ECG abnormality in 28 (15%). A total of 175 (89%) children were available for follow-up: 4 (2%) died and 18 (9%) were lost to follow-up. Participants were followed up for 283.9-person years (pys). Left heart abnormalities developed in 7 children (rate 2.47/100pys), right heart abnormalities developed in 16 children (rate 5.64/100pys). The risk of RV dilatation developing was 12/163 (7%), and of LA dilatation 1/161 (1%) and LV hypertrophy 3/159 (2%). RV dilatation persisted at follow-up in 11/12 (92%) children; LA dilatation in 14/14 (100%) and LV hypertrophy in 11/16 (69%) children. In 10/58 (17%) children, cardiac abnormalities present at baseline had reverted to normal by follow-up. There was an overall increase in mean cardiac z-scores at follow-up.

**Conclusions:** There is a high prevalence and incidence of cardiac abnormalities in HIV-infected children on ART. Some cardiac abnormalities are transient, most likely explained by acute illness in the period before echocardiography, and some are persistent. The implications of the increase in mean z-scores over this relatively short period of follow-up are unknown, but might indicate the early signs of future cardiac abnormalities.

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## Gender-related roles and behaviours impact on adherence to antiretroviral among HIV+ youth

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**Background:** Gender related behaviours and gender-based violence and inequity are associated with negative health outcomes in men and women, including HIV transmission and disease progression and adherence to antiretroviral therapy (ART). Although HIV is the leading cause of death for youth in sub Saharan Africa, adherence rates to ART among youth are much lower than adherence rates among adults with HIV. Little is known about how gender related factors contribute to adherence to ART among youth. The purpose of this study is to describe the association of gender related behaviours and inequality and gender-based violence to adherence to ART among youth with HIV in Rwanda.

**Methods:** Participants were 357 aged 14-21 year old HIV-seropositive Rwandan males and females enrolled in a study to evaluate the efficacy of an adherence-enhanced, trauma-informed cognitive behavioural intervention (TI-CBTe) to improve adherence to ART. Youth were recruited by research staff and guardian consent and youth assent were obtained. All youth completed baseline assessments prior to the intervention including demographics, a 6 point (very poor, poor, fair, good, very good, excellent) likert single-item self-rating (SISR) adherence assessment ("In the last 30 days, how good a job did you do at taking your HIV medicines in the way you were supposed to?"), a gender-based violence (GBV) survey (adapted from the WHO Multi-country study on women's health and life experiences), gender relations survey (adapted from Stepping Stones survey), the sexual relationship power scale survey (SRPS) including questions like "Most of the time, we do what my partner wants to do", and the silencing the self (STSS) scale (measuring prescribed gender roles such as silencing needs in interpersonal relationships). Simple linear regression was used to

test the zero-order association between each gender variable and the SISR.

**Results:** Of the 183 females and 174 males enrolled, median age was 16.8 years, 23% were orphans, and 62.2% had been followed in clinical care for more than 5 years, 93% were perinatally infected with HIV, 97% were poor. Self-silencing ( $p=.005$ ) and GBV ( $p=.01$ ) are both significantly negatively related to adherence. For girls, having more control in their relationships with partners was significantly associated with adherence ( $p=.01$ ). The gender relations survey was not associated with adherence. There were significant interactions between GBV and self-silencing ( $p = .005$ ) and for GBV and relationship control ( $p=.017$ ) in predicting poor adherence.

**Conclusions:** Relationship control, GBV, and self-silencing were all significantly associated with lower adherence to ART among male and female youth at baseline in this study. Encouraging more equitable relationships, addressing gender norms, prioritising women's and men's different needs, and reducing GBV may improve adherence to ART and health outcomes in youth with HIV. Broader attention is needed at multiple levels (individual, community societal) to achieve these important structural changes.

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## Long term outcome of first-line antiretroviral treatment among HIV infected children in Uganda

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**Background:** HIV drug resistance-associated mutations (DRM) are increasingly jeopardizing antiretroviral treatment (ART) programs in African children. To preserve the already limited treatment options, prevention of acquiring DRM's is essential. However long term data of African children on ART and the development of Virological Failure (VF) and DRM's are lacking. This data is crucial to identify determinants for late (>24 months) VF and acquiring DRM's during life-long ART. To improve long-term outcome of African children on ART, this study describes the occurrence of early VF (< 24 months) and late VF (24-48 months) and the prevalence of acquired DRM's in HIV-infected children on first line ART, during 48 months of treatment in Uganda. Secondly determinants for late VF are investigated.

**Method:** Children aged ≤12 years (2010-2011) were enrolled. Baseline and 6-monthly viral load (VL) and genotypic resistance testing was done. The 2017 IAS-USA mutation list and Stanford algorithm (7.0) were used to score DRM's and susceptibility. Virological Failure (VF) was defined as two consecutive VLs >1,000 copies/ml or death after at least six months of ART, early VF as VF 0-24 months, late VF as VF 24-48 months and viral suppression as VLs <1,000 copies/ml. A logistic regression was performed to model the association with explanatory determinants (age, sex, WHO clinical stage at study entry, activity of baseline regime (baseline drug resistance against active regimen GSS<3), viral load at study initiation, adherence, previous use of NNRTI, exposure to PMTCT drugs, immunodeficiency at baseline and the presence of early and late VF.

**Results:** A total of 316 children were enrolled. Viral suppression was achieved among 194/256 (75.8%), 178/249 (71.5%), 162/223 (72.6%) and 126/182 (69.2%) at 12, 24, 36, 48 months respectively. Early VF was seen among 75/284 (26.4%) and late VF in 36/283 (12.7%). Early VF was associated with reduced activity of the first line ART regime at baseline (OR 6.0, 95% CI 1.9-18.5) and poor adherence (OR 3.1, 95%CI 1.3-7.4). Late VF is associated with age> 3 years at treatment start (OR 3.2, 95%CI: 1.4-7.1) and children with a WHO 3/4 HIV classification at baseline (OR 5.0, 95%CI 1.5-16.3). Acquired DRM were seen among 73/270 (27.0%) children at 0-24 months and 39/270(14.4%) at 24-48 months.

**Conclusion:** This study is one of the first reporting on long-term treatment outcome of HIV infected African children. Long-term outcome is important to challenge VF after 24 months. Although late VF is

less common than early VF, still 13% of the children failed after 24 months of treatment. Furthermore at 48 months a drop in viral suppression was seen, which is worrisome as it can implicate an increase of VF after 48 months of treatment. Secondly children with an advanced HIV disease stage and age >3 years at start of ART are at risk for late VF. This outcome is important as it underlines the WHO policy to start all children on ART despite age and WHO staging. More long-term outcome is needed to improve outcome among HIV infected children in ART programs as Uganda.

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### Pregnancy outcomes in women on contraceptives and established antiretroviral therapy in Malawi

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**Background:** Unintended pregnancies are common in African women living with HIV (WLHIV), including those using contraceptives. HIV infection is associated with poor pregnancy outcomes, including low birth weight (LBW), preterm birth (PB), still birth (SB) and spontaneous abortions (SA) but this may be mitigated by successful ART. Limited knowledge exists about unintended pregnancy outcomes in WLHIV on ART. We studied pregnancy outcomes in WLHIV enrolled into "a randomized open-label controlled trial of daily trimethoprim-sulfamethoxazole or weekly chloroquine among adults on ART in Malawi" (TSCQ trial).

**Methods:** We conducted a cohort study of WLHIV nested in the TSCQ trial, which enrolled adults on ART (≥6 months) with CD4 count ≥250 cells/μL and HIV-1 RNA ≤400 copies/ml and followed them 4-12 weekly. WLHIV of reproductive potential were required to be on contraceptives with pregnancy assessment done at each visit. Post-menopausal women and WLHIV with tubal ligation were

excluded from this analysis. We collected pregnancy data between November 2012 and September 2017. Pregnant women were followed up until delivery or pregnancy termination.

**Results:** We observed 210 pregnancies in 159 women. Mean age was 32.3 (95% CI 31.6–32.9) and mean parity 3.5 (95% CI 3.2–3.7). Mean CD4 count during pregnancy was 571 (95% CI 541 – 600), 86.7% had non-detectable HIV-1 RNA and 97.1% had HIV-1 RNA <1000 copies/ml. Pregnancy outcomes were as follows: normal birth (56.4%), SA (28.7%), induced abortion (4.3%), LBW (5.3%), SB (2.7%), PB (1.6%) and ectopic pregnancy (1%). Most SA occurred in the first trimester. In binomial logistic regression of variables associated with SA vs. normal birth, older age (aHR: 1.11, 95%CI: 1.01-1.23) was significantly associated with SA but not CD4 count, HIV-1 RNA, BMI, parity, incident infections or hormonal contraceptive use.

**Conclusion:** We describe unintended pregnancy outcomes in women on established ART, who report contraceptive use. One quarter of pregnancies ended in SA and older age increased risk of SA. More research is needed to understand pregnancy outcomes in this increasingly large population.

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## Prevalence and correlates of depression among HIV positive patients on Highly Active Antiretroviral Therapy at a Kenyan referral hospital

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**Background:** Co-morbidities in HIV related to mental health can impact negatively on treatment outcomes if not recognized and addressed appropriately. HIV positive patients are 2-3 times as likely to be depressed compared to HIV negative individuals. Depressed HIV positive patients are more likely to have low adherence, have poor clinical outcomes like rapid disease progression and have riskier transmission behavior. Screening for

depression is not routinely done at most HIV clinics in the public sector, and a dearth of knowledge regarding the prevalence and attendant risk factors exists. Our aims were to describe the prevalence and risk factors for depression in a cohort of HIV positive patients on treatment.

**Methods:** We conducted a cross-sectional study enrolling HIV positive patients on HAART at the HIV clinic between July and August 2015. Baseline demographics were obtained by means of interviewer-administered questionnaires while the clinical data were abstracted from patient records using a predesigned tool. We used the 9 item Patient Health Questionnaire (PHQ-9) to assess for depression. Descriptive and inferential data analysis was done in R ®.

**Results:** There were 202 (58.5%) females and the mean (SD) age of the study population was 42 (±9.5) years. Prevalence of depression was 20.6%. Most had minimal depression (61) whereas 10 had varying grades of major depression (mild (7), moderately severe (2), severe (1)). Most of the participants with depression were female (63%; n=45), though this gender difference was not statistically significant (p=0.354). A longer duration on antiretroviral therapy was protective against depression (aOR = 0.85, 95% CI [0.73, 0.98], p=0.005) whereas being co-morbid with hypertension increased the risk of depression (aOR = 5.20, 95% CI [1.52, 32.68], p=0.027).

**Conclusion:** Prevalence of depression in HIV is high and it poses a significant challenge to achievement of favorable treatment outcomes. Co-morbid conditions such as hypertension increase the risk of depression in persons living with HIV on treatment.

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## Pre-Exposure Prophylaxis in Zambia: Policy Engagement and Initial Implementation

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**Background:** Pre-exposure prophylaxis (PrEP) is a highly effective HIV prevention measure not yet widely deployed in sub-Saharan Africa. The University of Maryland Baltimore (UMB) has worked with the Zambian Ministry of Health (MOH) and National HIV/AIDS/STI/TB Council (NAC) to develop and implement national guidelines for PrEP. Since September 2016, UMB has engaged MOH and stakeholders on health services for key populations (KPs) as defined by the Zambia National AIDS Strategic Framework (2017-2021), leading to the first implementation of PrEP in Zambia.

**Materials & Methods:** UMB provided medical and technical expertise to MOH to introduce PrEP in the 2016 Zambia National Consolidated ART Guidelines for sero-discordant couples (SDCs) and persons at high risk of HIV infection. The 2017 guidelines expanded eligibility with risk-based criteria targeting KPs, including SDCs, female sex workers (FSWs), and high-risk men (HRM). From April to November 2017, UMB piloted a PrEP intervention package at a KP referral site in Lusaka that included community education about PrEP and training of 24 health care workers (HCWs) on PrEP implementation. We present programmatic data on PrEP initiation and follow-up at one month.

**Lessons Learned:** Discussions with KPs show near-universal positive perception of PrEP, but cite KP stigma, HCW reluctance, and negative media reports as barriers to PrEP access. In eight months of program implementation, UMB identified 649 HIV-negative clients: 168 (26%) were screened for PrEP, of which 57 (34%) were eligible, and 50 (88%) enrolled in PrEP; of those, 32 (64%) followed up at one month. Enrollment among SDCs (5/5), and HRM 36/36) was 100%, but 54% among FSWs (9/16). One-month follow-up was 100% among FSWs (9/9), 80% among SDCs (4/5), and 53% among HRM (19/36).

**Conclusions:** A concerted collaboration between MOH, UMB, and other implementing partners resulted in the introduction of PrEP into Zambian national guidelines. Initial implementation shows high interest but rapid loss to follow-up following initiation. SDCs demonstrate high uptake and adherence; HRM high uptake but moderate adherence, and FSWs moderate uptake but high adherence. Low screening rates may reflect HCW reluctance to offer PrEP. Further work should focus on HCW training and sensitivity, client education and adherence, and decreasing social barriers to accessing PrEP.

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## Leveraging on existing National HIV Commodity Supply Chain System to Scale up Oral Pre-Exposure Prophylaxis (PrEP) in Kenya

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**Background:** In 2016, Kenya's Ministry of Health included PrEP in the Guidelines on Use of ARV Drugs for Treating and Preventing HIV Infections in Kenya. This paved the way for PrEP scale up in Kenya. At the same time, several research and demonstration projects were ongoing in the country, each running their own parallel supply chain systems, resulting in uncoordinated supply chains for oral PrEP. Consequently, stakeholders voiced the need for a harmonized and nationally coordinated supply chain system for PrEP commodities. We describe how an integrated supply chain system for PrEP was established in Kenya.

**Description:** The National AIDS and STI's Control Program (NASCOP) constituted a National PrEP Technical Working Group (TWG). Under this TWG, a commodity security sub-committee (CSSC) was tasked with developing a coordinated approach to PrEP commodities' supply chain, that would align PrEP commodities management to the National ARVs (Anti-retrovirals) commodities procurement, storage, distribution, consumption data capture and reporting system.

A Framework for the Implementation of Pre-Exposure Prophylaxis of HIV In Kenya was developed and included how PrEP commodities were to be managed. First, all product donations to multiple implementing partners were pooled under the Kenya Medical Supplies Authority (KEMSA) for national level management. The existing ARV Logistics Management Information System (LMIS) tools were revised, printed and distributed, and training materials for building health care providers' capacity in capturing PrEP consumption data and reporting developed. An initial catalytic order was then issued to service delivery points (SDPs) initiating PrEP to activate demand and subsequently pull PrEP stocks monthly from KEMSA using the revised LMIS tools. National stock status was monitored through CSSC using LMIS reports from

KEMSA and SDPs. This guided procurement planning for all ARVs to maintain a minimum national and facility level stocks at 9 months of stock (MOS); which assured commodity availability with less likelihood for stock-outs. At SDP level, improved collection of client and dispensing data was enhanced through electronic ARVs dispensing tool (ADT) reporting, giving health care providers the ability to reliably determine oral PrEP quantities required for ordering. Between December 2016 and December 2017, 16,667 doses of Tenofovir/Emtricitabine (TDF/FTC) had been distributed nationally through the integrated system. This enabled rapid expansion of the National PrEP program, cumulatively reaching 11,450 clients by end of December 2017.

**Lessons Learnt:** The formation of the commodity security sub-committee provided a platform for national discourse among all stakeholders on an effective PrEP commodity supply chain. Consequently, all stakeholders pooled resources towards a nationally coordinated program. Leveraging on an existing national ARV distribution system provided a rapid and cost-effective approach for national PrEP scale up.

**Conclusions:** The national PrEP commodity security sub-committee was instrumental in guiding the integration of PrEP commodities into the National ARVs commodities pipeline. This strategy ensured a single national supply pipeline managed by NASCOP and KEMSA, guaranteeing seamless PrEP commodity ordering, distribution and reporting. For an effective national PrEP scale up program, leveraging on existing systems for commodity management provides a smooth and reliable path towards ensuring coordinated commodity management and security.

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## Acceptability of Infant Circumcision Among Top Ten Traditionally Circumcising Communities in Kenya: Variations in Views by Age and Sex of Respondents

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**Background:** Three trials showed that medical male circumcision (MMC) reduces the risk of heterosexually acquired HIV infection in men. MMC has therefore been adopted as an HIV prevention strategy in 14 countries in sub-Saharan Africa. In Kenya, circumcision programs focus on the 15% of Kenyans not practicing traditional circumcision, leaving out communities where circumcision is practiced as a rite of passage to manhood. However, circumcision in such communities has been associated with perceptions of enhanced masculinity and sexuality. We qualitatively explored factors that could promote infant male circumcision (IMC) as an approach to reduce the negative gender norms planted in the minds of adolescent boys during circumcision ceremonies and HIV risk associated with sex following traditional circumcision.

**Methods:** Between November 2013 and February 2014, 60 focused group discussions were conducted among selected members of the top 10 traditionally circumcising ethnic communities in Kenya. These communities were selected based on the proportion of circumcised men reported in the Kenya Demographic and Health Survey; 85-100% of 15-54 year old men were reported as circumcised. Questions explored meaning and importance of circumcision, preferred age of circumcision and gender of the person providing circumcision, ceremonies around circumcision, views about IMC, and role of women in circumcision. The views were analyzed by age (18-30 and above 30) and sex using Atlas.ti software. Two coders identified themes and patterns, and inter-coder reliability was assessed.

**Results:** The discussions elicited mixed reactions towards IMC. Some communities already embraced IMC while others were strongly opposed to it except under medical conditions. The analysis revealed that older men (above 30 years) across all communities were opposed to IMC, mainly on account that it will disclose to the women secrets that should be solely in the male domain: "Circumcising a child that will be cleaned and attended to by the mother is like a curse or taboo" or "... the mother will know a lot of things and we do not want women to know about circumcision processes." On the other hand, younger (18-30 years) men were generally ready to embrace IMC and acknowledged its benefits: "I say this circumcision while young is better because the healing will take a short time, but when circumcised an adult it will be a problem for healing." Similarly, females across the two age groups supported IMC:

"A new born of 3 days, an infant of 1 year, 2 years, you can circumcise because their wound heals fast."

**Conclusion:** Although deeply rooted beliefs on traditional circumcision as a rite of passage to adulthood persist among older men in traditionally circumcising communities in Kenya, there are indications that women and younger men are more accepting of IMC. While circumcision programs in Africa are considering IMC for purposes of sustainability, the focus should expand to traditionally circumcising communities, and women and younger men could be the initial advocates needed to jumpstart this process.

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### Phylogenetics of HIV in East Africa: characterizing genetically related sequences with drug resistance mutations in the Cross-Border Integrated Health Study, 2016

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**Background:** East African cross-border sites are visited by mobile and vulnerable populations, including young women, female sex workers, fisherfolk, workers at public places, truck drivers, men who have sex with men, and people who inject drugs. They may not benefit from HIV treatment and prevention interventions conducted at their place of residence. No phylogenetic studies have been conducted in this population. The objective of this analysis is to identify and characterize the genetic relatedness across sequences collected from East African cross-border sites.

**Methods:** The USAID- and PEPFAR-funded MEASURE Evaluation project, led by the University of North Carolina at Chapel Hill, collected cross-sectional data using the Priorities for Local AIDS Control Efforts (PLACE) sampling method at 14 cross-border locations near or along the land and lake borders of Kenya, Rwanda, Tanzania, and Uganda from August 2016–January 2017. This bio-

behavioral survey captured information from 11,428 individuals, 576 of whom were identified as HIV-positive. Data were weighted and analyzed using survey methods that accounted for the complex sampling design.

We conducted HIV-1 pol gene sequencing for a subset of 125 people with unsuppressed HIV and detectable viral loads (>1000 copies/mL). The phylogenetic analysis was conducted using the Bayesian Evolutionary Analysis by Sampling Trees (BEAST) package v1.8.4. We specified a log-normal prior for the uncorrelated relaxed clock rate, a HKY85 nucleotide evolution model and a Bayesian skyline coalescent tree prior.

**Results:** Of the 125 people with sequence data, 18 clades were identified including 52 individuals, with the largest clade containing 16 persons and the smallest clade containing 2 individuals. Many individuals in clades were members of cross-border mobile and vulnerable populations with most being young women (n=11) or fisherfolk (n=8). Six individuals in clades were female sex workers. No truck drivers, injection drug users, or men who have sex with men living with HIV and identified in the study were included in a clade, but few of these populations tested positive for HIV in the study. Of the clades identified, 9 clades contained individuals recruited from two countries and 1 clade contained individuals recruited in three different countries. Seven of the participants identified with a resistance mutation were also identified in a clade.

**Conclusions:** The existence of genetically related clades containing drug-resistance in this population may suggest the presence of transmission clusters in vulnerable populations that may compromise treatment success across several cross-border sites and countries. Additional research to examine possible transmission of resistant clusters in these populations could aid in prevention of HIV in these communities.

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## Viral Load Suppression trends in Kenya from January to December 2017

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**Background:** According to WHO's strategy for the surveillance and monitoring of HIV in low and middle income countries, a viral load of < 1000 RNA copies per ml should be taken as evidence of viral suppression. Achieving "viral suppression" is the end goal for people living with HIV who are receiving anti-HIV medications. Over the past decade, the proportion of individuals on highly active antiretroviral therapy (HAART) who achieve HIV RNA suppression has increased dramatically in Kenya. Keeping HIV at this low level improves longevity, reduces morbidity and greatly reduces HIV transmission. The success of HAART has been attributed to improved medication adherence because of decreased HAART toxicity, fixed-dose combination pills, and simplified dosing strategies. Viral load is recommended as the preferred monitoring approach to diagnose and confirm HIV viral suppression.

**Objective:** The objective of the study was to evaluate the twelve months HIV viral load suppression trends in 47 counties in Kenya from January to December 2017.

**Methods:** Using 2017 viral load data from the HIV NASCOP database for Kenya, a multi-site cross sectional study of HIV-infected patients receiving HAART was analyzed. Total number of patients who had attained suppression was analyzed using sociodemographic characteristics and test outcomes.

**Results:** A total of 1,088,132 viral load tests were done in the whole country from January to December 2017. Routine VL Suppression rate was 83.6%(869,852), while non Suppression was 16.4%(170,467). Baseline viral load test were 4,690 with anon suppression of 1319(28.1%), while confirmatory repeat test were 43,123 with a suppression of 21,355(49.5%). Routine viral load by gender showed that a total of 709,951 Females were tested and 601,050(87.4%) were virally suppressed,

while the male viral suppression was 258,996(81.3%). Routine viral load suppression by age shows that: No data on age had a suppression of 51,341(86.5%), <2yrs-1295(53.2%); 2-9yrs-27858(66.7%); 10-14 yrs-27793(66.9%); 15-19 yrs-19,235(65.8%); 20-24-37930(81.1%); 25 yrs and above 706,398(86.0%). Suppression rates by county showed that: Kirinyaga country-88.7%; Kiambu-88.4%; Kisii-87.4%; Migori-86.9%; Kisumu-85.9% and Homabay county 85.7

### Conclusion:

An overall Country suppression of 83.6% showed impressive results towards achieving the desired 90-90-90 treatment target by 2020 in Kenya, which is a positive indicator to treatment adherence. The ministry of health, partners and collaborator in Kenya could use these findings to provide a powerful monitoring tool for strengthening HIV programmes in Kenya.

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## Routine Viral Load measurement in children living in hard to reach areas in 3 rural districts in Zimbabwe; review of feasibility and outcomes

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**Background:** Zimbabwe adopted the WHO recommendations for the use of Viral Load (VL) as gold standard for monitoring Antiretroviral treatment (ART). The Ministry of Health and Child Care (MoHCC)'s VL scale-up strategy (2015-2018) describes the roll out of VL-testing to district and Rural Health Centre (RHC) level, with initial focus on target groups, including children. SolidarMed, a Non-Governmental Organisation in Health, partnering with the Zimbabwe MoHCC, assists in health system strengthening by improving access to routine VL testing in children living in hard to reach areas in 3 districts within Masvingo Province. The feasibility of VL service delivery and the incidence of viremia within this target group was assessed for the year 2017.

**Materials & Methods:** HIV care is decentralized to all the 79 health facilities within the districts, with more than 80% of the patients receiving treatment at RHC level. With limited access to VL measurements at the Masvingo Provincial Laboratory, requiring full blood samples, additional targeted support was offered to collect specimens as Dried Blood Spots (DBS) which were processed at an accredited laboratory in South-Africa (SA) using BioMerieux Platform. The dataset consisted of children <15 year of age, who had routine VL done through the SolidarMed supported system (DBS) or the National Program (plasma) in 2017; sample results were recorded in excel. Key variables included basic demographic data, turnaround time (TaT) of results, and level of viremia. Descriptive analyses of all variables were performed.

**Results:** Within the 3 districts, a total of 48'612 patients were on ART, 3'737 (7.7%) being children. In 2017, 57% of the children on ART received a VL measurement. SolidarMed supported 380 routine DBS VL samples from 35 health facilities (40% of all treatment sites): 84(24%) in 0-5y, 154(41%) in 6-9y and 147(37%) in 10-14 year olds. 250(67%) samples came from RHCs, remaining from hospitals. 33% had a detectable VL  $\geq 1000$  copies/ml, which is the cut-off point used to define treatment failure, with the largest proportion of suspected treatment failure in the age-group 6-9 yrs. An additional 20% had a low detectable VL between 20-1000 copies/ml. Turn-around time (TAT) from sample collection to return of result was a median of 41 days (IQR 34-56). At the Provincial Laboratory, 1717 plasma samples were successfully processed (children <15 yrs) with 450(26%) found to be detectable  $\geq 1000$  cps/ml and an additional 716(42%) low detectable. TAT of plasma samples was not captured. Sample success rate was high in both methods (99.9% in DBS, 98.2% in plasma).

**Conclusions:** Coverage of routine VL monitoring in children within the reviewed districts was still low (57%), and time restricted transportation of plasma VL samples remains a challenge for areas that are poorly accessible by road. 18% of paediatric VL samples were collected through DBS and it appears feasible to use this method to promote uptake for routine VL in children in remotely located areas of rural Zimbabwe. The high level of viremia in children remains concerning and stresses the need to pursue improved coverage.

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## Impact of weekly SMS reminder on quality of Life and adherence among HIV/AIDS patients on ART in Rural Botswana, Prospective Cohort Study.

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**Background:** Improved patients' quality of life(QoL) and optimal adherence are crucial to ART program success thus to achieving HIV epidemic control. However, there is limited evidence on whether SMS technology promote high adherence to anti-retroviral therapy (ART) and improve quality of life among HIV/AIDS. This study sought to determine the impact of weekly SMS on adherence and quality of life of PLHIV on ART

**Method:** This prospective cohort study included 298 patients attending ART clinic at Letlhakane Primary Hospital. The study comprised of two groups: exposed and control groups. Participants enrolled in the first group received a weekly reminder during 24 weeks while those in the control group did not receive any SMS. The WHOQOL HIV BRIEF, English and Setswana version were used to assess QoL at enrolment and at the end of the study. QoL scores for each domain were obtained by rescaling the six domains (physical, psychological, environmental, level of independence, spiritual and social relationship) from 4 to 20, with 20 being the most favorable outcome.

Adherence score was assessed by the pill count method and patients who scored 95% or more were considered as adherent and those who scored less than 95% were classified as non-adherent. Descriptive and inferential statistics were performed using STATA 13.

**Results:** From October 2016 to July 2017, 298 patients received weekly SMS reminder. 162 were females (54.4%) and 136 males (45.6%). Participants mean age was 39; 87.4 % (260) of them received at least a primary education while 12.6% (38) did not receive any formal education and 54 % (161) were single.

During our intervention; QoL mean score improved from  $16.26 \pm 2.44$  to  $16.96 \pm 2.40$  in the exposed group while a decrease from  $16.70 \pm 2.31$  to  $16.26 \pm 2.04$  was observed in the control group. In a

bivariate analysis, SMS intervention (p 0.003) and education level (p 0.011) were significantly associated with an improvement of QoL while in a multivariate analysis only SMS intervention (p 0.000) was associated to QoL improvement.

Further analysis demonstrated that the changes depicted in QoL were mainly driven by the following domain : level of independence (p 0.031), social relationship (p 0.017) and environmental domain (p 0.025)

Adherence mean was at 98.1% for the exposed group and 97.7% in the control group at the beginning while at the end of our intervention it was at 99.9% in the exposed group and 98.5%. The bivariate analysis has shown an association statistically significant between the mean adherence (P=0.011) over the six months of our intervention and the SMS intervention moreover, the mean adherence did not show any significant association with other variables.

**Conclusion:** Text messaging supported significantly adherence to ART and improved quality of life. Among patients who received SMS compared to the control group. Mobile technology could be an effective tool to support HIV care.

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### Exploring high-yield approach to HIV testing in Kenya: contact notification services

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**Background:** Sexual partner notification and testing of contacts of index patients is an efficient, high-yield approach to identifying HIV-infected persons. Newly-diagnosed patients are likely to have HIV-infected partners or children.

**Methods:** This was a prospective cohort study in 53 hospitals in Lower Eastern Kenya. Index cases were defined as patients 15 years and above, diagnosed with HIV between October 2016 and June 2017. Sexual contacts and children of all enrolled patients were recorded in a register. Sexual contacts with

unknown HIV status and those previously negative but not tested within three months prior to the index testing were considered eligible for testing. Sexual contacts were invited for testing using an invitation card while index patients were asked to bring children for testing. Contacts who did not turn up for testing within 30 days were contacted through a telephone call. Z-test for difference in proportions and logistic regression analysis were used. Exact 95% confidence intervals were reported but with no adjustment for facility clustering.

**Results:** In total, 1128 index cases were identified out of whom 564 sexual contacts and 1227 children were listed. Of those listed, 490 (87%) sexual contacts and 1097 (89.4%) children were eligible for testing. A significantly higher proportion of sexual contacts were tested (39%) compared to children (30%), p<0.001. Similarly, significantly more female sexual contacts (46.9%) compared to males (34.2%) were tested (p=0.005). The median time to test for sexual contacts was one day (interquartile range(IQR): 1-14) and 13 days (IQR: 4-27) for children.

Of the 523 contacts tested, 104(19.9%) were HIV positive. HIV positivity was 6.0% (95% CI 3.6 - 8.3) among children and 43.2% (95% CI 36.2 - 50.2) among sexual contacts. Positivity was higher in female sexual contacts (48.3%) than in males (38.2%), but without statistical significance (OR 1.51 [95% CI 0.84 - 2.69, p=0.16]). Positivity among sexual contacts 25 years and above was higher, but not significantly so compared to those aged 15-24 years (OR 1.16 [95% CI 0.39 - 3.38, p=0.8]). Factoring in the contacts enrolled with a known HIV status, children had a positivity of 7.8% (95% CI 4.8 -10.0) and sexual contacts 58.6% (95% CI 52.7 - 64.5).

**Conclusion:** Contact notification and testing had a high HIV-positive yield. If scaled up, the approach can reach networks of sexual contacts and children of index patients and accelerate achievement of the first of the 90-90-90 cascade; identification of HIV-infected persons. Structures should be put in place to ensure all listed contacts are tested in a timely manner.

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### Implementation of HIV Rapid Testing Quality Improvement Initiative (RTQII) in 14 Scale Up LGAs in Nigeria



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**Background:** PEPFAR is accelerating progress towards HIV epidemic control and this requires specific strategies to reach out to key populations in the communities and optimize HIV testing services (HTS) in health facilities. The result is the upsurge of HIV testing points mostly manned by trained non-laboratorians causing poor performance of HIV serology testing which has led to some cases of misdiagnosis. This poses a serious challenge to the Test and Start program in attainment of the UNAIDS first 90-goal. The HIV Rapid Testing Quality Improvement Initiative (RTQII) is an innovative approach by PEPFAR to ensure reliability and accuracy of HIV test results. Using the HIV RTQII model as funded through USAID, FHI360 provided intervention in the Quality Assurance process of HIV Rapid Testing at selected Testing points (TPs) through the SIDHAS project. Here, we report the implementation of the HIV RTQII project across the 14 priority LGAs supported by FHI 360 in Lagos, Rivers, Akwa Ibom and Cross River states in Nigeria.

**Materials & Methods:** A total of 804 TPs were enrolled between March 2016 and September 2017. Stakeholders sensitization and engagement meetings (SHM) were held in four prioritized states, State Quality Improvement Initiative Teams (SQIIT) were formed followed by trainings at different levels. Proficiency testing (PT) using Dried Tube Specimen (DTS) panels was scaled up to all enrolled TPs, four DTS PT cycles of five characterized PT panels were produced and administered to TPs; site assessment was done by SQIIT and project staff using the Stepwise Process for Improving the Quality of HIV Rapid Testing (SPI-RT) audit checklist. Each TP was classified based on HIV RTQII pre-certification levels (Level 0,1,2,3 & 4) for testing sites. HIV testing worksheet was revised, quality control (QC) log sheet booklets introduced and monthly data pick up was conducted. These were followed by corrective action to address gaps identified.

**Results:** The SQIIT members were trained twice; first 59 persons (30M:29F) and second 76 (M25:F51) at State level who in turn trained 1,045 (M290:F755) testers at the TPs. Of the 804 TPs assessed at baseline, only 0.1% (1) TP was on Level 4, however, at follow up assessment 23.0% (149) TPs improved to Level 4 out of 649 TPs assessed. The number of TPs that scored the benchmark of 90% and above in

PT improved from Trial 0216 (86.2% of 776 TPs) to Trial 0217 (93.5% of 804 TPs). Competency assessment was conducted for 90.7% (948) of the trained testers, out of which 65.8% were found to be competent (scored above benchmark of 80%). From the monthly HIV testing data, the logbook data analyses revealed a decrease in discordance between the initial and final testing from 0.31 to 0.0%, showing a significant improvement.

**Conclusions:** The implementation of HIV RTQII has brought about significant improvement in the reliability of the HIV test results being generated at the registered TPs. Implementation and continuous monitoring of the initiative will help to drastically reduce cases of HIV misdiagnosis and significantly contribute to the attainment of the UNAIDS 90-90-90 goal.

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### Cost-effectiveness of ACTA trial induction treatments for cryptococcal meningitis versus 2 weeks of amphotericin plus FLU or 5FC

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**Background:** Mortality from cryptococcal meningitis remains unacceptably high due to lack of sustainable, effective treatments in resource-limited settings. The ACTA trial tested new induction strategies: 2 weeks oral combination therapy with fluconazole (FLU) plus flucytosine (5FC), and short, 1-week, amphotericin B (AmB) with either FLU or 5FC, against the standard of 2 weeks AmB with either FLU or 5FC, in a 2:1:1:1:1 ratio. This analysis assesses health service costs in relation to health outcomes for these alternative treatments.

**Methods:** From January 2013 to November 2016, we collected individual-based data on 678 participants in 4 trial countries on all clinical resource use and health outcomes, including complications. A detailed costing study was done at University Teaching Hospital in Zambia, between 2012 and 2015, following health service perspective. We estimated total costs for each treatment by multiplying unit costs in US\$ by the arm-specific resource use over 10 weeks. The primary health outcome was 10-week mortality, and the incremental health outcome the number of deaths prevented per 100 patients. For cost-effectiveness analysis, we used non-parametric bootstrapping, with 1000 samples, to estimate cost-effectiveness ratios per death averted. Confidence intervals, scatter plots, and acceptability curves were used to illustrate uncertainty, and tornado graphs the effect of individual parameters.

**Results:** Mean total costs and 10 week mortality for the 5 treatment arms were US\$1654 and 35% for oral FLU+5FC, \$1936 and 49% for 1 week AmB+FLU, \$2070 and 24% for 1 week AmB+5FC, \$2321 and 41% for 2 weeks AmB+FLU, and \$2481 and 38% for 2 weeks AmB+5FC. The cost of hospitalization was the major driver of total costs.

Both oral FLU+5FC and 1 week AmB+5FC were less costly and more effective than (dominated) the standard of 2 weeks AmB+5FC. When the mortality of 1-week AmB+5FC was varied to the upper 95%CI (32%), 1-week AmB+5FC still dominated 2 weeks AmB+5FC. The incremental cost effectiveness ratio for 1 week AmB+5FC versus oral treatment was US \$53 per death averted (95% CI: 16-151).

**Conclusions:** 1-week AmB+5FC and oral FLU+5FC are highly cost-effective regimens suitable for implementation in resource-limited settings. 5FC

needs to be made widely available for treatment of cryptococcal meningitis.

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Pathogenesis, and Prevention Research in  
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### A review of implementing prep demonstration projects for the ministry of health with multiple partners and linkages/Swaziland

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**Background:** Based on the findings from the December 2016 PrEP health facility knowledge assessment conducted by the Ministry of Health (MoH), Swaziland, the MoH approved a national framework to guide implementation of pre-exposure prophylaxis (PrEP), including demonstration projects to inform policy decisions on how PrEP can be rolled out nationwide. We present lessons learned in the ongoing PrEP demonstration projects being coordinated by the MoH.

**Methods:** In March 2017, the MoH supported a multiple-site design of protocols for three implementing partners—LINKAGES/FHI 360, Medicien San Frontiers, and Clinton Health Access Initiative—using oral PrEP preparations of Tenofovir 300mg and emtricitabine 200mg. The projects aim to enrol a total of 2,632 (FHI 360 1,300, CHAI 538, MSF 794) males and females ages 16 and above at substantial risk for contracting HIV. The enrolment duration is 12-month recruitment and 6-month follow-up. Quantitative data are being collected using MoH standard tools for PrEP. Ethical approvals were obtained from each partner's country ethics committees, including Swaziland.

**Results:** The MoH has been successfully coordinating the three PrEP studies through partner implementation meetings and establishing a national PrEP database for monthly data entry. Partnerships have minimized duplication of effort in the implementation through synergies in the development of information, education, and communications materials and training for service providers. By December 2017, 1,003 clients were screened for substantial risk; 76% (n=762) were at substantial risk and 55% (n=422) were eligible for PrEP screening. Out of these, 93% (n=360) were eligible and initiated on PrEP. Seventy-eight percent of the initiates (n=281) were females and 22% (n=79) males.

**Conclusions:** Partnership synergies with the MoH appear to work, as evidenced by current PrEP enrolment in support of the MoH's study of PrEP scale-up in Swaziland.

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### PrEP accessibility and uptake-A comparison study between a government facility and a non-governmental organization.

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**Background:** PrEP (Pre-exposure prophylaxis) was rolled out in Kenya by the Ministry of Health & NASCOP (National AIDS & STD

Control Programme) in March 2017 for all people at risk. However a pilot study had been carried out at Liverpool Voluntary Counselling & Testing Centre (LVCT), a Kenyan NGO in 2015-2016 which serves key populations. The objective of this paper is to compare the immediate uptake & retention at a site that serves the key population only (LVCT) & a government facility that serves all those who are at risk (Kangemi health centre).

**Study design:** This was a retrospective study, where existing data already recorded by the sites was used. The data collected was from March to August 2017. However, data analyzed was for the first four months from the time of enrolment because the Kangemi site began in the month of May.

**Study subjects:** Participants in the study were already enrolled at both sites and had begun receiving the PrEP therapy. Eligibility criteria for receiving PrEP were those at risk of being infected with HIV & at enrollment were HIV negative.

**Results:** At LVCT a total of 156 (103M: 53F) clients were enrolled. Majority were the key population 84.6% (132), general populations were 14.7% (23) and from discordant unions were 1.0% (1). Most of the clients 78.2% (122) who returned for refill were key populations. Those who enrolled from outreach services none came for refill 8.3% (13).

At Kangemi Health Centre a total of 78 (39M: 39F) clients were enrolled. Majority were general population 46.1% (36), key populations were 32.1% (25) and from discordant unions were 21.8% (17). Only 24.3% (25) returned for refills.

**Conclusion:** It was noted that clients who perceived their risk were more likely to return for their refill.

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### Risk and perception barriers for oral PrEP as an additional HIV prevention strategy- an experience from Swaziland demonstration projects

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**Background:** In 2015 WHO recommended adoption of oral PrEP as part of combination HIV prevention package. While the efficacy of PrEP has been shown, currently feasibility and acceptability of implementing PrEP under programmatic conditions in Swaziland is unknown. We therefore, conducted a demonstration project to assess the feasibility, acceptability and retention among individuals likely to benefit from PrEP.

**Methods:** Using a national implementation framework approved by MoH directorate, we implemented PrEP in collaboration with three partners. Participants who are sexually active, HIV seronegative and at substantial risk of acquiring HIV infection were eligible to participate in the PrEP demonstration projects. HIV testing was conducted at every follow up visit which were structured at month 1, 3 and every three months thereafter. Clients who missed appointment were followed up through phone calls. Frequencies and proportions were used to describe the uptake of PrEP and retention with some qualitative data collected periodically.

**Results:** By December 2017, 1003 clients were screened and 762 (76%) of them were at substantial risk of acquiring HIV. Of these,

422 (55%) consented for PrEP eligibility screening, of which 389 (92%) were eligible and 360 (93%) were initiated PrEP. Among those initiated 281 (75%) were females. Out of the 360, 10 (3.6%), 1 (0%) identified themselves as female sex workers (FSWs) and man who have sex with man (MSM), respectively. Non-condom use was cited as the reason for accepting PrEP in 303 (84%) of the initiates. There were 216 (60%) who returned for 1-month review. Among those who did not return for 1-month visit, 39 (27%) were reached through phone calls, of which 15 (38%) cited personal decision whilst 9 (23%) and 4 (10%) cited that they were no longer at risk and side effects respectively.

**Conclusions:** PrEP implementation is feasible and acceptable in public health setting when it is open to general population than targeting only specific groups. PrEP adds value to HIV prevention package and individuals stop PrEP out of will without a clinical related reason.

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### Barriers to PrEP implementation: The Ministry of Health demonstration projects in Swaziland

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**Background:** Whilst the efficacy of HIV pre-exposure prophylaxis (PrEP) is proven, little is known about feasibility and acceptability of implementing (PrEP) in Swaziland. We present our experience in implementing oral PrEP demonstration projects amongst population at substantial risk of acquiring HIV infection from August to December 2017.

**Methods:** We used a Ministry of Health national implementation framework in collaboration with three partners; FHI 360, Clinton Health Access Initiative and Medicine San Frontiers using oral PrEP preparations of TDF/3TC 300mg or TDF/FTC 200mg. Ethical approvals were obtained from Swaziland Ethics Committee. Eighteen MoH clinics were chosen to implement the projects. Consenting participants aged 16 and above, who are sexually active, HIV sero-negative and at substantial risk of acquiring HIV infection were enrolled in the project. HIV testing was conducted at 0, 1 and 3 months visits. Clients who missed an appointment were followed-up three days after their scheduled visit expired and three phone calls at 2-days intervals were made. MoH approved tools were used to collect quantitative and qualitative data.

**Results:** A total of 1003 clients were screened, 76%(n=762) were established at substantial risk. Of these, 55%(n=422) were eligible and 93%(n=360) were initiated on PrEP. Among those initiated 75%(n=281) were females (10 self-identified as female sex workers and 1 man who have sex with men). Non-condom use was cited as the reason for accepting PrEP in 84%(n=303) of the PrEP initiates. Sixty percent(n=216) returned for their one-month follow-up visit and among those who did not, 27%(n=39)) were contacted by phone calls and 38%(n=15) cited various personal reasons for not showing up including distance to travel to clinic for PrEP refills. Twenty three percent (n=9) cited that they were no longer at risk and opted out.

**Conclusions:** PrEP uptake is promising and the demonstration project appears well integrating in existing MoH clinics. Key barriers to PrEP implementation remains as retention. PrEP

demonstration projects should consider innovative ways to improve retention, for meaningful impact in HIV prevention.

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### Assessing Uptake and Acceptability of PrEP among the Sex Workers one Year after Scale up in Nairobi, Kenya

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**Background:** Feasibility studies in Kenya had shown high PrEP acceptability before roll out. After a promising PrEP demonstration project and approval of PrEP use as part of the HIV combination prevention by WHO and Pharmacy and poisons board, MOH in Kenya, scale up commenced in February 2017. Due to the effective community engagement program and meaningful involvement of peers in the programming, the Sex Workers Outreach Program (SWOP), was selected to participate in the PrEP scale up. SWOP has 7 Drop in Centres (DICes) across Nairobi and serves 28000 Female Sex Workers (FSWs) and 1600 Men who have with Sex Men (MSMs), of which 17000 FSWs and 1200 MSMs are eligible for PrEP. Despite all the efforts and resources that have gone into demand creation for PrEP over the past year, the uptake and adherence remains poor. Additionally, there is little documentation on why the uptake is low and this study addresses that gap

**Methodology:** SWOP uses a Peer- Led hot-spot based model to sensitize the SWs, and has 340 Peer Educators (PEs). All the PEs were intensively trained about PrEP at the onset of the scale up. They are now responsible for sensitizing and mobilizing the SWs at the hotspots, and referring those interested in the intervention for the clinical sites. At the seven clinics those interested with PrEP are provided with more information on intervention and initiation conducted among those eligible. The data was sourced from records of PrEP users between February and December 2017. Qualitative data was collected through services exit questionnaires, follow-up phone calls, and feedback from the PEs.

**Results:** 15000 (88%) FSW and 1000 (62.5%) MSM have been mobilized at the hotspot. At the close of the year, only 600 SWs had been initiated on PrEP. The uptake among the MSM and the FSW is therefore 45 (4.5%) and 555(3.7%) respectively. The reasons for the low uptake have been reported as:- fear of immediate and long term side effects (%), stigma around PrEP use (%), and perceived individual low risk (%).

**Conclusions:** Health education and demand creation for PrEP should be intensified as a priority. Research efforts towards the attitudes of Sex Workers on PrEP the motivators and barriers on PrEP use should be undertaken soonest for evidence based programming

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### Breaking Barriers and Enhancing Capacity for Gender Based Violence Case Identification and Reporting in Northern Nigeria.

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**Background:** Harmful gender practices remain a challenge in Nigeria. The low capacity of health care workers working in HIV care and treatment clinics, to screen and provide post gender based violence (GBV) services makes GBV case identification and reporting extremely challenging and further compounds the current situation in Nigeria.

**Materials & Methods:** To address these challenges, the USAID funded Care and Treatment for Sustained Support (CaTSS) project implemented by MSH, conducted a GBV baseline assessment which revealed capacity gaps amongst HIV care providers to adequately provide GBV services in 41 partner health facilities located across the five Northern Nigerian states of Sokoto, Zamfara, Kebbi, Kwara and Niger. A five-day Training of Trainers (ToT) on gender mainstreaming was facilitated for 30 select HIV service providers (19Males and 11 Females) in October 2017. This training workshop was used to build and strengthen the skills of physicians, nurses, and adherence counsellors. Specifically, trainees' skills were built on GBV case identification, clinical and non-clinical aspects of post GBV services provision, and data and results management. Each trainee was designated as a GBV champion post-training and mandated to conduct a step-down training, and also mentor a multi-disciplinary team of service providers in their primary place of work. We abstracted GBV service data and compared the total number of reported cases before and after our intervention and services provided.

**Results:** In the 10 months pre-training period, only 8 GBV survivors (3Males and 5Females) were reported across the 41 health facilities-a 0.8% reporting rate. In the two months post training, remarkable improvements in screening skills and documentation was observed. A total of 68 GBV survivors (17Males and 51Females) were identified across the 41 partner health facilities, and provided with post GBV services, which included Post Exposure Prophylaxis (PEP) using a combination therapy of Tenofovir+Lamivudine+Efavirenz for 28 days. This result represents a 40 fold increase in the number of GBV survivors who received clinical and non -clinical post GBV services.

**Conclusions:** Instituting innovative strategies for identifying cases of GBV and ongoing capacity enhancement of service providers is a critical intervention towards addressing gender inequalities and effective provision of post GBV services to survivors in Nigeria.

## 45

### The influence of gender on loss between HIV diagnosis and initiation of antiretroviral therapy in the "treat all" era: Experiences from Zimbabwe

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**Background:** The last decade has seen remarkable progress in scale up of antiretroviral therapy (ART) with guidance from the WHO to the current "treat all" recommendation of 2015. An estimated 81% and 65% of adults (15+ years) females and males living with HIV in Zimbabwe were receiving ART in 2016, respectively. Although, treat all has potential to reduce the disparities, the impact has not well assessed in sub-Saharan Africa. This targeted assessment aimed at understanding gender differences in linkages to HIV treatment using the new treat all guidelines to support development of targeted interventions to improve program performance.

**Methodology:** We conducted retrospective cohort analysis using program data of newly diagnosed HIV positive clients from September to December 2016 in Manicaland and December 2016 to March 2017 in Midlands province when "treat all" strategy was adopted. Thirteen health facilities were purposively selected through collaboration between the facility-based Families and Communities for Elimination of HIV (FACE HIV), and community-based Zimbabwe HIV Care and Treatment (ZHCT) programs supporting MOHCC in the HIV care and treatment program in Zimbabwe. Descriptive analysis and statistical inferences were conducted using STATA v12.

**Results:** Overall, 2183 adults 15+ years were newly diagnosed HIV positive and 58% (1272/2183) were females. The median age was 30 and 35 years among females and males, respectively. Overall, there were no gender differences between HIV testing and enrolment in HIV care, 67% among men compared to females 65%. Further analysis showed that among clients diagnosed in the community, a higher proportion of women were enrolled into HIV care at the facility where they received the HIV positive result compared to men, 38% vs 32%, although difference was not statistically significant,  $p=0.079$ . The data showed that a significantly higher proportion of the men enrolled into HIV care at other health facilities compared to women, 33% vs 24% ( $p=0.005$ ), respectively. There were significant gender differences between enrolment in care and HIV treatment, 77% and 67% among females and males, respectively ( $p<0.0001$ ). The pattern was consistent across the two HIV testing models of the current assessment. The data show that females 15 years and above had higher proportions linked to HIV treatment from enrolment into care compared to males of the same age across the two HIV testing models, 89% among females vs 50% among males and 82% among females vs 45% among males for facility and community testing HIV testing models, respectively.

**Conclusions:** The analysis highlights important gender differences in access to HIV care and treatment services. Although, community HIV testing model is an essential intervention to reach males, the findings indicate the need for more effective linkage to HIV care and treatment strategies. We recommended providing a comprehensive package including community ART initiation to strengthen linkages from testing to treatment specifically targeting men. Overall, the gender differences between enrolment in HIV care and treatment requires further research under the "treat all" guidelines to appropriately address the barriers which are specifically faced by the male counterparts along HIV cascade towards the UNAIDS 90-90-90 targets.

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### How the perceived low status of women in Malawi interacts with gender inequalities to increase their vulnerability to HIV: A qualitative study

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**Background:** Limited information exists about how gender inequalities contribute to high HIV incidence among women in sub-Saharan Africa. Mostly, women are perceived to be of low status and this is influenced by patriarchal ideologies common in most African societies. Our study attempts to describe how the perceived low status interact with gender inequalities to increase women's vulnerability to HIV infection.

**Methods:** This is a qualitative study that targeted sixteen males and females over 18 years old from 19 July 2017 to 04 August 2017 in Lilongwe, Malawi. The study participants were only those that had been in a heterosexual relationship for over two years. Such participants were presumed to have extensive knowledge about heterosexual relationships. The participants were categorized into four groups: a) Married Males and females; b) Males and females in a sexual relationship other than marriage; c) Widows and widowers; d) Males and females who have been in a sexual relationship before but not at that moment.

**Results:** Results showed that in most societies, the society hierarchy creates an ideology where women are perceived to be of low status compared to men which leads to gender disparities between the two sexes. Participants appeared to agree on the point that because women are of low status men are dominant and have authority to make decisions in sexual relationships without question. The study also found that the perceived low status of women creates a social ideology where women are expected to succumb to men's sexual desires which include having unprotected sex leaving them vulnerable to other STIs and HIV. It was also found that culture also creates a gender ideology where women are expected to be passive and obedient to men leaving them vulnerable to sex exploitation.

**Conclusion:** Gender disparities create a phenomenon where women are perceived to be of low status in sexual relationships. Men are dominant and have the authority in sexual relationships leaving women vulnerable to sex exploitation which makes them vulnerable to STIs and HIV.

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### HIV-free surviving fetuses in young infected women with advanced abdominal pregnancy: A case series in Dschang Cameroon

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Abdominal pregnancy (AP) is defined as the implantation and development of the product of conception in the peritoneal cavity. The pregnancy is said to be advanced after 20 weeks of gestation. Given the poor antenatal care quality and coverage, the reduced access of pregnant women to medical imaging technology and the rare nature of advanced abdominal pregnancy (AAP); the low suspicion index among clinicians allows

diagnosis to be made only at term or in life threatening circumstances. In Cameroon, the incidence has shown an increasing trend over the last two decades; 1:10000 births in 1995 to 3.3:10000 births. Foetal survival is exceptional with a perinatal mortality ranging from 40-95% associated with a significant maternal morbi-mortality (can exceed 20%). A good number of cases of HIV-AAP co-existence have been reported in literature. Sexually transmitted infections among HIV patients predispose them to having tubal lesions thereby increasing the incidence of ectopic pregnancies. About all the studies carried out in this domain do not describe the HIV-status of babies surviving from AAP in HIV-positive mothers; due either to premature intra-abdominal demise, or early neonatal death or lost-to-follow.

In Dschang; West of Cameroon, the mother to child transmission rate of HIV during intra-uterine pregnancy is 1.2% in 12 months with an infant HIV-free survival rate of 91%. We report two cases of HIV seronegative infants issued from AAP.

We managed 03 cases of AAP in two hospitals in Dschang from 2013-2016. Their CD4 counts at the moment of abdominal pregnancy diagnosis were 225, 149 and 313 respectively and their respective viral loads (copies/ml): 10200 ; 616623 et <9000. During pregnancy, all the three were on highly active antiretroviral therapy. Two babies were born at term, both female, weighing 2400 and 3400g. No neonatal resuscitation measures were taken. Immediate postnatal care included: warm antiseptic bath immediately following delivery, prevention of neonatal ophthalmic infections, administration of vitamin K, and vaccination. Nevirapine prophylaxis was initiated immediately and cotrimoxazole prophylaxis at 6 weeks following delivery. The follow up extended over a period of two years with weight and height monitored. The babies were exclusively breastfed for the first 6 months of life. PCR (polymerase chain reaction) for HIV detection done at 1 and 6 months following delivery were negative. At 12 and 18 months of life, HIV strip tests for antibody detection were also carried out with negative results.

We encountered 03 advanced cases of abdominal pregnancy among HIV-positive women in only 03 years.

HIV-positive women with abdominal pregnancy may give birth to non-infected healthy infants. To reduce mother-to-child HIV transmission in AAP, a closed follow-up after birth is necessary, nonetheless the mother still under antiretroviral therapy with the baby well breastfed for the 06 first months of life; and other postnatal care as for normal pregnancies. The discovery of a viable AAP should not always compulsorily lead to its medical termination. To avoid their obstetrical compromise, other studies should emphasize on how we can successfully manage such cases, given that we still make the diagnosis incidentally at term.

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### HIV Testing Services, Linkage to Care, and Prevention for Adolescent Girls and Young Women in Kenya (GIRLS Study): Preliminary Baseline Findings

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**Background:** Adolescent girls and young women (AGYW) ages 15-24 years are twice as likely as their male peers to be HIV-infected, making females in sub-Saharan Africa the most at-risk group for HIV infection. Expansion of HIV testing services in the sub-Saharan region has not translated into increased access and uptake of testing, and HIV associated mortality remains unacceptably high. There is a critical need to prioritize implementation science research on strategies for increasing access to HIV testing, prevention, and treatment for this vulnerable population.

**Materials & Methods:** Within a framework of implementation science, we are evaluating prevention-treatment continuum interventions to increase uptake of HIV testing, linkage to and retention in care, and prevention among AGYW. We are comparing two “seek” recruitment strategies, three “test” strategies, and pilot “linkage” to care interventions (SMART design) among AGYW in Homa Bay County, western Kenya. Participants are recruited from urban, fishing, and rural communities via home-based or community-based strategies that run concurrently. AGYW are offered three testing options: (1) oral fluid HIV self-testing, (2) immediate staff-aided rapid HIV testing or (3) referral to a health care facility for standard HIV testing services. For those who select self-testing, reactive results and a proportion of non-reactive results are confirmed per Government of Kenya guidelines. Study administers a standard baseline questionnaire that collects data on sociodemographic characteristics and sexual risk taking. Newly diagnosed HIV positives are enrolled in a cohort to pilot the most effective way to support AGYW with initial linkage to care. We also evaluate a primary prevention messaging intervention to support high risk HIV-negative AGYW to reduce their HIV risk behavior and adhere to HIV retesting recommendations.

**Results:** As of 14 February 2018, 902 participants have enrolled, 759 (84.1%) in the home, and 143 (15.9%) at mobile health events. The mean age at enrolment is 19.8 (SD:2.4), and 136 (15.1%) were aged 15-17 years old. Eighty-six percent reported ever having sex. The mean age at sexual debut was 16 years (SD:1.9). Only 32.4% reported condom use at last sex. Most, 728 (80.7%) chose staff-aided testing, with 170 (18.8%) choosing self-testing, and 4 (0.4%) health care facility referral. For those who selected self-testing, no invalid results or serious adverse events have been reported. There were 24 (2.7%) newly diagnosed HIV-positives, all enrolled in the pilot, and 15 (62.5%) have linked to care. Out of 878 HIV negatives, 158 (18.0%) were identified as high risk and 77 have been randomly selected and enrolled to the HIV negative cohort.

**Conclusions:** Adolescent girls and young women prefer home-based recruitment strategy and staff-aided HIV testing regardless of recruitment site. High prevalence of high risk HIV-negative AGYW demonstrates the importance of HIV testing to inform prevention interventions to avert new infections.

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### Women's Views on the Challenges and Solutions in Preventing the Gendered Spread of HIV in Durban, South Africa

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Despite numerous national prevention efforts, South Africa remains at the epicenter of the HIV/AIDS epidemic. The burden of the epidemic is extremely heterogeneous, with province, race, gender, age, and socioeconomic status serving as key variables in determining HIV prevalence rates. Black African women are disproportionately affected by the epidemic, with those between the ages of 20 and 34 having an HIV prevalence rate of 31.6%, the highest in the country (Shisana et al., 2014).

The purpose of this study was to engage with black African women about the challenges they believe women face in protecting themselves against HIV, and potential solutions. Participants were recruited from Masxha, Cato Manor, located in KwaZulu-Natal. Interviews were conducted in order to allow participants to describe their opinions on the topic.

This study was grounded in the culture-centered approach (CCA), which is a health communication model that emphasizes the importance of having members from a community at the center of defining important problems and developing solutions. The prevention challenges and solutions identified by the women were compared with current prevention programs, policy, and existing research. While some commonalities existed, it is clear that the challenges and solutions expressed by participants were not fully addressed.

Ultimately, this study showed that there is a great need for more community engagement in the battle against HIV.

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### Increasing access to Comprehensive HIV Services among Pregnant women; The Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS) Approach

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**Background:** Access to ANC services and routine HIV testing services (HTS) for pregnant women remains a key entry point to closing the PMTCT gap. This study seeks to review the effect of series of interventions aimed at facilitating access to HIV services by pregnant women in Rivers State.

**Materials & Methods:** This is pre-and post-intervention design study with the pre-intervention phase (PIP1) from October 2014 to September 2015, while the post intervention phase (PIP2) was October 2015 to September 2016. The routine standard for HTS prior to the intervention was general routine testing for all pregnant woman. During PIP2, HTS were scaled up to include community structures like Traditional Birth Attendants', testing in congregate settings within the community, household testing, churches offering ANC services and ultrasound scanning centres. Effective referral, cluster linkages, treatment supporters, mentor mothers and lay counsellors to optimize community-facility linkages were additional strategies deployed in PIP2. We reviewed HIV service data of 114 health facilities supported by the USAID funded Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS) project.

**Results:** A 60% increment in ANC attendance was achieved from PIP1 (21, 027 attendees) to PIP2 (33,675 attendees). Pregnant women accessing HTS had a 48% increment from 22, 329 to 33, 061 post intervention. Increasing access to HTS resulted in increased number of women knowing their HIV status and accessing care and treatment with a total of 1,028 (3%) and 795 (4%) HIV positive women identified at the post and pre-intervention phase respectively. Similarly, 1,010 (98%) and 773 (97%) of the identified positive were placed on treatment during the post and pre-intervention phase.

The number of HIV+ pregnant women delivering within the health facilities also increased from 276 in pre-intervention to 323 post intervention, a 17% increment, while the number of HIV positive pregnant women who received family planning counselling also increased by 19% from 734 to 877 post intervention.

**Conclusions:** Findings underscore the importance of implementing comprehensive HIV prevention, diagnosis and treatment services that would strengthen community and facility linkages, promote health seeking behaviours of women in order to close the wide PMTCT gaps in Nigeria.

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### Acceptability and primary outcomes of an integrated early childhood development (ECD) program for Option B+ mothers in Malawi

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**Background:** Successful strategies in the fight against HIV have changed the agenda for HIV infected and affected children from survival to thriving. Both HIV infection and the strained caregiving environment experienced by HIV affected families have negative impacts on children's cognitive development. Responsive and stimulating parenting plays a vital role in improving cognitive development, although such skills are rarely taught in low-resource, sub-Saharan settings. This study examines the acceptability and primary outcomes of an early childhood development (ECD) programme that imparts responsive, stimulating parenting skills to Option B+ mothers in Malawi.

**Methods:** The integrated Option B+/ECD programme was conducted in two rural antiretroviral therapy (ART) clinics in central Malawi. Pregnant, Option B+ women were approached to participate in an interactive ECD skills development programme starting from when the child was 6 to 8 weeks of age. The intervention was comprised of 9 monthly sessions (approximately 1-hour each) that coincided with mothers' scheduled ART appointments. Trained ECD counselors led each session using the WHO-UNICEF "Care for Child Development" package. Baseline and follow-up home visits and exit interviews were conducted at 2 and 9 months of age to assess changes in mothers' ECD knowledge and practice. Descriptive statistics and McNemar Tests were used to analyze the data.

**Results:** Between April-December 2016, 149 mother-infant pairs were enrolled in the programme. Of the enrolled mothers, 114 (77%) graduated from the ECD programme. There were no socio-demographic differences between mothers who dropped out of the programme and those who graduated. Among graduates, 96 (84%) attended >8 of the 9 ECD sessions. Graduates' knowledge

and observed practice of ECD activities significantly improved following the 9-month program. Availability of homemade toys (42.6% to 85%), reading (14% to 73%) and singing to the child (19% to 90%) showed a 2 to 5-fold increase at the end of the programme all with P-value of < 0.001. Mothers believed that the ECD programme improved their parenting skills overall, and increased familial involvement in child-rearing, especially among fathers. Four mothers also reported initiating ECD group activities in their communities suggesting desire for such programs.

**Conclusions:** : High retention and positive ECD outcomes provide encouraging indications of the acceptability and effectiveness of an ECD intervention integrated into HIV care.

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### Motivations to use contraceptive Methods: and condoms among HIV-infected and uninfected women assigned to progestin contraception in Malawi: A qualitative study

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**Background:** Although many countries have been promoting contraceptive and condom use to improve women's health and prevent HIV transmission, it is unknown how the women targeted by these messages have interpreted and internalized them. We therefore describe HIV-infected and uninfected women's understanding of the usefulness of contraception and condoms and their motivations to use them.

**Methods:** This is a qualitative sub-study from a trial evaluating the effects of progestin contraception on HIV-infected and uninfected women. Women aged 18-45 years were randomly assigned to depot medroxyprogesterone acetate (DMPA) or the levonorgestrel (LNG) implant from May 2014-April 2015 in Lilongwe, Malawi. The 27 women in this purposive sample were recruited after randomization to participate in semi-structured interviews. Participants were categorized into three groups: A) HIV-uninfected women; B) HIV-infected women who received both pre- and post-randomization counseling messages about antiretrovirals (ARV) and implant effectiveness; C) HIV-infected women randomized to LNG implant who received only post-randomization messages about ARV and implant effectiveness. All women received messages about a potential risk for increased HIV acquisition/transmission with progestin contraception.

**Results:** We interviewed 10 women in Group A, 10 women in Group B, and 7 women in Group C. All women understood that HIV is transmitted through unprotected sex and can be prevented through condom but not DMPA or implant use. Nearly all HIV-infected women said their partners agreed to condom use but few used them consistently, possibly because almost all were also HIV-infected. Most HIV-infected women believed that condoms were effective at preventing HIV and pregnancy, whereas many HIV-uninfected women were worried about their contraceptive effectiveness. Many HIV-infected women were also interested in using condoms to prevent HIV reinfection from their partner and talked about the importance of keeping their viral load low. Nearly all women considered contraception

important as both pregnancy and HIV were considered physically taxing.

**Conclusion:** Both HIV-infected and uninfected women understood HIV modes of transmission and prevention. Although HIV-infected women were also motivated to use condoms to prevent HIV reinfection, they faced challenges from their partners in using condoms to prevent both pregnancy and HIV.

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### Understanding the impact of HIV-related counseling messages on discontinuation of progestin contraception in a randomized clinical trial of HIV-infected and uninfected women in Malawi

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**Background:** Limited information exists about how counseling messages impact women's decisions to discontinue hormonal contraception. Therefore, we examined the extent to which 1) HIV-infected and uninfected women understood HIV and antiretroviral therapy (ART) risk-related contraceptive counseling messages; and 2) factors that impacted their decisions to discontinue their assigned progestin contraceptive.

**Methods:** This qualitative sub-study is from a trial evaluating the effects of progestin contraception on HIV-infected and uninfected women. Women aged 18-45 years were randomly assigned to depot medroxyprogesterone acetate (DMPA) or the levonorgestrel (LNG) implant from May 2014-April 2015 in Lilongwe, Malawi. Women were recruited after randomization to participate in semi-structured interviews about HIV and family planning using purposive sampling. Interviews were recorded, transcribed, coded and thematically analyzed using within and between group comparisons. Participants were categorized into four groups: A) HIV-uninfected women; B) HIV-infected women who received pre- and post-randomization counseling messages about ARV and implant effectiveness; C) HIV-infected women randomized to LNG implant who received only post-randomization messages about ARV and implant effectiveness; and D) HIV-infected women randomized to DMPA who discontinued it. All women received pre- and post-randomization messages about a potential risk for increased HIV acquisition/transmission with progestin contraception. All messages encouraged condom use.

**Results:** We interviewed 30 women (Group A=10, B=10, C=7, D=3). Nine discontinued their assigned contraceptive (Group A=1, B=3, C=2, D=3). Most remembered the messages about the importance of condom use, but few remembered the message about potentially-increased HIV acquisition/transmission risk with progestin contraception. About half of HIV-infected women remembered or were able to explain the message about potentially-increased pregnancy risk with ARV and implant use and the need for condom use. Understanding of risk messages was not related to whether women discontinued their assigned contraceptive; women who discontinued more often reported having experienced abnormal bleeding or husband/friend disapproval. For women who continued their method,

encouragement from husbands, friends, and family were important regardless of HIV status.

**Conclusions:** Most HIV-infected women were able to remember or explain the ARV and implant effectiveness messages, but few women remembered the HIV acquisition/transmission with progestin contraception message. These messages were not reported as reasons to discontinue their assigned method.

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### Assessment of health care workers' implementation of the routine HIV 'opt-out' testing policy in antenatal care clinics in Machinga district, Malawi.

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**Background:** In 2003, as a response to the high rate of mother-to-child-transmission (MTCT) of HIV, the government of Malawi mandated routine HIV testing with an 'opt-out' approach for all pregnant women within the Prevention of Mother to Child Transmission of HIV (PMTCT) services. Opt-out policy assumes that all pregnant and lactating women will be tested for HIV unless they voluntarily opt out of the service. Despite the positive gains resulting from the policy such as increased uptake of HIV testing services among pregnant women, implementation challenges exist within the policy. Previous studies on opt out policy have primarily focused on perceptions and acceptability of the policy among pregnant women with limited attention to health care workers. Realizing that gap, we assessed health care workers' perceptions and implementation of the HIV 'opt-out' testing policy in antenatal care clinics.

**Materials & Methods:** This was a cross-sectional study utilizing qualitative research method that took place in 3 antenatal care (ANC) clinics in Machinga district, Malawi. Data was collected through 12 semi-structured in-depth interviews (IDIs). In addition, 9 non participatory observation sessions were conducted as the health workers were giving pre-test information to the pregnant women, carrying out the HIV test, up to post test counseling. Data was analyzed using thematic analysis approach.

**Results:** 11 out of 12 health care workers were aware of the HIV 'opt-out' testing policy. They know that it is a recommendation that pregnant women be given an opportunity to provide an informed consent as regards to HIV testing. They were also able to outline what needs to be done in case a woman refuses an HIV test (according to guidelines). However, the non-participatory observations showed that pregnant women were not being given the chance to make an informed choice. Health care workers' opinion was that pregnant women should not be given a chance to opt-out of HIV testing considering the benefits to both the woman and her baby. They appealed that government should make HIV testing for pregnant women mandatory.

**Conclusions:** Despite being knowledgeable about the HIV 'opt-out' testing policy for pregnant women, health care workers do not follow it due to factors like: lack of supervision, in adequate HIV testing rooms, perceived benefits of HIV testing, and wanting to reach other targets such as the 90-90-90 target. All in all, health care workers prefer mandatory HIV testing for pregnant women.

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### Maternal characteristics among HIV positive pregnant mothers attending PMTCT services in a Kenya facility

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**Introduction;** Globally, about 330,000 children were infected with HIV in 2011, with over 90% of these infections occurring in sub-Saharan Africa (SSA) and mainly through mother-to-child transmission. There are 2.5 million children infected with HIV in the world with 90% living in low resource settings. In Kenya new child HIV infections have decreased since the introduction of PMTCT but absolute numbers remain high as HIV transmission rates, range from 8 - 27%. The study sought to establish the maternal outcomes among those on ART during the offering of PMTCT services. The clients were recruited using a convenience sampling approach to achieve the cohort sample.

**Study Population;** Mothers on PMTCT services

The women were given informed consent for their data to be included in the clinic database and used for research purposes.

**Data collection;** The pretesting of instruments was done and then revised to ensure validity. In addition the questionnaires was checked daily for completeness and consistency before data entry. Data collection was done by use of structured questionnaires and analysis of the specimen results. Each questionnaire and specimen was labelled and coded for confidentiality.

**Data entry;** Data entry was done using Microsoft access through using unique identifiers in duplicate for validation (double entry) and exported in SPSS version 21. The data will was cleaned, cross-checked for entry errors and range checks. Data storage was done on flash disks and desktops while laboratory reports and questionnaires sheets was kept under lock and key.

**Data Storage;** The data collected was entered into a computer database designed using MS-Access then exported to SPSS. The data was stored in hard drive disks in the computer ready for analysis. All information was coded and password protected whereas filled questionnaires were arranged in folders and properly kept under lock and key.

**Data Analysis;** The descriptive statistics was used to analyze continuous and categorical variables. Pearson's Chi-square test of association between independent and dependent variables such as mother characteristics and ART to establish association.

**Results;** The average age of the respondents was 25.4 years, ranging from 19 to 39 years. Majority (88.5%) of the respondents were married and 42.9% had attained the primary education while 13.6% had tertiary level. Majority of the respondents received ARV prophylaxis and 82% received ART for PMTCT. Using Analysis of variance (ANOVA)  $p = 0.008$  mean CD4 counts increased from 308.1 cells to 436 cells according to the repeated measure. The correlation analysis showed that a higher CD4 count at commencement of ARVs, with a higher most recent CD4 count, whilst a lower CD4 count at commencement of ARVs correlated with a lower CD4 count  $P < 0.01$ .

**Conclusion;** ; There is need for active followup of pregnant mothers during the antenatal period to ensure proper outcomes. Recommendations; Future research is needed to establish reasons for not using/or discontinuation of PMTCT.

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### Women's perspectives on relationship dynamics with their partners and its role in HIV acquisition, contraceptive uptake, and condom use.

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**Background:** Limited information exists about relationship dynamics and its role in HIV acquisition, contraceptive uptake, and condom use among women in Malawi. Therefore, we examined Malawian women's perspectives on their previous and current sexual relationships and their understanding of how relationship dynamics played a role in their HIV acquisition (if HIV-infected) and their contraceptive uptake and condom use.

**Methods:** This qualitative sub-study is from a trial evaluating the effects of progestin contraception on 73 HIV-infected and 24 uninfected women. Women aged 18-45 years were randomly assigned to depot medroxyprogesterone acetate injectable or levonorgestrel implant from May 2014-April 2015 in Lilongwe, Malawi. Women were recruited after randomization to participate in semi-structured interviews about HIV and family planning using purposive sampling. Interviews were thematically analyzed using within and between group comparisons. To explore relationship dynamics, we examined what the women said about their conversations with their partners about disclosure of their contraceptive use and HIV status, relationship fidelity, and the partner's willingness to use condoms.

**Results:** We interviewed 30 women: 20 (67%) HIV-infected women and 10 (33%) uninfected women. Twenty-two (73%) were married (14) or referred to their partner as "husband" (8). Fourteen women (47%) knew their partners were HIV-infected, only one of these women was not HIV-infected. Most HIV-infected women disclosed their status to their partners and most of their partners agreed to get tested only after their disclosure. All women regardless of their HIV status said they had discussed condom use with their partners. Nearly all HIV-uninfected women said their partners agreed to use them. However, most reported they used them inconsistently or only during menses. Similarly, nearly all partners of HIV-infected women agreed to use condoms, but few used them consistently. This may be because most partners of HIV-infected women were also infected. However, some of these partners agreed to use condoms due to concerns about viral load and HIV resistance. Nearly all women believed their current and former partners had outside partners. Some women who experienced increased bleeding while using hormonal contraception thought their partner's infidelity might be due to their disinterest in sex during menses. Women included their partners in contraceptive decision-making as long as their partner was supportive. If the woman suspected her partner might impede her ability to use contraception, she did not disclose its use.

**Conclusions:** Relationship dynamics played an important role in decision-making concerning contraceptive uptake, condom use, and HIV acquisition for women in this study. Women included their partners in their decision-making concerning contraceptive use when possible. Most women disclosed their HIV status and discussed condom use with their partners. Whether power

dynamics based on varying access to economic resources between the women and their partners played a role in these findings needs further exploration. Partner infidelity was a serious concern for the women since most believed their partners were the source of their HIV infection. Despite the strong disposition of these women to protect themselves from pregnancy and HIV, women face continue challenges when it comes to consistent condom use.

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### Prevention of Mother-to-Child Transmission (PMTCT) of HIV at the WENNA HEALTH ASSOCIATION MEDICAL CENTRE, Lomé-TOGO ( WEST AFRICA)

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**Background:** Most HIV infections in children fewer than sixteen years are due to Mother-to- Child Transmission. Due to the presence of the maternal antibodies in Childs until the age of 14-20 months, early diagnosis of HIV, as RT/PCR HIV, will be use among newborns of infected mothers to determine the residual rate of MTCT for an early medical care with ARV.

**Methods:** From February 2013 to April 2016, at WENNA HEALTH ASSOCIATION medical center, we screened 2553 pregnant women aged 18-45 years with a mean age of 28.67± 5.56 and with less than 32 weeks of amenorrhea. The pregnant HIV infected having therapeutic indications have started HAART. While some have received mono- prophylaxis with single dose nevirapine, and the others, from August 2013 received zidovudine during pregnancy and lamivudine+ nevirapine (AZT/3TC+NVP) at the labor. The RT/PCR has been done in the thermocycler 9500 using the kit HIV-1 RNA direct. Electrophoresis was performed in 2% agarose gel in TBE buffer. The fragment were visualized and photographed under UV light.

**Results:** Using information obtained from the clinical and biological records, we found among 2553 pregnant women, 54.7% housewives, 24.5 from informal sector; 7.8% employed; 6.10% pupils and 4.7% students. HIV testing has revealed that 350/2553 (12.50%) women were HIV-1; 7/2553 (0.18) HIV-2 and 0/2553 (0.0%) HIV-1/2. The rate of MTCT of HIV-1 was 5.58% (22/350): either a rate of 9.10% (15/167) for NVP alone; 4.56% (7/112) for "AZT/3TC+NVP"; and 0.00% (0/87) for HAART.

**Conclusion:** Without prevention, the vertical transmission is 30% on average. We recommend the administration of HAART to pregnant HIV-infected. In this regard, the use of RT/PCR as a molecular technique for HIV-1 infection in infants born to HIV positive mothers is necessary and advisable for their immediate access to treatment.

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### 12-month laboratory and adverse events, and viral suppression among women initiating ART through Option B+ in Malawi

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**Background:** Malawi implemented Option B+ in 2011, which provides universal ART with tenofovir/lamivudine/efavirenz (TDF/3TC/EFV) to pregnant and breastfeeding women without routine laboratory monitoring. We report 12-month safety outcomes of pregnant women who initiated ART through Option B+.

**Methods:** 12-month follow up data from an observational cohort study on Option B+ was analyzed among women newly-initiating TDF/3TC/EFV at a government antenatal clinic in Lilongwe, Malawi. Proportions of retention in care, incidence of grade 3-5 adverse events, DAIDS grade 3 or 4 lab toxicity, viral load suppression (<1000 copies/mL), and switches to 2nd line ART are presented.

**Results:** Participants (n=299) had a median age of 26 years (range 17-40), median CD4 count of 352 cells/μL (range 11-1099), and 94% were in WHO Stage 1. Twelve months after ART initiation, most women (88%) were still under active follow up, 1% had died, 2% had transferred care or exited the study, and 9% were lost to follow up. At baseline, 5% of women had Grade 3 hemoglobin values. In the first 12 months, 9% and 3% of women developed DAIDS Grade 3 and 4 lab results respectively. Low hemoglobin (n=17), elevated ALT (n=10), and low neutrophil count (n=5) were the most common events. For adverse events, 14% of women had Grade 3 events, 5% had Grade 4, 7% had fetal losses after 20 weeks gestation or new obstetric or postpartum events, and 2% had new WHO Stage 3 or 4 conditions. HIVRNA was < 1000 copies/ml for most women at 6 months (89%) and 12 months (90%). Five participants (2%) discontinued TDF/3TC/EFV: n=4 switched to second-line ART regimens, and n=1 had ART withheld due to toxicity but later resumed another first-line regimen.

**Conclusion:** At 12 months after initiating ART through Option B+, the majority of women remained on ART and had suppressed viral loads. While DAIDS Grade 3 or 4 lab values occurred in about 10%, ART regimen change due to toxicity was uncommon. Our results do not support routine laboratory monitoring in this population; symptom monitoring is likely reasonable under a public health approach.

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### Inpatient mortality rates during an era of increased access to HIV testing and ART: A prospective observational study in Lilongwe, Malawi.

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**Background:** In the era of increased access to HIV testing and antiretroviral treatment (ART), the impact of HIV and ART status on inpatient mortality in Malawi is unknown.

**Methods:** We prospectively followed adult inpatients at Kamuzu Central Hospital medical wards in Lilongwe, Malawi, between 2011 and 2012, to evaluate causes of mortality, and the impact of HIV and ART status on mortality. We divided the study population into five categories: HIV-negative, new HIV-positive, ART-naïve patients, new ART-initiators, and ART-experienced. We used multivariate binomial regression models to compare risk of death between categories.

**Results:** Among 2911 admitted patients the mean age was 38.5 years, and 50% were women. Eighty-one percent (81%) of patients had a known HIV status at the time of discharge or death. Mortality was 19.4% and varied between 13.9% (HIV-negative patients) and 32.9% (HIV-positive patients on ART  $\leq 1$  year). In multivariable analyses adjusted for age, sex and leading causes of mortality, being new HIV-positive (RR = 1.64 95% CI: 1.16 – 2.32), ART-naïve (RR = 2.28 95% CI: 1.66 – 2.32) or being a new ART-initiator (RR = 2.41 95% CI: 1.85 – 3.14) were associated with elevated risk of mortality compared to HIV-negative patients. ART-experienced patients had comparable mortality (RR = 1.33 95% CI: 0.94 – 1.88) to HIV-negative patients.

**Conclusion:** HIV related mortality remains high among medical inpatients, especially among HIV-positive patients who recently initiated ART or have not started ART yet.

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### Outcomes of targeted HIV Index Client Partner Testing for Clients with Unsuppressed Viral Load (VL $\geq 1000$ c/ml) in Kamwokya Christian Caring Community, Kampala- Uganda

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**Background:** Index Client Partner Testing (ICPT) is an entry point for HIV Testing Services (HTS). In Sub-Saharan Africa, ICPT has had a slow start due to challenges with HIV disclosure, stigma and fear of intimate partner violence. In Uganda, a Viral Load (VL) of  $\geq 1000$  copies/mL is considered “unsuppressed”. It is suppressed if it is  $< 1,000$  copies/mL. Sexual partners of clients with unsuppressed VL have a high risk of HIV acquisition but the yield from partner HIV testing in this subpopulation is unknown since this indicator is not routinely tracked by the HIV program.

**Objective:** To compare the HIV test yield among partners of clients with unsuppressed VL and clients with suppressed VL.

**Materials & Methods:** A descriptive cross-sectional study was done in Kamwokya Christian Caring Community (KCCC) Health Centre II in Kampala. A total of 77 consenting PLHA enrolled in KCCC HIV clinic had their partners tested for HIV between January and November 2017. Verbal consent was given by the index client for partner notification as part of routine counseling support for ART.

**Data Collection:** The MOH Family Tracking tool and a generic ICPT log sheet were used to record sexual partners of index clients whose HIV status was unknown. The index client was offered two options of confidentially reaching their partners i.e. anonymous

home visiting by the health worker for home-based testing or partner invitation to the health facility by the index client. Standard HTS procedures were conducted in line with the MoH HTS policy guidelines. The HIV testing and Viral load registers were used as data sources for partner testing and index client VL results respectively.

**Results:** In total, from Jan-Nov 2017, KCCC conducted HTS on partners of a total of 77 index clients of whom 25 (9 males and 16 females) had unsuppressed VL and 52 (20 males and 32 females) had suppressed VL. Each index client had one partner tested for HIV. The majority of partners (49 i.e. 63.6%) were reached by assisted partner notification with support of the health workers (counselors). The yield was proportionately much higher among partners of clients with unsuppressed VL compared to those with suppressed VL i.e. 80% versus 15.4% respectively, with the overall yield at 36.4%. By gender, females had proportionately higher HIV positivity than males in both partner groups of suppressed and unsuppressed clients. No cases of intimate partner violence were observed.

**Discussion:** Unsuppressed VL leads to increased HIV infectiousness. The sample of 77 clients was considerably small from the overall number of 3,329 actively enrolled clients. Sexual contact tracing is subject to recall bias and social-desirability bias. A case-control study design is preferred and recommended for subsequent studies.

**Conclusions:** Testing the partners of index clients with unsuppressed VL has a comparatively higher yield than among partners of index clients whose viral load is suppressed. ICPT should be prioritized for index clients with unsuppressed VL, towards achievement of the 90-90-90 UNAIDS targets.

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### Using Testing Data to align Strategies for Facility-based HIV Testing towards Meeting UNAIDS 2030 goals in Enugu State, South-East Nigeria

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**Introduction:** The 90-90-90 UNAIDS goals towards ending HIV/AIDS by 2030 starts with ensuring that at least 90% of people living with HIV are identified and linked to treatment services. Targeted HIV Testing Services (HTS) is required to meet the goal of ending HIV scourge by 2030. HIV project implementation shifts that favor facility testing and restrict community outreaches in the South-East Nigeria rely on the health seeking behavior of the populace. Despite concerted effort by Government of Nigeria to ensure universal access to HTS, considerable number of people living with HIV are yet to be identified for treatment. The combination of low HIV prevalence and poor facility-based HIV Testing Services uptake affect effective identification as well as treatment of HIV positive persons in South-East Nigeria. This study reviews pattern of HIV positive yield from testing data in order to align HTS strategies towards meeting the UNAIDS 2030 goal.

**Methodology:** A retrospective review was conducted to identify pattern of HIV positive yield from testing data obtained from 95 health facilities drawn from 5 Local Government Areas in Enugu State, South-East Nigeria, from January 2014 to December, 2015.

Health Facilities (HF) were classified into High Testing-High Yield, High Testing-Low Yield, Low Testing-high Yield and Low Testing-Low Yield based on number of individuals offered HTS and the number of HIV positive Patients identified. The study defined high testing as > 10,000 tests; Low Testing as < 10,000 tests; high yield as >100 HIV positive persons identified and Low yield as <100 HIV positive persons identified in a year. Microsoft excel and SPSS data package were used to analyze data.

**Results:** 162,776 persons were offered HTS during the review period. 1,694 HIV positive persons were identified; out of which 1,650 (97%) were successfully initiated on HIV treatment. 17 HF (17%) were High Testing-High Yield; 15(16%) were High Testing-Low Yield; 13 (14%) were Low Testing-High Yield; and 51 (53%) were Low Testing-Low Yield. First 3 health facility categories identified and linked over 95% of HIV positive persons to treatment. 28 (55%) of the facilities categorized as Low Testing-Low Yield did not identify any HIV positive person during the review period.

**Conclusion:** Optimizing HTS and ensuring successful linkage of identified HIV positive persons to treatment; focusing on High Testing-High Yield; High Testing-Low Yield; Low Testing-High Yield health facilities are sure strategies to meeting the UNAIDS 2030 goals.

#### Recommendations

Health care resources targeted towards meeting the UNAIDS 2030 goals (Human, rapid test kits, funds) should be directed to high testing and high yield facilities. Effort should be made to strengthen HTS at Low Testing-High Yield facilities as these facilities may suggest the presence of a high prevalent surrounding communities.

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### Genetic Diversity and Antiretroviral Drug Résistance among Drug-naïve HIV type 1 Infected Patients attending Clinics in Kinshasa, Democratic République of Congo

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**Background:** The massive use of Antiretroviral (ARV) created the emergence of mutant strains résistance to treatment. Thus, the World Health Organization (WHO) recommends epidemiological monitoring for newly infected patients with HIV. The objective of this study is to determine the genetic diversity of HIV type 1 and the prevalence of mutations associated with resistance to ARV in treatment-naïve patients in Kinshasa.

**Methods:** One hundred fifty-three subjects diagnosed positive for HIV type 1 voluntarily participated in this study. They were recruited from different centers in Kinshasa. The inclusions were conducted from August 2013 to February 2014. Five milliliter (5 ml) of blood were collected in a tube with anticoagulant EDTA. Five hundred microliter (500 ul) of plasma was sent for analysis to the AIDS Reference Laboratory of the University Hospital of Liège, Belgium. RNA was extracted from 140 ul of plasma using the QIAamp RNA Mini Kit (QIAGEN). A Reverse Transcriptase (RT) PCR and a Nested PCR enabled amplification of the regions of interest on the Protease and RT for subsequent sequencing.

**Results:** The mean age of patients was 37 years, ranging from 18 to 65 years. The median values of Viral Loads (VL) and rate of CD4

lymphocytes were respectively 5.68 log<sub>10</sub> RNA copies/ml and 180 celles/ml. Protease and RT were amplified and sequenced, respectively, for 130 (84.9%) and 145 (94.8%) patients out of 153. Subtype A was dominant with 35 cases (22.9%), followed by CRF02\_AG (11.1%), C (9.8%), G (9.8%), K (9.8%), D (7.8%), H (7.8%) and J (5.0%).

**Conclusion:** The results of the study confirm the high diversity of HIV type 1 in Kinshasa. It reveals the heterogeneity and dynamic of the virus, and the presence of transmitted resistance associated with Antiretroviral drugs.

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### Increasing burden of HIV among people over 50 years of age in Uganda, 2011-2016

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**Background:** With increasing uptake of antiretroviral treatment (ART) PLHIV are living longer. Thus the prevalence and burden of HIV in older age groups may be increasing. Aging with HIV has special challenges including the development of HIV-related chronic conditions. It is important to document change in prevalence and burden of HIV to properly allocate public health resources.

**Methods:** We analyzed data from the 2011 Uganda AIDS Indicator Survey (UAIS) and the 2016-17 Uganda population-based HIV impact assessment (UPHIA). Both were nationwide, household-based, cross-sectional surveys. UAIS included people up to 59 years; UPHIA included people up to 64 years. Blood samples in both surveys were tested for HIV; UPHIA tested viral load levels if HIV+. Interview measures included demographics and ART use. We calculated the prevalence of HIV by age group; we used population tables to calculate the total burden in the 50-59 age group, and the percent of adult (age 15-59) HIV cases in the 50-59 age group. We calculated the UNAIDS 909090 goals for those 50-64 in UPHIA.

**Results:** A total of 1877 persons aged 50-59 and 3,454 persons aged 50-64 years participated in UAIS and UPHIA respectively. Compared to 2011, the prevalence of HIV by age group in 2016 was lower in those <40 years and higher in those > 40 years (Figure 1). In 2011, the prevalence of HIV in those 50-59 was 6.6% (95% CI 5.1-8.0) and rose to 9.6% (8.3-11.1) in 2016. In 2011, there was an estimated 71,743 PLHIV aged 50-59 years which increased to 136,040 in 2016; the proportion of adult HIV cases in those 50-59 increased from 6.5% to 11.3%. In 2016, 79.9% (73.4-84.4) PLHIV aged 50-64 years reported that they were HIV+, of which 93.3% (89.6-97.1) reported that they were on ART. Of those on ART, 83.5% (80.5-90.2) had viral load suppression.

**Conclusion:** The number of people aged 50-59 who were HIV+ almost doubled from 2011 to 2016. More efforts are needed to identify patients with HIV in the older age group and ensure viral suppression. As the HIV epidemic matures, public health must increasingly cater to older patients.

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### Acceptance and Safety of Invasive Procedures in a Study among HIV Infected and Uninfected Adults in East Africa

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**Background:** The viral dynamics and immunobiology of HIV across anatomic compartments and phases of infection have become more relevant to understanding and eradication latent virus reservoirs. Interrogation of these biologic sites requires invasive procedures to obtain viable samples for analysis. We describe the acceptability and safety of invasive procedures in the context of a specimen collection and analysis study at three clinical sites in East Africa.

**Methods:** A multi-site specimen collection protocol, known as RV419, is enrolling HIV infected and uninfected adults at clinical sites in Kampala, Uganda, Kericho, Kenya and Mbeya, Tanzania. Participants are recruited from both the general community and high-risk clinics. Eligible individuals interested in enrolling in the study are required to elect, at baseline, one of three invasive procedures: ultrasound-guided inguinal lymph node biopsy, lumbar puncture, or rectal biopsy. We conducted a retrospective review of enrollment, demographic and safety data among all participants screened between 24 June 2017 and 09 January 2018.

**Results:** Across sites, a total of 56 participants were screened and 35 enrolled. Among those enrolled, the median age was 28 and 46% (n=16/35) were HIV infected. Three quarters of participants were female (n=26/35). To date, enrolled participants have consented to 43 invasive procedures (16 lumbar puncture, 16 lymph node biopsy, 9 rectal biopsy). Eight adverse events were reported that were related to the study procedures: 2 related to the lymph node biopsy and 6 related to lumbar puncture. Related adverse were generally mild and limited to incision site pain for the biopsy and headache from the lumbar puncture.

**Conclusions:** The current study evaluating the immunopathology of HIV in different biologic compartments demonstrates that invasive procedures among a small subset of both HIV infected and uninfected individuals living in East Africa is generally well accepted and well tolerated.

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### Feasibility of Enrolling HIV Infected Volunteers into Ebola Vaccine Trials; An Experience at Makerere University Walter Reed Project, Kampala Uganda.

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**Background:** Participation of HIV infected participants in clinical trials testing interventions other than those that are specific to HIV may sometimes seem unfathomable due to clinical concerns including those related to their immunological states. We describe the feasibility of enrolling HIV infected volunteers into experimental Ebola vaccine trials at a clinical trial site in Uganda.

**Methodology:** We retrospectively reviewed site briefing and screening logs for two Ebola vaccine trials that enrolled HIV infected participants from January to December 2017. HIV patients were approached through their HIV care and treatment centers in Kampala metropolitan area and were briefed about the study. Those that expressed interest were invited to the clinic for further information, a review of the consenting process and screening following consenting. Eligible participants were subsequently enrolled, vaccinated and followed up. We employed descriptive statistics to summarize the data.

**Results:** During the review period, 304 HIV infected patients with a median age of 38 years (range 21-59) were briefed. Majority, 74.3 % (n=226/304) were female. Overall, 41.4 % (N=126/304) participants accepted to be screened out of which in a period of two to three months 54% (n=68/126/132) were finally enrolled. There was no observed sex differences in screening and enrollment proportions with a 42% (n=95/226) screening proportion for females compared to 39.7% (n=31/78) for males while the enrolment proportions for females and males were 52.6 % (n=50/95) and 58.1 % (n=18/31) respectively. Reasons for non-enrollment included; ineligibility 27% (n=34), lack of reliable contact details 4 % (n=5), declined participation 4.8 % (n=6) and due to full enrollment 10.3 % (n=13). We observed 100% retention rate after an average duration of six months of follow up for enrolled participants.

**Conclusion:** Our findings demonstrate that it is possible to enroll HIV infected volunteers into Ebola clinical trials and achieve good retention. Female participation in these trials is noticeable and encouraging.

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### Understanding linkage to care or prevention in the context of secondary distribution of HIV self-test kits for men: A descriptive analysis

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**Background:** HIV self-testing (HVST) was strongly recommended by the World Health Organization (WHO) as strategy for increasing uptake of testing. A key problem with HVST is measurement of linkage to carer or prevention. The partner-provided self-testing and linkage (PASTAL) trial investigated linkage among male partners of antenatal care clinic (ANC) attendees in Blantyre, Malawi. Here we compare characteristics of women as well as for men that were associated with linkage in the PASTAL trial.

**Materials & Methods:** We conducted a descriptive analysis to investigate key differences in characteristics of women and men that led to linkage. The PASTAL trial distributed self-test kits



through ANC attendees aiming to reach their male partners. The primary outcome was male partner clinic attendance for HIV care or prevention measured within 28 days woman enrolment. results of PASTAL have previously been presented. Here we focused on baseline data from women reporting on their own and their male partners' characteristics and testing history. We merged the baseline and data for men who achieved the primary outcome. We generated a binary variable to identify men who achieved the primary outcome and those who did not. We tested differences between men who linked and those who did not using t-test for continuous variables and Chi-square for categorical variables.

**Results:** A total of 2349 women were enrolled in the PASTAL trial from 71 ANC days with 676 (28.8%) male partners achieving the primary outcome. Characteristics of women associated with male partner clinic attendance were: age,  $p=0.001$ ; HIV testing in this pregnancy,  $p=0.011$ ; living together with partner,  $p=0.043$ ; education, 0.027; occupation,  $p<0.001$ ; and self-rated general health status,  $p=0.001$ . The mean age of women whose male partners attended the clinic was higher than that of non-attendees, mean 25.3 (standard deviation [SD]: 5.37) years vs 24.7 (SD: 5.41). 94/2233 (4.2%) women reported that they did not have an HIV test during their ANC attendance. 54/1559 (3.5%) of the women whose partners did not attend the clinic reported that they did not have an HIV test during their ANC attendance compared to 40/674 (5.9%) whose male partners attended the clinic. 89/1559 (5.7%) women whose male partners did not attend the clinic said they were not living together with their partner compared to only 24/674 (3.6%) whose partners attended the clinic. Of note, male partner clinic attendance was higher among women who reported being in any form of employment compared to those who did not: 121/674 (18.0%) vs. 135/1559 (8.7%). Men who attended the clinic were older, mean age 30.4 (SD: 6.22) than non-attendees 28.9 (SD: 6.49);  $p=0.001$ . Of the 1674 men who did not attend the clinic, 730 (43.7%) were from Ndirande recruitment site compared to 192/675 (28.4%) among attendees,  $p<0.001$ .

**Conclusions:** Key characteristics of distributors of self-test kits as well as men themselves seem to have played a role in determining who was going to link to care or prevention apart from the interventions offered in PASTAL. Characteristics such as lack of education and employment among distributors should be considered in future studies.

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### Prevalence of herpes simplex virus (HSV) co-morbidity among human immunodeficiency virus (HIV)-positive patients in Northcentral, Nigeria.

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**Background:** Herpes is an infection that is caused by a herpes simplex virus (HSV) and is divided into two types; HSV-1 causes primarily infection above the umbilicus whereas HSV-2 below umbilicus. However, each may cause infections in all areas. Viral co-morbidity in HIV are in the increase<sup>1,2,3</sup>. This study determines the prevalence of herpes simplex virus (HSV) co-morbidity among human immunodeficiency virus (HIV)-positive patients in Northcentral, Nigeria.

**Materials & Methods:** This is a descriptive cross – sectional study which spanned fourteen months. The study was carried out at the venereology unit, department of Medical Microbiology, University of Abuja Teaching Hospital, Gwagwalada, F.C.T., Northcentral Nigeria. A total of 210 consecutive adult comprising of 160 HIV seropositive patients recruited from venereology clinic and 50 HIV seronegative patients recruited from the General Outpatients Department with symptom of STI (papular rash). The detection and quantification of Herpes simplex type 1 (HSV-1) and Herpes simplex type 2 (HSV-2) were determined using enzyme-linked immunosorbent assay (The fortress diagnosticsR, LA, USA). Consent form and Interviewer-administered, structured questionnaires were used as study tool. The data were analyzed using SPSS version 20.0. Chi square at significant level of 0.05 and confidence level of 95% was used to determine significance. The study was approved by the ethical Committee University of Abuja Teaching Hospital, Gwagwalada.

**Results:** The clients for this study were 210 aged between eighteen years and sixty years and none declined to participate in the study. From the 210 subjects, the prevalence of Herpes simplex infection was 11.4% (HIV+ and HIV- was 13.8 and 15.3% respectively). The mean age of the seropositive subjects was  $29 \pm 13.9$  years and the male to female ratio was 1:2, while that of seronegative subjects was  $24 \pm 12.6$  years with ratio 1:1 M:F. There were 52 males (32.5%) and 108 females (67.5%) seropositives and 7 out of the 52 males investigated were positive for HSV, 3.8% of herpes simplex infection was HSV-1 (2 vs 7) while 9.6% represents 5 serum positive to HSV-2. Out of the 108 females investigated, 15(13.9%) were positive with Herpes simplex virus, representing 9.4% of total seropositive population while 12(11.1%) and 3(2.8%) females tested positive for HSV-2 and HSV-1 respectively. Among the seronegative subject studied the 2 (8.0%) positive samples, tested positive for HSV-2 and were all female samples. There was a significant relationship between the virus and gender (OR=12.462, 95% CI= 2.667–49.992,  $P=0.004$ ). The difference between the two serogroups was statistically significant ( $p=0.000$ ). In association with CD4 counts, 22.6% (7 vs 62 ) represent subjects with CD4 counts of less than 200cells/cmm; 46.6% (14 vs 48) represent CD4 counts of 200-500cells/cmm while 2.0%(1 vs 50) with counts greater than 500cells/cmm. The differences observed was statistically significant ( $p=0.0002$ , Pearson Chi-Square= 25.217, df= 1, positive Spearman Correlation= 0.624)

**Conclusion:** Herpes simplex infections are important viral co-morbidity among HIV patients; this was more observed among females. Sexual practice play important role with occurrence of HSV-1 in patients with genital rash.

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### Performance of the national HIV testing algorithm in a population based study in Nigeria: experience from the Akwa Ibom AIDS Indicator Survey (AKAIS)

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**Background:** Monitoring trends in HIV epidemic through surveillance activities is needed to design programs that combat

spread of the disease. Akwa Ibom AIDS Indicator Survey (AKAIS), a USAID funded cross-sectional population-based survey was designed to fill gaps in data describing the HIV epidemic in the state and to guide future HIV control activities. The survey was a collaborative effort between Akwa Ibom state government and USAID implementing partner FHI 360. Here, we describe the performance of the serial testing algorithm used in the AKAIS.

**Materials & Methods:** Rapid HIV-1/2 testing was performed on 14,899 consenting respondents in 4,313 households (HH) by trained laboratory personnel following the national HIV serial testing algorithm (Determine – Unigold – Stat-Pak) using finger prick. Venous blood samples were collected from participants 18 months old and above who tested HIV positive and also from 10% of the same age group who tested HIV negative in the household. Samples were bar-coded and linked to personal identifying information. The negative samples were subjected to re-testing at the satellite laboratories following same serial algorithm while all positive specimens were retested at the central quality control laboratory (CQCL) of University of the Uyo Teaching Hospital, Uyo Akwa Ibom state using Bio-Rad Geenius HIV 1 /2 confirmatory assay. Discordance between the Determine and Unigold/Stat pak kits from the rapid test results were sent to CQCL. A total of 1,836 samples were subjected to laboratory based QC - retesting comprising 394 HH positives and 1442 (one tenth) HH negatives.

**Results:** The overall accuracy of the QA in the laboratory when compared to the house hold results was 97.7% (95% confidence interval (CI) 98.5–99.2). Of the 394 positive samples retested, 385 was confirmed positive while 1,408 came out as negative from the retesting of 1,442 HH negative samples. Thus, among the 419 true HIV positives identified, 34 (8.1%) tested false negatives during HH testing. Among the 1,417 true negatives confirmed in the laboratory QA, 9 (0.6%) were false positives during HH testing. The sensitivity, specificity, positive predictive value and negative predictive value were 91.1% (95% CI 87.5–93.7), 99.9% (95% CI 99.8–100), 99.3% (95% CI 97.4–99.8) and 99.1% (95% CI 98.8–99.4) respectively.

**Conclusions:** This paper demonstrates that HIV rapid testing conducted at the household level, performs well with high level of accuracy in comparison with the retesting done in the laboratory. However, there were few false positives, and the sensitivity was lower than expected with high false negatives. The reduced sensitivity calls for the re-evaluation of the national serial algorithm to avoid misdiagnoses of clients with HIV. A false negative result has implication on transmission of HIV to uninfected individuals. With implementation of test and start, this may cause delay in entry into care and increase HIV morbidity. Laboratory based quality assurance of field results is essential in household or population-based HIV testing to ensure accurate HIV test results

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### Factors Associated with Late Presentation for HIV/AIDS Care in Harare City, Zimbabwe

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**Background:** Despite widespread awareness and publicity concerning Human Immunodeficiency Virus (HIV) care and advances in treatment, many patients still present late in their HIV disease. Preliminary review of the Antiretroviral Therapy (

ART) registers at Wilkins and Beatrice Road Hospitals, both located in Harare, indicated that 67% and 71% of patients enrolled into HIV/AIDS care presented late with baseline CD4 of <200 cells/uL and/or WHO stage 3 and 4 respectively. We therefore sought to explore factors associated with late presentation in Harare City.

**Methods:** We conducted a 1:1 unmatched case control study where a case was an HIV positive individual (>18 years) with a baseline CD4 of <200/uL or who had WHO clinical stage 3 or 4 at first presentation to OI/ART centres in 2014 and; a control was HIV positive individual (>18 years) who had a baseline CD4 of >200/uL or WHO clinical stage 1 or 2 at first presentation between 2013 and 2015. Written informed consent was obtained from all study participants

**Results:** A total of 268 participants were recruited (134 cases and 134 controls). Independent risk factors for late presentation for HIV/AIDS care were illness being reason for test (Adjusted Odds Ratio [aOR] =7.68, 95% CI=4.08, 14.75); Being male (aOR=2.84, 95% CI=1.50, 5.40) and; experienced HIV stigma (aOR=2.99, 95% CI=1.54, 5.79). Independent protective factors were receiving information on HIV (aOR=0.37, 95% CI=0.18, 0.78) and earning more than US\$250 per month (aOR=0.32, 95% CI=0.16, 0.67). Median duration between first reported HIV positive test result and enrolment into pre-ART care was 2 days (Q1=1 day; Q3=30 days) among cases and 30 days (Q1=3 days; Q3=75 days) among controls.

**Conclusion:** Late presentation for HIV/AIDS care in Harare City was a result of factors that relate to the patient's sex, reason for getting a test, receiving HIV related information, experiencing stigma and monthly income. Based on this evidence we recommended targeted interventions to optimize early access to testing and enrolment into care.

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### How different are persons who use health facilities for HIV testing from those who use community services? Implications for targeting services.

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**Background:** Getting persons who are living with HIV to know their status is the first step in the cascade to control the HIV epidemic. As the numbers of persons who do not know their status continues to reduce, it becomes more important to efficiently target efforts at HIV case finding. Studies and programme experience have shown that HIV case finding efforts must include a combination of facility and community-based efforts. It remains unknown who should be targeted in these settings? In this abstract, we present characteristics of persons accessing HIV testing services (HTS) in the facility compared to the community.

**Methods:** Retrospective review of data collected through routine service provision in 14 high HIV burden local government areas in Nigeria. We included 4,333 clients who accessed HTS in the month of December 2016.

**Results:** The average ages of persons tested in the community and facility were 29.5 + 12.9 years and 30.3 + 14.7 years respectively (p-value 0.057). Persons who tested in the community were evenly distributed as males and females. In the

facilities however, 57.6% (1244) of testers were female. Close to six of every 10 persons who tested in the community were single. In the facilities, single and married persons were similar proportions (p-value <0.001). All persons who tested in the community and 82.7% of those in the facility did so in the local government areas where they were resident (p-value <0.001). There were more (33.8%) repeat testers in the community than the facility (15.3%) (p-value <0.001). Risky behavior was higher among persons testing in the community than in the facility; unprotected sex with casual partner in last 3 months preceding the testing (community 13.5%, facility 9.4%), more than one sex partner in the three months preceding testing (community 8.0%, facility 6.7%), p-value <0.001. persons testing in the facility however reported higher TB screening scores, p-value <0.001. HIV positivity rate was higher (18.2%) among those tested at the facility than the community (p-value <0.001).

**Conclusion:** Younger persons exhibiting risky sexual behavior take advantage of the availability of testing in their area of residence. these individuals test often. At the facilities, persons with illnesses such as TB get tested. While expanding access, the low positivity rate in the community makes it imperative to further target testing to make it more efficient.

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### Timing of ART initiation and pregnancy outcomes among women initiating ART through Option B+ in Malawi

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**Background:** In 2011, Malawi adopted Option B+, providing life-long antiretroviral treatment (ART) (TDF/3TC/EFV) to pregnant and breastfeeding women to prevent mother to child transmission (MTCT) of HIV. We examined the association between timing of ART initiation and pregnancy outcomes in women enrolling in Option B+ in Malawi.

**Methods:** Pregnant women initiating TDF/3TC/EFV through Option B+ were recruited from a government antenatal clinic in Lilongwe to be enrolled into an observational cohort from 2015-2016. Singleton births from the index pregnancy during study follow up were included. Participants who initiated ART in the third trimester or with multiple gestation pregnancies were excluded. Women initiating ART in the third trimester are less likely to experience preterm birth since they are further along in pregnancy. Multiple gestations are associated with higher risk of preterm birth. Preterm was defined as live birth with GA 27 to <37 weeks, and extreme preterm was GA <27 weeks. GA was calculated using Ballard scores or estimated from last menstrual period when Ballard scoring was unavailable. Mean time on ART before delivery, proportion virally suppressed (<1000 copies/mL) at delivery, and proportions of pregnancies that delivered preterm, resulted in fetal death, or had spontaneous vaginal delivery (SVD) are presented. Association between ART initiation in the first or second trimester and preterm birth, fetal death, SVD, and maternal viral suppression at delivery was analyzed using generalized linear models with Poisson distribution and robust standard errors to estimate the risk ratio (RR), adjusting for maternal age.

**Results:** Of enrolled participants (n=299), 19 (6%) were lost before giving birth. There were 280 index pregnancies, 259 of which were included in analyses--3 multiple gestations and 24 who initiated ART in the third trimester were excluded. Participants had mean age of 26 years, median 2 previous pregnancies, 17% (n=45) initiated ART in the first trimester, and 83% (n=214) initiated in the second trimester. Live birth was observed in 97% (n=251) of pregnancies, 2% (n=6) were stillborn deliveries, and <1% (n=2) of pregnancies ended in spontaneous abortion. HIV viral suppression was high, with 84% (n=209) suppressed at childbirth. Most deliveries were SVD (84%, n=210), 11% (n=27) of infants were preterm, and 4% (n=9) were extreme preterm. Mean duration of ART was 113 days. Adjusted regression models did not show an association between later ART initiation and live birth (RRa 0.96, 95% CI: 0.91, 1.01), preterm birth (RRa 0.63, 95% CI: 0.13, 3.05), or viral suppression at delivery (RRa 1.24, 95% CI: 0.88, 1.75). Initiating ART in the second trimester was associated with lower risk of SVD (RRa 0.78, 95% CI: 0.69, 0.89), adjusting for maternal age.

**Conclusions:** In this cohort of pregnant women newly initiating TDF/3TC/EFV through Option B+ in Malawi, there was no association between early ART initiation and live births, preterm birth, or viral load suppression at delivery. Women starting ART in the first trimester were more likely to have SVD. These results suggest that early initiation of ART in the first trimester is not associated with adverse pregnancy outcomes.

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### Effects of scarce commodities in post HIV prevention efforts among key populations in Nigeria

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**Background:** Despite the harsh policies of the Nigerian government on same sex activities, and the unaccepted conditions which sex workers operate, majority of the new HIV infections are from these key populations. Denying them access to prevention commodities will contribute to the increase in the monstrous spread of HIV in Nigeria. In 2012, Nigeria attained mixed epidemic status with the average state HIV prevalence among the general population at 3.4percent but was over 15percent in certain geographic areas in addition, there is evidence of a high HIV prevalence among key populations at greater risk of HIV, particularly among FSWs (up to 46percent in certain locations) and MSM (up to 37percent). This made condom programming with lubricants imperative for all prevention interventions.

**Methods:** Prevention of new infection project among 300 sex workers and 92 men who have sex with men was carried out across 3 local government areas with high social activities in Ondo State of Nigeria with the support of the State Agency for the Control of AIDS (ODSACA). This project enjoyed regular supply of prevention commodities including condoms and regular supply of lubricants from the beginning of the project to the end. Shortly after the project ended, there was stock-out of the prevention commodities for the target population. Demand for condoms and lubricants was very high especially among sex workers from the 3 areas of intervention. This was due to poor forecasting and quantification of the needed commodities.

**Results:** Behaviour maintenance activities stopped and in 6 months after the project, HIV test was randomly conducted among 30 sex workers and 10 MSM who were non-reactive during the project implementation. 3 sex workers (10%) and 7 of the 10 MSM (70%) tested reactive to HIV. The findings showed that more sex workers imbibed the 'No Condom No Sex' principles which was hammered during the project. Pictures of different types of STIs were equally part of what they had access to during the project. Gains won during project implementation has been lost to inadequate planning and forecasting.

**Conclusion:** The devastating effect of poor supply chain mechanism can be managed to save lives. Programming for sex workers and particularly MSM, programmers should factor behaviour maintenance activities that will be in place even when the project cycle has ended. Government at all levels should complement implementer's efforts by putting in place prevention commodities that can be used to sustain interventions most importantly among MSM and other Key populations like sex workers. These will help contribute towards the reduction of the impact of unprotected sexual activities and halt the monstrous spread of HIV infections among key populations.

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### Sexual Behaviour and Experiences of Sexually Transmitted Infections among Men who have Sex with Men in Ibadan, Nigeria

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**Background:** Many STIs disproportionately affect MSM, particularly those living with HIV. Transmission within these populations is facilitated by relatively small sexual networks, in which STI and HIV infections can reinforce each other (that is, STIs increase the risk of HIV transmission and HIV increases the risk of STI transmission). This is not only conducive to the quick spread of HIV and other STIs, but also the development of drug-resistant and potentially more harmful forms of these infections. This study therefore designed to explore the sexual behaviour and experiences of STIs among MSM in Ibadan, Nigeria

**Methods:** This is a cross-sectional study. Snowball sampling technique was used to select 52 MSMs in Ibadan. Respondents were interviewed using a pre-tested semi-structured questionnaire to collect information on respondents' socio-demographic characteristics, sexual behaviour and experiences of STIs. The data were analysed using descriptive statistics and Chi-square test.

**Results:** Respondents mean age was 25.4 ± 6.2 years, 87.4% were single and 89.7% had a tertiary education. Respondents mean age at sexual initiation was 19.6 ± 5.6 years with first sexual partner being boyfriend (10.2%), girlfriend (56.4%) and sex worker (3.3%). Majority (86.4%) of the respondents currently had at least two male sexual partners and 12.9% also have female partners. Many (67.8%) of the respondents did not like using condom and only 23.7% used condom during the last sexual intercourse with their male partners. Some (34.8%) of the respondents reported doing nothing to protect themselves from STIs. Majority (87.6%) of the respondents did not consider themselves at risk of STIs including HIV and only 45.9% were of the believed that they did not currently have an STI. Some (23.7%) of the respondents had ever been told by health worker to have an STI. Few (12.6%) of the respondents had experienced

pus-like discharges from penis and an itch in the penile region (15.4%) in the last 12 months.

**Discussion:** Many of the respondents did not perceived themselves being susceptible to sexually transmitted infection including HIV despite their risky sexual behaviour. Behavioural change intervention programme should be put in place for respondents to develop accurate means of assessing their personal vulnerability and self-appraisal of HIV-related risk by non-governmental agencies.

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### Virological outcomes among young adults at the infectious diseases institute (IDI) Kampala, Uganda

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**Background:** In Uganda routine viral load (VL) monitoring was introduced in 2015. To achieve the 90-90-90 target set by UNAIDS, it is paramount that HIV-positive young adults (YAs) (18-25 years) are targeted since they are less likely than older adults to be adherent and virally suppressed. For this study we assess treatment outcomes among YAs compared with those of older adults (>25years) at the Infectious Diseases Institute (IDI) a large urban HIV Center in Uganda.

**Methods:** As per internal guidelines, viral load results >75 copies/ml are flagged by the Quality assurance department and reviewed by a clinician. We included all patients on ART for >6 months between 01st January 2015 (when routine viral load (VL) monitoring was introduced in Uganda and at IDI) and 31st December 2016. We extracted data on demographic, clinical and VL testing results. Viral failure was defined as most recent VL>75 copies/ml with in at least 6 months from ART start. Factors associated with viral failure were explored using multivariate logistic regression.

**Results:** Overall 7,435 patients were on ART for >6 month; 318 (4.3%) were YAs, the median age was 24 years (IQR:22-25) among the YAs and 43 years (IQR:37-49) among adults. The median time on ART for YAs was 39.6 months (IQR: 24.6-56.7) and 73.5 months (IQR: 43.9-124.6, p<0.001) for adults. There was a higher proportion of viral failure in YAs compared to adults (79 (24.4%) of 318 vs. 831 (11.7%) of 7,117, p<0.001). The overall proportion of virological failure was 12.2%.

Factors associated with virological failure included: being YAs (odds ratio [OR] :2.84; 95% CI: 2.09- 3.86, p<0.0001), being on second line compared to first line (OR: 5.64 CI: 4.80-6.63,p<0.0001) or third line regimen compared to first line (OR:2.75 CI:1.06-7.13,p<0.0001),having last CD4 count below 500 cc/ml compared to above 500 cc/ml (OR: 2.93 CI: 2.47-3.46,p<0.0001) and being on ART for less than one year compared to two years (OR:0.64 CI:0.37-1.12) or more (OR:0.40 CI:0.25 - 0.66 , p<0.001)

**Conclusion:** We found high rates of virological failure, among YAs compared to adults. Quality health care strategies need to be put in place targeting especially YAs on order to achieve the UNAIDS 90 90 90 target.

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### The enhanced peer outreach approach: an innovation to increase key population reach and hiv case-finding in Swaziland

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**Background:** To achieve the 90-90-90 targets, new ideas are needed to reach and increase HIV case-finding, among key populations (KPs). We present our experience with the enhanced peer outreach approach (EPOA) among KPs within the USAID- and PEPFAR-funded, FHI 360-led LINKAGES/Swaziland project.

**Methods:** We used the EPOA end user incentive-based peer network approach to increase KP reach and case-finding in all four regions of Swaziland in a series of campaign activities from August to October 2017. The EPOA uses outreach campaigns to reach hard-to-reach KPs. Outreach mobile clinics were used to deliver HIV services to 240 hot spots. Fifty-six program outreach workers (ORWs) were recruited, trained for 1.5 days, and introduced to referral slips using paper and virtual cards to share with KP peer networks. This EPOA campaign focused on providing health services to KP including HIV testing. Performance-based incentives were provided for ORWs: the highest tier incentive was US\$16.17 for ORWs who referred more than 150 peers to mobile clinics. Peers who completed referrals and accessed mobile services received a coffee mug as a token of appreciation. Qualitative data were obtained using program tools. The Swaziland Ethics Committee determined that no ethical approval was required.

**Results:** A total of 4,766 FSWs and 953 MSM were reached with HIV services during the two months of implementing the EPOA, compared to a total of 2,686 FSWs and 603 MSM reached over eight months prior to the EPOA. Fifty-nine percent of those that tested (1,157 FSWs and 444 MSM) tested for HIV during the EPOA representing an increase in case-finding from 9.4% to 11.3% for FSWs, and from 6% to 9.3% for MSM, and 45% were enrolled in care and initiated on ART.

**Conclusion:** Implementing the EPOA within the context of Swaziland resulted in increased reach and HIV case-finding among KPs. Effort should be made to scale up this approach and to integrate the lessons learned into routine programming.

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### Experience of Recruiting and Retaining Most at Risk populations from a Fishing community and an urban slum community in the Early Capture HIV Cohort Study in Kampala District, Uganda.

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**Background:** Fisher folk and urban slums are recognized as key drivers of the HIV epidemic in Uganda and a target for research aiming at recruiting Most at Risk populations (MARPs) for HIV. We share experience in recruiting and retaining MARPs from Lake Victoria landing site and an urban slum in Kampala into the Early Capture Observation Study (ECHO). The objective of ECHO is to identify HIV-1 prevalence, incidence, cohort retention, and host genetics & viral diversity in East Africa and Thailand.

**Methodology:** Recruitment records for the ECHO study were reviewed from April 2016 to December 2017 to identify how recruitment method contributed to study enrollment. Three strategies were employed; Peer Led method (PLM), Moonlight (ML) and Snowballing (SB), to identify potential participants following community consultations. Audio Computer-Assisted Self-Interviews (ACASI) with a risk eligibility criteria were administered to consenting participants to identify MARPs before enrolment into ECHO. Retention of study participants was achieved through obtaining detailed contact/ locator information with regular updates in case of changes, availing visit schedules, phone reminders, working with participant's peer(s)/confidants for appointment reminder or knowing participant whereabouts and utilization of study visit windows periods.

**Results:** For the review period, 341 participants were screened and 83.6% (n=285) met the criteria for MARPs. Only 16.4% (n=56) failed the risk eligibility criteria in ACASI. Of the 285 MARPs, 85.3% (n=243) were enrolled while the rest screened out (n=42) due to; HIV infection (n=12), lost interest in study (n=5), relocated out of area (n=11), out of window (n=13) and death (n=1). Majority of enrolled participants were recruited through the ML approach 49% (n=120), followed by SB 28% (n=68) and the PLM, 22.6% (n=55). Compared to PLM (32.9%) and SB (18.6%), only 3% of those that failed ACASI risk eligibility criteria were recruited through ML. PLM was observed to have "coached" participants by peers while ML raised fears of being arrested among sections of MARPs. Overall retention rate was 81.1% (n=197) with rates of 85.5%, 84.2% and 72.1% for PLM, ML and SB respectively.

**Conclusion:** Recruiting and retaining of MARPs in our setting is possible with the moonlight approach being the most successful recruitment strategy.

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### Examining determinants of consistent condom use among female sex workers in Rwanda to guide program implementation.

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**Background:** A recent published study found that 51% of Female Sex Workers (FSW) in Rwanda were living with HIV. Given the high burden of HIV, consistent condom use with clients remains a primary HIV prevention modality especially in the context of no access to pre-exposure prophylaxis (PrEP). Thus, this study

examined the level of CCU among and the determinants of CCU among FSW in Rwanda.

**Methods:** We used data from the same recently published study on HIV prevalence among FSW. This was a cross sectional study of FSW aged 15 and above using time-location sampling was conducted in February 2010 in Rwanda. Structured face-to-face interviews was used to collect information and HIV testing was done. A multivariable logistic regression was used to analyze the determinants of CCU.

**Results:** The study enrolled 1338 FSWs. CCU with clients in the 30 days preceding the survey was 33.6% (448/1332) [95%CI:31–36.2]. Refusal from the client 41% (108/263) and not having a condom readily available at the time of sex 19.3%(51/263) were the commonest reasons for non-condom use. Of them, 45%(564/1255) reported to have ever experienced condom breakage during sex and 92.3%(1170/1297) had never used a lubricant during sex.

In the multivariable analysis, province: southern province OR=1.7[95%CI:1.1–2.4] and higher income - second quartile OR=1.4[95%CI:1.0–1.8], Third quartile OR=1.4[95% CI:1.0–2.0] and highest quartile OR=1.6[95%CI:1.1–2.2] were positively associated with CCU. Difficult access to condom i.e more than 10 min to walk to a condom outlet OR= 0.5[95%CI:0.4–0.8]; drug use OR= 0.5[95%CI:0.4–0.8] and STI infection OR= 0.7[95%CI:0.5–0.9] were negatively associated with CCU. HIV infection OR= 1.3[95%CI:0.9–1.7] and age were not significantly associated.

**Conclusion:** CCU remains limited among FSW in Rwanda reinforcing the need for programs to not only distribute condoms, but also consider determinants of use. The data presented can inform implementation of condom programs including distribution and specific attention to FSW with challenges in accessing condom use. Given the high prevalence of HIV and the lack of relationship between CCU and HIV, it highlights significant risks of onward HIV transmission reinforcing the need for community ownership and empowerment programs but also consideration of PrEP where condom use remains low.

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### Evaluating the Mother-to-child transmission of HIV risks among south African Female Sex Workers; have we forgotten PMTCT in their HIV programming?

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**Introduction:** Female sex workers (FSW) have a greater HIV burden compared to other reproductive-aged women and experience high incidence of pregnancies. However, there are limited data on mother-to-child transmission of HIV in the context of sex work. This study assessed the uptake of prevention of mother-to-child transmission (PMTCT) services in order to understand the vertical HIV transmission risks among FSW in South Africa.

**Methods:** FSW ≥18 years were recruited into a cross-sectional study using respondent-driven sampling (RDS) between October 2014–April 2015 in Port Elizabeth, South Africa. An interviewer-administered questionnaire captured information on demographics, reproductive health histories, and HIV care, including engagement in PMTCT care and ART. HIV and pregnancy testing were biologically assessed. This analysis characterizes FSW engagement in HIV prevention and treatment cascades of the four prongs of PMTCT.

**Results:** Overall, 410 FSW were enrolled. The RDS-weighted HIV prevalence was 61.5% (95% bootstrapped confidence interval 54.1–68.0). A comprehensive assessment of the four PMTCT prongs showed gaps in cascades for each of the prongs. In Prongs 1 and 2, gaps of 42% in consistent condom use with clients among HIV-negative FSW and 43% in long-term high efficacy contraceptive method use among HIV-positive FSW were observed. The analyses for prongs three and four pertained to 192 women with children <5 years; 101/192 knew their HIV diagnosis prior to the study, of which 85% (86/101) had their children tested for HIV after birth, but only 36% (31/86) of those who breastfed retested their children post-breastfeeding. A substantial proportion (35%, 42/120) of all HIV-positive women with children <5 years of age were HIV-negative at their last delivery and seroconverted after delivery. Less than half (45%) of mothers with children <5 years (45/101) were on ART and 12% (12/101) reported at least one child under five living with HIV.

**Conclusion:** These findings show significant gaps in engagement in the PMTCT cascades for FSW, evidenced by sub-optimal uptake of HIV prevention and treatment in the peri/post-natal periods and insufficient prevention of unintended pregnancies among FSW living with HIV. These gaps result in elevated risks for vertical transmission among FSW and the need for PMTCT services within FSW programs.

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### Human Immunodeficiency Virus, Syphilis and Hepatitis B Virus Infections in the Fishing Communities of Koome and Buvuma Islands in Uganda in the Era of Universal Antiretroviral Therapy

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**Background:** Documented unique features of fishing communities heightens their risk of sexually transmitted infections. In the first phase of the RV432 study, we conducted a sero-behavioral survey to determine the prevalence and associated factors of HIV, syphilis and HBV infections in the fishing communities of Koome and Buvuma Islands of Lake Victoria, in Uganda.

**Material and Methods:** We randomly selected 56 enumeration areas on each island, followed by a random selection of 28 households in each enumeration area. Consenting household heads and adult members of each household completed household and individual behavioral questionnaires respectively and submitted to onsite HIV, syphilis and HBV testing based on

national testing algorithms. Descriptive, and Chi square tests were done using STATA version 15.0.

**Results:** Between April and December 2017, 3245 participants were interviewed (Koome, n=1897; Buvuma, n= 1348). The median age was 31 (IQR=25-40) years, 49.1% (n=1593) were males and 73.3% (n=2380) married. HIV infection was identified in 15.8% (n=511) of participants, 10% on Buvuma and 19.8% on Koome. HIV prevalence was high among fish related occupations, 41.5% (n=27), bar workers, 33.9% (n=21), hair dressers, 29.1% (n=8), while fishermen had a relatively lower prevalence at 15.6% (n=110). In general, 49.8% (n=1615) reported knowing their HIV status, more among HIV infected (65%) and on Koome (69.2%) compared to 53.3% on Buvuma. Consistent condom use was low at 10.8% (n=304) with significant differences in use between Koome 12.9% and Buvuma 8% (p=0.0001). Overall 20.7% of participants exchanged money or gifts for sex at the last sexual intercourse. Prevalence of Syphilis was 11.8% (n=376), higher in Koome (13.6%) compared to Buvuma (9.2%) while HBV prevalence was 4.2% (n=136) with no difference between the islands. Co-infection with HIV was 26.6% if one had syphilis and 19.1% if one had HBV.

**Conclusions:** Despite both being fishing communities in the same geographical area, Koome carries a significantly higher HIV burden but also better awareness of the infection than Buvuma. Higher than national average of HIV and syphilis prevalence in the fishing communities of Koome and Buvuma calls for intensified HIV/STI prevention efforts, to achieve the first UNAIDS 90 target in these communities.

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### HIV Programming for Female Sex Workers in Rwanda - Overview and Strategies for Success

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**Background:** Rwanda has made significant progress in controlling its HIV epidemic. However, female sex workers (FSW) continue to be a high-risk key population that requires targeted prevention services and linkage to treatment in order to reduce ongoing transmission. FSW have poor health-seeking behaviour and experience barriers to care due to stigma and cost. We implemented free, FSW-friendly HIV prevention and care programming in government clinics for FSW in order to build national capacity for FSW-appropriate services, to increase healthcare access and utilization among FSW, and to reduce HIV transmission.

**Methods:** Since November 2015, PSF has implemented a comprehensive package of HIV services for FSW. FSW are primarily recruited using a snowball approach. In select districts, community health workers formerly involved in sex work also assist with recruitment. FSW are offered HIV testing every 6 months, with viral load testing and linkage to care for those identified as positive, along with syphilis testing and treatment, syndromic STI screening and treatment, family planning

methods, and condom distribution at each visit. PSF trains collaborating government clinics across Rwanda on stigma reduction, data collection, and national guidelines for HIV and STI management before initiating service provision.

**Results:** From November 2015 to December 2017, we enrolled 11,050 FSW at 22 Kigali clinics and 25 rural clinics. Of those who have been enrolled for over 6 months, 79% have been received for follow-up. Recruitment of FSW required an adaptable approach as different districts presented different barriers to and opportunities for recruitment: our recruitment strategy varied across districts based on the geography of local hotspots and information from local key informants. Recruitment in each district utilized a blend of community health worker promotion, snowball recruitment, hotspot visits, and leveraging pre-existing relationships between clinics and local FSW. High retention of enrolled FSW was facilitated through provision of multiple services in addition to HIV testing: FSW continue to benefit from enrolment even after receiving baseline testing.

**Conclusion:** This program demonstrates that with adaptable recruitment strategies and provision of a comprehensive service package, FSW in Rwanda can be successfully engaged in effective HIV prevention programming. Enrolment and retention of FSW in our program supports progress towards the UNAIDS 90-90-90 targets by increasing awareness of HIV status and by facilitating linkage to HIV treatment among the highest-risk populations.

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### Geographical differences in HIV prevalence among female sex workers in Rwanda

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**Background:** According to a 2010 Behavioral Surveillance Survey conducted in Rwanda, the HIV prevalence among female sex workers (FSW) is 51%, compared to the 2.9% estimated HIV prevalence among adults 15-49 years. Due to the high prevalence of HIV among FSW and the nature of their work, it is estimated that transactional sex contributes to 20% of the HIV incidence rate in Rwanda. We are reporting on the geographic variation of HIV prevalence and linkage to care and treatment services among FSW in Rwanda.

**Methods:** Since November 2015, Projet San Francisco in partnership with the government of Rwanda has been implementing an HIV treatment and prevention program that targets FSW in Rwanda. FSW are recruited from known hotspots, and invited to go to their closest government health center for HIV testing, STI screening and treatment, and family planning services. FSW identified as HIV positive are linked to care and treatment services. In 2017, the program was expanded from Kigali and the Western Province (22 health centers, 5 districts) to the Northern, Southern, and Eastern Provinces (47 health centers, 12 provinces).

**Results:** Between November 2015 and January 2018, 11,684 FSW were identified and enrolled in the PSF program in Rwanda. The average age of women enrolled is 31.1 (SE + 0.07) years and the average number of sexual partners within the past 7 days is 5.3 (SE + 0.05). Through program activities 3,933 of FSW enrolled have been found to be HIV positive (34%) and of those 3,653

(93%) have been linked to treatment. The HIV prevalence among FSW in the different provinces ranges from 22-38%. The highest prevalence of 38% is in Kigali (2,272 of 5,999) and the Northern Province (219 of 575) and the lowest prevalence is in the Southern Province at 22% (485 of 2,202). The Eastern Province has a prevalence of 36% (74 of 204) and the Western Province 33% (883 of 2,704). Linkage of HIV positive FSW to care and treatment services is high across all provinces, ranging from 91-95%.

**Conclusions:** These data show that while FSW have uniformly high HIV prevalence, there is a statistically significant difference between the geographic areas with the highest and lowest prevalence in Rwanda. The Southern province has an unexpectedly low prevalence rate. Further studies are needed in order to explain this difference. Despite the geographic variation in HIV prevalence among FSW, the linkage to care and treatment services for FSW who are HIV positive are consistently in line with UNAIDS 90-90-90 goals.

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### Enhancing Psychosocial and ART support among children living with HIV at Baylor College of Medicine Children's Foundation Malawi (BCM-CFM) Clinic through HIV disclosure

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**Background:** Disclosure is the process of sharing information about a person HIV status with others. As adolescents living with HIV (ALHIV) gain independence over their self-care and begin to engage in sexual relationships, their experiences of being informed about their HIV status and of telling others about their HIV status may affect their ability to cope with having the disease. As one way of enhancing self-care and adherence to ART among ALHIV, BCM-CFM realised the need for a formal disclosure process.

**Method:** Disclosure is Process not an event and is done by psychosocial workers, peer supporters and social workers using little soldier books. There are two types of disclosure, partial and full disclosure. Partial disclosure is appropriate for the younger children between 6 to 9 years where information about their condition is given without using the words HIV or AIDS and is an effective strategy to help caregiver who do not feel ready for full disclosure. Full disclosure usually happens by the time a client is 10 years or above, this is when a young adolescent is told that he or she is HIV positive and given further HIV related details.

**Results:** From January 2016 to December 2017, teens were 1772 (834F 938M) fully disclosed at BCM-CFM and teens were 940 (420M 520F) partially disclosed within the same period. This has increased the number of teen club enrolment at BCM-CFM with as 90% only fully disclosed teens are eligible for teen club enrolment hence majority of the teens have access to comprehensive psychosocial service offered during teen clubs.

**Conclusion:** Disclosure also reduces level of anxiety, depression, and low self-esteem in adolescents hence this promotes adherence to ART and it is greatly powerful as it assist adolescent to improve access to treatment, care and positive living

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### Part-time Continued Education: embracing a second chance for Adolescent Girls and Young Women (AGYW) in Mutare District, Manicaland Province, Zimbabwe

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**Issues:** AGYW aged 15 to 24 years engage in high risk sexual behaviours because of low socioeconomic status, exposing themselves to disproportionately high HIV incidence rates. In sub Saharan Africa, adolescent girls account for 74% of new HIV infections. Based on the research findings that education contributes significantly to improving lives of AGYW and their families, those educated are likely to make informed choices on safer sexual practices, family planning and healthy lives. Family AIDS Caring Trust (FACT) through the PEPFAR funded DREAMS Initiative has chosen to use part-time continuing education (PTCE) to address these risk factors and vulnerabilities of AGYW in Mutare.

**Description/Method:** Sixteen (community childcare workers, guidance and counselling teachers, village health workers and early childhood stimulation facilitators) in Mutare were trained on HIV sensitive case management, adolescent girls empowerment program, stigma and discrimination, and on PTCE program. Twenty AGYW were enrolled for PTCE in July 2017. Recruitment targeted AGYW sex workers, Apostolic girls, adolescent mothers, girls living with HIV, in early marriages, single/double orphaned and those from ultra-poor families. Legibility assessment for placement was conducted by the above cadres and 95% were enrolled in Form 3 and 5% in Form 5. AGYW were assigned classes to assist them achieve expected competencies in recommended academic subjects. Teachers were to teach AGYW in selected subjects. Case files were opened for each AGYW. Assessment was then done to analyse if PTCE improved the lives of AGYW from July 2017 to February 2018. PTCE is through remedial education.

**Results:** Median age of AGYW was 20 years. AGYW appreciated the second chance and schooling them became a strategy to keep them away from HIV risk environment. PTCE now acts as a platform for psychosocial support and guidance and counselling for the girls. School has become a safe space for AGYW to meet and interact with each other and sharing experiences for motivation. AGYW receive SRH and family planning education. Those with kids benefitted from parenting, nutritional and childhood stimulation input. Loss of concentration was observed among the mothers fearing for the welfare of their children left with friends during lessons. In 2018 all children have since been enrolled for ECS, feeding, care and support to facilitate school concentration by the young mothers.

Great professional ambitions were set by AGYW as they saw the purpose in their lives now and in the future. 30% of AGYW and 5 children who were not HIV tested received the testing and the majority disclosed their HIV results. AGYW were trained on reusable sanitary ware production that contributed to uninterrupted studies. AGYW also received economic strengthening training for income generation. Sex workers have since started buying and selling of goods for income.

**Conclusion:** Beyond lack of education, PTCE was an effective strategy for addressing other HIV risks facing AGYW. It also reduced stigma and discrimination, and resultant marginalisation, which AGYW often face due to their lowly-perceived status and conditions. The trained community cadres



supported the AGYW by timeously responding to their needs and helping them overcome stigma.

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### **“I feel brave and positive”: Feasibility and acceptability of financial incentives for improving retention in care and adherence to anti-retroviral therapy amongst adolescents living with HIV in Rwanda**

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**Background:** Although antiretroviral therapy (ART) has shown to be critical in the treatment of HIV by suppressing HIV viral load and sustaining immune function, its adherence has been poorest in adolescents, especially in Sub-Saharan Africa. Financial incentive-based programs have shown early promise in motivating healthy behaviors, however concerns around acceptability remain. This study evaluated the feasibility and acceptability of a multipronged intervention ART adherence and care retention amongst HIV+ adolescents in Rwanda, to adapt the model for scale-up and policy uptake.

**Description:** Study participants were 72 adolescents (35 female, 37 male, aged 12-19), recruited through random stratified sampling from an urban (n=50) and a rural (n=22) clinic in Rwanda. Inclusion criteria were adolescents aware of their HIV-positive status, enrolled in care at one site for >1 year, and prescribed ART for >1 year. The intervention, called YBank, consisted of: a) short-term and long-term financial incentives for clinic attendance and suppressed viral load; b) monthly life-skills training for financial literacy; and c) peer support from older HIV+ youth. Data collection included: a) baseline and endline survey data on demographic characteristics, clinic attendance, and viral load; b) historical clinical data; and c) semi-structured interviews (30 adolescents, 20 caregivers, and 4 healthcare workers).

**Lessons learned:** All interviewees found the intervention highly acceptable, and reported emotional benefits associated with the incentive. Key themes expressed by adolescents were feeling rewarded and enhanced future planning. Few caregivers expressed concerns about adolescents accessing mobile money accounts independently. Overall, savings increased and we observed no increase in risky spending behaviors. Although there was no statistically significant reduction in viral load, early results indicate that the intervention may have greater impact on historically vulnerable groups including very young and out of school youth.

**Conclusions:** /Next steps: Financial incentives, combined with a supportive environment and adequate skills-training, shows promise in motivating health behavior change in adolescents. The intervention was deemed acceptable to adolescents and caregivers, however its feasibility was limited by operational challenges, like access to mobile money accounts. The study indicated a need for mixed-methods in designing youth-targeted financial services, and evaluating their efficacy over time using large multi-site RCTs.

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### **Adolescent initiation of anti-retroviral treatment before and after Introduction of Universal Test and Treat in South Africa: When do adolescents initiate and why?**

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**Background:** Between January 2015 and August 2016, South Africa's National Department of Health (NDOH) guidance was to offer ART to HIV-infected pregnant women and all patients with CD4 counts <500. UTT was introduced on 1 September 2016, making ART available to all HIV-infected persons regardless of CD4 count, and same-day initiation (SDI) advocating ART initiation on the day of HIV diagnosis, came into effect on 1 September 2017. We describe patterns of ART initiation among HIV-infected adolescents, aged 10-24 years, attending an adolescent-only public clinic – the Ward 21 Adolescent Clinic in Johannesburg, South Africa.

**Methods:** We used a mixed methods approach to determine rates of ART initiation, time between HIV diagnosis and initiation, changes in CD4 count at ART initiation, loss to initiation, reasons for non-initiation and loss to follow-up (LTFU) in the periods following introduction of UTT and SDI. Data was extracted from the NDOH's TIER.net ART database for all patients attending Ward 21, testing HIV positive between January 2015 and 31 January 2018. Patients' HIV diagnosis dates were categorised as either pre-UTT, post-UTT or post-SDI. Loss to follow-up (LTFU) was defined as not attending the clinic at least three months after a missed visit, and being un-reachable on three attempts to contact them. Information about patients' reasons for non-initiation were collected by facility based staff. Data were analysed using STATA v.13.

**Results:** During the study period 358 non-pregnant patients tested HIV-positive and had their diagnosis date recorded in TIER.net. Of these patients: 80% were female; 14% were aged 10-14 years, 40% were 15-19, and 46% were 20-24. Two-thirds (236/358) initiated ART during the study period and nearly one-third (115/358) never initiated ART at Ward 21. Among those initiating ART: 38% were diagnosed pre-UTT, 50% post-UTT, and 12% post-SDI. Among 189 ART-initiated patients for whom additional visit attendance data was available, 70% were active on ART 6 months post-initiation, this was consistent across the three time periods. Of the ART-uninitiated (n=115), 28 transferred to another clinic and 87 were LTFU. Pre-UTT, 38% of patients initiated one month or less after HIV diagnosis, post-UTT this rose to 44%, and post-SDI to 81%. During the pre-UTT and post-UTT periods about one-third of patients never initiated treatment, post-SDI this reduced to 17%. Median pre-ART CD4 count was 341 pre-UTT, 437 post-UTT, 438 post-SDI, and 398 for those who never initiated ART. Qualitative data from health care workers described emotional readiness and lack of adequate personal support systems as main barriers to rapid treatment initiation.

**Conclusions:** In this clinic, the proportion of adolescent patients initiating ART within one month of HIV diagnosis increased after implementation of UTT and SDI. Baseline CD4 counts increased from pre-UTT levels, suggesting the policy change may have brought previously ineligible people into care. While policy shifts shortened time to ART initiation, loss to initiation remained high and there was no improvement in 6-month retention in care. An innovative peer-navigator programme is part of an intervention

package being implemented to improve initiation rates and reduce patient treatment defaulting.

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### Youth Care Clubs: Optimising clinic time, fostering peer support, improving adherence

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**Background:** Long waiting times are common in South Africa's public health services. Peer support amongst adolescents living with HIV (ALHIV) positively effects emotional well-being and treatment adherence. We examined the efficiency gains, adherence and potential emotional benefits of a group model of ALHIV clinical and psychosocial care.

**Methods:** Wits RHI's USAID-funded Adolescent Innovations Project (AIP) implements 31 Youth Care Clubs (YCCs) in 18 clinics in two health sub-districts. YCCs are closed peer groups, comprising 20 ALHIV on antiretroviral therapy (ART). They are available to newly diagnosed, virally suppressed and un-suppressed patients. At each meeting, the club's facilitator conducts members' routine health screens (i.e. TB, STIs, nutrition, and psychosocial wellbeing), offers contraceptive services, facilitates an adolescent issues-focused conversation and distributes pre-packed ART. Coordinated annual viral load testing is conducted. Initially clubs meet monthly which fosters friendship development and encourages peer support. Club members keep in touch outside meetings through WhatsApp groups and online.

Time-motion observations were conducted assessing standard of care (SOC) clinic visits and YCCs. Retention and viral-load suppression data were extracted from YCC registers.

**Results:** Between August 2016 and December 2017, 542 ALHIV enrolled in YCCs. Median age at enrolment was 18 years; 368 (68%) were female. Health screening was conducted at 96% of eligible in-person visits.

Retention in YCC care was 85% compared to 84% in SOC; 97% of YCC patients were virally suppressed after 12 months compared to 86% of patients in SOC. Each ALHIV attending an SOC visit spent an average of 86 minutes in the clinic of which 64 minutes was spent in "unengaged" waiting. YCC ALHIV spent 130 minutes for a YCC visit, however, "waiting" time was spent engaged in facilitated conversations with familiar peers and healthcare providers building supportive relationships. Despite overall longer clinic visits, YCCs reduced patients' total clinic visits by combining ART refills, contraceptive services and psychosocial support.

**Conclusion:** The YCC group model of clinical and psychosocial care provides efficient, comprehensive, convenient care for ALHIV without compromising retention or viral-load suppression, and fosters supportive social relationships between peers and healthcare workers.

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### Prevalence and factors associated with HIV among adolescent girls and young women involved in sex work in Rwanda

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**Background:** Adolescent girls and young women (AGYW) in Sub-Saharan Africa have an exceptionally high burden of HIV new infections. According to UNAIDS report 2016, around 500,000 new HIV infections in 2015 occurred in AGYW aged 15-24 years in Sub-Saharan Africa. AGYW sex workers (SW) are a key population for HIV acquisition and transmission, with HIV prevalence of 31% estimated to be 12 times higher than in the general female population in Sub-Saharan Africa. The objective of this secondary analysis of the Rwanda FSW BSS 2015 dataset was to determine the factors associated with HIV infection among AGYW-SW in Rwanda.

**Materials & Methods:** A cross-sectional biological and behavioral surveillance survey was conducted in 2015 in Rwanda using respondent driven sampling (RDS) approach. The survey population was 1978 FSW, among whom 804 were AGYW. A secondary data analysis on this sub-group was conducted using STATA statistical software to investigate the association between socio-demographic characteristics variables, risky sexual behaviors (unprotected sex, engagement in anal sex, number of sexual partners, and drinking alcohol), district of work, having signs and symptoms of sexually transmitted infection (STI), occupational violence and HIV infection. Descriptive statistics, Chi-square test and multi-variable logistic regression were used to analyze and summarize the data accounting for the sampling and survey design.

**Results:** A total of 804 (41%) of the 1,978 surveyed female SW population were AGYW aged 15-24 years. Slightly more than a third (35.6% [30.9-40.7]) of the AGYW SW aged 15-24 years tested were infected with HIV compared to 45.8% for the whole female SW survey population ages 15 years and above. Young women sex workers (20-24 years) were approximately twice as likely to be infected with HIV [OR (95% CI): 1.77(1.06-2.95), p= 0.027] versus adolescent girls sex workers (15-19 years). AGYW-SW respondents who ever had signs of STIs [OR (95% CI): 1.63 (1.11-2.39), p= 0.012], or ever experienced occupational violence [OR (95% CI): 1.68 (1.13-2.50), p= 0.009] were significantly more likely to have HIV infection. Consistent condom use with paying partners was protective against HIV infection [OR (95% CI): 0.65 (0.46-0.93), p= 0.018]. Engagement in anal sex, number of sexual partners, drinking alcohol and district of work were not significantly associated with HIV infection among AGYW-SW in Rwanda.

**Conclusions:** In this survey, HIV prevalence among AGYW- SW aged 15-24 years was 35.6% which is almost 27 times higher when compared to Rwanda Demographic Health Survey (DHS-2015) HIV prevalence estimates for women in the same age category in the general population. HIV prevention programs among AGYW- SW should be strengthened, especially for promoting consistent condom use, preventing sexual violence, and providing regular screening and treatment of sexually transmitted infections.

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### Improving HIV treatment uptake among HIV-positive female sex workers in Naivasha, Kenya

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**Background:** Stigma and discrimination (S&D), inadequate information on HIV treatment services, and inefficient key population (KP)-specific support mechanisms in the community negatively affect sex workers' ability and decision to access care and treatment services. To increase use of HIV treatment services, LINKAGES/Kenya — led by FHI 360 and supported by USAID and PEPFAR — implemented the encounter initiative, a personalized process for linking HIV-positive female sex workers (FSWs) to antiretroviral therapy (ART) in Naivasha, Kenya.

**Methods:** The encounter initiative involves two strategies: 1) small, personalized group meetings dubbed encounter groups and 2) client feedback forums focused on addressing S&D against KPs living with HIV (KPLHIV). Encounter groups comprise of three people: the client (a KPLHIV who has not begun or has stopped taking ART), a clinician, and a trained KPLHIV champion who has been on treatment for at least 24 months. Meetings involve talking with the client about benefits of treatment and factors that hinder their access to treatment, and formulating a plan to link them to care. Up to three encounter meetings are conducted. KPLHIV are linked to care at nearby government-run ART centers and supported by the KPLHIV champion. Feedback forums are held with the KPLHIV to understand if they face S&D at the ART centers; if stigma is reported, the clinician organizes a sensitization meeting at the facilities to highlight the importance of providing stigma-free services to KPs.

**Results:** In January 2017, there were 112 KPLHIV enrolled within the program, of whom 30 (27%) were on ART. From March to December 2017, 99 KPLHIV who were not yet on ART or had stopped treatment were engaged in encounter groups and followed up with feedback forums. Seventy (71%) of those KPLHIV initiated ART thus raising overall uptake to 100 (72%) (Figure 1). The most commonly cited reason (75%) for poor uptake of ART was S&D from healthcare workers. To address this, we conducted two sensitization meetings at two facilities commonly mentioned.

**Conclusions:** Establishing community support for KPLHIV is key in their initiating antiretroviral therapy. Additionally, interventions to address S&D and accommodate KPs will encourage use of HIV treatment services by sex workers.

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### Correlates of HIV infection among female sex workers with less than 2 years of sex work experience, Rwanda FSW-BSS 2015

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**Background:** Despite Rwanda's remarkable efforts in the fight against HIV/AIDS the, Rwanda AIDS indicators and HIV Incidence survey (RAIHIS-2014) estimated that 0.27 adults are infected with HIV per 100 HIV negative individuals followed for a period of one year. According to Rwanda's Female Sex Workers Behavioral Surveillance Survey (FSW BSS) study of 2015, FSW have an estimated HIV prevalence of 45.8%; that is 15.6 times higher than women of the same age in the general population. The Rwanda mode of transmission study of 2008 estimated that, FSWs contribute 28% of all new HIV infections in Rwanda. Therefore, HIV prevention programs need to identify important parameters associated with HIV infection in FSWs, especially those commencing sex work in the last two years, as HIV infection was proven to be increasing with time in Sex work in order to develop appropriate interventions to prevent HIV in both FSWs and the general population.

**Methods:** A secondary data analysis was carried out using data from the national FSW-BSS cross-sectional survey conducted in Rwanda in 2015 using Respondent Driven Sampling approach (RDS). The analysis was weighted to account for survey design used and non-responses. Descriptive statistics, bivariate analysis and multi-variable logistic regression models were fitted using STATA 15.

**Results:** A total of 742 (37.5%) of 1,978 FSWs surveyed had less than 2 years of experience as sex workers. The majority (53.6%) of which sex work was started between the ages of 16 and 20 years; mainly young (43.7% were aged 20-24 years), unmarried (66.7%), with children (64.5%), had completed primary education (72.5%), and had experienced occupational (42.0%) or sexual violence (12.0%) before the age of 15. HIV prevalence and syphilis prevalence were 38.7% and 48.3% respectively among those FSWs with <2 years of experience compared to 51.8% and 53.7% respectively among those with ≥2 years of sex work experience. After adjusting for age, HIV infection was positively associated with syphilis (AOR = 3.9 [95% CI: 2.4–6.5]), giving clients the right to decide the use of condom (AOR = 2.7 [95% CI: 1.2–6.4]), having children if unmarried (AOR = 3.2 [95% CI: 1.8–5.9]) and experience of any occupational violence (AOR = 1.7 [95% CI: 1.1–2.4]).

**Conclusion:** The prevalence of HIV infections is very high among FSWs with <2 year experience in sex work, but lower than the prevalence among females with ≥2 years of experience in sex work, reinforcing the importance of the time period around initiation/early years of sex work for HIV prevention efforts. FSWs with less than 2 years in sex work are characterized by being inexperienced in negotiating use of condoms with clients, being younger, and having very high burdens of syphilis, and occupational violence (both physical and sexual). Existing targeted and friendly prevention programs for new FSWs to treat STIs infections; address sexual and occupational violence and empower FSW to always use safer sex methods should urgently be improved. In addition, FSW who are new to sex work might especially benefit from structural interventions to help them find alternative livelihoods through their existing associations.

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### Operating a Key Populations HIV Clinic in a Stigmatized Setting - Experience of Makerere University Walter Reed Project in Kampala, Uganda

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**Background:** The Joint United Nations Programme on HIV/AIDS has estimated that globally 40 to 50 percent of HIV incidence cases occur in members of key populations (KP) like the commercial sex workers, men who have sex with men, fishing communities, injection drug users, bar workers and long truck drivers. On the other hand access to safe, effective and quality HIV and AIDS services for these KP remains low largely due to barriers like stigma, discrimination and laws that criminalize their behaviours. In this abstract we describe Makerere University Walter Reed Project (MUWRP) experience providing comprehensive HIV care and treatment services to KP in Kampala, Uganda.

**Methods:** The MUWRP KP HIV clinic was established in 2016 to provide HIV/AIDS services to members of the KP residing within communities from which MUWRP recruits participants for its clinical studies. HIV infected members of KP are identified from MUWRP's research cohorts, Moon light HIV testing points, and referrals from other research groups that work with KPs. The KP HIV clinic follows the MOH recommended treatment, laboratory monitoring, and client data management guidelines. The KP HIV clinic recognizes that each member of the KP is unique and so elaborate Client Centred Approaches (CCA) that includes individualized counselling, phone call reminders, and flexible ARV refill that take care of anticipated away period is utilized to promote retention and adherence for those in care. Adherence monitoring through pill count at each visit is also undertaken. Viral load (VL) monitoring occurs at six months following ART initiation and annually thereafter using a centralised testing approach that relies on either Dry Blood Spot (DBS) or plasma with a limit of detection at 839c/ml and 75c/ml respectively.

**Results:** Between October 2016 and Feb 2018, a total of 53 HIV infected clients from KP were enrolled in HIV care treatment services, 54.7 % (n=29) with a median age of 29 (range 04-49). Majority, 58.5% (n=31) were referrals from research organisations working with KP. As of Feb 2018, 84.9% (n=45) were retained in care at this facility, with observed differences between male (79.3%) and Female (87.5 %) clients. 3 males and 3 females were officially transferred to alternative treatment centres; while 5.7% (n=3, all males) were lost to follow up. Of the clients still active in care at this facility, 25% (n=11) have had adherence challenges on at least one of the previous visits. Common reasons for poor adherence include; incarceration 18.1% (n=2); lack of food 9.1% (n=1); excessive alcohol use 18.1% (n=2); travels 27.2 (n=3), toxicity/side effects of ARVs 18.1 (n=2); and stigma 9.1% (n=1); and these were variously addressed through CCA and PC. Overall, 23 clients have had at least one viral load testing at 6 months and all except one (95.7%) had undetectable viral load.

**Conclusion:** Running a KP HIV clinic in a stigmatised setting has unique challenges but remains feasible. Client Centred Approaches are key in ensuring that key populations are retained in care.

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### Violence against Female Sex Workers: Correlation with HIV and Syphilis Infections, Rwanda FSW-BSS 2015

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**Background:** Violence against Female Sex Workers (FSWs) is increasingly considered an important risk factor for HIV infection and Sexually Transmitted Infections (STIs) among the FSWs population. During the Rwanda Biological and Behavioral Surveillance Survey (BBSS) conducted among FSWs in 2015, information was collected on the types of violence (physical and sexual violence); the perpetrators of the violence (occupational, and intimate partner violence); the age when the violence occurred (violence before or after 15 years of age), condom use, HIV infection, and Syphilis. In this analysis, we explored the frequency of different types of violence and their correlations with HIV and Syphilis in FSWs.

**Materials & Methods:** A secondary data analysis was performed on the dataset derived from the BSS conducted among FSWs in Rwanda in 2015 using Respondent Driven Sampling approach (RDS). Structured interviews, HIV infection testing (ELISA used for final reported method) and Syphilis testing (antibody test) were conducted. The analysis was weighted to account for survey design used and non-responses. Descriptive analyses (to quantify the frequency), bivariate analysis (to identify association between factor and HIV infection/Syphilis outcomes) and multi-variable logistic regression model were computed (to quantify the association), all using STATA 15.

**Results:** Overall, 1,978 FSWs consented for interview. Approximately two thirds of FSWs (63.8%) had experienced any type of physical violence, of which 27.1% had experienced intimate partner physical violence, 33.0% reported occupational physical violence and 43.1% had experienced physical violence before age 15. Sexual violence was reported by slightly more than a third of FSWs (34.1%), of which 19.5% reporting occupational sexual violence, 16.0% reporting intimate partner sexual violence and 14% reporting sexual violence before the age of 15. FSWs numbering 1,967 consented to both the survey and blood draw, the overall prevalence of HIV was 45.8% [95% CI: 43.5 – 50.1] and of syphilis was 53.7% [95% CI: 50.0 – 57.5]. Positive association was found between HIV infection and occupational violence (physical or sexual) (AOR = 1.3 [95% CI: 1.0–1.7]). Any type of sexual violence showed a positive association with syphilis (AOR = 1.3 [95% CI: 1.0–1.64] and consistent condom use with paying or nonpaying partners showed a negative association with syphilis (AOR = 0.7 [95% CI: 0.4–0.9]).

**Conclusion:** Violence against FSWs results in several health outcomes; including the risk of HIV and Syphilis infections due to the risk of unprotected sex surrounding violent sex practice. Empowerment-based behavioral and Violence risks reduction interventions for FSWs should be reinforced.

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### Behavioural Drivers of a Programme Implemented in Out of School Adolescent Girls & Young Women

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**Background:** The Rise Young Women Clubs (RYWC) aim to mobilise young women to participate in taking responsible action to shape their lives and communities. A qualitative study was conducted to understand behavioural drivers of programme implementation on out-of-school adolescent girls and young women (AGYW) accessing the RYWC programme in Cape Town.

**Materials & Methods:** AGYW, aged 19-24, out-of-school, belonging to and undertaking the RYWC curriculum, living in walking distance from the RYWC.

**Methods:** Youth friendly health facilities set up with the Department of Health, and sexual reproductive healthcare provided by mobiles units, formed the structural intervention. Behavioural interventions implemented with community stakeholders to promote HIV counselling and testing, and providing and sharing educational material through formal sessions, enabled recruitment to RYWCs. Basic demographics were collated, starter-packs issued, and registration on a biometric system used to monitor attendance. Monthly visits were required by members. After 9 months a decline in attendance was seen. All members were invited to attend two focus group discussions (FGD), to determine success and barriers to attending the RYWCs.

**Results:** The RYWC commenced in April 2017; 433 enrolled by the end of November 2017; 27 (64%) remained as active members. Key themes identified from the FGDs are outlined below:

- 1) Education: Links to higher education institutions; training in generic skills (e.g. leadership)
- 2) Employment: Employment was preferred to starting own business due to intensity of work and risks involved; consideration for jobs within the implementing team
- 3) Motivation: Benefit from the curriculum; social aspect (e.g. new friends, discussed topics they could not discuss with parents); more events (e.g. sports day, camps)
- 4) Incentives: Refreshments, uniforms, toiletries, watches, USBs, laptops, smartphones were preferred to cups, umbrellas and selfiesticks

**Conclusion:** Conditions associated with not being in school makes AGYW vulnerable to HIV acquisition. Decentralised community-based programmes like the RYWCs are designed to empower them to take responsibility to shape their lives, promoting their rights at all levels. These results need to be considered when implementing programmes. Behavioural change is possible but must be done with structural and biomedical drivers. Further qualitative work is needed to understand if RYWC improved health-seeking behaviour impacting HIV and STI acquisition.

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### Characterizing the prevalence and determinants of newly HIV diagnosed female sex workers in urban centers across Cameroon

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**Background:** Female sex workers (FSW) are disproportionately affected by HIV in Cameroon with an estimated HIV prevalence of 23.6%. Although HIV incidence data are unavailable, here we assess the prevalence and determinants of new HIV diagnoses among FSW in Cameroon.

**Materials & Methods:** In 2016, FSW (sex work principal source of income in past year) were recruited through respondent-driven sampling for a biobehavioural survey carried out in five urban centers in Cameroon. New diagnoses were defined as testing HIV positive when participant reported HIV-negative or unknown status; participants self-reporting to be living with HIV or with indeterminate test status were excluded from these analyses. A multivariable Poisson regression model was developed to assess determinants of new HIV infection using a priori determined individual, network and structural covariates, with manual backwards elimination and controlling for clustering among seeds; adjusted prevalence ratios (aPR) are reported if significant ( $p < 0.05$ ).

**Results:** Overall 2,255 FSW were recruited. Excluding participants who self-reported HIV positive ( $n=297$ ) and indeterminate ( $n=7$ ) test results, prevalence of newly diagnosed HIV was 13.3% (260/1,951). Based on the analysis sample ( $n=1951$ , median age 27 years), 1,151 (59%) FSW reported an HIV test in the past year. Most FSW reported engagement in sex work for 2-4 years (52%) or 5+ years (34%). Overall, 828 (42%) FSW reported ever being imprisoned or incarcerated.

Variables significantly associated with new HIV diagnosis were: 2-4 years (aPR: 2.21, 95%CI: 1.03-4.75) or 5+ years (aPR 3.26, 95%CI: 1.50-7.11) involvement in sex work compared to <1 year; primary school education or less (aPR: 1.63; 95%CI: 1.19-2.24); no HIV test in previous year (aPR: 2.90, 95%CI: 2.11-3.97); history of incarceration (aPR: 2.40, 95%CI: 1.39-4.13) or arrest (aPR: 1.40, 95%CI: 1.02-1.92); and low social capital (aPR: 1.54, 95%CI: 1.14-2.07).

**Conclusions:** In the absence of HIV incidence data, these results provide insights into ongoing HIV acquisition risks among FSW across Cameroon. There are significant social and structural factors which may both increase risk of HIV infection and delay HIV diagnosis. These data specifically suggest the need to build social capital and better integrate services such as PrEP into HIV programs to prevent new HIV infections. Further, there is urgent need for sensitisation of police and other authorities on the needs and rights of FSW to promote an environment supportive of HIV prevention and social protection of FSW in Cameroon.

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### Young female sex workers and men who have sex with men in Cameroon: unmet need for HIV prevention and treatment services

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**Background:** In Cameroon key populations (KP), including female sex workers (FSW) and men who have sex with men (MSM), are disproportionately affected by HIV. While there are limited data, young KP may be additionally vulnerable to HIV infection due to ongoing sexual risks in the context of compounded legal and social challenges to effective service provision.

**Materials & Methods:** In 2016, FSW (sex work principal source of income in past year) and MSM (anal sex with man in past year) aged 18+ years were recruited through respondent-driven-sampling for a biobehavioural survey carried out in five cities of Cameroon. Unadjusted-HIV prevalence, risk, stigma, and service access were compared between young (<25 years) and older (25+ years) KP using  $\chi^2$ -tests-of-proportion (0.05 significance).

**Results:** Among 2,255 FSW, 724 (32%) were aged <25 years. The median age of first transactional/compensated sex was 22 years (IQR:19-28). HIV prevalence was 7.9% and 32.2% in young and older FSW, respectively, with 10% of FSW living with HIV <25. More cases were newly diagnosed in young FSW (65%) than older FSW (45%). Less young FSW than older FSW reported receiving HIV information (63% vs. 68%), participating in peer education (9% vs. 21%), receiving free condoms (26% vs. 39%) and receiving professional treatment for STI symptoms (40% vs. 53%).

Among 1,323 MSM, 839 (63%) were aged <25 years. The median age of first anal sex with men was 18 years (IQR:17-21). HIV prevalence was 14.2% and 32.1% in young and older MSM, respectively, with 44% of MSM living with HIV <25. A similar proportion of cases were newly diagnosed in young MSM (60%) and older MSM (56%). Less young MSM than older MSM reported an HIV test (past year: 50% vs. 65%), receiving HIV information (43% vs. 57%), participating in peer education (19% vs. 31%), and receiving free condoms (31% vs. 47%).

In both populations, condom use, recent experience of physical violence and forced sex were similar between age groups. Lifetime experience of stigma/discrimination was lower among young than older KP but remained high: Perceived stigma was reported by 20% and 18% of young FSW and MSM respectively, and by 27% and 26% of older FSW and MSM respectively; enacted stigma (excluding violence) was reported by 66% and 33% of young FSW and MSM respectively, and 71% and 48% of older FSW and MSM respectively.

**Conclusions:** Service coverage levels are lowest among young KP in Cameroon. Although prevalence is lower in young KP than older KP, incidence rates are likely higher given the age-dependent relationship observed for HIV prevalence. Further,

prevalence is substantially higher than young people nationally (1.7%). While social and legal systems affecting young KP are complex, achieving an AIDS-Free generation necessitates addressing the specific HIV prevention and treatment needs among youth.

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### Barriers to accessibility and utilization of health services among key, vulnerable and mobile populations living in the Gatuna (Rwanda-Uganda) and Rubavu (Rwanda-DRC) borders

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**Background:** People working and living along EAC transport corridors are at elevated risk of HIV infection due to limited access to quality health services including HIV prevention, care and treatment. This qualitative study aimed to understand barriers to accessibility and utilization of health services among hard-to-reach mobile populations, including key populations and other vulnerable mobile populations living in the Gatuna (Rwanda-Uganda) and Rubavu (Rwanda-DRC) borders.

**Methods:** In 2017, using a qualitative design we carried out 34 focus group discussions (8-10 participants) with female sex workers; vulnerable women and girls 15-24 years; people living with HIV; fisher folk; long distance truck drivers; clearing and forwarding agents, and community health workers. The team conducted 60 in-depth interviews with these same target populations, and people who inject drugs and men who have sex with men. Twenty-nine key informant interviews were conducted with policy makers, healthcare providers community opinion leaders and local administrators. The qualitative data was analyzed using NVivo software.

**Results:** The study revealed there is lack of health insurance among key populations and vulnerable mobile populations living in cross-border communities leading to higher charges in Rwanda where health insurance coverage is high. They seek health care services in neighboring countries with free or low cost services are available. Long distances to health facilities and long waiting time largely was reported by all FGDs as barriers to access. Key populations in Gatuna reported lack of comprehensive health care services at convenient times. Respondents from key and vulnerable populations reported difficulties in accessing condoms. FGD participants also identified distance to health facilities and fear among their challenges in collecting condoms from health facilities. All interviewed MSM reported challenges accessing lubricants and lack of knowledge on their use.

**Conclusion:** Our findings suggest that K&VPs are willing to utilize HIV prevention and treatment health services if they were accessible. Making health insurance available and portable will enable them access services across borders in the region. There is need to strength border health facilities to deliver comprehensive HIV services targeting hard-to-reach mobile populations and conduct mobile clinics and outreach services.

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### Harm reduction in Senegal. Political adjustments and perceptions of injecting drug users

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**Introduction:** Injecting drug users (IDUs) in the Global South are often seeking care for their addiction in a context where health systems do not offer them services and national policies are hostile to opioid substitution drugs. In Dakar, since December 2014, an Integrated Center for the management of addictions (CEPIAD) has been offering medical and social support including opioids substitution treatment (OST) using methadone.

**Method:** This presentation aims to describe the institutional context and the political adjustments that allowed the release of this “drug-treatment” in Senegal then to analyze IDUs answers to OST. The data used for this presentation come from qualitative studies (interviews, focus groups and participating observation) with several populations in Dakar (IDUs, health and social support actors, caregivers, associations, state authorities) between 2012 and 2016 in Senegal.

**Results:** Following a cross-sectional study conducted in 2011 in Dakar (size estimation and bio-behavioral survey), advocacy was made at the political level and enabled the inclusion of methadone in the national essential drugs list. In addition, for the first time, the population of IDUs was taken into account in the 2014-2017 Strategic Plan of fight against HIV/AIDS. The administrative authorization for methadone delivery is, however, subject to the condition of directly observed treatment (DOT) strategy to prevent its circulation on the illicit market. Legal concerns have raised about needle exchange activities since outreach team members were subjected to arrestations due to the fact that having syringes might be considered as evidence of using drugs. The different stakeholders created a framework consultation with the legal authorities to change the texts relating to drug use in order to allow medico-social interventions in direction of IDUs such as needle exchange. At the individual level, IDUs appreciate positively CEPIAD and regret its late opening in Senegal. The OST using methadone, however, raises critics about DOT delivery, treatment duration and side effects mainly on sexuality. The fight, which was once focused on advocacy for access to substitution drugs, has shifted to demand for shorter methadone treatment course and final exit from the program.

**Conclusion:** The Senegalese experience of methadone delivery, the first of its kind in West Africa, plunges the sub-region into an international dynamics of treatment for IDUs. However, to better take into account the specificities of Africa, it is necessary to integrate into this treatment program other significant components such as incriminating positive legal and social environment, religious reluctance, family traumas, precariousness, sexuality and maternity of the IDUs.

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### Key Populations Living with HIV support group; an important structure to attract FSW to access HIV care services in Mangochi district, Malawi

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**Background:** Despite the effectiveness of peer outreach activities in reaching out to Female sex workers (FSW) with comprehensive package HIV services, challenges existed on how to keep the FSW in care and treatment. We established support groups to motivate FSW infected with HIV to initiate and stay in HIV treatment and care.

**Description:** Support groups for key population living with HIV (KPLHIV) were established by peer navigators and these are KPs own establishments where HIV positive FSW are given psychosocial, nutrition and treatment adherence support by their peers in the groups as well as their peer navigators (fellow HIV positive peer leader). They mobilized FSW who were HIV infected to join; they meet on monthly basis to support each other on various health issues affecting them, sports activities, and they also empower each other on nutritional and economic empowerment support.

**Lessons learned:** Pakachere in Mangochi district established a total of 8 support groups where 773 FSW accessed community care on HIV by the end of FY17. Before Pakachere established these groups only 306 FSW accessed community care services in FY16. This was an increase of 160%. Nearly 50% of FSW who registered in the project this time entered through the support groups. The support groups also attracted 43 treatment defaulters from other treatment programs other than LINKAGES Project and were successfully re-initiated on treatment, this is compared to 2 only from the previous year. So far Mangochi has not reported any ART defaulter on all clients initiated on ART by the project.

**Conclusion:** Establishment of KPLHIV support groups for KPLHIV improves access to comprehensive HIV services and creates an opportunity for them to be empowered on other social needs. If these structures are well supported to develop their capacity they may attract more clients into treatment services

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### Targeted adolescent HIV testing in two South African health sub-districts

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**Background:** HIV testing among adolescents and young people is generally low, and young men in particular are unlikely to test regularly. HIV testing is an essential entry point to HIV care and treatment, but also for access to effective prevention services.

Wits RHI's USAID-funded Adolescent Innovations Project (AIP) aims to develop, implement and evaluate a high quality comprehensive model of HIV testing, treatment, care and prevention for adolescents and young people aged 10-25 years. The AIP is implemented in collaboration with the Department of Health in 31 public health facilities in two health sub-districts: Sub-district F, City of Johannesburg and Matlosana, North West Province, South Africa.

**Methods:** During 2017, the AIP leveraged clinic entry points including: contraception, antenatal care, sexually transmitted infection (STI) and routine primary health care services with clinician and counsellor provider initiated counselling and testing (PICT) to increase young people's HIV testing and linkage to care. AIP also expanded out of facility testing, through mobile and community testing services that targeted: men's hostels, informal settlements, parks, taxi ranks, colleges, libraries and youth events, utilising community liaison officers and peer-educators and with linkage to primary care and screening for HIV, TB and STIs and referral to local medical male circumcision services. HTS data routinely collected by service providers in all testing modalities were analysed. Patient age, gender and test result, as well as whether the test was a first-test or a repeat were collected. Twelve-month data (January-December 2017) were analysed, representing a time period of intensive, targeted HTS promotion and data collection improvement activity.

**Results:** In total 37,532 HIV tests were recorded in the age group 10-25 years, in 2017 with 81% conducted in facilities and 19% in mobile/community settings. Overall HIV positivity was 7.3%; 7.8% in facilities and 4.9% in mobile/community settings. The number of tests performed was approximately equal between the two sub-districts. Females received 80% of all tests and 80% of all positive results in facilities; 60% of all tests and 79% of all positive results in mobile/community settings. Proportionally, twice as many males tested in mobile/communities settings than facilities (40% vs 20%), with higher positivity rates (21.3% mobile/community vs 19.5% facilities). More tests were performed in 20-24 year olds (58% of facility tests & 70% of mobile/community), who also had the highest proportion of positive results (65.8% of facility positives & 66% of mobile/community positives). Patients aged 15-19 years comprised one quarter of tests performed (23% in facility & 26% in mobile/community) and 14% of positive results in facility and 20% in mobile/community. Repeat tests accounted for 67% of all tests done in facilities, but only 28% in mobile/community.

**Conclusions:** Most HTS is performed in health care facilities where higher positivity rates are found as compared to mobile/community settings. However, mobile testing is an important entry point for males and for first time testers. Leveraging primary health care service entry points is also an important strategy for integrated HIV counselling and testing services, with linkage to prevention or ART services for young people.

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### HIV-related knowledge, attitudes and utilisation of HIV testing services: a comparative study of male and female senior secondary school students in a suburb in Lagos, Nigeria.

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**Background:** The Human Immunodeficiency Virus (HIV) is one of the most serious, lethal infectious viruses in medical history. Knowledge of HIV and use of HIV testing services (HTS) in Nigeria is still far from optimal. Improving HIV-related knowledge and attitudes is important in reducing risky behaviours among adolescents. Key to HIV interventions is HTS. The aim of this study was to assess and compare HIV knowledge, attitudes and uptake of HTS between male and female senior secondary school students in Lagos, Nigeria.

**Methods:** A multistage sampling method was used to select the participants in a comparative cross-sectional study carried out in six senior secondary schools in Alimosho L.G.A, Lagos State. Data on knowledge, attitudes and HTS uptake was collected using a pre-tested, self-administered, semi-structured questionnaire and analyzed using SPSS version 20. The level of significance was set at  $P \leq 0.05$ .

**Results:** A total of 543 students participated in the study (50.3% male, 49.7 % female). Participant's level of knowledge of HIV/AIDS was mostly good (67.8% male, 64.4% female), the difference was not statistically significant. The main source of information regarding HIV/AIDS among the majority of the respondents was through their teachers at school. Attitudes towards HIV and HIV testing were mostly positive (99.3% males, 98.1% females). HTS uptake in both male and female respondents was low; only 27.8% male and 24.1% female had ever used HTS services. Only 28.1% male and 33.7% female knew where HTS services were offered. The HCT uptake showed a significant association, for the males, with family structure ( $p=0.034$ ), discussing important issues with father ( $p=0.039$ ) and the importance of religion ( $p=0.044$ ), while for the females, the mother's level of education ( $p=0.036$ ), no of siblings ( $p=0.044$ ) and alcohol use ( $p=0.006$ ) were statistically significant.

**Conclusion:** The overall HIV/AIDS knowledge and attitude were generally high. The uptake of testing was however low as most of the respondents in both groups did not have testing services accessible to them. Teaching students about HIV/AIDS in school should be improved and sustained, but to improve their use of screening services, more HTS centers, especially Youth Friendly Centers should be provided.

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### Sex and test: Reaching hard-to-reach MSM and clients of FSW at diverse sex venues in Cameroon

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**Background:** CHAMP is a USAID-funded project in Cameroon which aims to reduce HIV/STI infections and related morbidity/mortality by providing evidence-based prevention, care and treatment services to men who have sex with men (MSM), female sex workers (FSW) and their clients in three major cities.



**Description:** To increase access to hard-to-reach key populations and clients of FSW, CHAMP devised two strategies: (1) Outreach workers targeted harder-to-reach MSM through chill-ins (private gatherings where group sex occurs); and (2) FSW were mobilised to refer their clients to HIV testing after sexual transactions. These were piloted between July and September 2017.

**Lessons learned:** During a two-month pilot phase, outreach workers tested 375 MSM for HIV at chill-ins (56% of all MSM tested on the program). HIV positive yield was substantially higher for MSM tested at chill-ins (15%) than among MSM tested through other outreach modalities and in community drop-in centers (9%) during the same period. Involvement of peer educators was critical in earning the trust of beneficiaries and gaining access to chill-ins. Direct intervention at chill-ins with strategical behavioural communication, condoms and lube, and HIV testing and counselling also provided timely opportunities to reduce risk behaviours.

Encouraging FSW to refer clients for testing immediately before or after transactional sex increased the number of clients tested for HIV by 44% from the previous two months, from 1,071 to 1,540. The increase in clients tested suggests FSW are both willing and motivated to refer their clients for testing.

**Conclusions:** In Cameroon, HIV prevention services and testing at chill-ins appears to be an acceptable and effective strategy for testing high risk and unreached MSM. FSW referral of clients also appears to be effective in increasing client testing. CHAMP will scale these strategies alongside current outreach strategies to increase case finding and service uptake among these populations.

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### Predictors of poor adherence among children and adolescents on ART for at least 1 year in Kigali Pediatric Centre of Excellence, Rwanda

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**Background:** The Centre of Excellence at University Teaching Hospital of Kigali (CHUK) provides multidisciplinary outpatient care for Rwandan children and adolescents living with HIV. Clinicians anecdotally reported an increase in the number of patients with poor long-term adherence and with high viral loads. We studied measures of adherence to ART and predictors of poor adherence among children and adolescents receiving HIV Care at CHUK.

**Objectives:** 1) To determine the adherence on ART and the proportions of patients with VL suppression among children and adolescents on ART for at least 1 year at the COE.  
2) To describe the predictors of poor adherence and lack of VL suppression in this population

**Methods:** A cross sectional study was conducted among patients age 1-18 years receiving HIV care at CHUK who have been on ART for at least 1 year. Data was collected by medical record review and a questionnaire which was administered during support group sessions where participants also received education on the importance of adherence. Adherence levels were measured by self-report using the CASE adherence index questionnaire and by measuring viral loads. Data on the socioeconomic status, education level, knowledge about HIV infection and self-reported barriers to optimal adherence were collected.

**Results:** At the time of data collection, 43% of children and adolescents had a detectable VL with 12.8% having a low-level viremia and blips and 30% having a viremia of > 1000copies/ml. 29.44% of participants were classified by the CASE adherence index as having poor adherence. Poor adherence using the CASE index was associated with detectable VL, with 38.1% having detectable VL among the adherent group versus 54.7% among the poorly adherent participants ( $p=0.042$ ).

The following barriers were associated with poor adherence by multivariate logistic regression analysis: the "difficult to respect the same time of medication" ( $p\text{-value} = 0.031$ ), the "bad taste of the drugs" ( $p\text{-value}=0.008$ ) and the "belief in God's healing" ( $p\text{-value}=0.008$ ) and the "bad drugs' taste" were associated with detectable viral load ( $P\text{value}= 0.039$ ).

**Conclusion:** The CASE self-reporting tool correlates with poor virologic suppression and can be used to measure adherence. Children and adolescents of our Centre of Excellence have many barriers that are associated with poor adherence and virologic suppression. Intervention to address these barriers must be developed and a systematic adherence screening must be implemented in our clinic.

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### Addressing Stigma and Discrimination among HIV positive workers in Ethiopia through effective HIV prevention programs

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**Background** and objective: HIV&AIDS related stigma and discrimination, particularly among the workforce is a global problem affecting all sectors, society and now a days becoming Africa's development and public health threat. Its drastic effects are much higher among productive young female and male work forces in the electric power and utility sector with mobile and those workers living in camps. These workplaces are located around hotspots with commercial sex workers driving them to HIV risks. This study aims to address stigma and discrimination through effective implementation of HIV prevention programs and bring the desired attitudinal and behavioral changes among young workforce in Ethiopian Electric Utility (EEU).

**Method:** This study was conducted between August and November 2017. Both quantitative and qualitative methods were employed. Multi-stage sampling techniques (purposive, random, and stratified) were used to select the study settings (5 regions & 2 project sites) respondents. Primary data was gathered through questionnaire survey from 600 respondents, key informants, focus groups, in-depth interviews and cases of practical stigma and discrimination related life experiences of HIV positive workers. Document reviews were made for secondary data. Triangulation was made to ensure validity and reliability of data.

**Results:** The response rate was 95%. The majority of respondents declared that stigma and discrimination among EEU employees and (at national level) was drastic and inhibitor of seeking HIV prevention services. They added that HIV prevention approaches like peer-to-peer education, leadership commitment of being model managers, contributed a lot to address the stigma and discrimination problem at this company. Hence peer education program helped employees to believe and consider HIV can affect everyone as such helped them to be aware of HIV/AIDS.

52.5% of them reported that they would keep secret if a family member is infected with HIV while 15.8% of them decided to not stigmatize employees and stop to discriminating peers and colleagues affected/afflicted by HIV and to be a friend if either of colleagues' parent die of AIDS. Only 47.7% of them have comprehensive knowledge about HIV&AIDS. 42.9% shown positive attitude towards VCT and less than 20% utilized the HIV services with significant variations (p-values < 0.05) towards stigma among regions, project sites and respondents. ¾ of participants don't perceive they are at risk of HIV and only 23.4% had ever used condoms in the last 12 months in the EEU workplaces.

**Conclusions:** The majority of respondents lack of comprehensive knowledge about stigma and discrimination related HIV. Lacks of contextualized stigma and discrimination interventions were found to contribute to misconceptions and poor utilization of the available services. These gaps should be filled with rethinking the prevention program geared towards effectively sustaining changes in trends of stigma and discrimination, reforming the existing program through an eye of addressing stigma and associated discrimination fine-tuned mainstreaming.

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### An example of the management of cases of violence among men who have sex with other men (HSH) by the African Solidarity Association in Ouagadougou, Burkina Faso

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**Background:** Many HSH are not familiar with the law, this document is a basic information on the legal rights and assistance of HSH victims of HIV-related violence. Show the ways and means to protect themselves, it will also strengthen the knowledge of the HSH and allow them to document the different cases that have not been documented.

**Method:** A different approach has been put in place for cases of violence. First make a state of the premises to AAS. Organize information and training meetings with all the actors working with the HSH. In addition, cases of violence were addressed during the speech group animations, outreach meetings, educational talks for six months and the title of the theme was "the management of cases of violence"

**Results:** The approach has enabled 427 HSH to be touched during the activities of speech group animations, awareness-raising meetings, educational lectures on rights (cases of violence) linked to HIV. It allowed two complaints to be filed with the gendarmerie and a complaint at the court house. Many allies have been created and this will contribute to making the HSH's massive participation in activities at the Oasis centre and outside the centre more fulfilling and facilitating.

**Conclusions:** The participation of actors in the field is crucial for the management of cases of violence. See its similar the explain things puts it in confidence so to establish this activity in associations a peer involvement will make it easier to give a satisfactory result. Our various complaints have not been successful because the HSH have preferred to abandon the suite for fear of being unmasked by their families who are not aware of their sexual orientation.

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### Targeted LGBTI social inclusion for an improved HIV response

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**Background:** Stigma and discrimination prevent LGBTI people from accessing healthcare. MSM and TG form part of this group and are a key population at high risk for HIV infection. This is particularly true of rural areas and townships in the Eastern Cape, South Africa's most homophobic province. Social inclusion of LGBTI people by addressing harmful traditional beliefs and gender stereotypes is therefore key to fighting HIV.

Current LGBTI sensitization interventions focus mainly on providing training to mainstream service providers e.g. civil servants and healthcare workers. Large-scale community interventions are costly and impractical given available resources. Targeted approach are therefore required to be able to create the most meaningful social change with the least amount of resources. Community leaders are a key target group as their attitudes influence those of the community as a whole.

We aimed to test whether targeted social inclusion with ward committees is an effective tool to reduce stigma and discrimination in communities.

**Materials & Methods:** In South African local government, municipalities are divided into wards. Each ward has a ward committee comprising 11 leaders from that community e.g. representatives of traditional leadership, religion, special groups and geographic sectors. Ward committees therefore provide a unique opportunity to access the complete spectrum of leaders in a community in a single intervention.

Phase 1 has focused on 4 wards (total population 54,403) within the Mdantsane area of the Buffalo City Municipality in the Eastern Cape Province, an area with high rates of violence against LGBTI people.

Context-specific curriculum was developed and presented during workshops. Content was focused on how leaders in local government can assist LGBTI constituents. The impact of the project was measured using self-administered pre- and post-intervention questionnaires with the aim of measuring the extent of attitudinal shift in the project beneficiaries.

**Results:** Significant attitudinal change was measured as a result of the intervention. Higher rates of acceptance of LGBTI people and desire to include LGBTI people into community affairs are clearly evident post-intervention. Follow-up measurements will be taken after 3 months to establish whether attitudinal change has been maintained.

**Conclusions:** People are generally very receptive to knowing more about LGBTI people, however the programme needs to be relevant to the specific contexts and audience, and needs to highlight the importance and benefits of including LGBTI people into the community. The programme is unique in its targeted and strategic delivery i.e. ward committees, it can be implemented with limited resources and is primed for scalability.

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Everyday 'lies', hiding and secrecy:

### Ethnographic study exploring strategies adopted by young women living with HIV in urban Zambia to protect their identity

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**Introduction:** Young women living with HIV (YWLHIV) require resilience and coping strategies to manage the numerous challenges they face around disclosure, stigma, relationships and adherence to treatment. Through ethnographic study in urban Zambia, we aimed to explore the daily navigation of YWLHIV to protect their identity and manage their HIV.

**Methods:** 24 YWLHIV aged 15-18 years were originally recruited from health facilities in Lusaka in 2015 for a qualitative study exploring experiences living with HIV. In 2017, seven of these participants (aged 18-19 years and middle-income), were purposively selected to participate in a follow-up in-depth ethnographic study over 10 months.

Participant observation was undertaken at their homes, colleges, workplaces, recreational spaces and churches, with participants and their family, friends and boyfriends, to understand their everyday lives. Notes were written-up after each observation (n=75), and subsequently analysed manually and inductively.

**Results:** Participants described unintentional disclosure of their HIV status as "the worst thing that could happen to me". They hid their HIV status to maintain an identity beyond HIV in three main ways: by telling "lies"; hiding their ARVs; and using concealed language when talking about HIV.

Participants said they "tell lies every single day", including around their presence at the ART clinic, how their parents died, and what their medicines were. The researcher also participated in these "lies" to protect participants' HIV status.

Participants went to great lengths to conceal their ARVs, especially given their limited private space. Participants who boarded at college found this particularly challenging: "it is the biggest difficulty I have". Conversely, being on ART helped them 'look healthy' and conceal their status.

Even verbally, participants used concealed language around HIV and ARVs, such as "she's in my shoes" to refer to another YWLHIV, even when there was no chance of being overheard.

**Discussion:** Hiding part of their identity, maintaining an identity beyond HIV, and avoiding anticipated stigma is a daily stress for YWLHIV, with anticipated long-term psychological effects. These insights into the pragmatic management of HIV by YWLHIV highlight the lengths undertaken to appear 'normal', questioning the global narratives of the 'normalisation' of HIV.

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### Integrated outreach services to mitigate stigma and violence against men who have sex with men (MSM) in Bamenda, Cameroon

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**Background:** In Cameroon female sex workers (FSW) and men who have sex with men (MSM) are key populations (KP) for HIV prevention and control. The Continuum of HIV/AIDS prevention, care and treatment for Most-at-risk Populations (CHAMP) program aims to reduce HIV/STI infections and related morbidity/mortality by providing evidence-based prevention, care and treatment services to KP in Cameroon through community-based organizations (CBOs). Bamenda, one of three implementation sites, is currently experiencing elevated socio-political unrest, and sociocultural norms contribute to high levels of hostility and discrimination against KP, especially MSM. This negatively impacts demand for, access to, and provision of HIV services among KP.

To address increased risk of violence and its associated impact on access and provision of services to MSM in Bamenda, outreach workers (OW) from two CBOs focusing separately on MSM and FSW integrated outreach services. From July 2017, OW from each CBO began to reach and recruit members of KP into HIV testing and counselling who are not their primary focus (i.e. FSW OW reach/recruit MSM, and MSM OW reach/recruit FSW). During this time, additional strategies for mobilizing FSW were also deployed.

**Materials & Methods:** The number of MSM reached, tested, diagnosed HIV positive and initiated on antiretroviral therapy (ART) was compared between quarter 3 (Q3, April-June 2017) and quarter 4 (Q4, July-September) using routine programmatic data. Differences in uptake of services and HIV positive yield were compared using  $\chi^2$ -tests-of-proportion to 0.05 significance. Impact on FSW could not be assessed due to simultaneous implementation of multiple strategies. Qualitative data were obtained through anecdotal reports from Peer Leaders involved in mobilization of KP for HIV services.

**Results:** The number of individual MSM reached increased from Q3 (n=320) to Q4 (n=458) following the implementation of integrated service provision. In Q3, 162 (51%) MSM were tested for HIV compared to 378 (83%) in Q4 ( $p<0.01$ ). The HIV positive yield non-significantly increased from 3.1% (n=5) to 6.8% (n=26) in the same period ( $p=0.08$ ). In Q4, 15 (58%) MSM diagnosed with HIV were linked to treatment compared to 1 (20%) individual in Q3 ( $p=0.12$ ). There were no instances of interpersonal violence reported in Q4, compared to two incidents in Q3.

Qualitative data suggest that many MSM prefer to be approached by individuals who are not immediately identifiable as belonging to their KP group. This approach may also have the added benefit of reducing corollary stigma and violence.

**Conclusions:** Integrating service delivery between CBOs working with MSM and FSW may be an acceptable and effective way to increase service uptake and mitigate stigma and violence among MSM. An evaluation of the acceptability among FSW will inform programs on the potential for integrated service delivery to reduce the negative impact of violence on HIV service uptake. CHAMP is also exploring ways in which this approach can increase service uptake and changes in reported stigma/violence in cities unaffected by social unrest.

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### Counselling as a stigma management tool in adolescents living with HIV/AIDS in Kendu-Bay, Kenya

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**Background:** Stigma is a potential risk factor to adolescent living with HIV/AIDS, it may lead to delayed HIV testing and enrolment to care, increased barriers to access and retention in HIV care, nonadherence to medication and increased risks of other diseases relapse hence these can perpetuate to physical, emotional or social isolation of adolescents living with HIV/AIDS. Kenya's antiretroviral therapy guidelines recognize the importance of performing psychosocial assessment as part of the assessment and preparation of patients for ART however there is paucity in continuous counselling and management of stigma in adolescents living with HIV/AIDS, thus, we sought to evaluate counselling as stigma management tool.

**Method:** This was a cross sectional study conducted among adolescents living with HIV/AIDs aged 15-22 years old who visited Kendu Sub-County Hospital between March to August 2017 in Kendu-Bay, south-western part of Kenya. After selection and consent sought, they were enrolled in the study. A closed-ended questionnaire was administered, which contained stigma assessment and evaluation key points of interest such as; attitude towards ARV drugs, stress, belief on the drug, influences, and fears.

**Results:** A total of 156 participants on care and treatment were enrolled in the evaluation study, of these, 89 (57%) were female while 67 (43%) were male. One hundred and four (67%) of the study participants attended monthly stigma management counselling at the clinic for the study period while 52 (33%) were inconsistent in their attendance. Based on the completed questionnaires, 100 (96%) of the participants who attended counselling session found it easier taking ARVs on daily basis while 48 (92%) of the inconsistent attendee found it hard. Ninety-four (90%) of the participants attending counselling did not find it stressful going for the drugs at the clinic, while 49 (94%) of the inconsistent participants found it stressful. Twenty-two (14%) of the study participants had a negative belief towards the drugs. Forty-six (88%) of the inconsistent participants took drugs out of influence from guardians and peer while all those consistent in attending counselling sessions took drugs out of free will. Fifty (96%) of the inconsistent participants and 2 (2%) of consistent participants feared being associated with ARVs for fear of stigmatization.

**Conclusion:** the study revealed that HIV related self-stigma compromised participants' ability to successfully adhere to ART, therefore, interventions to reduce stigma should target multiple intrapersonal attributes such as attitude, beliefs, fear and stress as well as interpersonal attribute such as influence to have maximum effectiveness on improving ART adherence and stigma elimination. We therefore highly recommend continuous counselling among adolescents living with HIV/AIDS in relation to ART adherence

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### Delayed Policy implementation Increases Stigma and Discrimination in Malawi: The case of Stavudine based ART (d4t) versus Tenofovir based ART (5A)

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**Background:** Malawi government in collaboration with other development partners and stakeholders do formulate laws and policies or implement some international recommendations towards the HIV/AIDS programming. In some cases implementation of these policies and recommendations brings in issues of inequality, stigma and discrimination for PLHIV. It is against this background that a study was conducted to investigate and analyse a specific policy, strategy and recommendation developed under the HIV/AIDS response. The study critically analysed policy implementation delay which eventually increased stigma and discrimination as well as affecting equitable access to quality treatment care and support for PLHIV in Malawi.

**Methodology:** We used a multi-method qualitative case study design to collect data (literature review and focus group discussions).The participants were office bearers of CBOs working with PLHIV and members of different support groups from TAs Chowe and Bwananyambi in Mangochi district. Interviews were audio-taped in which thematic content analysis was conducted through coding data from common answers.

**Results:** The study revealed that the World Health Organisation recommendation of 2009/10 that Stavudine based ARVs(d4t) be phased out because of the side effects and its well recognised toxicities to some PLHIV and be replaced with a new Tenofovir based ARVs(5A),took almost three years to be fully implemented in Malawi. This was fully implemented in 2013.This increased stigma and discrimination rising from lypodystrophy (abnormal body looks, shapes and fat distribution)yellow eyes and other side effects. These physical deformities increased stigma and discrimination for PLHIV.

**Conclusion and Recommendation:** It is a fact that stigma and discrimination interferes with successful HIV prevention, diagnosis, treatment, care and support as such formulation and implementation of legal frameworks and policies must always provide a timely continuum of equitable access to HIV/AIDS services and support hence reducing stigma and discrimination.

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### Improving retention of HIV positive clients in care by conducting real time follow up of clients using full time community Health Workers. (CHWs): An experience of five districts in western Uganda.

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**Background:** Retention in care is an indicator of good adherence and a requirement for Viral suppression among people living with

HIV on ART. Poor retention remains a major hindrance to the attainment of the 90-90-90 goals in Uganda. The 12 months retention was low below the 90% target for three of the five districts in western Uganda which is a bottle neck to the third 90 viral suppression. The current viral suppression for Uganda is at 69%. The objective of this intervention was to improve the retention of clients in care using full time Community Health Workers (CHWs) to conduct daily real time follow up of clients who miss clinic appointments.

**Description:** CHWs, a newly recruited cadre of support community staff were recruited and attached to health facilities providing ART in 5 scale up districts in western Uganda. CHWs updated the clinic appointments daily and developed lists of clients that had missed clinic appointments. This was different from the use of VHTS that work on a volunteer basis and conduct monthly follow up of clients.

**Lessons learned:** There was marked improvement in the retention of clients in all five districts. Four out of five districts registered retention above 90% and the fifth district improved from 85% to 89%. Clients were more receptive to the CHWs who conducted the home visits because they had interacted with them at the health facility. The clients were not familiar with the VHTS were not regular at the health facility. In addition clients that were followed up reported less stigma from the CHWs.

#### Conclusions /Next steps:

The use of CHWs as full time recruited staff and attached to health facilities are able to conduct real time daily follow up of clients who miss appointments. The clients are more responsive to health workers with whom they have interacted with which reduces the likelihood of receiving wrong locator information provided by the clients recruited in care.

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### Stratégies pour atteindre les objectifs 90-90-90 de l'ONUSIDA par les OSC identitaires au Cameroun dans un contexte de criminalisation de l'homosexualité

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**Contexte :** Face à l'insécurité des OSC identitaires due aux violences de la population homophobe qui se base sur la loi camerounaise dont l'article 347-1 du code pénal condamne l'homosexualité, les organisations qui luttent contre le VIH auprès des populations clés au Cameroun rencontrent de nombreux obstacles pour mettre en œuvre des actions visant à atteindre les objectifs 90 – 90 – 90 de l'ONUSIDA. Ce climat d'insécurité s'étend d'ailleurs jusqu'aux bénéficiaires qui préfèrent se rendre dans des centres communautaires pour une prise en charge que dans des hôpitaux conventionnels à cause de la discrimination/stigmatisation qui y règne. La conséquence directe est le repli sur soi de ces personnes LGBTI PVVIH, qui refusent dorénavant de se rendre dans ces centres, s'abandonnant à la maladie et favorisant la propagation du VIH. Cependant, sachant le taux de prévalence au sein de la communauté HSH au Cameroun (37,2% avec 44% dans la ville de Yaoundé), on peut penser que pour ces chiffres qui datent de 2011, le "relâchement des actions de prévention" et la "banalisation de l'infection à VIH", entraîne une progression de la pandémie

**Méthode :** CAMFAIDS, pour résoudre cette situation, a mis en œuvre les actions suivantes :

Le plaidoyer envers les autorités des forces de l'ordre visant une protection des OSC identitaires qui luttent contre le VIH auprès des populations clés. A travers de nombreuses rencontres formelles et informelles avec les autorités administratives, le commissariat spécial de Nkolmesseng et le sous-préfet de Yaoundé 5 à qui nous avons demandé une assistance. La sensibilisation des populations riveraines en faisant du porte-à-porte, en les invitant lors des campagnes de sensibilisation et de dépistage. La sensibilisation de nos bénéficiaires à l'adoption d'un comportement plus responsable envers les autres et à une interpellation à l'observance du traitement.

**Résultats :** Le nombre de nos alliés dans le gouvernement est passé de zéro à 06, dont 02 commissariats (Mimboman et Nkolmesseng) et la DGSN, la brigade de Ngousso, le Sous-Préfet de Yaoundé 5ème et 02 chefs de quartiers sensibilisés qui nous soutiennent et ont donné des ultimatums aux riverains pour que cessent les violences

Depuis le début d'année 2018, nous avons mené 07 actions de sensibilisation contre le VIH à grande échelle contre 03 à la même période en 2017 et avons touchés 395 bénéficiaires

La demande en service de prévention au Centre CAMFAIDS s'est accrue et nous avons déjà distribué 6080 préservatifs à nos bénéficiaires entre janvier et février 2018

Prochaine Etape : Mener un plaidoyer au niveau national pour l'obtention d'un moratoire protégeant les OSC identitaires qui luttent contre le VIH auprès des populations clés

**Conclusion:** La lutte contre le VIH au Cameroun auprès des populations clés passe par l'assainissement du milieu de travail des OSC identitaires qui s'occupent de ces cibles. Nous avons démontré que par le plaidoyer, nos actions peuvent être plus importantes et que la lutte pour l'atteinte des objectifs 90-90 – 90 de l'ONUSIDA et l'éradication du sida nécessite une société plus tolérante envers toutes les couches de la population.

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### Experiences of Foster Parents: Care and Protection of HIV Positive Children in Khayelitsha, South Africa

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Foster care is currently the main form of care available to HIV positive children in South Africa, who are no longer in the care of their parents. The number of foster care placements has been increasing rapidly due to the increase in the number of children orphaned by and living with HIV. South Africa has one of the highest numbers of HIV infection rate in the world which is mostly concentrated in townships. The objective of this study was to explore the role of foster parents or caregivers in providing care, protection, and addressing the needs of HIV positive children in Khayelitsha.

The qualitative study investigates in detail the experiences and challenges that foster parents caring for HIV positive children faced in Khayelitsha. The study was conducted through face to face in-depth interviews with nineteen foster parents who have

been caring for HIV positive foster children for a period of two years or more.

The study found out that the majority (85%) of the foster care parents interviewed had a general understanding of their perceived roles in foster care and protection of HIV positive children. However, despite their general knowledge of foster care, the research found that 80% of the foster parents did not know about the HIV status of their foster children and 60% reported that they fear the consequences of dealing with disclosure to their HIV positive foster children. The study found that the majority of foster parents were not adequately trained prior to fostering for an HIV positive child. For example, thirty-seven percent of the participants lacked enough knowledge to ensure adherence to antiretroviral treatment for children.

Moreover, several challenges reported by the respondents in the study include dealing with disclosure, stigma and discrimination of HIV positive children in the township (90%), lack of support from social workers (47%), negative attitude of health personnel at public health facilities during consultation visits which resulted on non-adherence to treatment, and managing substance abuse and behavioral problems exhibited by adolescent HIV foster children.

The majority of the respondents indicated that HIV positive children under their care often experience emotional trauma with little support from the government. In addition, the majority of foster parents acknowledged the foster grant given by the government but indicated that it was not enough to cater for the daily upkeep and special needs of the HIV positive children. In most cases, they had failed to adequately provide for the children basic needs as the cost of living was very high.

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### Index partner testing in the community key to identifying new people living with HIV (PLHIV)

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**Background:** According to UNAIDS (2017), 85% of people living with HIV(PLHIV) in Botswana know their status. The Advancing Partners and Communities (APC) project in Botswana funded by PEPFAR through USAID is implementing targeted HIV Testing Services (HTS) to identify the remaining PLHIV who are unaware of their status, placing more emphasis on index partner testing.

**Description:** HTS training was provided to lay HTS counsellors in collaboration with the Ministry of Health and Wellness (MoHW). APC developed Standard Operating Procedures (SOPs) on targeted HIV testing to guide HTS counselors on strategies to obtain contacts of sexual partners from newly identified PLHIV in the community. HTS counsellors were provided mobile phones, data bundles and local transport fare to facilitate access to index partners of newly identified HIV positives and those new on ARV treatment in the community for testing.

**Lessons learned:** All targeted testing modalities have potential to identify new PLHIV, however, index partner testing had a higher positivity rate than other testing modalities. From October 2016 to September 2017, the APC project tested 32,382 people for HIV and identified 2,012 positives (6.2% positivity). 3,365 people were tested through index partner testing with 17% testing HIV positive. Out of 17,574 clients tested through targeted home

testing, 6% tested HIV positive. Targeted mobile and VCT each had 3% positivity for the 10,481 and 962 people tested, respectively. Index partner testing is resource intensive and time consuming as repeated visits are required to obtain partners' information from newly identified PLHIV.

**Conclusions:** /Next steps: Index partner testing is an effective strategy to identify new PLHIV. Scale-up of index testing by all HIV testing organizations should be the leading strategy to identify new HIV positives, link them to HIV care and treatment and prevent further new HIV infections in Botswana.

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### Community-level monitoring, management and reporting of social harms and adverse events within a community-based HIV self-testing project in Southern districts of Malawi.

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**Background:** Self-testing for HIV (HIVST) provides highly accurate results and facilitates access to underserved groups of people thus contributing to the attainment of the first 90% of the UNAIDS 90:90:90 targets. Previous research on HIV testing has shown that fear for potential HIV testing-linked social harms is likely to impact testing uptake from the decision making process, throughout the testing process to post-test experience. This study reports social harms and adverse events monitored within a cluster randomized trial implementing a community-based HIVST project by Population Services International in four districts of southern Malawi.

**Methods:** A qualitative mapping exercise was carried out to identify existing community structures that were used to report social harms for the trial in selected villages. Twenty-two FGDs with community members which aimed at identifying existing reporting structures within communities to develop prototype reporting systems were conducted. 4 Key Informant Interviews with village heads were also conducted to understand issues of trust and relationships between community structures and the community members. 6 stakeholder participatory workshops were conducted to validate the identified (prototype) reporting systems. To monitor social harms and SAEs, weekly and monthly follow-ups with the reporting systems focal person were done, and quarterly monitoring visits were conducted to reinforce performance of the reporting systems.

**Results:** Community structures have been very key in reporting and managing social harms. After distribution of HIVST kits for Fifteen months, there has been low rates of reported social harms and SAEs. Uptake of HIVST has been high amongst the youth and women. More than 172,830 self-testing kits have been distributed and only thirteen cases have been reported through the established systems. Only three of the cases were directly linked to HIVST, which involved two marriage break-ups and discrimination after self-testing. All the reported cases were resolved by the reporting structures established. Due to a low

incentive nature of the reporting systems, there was a risk of members of the systems dropping off.

**Conclusions:** There is sparse evidence of social harms and SAEs in HIVST. However, the systems require active engagement of the victims since the reporting systems were operating passively. Working with established Community Based Organizations is an efficient mechanism for improving HIVST delivery.

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### Importance of effective community engagement and involvement in HIV/AIDS research and trials. A case of AIDS Clinical Trials Group Community Advisory Board in Kalingalinga, Lusaka, Zambia.

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**Background:** The Center for Infectious Diseases Research in Zambia, in 2007 had built a ultra-modern laboratory to support HIV/AIDS, T.B. HPV and other trials at the clinic. Members of the community had not been adequately informed on the purpose of the facility, were suspicious and rumors began to circulate that foreigners were getting blood samples for satanic activities. Health workers and research site staff at the health center lived in constant fear of being attacked either at work or home, since all were considered to be Satanists. One Volunteer outreach worker's house was set ablaze by members of the community and she had to flee to another town. To address this problem, the Community Advisory Board and the research staff at the clinic took a courageous step and decided to intensify community education.

**Methods:** The members of the Community Advisory Board reached out to various segments of the community such as marketeers, youth sports teams, Church leaders, men and women's groups, HIV/AIDS support groups, and civic leaders among others. Clinical research trials, their importance and processes were discussed. Tours of the laboratory and other facilities were also conducted.

**Results:** Myths and misconceptions over clinical trials and clinic laboratory facilities were corrected and participants now inform others on the importance of HIV/AIDS research and community participation. Site-staff- community relations have become sound and accrual has equally improved.

**Conclusions:** Success of any HIV/AIDS clinical trial or research is to a great extent dependent on effective community sensitization, education, involvement and participation. Without these, there will be negative speculation, myths, misconceptions, reduced or community apathy in HIV/AIDS trials. This may also lead to non-adherence to HIV/AIDS and T.B treatment which causes further complications that come with drug resistance and impacting negatively on the fight against the HIV/AIDS problem.

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### Unchanged HIV prevalence trends among age sets of infants born to HIV infected mothers

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**Background:** Kenya estimates 13,000 new infant HIV infections annually. Various PMTCT programmes including antenatal services and HIV testing and treatment during pregnancy are in place for women and their infants. However, unchanged HIV prevalence within subsequent years among the infants poses health concerns. Therefore, this study aimed at determining the trends of HIV prevalence among age sets of early infants born to HIV infected mothers.

**Methods:** This was a cross-sectional study from 2012-2013, 2013-2014, 2014-2015, 2015-2016, 2016 to 2017 which involved a total of 792, 800, 745, 756, 810 respectively blood samples collected from infants aged ≤18months. Samples were analyzed in Kenya Medical Research Institute using automated PCR assays. Descriptive statistical tests and chi-square were used to analyze prevalence and trends respectively. Samples collected per year for each age set were as follows: 2012 to 2013, 122, 124, 120, 121, 104, 100 and 101 samples from ≤ 1.5, 1.6-3.0, 3.1- 6.0, 6.1-9.0, 9.1-12.0, 12.1-15.0 and 15.1-18 months old infants. 2013 to 2014, 124, 120, 119, 125, 102, 104 and 106 were collected from ≤ 1.5, 1.6-3.0, 3.1- 6.0, 6.1-9.0, 9.1-12.0, 12.1-15.0 and 15.1-18 months old infants. 2014 to 2015, 100, 102, 119, 104, 111, 110 and 99 were collected from ≤ 1.5, 1.6-3.0, 3.1- 6.0, 6.1-9.0, 9.1-12.0, 12.1-15.0 and 15.1-18 months old infants. 2015 to 2016, 105, 100, 121, 105, 110, 108 and 107 were collected from ≤ 1.5, 1.6-3.0, 3.1- 6.0, 6.1-9.0, 9.1-12.0, 12.1-15.0 and 15.1-18 months old infants. 2016 to 2017, 113, 109, 125, 125, 113, 114 and 111 were collected from ≤ 1.5, 1.6-3.0, 3.1- 6.0, 6.1-9.0, 9.1-12.0, 12.1-15.0 and 15.1-18 months old infants.

**Results:** 2012- 2013, HIV prevalence were as follows: ≤ 1.5 months old, 4.1%; 1.6-3.0, 4.0%; 3.1- 6.0, 5.0%; 6.1-9.0 months, 10.7%; 9.1-12.0 months, 10.6%; 12.1-15.0 months, 9.0% and 15.1-18 months, 5.9%. 2013-2014, prevalence was as follows: ≤ 1.5 months, 3.2%; 1.6-3.0 months, 3.3%; 3.1- 6.0 months, 4.2%; 6.1-9.0 months, 10.4%; 9.1-12.0 months, 9.8%; 12.1-15.0 months, 8.7% and 15.1-18 months, 4.7%. 2014-2015, HIV prevalence was as follows: ≤ 1.5 months old, 3.0%; 1.6-3.0, 3.8%; 3.1- 6.0, 4.9%; 6.1-9.0 months, 9.6%; 9.1-12.0 months, 9.9%; 12.1-15.0 months, 9.1% and 15.1-18 months, 5.1%. 2015-2016, HIV prevalence was as follows: ≤ 1.5 months old, 3.2%; 1.6-3.0, 3.6%; 3.1- 6.0, 4.5%; 6.1-9.0 months, 9.5%; 9.1-12.0 months, 9.5%; 12.1-15.0 months, 9.3% and 15.1-18 months, 6.2%. 2016-2017, HIV prevalence was as follows: ≤ 1.5 months old, 3.1%; 1.6-3.0, 3.3%; 3.1- 6.0, 4.4%; 6.1-9.0 months, 9.0%; 9.1-12.0 months, 9.3%; 12.1-15.0 months, 9.3% and 15.1-18 months, 5.6%.

**Conclusion:** Statistical test revealed that, there were no significant differences in the trends of HIV prevalence. More studies are needed to elucidate these stunted changes regardless of PMTCT shifts in the country. Information gathered from this study will advise on the general management of infants born to HIV infected mothers.

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### Cultural practices that spread HIV among adolescents in rural Mulanje district

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HIV prevalence among adolescents (15-24) in urban is estimated to be as twice as much higher than in rural areas. The spread of HIV in urban areas is attributed to increase in social interaction due to existence of multiple recreational facilities where most youths congregate and celebrate. In rural areas most adolescents undergo various cultural initiation ceremonies to prepare them for adulthood, and this promotes the spread of HIV among them. One harmful cultural practice called "kusasa fumbi," where multiple initiated adolescents were forced to have unprotected sex with a single person, has been abolished in Malawi. The present study was conducted to find out how capable are the remaining initiation ceremonies (Chinamwali and Zoma) of contributing to the spread of HIV among adolescents in Mulanje district.

The study used a triangulation research design where 1 CDSS was selected purposively from which samples of 100 learners and 4 key informants from surrounding community were obtained randomly. Data were collected through questionnaires, in-depth interviews and observation, and then statistically analysed using Online SSS and tested by Fisher's exact test to determine the degree of association to which learners agree that initiation ceremony has contributed to the spread of HIV and alternatively not.

It was reported by 75% of the key informants that during the initiation ceremony adolescents are taught sex lessons such as how to handle a sex partner during sexual activity. The adolescents under initiation are also given herbal aphrodisiac to stimulate their sexual desire. Of the learners 68% indicated that initiated adolescents have high sexual desire soon after ceremony are later involved in unprotected sex with experienced partners. However, the Fisher's exact test value is 0.532285 at  $\alpha=0.05$  implied that the role of initiation ceremonies is not statistically significant in spreading of HIV.

The study has demonstrated that initiation ceremonies have potential of spreading HIV though at low rate. The use of aphrodisiacs by adolescents increases their sexual drive which culminates in sexual activities. The ultimate principle of the abolished "kusasa fumbi" practices is also embedded in other cultural practices in that they complete their process by act of unprotected sex with an experienced person. The government and relevant stakeholders should take a leading role to encourage traditional leaders to expose and involve youth in only non-harmful cultural practices.

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### Evaluation of HIV Prevention Programs in addressing Sexual and Reproductive Health needs Targeted on Changing Knowledge, Attitude and Behaviors among Students and Young University Staff in Ethiopia

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**Background** and objective: HIV/AIDS is one of the worst population health and development crises in Africa where over 88 percent of HIV infection and sexual and reproductive health (SRH) problems affecting the youth aged between 15 and 25, and over 60% women. The University students and staff are not immune from the risks and impacts of the epidemic. This study sought to assess risks to HIV/SRH problems and trends of change

in the level of knowledge, attitude and behaviors of students and young staff community in the selected higher education institutions in Ethiopia.

**Method:** A cross-sectional survey was conducted between April and July 2017. Mixed methods of combining structured survey questionnaire (conducted first), focus group discussions and key informants interviews (to draw out insights gained from the quantitative part) were conducted.

**Results:** Out of 1750 respondents, 1738 returned the questionnaire. The majority (79%) of respondents generally aware about the HIV related risk factors, ways of transmission (76%) and HIV prevention (72%) and related HIV/SRH problems. All respondents never perceive their specific risk for HIV. Unsafe sex and multiple concurrent sexual partnerships (MCP) were reported by 68% of female students joined the universities from rural settings, among all socio-cultural and religious groups, and 58% of young teaching staff. No significant change in the level of comprehensive knowledge on combination prevention programs and compatibility with the desired behavior change towards SRH problems and HIV. Qualitative data support this finding.

**Conclusion:** Positive changes in awareness and attitudes toward HIV/AIDS were identified, yet trends and levels of comprehensive knowledge and compatibility with safe behaviors are found inadequate or lacking. Based on the findings of the study a model for contextualized combination prevention intervention program is suggested for future actions of owning and sustaining feasible programs for the youth in the higher education institutions.

Key words: HIV/AIDS, SRH, Higher Education, Prevention, Ethiopia

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### Successful intervention program on biomedical HIV prevention education for adolescents in Lagos, Nigeria

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**Aim:** Behavioral patterns acquired during adolescence tend to last throughout adult life. In view of the growing prevalence of HIV infection among adolescents in Nigeria, it was important to educate and support adolescents to access biomedical HIV prevention tools. The project focused on reaching out to adolescents to dispel myths and misconceptions on HIV acquisition/transmission, facilitate their access to HIV testing services (HTS), and educate them on how to access biomedical HIV prevention tools.

**Method:** The target population were adolescents attending lectures in preparation for the exams into higher institutions in Nigeria. Students attended a 90 minutes session twice a week led by a trained youth. Twelve main topics on HIV, AIDS, sexual and reproductive health, male circumcision, female gender mutilation, biomedical HIV prevention tools, PrEP, PEP and microbicides including their uses, accessibility, common myths and misconceptions were covered over a 3 months period. Condom demonstrations and songs on behavioural change communication were part of training activities. Skills building sessions were also included. Each session ended with a question and answer session.



**Findings:** Peer led interventions can facilitate access of adolescents to HIV prevention services. Within a 3 months period, the 86 adolescents who were exposed to the three months intense education session attended the complete 24 sessions; 431 adolescents were sensitized through community outreaches; 2,750 adolescents were through Instagram; and 67 persons had access to HTS for the first time. Only 95% of the adolescents reached had learnt about new HIV prevention tools. Contacts with adolescents for follow up activities can be challenging as most had to rely on the use of cellphones of friends/relatives: only 28% of adolescents reached through this programme had their personal cellphone. Adolescents also require constant assurance of your trust/confidentiality before they open up and discuss personal sexual and reproductive health issues.

**Conclusion:** Peer led educational sessions using face to face encounters and online platforms can help improve adolescents' education on HIV prevention. Face to face meetings is more suitable to facilitating access of adolescents to HTS. The use of the cellphone for interactions with adolescents in Lagos State can be challenging as a significant proportion do not have personal cell phones. The State needs to create more opportunities for peer led interventions for adolescents.

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### Factors associated with HIV testing among adolescents and young adults (15-24 years) living in high-burden setting in western Kenya

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**Background:** Identifying individuals with undiagnosed HIV infection and linking them to antiretroviral (ART) treatment can be effective in reducing onward HIV transmission. In spite of efforts towards increasing HIV testing services (HTS) in the last two decades, the proportion of undiagnosed HIV infection is still unacceptably high among adolescents and young adults (AYA) in sub-Saharan Africa. To address lower HTS uptake among AYA compared to older adults, understanding the factors associated with HIV testing is essential to inform the design and implementation of tailored interventions for future scale-up of HTS services. In preparation for an HIV prevention study among AYA, we aimed to identify factors associated with lifetime and recent (in the past 12 months) HIV testing in the high-burden setting of Homabay County, western Kenya.

**Methods:** We conducted a cross-sectional study targeting AYA (15-24 years) with known HIV status mobilized through mobile health events. Eligible participants completed a computer-assisted personal interview (CAPI) that assessed sexual behavioral characteristics, HIV testing, and potential predictors of lifetime and recent HIV testing. Associations of demographic and sexual behavioural characteristics with the uptake of HIV testing were analyzed using logistic regression.

**Results:** A total 1093 participants, including 689 (63%) females were enrolled in the study. The mean age was 18.5 (SD=2.5) years, over one third (35%, 287/825) reported sexual debut below 15 years of age, 75% (626/832) had  $\geq 2$  sexual partners, and 43% (362/841) reported no condom use at last sex. Out of the 225 participants who engaged in transactional sex, 165 (73%) were female. Lifetime HIV testing and testing in the last 12 months was 86% (942/1093) and 56% (609/1093), respectively. The odds of lifetime HIV testing were higher among participants aged 20-24 years (adjusted Odds Ratio (aOR) = 2.04; 95%CI: 1.02-4.26; p=0.043), having secondary education (aOR=4.27; 95%CI: 1.36-21.34; p=0.010) and knowledge of partners' negative HIV status (aOR=6.19; 95%CI: 3.40-11.96; p<0.000). Factors associated with undergoing HIV testing in the past 12 months included: being female (aOR= 2.08; 95%CI: 1.21-3.63; p=0.008), having secondary education (aOR= 1.88; 95%CI: 1.14-3.16; p=0.012), multiple sexual partnership (aOR= 1.75; 95%CI: 1.12-2.77; p=0.015), knowledge of partners' HIV status (aOR= 2.39; 95%CI: 1.07-5.64; p=0.033) and being in the same age group with sexual partner (aOR= 1.70; 95%CI: 1.05-2.82; p=0.032).

**Conclusion:** Having secondary education and knowing partner's HIV-negative status were associated with both lifetime and recent (past 12 months) testing while age 20-24 was only associated with lifetime testing. On the other hand, being female, having multiple partners and being in same age category as the partner were associated with recent testing. To improve testing among AYA currently underserved, HIV testing programs should focus on: knowledge of partner status, AYA with low education level, adolescents 15-19 years, and males. The association between knowledge of partner's negative status and both lifetime and recent HIV testing suggest that couples are testing together and sharing results. Thus, coordination of testing by couples should be actively supported by HIV testing programs.

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### What motivates men to do voluntary medical male circumcision

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The aim of this study conducted at a munition supplier in Potchefstroom, South Africa, was to establish (from the perspective of male employees) what motivates men to do voluntary medical male circumcision (VMMC). This site was specifically chosen as an earlier onsite presentation about VMMC was found to motivate men to do VMMC. However, the reasons as to why some men underwent VMMC were never systematically collected.

A non-probability convenience sampling method was followed with all male employees eligible to participate. A self-administered questionnaire was completed (n = 36). In addition, 5 participants were approached randomly to be interviewed as part of the data collection process.

Main findings showed that the level of VMMC knowledge was high, as all the questions were answered correctly by 80%+ of the participants, except one question. That is, none of participants knew that VMMC at a public medical facility can be done for free.

The VMMC presentation held prior to the current study and peer influence were perceived as the major motivational factors for VMMC uptake. The following factors were also perceived by

most participants as motivating factors for VMMC uptake: (1) VMMC reducing the risk of HIV infection and STD infection for both themselves and their female partners, (2) VMMC increasing the sexual pleasure for both sexes, and (3) VMMC resulting in longer erections. Given the latter factor e.g. longer erections motivating men to have VMMC done, it may be surprising that one of the main reasons given by the respondents about what discouraged or prevented men from having VMMC were that VMMC might result in them having problems with erections. Another common reason given by the respondents about what discouraged or prevented men from having VMMC was having to take time off work to have the procedure done.

Possible surprising findings were that barely half of the participants reported that they will be motivated to do VMMC if their doctor advised them to do so, while the post procedure complications of this procedure were not viewed as a deterrent for VMMC uptake. Possible encouraging findings were that (1) perceived stigma about VMMC amongst the workers was low, and (2) almost half of the participants said men would go for VMMC if their female partners encouraged them to do so.

Based on the above findings, main recommendations included that more VMMC programmes and presentations be arranged at the workplace, and to include the employees ("peers") who did VMMC at the workplace as part of these interventions. Furthermore, more information on the following themes related to VMMC are recommended for inclusion as part of e.g. follow-up HIV and VMMC training sessions, as participants seemed to be misinformed about: (1) VMMC that can be done at no costs by a clinician in a Government hospital, local clinic or at the workplace, (2) the possible complications of VMMC, and (3) that taking time off work following VMMC during the healing period is allowed.

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### Optimizing Index case HIV testing to reach the 1st 90 in Benue state Northern Nigeria: AIDS Healthcare Foundation Experience

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**Background:** HIV Counselling and testing is the entry to Antiretroviral therapy program. Majority of people infected with HIV do not know their status in sub Saharan African countries. AIDS Healthcare Foundation currently implement comprehensive prevention, care and treatment services in 7 local government areas with a state prevalence of 15.4%. This study aims to analyse and share the successes of identifying HIV positive clients using the index case testing.

**Methods:** Index case testing is provided following identification of HIV positive client(index) who had been confirmed with a Unigold or stat pak test kit during the community outreaches models or HIV tests done at different service delivery points in health facilities. All positive cases are referred through escort services for enrolment and baseline investigation while eligible clients commenced on appropriate antiretroviral drugs. Retrospective data from desk review was analysed using descriptive statistical method.

**Results:** Over a period of 12 months, a total of 879 households of index case was visited, 4823 index case HIV tests (41% male, 59% female) was done with 147 positive cases (1.0% male, 2.0% female) seen. 141(2.9%) of the positive clients were linked to treatment clinics and commenced on antiretroviral drugs. 6(0.1%) of the clients declined treatment due to self -denial and stigmatization.

**Conclusion:** The positive yield from the testing activity demonstrates a high potential in index case HIV testing. Qualitative studies to address Structural barriers need to be explored for scale up ART services in rural settings.

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### Description of a High Risk Single Women Cohort in Zambia for HIV Efficacy Trials

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**Background:** Worldwide, Female Sex Workers (FSW) and single women with children under 5 years old (U5) are High Risk (HR) groups for HIV. In Sub-Saharan Africa, 66% of new HIV infections occur in women aged 15-24. The Zambia Emory HIV Research Project (ZEHRP) describes a cohort of high risk single HIV negative women in Ndola, Zambia that would benefit from future HIV vaccine efficacy trials.

**Materials & Methods:** Women enrolled in the HR cohort reported to ZEHRP after one month and then quarterly. Women are tested for HIV, syphilis, and trichomonas and are administered questionnaires about pregnancy, contraceptive use, and breastfeeding. We analyzed data on self-reported pregnancies; breastfeeding; contraceptive use, and HIV and STI incidence and prevalence.

**Results:** 418 single women (237 U5; 181 FSW) are currently being followed in the HR cohort in Ndola, Zambia. Syphilis prevalence at baseline was 11% among U5 and 7% among FSW, while trichomonas prevalence at baseline was 11% among U5 and 13% among FSW. At the most recent follow-up visit, 55% of U5 and 39% of FSW reported being on effective contraceptive methods (injectable, implant, IUD); 7% of U5 and 8% of FSW reported pregnancies; and 19% of U5 and 28% of FSW reported breastfeeding. HIV sero-incidence is 2.7/100PY (95%CI: 1.4, 4.6) among U5 and 2.9/100PY (95%CI: 1.7, 4.5) among FSW. A subset of 256 single women had baseline samples tested for chlamydia (CT) and gonorrhea (NG). The combined CT/NG prevalence was 17 % for the cohort with 16% for U5 and 19% for FSW.

**Conclusions:** We show that women in the HR cohort are ideal candidates for HIV vaccine efficacy trials. A low percentage of women reported pregnancies and breastfeeding, which is ideal given that pregnant or breastfeeding women cannot participate in vaccine trials. Opportunities exist to educate women on contraception if they do not want children in the next two years. HIV and STI incidence and prevalence demonstrates women are at risk for HIV.

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### Fostering HIV/AIDS prevention in Nigeria through adequate male involvement in contraceptive usage

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Since the advent of HIV/AIDS pandemic, many countries have stepped up efforts to stem the spread of the disease. In most these countries, the efforts at curtailing the spread of the disease centred on prevention as the most appropriate approach. Nigeria has the second largest number of people living with HIV/AIDS (PLWHIV) in the world and adopted the ABC (abstinence, be faithful and use condom) prevention approach. However, there are questions regarding the reliability of the ABC approach as effective preventive measures, with special emphasis on the first two points (abstinence and being faithful), in a society with high level of sexual activities. Also, the messages on HIV/AIDS prevention in the country tend to project the female as having more responsibilities in preventing the spread of the disease. This is despite the fact that men usually dominate the decision-making processes in sexual negotiation in a patriarchal society. Thus, adequate involvement of male in contraception is critical to HIV/AIDS prevention in Nigeria.

This study was conducted among 800 respondents (for the quantitative) and 24 participants (for the qualitative) in selected local government areas in Delta State, Nigeria. The study focused on males and explored their attitudes towards HIV/AIDS test/counselling, level of knowledge of HIV/AIDS status, and the relationship between HIV/AIDS test/counselling and regular usage of condom.

Findings indicate a low level of knowledge of HIV/AIDS status among the respondents. The level of current use of condom is low (36.4%) while regular use is about low 6.5%. Result also showed that a significant relationship exists between knowledge of HIV/AIDS status and regular usage of condom. Revelations from qualitative data suggest that some of the factors responsible for low adoption of condom include lack of regular availability and the tendency of condom to burst during sexual intercourse.

In general, males' attitude to contraceptives is low. It was recommended that condoms be made available and free, and distributed through local stores and public facilities. Male-focused programmes should be designed to stimulate higher contraceptives acceptance and responsibility among men.

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### Accelerating adolescents' HIV programme interventions in Rwanda

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**Background:** Global analysis reveals that major achievements have been made on the HIV response though challenges remain among adolescents (10-19 year age group) where new HIV

infections and AIDS related deaths are not decreasing at the same rate as in younger children and adults. AIDS remains a leading cause among adolescents. In 2015, Rwanda was prioritized as one of the 25 countries for "All In" call to action to accelerate HIV results for adolescents as a means to steer the country towards achieving the global target of "90 - 90 - 90" by 2020 and ending the AIDS epidemic. This abstract presents findings of an assessment on coverage and gaps in adolescent programming in Rwanda.

**Methodology:** A desk review of national programme documents and reports, data from national surveys such as Rwanda Demographic and Health Surveys, Behaviour Surveillance Surveys, and UNAIDS Spectrum estimates were used to analyze adolescent demography, HIV epidemiology and sexual and reproductive health (SRH) issues. A questionnaire on enabling environment was administered to key national stakeholders and responses were scored on a scale of 0-10. A workshop was conducted with adolescents and their views on participation and engagement in planning and implementation of adolescent programs were solicited. The data was entered in an excel-based tool 'Adolescent Assessment and Decision Makers' was used to display findings in a dashboard.

**Results:** Adolescents constitute 23% of the total population, of whom 10.5% are 15-19 years. Young girls are five times as likely to be living with HIV as compared to boys of the same age, 2.5% vs. 0.5% respectively. HIV incidence is higher among young people compared to the general population (0.33% vs 0.27%). The uptake of HIV prevention services among adolescents 15-19 years remains low: HIV testing is less than 30%, condom use is 61% for adolescent girls and 75% for boys, male circumcision is at 24% and ART among adolescents living with HIV is 34%. Of the adolescents who access HIV testing, 97% are linked to treatment and 75% are biologically suppressed (VL<20 copies/ml).

**Conclusion:** Adolescent's needs on SRH remain unmet, particularly for HIV. The low access and utilization of HIV services is a wake-up call and Rwanda will ensure the country operational plan for adolescents is implemented and monitored to achieve the national targets.

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### Causal relationship between risky sexual behavior and HIV testing among young adults (18-35 years) in Uganda: a structural equation analysis

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**Introduction:** HIV testing is widely accepted as the cornerstone of HIV prevention programmes because of its multiple benefits (First 90 of the UNAIDS, 90:90:90 Goals). Despite advantages of HIV testing, uptake in Uganda remains disappointingly low with reports of 12% to 56% testing rates. HIV testing is particularly low among young adults who also engage in risky sexual behaviors including having multiple sexual partners, inconsistent condom use and engagement into sexual actions at an early age. We assessed the causal relationship between risky sexual behaviors and HIV testing among sexually active Ugandan young-adults aged 18-35 years.

**Methods:** We used data from the 2011 Uganda Demographic and Health Survey from both the women and men questionnaires (excluding young-adults that had never had sex and young women who had given birth in the last one year). We used descriptive statistics and frequency distributions to describe continuous and categorical variables respectively. Generalized Structural Equation Modelling (GSEM) was used at multivariable level to assess direct and indirect associations of risky sexual behaviors (multiple sexual partners, inconsistent condom use and early sexual debut) on HIV testing status (endogenous variables) and exogenous variables of sex, education level, marital status, residence, exposure to media and HIV knowledge.

**Results:** From a total 11,969 respondents (8,674(72.5%)-females and 2,295(27.5%)-males); 4,181 were included into the study since they met the inclusion criteria. Majority of the respondents; 3,120/4181(65.2%) were females with a median age of 26(IQR=22-30) years. For endogenous variables, 523/4181 (12.5%) had sex before 15 years; 980/4181 (23.4%) had multiple sexual partners; 3,704/4181 (88.6%) did not use a condom during their last sexual intercourse while 3,054/4181(73%) had ever taken an HIV test and received results. At the multivariable analysis (GSEM), HIV testing was found to be more likely among young adults with multiple sexual partners [OR=1.3 (95% CI: 1.1-1.5)] and less likely among females [OR=0.6 (95% CI: 0.5-0.7)]. HIV testing was indirectly influenced through multiple sexual partners status by inconsistent condom use [OR=1.5 (95% CI:1.2-1.9)]; primary education [OR=1.8 (95% CI:1.2-2.6)] and post-primary education [OR=3.0 (95%CI: 2.0-4.5)] compared to non-educated young-adults; rich wealth index [OR=1.8 (95% CI:1.4-2.3)] and middle wealth index [OR=1.7 (95% CI: 1.3-2.2)] when compared to the poor; rural residence [OR=0.6 (95% CI:0.5-0.7)] and female sex [OR=0.3 (95% CI:0.2-0.4)]. It should be noted that risky sexual behaviors of condom use [OR=0.9 (95% CI: 0.8-1.1)] and early sexual debut [OR=1.1 (95% CI: 0.9-1.3)] did not directly affect HIV testing status among young adults.

**Conclusion:** We observed an association between risky sexual behaviors and HIV testing among young adults in Uganda particularly a direct effect from having multiple sexual partners and an indirect effect from inconsistent condom use. We recommend for the increased distribution of condoms, increase in mass media messages on HIV testing, and designing of current strategies for reduction of risky sexual behavior among this population.

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### Predictors of and barrier to condom use in the African cohort study

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**Introduction:** Habitual condom use is influenced byHIVstatus as well as environmental, social and structural factors.

Improved understanding of these factors among individuals in sub-Saharan Africa is needed to inform HIV prevention efforts. We assessed condom use with a regular partner by participants in a multi-site cohort in sub-Saharan Africa.

**Method:**The African Cohort Study (AFRICOS) prospectively enrolls adults at 12 PEPFAR-supported clinics in Tanzania, Uganda, Kenya, and Nigeria. Upon enrollment, participants complete a socio-behavioral questionnaire that includes questions about condom use at last sex with a regular partner. Participants who reported not using condoms at last sex with a regular partner are asked reasons for not using them. Enrollment data for HIV-infected participants that reported at least one regular partner in the last six months were included in these analyses. Chi-squared tests were used to compare condom use status with a regular partner at last sex and, among those not using condoms, to compare reasons for not using condoms by demographic characteristics. Generalized linear models with Poisson distribution and robust errors were used to estimate unadjusted and adjusted prevalence ratios (aPR) and 95% confidence intervals (95% CI) for association between various factors and condom use.

**Results:** As of September 2017, 2302 participants reported having one regular partner in the six months prior to enrollment. The majority (54.0%) were aged 25-39 years, female (53.4%), and HIV-infected (79.5%). An HIV-infected regular partner was reported by 48% of these participants. In the multivariable analysis, increased condom use at last sex was associated with higher age 40-49 years aPR: 1.25[95% CI 1.08-1.45]; 50+ years 1.22 [1.04-1.42], compared to participants age 18-24 years, specific sites Kericho 2.02 [1.77-2.30]; Kisumu 1.92 [1.68-2.20]; Tanzania 1.33 [1.13-1.57], compared to Uganda, being HIV-infected (1.27 [1.17-1.39], compared to HIV uninfected, and having an HIV-infected regular partner (1.09 [1.02-1.16], compared to an HIV-uninfected regular partner. Decreased condom use was observed among married participants (0.78 [0.70-0.87], compared to single participants and those whose regular partner), had unknown HIV status (0.78 [0.71-0.86], as compared to an HIV-uninfected regular partner). Eighteen percent of HIV-uninfected participants endorsed "I trust my partner" as reason for not using a condom compared to 8.5% of HIV-infected participants (p<0.001). "Partner disapproval" as reason for not using a condom differed by HIV status (4.6% of HIV infected participants vs 2.5% of HIV-uninfected participants, p=0.047), gender (7.2% of female participants vs 0.7% of male participants <0.001) and age (7.0% of participants aged 18-24 years, 4.9% 25 -39 years, 3.0% 40-49 years and 1.6% 50+ years, p=0.0006). "Allergic" was reported as reason for not using a condom among 1.7% of HIV-uninfected participants compared to 0.6% of HIV-infected participants (p=0.0192).

**Conclusion:** Increased condom use was associated with increased age, being HIV-infected and having a HIV-infected partner which may reflect increased knowledge and more interactions with the healthcare system. Partner disapproval was highly endorsed by female and younger participants suggesting that these populations need to be empowered to negotiate condom use when designing HIV prevention and counseling models

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### Acceptability of Mucosal Specimen Collection amongst HIV Vaccine Clinical Trial

## Participants at Makerere University Walter Reed Project, Kampala, Uganda

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**Background:** Human Immunodeficiency Virus (HIV) is predominantly sexually transmitted across genital or rectal mucosae. Understanding mucosal immune responses is critical in informing HIV vaccine approaches or candidates. We describe the acceptability of rectal and genital mucosal collections among low risk participants in HIV vaccine trials at a clinical site in a low resource setting.

**Methods:** We retrospectively reviewed source data for participants screened for two HIV vaccine trials, a phase I and a phase I/II, conducted between May 2012 and September 2017. Consent for optional mucosal collections was obtained at the screening visit. Sample collection was required at 6 or 7 scheduled time points. Data on mucosal collections including; soft cup (SC); semen (S) and rectal sponge (RS) for males/females were reviewed. Acceptability was defined as consent to collect at least one sample type. We also assessed whether acceptability was sustained at all time points. We employed simple descriptive statistics to analyse screening and mucosal collection data.

**Results:** A total of 133 participants were approached for mucosal collection of which 75.2 % (n=107) were males. Overall, 74.4% (99/133) consented to at least one mucosal type, majorly to Semen collection, 75.7% (n=81/107) and soft cup collections, 69.2% (n=18/26) and least to rectal sponging, 30% (21/70). Only 46.5% (46/99, 42 males and 4 females) of those who consented for mucosal collection met eligibility for the main studies and were available for mucosal collections. Majority, 100% (n=4/4), 90.5% (n=38/42) and 88.9% (n=8/9) provided at-least one sample for SC, S and RS respectively. Only 8.7% (n=4), all males, failed to collect semen and 2.2% (n=1) females failed to collect RS throughout the study. There was no consent withdrawn for any mucosal collection throughout the studies. Reasons for unacceptance of mucosal collections included: lack of masturbation experience, perceived discomfort of the procedures and menorrhagia.

**Conclusion:** Mucosal collections are acceptable in HIV vaccine studies. However, the main studies' high screen failure limited the mucosal sample pool. Strategies of reducing the high screen failure to maximize on samples need to be explored.

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## HIV Screening Strategy to boost HIV testing in Dakar AIDS Center

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**Background:** « Test All Treat All and Retain all persons living with HIV (PLHIV) in care places: TATARSEN » is a main challenge of Senegalese AIDS programme.

This paper aims to share learned lessons about HIV screening strategy for family of persons living with HIV (PLHIV) followed in

the AIDS Center of Dakar (CTA) and other patients of Fann Hospital.

**Methods:** This is an experimentation carried out from July to December 2017 in AIDS Center of Fann hospital/Dakar for testing, treat and retain PLHIV in care places.

- First activity consisted in a strengthening capacity session for 30 persons working in Fann Hospital about Counseling and HIV testing.
- HIV screening was strengthened with a strategy of proposal :
  - . HIV screening to the patients seen in consultation or hospitalized in the departments
  - . HIV screening to the sexual partners of PLHIV
  - . HIV screening to the children of the PLHIV with the support of social workers, PLHIV communities.
- The initial blood test, to start antiretroviral treatment, was available and free.
- Viral load monitoring was available and free too.
- A therapeutic educational was organized for the PLHIV in viral bounce.
- Lost follow up patients were looked for.

**Results:** From July to December 30th, 2017: A total of 1653 persons, from 10 differents services of Fann Hospital or from PLHIV communities, benefited of HIV screening. Mean age was 29 years (1 - 87), median age: 27 years, 54 % were female (sex ratio: 0,8). Among 1653 testing persons, 26 % were sexuals partners of PLHIV or children of PLHIV, 9 % of pregnant women , 4 % tuberculosis patients and 1 % hepatitis B carried. Among 1653 testing persons, 72 were HIV positive: Positive rate 4 %.

**Conclusions:** « Test All Treat All and Retain all persons living with HIV (PLHIV) in care places : TATARSEN » strategy allowed to boost HIV screening, targeted sexuals partners of PLHIV and children of PLHIV in Dakar AIDS center (CTA) compared with 2016. It's an HIV prevention strategy.

The implication of local communities and PLHIV associations was decisive in achievement of the fixed indicators.

Our experimentation shows communities and PLHIV implication in an HIV screening and prevention strategy.

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## HIV Self-testing secondary distribution by young women reaches more than just young women in rural South Africa, Bushbuckridge.

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**Background:** In order to reach the first 90% of the UNAIDS 90/90/90 targets, novel approaches, such as introducing HIV self-testing to young women, are important as young women remain the epicenter of the HIV epidemic in South Africa. Adding secondary distribution of test kits to peers and partners could help identify and link to treatment undiagnosed HIV infections. We aim to describe who young women distributed self-test kits to in rural South Africa.

**Methods:** From December 2016 to December 2017, 287 young women aged 18-26 years were enrolled in a randomized

controlled trial in rural Agincourt, South Africa. Participants were randomized to either clinic-based HIV Counselling and Testing (HCT arm) or given a choice between HCT or Oral HIV self-testing (choice arm). The young women were then given either 5 referral cards for HCT or 5 HIV self-test kits, based on their randomization arm. Young women were asked to return 3 months later to share their testing and distribution experience. During their follow-up visit, young women provided the contact information of the peers and partners they distributed their testing packages to. We used the contact information to invite the peers and partners to attend a study visit where we asked about their testing experience.

**Results:** 287 young women were enrolled in the study; 49% were randomized to the choice arm (135/141 96% HIVST, 6/141 4% HCT) and 51% to the HCT arm. 273/287 (95%) young women returned for their month 3 visit; 136 under the choice arm (130/136 96% HIVST, 6/136 4% HCT) and 137 under the HCT arm. 15% of young women who attended their 3-month visit had given a HCT invitation card or a HIVST Kit to at least 1 person 10 years older than themselves, a total of 53 peers and partners, ranging in age from 36-77 years old. Under the choice arm 37/53 (70%) were invited, of those none were partners: 7 were friends, 26 were relatives, and 4 were categorized as other. Under the HCT arm 16/53 (30%) were invited, of those 1 was a partner, 1 was a friend, 13 were relatives, and 1 was categorized as other. 1/37 (3%) young women in the choice arm reported getting a negative reaction when offering a kit/card to an older peer/partner compared to 4/16 (25%) in the HCT arm. No one in the choice arm had difficulty persuading older peers/partners when offering a kit/card but 3/16 (19%) reported difficulty in the HCT arm. In the choice arm 14/37 (38%) tested together with their older peers/partners compared to 1/16 (6%) in the HCT arm.

**Conclusion:** While the aim of this randomized control trial was to reach young people, the distribution of self-test kits to older peers and partners resulted in fewer negative reactions and difficulty compared to inviting peers and partners for HCT. Furthermore, more than one-third of participants tested with their peer or partners. HIV self-testing secondary distribution by young women can reach middle age and older adults, particularly family and friends of these young women.

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### Systematic Scale up of Oral Pre-Exposure Prophylaxis in Routine Health Services in Nairobi County: Experiences from the Jilinde Project in Kenya

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**Background:** Kenya has a high HIV burden that is disproportionately distributed across the 47 counties. Nairobi County has the highest number of people living with HIV. New HIV infections in Nairobi County have been attributed to large proportions of key populations (KPs), which include female sex workers (FSWs), men who have sex with men (MSM) and people who inject drugs (PWIDs). Following the World Health Organization (WHO) 2015 recommendation of oral Pre-Exposure Prophylaxis (PrEP) as an HIV prevention strategy for those at substantial risk, and inclusion of oral PrEP in the 2016 Guidelines on Use of Anti-retroviral Drugs for Treating and Preventing HIV infection in Kenya, by the Ministry of Health, Nairobi was among the first Counties to scale up PrEP. We describe a systematic

approach employed by Jilinde, a four-year project, funded to introduce PrEP services within existing health systems in Nairobi County.

**Materials & Methods:** PrEP scale up in Nairobi County began in October 2016 with an introductory meeting with the County Health Management Team (CHMT) and other implementing partners, where lessons from the PrEP demonstration projects implemented in Kenya were shared. These lessons informed the development of a county PrEP scale up plan. Through this plan, 57 health facilities that were already providing HIV prevention services to key populations and other high risk groups were selected and assessed to determine their capacity to deliver PrEP. The assessment was based on pre-determined criteria, such as human resource capacity and service delivery infrastructure. Assessment feedback was used to select the final list of 35 sites, and a plan was developed to prepare the sites for PrEP roll out. Subsequently, 76 health service providers that included clinical officers, nurses and pharmacists were trained using the national curriculum "Pre-Exposure Prophylaxis for the prevention HIV infection – A toolkit for health service providers". The trained providers then conducted whole site orientations in their respective facilities to ensure all facility staff were provided with accurate information about PrEP in order to gain overall facility-level support. Next, 197 peer educators and community health volunteers were trained to conduct PrEP demand creation activities and refer clients to the facilities. Participating sites were stocked with PrEP commodities, leveraging on the existing anti-retro-viral drugs supply chain. Service provision commenced in April 2017. Supportive supervision and on-the-job training were implemented on an ongoing basis. Performance review meetings were conducted to identify and address implementation challenges.

**Results:** Between April and December 2017, a total of 3758 clients were initiated on PrEP in Nairobi County; that includes 2503 FSWs, 567 MSM, 289 sero-discordant couples, 396 general population clients and 3 PWIDs.

**Conclusions:** Systematic PrEP scale-up enhanced institutionalization of PrEP into county health systems, which is a major step towards successful integration of PrEP within routine service delivery. A participatory approach was used to ensure acceptability, ownership and sustainability of PrEP services within the existing healthcare system. This model provides a road map that can be adopted or adapted in other settings for seamless PrEP scale-up

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### Institutionalizing Sustainable Comprehensive Sexuality Education in a Resource Limited Setting: Lesson Learned from Teachers's Sensitization

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**Background:** Comprehensive Sexuality Education otherwise (CSE) known as Family Life and HIV Education (FLHE) programme was introduced in 2003 by the Nigeria government to equip in-school youth with the requisite knowledge, values and skills to

improve their reproductive health practices and prevent HIV. Though FLHE topics have been mainstreamed into school curriculum in the Federal Government Colleges (FGCs), the coverage of the programme were not being tracked by the teachers. Lack of adequate orientation of teachers on the delivery of CSE, its data capturing and reporting were identified as responsible.

**Description:** The World Bank HIV Prevention Development Project (HPDP II) through the National Agency for the Control of AIDS (NACA) supported the Federal Ministry of Education (FMOE) HIV/AIDS unit to scale up implementation of FLHE.

Teachers including vice principals, guidance and counselors across 104 Federal Government Colleges were sensitized on FLHE for the 2015/2016 academic session. They were sensitized on the modalities of FLHE implementation such as curricular (classroom delivery), community awareness and peer education (assembly talk, songs and drama) as well as data collation and reporting. Step down sensitization workshops were held for minimum of 18 Teachers and 2 management staff in each school in order to disseminate and deliberate on FLHE implementation strategies.

**Lesson Learned:** 4,554 teachers and management staff (male: 2,261 and female: 2,293) were sensitized. School management adopted implementation strategies and the use of school registers for reporting. About 97% of the FGCs started reporting after sensitization workshop. 104,329 students (37,752 male, 66,587 female) were reached with FLHE in 2015/2016 academic session. Orientation is important for effective implementation, coordination and reporting of FLHE. The programme provided school managements and teachers with understanding that FLHE can be implemented without additional resources for monitoring and record keeping.

**Conclusion:** /Next steps: Strengthen FMOE for effective coordination of FLHE implementation, data management on Education Management Information System (EMIS) and linkage with the National Health Management Information System (NHMIS). Advocacy to relevant stakeholders towards institutionalizing FLHE in Colleges of Education training curricula.

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### Factors associated with willingness to participate in HIV preventive vaccine trials in a high risk population in western Kenya

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**Background:** The successful conduct of a preventive HIV vaccine trial requires infrastructure and community engagement to support the recruitment and retention of an at-risk population with high incidence of HIV. In Western Kenya, we have identified and prospectively followed a population with a high burden of HIV infection. We assessed willingness to participate (WTP) in future HIV vaccine trials among adult men and women at risk of HIV infection in Kisumu County, Kenya, in order to determine the feasibility and acceptability of future vaccine research in this community.

**Methods:** From January 2017 to February 2018, 508 participants aged between 18 -35 years were screened for HIV infection as part of an ongoing observational cohort study designed to assess HIV incidence, participant retention and WTP in future HIV vaccine trials. Data were collected through questionnaires on demographics, sexual behaviors, vaccine knowledge and concerns about participating in an HIV vaccine trial. WTP was assessed through a close-ended question-"Would you be willing to participate in such a study to test an experimental HIV vaccine?" with yes/no/do not know/no response as the choices. Using a skip pattern and multiple choice questions, those who answered "yes" were further asked about personal advantages anticipated and those who answered "No" were asked why they are not willing to participate in a HIV vaccine trial. Data from the screening visit were extracted and descriptive methods were used to analyze the data. Chi-square or Fisher's exact test were used to assess associations between participants' characteristics and willingness to participate.

**RESULTS:** Among 508 participants, 40.4% were females and the median age was 26 (IQR 22-29). The HIV prevalence was 18%. Overall, 97.8% were willing to participate. WTP was more common among participants who exchanged commodities for sex as compared to those who did not (99.2% vs. 96.3%, p=0.03) and participants with more than one partner as compared to those with one or no partner (98.7% vs. 94.9%, p=0.02). Other factors such as level of education, income, occupation, and condom use were not significantly associated with WTP. Vaccine awareness was generally high in the study population (97.6%). The desire to help advance HIV prevention was an important factor in deciding to participate in a vaccine trial. Among personal advantages of participating in a vaccine trial, learning how to avoid risky behavior was most selected (98.9%) while monetary incentives were least considered (78.7%). Eleven participants were not willing to participate, among them 63.6% (7/11) cited fear of getting HIV and 54.5% (6/11) cited fear of vaccine side effects as reasons for not wanting to participate in HIV vaccine trials.

**CONCLUSION:** The vast majority of participants in this observational cohort study were willing to participate in a future HIV vaccine trial. This being baseline data, it is crucial to analyze further the trends of WTP, HIV incidence and participant retention as the study progresses.

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### "Might this pill decrease my libido?" Male perspectives on PrEP uptake and decline in Swaziland

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**Background:** HIV pre-exposure prophylaxis (PrEP) has the potential to substantially alter the trajectory of the HIV epidemic in hyperendemic countries provided that potential beneficiaries take up and adhere to the regimen. Heterosexual men are often at high risk for HIV infection due to multiple sexual partners and inconsistent condom use, but few studies have examined factors that compel or dissuade men from taking up PrEP. Studies that have drawn in male perspectives have focused on hypothetical insights (as PrEP had not yet been available), or gathered

perspectives from unique populations (injecting drug users, sero-discordant partners and men who have sex with men). Studies examining reasons for PrEP uptake or decline among heterosexual men in the general population are lacking.

**Materials & Methods:** Nested within a PrEP demonstration study in six primary care clinics in Swaziland, this mixed methods research was undertaken with men who were sensitized on PrEP and either declined or took up the intervention. Quantitative research drew on routine client data from HIV risk assessments administered to 110 men. Clients determined to be at risk were asked additional questions to assess reasons for PrEP interest or decline. Qualitative research drew on in-depth interviews with 9 men and 27 stakeholders (including policymakers and program implementers), as well as focus group discussions (n=3) with adolescents, bus drivers and community representatives. Quantitative data was analysed using Stata. Qualitative thematic analysis was conducted with NVivo.

**Results:** Between 1 August 2017 and 31 January 2018, 58 men initiated PrEP, which represents 24% of all clients initiated during the period. According to quantitative risk assessment data, main reasons for PrEP interest among men at risk for HIV (n=79) included: fear of becoming infected with HIV (61.5%), knowing a partner is HIV-positive (41.6%) and having multiple partners (32.4%). Qualitative methods echoed this, but also emphasized that frequently forgetting condoms and mistrusting a partner's faithfulness compelled PrEP uptake. Main reasons for PrEP decline among men at risk for HIV (n=20) included: needing to think about it (36.8%), not considering oneself at risk (25.0%) and needing to consult a partner first (15.8%). Qualitatively, men highlighted fears of side effects (diminished libido and fear of forgetting tablets due to alcohol intake), stigma (being seen receiving PrEP medication or having to queue with people who collect antiretrovirals), and hesitations about daily pill consumption. Men and stakeholders suggested using decentralized approaches to reach more men for PrEP (going to sporting events, cattle vaccinations, workplaces and official community gatherings).

**Conclusion:** Men represent a minority of PrEP clients in this demonstration study engaging clients on PrEP among the general population of people attending public-sector primary-care clinics in Swaziland. Male concerns regarding PrEP merit more and specific consideration for the design of future PrEP programs – in particular, because several of the salient concerns are not typically addressed in current messages about PrEP, such as sexual performance and alcohol intake.

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### Is self-perceived risk associated with oral HIV pre-exposure prophylaxis (PrEP) interest? Findings from a longitudinal cohort study among the general population at risk for HIV in Swaziland

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**Background:** Daily oral HIV pre-exposure prophylaxis (PrEP) has the potential to play a pivotal role in the fight against HIV. A key to successful uptake of PrEP is for potential users to be aware of their HIV risk, understand the implications of their level of risk and view PrEP as a viable option within their HIV prevention package. To assess the performance of PrEP as an additional HIV prevention method offered within the government-managed health system, a demonstration study began August 2017 in Swaziland. Six primary healthcare clinics participating in the study offer PrEP services to clients ≥16 years among the general population at risk for HIV. We describe self-perceived risk among clients in this study and investigate the relationship between self-perceived risk and PrEP interest.

**Materials & Methods:** From 1 August 2017 to 31 January 2018, healthcare workers engaged clients in an HIV risk discussion using a standardized Ministry of Health risk-screening tool capturing self-perceived HIV risk on a Likert scale. Based on the risk screening, the health care workers determined whether the client was at risk for HIV and could benefit from PrEP. Healthcare workers also recorded clients' PrEP interest. The relationship between self-perceived risk and PrEP interest was assessed using a multivariable Poisson regression model with robust standard error, controlling for sex, age and fixed-effect of clustering at the clinic level.

**Results:** Over the 6 month period, 669 clients were screened for HIV risk and the majority were female (84%; 95%CI 75-92). Of those screened for HIV risk, 77% (95%CI 68-87%) were found to be at substantial risk by a healthcare worker and 61% (95%CI 49-73%) of those clients were interested in PrEP. Among all clients screened, 40% (95%CI 23-56%) perceived themselves to be at low/no risk, 31% (95%CI 21-42%) at some risk and 29% (95%CI 19-40%) at high/very high risk. Men were more likely to describe themselves at high/very high risk for HIV infection (RR 1.5; 95%CI 1.2-2.0). More than a quarter of clients (27%; 95%CI 11-43%) found to be at risk for HIV by a HCW had no/low self-perceived risk. Clients with high/very high self-perceived risk were nearly five times more likely to be interested in PrEP compared to those who considered themselves at no/low risk (RR 4.8; 95%CI 3.5-6.5). Men with high/very high self-perceived risk were more likely to be interested in PrEP (RR 7.5 95%CI 2.0-27.8) compared to women with similar perceptions of risk (RR 4.7 95%CI: 3.4-6.5).

**Conclusions:** Men considered themselves at high risk for HIV more often than women, highlighting the need for engaging men in HIV prevention discussions. Clients whose self-perceived risk was very different from the healthcare worker-determined risk may require additional counselling and support to facilitate uptake of HIV prevention services, including PrEP. Our findings show that self-perceived risk for HIV infection is significantly associated with PrEP interest. Therefore, we recommend that clients' ability to judge HIV risk is strengthened before perceptions of risk are elicited and that engagement about PrEP takes account of perceived risk.

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### Youth participation: a way of achieving increased uptake of HIV prevention services among out-of school youths.

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**Background:** In Nigeria, young people between 15-24 years make up 15% of the people living with HIV. These young persons, who are either in-school or out-of-school account for about 36% of new HIV infection in Nigeria. While several HIV interventions such as family life and HIV/AIDS education, peer group sessions and anti HIV/AIDS club activities have targeted in-school youths, out of school youths are not adequately reached with HIV prevention programmes, largely because of their complex diversity and mobility. To address this gap, an outreach project was designed by the Federal Ministry of Youth Social Development (FMYD) for out-of-school youths in Nigeria.

**Description:** The World Bank HIV Prevention Development Project (HPDP II), through National Agency for the Control of AIDS supported the FMYD to conduct HIV prevention outreaches in 12 states with high HIV prevalence in Nigeria. Youth-focused non-governmental organizations and community-based organizations working in each state were engaged to conduct HIV testing services (HTS) and distribute condoms to 2,000 out-of-school AYP per state. Furthermore, AYP living with HIV (AYPLHIV) from established support groups were also involved in the outreaches to facilitate linkage of positive persons to facilities for care. The venues of the outreaches included motor parks, automobile repair workshops, and markets. The out-of school youths targeted includes apprentices, artisans, food sellers, and street children (area boys).

**Lesson Learned:** 31,000 out-of-school youths were reached with HIV prevention interventions across the states within 4 days. 260 HIV positive AYP were identified linked to care. Willingness to test for HIV is high among AYP out-of school youth. Young people's participation in planning and mobilization boosted the uptake of services. The presence of AYPLHIV provided immediate psychosocial support and ensured complete referrals. Engagement of AYPLHIV was critical for ensuring immediate psychosocial support and completed referrals. Workplace model for HIV service delivery favored out-of-school youth as most of them had little time to access facility based interventions.

**Next step:** National Agency for the Control of AIDS (NACA) plans to develop guidelines for implementation of AYP focused HIV intervention in Nigeria. HIV programmes should be all inclusive to address specific needs of AYP in Nigeria including provision of mobile HTS.

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### Tolerability of routinely offered HIV testing in children admitted in kenyan public hospitals.

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**Background:** In the Global arena, more than 270,000 children under 15 years died of Acquired Immune Deficiency Syndrome (AIDS) in 2009. The antenatal HIV prevalence in Angola is 2.8% and in one of the public hospital i.e. Lubango is 2.2%. With the recent availability of Antiretroviral Therapy (ART), routine HIV testing is now an essential component of HIV prevention and care. However many HIV infected children are never identified or are lost from the health care system before they can be enrolled into care contributing to high mortality. It is therefore essential for health care workers in health facilities to recognize routine HIV testing and counseling strategies for admitted children

**Aim:** This study aims to determine the acceptability of routinely offered HIV testing among children admitted in public Pediatric

Hospital in Kenya. In addition determine the factors associated with acceptability of HIV testing.

**Materials & Methods:** The children admitted in the wards underwent a physical examination, test for HIV antibody and HIV DNA-PCR; those who tested positive were classified using the World Health Organization (WHO) criteria from November 2013 to January 2014.

**Results:** A total of 370 participants (caregiver- child pairs) were recruited into the study and their data analyzed. Majority 81.3% of the caregivers were single with a mean age of 27 years. Majority (88.1%) of the participants resided in the urban areas close to the hospital. A significant number (86.7%) of the caregiver had some form of education with the majority having primary education. Most (96.2%) caregivers were the biological mothers of the children

After successful iterations at the multivariable modeling, the significant predictor for acceptability for HIV testing was education level and residence.

Education level was associated with acceptability for HIV testing. Caregivers with some level of education had 3 times higher odds of accepting the test compared to those with no education (3.34; 95% CI 1.02- 10.92,  $p = 0.05$ ) after adjusting for all factors in multivariable model. Urban dwellers were more likely to accept HIV testing OR = 4.4 (95% CI 1.41, 13.9)  $p = 0.02$ . Parents of female children were less likely to accept HIV testing as compared to parents of boys children, 181 (98.3%) of 184 boys were tested compared to 160 (93.5%) of 171 girls.

**Conclusion:** The acceptability of routinely offered HIV testing (opt out) of children admitted at public Pediatric Hospital was high (92%). The predictors of accepting a HIV test are maternal level of education and Residence.

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### Prison inmates' access to HIV care and services in Southern Malawi

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**Background:** Despite a global decrease in HIV incidence, the prevalence of HIV amongst prison inmates remains high. In Malawi, HIV prevalence is around 35% in prisons compared with 10.6% in the general population. While there have been program initiatives to reach more institutionalized populations with HIV/AIDS services in Malawi, prison inmates' access to HIV treatment and care services remains limited. The aim of this study was to explore prison inmates' access to HIV/AIDS care and services and identify any challenges they may face in accessing these services.

**Materials & Methods:** This was a mixed method cross-sectional study using both qualitative and quantitative interviews in six prisons: Zomba, Chichiri, Mulanje, Mangochi, Mpyumpyu and Domasi located in Southern Malawi. Open Data Kit platform (ODK) was used to collect data from 412 prison inmates and 34 health care service providers from January to February 2018. We conducted 42 in-depth interviews with HIV positive prison

inmates. Descriptive analysis was utilized to determine prisoner's access to HIV services.

**Results:** The median age of prison inmates was 32 years (IQR = 18 - 75); 61% were married, 93% were male and 70% were doing business before coming into prison. Seventy eight percent were tested for HIV while in prison and 2.7% had their HIV treatment interrupted while in prison. Forty-six percent of inmates had reported consensual sex with fellow inmates within prison cells with the practice more common at Zomba maximum prison. In all prisons, 78% of inmates reported believing that they were at high risk of contracting TB in prison cells. During the in-depth interviews, inmates reported that HIV/AIDS care services including HIV testing, antiretroviral drugs (ART), TB screening and screening of sexually transmitted diseases were available in the prison clinics and were easily accessible on daily basis. Prison inmates also recognized the support from non-governmental organizations in improving access to HIV services compared to when the clinics were run by Ministry of Health and prison staff only. However, inmates in two district prisons reported delays in accessing HIV/AIDS care services because it being offered outside the prison premises only. In two prisons, inmates felt that some young inmates were at high risk of acquiring HIV due to forced sexual advances by older prison inmates. Common challenges reported by inmates included: lack of access to HIV services in some prisons, poor nutrition especially for those on ART and limited access to HIV services outside prison premises. Also, prison inmates had reservations on distribution of condoms in prison cells because it would encourage the behavior of homosexuality and suggested considering harder punishments to protect vulnerable inmates.

**Conclusion:** Consensual sexual practice is common among prisoners in Malawi. HIV/AIDS services are not readily available to inmates in some prisons which may delay access to HIV care and treatment services.

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### Understanding and experiences of male partner engagement policies and guidelines in HIV care in the context of universal test and treat: A qualitative study in rural Malawi and Tanzania.

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**Introduction:** Male partner engagement in HIV care and treatment is considered to be an important factor in achieving the 90-90-90 targets. We conducted a study to (i) document changes in partner engagement policies and (ii) explore how "test and treat" has influenced the experience of HIV care-seeking for pregnant women and their partners.

**Methods:** We reviewed national HIV policies and guidelines at three time-points (2013, 2015 and 2017) to assess the evolution of partner engagement. Four policy indicators were summarised and categorised as being explicit, implicit or absent, and

compared across settings. In-depth interviews were conducted with 18 health care workers (HCW), 10 HIV-positive pregnant women on antiretroviral therapy through Option B+, 10 HIV-negative pregnant women receiving antenatal care (ANC) and 10 partners in Malawi and Tanzania. Interviews were recorded, transcribed and translated. Themes were derived through inductive and deductive coding.

**Results:** We found that explicit policies to encourage male involvement in ANC and HIV care were included in sexual and reproductive health policies in Malawi and Tanzania, which were updated with increasing detail over time. HCWs and patients reported that partner involvement was initially attempted through the women's verbal or health worker's written invitation, and strengthened with local by-laws. All women, regardless of HIV status, appreciated their partners' engagement efforts reporting that it often led to the provision of new clothes and materials for delivery as well as being given priority treatment. Some HIV-negative women reported that their partners refused to attend services, with husbands' fearful of receiving a positive results. In some instances women adopted strategies to satisfy local by-laws and recruited "local motorbike drivers" to test on their husband's behalf. For partners that tested positive, delays in treatment initiation were often reported. Very few women however, reported that male partner invitations and engagement encouraged their partners to know their own HIV status.

**Conclusion:** The effectiveness of Universal Test and Treat requires individuals and partners to engage earlier with HIV care. Policies are increasingly calling for partner involvement yet this has not been reflected in practice. The policy intentions are not clearly understood by the providers and users. Efforts are needed to clarify policies and develop provider and user driven strategies to promote couple engagement.

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### Key Considerations for Successful Implementation of HIV Self Testing in Rwanda

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**Background:** Rwanda adopted HIV self-testing since February 2017 as an additional HIV testing strategy. Diagnosing 90% of all people with HIV is the first of three global goals set by the United Nations to end the HIV epidemic by 2030. Despite scale-up of HIV testing services, testing coverage is low in most settings, and late diagnosis and linkage to prevention, care and treatment persists. The HIVST using Oraquick was initiated in Country because of the simplicity and safety of HIVST Oraquick collection compared to HIVST Blood Sample collection. Oraquick based tests are well accepted as in-home testing. This method is useful for people who would not otherwise be tested due to programmatic and systemic structures. There's a large group of people who are infected, and don't know it and even if they are engaged in behaviors that would put them at risk of getting HIV.

**Methods:** We have reviewed the process followed in implementation process of HIV self-testing initiative and here is presented key program milestones accomplished since the test was announced as an alternative HIV testing option

**Lessons Learnt:** Prior implementations of HIV self-testing, key steps were followed to enable successful implementation of this new initiative focusing policy environment and implementation road map. In line with outlined steps, following activities were done as follows:

1) amendment to the national HIV guidelines to reflect HIV self testing using oral fluid as an alternative HIV testing option, by the technical working group and approved by the Ministry of Health in February 2017; 2) quantification for HIV self testing kits and procurement process; 3) definition implementation phases starting with the City of Kigali due to its high HIV burden; 4) Selection targeted population that include key populations in hot spots, professionals in both public and private institutions and students in University surrounded by a hot spot; 5) Training of focal point on HIV Self Testing and counseling at each selected distribution point; 6) raising awareness about availability of HIV self testing through media; 7) Development of Monitoring and Evaluation tools to capture data on kits distributed and 8) set up of free hotline to facilitate answering potential question related to HIV self testing.

After the preparatory phase, HIV self testing distribution started in February 2018, in total 3,299 kits were distributed

As implementation of new approach phase, more efforts should be invested to ensure adequate practice and correct results; 1) intensifying mentorship of focal points to ensure high quality standards in service delivery; 2) to connect HIV Positive cases to the confirmatory test by trained health care providers; 3) Improving Professionals, students from Universities and family in community involvement to ensure HIV status.

**Conclusion:** Adequate preparation HIV Self Testing initiative is associated to increase uptake and frequency of HIV testing. However, further research on how to support linkage to confirmatory testing, prevention, treatment and care services is needed. HIV Self Testing holds great promise for people unaware their HIV Status, results from first phase implementation are waited to inform large scale up.

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### Profile of HIV-Negative Women Enrolled in a Phase III Placebo Controlled Dapivirine Vaginal Ring trial vs a Phase IIb Open-Label Extension Trial

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**Background:** The monthly Dapivirine Vaginal Ring (DVR) is a flexible silicone ring that provides sustained-release of the antiretroviral drug dapivirine locally to the site of potential HIV-1 infection during vaginal sex with low systemic absorption. Two pivotal Phase III trials found DVR well tolerated and reduced women's risk of acquiring HIV-1 by about 30% overall. The interim data of Phase IIb, open-label extension (OLE) trials demonstrated an HIV-1 risk reduction of approximate 50% relative to the expected rate in the absence of access to DVR based on bootstrap sampling.

**Methods:** The Phase III trial, The Ring Study/IPM 027 (2:1 randomized, double-blind, placebo-controlled) was designed with routine 4-weekly visits over a period of approximately 24 months. Women replaced their ring at each visit.

The OLE trial, DREAM/IPM 032 is being conducted among HIV-negative women at five former Ring Study sites in South Africa and one in Uganda. For the first three months, DREAM participants could attend monthly visits, receiving a new ring at each visit. Thereafter, quarterly follow up visits are conducted; women can choose to collect three rings and return every three months, alternatively collect their rings monthly. Women self-inserted their rings.

In both trials women routinely receive HIV testing and counseling, condoms, syndromic treatment for sexually transmitted infections, and supportive adherence counseling. The profile of women enrolled in the Phase III trial, The Ring Study, and OLE trial, DREAM, were compared with regard to baseline characteristics, visit retention and adherence to ring use.

**Results:** A total of 1959 women enrolled in The Ring Study; 1567 were eligible to enrol in DREAM. A total of 1034 were screened and by 30th September 2017, 900 were enrolled in DREAM. Major reasons for declining participation in DREAM were relocation, not interested, planning to get pregnant or getting married. Most common reason for screening failure was women testing positive for HIV (41%). As expected, median age was higher, 29 (range 20-50) for DREAM compared to 25.9 (range 18-45) years in The Ring Study. Preferred method of contraception remained long-acting injectable progestins: 79% for The Ring Study and 74.0% for DREAM. Most participants remain unmarried: 89% for The Ring Study and 80.4% for DREAM. Sexually transmitted infections prevalence at baseline declined (The Ring Study: 27.5% and DREAM: 18.1%). Overall, visit retention increased from 82% (The Ring Study) to more than 98% in DREAM. Ninety-six percent of returned rings in DREAM had dapivirine residual levels of  $\leq 23.5$  mg, indicating at least some ring use, compared to an overall of 83% in The Ring Study. These results illustrate that the profile of women who consented to participate in the DVR OLE trial might be intrinsically more adherent to ring use due to their higher age profile and knowledge of the safety and efficacy results of The Ring Study.

**Conclusion:** OLE data indicates higher adherence to DVR compared to Phase III trials, similar to results from OLE studies of oral PrEP. If approved, the ring could expand women's options with the first long-acting HIV prevention method.

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### Natural killer cells kir genes profile implicated in HIV-1 disease progression in the context of anti-retroviral naïve HIV-1 infection

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**Background:** In the absence of a functional adaptive immune response due to HIV infection, Natural Killer (NK) cells could play a prominent role in controlling the virus by direct lyse of virus-infected cells and immune-regulatory activity. NK cell function is tuned by the engagement of several receptors expressed on the cell surface, including both inhibitory and activating killer cell immunoglobulin-like receptors (KIRs). Direct genetic evidence to support their implication in HIV-1 infection acquisition and progression is lacking. This study aimed to assess the profile of

KIR genes in the context of ARV naïve HIV-1 infection with respect to biological markers of HIV-1 disease progression.

**Material and Methods:** 24 ARV naïve HIV-1 positive and 20 HIV negative people from the Afrodec cohort in CIRCB (Yaoundé, Cameroon) were recruited to be part of this study. After venous blood drawing, Peripheral Blood Mononuclear Cells (PBMC) were isolated from the whole blood by density gradient centrifugation (using ficoll-hypaque). DNA extraction was performed according to the manufacturer's instructions (Qiagen) following by KIRs molecular typing using PCR-SSP technology and Agarose gel electrophoresis to identify allelic variation within the NK cells KIR genes. Statistical analysis were performed using Excel and Prism (Graphpad 5) soft-wares. Non-parametric test (Spearman) were used for comparison between groups; p-values <0.05 were considered statistically significant.

**Results:** KIR2DS2, an activating gene was significantly least frequent in HIV negative compared to HIV-1 positive participants with 55% versus 79% ( $P=0.04$ ). KIR 2DL2 and 2DS1 were significantly least frequent in HIV-1 positive compared to HIV negative group with 37.5% versus 60% ( $P=0.04$ ) and 54% versus 85% ( $P=0.03$ ) respectively. These two genes were also completely absent in HIV-1 positive group with a viral load more than 4.5 Log10. Interestingly HIV-1 infected people with CD4 < 200/mm<sup>3</sup> did not possess KIR 2DL2 and 2DS1 as observed among individuals with high viral load (VL > 4.5 Log10), where 2DL5 showed low frequency (around 10%) which is in accordance with the absence of KIR 2DL2 and 2DL5 shown in participants with CD4 < 200/mm<sup>3</sup>.

**Conclusion:** KIR 2DS2 was more relevant in HIV-1 acquisition, people bearing this gene are more susceptible to acquire HIV infection; others such as KIR 2DL2, 2DS1 and 2DL5 seem to be implicated in the resistance to HIV-1 disease.

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### Knowledge of prevention of mother to child transmission (PMTCT) and adherence to PMTCT test and treat strategy among HIV positive pregnant women

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**Background:** In 2013, an estimated 24.7 million people in Sub-Saharan Africa were living with HIV, accounting for 71% of the global total. There were 1.5 million new HIV infections and 1.1 million related deaths in the same year. More than 90% of HIV infection in children are due to Mother to Child Transmission (MTCT) with at least two thirds occurring during pregnancy, delivery and during breast feeding (WHO, 2013). Seven hundred and twenty thousand women are living with HIV, 70000 of which are pregnant. Adherence is key in achieving the goal of PMTCT Test and Treat Strategy

**Methods:** The study utilised a descriptive correlational design with a random systematic sample of 120 HIV positive women on ART at Parirenyatwa Group of Hospitals. Approval for the study was granted by respective ethical review boards. All participants gave written informed consent. Interviews were conducted in a private room and the researcher had sole access to filled-in questionnaires that were kept in a lockable cupboard. Data were

collected from March to April 2017. Data were analysed with SPSS version 20.

**Results:** Mean knowledge of PMTCT was 91% with 53.3% having high knowledge. Mean adherence was 86% and 16.7% participants had high adherence (>95%) to PMTCT. Pearson's correlation co-efficient  $r$  was 0.184. Regression analysis  $R^2$  was 0.340. The major challenge of adherence was stigma reported by 53.3% participants. Possible solutions suggested were disclosure (95%), health education on PMTCT (95%), and partner involvement in testing and booking for ANC (83.3%).

**Conclusion:** Knowledge of PMTCT was high. Adherence to PMTCT Test and Treat Strategy was sub optimal and there was a weak positive relationship between knowledge and adherence to PMTCT.

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### Determinants of child survival(0-59 months) in mothers living positively with HIV/aids in Ndejje health centre iv, wakiso district

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**Background:** Global estimates for children born with HIV on daily basis add up to 1,000 and many die at the age of two if they do not receive the appropriate medical care. Over 3 million babies are estimated to be dying around the world before 28 days of life although a lot of efforts have been put in place to improve on child survival within the past 10 years; new born mortality has gone low compared to the overall child mortality.

**Objective:** to establish determinants of infant and child survival (0-59 months) among mothers living positively with HIV/ AIDS receiving health care services at Ndejje H/C IV- Wakiso district

**Method:** This was a cross sectional study on 152 mothers living positively with HIV/ AIDS at Ndejje H/C IV- Wakiso district. Structured interviews were used to collect data on infant and child survival (0-59 months) among the study respondents. Chi square tests were used to assess the association between individual attributes of the mother and health services factors with infant and child survival. All statistical cox regression tests were two-tailed and P-value less than 0.05 were considered significant.

**Results:** The survival rate of infants and children was at 85.5%. The results showed Child's age ( $\chi^2=6.476$ , P-value of 0.039), child's HIV status ( $\chi^2=8.574$ , P-value of 0.003), maternal age ( $\chi^2=33.468$ , P-value of 0.001), level of education ( $\chi^2=25.499$ , P-value of 0.008) employment status ( $\chi^2=6.032$ , P-value of 0.010), income level ( $\chi^2=16.788$ , P-value of 0.019) ARV at birth ( $\chi^2=11.170$ , P-value of 0.008), number of ANC visits ( $\chi^2=6.431$ , P-value of 0.027) and the place of delivery ( $\chi^2=21.268$ , P-value of 0.000) were the child's characteristic that were found to have a significant association with child's survival but the only variable that was statistically significant at the cox regression was income level with P-value of 0.028.

#### Conclusion and recommendation

The survival rate of the children was moderate. It is recommended that government and its partners should increase the level of sensitization on HIV related issues to the public to enhance informed decision making and to economically empower mothers. Safe practices and the need to reinforce the

facility delivery policy through health education with emphasis on promotion, protection and support of HIV programs should also be considered

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### Efavirenz concentrations in HIV-infected Malian women and their nursing infants.

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**Introduction:** Breastfeeding increases the risk of HIV transmission by 14%. There is limited data on antiretroviral pharmacokinetics in breast milk. In this work, we measured plasma and milk levels of ARVs from HIV-infected mothers and their infants during breastfeeding. The second objective was to evaluate the correlation between plasma concentrations and plasma viral load.

**Materials & Methods:** Included patients were HIV-positive pregnant women receiving antiretroviral prophylaxis from gestational week 25 up to 6 months postpartum and their breastfed infants. Blood samples were taken at delivery and at month 1, 3 and 6 postpartum. The efavirenz concentrations were measured by a tandem mass spectrometry high liquid chromatography method. The limit of detection for the quantification of efavirenz was 0.216 mg / L. Plasma viral load was measured on M2000rt (Abbott). The limit of detection of viral quantification was 40 copies /mL. Viral load was determined at delivery and at 6 months postpartum for mothers and at 3 and 6 months postpartum for children. All children received nevirapine for 6 weeks after birth.

**Results:** A total of 32 mother-child pairs were included: 32 mothers received tenofovir (TDF), lamivudine (3TC) and efavirenz (EFV). During pregnancy, mothers received a combination of three antiretrovirals that was also followed during breastfeeding (up to 6 months) and thereafter. The age of the mothers in the median was 29 (19 to 40 years). The median (IQR) duration of ART before inclusion was 57 (0-168) months. All women reported 100% adherence to ART based on diary cards for three days prior to the study visit. The mean number of CD4 + cells delivered (cells / mm<sup>3</sup>) was 589.31. The median maternal plasma concentration (IQR) EFV was 3105 ng/mL (2450, 6595) at month 1; 3050 ng/mL (2060, 6685) at month 3; 2740 ng/mL (2150, 8080) in month 6. The median infantile plasma concentration (IQR) EFV was 356 ng/mL (282, 572.5) at month 1; 268 ng/mL (142, 464.5) at month 3; and 175 ng/mL (89.7, 331) at month 6. Six samples of children were undetectable at 7.4%. The median ratio (IQR) (infant plasma / maternal plasma) was 0.057 (0.031, 0.1133) at month 1; 0.072 (0.051, 0.091) at month 3 and 0.048 (0.033, 0.070) at month 6. Across the study period, the median (IQR) breast milk-to-maternal plasma ratio (BM:MP) of efavirenz was 1.16 (0.96-20.62), which corresponds to a relative

infant dose of 2.46 % of the recommended weight-adjusted pediatric efavirenz dose at month 6. The median (IQR) apparent infant clearance (CL/F) of efavirenz was 0.146 (0.111-0.246) L/h/kg at months 6. No adverse reactions or drug-related toxicity to the mother were observed in any of the infants. A mother was presented with a viral load > 50 copies / mL at 6 months, had undetectable plasma concentrations of the drug at the same time.

**Conclusions:** In our study, we have shown that during chronic ART among breastfeeding women, efavirenz was detectable in small quantities in the plasma of breastfed infants without side effects.

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### Where are the missing babies along the EID cascade? The experience of tracking "lost to follow up" infants in Kabarole and Bunyangabu, western Uganda.

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**Background:** Lost to follow up of HIV exposed infants remains one of the main bottle necks to elimination of mother to child transmission in Uganda. The lost to follow up rate for HIV exposed infants (HEI) in Uganda is at 60%. To account for the outcomes of the HEI within a 24 months cohort in Kabarole and Bunyangabu districts (Babies born between July to December 2014). Baylor Uganda conducted tracking of Mother-baby pairs that had been declared lost) having no outcome after 18 months of enrolment in to care.)

**Methodology:** The activity was conducted in Kabarole and Bunyangabu districts, western Uganda over a period of 4 weeks. Community health workers (CHWs), a newly recruited cadre working full time and attached to specific health facilities were used to follow up all HEI infants declared lost. Lists of all lost HEI infants, were generated with locator information including addresses and phone contacts of primary givers. The lists were then shared with the CHWs who, worked together with the community structures to conduct home visits and find the missing babies. Referrals were made by the CHWs to all identified babies and the HIV antibody tests done for HEI infants that reported to the health facility.

**Results:** A Total of 163 infants were tracked, 76(47%) returned to care and had a negative HIV antibody test, 2(1%) were HIV positive, 6(4%) died, at the time follow up was done, 33(20%) had self-transferred to other health facilities, 10(6%) had changed addresses outside the coverage of the health facility 10(6%) 9(6%) had moved outside the district and could not be traced by the district community health structures, 23(14%) had given wrong locator information, 4(3%) had a new primary care giver.

**Conclusion:** The use of CHWs attached to health facilities was useful for reaching some of the infants who had been lost. There is a need to strengthen intra and inter-district linkages including introducing data exchange meetings for the HEI program to ensure that HEI infants that move within and across districts are tracked. A system that validates locator information for HEI babies should be developed to ensure successful tracking of HEI infants.

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### Survival analysis on HIV positive Infants in selected PMTCT clinics in Oyo State, Nigeria

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**Background :** HIV infection among children, particularly those under 24 months of age, is often rapidly progressive; as a result guidelines recommend earlier access to antiretroviral therapy (ART) for HIV infected children. However, patients in resource-poor countries have higher mortality rates, particularly the first months after initiating ART. We determined the survival time and its determinants among HIV positive infants from enrollment into care to their outcome.

**Materials & Methods:** A retrospective cohort study was conducted to analyze the information of HIV positive infants from birth to their outcome from 2014 to 2016 in Oyo State. Data on patients was collected from selected PMTCT clinics records. Life table was applied to calculate the survival proportion, and Cox proportion hazard regression model was used to identify determinants that were related to the time of survival with Epi-info version 7.

**Results:** 70 infants were assessed for ART eligibility based on Immunological status, the median age was (7.5±9.0) months old, with 73.9% being males, among whom 25 (35.7%) , 33 (47.1%) and 12 (17.1%) were completed intervention, lost to follow-up and died respectively without starting ART. Time from 1st PCR HIV tested HIV positive to starting ART was (6.0±2.1) months, their median time of receiving Nevirapine was (3.7±3.5) weeks, and 32.8% of them died within the first 6 months of treatment. Cumulative survival rates of the HIV positive infants who had received ART in 1, 2, 3, years were 97%, 93%, 89%, respectively. results from multivariate Cox regression showed that female patients who received ART were at a lower risk to the death (HR = 0.556, 95%CI: 0.367-0.872), when compared to the males. Patients with baseline CD4 % at <15 (HR = 11.996, 95% CI: 6.714-21.435) or 15-24% (HR = 2.481, 95%CI: 1.620-3.798) were at a higher risk to death than those with CD4 % ≥25. Patients without pulmonary tuberculosis symptoms were at a lower risk to death (HR = 0.511, 95% CI: 0.330-0.791) when compared to those with pulmonary tuberculosis symptoms.

**Conclusion:** Antiretroviral treatment could prolong the survival time of HIV positive infants and with a better rate on survival. Programs on follow-up and CD4% for HIV positive infants should be conducted regularly, as well as timely initiation of the antiretroviral therapy.

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### Male partner involvement in increasing the uptake of safe infant feeding practices by HIV positive mothers in sub Saharan Africa: A systematic review and meta-analysis

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**Background:** The low level of male partner involvement in Prevention of Mother to Child Transmission of HIV services such as safe infant feeding practices poses a serious challenge to the implementation of guidelines on safe infant feeding and may undermine efforts towards elimination of mother to child transmission of HIV in sub Saharan Africa(SSA).We conducted a systematic review and meta-analysis to identify the approaches that are used in improving on male partner involvement in PMTCT and the impact on the uptake of safe infant feeding practices by HIV positive mothers in SSA.

**Methods:** In this systematic review and meta-analysis, Ovid Medline, Embase, PsycINFO, Cochrane library, ClinicalTrials.gov, Web of Science and Current Controlled Trials were searched from 1st November 2015 to 31st November 2017. Only studies carried out in SSA that reported an approach used in involving male partners and the impact on the uptake of safe infant feeding practices irrespective of the language and date of publication were included. Odds ratios were extracted or calculated from studies and combined in a meta-analysis using the statistical package Stata version 11.0. Forest plots were generated using the random effect model. Publication bias was assessed using funnel plots and the Egger's test.

**Results:** From an initial 2316 non-duplicate articles, 06 articles were included in the systematic review and meta-analysis. The approaches used were broadly classified as enhanced psychosocial interventions, verbal encouragement and complex community interventions. The pooled unadjusted OR= 2.74[95%CI: 1.56-4.82] while the pooled ORs for enhanced psychosocial intervention (02 studies), verbal encouragement (02 studies) and complex community intervention (02 studies) are 5.14(95%CI: 2.42-10.90), 1.74(95%CI: 1.21-2.51) and 2.75(95%CI: 0.90-8.37) respectively. The I<sup>2</sup> = 86.0%. The heterogeneity was not explained by any variable on metaregression. There was no publication bias.

**Conclusion:** Limited studies exist that have explored the impact of male partner involvement on the uptake of safe infant feeding practices by HIV positive mothers in SSA. There was stronger evidence that involving male partners through enhanced psychosocial interventions and verbal encouragement increases the uptake of safe infant feeding practices by HIV positive mothers. The high heterogeneity suggests more studies that are conducted using similar methods are needed in the future. In addition, more studies including randomised controlled trials that will recruit a representative sample of patients are needed in future.

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### HIV positive mothers' perceptions about breastfeeding in Makaleng in Botswana

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The Management of HIV/AIDS has shifted from being an emergency to a more chronic manageable disease since the introduction of Highly Active Antiretroviral Treatment (HAART). The use HAART extended to prevention of HIV and Prevention of Mother to child Transmission (PMTCT) which has led to a significant reduction of mother to child transmission of HIV to unborn children. The PMTCT has also evolved from single drug

used to using HAART for the mother with benefits for the unborn child. The recent evidence says that HIV-positive mothers can now breastfeed their babies without transmitting the virus to their babies, as long as they are virally suppressed (meaning on ART) with good CD4 cell count.

This qualitative study explored perceptions of HIV-positive mothers about breastfeeding for their children in Makaleng, Botswana, through in-depth interviews from sixteen HIV-positive mothers who have delivered or pregnant as key informants of study from which the following findings were generated. The study found that HIV-positive mothers on Antiretrovirals had knowledge on HIV and AIDS transmission and ART management. For examples, half (50%) of the participants were unemployed. More than half (56%) of the participants are aware that there is no cure for HIV/AIDS. Majority (100%) of the participants reported good knowledge about condom usage as one of the ways to prevention of HIV transmission. Majority (100%) of the participants reported to have knowledge that use of ART can prevent HIV transmission. It was also found that all the participants had general knowledge on HIV/AIDS.

Despite their knowledge and evidence of safety use of breastfeeding by HIV-positive mothers on ART, the research found that very few women choose breastfeeding feeding option for their children. Majority (100%) of the participants reported that breastfeeding while HIV-positive is not a choice because of fear to expose their children to HIV.

The study found that majority (100%) of women choose formula feeding as safe and their choice for infant regardless of being on HAART. Moreover, the 87.5% of the participants reported knowledge of good bottle hygiene. The provider of formula milk is the government for (100%) of the participants. Moreover, the study also found that the participants were satisfied with the antenatal services they receive. However, there is evidence from this study that the information provided by nurses is not value-free. For example, some nurses are still not swayed about the evidence that breastfeeding while HIV-positive is safe for the baby.

Further studies are needed to explore other factors such as family, spouse and health care professional influences in women feeding choices.

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### Adherence Versus Acceptance Studies in Adolescents at Gertrude's Children's Hospital, Nairobi

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**Issue:** Medication adherence is the extent to which a patient takes a medication in the way intended. Acceptance is rooted in patient identity while adherence is on the perceived impact by the physician. Studies conducted in eight focus groups with PLHIV in two US cities found physician-patient relationships and communication quality are related to medication adherence and outcomes in HIV care. Gertrude's Children's Hospital, Kenya has a client base of 424 adolescents living positively. Adherence is measured using patients' self-report, laboratory tests, days supplied with ART, and appointment attendance. Between January and December 2017, we had over 12 meetings and training sessions with over 500 adolescents. Adherence went

from 65% to 87% from January to December 2017, our target being 90%. We noted responses that concerned us (as discussed later) because over 80% of our clients were born positive and have been on treatment for most of their lives. Lack of acceptance points to psycho-social issues leading to non-adherence. We sought to explore whether we were seeing cases of adherence without acceptance.

**Description:** In a training session conducted by our partners AYARHEP –Ambassadors for youth Sexual reproductive health; the trainer asked everyone to write what they disliked about themselves. Out of the 28 participants that day, 6 wrote how much they resented the fact that they were HIV positive. As a sample size for successive meetings held during the year where we have had similar responses, this would translate to about 72 clients or 16% of all our adolescents. Our experience shows that individuals who are unhappy with their status are more likely to non-adhere if there's no psycho-social intervention.

**What we learnt:** Adherence is not a director indicator of acceptance. Adolescents who express distress or anger about their health status may need psycho-social support to enhance acceptance and potentially adherence. Non-acceptance is always an indicator of underlying psycho-social issues.

**Next steps:** Findings helped revamp the design of our "one adolescent at a time approach" program to provide psycho-social support to adolescents and helped inform the design of future research studies to understand adherence.

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### Evaluating psycho-social support in improving adherence among HIV positive adolescents aged 10-19 years at Gertrude's Children's Hospital

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**Issue:** Gertrude's Children's Hospital has a client base of 424 adolescents, 227 female and 197 male, all living positively. Over 80%, (340) of these were born positive. In January 2017, adherence measured 65% low. Adherence is measured by self-reports, pill count and viral load tests. At the time of the study, all adolescents were receiving ART. The psycho-social team implemented a 'one adolescent at a time' approach to curb non-adherence.

**Description:** Adolescents were grouped in five, the groups color coded and named. Groups worked competitively towards viral suppression. Members could exchange and share. If clients attained viral suppression individually, a token was given. Any issue was reported to peer supporters. We targeted those with detectable viral loads numbering 80, (18.9%). One to one approach included counseling sessions and monitoring on 1) drug and substance use, 2) ART-adherence, 3) Mental health assessment. We gave shorter appointments. Adolescents were exposed to at least 6 sessions. Viral load tests were carried out once after three months of instituting good adherence, and continued annually. The approach took place during appointment days. Adherence data was analyzed generally and recorded at 87% at year's end, our target being 90%.

**What we learnt:** Clients supported each other. Communication with staff improved. Staff could obtain information on the well-being of clients easily. Adolescents were active on social media, opening up about many issues; greatest fears shared were 1)Marriage/intimate relationships, 2)Death, 3)Stigma, 4)Disability due to HIV; all addressed during the one to one sessions. It became clear that adherence does not mean acceptance. Adolescents still needed psycho-social support. Staff's involvement in client's lives was noted.

**Next steps:** The success of the intervention underscores the importance of providing safe spaces for adolescents to discuss issues outside the clinical set up and guide future support groups. The interventions brought out the unique nature that social/fun activities incorporated within treatment matters, these improved adherence and bonding. One to one approach and assessment offered keener insight into client's social activities that may affect adherence, such as drinking too much.

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### Viral load testing and suppression during pregnancy among HIV positive women in Rwanda using routine PMTCT data

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**Background:** Expansion of programs to prevent mother-to-child transmission (PMTCT) have resulted in a marked decrease in vertical HIV transmission in Sub Saharan Africa. Among priority interventions in these programs, WHO recommends to roll out Viral Load (VL) testing during pregnancy and around the time of delivery. Previous studies on viral suppression in South Africa (Chetty 2018) and Rwanda (Gill 2016) found that around 15% of HIV positive women enrolled in PMTCT services had a VL > 1,000 copies during pregnancy. Here we will analyze data on viral load testing and suppression during pregnancy in eight facilities in Rwanda.

**Methods:** Cross-sectional data from HIV positive post-partum women active in PMTCT programs at the time of data collection (August 2017) from eight public health facilities supported by the AIDS Healthcare Foundation in Rwanda were included in the study. Age, antiretroviral treatment (ART) regimen, partner HIV status, time on ART and VL test during pregnancy were extracted from client files. Multivariate logistic regression was used to identify predictors of viral suppression during pregnancy in that population.

**Results:** 906 women met the inclusion criteria, median age was 31 years, and median time on ART at delivery was 2.5 years. 68.9% of the clients were already on ART at the time of the first antenatal visit and 68.4% knew the HIV status of the partner pre-partum. Tenofovir/Lamivudine/Efavirenz was the regimen most frequently prescribed (76.6%) and 2.0% of the patients were on second line ART. Just 345 patients (38.1%) had a VL test documented during pregnancy, with 90.7% of the results < 1,000 copies. No patients on Zidovudine-containing regimens (48) had a VL > 1,000 copies. In multivariate analysis, none of the factors analyzed were independently associated with viral suppression during pregnancy.

**Conclusions:** Our study found a low percentage of women with a VL result during pregnancy in the health facilities evaluated, what represents a missed opportunity to use VL for assessing

transmission risk in PMTCT programs. The percentage of pregnant women with VL < 1,000 copies that we found is higher than in previous studies in our context, what could reflect better adherence to ART. Finally, knowledge of partner status was high in our population partly due to efforts to increase partner HIV testing during antenatal care.

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### HIV Prevalence of Children born to Female Sex workers living with in Rwanda

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**Background:** In Rwanda, HIV prevalence in FSW is 45.8% according to 2015 behavioural sentinel Survey. Despite the vulnerability of children of female sex workers to HIV infection, either through mother to child transmission or through sexual abuse by the mother's male clients, HIV testing among these children is limited thus denying them the opportunity to be diagnosed early and linked to treatment and care services. With UNICEF Support, PSF leveraged its FSW program to provide HIV testing opportunities for children of FSW as a strategy to identify children with undiagnosed HIV infection and link them to HIV care and treatment services.

**Methods:** In November 2015, PSF in collaboration with government health facilities began a program to provide HIV prevention services to female sex workers. In 2017, PSF leveraged the existing program and introduced HIV testing of children of FSW aged 0-19 years. Simple data collection tools were developed to document testing and unique identification codes were used to link children to their mother's HIV status. PSF trained health center staff in age appropriate counseling and paediatric psychosocial support. Additionally, PSF trained FSW peer educators to sensitize and recruit eligible FSWs and their children. FSW mothers were asked to bring their children for HIV testing at their local health facility on a given day. Ages appropriate group information and individual pre and posttest counseling were provided. Children who had previously tested HIV positive and were on Antiretroviral Treatment were not retested. Children newly diagnosed to be living with HIV were linked to pediatric HIV care and treatment programs.

**Results:** From August 2017 through January 2018, 1735 children belonging to 873 HIV FSW mothers living with HIV services were enrolled. Among them, 102 children were under two years of age, 89 were reported having tested HIV negative at either 6 weeks or 9 months and 13 children were either waiting for **Results:** or were not due for testing. Out of the 1633 children aged 2-19, 73 (4.5%) were HIV positive: (29 boys and 34 girls among 0-14 years old; 3 boys and 7 girls among 15-19 years old). Twelve of the total HIV positive children were newly diagnosed and linked to care and treatment. The other 61 were known to be HIV positive and were already on treatment.

**Conclusion:** In this programme, children of FSWs living with HIV were found to have a higher prevalence of HIV (4.5%) than the prevalence among children in general population under 19 years old (<1%). This is related to high HIV prevalence rates among FSW, inadequate access to PMTCT and HIV prevention and



treatment services and hence their children are vulnerable to HIV infection. Therefore, FSW and their children should be prioritized for HIV testing/diagnosis and linkage to prevention and treatment services.

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### Rate of Vertical Transmission of HIV among Seropositive Women followed in different treatment centers in Kinshasa from 2010 to 2015.

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In Democratic Republic of Congo, the service of Prevention of the Transmission of the infection by the Human Immunodeficiency Virus from Mother to Child (PTME) still remains very slightly utilized in the country.

**Objective:** The objective of the study was to estimate the prevalence of the seropositive children born from seropositive women in various treatment centers of Kinshasa.

**Methodology:** This study is 2 years a retrospective cohort based on the files of the seropositive pregnant women followed in 8 private and non-private treatment centers in Kinshasa. On the basis of model of card of investigation having quite precise criteria, approximately 190 files couple had been retained.

**Results:** The age interval the most represented was 26 to 35 years with 40 women (58%). Approximately 45% of the women had been presented at the antenatal consultation in the 2nd trimester of pregnancy. The majority of the women (82. 6%) were under AZT+3TC+NVP and Cotrimoxazole. 139 women were diagnosed at the stage 1 of the infection. 97% of children were put under treatment at birth of which 49% under Névirapine syrup. 95 % of children born of seropositive mother were diagnosed negative for HIV by PCR 9 months after the birth and 3% of the children had an unspecified serology.

**Conclusion:** In spite of the insufficiency of coverage of the service of PTME, these centers of follow-up answer the approach of PTME and the rate of transmission mother-child in the 8 centers from 4 districts of Kinshasa was of 2% to 9 months of birth.

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### Determinant of HIV Infection and retention to care among HIV Exposed Infants Rwanda: A retrospective Cohort Analysis

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**Background:** Despite the fact that Rwanda has adopted and scaled up the Option B+ PMTCT programme since 2012, new HIV infections in children continue to occur and the HIV status of some HIV exposed children remains undetermined due to loss to follow-up. To implement strategies to improve PMTCT services and further reduce the rate of MTCT, Rwanda Biomedical Centre and its partners conducted a study to determine the factors associated with HIV transmission among HIV exposed children.

**Methodology:** This is a retrospective study design among a three-month cohort of HIV exposed infants born from October to December 2013, 2014 and 2015. Health facility records were reviewed primarily to determine the HIV status at 18 months of age. A total of 84 infants were identified as HIV positive. To determine risk factors for HIV infection, each HIV positive infant was matched with two negatives infants with respect to ; health facility location, age and occupation of the mother. Furthermore, Linkage and retention to care was assessed among HIV identified positive infants. Mother- Infant pairs was extracted from the registers using Personal Digital Assistant (PDA) and transferred to STATA, version 13 for analysis. Descriptive statistics, bivariate and multivariable logistic regression analyses was used to identify factors associated with HIV transmission with 95% Confidence interval.

**Results:** The median age of the mothers was 28 years; the main parent's occupation was informal low-income activities for 199(80.2%). Of 196 women who had complete records on ANC attendance, 153(78.1%) attended at least once, 35 (17.9%) attended four visits and 46 (23.5%) visited the health facility in the first trimester of pregnancy. Of 84 HIV infected children, while 77(91.7%) were initially enrolled in care and 7(8.3%) were linked to care during the study period. While 77 enrolled in care after 12 months, 63(81.8%) were retained on ART, 6(7.8%) were transferred out, 3(3.9%) were lost to follow-up and 5(6.5%) were reported to have died. In the bivariate analysis, being on ART before pregnancy, ANC during first trimester, male partner involvement, treatment failure, retention in care, facility delivery, and infant ART prophylaxis were significantly correlated with HIV status. In the multivariate analysis, women who were not retained in care during pregnancy [OR: 6.5, p-value 0.001]; those who experienced treatment failure during pregnancy [OR 6.7, p-value 0.005] and late ART initiation during or after delivery [OR 8.6, p-value: 0.002] were significantly associated with HIV transmission from mother to child.

**Conclusions:** Findings from this study indicate a strong need to identify and treat HIV infected women as soon as possible during their first trimester. Retention in care and viral suppression among these women is critical before, during and after delivery as the country prepares to achieve elimination of HIV transmission from mother to child..

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### The role of Male Involvement in PMTCT program in Rwanda

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**Background:** Globally, involvement of male partners has been recognized as a strategy to strengthen Prevention of Mother To Child Transmission of HIV (PMTCT) program. Despite HIV testing in PMTCT settings being the main entry point, access and uptake remains a challenge in most low- and middle-income countries. In 2002, Rwanda institutionalized counseling and testing of male partners of pregnant women. The aim was to improve PMTCT

care continuum while reducing the risk of vertical HIV transmission to the child or to the HIV negative partner in sero-discordant couples. Since then a lot of work was put into the promotion of male partners involvement in PMTCT at large and couple's voluntary HIV counseling and testing specifically. We report on 10 years' achievement of male HIV testing update in the context of PMTCT program in Rwanda.

**Methods:** We analyzed routinely reported facility-level data on HIV testing among pregnant women and their male partners and children in national PMTCT program from January 2005 to December 2015. Between 2005 and 2015, a trend analysis over the years on uptake of partner testing in antenatal care was done.

**Results:** Overall, 2,626,000 women received antenatal care services; of these, 2 196 591 (96.4%) accepted HIV testing as an entry point to PMTCT program care continuum. The acceptability of HIV testing increased from 88% in 2005 to 97% in 2010 and 98.4% in December 2015. Of women tested, 99.3 % received their results. HIV prevalence among pregnant women tested decreased over years from 5.5% in 2005 to 2.6% in 2010 and 1% in 2015

Between 2005 and 2015, a total of 1,619,798 male partners were tested for HIV together with their wives in antenatal care. This number increased overtime from 30% in 2005, to 80.1% in 2010 and 85.9% in December 2015. HIV prevalence among male partners tested decreased from 5.4% in January 2005 to 2.7% in 2010 and 0.9% in December 2015.

**Conclusions and Recommendations:** Despite the long way to arrive to current results, routine program data demonstrate successful involvement of male partners in PMTCT program in Rwanda. Political commitment, stakeholders engagement and community mobilization are the key factors associate to this success.

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### Patterns of detectable viral load in a cohort of HIV-positive adolescents on HAART in Cape Town, South Africa

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**Background:** Despite improved treatment and access to care, adolescent AIDS deaths are decreasing more slowly than in any other age group. There is lack of longitudinal data around adolescent adherence and the dynamics of viraemia over time. We aimed to describe patterns of detectable viral load (DVL) in a cohort of adolescents attending an ARV clinic in Cape Town, South Africa.

**Methods:** We conducted a retrospective cohort study of all patients on HAART aged 10-19 years. Participants were included if they underwent at least two viral load (VL) measurements and attended the Groote Schuur Hospital HIV Clinic for at least 24 months between 2002 and 2016. The primary outcome was two consecutive HIV viral VL >100 copies/ml, in line with the lower limit of detection of assays in use over the follow-up period.

**Results:** Of 482 screened subjects, 327 met inclusion criteria. Most subjects were vertically infected (n= 314; 96%), and 170 (52%) were male.

Overall, 203 episodes of confirmed DVL involving 159 (49% [95% CI 43%–54%]) subjects were experienced during the follow-up period. A total of 111 (34%) subjects never experienced DVL, while 16 (5%) never suppressed throughout the follow-up period. Median age at first DVL was 14 (IQR 11-16) years. Of the 159 subjects who experienced DVL, 102 (64%) re-suppressed, of which 38 (37%) had a subsequent DVL. Six subjects had genotyped resistance to protease inhibitors. Four of these never suppressed, while two suppressed on salvage regimens. Total follow-up time was 1723 person years (PY), of which 880 (51%) were contributed by the 159 subjects who experienced DVL. Overall time with DVL was 370 PY which comprised 22% of total follow-up time, but 42% of those who experienced DVL. The rate of DVL was 11.8 (95% CI 10.3–13.5) episodes per 100 PY. The risk increased by 24% for each year of increasing age (RR 1.24 [95% CI 1.17-1.31]; p<0.0001). Neither prevalence, duration nor rate of DVL was influenced by gender.

**Conclusion:** DVL was seen in nearly half of adolescents, with the rate increasing with age. Further study is warranted to correlate these findings with risks and clinical outcomes.

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### A randomized, open-label, balanced, two-treatment, single-dose, crossover oral bioequivalence study of Lopinavir/Ritonavir Granules 40mg/10mg with KALETRA® (Lopinavir/Ritonavir) Oral Solution 80 mg/20mg per mL in healthy adults under fed conditions

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**Background:** The development of pediatric fixed-dose combinations (FDCs) for all lines of therapy has become a priority to simplify dosing, increase adherence and thus improve pediatric care. The use of LPV oral solution is limited by taste aversion and short storage period, alternative solid formulations for small children are wanted. The objective of this study was to evaluate the relative oral bioavailability and safety profiles of Lopinavir/Ritonavir Granules 40 mg/10mg (2 Sachets with 40/10mg, Mylan Laboratories Limited, India) with KALETRA® (Lopinavir/Ritonavir, AbbVie Inc.) Oral Solution 80mg/20mg per mL.

**Methods:** In this open label, 1:1 randomized, two-period, two-treatment, cross-over, single dose evaluation, the relative oral bioequivalence was tested in 68 healthy adult subjects under fed conditions. In each study period, a single oral dose of either test product (T) or reference product (R) was administered orally under fed conditions. Subjects were monitored for safety and tolerability until completion of the study. Serial blood samples from pre-dose 0.00 hour up to post-dose 36.00 hours were collected in each period.

Drug concentrations in plasma were quantified by using a validated method for test product (T) and reference product (R).

Pharmacokinetic parameters (C<sub>max</sub>, AUC<sub>0-t</sub>, AUC<sub>0-inf</sub>, T<sub>max</sub>, K<sub>el</sub>, t<sub>1/2</sub> and AUC<sub>%Extrap\_obs</sub>) were computed using the non-compartmental model of Phoenix® WinNonlin® software version 6.3 (Pharsight Corporation, USA) for T and R. Statistical comparison of the pharmacokinetic parameters of both formulations were carried out by using PROC GLM from SAS® statistical software version 9.2 to assess the bioequivalence of T and R.

**Results:** The 90% confidence interval for the ratio of the test and reference product averages pharmacokinetic parameters C<sub>max</sub>, AUC<sub>0-t</sub> and AUC<sub>0-inf</sub> were between 80% and 125% for the ln-transformed data with respect to Lopinavir and Ritonavir.

Ratio of test product (T) and reference product (R), T/R, (90% confidence intervals):

LPV [T/R (90% CI)]: C<sub>max</sub>: 105.36 (94.15-117.91), AUC<sub>0-t</sub>: 106.42 (94.48-119.86) and AUC<sub>0-inf</sub>: 104.52 (92.58-117.99)

RTV [T/R (90% CI)]: C<sub>max</sub>: 110.37 (100.91 -120.72), AUC<sub>0-t</sub>: 108.71 (98.53-119.94) and AUC<sub>0-inf</sub>: 108.83 (98.36-119.42)

Both the test and reference products were well tolerated, when administered as single dose under fed conditions.

**Conclusions:** Under fed conditions, the test product (T) Lopinavir/Ritonavir Granules 40 mg/10 mg of Mylan Laboratories Limited, India was bioequivalent to the Reference product (R) KALETRA® (Lopinavir/Ritonavir) Oral Solution 80 mg/20mg per mL of AbbVie Inc., USA, with regard to rate and extent of absorption. This new pediatric FDC could provide an easy-to-use treatment for small children.

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### Does in-utero HIV exposure influence macrophage polarisation and infant outcomes? Findings from a pilot study in Pretoria, South Africa.

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**Background:** An increasing number of children born to HIV-infected mothers do not contract HIV. Studies show, however, that HIV-exposed but uninfected (HEU) children are more likely to have growth and neurodevelopmental delay, immune dysfunction, and higher morbidity and mortality than their HIV-unexposed-uninfected (HUU) counterparts. Head circumference (HC) is associated with brain mass and viewed as a good indicator of neurological development. Macrophages have two main phenotypes: classically activated macrophages, which are pro-inflammatory, and alternatively activated macrophages, which are anti-inflammatory. An imbalance between phenotypes has been associated with various diseases and classically activated microglia and/or macrophages are known to exert cytotoxic effects on neurons and oligodendrocytes. We hypothesized that HEU infants would show poorer development and altered innate macrophage polarisation than HUU.

**Methods:** Fifty-five infants born to HIV-infected and uninfected mothers were recruited. Medical chart review and postnatal questionnaires provided data on maternal characteristics and infant development outcomes (APGAR scores; anthropometry [age-/sex-standardised; World Health Organization International Growth Standards]) were obtained. Macrophage activation markers (CD14, CD16, CCR2) were tested at birth and at ten weeks post-partum using flow cytometry. HC was measured at

the same time points and categorized according to percentiles and z-scores. Data analysis was done in Stata 14 at 5% significance.

**Results:** Thirty-three mothers were HIV infected, of whom 29 were on ART with a median CD4 count of 444 cells/uL and 19 had an undetectable HIV viral load. Only one infant was HIV-infected. There was no difference between exposed and unexposed infants in terms of gestation duration, weight or length. HC was lower in HEU infants (p=0.0054) and associated with weight (p=0.006); mid-upper-arm circumference (p=0.0086) and abdominal circumference (p=0.0081) at birth. The simultaneous expression of CD14 and CCR2 was higher in HEU at birth (p=0.0005). At ten weeks, CD16 expression was lower in infants with an HC <3rd percentile or z-score ≤2 (p=0.03) while CD14 marginally missed significance (p=0.07).

**Conclusion:** This study confirmed that HEU infants have reduced HC, which has been shown to be associated with suboptimal neurodevelopmental outcomes. Monocytes in HEU infants showed signs of increased activation and altered recruitment, which were associated with HC z-scores of ≤-2. It is possible that the neurocytotoxic effects of these classically-activated macrophages may be contributing to delayed neurodevelopment in HEU infants.

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### Early Infant Diagnosis test outcomes and Positivity trends in Kisumu County, Western Kenya

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**Background:** In infants who acquire HIV at the time of delivery, disease progresses rapidly in the first few months of life, often leading to death. The exposed children should receive prophylactic antibiotics (Cotrimoxazole) and anti-retroviral therapy (ART) as soon as they are medically indicated, this significantly increases their chances of long and healthy survival. Standard assay has limited utility in diagnosing HIV reactivity among infants till the age of 18 months by which time, many HIV-infected infants expire. The test for diagnosing infant and children below 18 months is DNA polymerase chain reaction (DNAPCR) either by dried blood spot (DBS) or whole blood sample (WBS). Due to the persistence of maternal antibodies in infants aged less than 18 months, the use of antibody tests, such as commercially available HIV rapid disposable tests, cannot accurately establish the infants HIV status. Instead, virological testing (either RNA PCR or DNA PCR testing) or ultrasensitive p24 antigen testing should be used to determine the HIV status of infants in that age group. Current WHO guidelines call for all HIV-exposed infants to have virological testing at 4–6 weeks of age or at the earliest opportunity thereafter. Although it is possible to use viral load testing for initial diagnosis of HIV infection in infants, to date such testing has not been widely used in resource-limited settings. Likewise, p24 antigen testing has been used in very few settings. Instead, the most widely used test for EID is the DNA PCR molecular test. The qualitative HIV-1 DNA test detects the presence of HIV proviral DNA, a form of the HIV-1 genome produced by the integration of viral DNA into host cell DNA.

**Objective:** The main objective was to evaluate EID Positivity outcome trends in Kisumu County, Western Kenya from January to December 2017.

**Methodology:** Using information from NASCOP EID Database of Kisumu County from January to December 2017, DNA PCR Test outcomes were analyzed. The test outcomes by: positivity trends, age, entry point, mother PMTCT regimen, infant prophylaxis and facility positivity test outcomes were the variable considered for analysis.

**Results:** The results show that a total of 11,579 Tests were carried out in Kisumu County, Western Kenya and 454(3.9) tests were positive. EID Positivity outcomes by age showed that <2 months-81(2.2%), 2-9 months-112(6%), 9-12 months-35 (5%), 12-24 months-33(7.7%). Results on Positivity by entry point showed that: MCH/PMTCT-219(3.5), CCC/PSC-16(4.5%), No Data-23(15.1), OPD-16(30.8%), Pediatric-6(15%), and Maternity 1 (8.3). Positivity by PMTCT regimen: HAART-137(3.4%), TDF+3TC+EFV-44(2.5%), TDT+3TC+NVP- 4(3.1%), ADT+3TC+EFV-8(6.2%). Results on positivity by infant prophylaxis (Initial PCR) showed that: NVP for 6 Weeks 51(3.7%), NVP during BF-28(3.6%), and NVP for 12Weeks- 21(3.1%), NVP+AZT-15(2.2%), SdNVP only 8(5.3%).

**Conclusion:** The EID Positivity in Kisumu County, western Kenya is at 4.5% for the period January to December 2017. Positivity is highest at ages 2-9 months (6%). Most infants were tested at MCH/PMTCT entry point with a positivity of 3.5%. The highest positivity was also experienced on infants from mothers on HAART. Infants on NVP for 6 weeks had the highest positivity.

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### Impact of SMS printers on turnaround time of Results: in the context of point-of-care for EID in Rwanda

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**Background:** Survival of HIV-infected infants depends on early HIV testing, prompt return of test results and urgent initiation of ART. Since March 2017, the Elizabeth Glaser Pediatric AIDS Foundation (EGPAF) and Rwanda's Ministry of Health introduced point-of-care (POC) testing to optimize early infant diagnosis (EID) networks. In June 2017 SMS printers were introduced to accelerate turnaround time of results.

**Methods:** POC platforms are placed in hub sites that provide on-site testing for patients and also receive tests from smaller nearby facilities, "spokes". Lab forms are transported with blood samples and information on turnaround times between sample collection, receipt of results by the caregiver, and initiation on treatment for HIV-infected infants are completed by clinicians. A copy of the information is collected and entered in a project-specific database. Turnaround time for result communication to caregiver was calculated and compared for the periods prior to the introduction of SMS printers (from March 27 through May 31, 2017) and after the introduction (from June 1 to December 31, 2017).

**Results:** Prior to the introduction of SMS printers, 87 tests from 16 spokes were performed. All results were communicated to

caregivers, of which two infants tested positive and were initiated to treatment the same day of result communication. The median turnaround time from sample collection to results communication was five days (IQR: 1-10; range: 0-42). After the introduction of SMS printers, 273 tests from 21 spokes were performed, where seven infants tested positive and were initiated on treatment. The median turnaround time to communication of results was 3 days (IQR: 1-7 days; range 0-56).

**Conclusion:** In sites using SMS printers, the median turnaround time to receipt of results by caregivers decreased by 40%, suggesting that combining SMS printers with POC could accelerate the return of results. Wherever it is not possible to place a POC/EID platform at every site, putting an SMS printer at spokes could make a difference in the early availability and initiation of treatment to infected children.

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### Particularities of the follow-up of parent-child couples infected with HIV in an adult care service. Abidjan, Côte d'Ivoire

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**Background:** Mother-to-child transmission of HIV remains the leading child-contaminating way with a high rate of child morbidity and mortality in sub-Saharan Africa.

**Objective:** To describe the epidemiological, clinical, biological and therapeutic aspects of children infected with HIV followed by Infectious and Tropical Diseases at the University Hospital of Treichville.

**Materials & Methods:** Cross-sectional study, descriptive from January to June 2017 in children under 15, recorded in the care, during the study period, at the service of Infectious and Tropical Diseases of the University Hospital of Treichville. It focused on the analysis of the medical records of the children of adults followed in this center. The following parameters were studied: sociodemographic, clinical, biological and therapeutic. The data collected was entered on Excel 2010 and analyzed using the epi info v7.

**Results:** Thirty one (31) children are followed in our adult site. The middle age was 8 years [2 and 14 years] with a male predominance of 54.8%. A high schooling rate of 87.1% was reported. Our study population was in the majority of cases, asymptomatic, at stage 1 WHO (40.7%) followed by stage 2 (9.6%). HIV infection 1 was predominant (96.8%). Only one child had a dual HIV1 + HIV2 serologic profile (3.2%). Most patients (87.1%) were on antiretroviral therapy. The first-line protocols used were: zidovudine + lamivudine + efavirenz (33.3%), abacavir + lamivudine + efavirenz (29.6%), zidovudine + lamivudine + nevirapine (18.5%) and abacavir + lamivudine + lopinavir / ritonavir (18.5%). In 2 cases, the protocol was modified due to therapeutic failure in the zidovudine + lamivudine + nevirapine. Cotrimoxazole chemoprophylaxis was systematically instituted in 89.7%. The retention rate was 96.8%. Nevertheless 3.2% of our series were lost to follow up.

**Conclusion:** Routine screening of children born to HIV-infected parents is interesting for their early management.

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### Improving HIV Viral Suppression in Children 5-19 years at Health Facilities using Adolescent Clubs in Tanzania

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**Background:** Tanzania adopted the use of HIV Viral load (HVL) for routine monitoring of people living with HIV (PLHIV) who are on antiretroviral treatment (ART) September 2016. The UNAIDS 90-90-90 goal to achieve 90% viral suppression in all HIV-infected people on ART is still a challenge to all age groups but more challenging specifically in children. Currently the HVL suppression rates in children is estimated to be around 60% in all regions including Tanzania Health Promotion Support (THPS) supported regions of Kigoma and Pwani as well as in Zanzibar. THPS initiated 31 teens/adolescents clubs at selected high volume health facilities aiming at improving children and adolescents' retention in HIV care and improving viral load suppression.

**Materials & Methods:** Thirty-one health facilities were selected to support teen/adolescents clubs activities. The use of HVL to monitor effectiveness of ART was communicated to health care workers supporting these facilities to try maximizing the efforts on adherence counselling and ART pick up to adolescents. Teen/adolescents clubs met on monthly basis. During their gathering adolescents discussed HIV related health education in addition to ART adherence and HVL testing to monitor effectiveness of ART. After one year of HVL rollout analysis from these facilities was done.

**Results:** Thirty-one HVL data set were analyzed from 31 facilities in THPS supported regions. The analysis included all age groups for under fifteen but the focus was more on the 5-19 age groups. From facilities with no teen/adolescents clubs results showed that viral suppression improved from 50.2% during January-March 2017 to 59.3% for October-December 2017 as compared to facilities with teen/adolescent clubs improved from 40.4% during January-March 2017 to 71.9% for the period of October-December 2017. For the age group of 5-14 years changes are from 50.3% to 58.0% from facilities without teen/adolescent clubs for the same time period as compared to 56.7% to 80.0% for facilities with teen/adolescent clubs.

**Conclusions:** Viral suppression rates among children and adolescents on ART were consistently low prior to initiation of teen/adolescent clubs. There was an increase in HVL suppression among teens and adolescents attributed to clubs. The clubs serve as important avenues to ensure quality and friendly teens/adolescent HIV services including psychosocial support, resulting to HIV viral suppression and good clinical outcomes.

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### Protease mutation characterization and factors associated with failure on second line anti-retroviral therapy in Uganda

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**Introduction:** There is limited data on factors associated with failure on second line antiretroviral therapy with PI mutations in Uganda and the type of drug resistance mutations acquired at failure. Patients on second line antiretroviral therapy are increasing yet there are limited laboratory infrastructure and therapeutic options beyond second line antiretroviral therapy. This study was aimed at characterization of PI mutations and identification of factors associated with failure on second line antiretroviral therapy with major PI mutations at Joint Clinical Research Centre Uganda.

**Objective:** Determination of factors associated with failure on second line ART and characterization of the HIV Drug resistant mutations

**Methodology:** Nested Case control study was used to analyze retrospective data of patients exposed to second line ART at JCRC with both qualitative and quantitative methods. Incidence density sampling was used. Continuous variables were compared using the Wilcoxon rank-sum test; while categorical and dichotomous variables were compared using the chi-square test and Fishers exact test where appropriate. Conditional logistic regression for paired data was used to assess association.

**Results:** At initiation of second line ART, viral load was significantly higher among the cases (P value< 0.001) while the CD4 was significantly lower in the controls (P value< 0.001). The mean number of Major PI mutations per isolate was 2.5(±1.4). The commonest PI mutations were at positions V82, I54 and M46 and the least occurring mutations were at positions I13, and I50. 12% of patients had accumulated ≥ 3 darunavir associated mutations and phenotypically darunavir was still susceptible in 80.24% of the patients. High viral load at initiation of second line ART was the only independent predictor of treatment failure. 3.9 (1.5, 10.3) Mental health and substance abuse assessments and inadequate identification of loss to follow up patients were the gaps identified in the qualitative assessment.

**Conclusion:** Darunavir is still efficacious in a large majority of individuals failing second line ART. Viral load at initiation of second line ART was the only independent predictor of failure on second line ART with PI mutations and the current routine viral load monitoring could be the solution mitigating the need for the costly post second line therapeutic options. Ensuring mental health and substance abuse for every patient and institution of measures to aid quick identification of loss to follow up patients will improve patient outcomes and prevent second line ART failure with PI associated resistance.

#### Recommendations:

Patients with very high viral loads at failure on first line ART will need special monitoring while on second line ART if it's to be taken efficaciously for a long time.

Resistance testing for patients specifically with high viral loads at failure of first line ART could be beneficial as time and effectiveness on second line ART will be increased

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### Long term risky sexual behavior among patients on antiretroviral therapy in urban and rural cohorts in Uganda: A longitudinal Prospective cohort study

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### Background

One African study indicates that urban patients on ART are less likely to practice risky sex compared to their rural counterparts. We evaluated changes in risky sexual behavior over a 4-year period among urban and rural long-term longitudinal ART cohort participants in Uganda

**Method:** We conducted a longitudinal analysis of one rural and one urban cohort of patients who initiated ART between April 2003 to July, 2007. Patients were included in the analysis starting at Year 4 (baseline), when the “sexual behavior” questionnaire was introduced and were followed every 6 months for 4 years. Risky sexual behavior was defined as sexual intercourse with two or more partners, or inconsistent or no condom use in previous 6 months. We used generalized estimation equations logistic (GEE) regression to assess the effects of ART on risky sexual behavior

**Result:** We included 1,012 participants, 402 (39.8%) urban cohort and 610 (60.2%) rural cohort participants with a mean age of 42 years at enrollment (IQR 34-45) urban and 46 years (IQR 39.5-50) rural. The median duration of follow-up was 66 months (IQR 66-67) for urban; 36 months (IQR 36-37) for rural. Risky sex declined from 33.1% at baseline to 9.62% after 42 months of follow-up in the rural cohort ( $p < 0.01$  for test of trend) and was unchanged from 9.7% at baseline to 9.94% after 48 months in urban cohort ( $p = 0.51$ ). We observed rural site (AOR, 3.69, 95% CI: 2.78-4.90); male gender (AOR, 1.88, 95% CI: 1.44-2.45) as factors significantly associated with increasing odds of risky sexual behavior. Not being married (AOR, 0.26, 95% CI: 0.20-0.34); Log viral load (AOR, 0.8, 95% CI: 0.72-0.92); CD4 >200copies/ml (AOR, 0.57 95% CI: 0.38-0.87); current age (AOR, 0.93, 95% CI: 0.91-0.97); time on ART (AOR, 0.55, 95% CI: 0.45-0.67) were associated with reduced odds of risky sex.

**Conclusion:** Overall, we observed a decline in risky sexual behaviors during years 4–8 of follow up on ART. Rural cohort participants initially reported more risky sexual behavior compared to urban participants, but this declined to the same levels by the end of follow-up; ART programs should continue emphasizing individual behaviors risky reduction practices even after patients have stabilizing on treatment

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## Leaving no one behind: Integrating Mental Health Services into ART Programs in Northern Nigeria

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**Background:** Approximately 20 million Nigerians suffer from mental illness. In 2015, prevalence of depression among PLHIV in Nigeria was 23.1%. Depression is a predictor of worse HIV treatment outcomes. It is associated with treatment failure and the emergence of drug resistant HIV strains, in part due to depression causing poor adherence to ART. ART success relies on life-long, strict adherence to medication regimes.

**Materials & Methods:** The USAID-funded Care and Treatment for Sustained Support project implemented by Management Sciences for Health, in June 2017 conducted a baseline assessment of mental health services provision across 41 partner hospitals (36 secondary and 5 tertiary) across five states. Assessment focused on availability of mental health services, capacity to screen, refer or treat clients with mental health disorders. The assessment finding revealed that, all 5 tertiary facilities have comprehensive psychiatric units, only 7 (19%) out of 36 secondary facilities have psychiatric units but lack trained staff, the remaining 29 (81%) secondary facilities do not have designated psychiatric units. To facilitate integration of mental health services into adherence service provision, we collaborated with Gede Foundation to build the capacity of 70 service providers made up of doctors, nurses and adherence counselors on how to screen and recognize signs of mental health disorders amongst PLHIV. Screening tools were adapted with referral linkages created with specialist hospitals.

**Results:** Of the 319 defaulters who were identified and evaluated between August to October 2017 post training, 56 (17.5%) were diagnosed with mental health disorders and referred for specialist care. 38 successfully completed their treatment and have fully adhered to their clinic appointments and drug regime. This represents a 68% success rate in ART adherence among PLHIV with mental health disorders.

**Conclusions:** By integrating mental health services into adherence services; clients receive multiple services in one clinic visit, time and cost is saved, negative impact of mental health disorders among PLHIV is reduced. Ultimately, ART adherence is improved thereby improving efforts towards achieving the third 90.

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## To what extent can intensive adherence counseling improve viral load non suppression? The virologic aftermath from a rural HIV clinic in eastern Uganda

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**Background:** Intensive Adherence Counseling (IAC) is counseling presented to patients with non-suppressed Viral Loads (VLs). It aids a client in developing an ample plan for adherence to Anti-retroviral drugs (ARVs). Herein, obstacles are identified, possible solutions are explored and a road map to medication adherence is prepared. IAC involves a Multidisciplinary team.

According to June 2017 data from Central Public Health Laboratories (CPHL), 3269 clients had non-suppressed Viral Loads (VLs). 1100 IACs were done, 700 suppressed and 405 needed resistance testing. We sought to determine the virologic

outcome of VLs for clients that completed all their IAC sessions and had a VL test between June 2015 – December 2017 in TASO Soroti.

**Methodology:** A Retrospective study that looked at correlates of a second non-suppressed VL after a first non-suppressed VL and three IAC sessions was conducted on 100 randomly selected records between June 2015 – December 2017 at TASO Soroti Center of Excellence HIV Clinic in eastern Uganda. Data was extracted from the national Central Public Health Laboratories (CPHL) VL dashboard and non-suppressed register and recorded into excel sheets. Analysis was done using STATA version 13 software and different variables were determined.

**Results:** Males were more likely to be non-suppressed (OR=2.25, p-value=0.06). Adolescents and children were 3 times more likely to be non-suppressed compared to adults, though this was not statistically significant.

65% of the clients were non-suppressed. 60% (n=39) of the non-suppressed clients were males. However, there was no significant relationship between sex and suppression status.

**Conclusions:** Most clients will have VL non-suppression after IAC with males and adolescents predominant. If the third 90 is to be achieved, we must re think around strategies to support these categories otherwise the UNAIDS 2020 goal shall remain a dream.

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### Clients' satisfaction with HIV treatment services in Bamenda, Cameroon: a cross-sectional study

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**Background:** Clients have explicit desires or requests for services when visiting hospitals; inadequate discovery of their needs may result in dissatisfaction. Patient satisfaction influences retention in HIV care, adherence to HAART and serves as determinant to HIV suppression. This study's objectives were to quantify clients' satisfaction with HIV services in Bamenda and determine relationship between satisfaction and clients' socio-demographic/structural characteristics.

**Methods:** A cross-sectional study was conducted on HIV-positive patients followed-up, on treatment and who consulted in the Bamenda Regional Hospital treatment centre between July and August 2014. Participants consent was sought and data collected on client's level of satisfaction to staff-patient-communication, staff attitudes, privacy and confidentiality and staffing and amenities situations in the hospital. Data was collected using a structured questionnaire interviewer-administered by investigator and trained health personnel. Collected data was analyzed using Epi Info version 3.5.4 and clients' satisfaction measured using frequencies and percentages.

**Results:** A total of 384 participants took part in this study and their median age was 37 years (IQR: 29-46). Two hundred and seventy-four (71.4%) participants were females. Overall satisfaction with HIV services was 91.2% and participants reported less satisfaction with overall staffing and amenities situation of the centre (3.6%). In the multivariate analysis, only being female, employed and perceiving high number of nurses

working at the treatment centre remained significant predictors of overall satisfaction with HIV services.

**Conclusion:** A high proportion of participants expressed satisfaction with HIV services. However, some dissatisfaction is masked in this high satisfaction level. This dissatisfaction underscores need to improve staff attitudes, staff-patient-communication, employ more staff and build better patient facilities. Future studies need to focus on assessing long-term progression of satisfaction levels with services and determinants of satisfaction involving larger samples in many treatment centres.

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### Tracking LTFU in high volume ART Clinics in the Djoungolo Health District and reasons for LTFU

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**Introduction:** Antiretroviral therapy is life-long and although it is widely available in Cameroon and free at the point of service, retention in HIV care is still significantly weak. The goal of this study is to explore reasons for loss to follow-up (LTFU) that can enable programs improve retention.

**Methodology:** CHAI in collaboration with MOH carried out a LTFU campaign in four selected ART clinics. Ten psychosocial workers (PSW) were identified to trace clients LTFU. A list of LTFU was established by the facility, which included defaulters since 2014. CHAI and MOH district staff carried out weekly supervisions to monitor progress. The questionnaire included information on client family and professional status, psychosocial support in the family or community and reasons for defaulting. Data collected was entered and analyzed using MS excel.

**Results:** A total of 373 patients who had been LTFU were contacted, the mean age was 38.3 years and 66% of those contacted were females. We registered a total of 704 children for all the patients LTFU who were directed to a community partner for HIV testing and other appropriate interventions. Of all the patients, 136 (36.5%) were deceased. Among the traced living patients (n=237), 152 (64%) had dropped out of treatment and 85 (36%) were still on treatment. We convinced 98 (64.5 %) of those who had dropped to resume ART. In addition, we found that about 49% of those presumed LTFU were still on treatment. They had either had relocated or self-transferred to another treatment center (38%) while 11% were receiving ART from private physicians. Those who had stopped ART cited reasons such as; temporal disability due to hospitalizations, childbirth, etc. (36%), 34% financial constraints to access to care i.e. cost, or distance to site (34%), toxicity or side effects of the ARVs (13%), denial of their HIV status (9%) and stigma and discrimination(8%).

**Conclusion:** These findings demonstrate that over 40% of those believed to be LTFU were not LTFU. This will guide support the implementation of differentiated models of care to improve retention. The introduction of electronic medical records (EMR) will enable better tracking of patients who self-transfer.

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### Reasons for changing first line ART: the role of toxicities over 12 years in a large urban program in Uganda

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**Background:** During the initial scale up of ART in sub-Saharan Africa, regimens included drugs with high potential for toxicity (particularly stavudine). In 2008 the Uganda Ministry of Health recommended a systematic drug substitution from stavudine to other NRTI regardless of toxicities. Simultaneously, a growing number of patients on first line ART requires 2nd-line treatment due to failure. Viral load monitoring was introduced in Uganda at the end of 2014 [3], and before ART was monitored using immunological criteria. We aimed to determine the reasons and risk factors for change of first line ART across the years.

**Methods:** We included patients started on standard 1st-line ART (2NRTI+1 NNRTI) at the Infectious Diseases Institute, Kampala between 2005 and 2016. We categorized the reasons of any treatment change in 1) toxicity 2) treatment failure 3) other. We also compared the incidence of the first drug substitution due to toxicity in patients initiated on ART before and after 2008. To identify factors associated with treatment change due to toxicity we used Cox proportional hazard model including sex, baseline CD4 count, age in 5-year increases, WHO stage, baseline and time dependent body mass index (BMI), year of ART start (before and after 2008), and regimen at ART initiation (zidovudine versus stavudine versus tenofovir based).

**Results:** We included 14,272 patients; 63.2%, were female, the median age was 36 (IQR: 25-42), 45.4% were in WHO stage 3 and 4. the median BMI and CD4 count at ART start were 21.9 (IQR:19.6-24.8) and 188 cell/μL (IQR: 65-353); 3,934 (27.7%) were started on stavudine, 6,557 on zidovudine (45.9%), and 3,751 (26.4%) on a tenofovir containing regimens. We observed an increased proportion of patients with drug substitution due to toxicity from 2005 to 2008, and thereafter a marked reduction. In 2015 we observed the higher proportion of patients switched to second line due to treatment failure. The cumulative incidence of drug substitution due to toxicity in patients started on ART before and after 2008 was 2.97 (CI: 2.80-3.16) and 2.10 (CI: 1.93-2.28) per 1000 person months, respectively (P <0.001).

In multivariate analysis patients who were less likely to change drugs due to toxicity were: male (HR: 0.78, CI: 0.69-0.88, P value: <0.001), with CD4 counts 200-250, and >350 cells/μL as compared to <200 cells/μL (HR: 0.83- CI: 0.73=0.96, and HR: 0.82. 0.70-0.97, P value: <0.001), with normal BMI as compared to BMI< 18.5 (underweight), (HR: 0.79, CI: 0.69-0.92) and started on tenofovir and zidovudine as compared to stavudine (HR: 0.39 CI: 0.34-0.45 and HR: 0.13, CI: 0.10-0.16, P value: <0.001) Older patients (HR: 1.14 per 5-year increase CI: 1.11-1.17, P value: <0.001), those in WHO stage 3 and 4 (HR: 1.21, CI: 1.09-1.36, P value: <0.001) were more likely to change regimen due to toxicity.

**Conclusions:** The contribution of toxicity as reason for drugs substitution decreased over time mirroring the phase out of stavudine. Treatment failure was likely underestimated up to 2014, as clearly demonstrated by the increase in switches to second line immediately after the introduction of VL monitoring.

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### Involvement of the Genetic Diversity of HIV-1 in the Virological Treatment Failure of First Line Antiretroviral in Kinshasa

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**Background:** Genetic Diversity of HIV type 1 affects the treatment and the emergence of resistance. The aim of this study is to determine the rate of virological treatment failure and the involvement of genetic diversity and different mutations in this failure in Kinshasa.

**Methods:** Of 153 antirétroviraux-naïve patients who were included in the cohort, 138 patients have been received for the appointment of the 6th month. Clinical parameters were recorded on individual patient charts. The détermination of Viral Load (VL) was done at the laboratory of Molecular Biology. Clinical and biological parameters of 6th month were compared with those taken at baseline of the cohort to determine the evolution of patients under treatment.

**Results:** At the 6th month consultation, 138 patients (90.2%) had returned out of 153 included. Eighty-one (58.7%) patients were women. The age of patients is between 18 and 65 years with an average of 37 years. Ten deaths (6.5%) and 5 missing (3.3%) have been reported. One hundred twenty-five patients (90.5%) were in clinical stage 3 and 13 (9.5%) in clinical stage 4. The median CD4 T cells was 560 cells/mm<sup>3</sup>. The median VLs of patients was 0.90 log<sub>10</sub> RNA copies/ml. Of the 34 patients in virological failure, 8 (23.5%) were in minimal failure, 23 (67.7%) in moderate failure and 3 (8.8%) in severe failure. According to the Pearson's test, VL at 6th month were highly correlated with that of inclusion, with V75 and K70 mutations for the NRTI, with V108 mutation for NNRTI as well as the virological treatment failure.

**Conclusion:** The results confirmed the hypothesis that high VL at the start of the treatment is a poor prognosis for the development of therapy. Transmitted mutations are also involved in treatment failure.

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### Compliance to guidelines for routine viral load testing in resource limited settings

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**Introduction:** To achieve the final 90 of the UNAIDS 90-90-90 targets, it is critical that timely viral load (VL) testing is offered to all patients on ART. The WHO guidelines recommend VL every 12 months; patients with VL≥1000 copies/ml should repeat VL after 6 months, and be promptly switched to 2nd line ART if treatment failure is confirmed.



We aimed to evaluate the compliance to the WHO guidelines in implementing VL testing and managing patients according to guidelines in a large urban clinic in Uganda.

**Methods:** This analysis included all patients at the Infectious Diseases Institute in Kampala on 1st line ART after December 2014 (date of VL monitoring implementation in Uganda). Patients not yet due for a repeat VL at database closure were excluded. We describe the “cascade” of VL management by reporting the proportion who received a VL test. Among those with VL<1,000 copies/ml we evaluated proportion with a VL performed within 15 months (12 months as per guidelines+3-month window for patients on 3-month prescriptions), late (>15 months), and never. For those with VL≥1,000 copies/ml we evaluated the proportion with a VL repeated within 7 months (6 months per guidelines+ 1-month window for patients on 1-month prescription- patients with detectable VL are taking off the 3 month-prescriptions program), late (>7 months), and never. For those with 2 VL≥1000 copies/ml we evaluated the proportion promptly switched to 2nd line, late (>3 months) and not switched. Prompt switch was defined as within 3 months from the second VL≥1000 copies/ml.

**Results:** Among 9599 registered patients, 6,893 were eligible; 61.0% were female, median age at ART start was 36 years (IQR: 30-42), the CD4 count was 166 (IQR: 68-293) cell/μL and the median(IQR) duration on ART was 41(IQR: 17-87) months, 6,357 (92.6%) had at least 1 VL, of which 512 (8.1%) had a VL ≥1000 copies/ml. Figure 1 shows compliance to WHO guidelines. Among patients with VL<1000 copies/ml, VL was repeated ≤ 15 months in 73.2% and totally in 89%. In patients with VL≥1000 copies/ml VL was repeated in 56.1% (287/512) within 7 months, totally in 86.3%, and was confirmed ≥1000 copies/ml in 249 (56.3%). Of the latter only 165 (66.3 %) were switched to 2nd line within 3 months with a total of being switched of 86.4%. Details for all the other patients are shown in the figure.

**Conclusions:** We found a high rate of viral suppression (92%) in a population where the majority of the patients had been on long term ART with no routine VL monitoring. These results are encouraging towards the achievement of the 90-90-90 targets. Compliance to timing of repeated VL in any category (VL < and ≥1000 copies/ml) was suboptimal, however the proportion of patients for which no action was taken at the different steps was low. Systems should be put in place in order to avoid delay, in order not to undermine the idea of Treatment as prevention (TasP).

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## Drug Resistance Among Women Attending antenatal hospitals in Ghana

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**Background:** Initial evidence from resource-limited countries using the WHO HIV drug resistance (HIVDR) threshold survey suggests that transmission of drug-resistance strains is likely to be limited. However, as access to ART is expanded, increased emergence of HIVDR is feared as a potential consequence. We have performed a surveillance survey of transmitted HIVDR among recently infected persons in the geographic setting of Accra, Ghana.

**Methods:** As part of a cross-sectional survey, 2 large voluntary counseling and testing centers in Accra enrolled 50 newly HIV-

diagnosed, antiretroviral drug-naïve adults aged 18 to 25 years. Virus from plasma samples with >1,000 HIV RNA copies/mL (Roche Amplicor v1.5) were sequenced in the pol gene. Transmitted drug resistance-associated mutations (TDRM) were identified according to the WHO 2009 Surveillance DRM list, using Stanford CPR tool (v 5.0 beta). Phylogenetic relationships of the newly characterized viruses were estimated by comparison with HIV-1 reference sequences from the Los Alamos database, by using the ClustalW alignment program implemented.

**Results:** Subtypes were predominantly D (39/70, 55.7%), A (29/70, 41.4%), and C (2/70; 2, 9%). Seven nucleotide sequences harbored a major TDRM (3 NNRTI, 3 NRTI, and 1 PI- associated mutation); HIVDR point prevalence was 10.0% (95%CI 4.1% to 19.5%). The identified TDRM were D67G (1.3%), L210W (2.6%); G190A (1.3%); G190S (1.3%); K101E (1.3%), and N88D (1.3%) for PI.

**Conclusions:** In Accra the capital city of Ghana, we found a rate of transmitted HIVDR, which, according to the WHO threshold survey method, falls into the moderate (5 to 15%) category. This is a considerable increase compared to the rate of <5% estimated in the 2006-7 survey among women attending an antenatal clinic in mamobi. As ART programs expand throughout Africa, incident infections should be monitored for the presence of transmitted drug resistance in order to guide ART regimen policies.

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## 90-90-13: The reality of viral suppression among ART-initiated adolescents in South Africa

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**Background:** Global fast-track targets include 90% viral suppression among all ART-initiated persons, particularly adolescents. Recent data suggests adolescents have worse viral suppression rates than children and adults, but little is known on adolescent progression through the HIV treatment cascade, once initiated on ART. This study examines HIV treatment cascade for a large sample of adolescents living with HIV in South Africa.

**Methods:** 1,060 ART-initiated adolescents (10-19 years; 55.0% female) from 52 urban and rural healthcare facilities in the Eastern Cape were interviewed in March 2014-September 2015. Participants' viral loads were extracted from paper-based medical records from all facilities (including participants with records in multiple facilities) through December 2017. Predictors of progression through the HIV treatment cascade were identified using multivariate regressions, with age (10-14/15-19 years), sex, urban/rural residence, type of healthcare facility, and mode of infection entered simultaneously.

**Results:** 92.1% of adolescents had any viral load recorded in clinic files. 62.3% had a viral load recorded in the past 2 years and 28.2% in the past year. At most recent viral load, 76.5% of measurements were ≤1000 copies/mL, but only 13.3% were undetectable VL (≤50 copies/mL). Participants were female (53.8%), median age 13 years, (IQR 11-16), living in urban areas (78.0%); and 39.3% attended at least 2 healthcare facilities. Older and vertically infected adolescents were more likely to have no viral load within the past 2 years (OR 0.59 [95%CI 0.43-0.81],

$p < 0.01$ ; OR 0.68 [95%CI 0.47-0.96],  $p = 0.03$ ), and to have viral loads  $> 1000$  copies/mL (OR 0.52 [95%CI 0.37-0.73],  $p < 0.01$ ; OR 0.68 [95%CI 0.47-0.98],  $p = 0.04$ ). Rates of undetectable viral load remained low and did not vary by gender, age, residence, or mode of HIV infection.

**Conclusions:** Viral suppression rates are worryingly low among adolescents in South Africa. Older, vertically infected adolescents were most at risk of poor virologic monitoring and failure – potentially due to experiences of down-referrals from tertiary paediatric facilities to primary-level clinics. Interventions supporting patient linkage to care may be essential to support older, treatment-experienced adolescents transitioning to new forms of care. With 40% of adolescents receiving care in multiple facilities, HIV care engagement requires responses beyond a single-clinic model.

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### High rates of loss to follow-up during transition from youth-friendly HIV clinics to adult care in urban Uganda

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**Introduction:** HIV positive adolescents and young adults, both perinatally and behaviorally infected, are increasingly becoming a key population of interest due to observed negative health outcomes. Retention among young adults (YA) is particularly low as they transition from adolescence and young adulthood to adult care. Our objective was to estimate retention before, during and post transition to adult care.

**Methodology:** We included adolescents (15-19) and young adults (20-25) who enrolled into care between January 2008 and July 2014 at the Infectious Diseases Institute (IDI), Uganda. At IDI patients  $< 25$  are seen in a specialized “young adults” clinic (YAC), and at 25 years they are transitioned to the routine adult clinic. Pre-transition phase was defined as age 15-24.5 years, transition as age between 24.5-26 years, and being above 26 years as post transition phase. Probability of retention outcomes within each of the phases were obtained using Kaplan Meier survival methods and Cox proportional hazards models we estimated the factors associated with being lost to program (LTP) (observed death or loss to follow-up (LTFUP) defined as not being seen  $> 90$  days) during the transition phase. All analyses were performed in STATA.

**Results:** A total of 1642 persons aged 15 to 25 years enrolled into care at the IDI YAC, 1360 (82.0%) were female, 295 (18.1%) were 15-19 years, and median CD4 count at ART initiation was 364 cells/uL (IQR:145-564). The average duration during pre-transition, transition and post-transition phases were 15, 18 and 31 months, respectively. During the pre-transition phase 748 (45.6%) had disengaged from care (13% died, 24% transferred out (T/O), 63% LTFUP). Only 894/1642 (54.4%) of YA joined the transition phase, of these 157 (17.6%) disengaged from care (10.8% died, 45% T/O, 44.2% LTFUP). We observed higher LTP during transition with males having 13.6% (95% CI:8.8-20.8) compared to females 5.0% (95% CI:3.5-7.1) after 12 months in transition. Similarly, males had 2-fold higher risk of LTP during transition, HR 2.51 (95% CI:1.42-4.43),  $P = 0.003$ . Among the 737/1642 (44.9%) of the YA who were present in the post transition period, 149 (20.2%) had disengaged from care; (6.7%

died, 62.4% T/O, 30.9% LTFUP) at the time of database closure. After the 1st and 2nd year post transition, there were no gender differences in LTP.

**Conclusion:** Our results show that transition to adult care is a critical time for young adults, particularly for the males. However, once successfully transitioned the rates of LTP level off. There is need for targeted interventions to ensure retention in care of young adults as they transition to adult care, in order to achieve successful outcomes in this increasingly important population.

## 180

### Differentiated service delivery for HIV viremic patients, early lessons learnt from Lusaka, Zambia

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**Background:** Despite progress with ART scale up, 10.8% of people living with HIV on treatment do not achieve virological suppression in Zambia.

Barriers to patient engagement in care and, ultimately, viral load suppression include clinic-related, psychosocial, and structural factors.

**Problem:** While standard Community Adherence Groups (CAGs) are tailored to fit the need of stable patients, unstable (viremic) patients face increased clinic visit frequency and longer waiting times.

**Intervention:** In October 2017, we adapted an existing CAG model operating at one hospital in Lusaka to accommodate the needs of viremic patients. We modified eligibility criteria for CAGs to include all HIV-positive clients aged  $\geq 14$  years, on ART for  $\geq 6$  months with a recent viral load  $> 1,000$  copies/ml.

We offered a combined community and clinic-based package of services to viremic patients, consisting of:

- 1) Inviting them to join a routine CAG
- 2) Close clinical follow up in a dedicated “Viral Load” clinic
- 3) Fast track of their repeat VL

**Hypothesis:** We hypothesize that our model helps achieve virologic suppression for viremic patients.

For our interim report we assessed uptake of CAG services among patients with “unsuppressed” viral load.

#### Study design and method

Retrospective cohort study

–Review of all patient records who received the intervention from October 2017 to February 2018

Descriptive statistics

–Clinical & demographic baseline

Multivariable binomial regression modelling

–To identify clinical and demographic characteristics associated with CAG uptake, retention, & re-suppression

#### Interim Results:

•1423 patients had a documented VL result.

•103 (7.23%,  $n/N = 103/1423$ ) had an “unsuppressed” VL

- 100 of 103 (97%) unsuppressed patients were eligible to join a CAG.
- 80 of 100 (80%) eligible patients were called about their test results and were sensitized about CAGs. 20 patients could not be reached because of missing contact details.
- 64 of 80 (80%) patients returned and were offered the intervention.
- Of these, 71.8% (n/N=46/64) accepted.
- 27 of 46 (58.6%) who accepted the offer were successfully placed in a CAG.

Overall, 27% (n/N= 27/100) of all eligible clients were successfully placed in a CAG. Of 64 clients who returned to the facility, all 64 (100%) attend the Viral Load clinic. 8 CAG patients have had their VL blood sample collected but results are pending.

**Discussion:** CAG acceptance among viremic clients stands at approximately 71.8%. Fear of HIV status disclosure in the community and lack of time to attend CAG meetings are main reasons for refusal to join CAG. It appears that one-on-one meetings with health care providers is preferred over CAG. Only 58.6% of clients who accepted a CAG have been successfully placed into one. Placement in a CAG requires finding a suitable group for the client. Suitability is mainly determined by finding a CAG that is located near the client's home. Prolonged turnaround time for VL testing slows down identification of clients with unsuppressed VL who might be eligible from our intervention and delays clinical decision-making.

## 181

### Prevalence and Pattern of Pretreatment Resistance mutations in HIV patients in an urban Malawian Cohort

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**Background:** The global rollout of ART has resulted in a great reduction in new HIV infections and in HIV related morbidity and mortality, particularly in low resource settings with high HIV prevalence. Malawi has set up a very effective treatment program reaching >70% of coverage in adult people living with HIV (PLWHA). Drug resistance surveillance is periodically performed in specific sites or populations under treatment, but not prior to treatment initiation. Concerns have been raised that the development and spread of HIV drug resistance (HIVDR) in adults and children in these settings could potentially threaten treatment successes and the control of the epidemic.

**Methods:** The Lighthouse clinics provide comprehensive HIV services to around 35,000 PLWHA in greater Lilongwe. As part of the ongoing LighTen Study (ClinicalTrials.gov NCT02381275), during the enrolment process plasma samples of 200 consecutively enrolled patients (two groups of 100 patients in Q4 of 2014 and Q1 of 2015) were analyzed for the presence of HIVDR mutations prior to treatment initiation. No particular selection criteria were applied for inclusion in the resistance testing. Nucleic acid extraction and protease reverse transcriptase region

amplification were performed according to standard protocols used in the 2 involved university virology labs. Amplicons were sequenced by illumina technology and interpreted by Stanford HIV Db interpretation algorithm 8.4. For HIV subtyping the COMET tool was used.

**Results:** All analyzed HIV isolates were subtype C. Resistance mutations were identified in 13 and 20 out of 100 samples in the first and second series respectively, yielding an overall HIVDR mutation rate of 15.15%, predominantly NNRTI related, with K103N and Y181C being the most frequent mutations. In 22 (11%) cases the HIVDR mutations are clinically relevant for the use of Efavirenz within the current Malawian first line treatment. No major PI mutation and only one for NRTI were detected.

**Conclusions:** The prevalence of 11% of clinical relevant mutations in the NNRTI class demonstrated here supports the call for resistance surveillance and the planned introduction of integrase inhibitors in first line treatment in Malawi.

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### Combination antiretroviral therapy and cognitive difficulties among HIV-positive adolescents in South Africa: a cross-sectional analysis of baseline data from the Mzantsi Wakho study

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**Background:** The effect of lifelong HIV treatment on brain functioning remains inconclusive. This study examined associations between combination antiretroviral therapy and cognitive difficulties among adolescents.

**Methods:** A total of 1059 cART-initiated 10-19-years-old adolescents and 467 community controls attending 53 public health facilities in the Eastern Cape were interviewed in 2014-15. Medication data were gathered from clinical files and supplemented with medication photographs (taken by interviewers) owing to inadequate medical records. Adolescents with unclear data (N = 558) were excluded leaving a final sample of N = 501 (47%). Cognitive difficulties were assessed as adolescent self-reports of past 6-months difficulties remembering things, following a story or conversation or < 60% immediate recall on a memory task or caregiver/school reports of an adolescent being a 'slow-learner' or attending a special needs schools. Analyses used multivariable logistic regressions, controlling for socio-demographic, psychosocial, and HIV-related covariates in Stata 14. Separate models compared NRTI-based regimens, NNRTI-based versus PI-based regimens, and efavirenz-based regimens. Model reduction used the Hosmer & Lemeshow approach.

**Results:** HIV-positive adolescents had significantly higher rates of cognitive difficulties than community controls: 66.2% vs. 60.2%, p=.024. HIV-positive adolescents were also less likely to be in an age-appropriate grade than community controls (46.2% vs. 56.8%, p< .001). The prevalence of cognitive difficulties in the

included sample was 63.7% (CI: 59.4-67.7). For NRTI-based analyses, only stavudine-containing regimens remained independently associated with lower odds of cognitive difficulties (aOR: 0.34, CI: 0.15-0.79) in the final model. Comparing efavirenz-based combination regimens, adolescents on stavudine/lamivudine/efavirenz had lower odds of cognitive difficulties (aOR: 0.12, CI: 0.03-0.43) than those on abacavir/lamivudine/efavirenz (aOR: 1.12, 0.69-1.84) and those on tenofovir/emtricitabine (lamivudine)/efavirenz (aOR: 0.79, CI: 0.41-1.54) in stage 1. In the final model, stavudine/lamivudine/efavirenz remained significantly associated with lower odds of cognitive difficulties (aOR: 0.26, CI: 0.10-0.70). No other regimens were found to be associated with cognitive difficulties in our sample.

**Conclusions:** Cognitive difficulties were high among HIV-positive treated adolescents. Apart from stavudine-containing regimens, no other regimens were found to be associated with cognitive difficulties among adolescents in our sample. The potential neuroprotective role of stavudine-based regimens may be worth investigating in future studies targeting to reduce stavudine-related toxicities.

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### Same Day Dilemma? Service uptake and outcomes among clients initiated on Same Day as HIV Diagnosis under Treat All in Zimbabwe

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**Background:** Early HIV treatment improves the health outcomes of PLHIV. HIV test and treat (Treat All) is an important opportunity to decrease time between HIV diagnosis and ART initiation among all PLHIV regardless of CD4 count or clinical stage. Little is known about the retention and outcomes of clients initiated on ART on the same day under Treat All in Zimbabwe. Our objective was to explore the clinical and service uptake characteristics among clients initiating on ART as the same day as HIV positive diagnosis in two Districts of Zimbabwe.

**Methods and Materials:** We conducted a retrospective cohort analysis of routinely collected facility data among all clients initiated on ART During Months 1(Jun-16); M3 (Sept-16) and M6 (Jan-17) of Treat All Learning Phase at 18 purposively selected health facilities in Bulilima (high incidence cross-border) and Mutare (high prevalence) Districts of Zimbabwe. De-identified client characteristics and retention in HIV care were captured from June 2016-August 2017. Data were entered into MSAccess and analysed using STATA13.

**Results:** A total of 984 patients were initiated on ART in months 1,3 and 6 of Treat All implementation. The majority were female (61.1%; 599), median age 34yrs (IQR:26-43); median number of days from HIV positive diagnosis to ART initiation was 7 days (IQR:0-202d). The proportion of same day initiations increased significantly over time (30.2%M1 vs. 54.4%M6; p=0.0001). Among clients testing positive after start of Treat All, 64.6% (401/621;95%CI:60.7-68.3) initiated on ART same day as diagnosis, with a significantly greater proportion of clients in cross-border Bulilima District initiated on same day (54.9% vs. 29.9%; p=0.0001). Clients initiating on the same day as diagnosis

had significantly higher documented LTFU from care at 6 months (25.9% vs. 17.8%, p=0.03).

**Conclusions:** We document success of the Treat All strategy at reducing time to ART initiation in Zimbabwe. Additional research is required to understand the specific needs of clients initiated on same day as HIV diagnosis in routine public care to promote early and sustained adherence and retention. Findings from this assessment have informed development of patient preparedness for ART tools to support identification and problem solving of barriers to sustained adherence and retention on HIV treatment.

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### Experiences and Lessons learned in implementing the Differentiated Care Model in HIV Clinics in Nyamira County, Western Kenya, January – September 2017

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#### Background:

Kenya, which is globally fourth with approximately 1.6 million PLHIV, adopted “Differentiated care model” (DCM) in 2017 to alleviate the burden on the health system. We describe experiences in implementing the DCM approach within Nyamira County of Kenya that has a HIV burden of 6.4% against the country’s national average of 5.6%.

**Description:** Between January and September 2017DCM was rolled out in 103 HIV clinics; it commenced with an induction to the DCM as per the Kenyan national guidelines to health workers. The criteria for qualification for “DCM package for stable PLHIV”, was that patients should have been on ART over 12months, aged above 20 years, completed IPT, be HIV virally suppressed, should have a BMI of ≥18.5 kg/m<sup>2</sup>, not been treated for an opportunistic infection in the preceding 6 months, and if female should not be currently pregnant. Stable- PLHIV would be offered an option of long-ART prescription refill via a facility-based fast track option (FFT) or a community-based ART group (CAG) comprised of 3-6 persons that belonged to a community psychosocial support group or were drawn from the same locality.

**Lessons learned:** Twenty-six percent (3110/12257) of patients met criteria for stable-PLHIV. Forty (41.7%) health facilities had introduced DCM among (78%) 2419/3110 patients; other facilities did not due to patients not having completed IPT (68.2%) 9346/12257 or not being virally suppressed (20.6%), other reasons (11.2%). FT was highly preferred to CAG (84.7% vs. 15.3%) due to fear of inadvertent disclosure of a positive status to community members. With the introduction of “family clubs” (groups of 2 to 6 extended family members that opted to form a CAG on their own initiative), patients found it easier to adhere to medication and clinic visits.

**Conclusions:** DCM did not alleviate patient workload as majority of patients preferred FFT. HIV programs should provide the necessary infrastructure to enhance health status of majority of PLHIV to well-PLHIV. An expanded definition of “stable patient” may be considered to include younger persons (e.g. school-going children) with committed care-givers. Specific adaptations of the recommended strategies may be required to facilitate the implementation of DCM.

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### High rates of Successful Tracing and re-engagement in HIV care Using Expert Clients In Malawi

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**Background:** Tracing and re-engaging HIV-positive clients who have difficulty staying in care is a growing challenge for the health system in Malawi. Partners in Hope, an EQUIP partner, introduced Expert Clients (ECs), who are HIV-positive volunteers from the local community, to assist in client tracing and follow-up.

**Methods:** Between October – December 2017, ECs received a 2-day training on client tracking tools and strategies for re-engaging HIV-positive clients in care. Facility data clerks reviewed medical records at 69 EQUIP supported health facilities and generated lists of clients with one or more criteria for tracking (defined as: defaulted from ART; missed ART appointment, high viral load; new positive but not initiated ART; or HIV-positive infants). Clients from the list were assigned to ECs for tracing and follow-up through phone calls, SMS, or home visits. Tracing outcomes were documented by ECs on a standardized client follow-up form. Client follow-up forms were reviewed to determine the proportion of clients traced, outcomes and re-engagement in care.

**Results:** 12,008 clients met one or more criteria for tracing, with nearly half of clients missing an ART appointment (Table). 9,685 (80.7%) of clients were traced and 6,698 (69.1%) of those traced re-engaged in care. Defaulters and HIV-positive clients who never initiated ART were least likely to return to care (48.9% and 51.4%, respectively). Reasons for not re-engaging in care included death, undocumented transfer to another health facility, or unwilling to come back to care.

**Conclusion:** We were able to reach a high proportion of clients in need of tracing through the use of EC volunteers who were familiar with the local community. In order for countries to meet the 90/90/90 goals interventions for retaining clients in care are needed. This study demonstrates one low-cost solution. Based on the lower proportion of re-initiates, new strategies for re-engaging clients who default or never initiate ART may be warranted. Additional work is needed to identify methods to reduce lost-to-follow-up and to ensure that clients who re-engage in care receive additional support to avoid future loss-to-follow-up. Additional comparison studies including costing evaluations should be conducted.

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### Retention on Treatment among HIV-Infected Patients in high communal crisis communities in Rivers State, Nigeria.

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**Background:** Retention on treatment of People Living with HIV (PLHIV) reflects percentage of original cohort alive and on ART 12 months after initiation on ART. It facilitates improvement in the quality of life and reduce of risk of transmission of HIV. Increased communal crisis and security challenges in the Niger Delta region limit technical assistance by partners and Government of Nigeria staff to ART facilities within affected communities. We examined the effect of communal crisis on retention of PLHIV accessing care in these facilities.

**Materials &Methods:** This was a retrospective review. We compared retention rates between two facilities located in crisis prone areas (General Hospital Ahoada and General Hospital Omoku) and two in non-affected communities (BMSH & Obio cottage hospital) in Rivers state supported through the USAID funded Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS) project. Cohort of interest was patients who initiated ART between October 2015 and September 2016. We followed them up to determine their current status after 12 months on ART. Key outcomes of interest were; missed appointment after three months of last ART pick up (Loss to follow up-LTFU) and proportion of adults and children known to be alive and on treatment twelve months after initiation on treatment. Data generated from the ART registers were analyzed using excel spreadsheet.

**Results:** A total of 787 PLHIV (268 Male and 519 Female) and 1203 PLHIV (402 Male and 801 Female) were initiated on ART in conflict prone areas and conflict free zones respectively. After a 12-month period, 2% (18) were reported dead, 25% (199) LTFU with 72% (570) retention rate in the conflict prone area. results from conflict free zones show 0.5% (6) reported deaths, 17% (201) LTFU, and 83% (996) retention rate with a statistical significant difference in retention rates across conflict prone area and conflict free zones. (P<0.05). Based on these results, clients are more likely to be LTFU in conflict prone areas than conflict free zones.

**Conclusions:** HIV programming in conflict zones will require innovative context specific approaches to ensuring client retention on treatment.

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### Shifting the HIV/AIDS treatment and care paradigm from an Implementing Partner (IP) led service to the Government of Nigeria owned program: hope for sustainability?

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**Background:** The Implementing Partner-led HIV/AIDS programme in Nigeria transformed into a government-owned and led programme, the NACA comprehensive HIV/AIDS Programme with States (NCAPS) when Government of Nigeria took over the provision of HIV services in health facilities in two states (Abia and Taraba). The respective states' Ministries of Health spearheaded implementation with technical support from federal-level managers. NCAPS promoted the vision of local ownership of and sustainability for the HIV response through its various strategic activities. Sustainability entails building the capacity of a country on all HIV/AIDS programmatic areas and transferring the responsibility of management of same after a period of guardianship. We report on the process and the

outcome in terms of enrollment of patients on first and second line ARVs in the two states.

**Methodology:** The government owned programme started October 2014 and to ensure that HIV/AIDS program quality was maintained, key sustainability strategies for ownership were instituted. These included annual refresher updates for all health care workers on current HIV/AIDS management, monthly meetings of grouped HIV care facilities (cluster coordination meetings), provision of HIV/AIDS job-aids to all the facilities, activation and re-establishment of ARV-switch committees, with monitoring and evaluation. The monthly reports from these states were submitted quarterly to NCAPS for reviews. Annual performance and ART cohort analysis were carried out as part of program review that set the tone for the following year. A comprehensive review of all patients enrolled between 2015-2017 in 51 comprehensive sites (30 in Abia, 21 in Taraba) that serve 336 and 66 primary health centres in both states respectively was done. Care-card data of all new entrants and old patients on HIV treatment were reviewed as well. These were compared with similar data for the years 2012-2014, the period of IP-led care.

**Results:** The results were analysed in two phases: the IP-led, and the country-owned era. A total number of patients on first line ARVs during the IP led phase for both states was 111054 representing 26102, 37242, and 47710 for years 2012, 2013 and 2014 respectively. Patients on second line regimen for that period were 39, 692 and 518.

During the country led process, a total of 185148 patients were on first line ARVs, disaggregated as 52691, 62898 and 69559 for years 2015, 2016 and 2017. Patients on second line regimen for same period were 612, 1018 and 988. This review shows a 2.7% increase from 2012 to 2017 in enrolment of patients accessing first line ART services

**Discussions:** The sustainability process adopted in this study steadily increased the level of uptake of ARVs as evidenced by the yearly addition in first and second line ART enrollments in years 2015, 2016 and 2017. NCAPS programme has endorsed capacity building, a process for supportive supervision and a cluster coordination system to facilitate monitoring and learning within the programme.

**Conclusion:** This proven sustainability model over three years with the lessons learnt from its implementation, could be a prototype model for other states in Nigeria for complete ownership and sustainability of HIV/AIDS programme.

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### Primary and referral health facilities disparities in linkages to HIV care and treatment among newly diagnosed people living with HIV

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**Background:** Approximately, 86.8% of adults living with HIV (15-64 years) in Zimbabwe aware of their HIV status were on ART (ZIMPHIA 2015-2016). Fast tracking access to treatment towards achieving the second 90 of the UNAIDS 90-90-90 targets requires evidence to inform strategies. The objective of the analysis was to examine linkage to treatment for newly diagnosed HIV

positive individuals, as little is known about the impact of health facility level.

**Methods:** We conducted a retrospective analysis of program data abstracted from registers for newly diagnosed HIV positive clients, September-December 2016 in Manicaland and December 2016 - March 2017 in Midlands provinces respectively, following adoption of the "Treat All" strategy. Thirteen facilities (6 primary, 5 district/mission and 2 provincial) were purposively selected from six districts. Data was captured using EPI Info and in STATA V12.

**Results:** Overall, 2297 clients were newly diagnosed HIV positive, where 101 (4%) were children 0-14 years and 2183 (95%) were adults 15+ years. Enrolment into care was highest among clients diagnosed at primary care facilities 71% (444/629) compared to referral hospitals, at the district/mission and provincial level (62% and 68%, respectively). The Kruskal-Wallis H test showed statistically significant difference in enrolment in HIV care,  $\chi^2(2) = 28.02$ ,  $p = 0.0001$  and treatment,  $\chi^2(2) = 35.46$ ,  $p = 0.0001$  amongst the three health facility levels. Sub-analyses indicate that the pattern of higher enrolment rates of the newly diagnosed clients at the primary health care facilities was consistent in both facility and community based testing services. Accordingly, among clients diagnosed in the community, a lower proportion were referred to or preferred enrolment at other health facilities, 13%, compared to those at district or mission hospital and the provincial hospitals, 37% and 28%, respectively.

**Conclusions:** We find significant facility level differences in enrolment in HIV care and treatment. High-level facilities with multiple entry points require service delivery modifications and teams to systematically analyse intra-facility linkages to strategically support newly diagnosed to effectively access treatment. Programmatic interventions to support higher-level facilities, which provide services to referral cases are urgently required towards achieving the second 90.

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### Barriers to linkages of recently diagnosed HIV positive individuals to HIV care and treatment: Perspectives of healthcare providers of test and treat strategy

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**Background:** In 2016, Zimbabwe adopted and rolled out the test and treat strategy recommended by WHO in 2015 offering antiretroviral therapy (ART) to all HIV positive individuals regardless of immunological status. While these are consented efforts to improve the health and lives of people living with HIV (PLHIV), poor linkages between HIV testing, care and treatment have often been reported as a hindrance to attaining the desired outcomes. An estimated 75% of PLHIV were accessing ART in 2016, Zimbabwe. This qualitative evaluation explored HIV care provider's perspectives of barriers to enrolment into HIV care and treatment among the recently diagnosed PLHIV using the test and treat guidelines.

**Methodology:** We conducted interviews with 24 healthcare providers of HIV care and treatment services who are tasked with linking diagnosed HIV positive individuals tested through both

facility and community HIV testing models. These were conducted at 13 purposively selected low performing health facilities (linkage to HIV treatment of new HIV positives below 80%, October-December 2016) in 7 districts. This was a collaboration between facility-based Families and Communities for Elimination of HIV (FACE HIV) program, and community-based Zimbabwe HIV Care and Treatment (ZHCT) program to support MOHCC in the HIV care and treatment program in Zimbabwe. Interviews notes from two note takers were subjected to thematic content analysis.

**Results:** The barriers to enrolment of newly diagnosed PLHIV to HIV care and treatment services reported fell into two main domains namely healthcare system and patient level factors. Healthcare system barriers included the mismatch of free HIV services and user fees for opportunistic infections and laboratory investigations; discharge of inpatients before ART initiation; centralisation of HIV care and ART initiation vs many HIV testing entry points, patient flow for clients seeking treatment for other illnesses; lack of OI/ART pharmacy services during the night, weekends and holidays and the testing of contacts of an index outside the health facility catchment area. Fear of disclosure specifically to partner, financial constraints to cover travel and care costs, long distances and reluctance to start ART among healthy clients (asymptomatic and those presenting mild symptoms) were reported as patient level hindrances to HIV treatment.

**Conclusions:** The findings highlight the need for combination intervention strategies to mitigate barriers to enrolment in HIV care and treatment among PLHIV to optimize the benefits of early entry into HIV treatment as anticipated by the “test and treat” approach. Targeted interventions including service delivery modifications, waiver of user fees, couple testing and counselling and health education programs on the importance of ART are urgently needed to address barriers to HIV care.

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### Reaching the Last 90; USAID Boresha Afya Southern Zone Program Experience in Five Regions in Tanzania.

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**Background:** Routine HIV Viral Load (HVL) monitoring allows for early identification of Antiretroviral Treatment (ART) success or failure among people living with HIV thus providing measure of progress towards reaching epidemic control. USAID Boresha Afya Southern Zone in October 2016 supported rapid scale up HIV viral load (HVL) testing among HIV patients on ART in five regions in Tanzania. Although efforts are being made to improve access to HVL test; however, there are currently less attention to the variations in uptake among different subpopulation groups. The program conducted an analysis of the HVL services uptake and results to examine this.

**Methods:** Routine collected data of patients who were on ART for more than 6 months and tested for HIV viral load from October 2016 to September 2017 in 5 regions in Tanzania were analyzed. Data was obtained from quarterly reports generated from HIV database from 196 supported health facilities. This was analyzed using STATA v15 to examine the variations in HIV viral suppression in various sub populations.

**Results:** A total of 52,005 patients were tested for HIV viral load from October 2016 to September 2017. Among those who were tested, females were 69% while males were 31%. Children less than 15 years who were tested constituted 3% of all individuals tested for HVL. Patients who were virally suppressed (HVL < 1000 copies/ml) were 43,917 which is 84% suppression rate. Children aged 0-14 years had a lower HVL suppression rate (59%) compared to that of adults (85%) (95% CI 0.23-0.28, p=0). Generally, HIV viral suppression was significantly higher among females 86% compared to 82% in males (95%CI 0.03-0.05, p=0). Likewise, among adults tested for HVL, adult females had a higher HVL suppression rate of 86% compared to 83% (95% CI 0.023- 0.037, p=0) in adult males.

**Conclusions:** Reaching 90% HIV viral suppression in Tanzania is promising. However, children and men are lagging in both HVL coverage and suppression. Implementation of client-oriented interventions targeting children and men subpopulations is key. Tailored ART adherence counselling and appropriate differentiated service delivery models for children and men will facilitate optimal coverage and good viral suppression.

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### Missed clinic appointments and long term retention of HIV positive adults in care in a large HIV clinic in Uganda

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**Background:** In sub-Saharan Africa, patients started on ART are usually seen monthly during the first six or twelve months to ensure close clinical and adherence monitoring. However, many patients miss scheduled visits in their first months of treatment. We hypothesize that missed appointments early in HIV care are an indicator of low long term retention. We aim to describe the patterns of missed visit appointments in the first six months of care and examine their association with long term retention in HIV care.

**Methods:** We included HIV positive patients registered into HIV care from January 2008 to December 2014 at the Infectious Diseases Institute clinic in Kampala, Uganda. Data included: patient's gender, baseline age, BMI, WHO stage, and CD4 count. A missed appointment was defined as no visit to the clinic within 3 days of the scheduled appointment. Missed visits were classified as: i) Ever missed(yes/no); ii) categorical (0, 1-2, >2); and iii) Percentage of all scheduled visits missed (0%, 1-10%, >10-25%, >25%). Long term retention was being active in care at 24 months. We used log rank test and a Cox Proportional Hazards model to investigate whether missed visits were associated with and could predict long term retention.

**Results:** The study included 9,374 patients, 5,876(62.7%) were female, median age 33-years(IQR:27-40), 1809(19.3%) were

young adults (16-25 years), 3,180 (33.9%) in WHO stage 3&4, median CD4 count 268 (IQR: 100-489) cells/ $\mu$ L, 1,036 (11.1%) were underweight (BMI < 18.5 kg/m<sup>2</sup>). Of the 9,374, 7,112 (75.9%) were in care at month 6 and 5,211/9,374 (55.6%) achieved long term retention. In the first six months, 2,802 (29.9%) had ever missed a visit, 110 (1.2%) had over 2 visits missed, 1,774 (18.9%) had >10-25% of their visits missed and 686 (7.3%) had over 25% of their visits missed. There was significantly a higher probability of non-retention (0.32: 95% CI: 0.02-0.37, P=0.0007) among those who missed over 25% of their visits in the first 6 months compared to those who missed 25% or less. In the multivariable analysis, patients with: higher proportions (10-25%) of missed visits (HR=1.20, 95% CI: 1.11-1.36, P=0.003) compared to no missed visits and higher baseline CD4 count (200-300, >300: HR=1.30 (1.22-1.60, p<0.01, HR=1.23 (1.10-1.40, p=0.002) respectively compared to <200 cells/ $\mu$ L, had higher risk of non-retention in care. However, the 6 months' behaviour alone poorly predicted the long term retention (24 months) with prediction accuracy of 48.6%, sensitivity of 32.9% and specificity of 73.9%.

**Conclusion:** Tracking missed visits in the first 6 months of ART can be a useful tool to identify patients at risk of low retention in order to target appropriate interventions. In the era of "treat all" our data also re-emphasizes the need for intervention for retaining healthier patients starting ART at high CD4 counts.

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### Beyond HIV Viral Load Test, Efforts Towards a Better Outcome; USAID Boresha Afya-Southern Zone Experience in Morogoro, Tanzania.

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**Background:** In line with the global campaign towards achieving 90% viral suppression among HIV patients on Antiretroviral Therapy (ART); HIV Viral Load (HVL) test has become a routine monitoring tool for patients on ART. Beyond the HVL test, patients whose viral suppression is suboptimal require prompt individual patient follow up and client focused interventions. However, currently in Tanzania, greater emphasis is on HVL coverage with lesser focus on the outcome and its use in patient management. USAID Boresha Afya-Southern Zone project followed up and evaluated the outcome of adult patients in Mafiga Health Centre whose initial viral load tests were suboptimal.

**Methods:** Data for adult patients who tested for HIV viral load between April and September 2017 was analyzed, patients with HVL > 1000 copies/ml were registered and those with mobile phones were tracked through phone calls by health care providers and others were tracked physically (home visit) by community volunteers. Those who returned were provided with multiple sessions of Enhanced Adherence Counseling (EAC) sessions over a period of three months. Afterwards, they had a repeat HVL test and the results: of the second test were analyzed.

**Results:** A total of 223 (52 Males and 171 Females) had viral load above 1000 copies/ml. Among these, 174 (78%) completed three EAC sessions; out of which 140 (80%) of them had second HVL test and 91 results: (65%) were received from the laboratory. Out of these 54% achieved viral suppression (<1000 copies/ml) while 46% (42) had HVL >1000 copies/ml. There was no significant difference in viral suppression between females (58%) and males (41%) (p=0.164). Out of 42 patients with unsuppressed viral load 31% had log drop >0.5 and continued with EAC, while 27 (64%) were switched to second line Antiretroviral regimen, one died, and one was lost to follow up.

**Conclusion:** Continuous monitoring of patient level HVL outcome is important in ensuring that the HVL results are used to make clinical decisions and to influence patient management. Tracking of the program level cascade facilitates early identification of gaps and appropriate interventions. Enhanced Adherence Counseling for virally unsuppressed patients is key towards achieving the last 90.

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### Sociodemographic and Anthropometric Profile of HIV-Positive Patients strating Traditionnal Treatment against HIV: Case of Bonkoko Center

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**Context:** In the Democratic Republic of Congo (DRC), the Antiretroviral (ART) drug coverage is still very low throughout the country. Hence, a large number of People Living with HIV (PLHIV) use traditional treatment made from plants to fight the HIV infection and the opportunistic infection associated to it.

**Objective:** The objective of this work was to evaluate the clinical parameters; Para clinical and socio-demographic studies at the beginning of treatment of People Living with HIV (PLHIV) who adhere to traditional treatment in Kinshasa.

**Methods:** A cohort study was conducted in the Bonkoko center with a baseline of 3 months; 97 HIV positive patients were included randomly according to the specific inclusion criteria from January 11, 2016 to April 11, 2016. Clinical, biological and socio-demographic parameters were recorded in all patients at baseline.

**Results:** A total of 97 patients were selected for the job. A total of 79 women (81%) and 18 men (19%) participated voluntarily. The mean age was 40.8  $\pm$  10 years and the most represented age range was 36-45 years. The mean Body Mass Index (BMI) is 23.07  $\pm$  3.8 at baseline. The married dominated the sample while the dominant religion was the other religions called revival. The level of study that dominated the population was the secondary level. The mean biological values at baseline were as follows: Glycemia



85 ± 19mg/dl; Urea 22.5 ± 6.66mg/dl; Creatinine 0.88 ± 0.22mg/dl; Total cholesterol 169.6 ± 37.7mg/dl; HDL 52.6 ± 15.1mg/dl; LDL 96.4 ± 31.4mg/dl; Triglyceride 102.8 ± 47mg/dl; SGPT 23.3 ± 11.1UI/L; SGOT 22.3 ± 10UI/L; Amylase 81.9 ± 31.1UI/L; and the median values for CD4 was 220cells/ml and for the Viral Load was 4.10 log10 copies of RNA/ml.

**Conclusion:** This study showed that patients who adhere to traditional medicine for the treatment of HIV infection are not different from those starting Antiretroviral into modern centers. The patient is in search of wellness and what is better. These patients followed by Traditional Medicine must be considered and taken care of in an integral way like all PLHIV followed by modern medicine.

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**“This is my secret ... I haven’t told even God”: Perspectives from People Living With HIV/AIDS about HIV/AIDS disclosure within Christian churches in Soweto, South Africa.**

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South Africa estimated that 18, 0% of the South African adult population aged 15–49 years was living with HIV, in 2017. The church plays a major role in influencing decision-making among HIV infected individuals. Churches in South Africa have been actively engaged with the community to increase awareness and education, to reduce stigma, and to encourage care and compassion for those infected with HIV. In addition, research has shown that religiousness/spirituality among HIV infected individuals is associated with slower disease progression when it complements modern medicine.

What is the role of religion in the lives of adults living with HIV/AIDS in Soweto, and what are their treatment-seeking and adherence behaviour?

Study participants consisted of ten men and ten women who were living with HIV/AIDS, were over the age of 21, of the Christian faith and reside in Soweto.

Twenty in-depth interviews were held with ten men and ten women who were: HIV infected, willing to participate in the study, were over the age of 21, lived in Soweto, and reported to be of Christian faith. People Living with HIV/AIDS (PLWHA) were recruited at ZAZI HIV testing centre of the Perinatal HIV Research Clinic. In-depth interviews were audio recorded, transcribed verbatim and translated into English. Data was analyzed using framework analysis.

Results showed that religiosity and spirituality contribute positively to the seeking and adherence of treatment regimen for PLWHA. Most participants reported that their faith enabled them to live “normal” lives and helped them find a new “reason for living”. However, most participants chose not to disclose their HIV status to the church community due to stigma and distrust of their church community, especially the religious leaders.

There is need for training to be provided to religious leaders about HIV prevention and care. Messages delivered by the church should reflect people’s lived experiences and shared realities, so as to reduce stigma, encourage disclosure in the

church, and thereby improving the current support efforts offered to PLWHA.

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**‘I go to them for dirty spirits, not for things like sicknesses...’Traditional health-related beliefs and practices of adolescent boys living with HIV in the Eastern Cape Province of South Africa**

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**Background:** Adolescent AIDS-related deaths have tripled in Eastern and Southern Africa since the year 2000 while decreasing in all other age groups. Initiatives to better understand the health practices of this group as they move into adulthood are crucial.

There is strong evidence that the use of traditional health products and services is common in South Africa, including for people living with HIV. Literature also suggests that men living with HIV may be more comfortable accessing traditional rather than biomedical health services. However, little is known about adolescent boys’ traditional and biomedical health-services engagement as they transition into manhood.

**Methods:** Life history narrative interviews were conducted with 36 adolescent boys and young men (ages 14-22) living with HIV in the Eastern Cape province of South Africa. Follow-up semi-structured in-depth interviews focusing on traditional and biomedical health service engagements and beliefs were conducted (n=21 - follow-up interviews on-going). In-depth interviews and 36 months of training with traditional health practitioners inform this work.

**Results:** Within this study, adolescent boys demonstrated strong HIV treatment literacy and understanding about HIV transmission routes and most did not believe that traditional health practitioners can cure or treat HIV. However, many boys had visited a traditional health practitioner or used a traditional health product at least once. The reasons for this use of traditional medicines were largely unrelated to HIV treatment – for example, protection, spiritual cleansing or luck. Traditional products were rarely orally ingested – rather they were used to bathe in, steam with, wear on the body, use in their home, or put into the blood via shallow skin cuts.

**Conclusion:** These findings affirm that the ways in which well-being is understood through this indigenous knowledge paradigm extend beyond physical bodily illness to include safety, fortune, spiritual and familial well-being. Despite a belief in the limitations of traditional medicines and practices for treating HIV, many participants used traditional health services and products for other areas of their lives. These finding points to the presence of traditional health beliefs and practices in the lives of many adolescent boys living with HIV, and complicate how we understand medical pluralism.

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### Lighthouse Enhanced Adolescent Services: A Differentiated Care Model

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**Background:** The Lighthouse Trust contributes to Malawi's national response to HIV as a model in providing a continuum of high quality care and building capacity in the health sector. The Enhanced Adolescent Services(Tiwale) is a Lighthouse Trust, youth friendly HIV initiative which was initiated in 2008. The first cohort of children initiated on ART at Lighthouse had grown into adolescents, as such, issues related to disclosure and lifelong ART adherence, coupled with sexual Reproductive health challenges were in anticipation, guardians were reluctant to disclose, and did not feel confident to handle adolescent HIV issues which led to stigma and discrimination of HIV positive adolescents. Of those that were disclosed, be it formal or accidental, had difficulties in adjusting to their HIV status.

**Methodology:** To provide a continuum of comprehensive quality HIV clinical, psychosocial care and support to HIV positive adolescents in a youth friendly environment Tiwale targeted HIV infected males and Females aged between 10 to 19 years who were in care at the Lighthouse (MPC and LH) in Lilongwe, resident in Lilongwe city area, had fully disclosed their HIV status and whose consent was granted from both the adolescents and their guardians. The enhanced adolescent services were offered in a separate youth only clinic that was conducted on Saturdays in groups of 85 to 100 per visit. Each group was seen every two months. This setting provided the opportunity to study attitudes and practices pertaining to interventions in a fairly controlled environment which combined; clinic review, clinical/nutritional assessment, ART adherence, refill and Viral Load (VL) monitoring, intentional activities, exchange education programs, sports, transition and therapeutic recreational sessions and life skills. The youths were transitioned into adult care at the age of 20 years. Before the transition ceremony they were provided with Leadership training skills, entrepreneurship skills and orientation training to prepare them for adult care

**Results:** Of the 1200 adolescents that were in the cohort, 702 were recruited and registered in the program. Viral load (VL) uptake increased from 80 to 90 %. VL suppression rate was over 75%. Default rate was at 1% and death was at 2%. Two percent of the adolescents were transfer out while 146 adolescents graduated from the program which represented 27%. The program was as success as retention into care was over 95% with good adherence VL suppression of over 75%. Over 98% of adolescents were in school. Furthermore, there was a creation of working partnerships with Baylor Access Health Africa, and Dignitas in the Implementation of adolescent family planning, parenting, leadership and transition programs.

**Conclusion:** Tiwale provided a youth friendly HIV initiative which encouraged to HIV disclosure and lifelong ART adherence. The program also helped adolescents to adjust to their HIV status reduce defaulters and help suppress their viral load eventually controlling HIV related deaths among the youths.

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### HIV Case Finding and Linkage to Care in Eleme Local Government Area, Rivers State:

### A Comparative Analysis of Facility HIV Services Optimization and Community Based HIV Intervention

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**Background:** A combination of effective and efficient approaches are necessary for scaling up of HIV case-identification, particularly in resource-limited settings. To increase access and coverage, communities need to be linked to facilities via community-based interventions that seek to promote health seeking behavior. This study compares the effect of community based HIV testing services (HTS) to HTS optimization at the facility level.

**Materials & Methods:** This is a pre-and post-intervention study conducted in Eleme, one of the priority LGA supported by the USAID funded Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS) in Rivers State. The pre-intervention phase (PIP1) covers the period November 2015 – October 2016 while the post intervention phase is from November 2016 – Oct 2017. PIP1 involved community entry/mobilization, HIV screening in general population, referrals and linkage to care and treatment services from the community to the facility, while the PIP2 focused on optimization of HIV testing services within the facilities through multipoint/Provider Initiated Testing and Counselling[PITC], targeted testing in the communities, Sexual Network and Genealogy Testing and referrals by escort to Service Delivery Points. We reviewed HTS and ART commencement data to compare differences in positivity yield and linkage between both phases.

**Results:** The PIP1 had 107,813 individuals counselled, tested and received result, 1,406 tested HIV Positive and 964 linked to ART while the PIP2 had 24,078 individuals tested, 614 HIV positive and 610 linked to ART. Findings show increase in positivity yield from 1% to 3% and linkage from 87% to 99% in PIP1 and PIP2 respectively.

**Conclusions:** Although community outreaches create awareness, a targeted approach to HTS including sexual network/genealogy testing may be a more efficient approach. In addition, PITC in health facilities yields a higher positivity and linkage rates, maximizes use of testing resources by focusing on higher risk populations.

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### An invisible epidemic: therapeutic failure in Cameroon

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**Background:** In 2018, more than 200,000 people are being treated with antiretroviral drugs in Cameroon. With an estimated 560,000 people living with HIV/AIDS, the coverage rate is only 40%. To achieve the goals of UNAIDS by 2030, the number of people identified and treated will double in the coming years. This growth is accompanied, as in many sub-Saharan African

countries, by a worrying increase in the number of therapeutic failures, accompanied by viral resistance. These resistances are a vital threat to both individuals and the community. They may compromise the effectiveness of available treatments and even those that are not yet available. The importance of prevention, early detection and appropriate management of treatment failures is therefore a major challenge. Is Cameroon's health system prepared for this challenge?

**Methods:** An anthropological study was carried out in 2012 in 4 public care sites in Yaoundé and Douala: the Central Hospital of Yaoundé, the Laquintinie Hospital of Douala, the Nylon District Hospital of Douala, the LADY ANRS 12169 research project. It consisted of semi-directive interviews with 85 patients who have experienced treatment failure and are, for the most part, on second-line ARVs and 53 health professionals. Observations and file reviews completed these interviews.

**Outcomes:** Detection of therapeutic failure is delayed due to limited access to viral load measurement. Management time has improved over the years, thanks to the availability of different combinations of second-line ARVs and better information for doctors. The announcement of failure, has a strong component of guilt and dramatization, caregivers attribute full responsibility to patients. However, there is little adaptation in medical care: short and mechanical consultations, little information on 2nd line treatments, considerable waiting time... Psychosocial care is centred on the time of change of treatment but there is no long-term follow-up after the first three months. There is a significant risk of persistence of the causes of poor adherence and thus of a new failure, which could be dramatic in a context of limited access to 3rd line ARVs.

**Conclusion:** The health system in Cameroon appears to be ill-prepared for the prevention and management of therapeutic failures. Hospitals, already overwhelmed by "ordinary" patients, have not adapted very well to deal with this new type of patient. This problem is common to other countries in sub-Saharan Africa, which have worrying rates of recidivism and failure. National and international mobilization is needed to strengthen health systems, train professionals in dealing with failures and ensure effective support for long-term compliance. Therapeutic failure can be seen as a new HIV epidemic, an invisible epidemic that threatens to undermine UNAIDS' goals of eradicating the epidemic by 2030.

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### Weight Status and associated factors among HIV-Infected Adults in African Cohort Study

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**Background:** Low body weight in HIV-infected people on antiretroviral therapy (ART) complicates the management of HIV infection and contributes to mortality, whereas being overweight increases the risk of other comorbidities such as cardiovascular disease. This analysis examines factors associated with weight

status among HIV-infected adults enrolled in a cohort study conducted in East Africa and Nigeria.

**Methodology:** The African Cohort Study (AFRICOS) prospectively enrolls adults at PEPFAR-supported facilities overseen by five HIV care programs in Kisumu West and South Rift Valley, Kenya; Uganda; Tanzania; and Nigeria. All enrollees have their weight and height measured. We examined weight status at enrollment using body mass index (BMI) calculated as weight (kg)/height (m<sup>2</sup>) and then classified participants as underweight (BMI <18.5kg/m<sup>2</sup>), normal (18.5-24.9kg/m<sup>2</sup>), overweight (BMI > 25-29.9kg/m<sup>2</sup>) or obese (≥ 30.0 kg/m<sup>2</sup>). Ordinal logistic regression was used to assess sociodemographic and clinical factors associated with the four BMI categories among HIV-infected study participants at enrollment.

**Results:** As of December 1, 2017, A total of 2746 HIV-infected participants were enrolled .11.0%, 63.3%, 18.8% and 6.7% were underweight, normal weight, overweight and obese, respectively. The highest prevalence of underweight BMI was seen in Kisumu West, Kenya (15.5%) and lowest in Nigeria (4.9%). Being overweight and obese was most prevalent in Nigeria (31.8 % , overweight and 11.6%, obese).

In the adjusted model, greater odds of having a higher BMI category was associated with study program (South Rift Valley aOR: 2.90 [1.92-4.36]; Kisumu West 1.66 [1.06-2.60]; Tanzania 5.47 [3.41-8.76]; Nigeria 3.41 [2.09-5.55], compared to Uganda), being female (3.19 [2.5-4.03], compared to being male), increased age (25-39 years 2.77 [1.79-4.36]; 40-49 years 3.28 [2.05-5.26]; 50+ years 3.31 [2.01-5.44], compared to participants aged 18-24), increased education (primary school 1.35 [1.06-1.72]; secondary school or above 1.47 [1.12-1.94], compared to participants with less than primary school), being employed (1.54 [1.19-2.01], compared to being unemployed), alcohol use (1.42 [1.07-1.88], compared to no alcohol use). In contrast, lower odds of having a higher BMI category was associated with increased WHO stage (WHO II 0.70 [0.54-0.92]; WHO III 0.54 [0.39-0.74], compared to WHO I), decreased CD4 count (350-499 0.70 [0.55-0.91]; 200-349 0.72 [0.55-0.93]; <200 0.48 [0.35-0.67], compared to CD4 count 500+), and active tuberculosis (TB) diagnosis (0.45 [0.21-0.98], compared to no TB diagnosis).

**Conclusions:** Targeted dietary counseling and weight management should be an integral component of care for females and older individuals who are at the greatest risk of obesity in order to maximize health outcomes and reduce weight-associated complications such as cardiovascular disease and diabetes.

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### Retention in Care among Adolescents living with HIV/AIDS in Thirteen Nigerian States

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**Background:** In Nigeria, 3.2 million people were reported to be living with HIV, with the occurrence of 220,000 new infections, 160,000 AIDS-related deaths and about 30% of persons living with HIV/AIDS on treatment as at 2016. In 2015, in Sub-Saharan Africa, about 25% of new infections were contributed by adolescent girls and women aged 15-24 years as they are at high risk of HIV infection. This was attributed to poverty, harmful gender norms and inequalities, and insufficient access to education and sexual and reproductive health services.

The USAID-funded Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS) project has assisted the Government of Nigeria since 2011 till date to reduce the burden of HIV/AIDS and TB by building sustainable local capacity to deliver high quality, comprehensive treatment, care and related services. This study estimates the proportion of a cohort of adolescents (10-19 years) retained on Anti-retroviral therapy (ART) at least 12 months after initiation at SIDHAS supported sites in thirteen Nigerian states.

#### Methods: and Materials:

A retrospective cohort study was conducted among adolescents (10-19 year old) who started treatment between April 2016 and September 2016 across seven hundred and fifty-one anti-retroviral treatment sites in thirteen states in Nigeria. Data for all persons living with HIV/AIDS (PLHIVs) at these sites was collected from client folders and service registers using the Retention and Audit Tool (RADET) in October 2017. Data were analysed using STATA 13. Cross sectional retention rate was calculated for the cohort. Binary logistic regression was used to understand retention rate of adolescents on ART using age, sex and geopolitical zones of residence.

**Results:** Between April 2016 and September 2016, 921 adolescents were enrolled on treatment, with about 3% having been transferred out as at October 2017. Of the 890 adolescents currently on treatment at these sites: 73% were females and 27% males (F=648, M=242); and 29% (n=262) were between 10-14 years of age and 71% (n=628) between 15-19 years of age. Retention rate was 62%; 35% lost to follow up; 2% died and 1% stopped. Retention among males (70%) was higher than females (60%); and also, higher among 10-14 year old (72%) than among 15-19 year old (58%). Age was found to be significantly associated with retention rate ( $P<0.05$ ). Adolescents aged between 15-19 year old were significantly less likely to be retained on treatment when compared with those who were between 10-14 year old (OR:0.59,  $P<0.05$ ). Adolescents in the North-East (OR:4.84,  $P<0.05$ ) and North-West (OR:2.21,  $P<0.05$ ) geopolitical zones were significantly more likely to be retained on treatment compared to adolescents in the South-South zone.

**Conclusion:** Retention in care among younger adolescents and male PLHIVs is quite better than older adolescents and females. These findings suggest that more innovative interventions targeted at older adolescents, particularly female clients, should be developed to improve retention.

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### HIV -1 viral load outcomes on children aged 1-14 years in Kenya

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**Background:** Monitoring individuals receiving antiretroviral therapy [ART] is important for identifying non-adherence and treatment failure. On initiation of ART, viral load should be undetectable within six months. In Kenya, the response to ART in children has not been well described, pockets of resistance have not been identified and success of treatment not well characterized. This study aimed to determine the impact of antiretroviral treatment out among HIV infected children 1-14 years.

**Methodology:** This was a cross sectional study between January -March 2017, whole blood, plasma and dried blood spots

samples were collected from HIV exposed infants accessing health services all over the country and delivered to testing laboratories using a dedicated courier service. HIV viral load was determined using Abbott Real-time HIV-1 PCR assay. results obtained were collated and analyzed using Stata: non-suppression was considered above 1000 copies/ml.

**Results:** Data information was successfully retrieved from National HIV database from January -March 2017. A total of 268,423 viral load tests were done across all age groups: 210,234(78.3%) were <1000 copies/ml, while 58,189(21.7%) were >1000cps/ml. Of those 36,470(13.75%) were done for children aged 14 years and below: 35,981(98.66%) were <1000 copies/ml, while 489(1.34%) were >1000 copies/ml. At age group >2 and <6 years, the suppression rate was 57.64 % (3340 children), while the non-suppression rate was 42.36 % (2455 children). At age group > 6-14 years, the suppression rate was 39.42%.

Out of the total, 30,602(83.91%) were on first line ART treatment regimens, 2,392(6.56%) were on second line regimen, 34 (0.1%) were on Dolutegravir while data on regimen was not available for 3,442 (9.93%) patients. The minimum duration of patients on ART was 0 months, with a maximum of 167.8 months a median of 39.4 months. The duration for Dolutegravir treatment was 6 months. The most common 1st line regimens were TDF+3TC+EFV (26.35%), AZT+3TC+NVP (25.21%) and ABC+3TC+NVP (14.12%). The most common 2nd line regimens were AZT+3TC+LPVr (35.95%), TDF+3TC+ LPVr (26.76%) and TDF+3TC+ATVr (19.27%). DTG was used in combination with TDF+3TC or ABC+3TC.

The odds ratio for non-suppression in those aged 14 years and below was 2.2( $P<0.05$ ) while the odds ratio for non-suppression in those aged 14 years and above was 0.3( $P<0.05$ ). The odds ratios for non-suppression in 2nd line treatment was 0.76( $P<0.05$ ) compared with those on other regimens. There was no significant difference between DTG and other regimens (OR 1.00, 95% CI 0.81-1.24,  $P>0.05$ ). For regimens listed as "Other", the odds ratio for non-suppression was 0.95(95% CI 0.91- 0.99,  $P<0.05$ ).

**Conclusion:** Patients aged 14 and below taking ARVs are significantly less likely to have viral suppression than patients above 14 years. Specific strategies should be identified to help achieve viral load suppression for patients aged 14 years and below.

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### Factors associated with viral load outcomes in a tertiary institution in Rivers State, Nigeria.

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**Background:** Plasma HIV-RNA viral load (VL) assessment remains the gold standard for patient monitoring while on antiretroviral therapy. Suboptimal viral suppression and CD4 response to antiretroviral therapy (ART) is known to cause poor treatment outcomes with increased cost of treatment. People living with HIV (PLHIV) may be at a high risk of staying on a failing first-line regimen and developing drug-resistance HIV variants if not monitored closely. Rivers State has a prevalence rate of 5.8%,

(2014 National HIV sentinel survey) with University of Port-Harcourt Teaching Hospital (UPTH) contributing significantly to the total number of PLHIV on treatment. This study aims at identifying associations between VL outcomes for PLHIV on ART and patients' socio-demographic status and clinical factors.

**Materials & Methods:** A cross-sectional study of all active clients on ART treatment at the University of Port Harcourt Teaching Hospital was conducted using data from the Lafiya Management Information System (LAMIS). Descriptive and multivariable analyses conducted with SPSS 24. Viral suppression rate was calculated and binary logistic regression used to examine possible predictors of viral suppression using age, baseline CD4, baseline WHO staging, education, sex, retention status and therapy switch/substitution. Statistical significance was considered at  $P \leq 0.05$ . Viral suppression was defined as VL  $< 1000$ cp/ml and  $\geq 1000$ cp/ml for virally unsuppressed clients.

**Results:** A total of 4,166 PLHIVs initiated ART between October 2011 and November 2017, with 68% females, 32% males ( $F = 2,850$ ;  $M = 1,316$ ). Children aged 0-14 years were 5% (190), clients aged 15-24 years 5% (227), 25 years and older were 90% (3,749). Viral load suppression was 73%, with similar viral suppression rates among females (74%) and males (72%). Factors associated with viral suppression included baseline CD4 count  $\geq 500$  cells/mm<sup>3</sup> (aOR 2.6, 95% CI 2.1- 3.2) compared to those with baseline CD4  $< 500$  cells/mm<sup>3</sup>, patients retained in care (aOR 2.5, 95% CI 1.16-5.2) compared to those not retained, no therapy switch/substitution (aOR 1.4, 95% CI 1.2-1.7) compared to therapy switch/substitution. Clients aged 15-24 years (aOR 7.5, 95% CI 3.4 -16.3), 25 years and older (aOR 5.8, 95% CI 2.9-11.3) were more likely to be virally suppressed than clients aged 0-14 years.

**Conclusion:** These findings suggest close monitoring for adherence and other opportunistic infections for children aged 0-14 years and patients with baseline CD4 cell  $< 500$  cells/mm<sup>3</sup>. It also highlights the crucial role of retention in care in supporting viral suppression.

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### Keeping Patients in Treatment through Early Identification and Tracking of Missed Appointments; USAID Boresha Afya-Southern Zone Tanzania Experience.

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**Background:** Successful Antiretroviral therapy (ART) depends critically on good medication adherence, which in turn depends on consistent antiretroviral medication refill and retention on treatment. Missed appointments and lost to follow-up are one the major challenges of the HIV treatment program. The resulting poor retention and its attendant consequences inevitably leads to poor treatment outcomes. There are various strategies deployed to improve patient retention. In this study, USAID Boresha Afya Southern Zone project evaluated 'Missed appointment' tracking strategy in five southern regions in Tanzania.

**Materials & Methods:** The project established a patient appointment system that promptly identifies patients who missed their appointment at the end of each clinic day. Within three days, their names and contact details were compiled and shared with the facility tracking team for immediate tracking. Patients with mobile phone numbers were contacted through phone calls by the facility healthcare workers and the rest were reached by community-based care workers and peer mentors through home visits. The outcome of the tracking exercise was documented using the tracking register. Those patients who 'promised to return' were followed up weekly to ensure they returned. Three months (October – December 2017) data from the appointment diaries and tracking registers from project supported health facilities in the five southern regions of Tanzania were analyzed using excel.

**Results:** Overall, 157,739 patients were expected to attend HIV clinic for antiretroviral medication refill but a total of 24,149 (15%) missed their appointments. However, there are regional variations in missed appointment rate, range 12 – 20 percent. Out of those who missed appointment 55% (13,202) were tracked and 46% (11,172) of them returned to the health facilities. Out of those tracked, 12% were reached by facility-based healthcare workers through phone calls; regional variations ranges from 1 – 20 percent.

**Conclusions:** Early identification and tracking of patients who missed appointment is one sure approach of improving patient retention which will in turn result in good clinical outcome. More targeted efforts should be made on regions with high missed appointment rates to develop clients tailored interventions that will respond to specific gaps and peculiarities. To facilitate easier and quicker tracking through phone calls, more efforts should be made to document patient's mobile phone contacts or that of their treatment supporter.

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### Scaling up access to viral load services: Experience and Lessons learned, in Rivers State, Nigeria

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**Background:** Efforts have been made over the years to control HIV epidemic globally with slow but gradual improvement in successes recorded, especially in resource-limited settings like sub-Saharan Africa where the burden is more. Viral suppression is central to the control of HIV infection and this has been significantly emphasized as part of UNAIDS ambitious treatment target which has its 3rd target focusing on ensuring that 90% of all persons receiving antiretroviral therapy (ART) achieve viral suppression by 2020. Access to viral load (VL) services had been poor in Nigeria until recently when PCR machines were installed across different zones in the country to reverse the situation. This study reviewed viral load (VL) services in Rivers State, including progress towards achieving UNAIDS 3rd 90 targets in the State. In addition, the study aimed to explore trends in viral load access and suppression, as well as to document lessons learned in program implementation.

**Methods: & Materials:** A retrospective review of data was collected from DHIS across 26 health facilities providing ART services in the State. Sample population was limited to clients who have received ART for at least 6 months across these sites. Data collected from the facility was validated using Specimen Receipt and Viral Load Monitoring Registers at the PCR reference center. The data collected and reviewed spanned from July 2016 to April 2017. Key outcomes of interest were level of VL access (percentage of eligible clients tested), suppression rate (percentage of clients tested with VL < 1000 copies) and patterns with respect to age and sex. Data was analyzed using Stata software.

**Result:** A total of 20,243 ART clients were eligible for VL services during the review period. Of these, 32% (6,494) were males and 95% (19,192) were adults. Forty-eight percent (9,756 – M=2,850 F= 6,906) of these clients had viral load analysis. More females had access with 71% against 29% for males. Majority (99%) were adults (9,659 – M: 2,801 F: 6,858) with only 1% (97 – M: 49 F: 48) from the children population. A total of 6,957 (M: 1,981 F: 4,976) clients had VL < 1000 copies which translates into 71% virologic suppression rate. Viral suppression in adults was 71% (6911) and 47% (46) in children. There was a significant difference in suppression rates between adult males 1,962 (28%) and females 4,949 (72%) ( $p < 0.001$ ). However, viral suppression among male children (39%) was not significantly different than among female children (56%) ( $p = 0.10$ ).

**Conclusions and Recommendations:** Remarkable efforts have been made to scale-up access to VL services, with about half of eligible clients reached within a year period. Good progress has also been made towards achieving suppression target in the State, however, there is need to redirect strategies to targeting children in a more holistic approach for improved access and suppression rates. In addition, more feasible strategies should be adopted for men as over 70% of persons reached were females.

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### Solidarity and missed opportunities among HIV patients, maternal siblings and their immediate relatives in the context of limited direct HIV status disclosure

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**Background:** Reducing HIV/AIDS deaths is one of the clearest indicators of success in HIV prevention and treatment programs and collecting information on HIV mortality during household surveys such as the Demographic and Health Surveys (DHS) therefore provides the best possible data on HIV/AIDS mortality in order to evaluate the impact of HIV programs. It is however not known how HIV positive deceased siblings interact with surviving sibling during their illness that lead to death and how HIV sero-status information gets disclosed to the surviving siblings. An understanding of HIV status disclosure will be important for HIV mortality surveillance through surveys and verbal autopsies. We conduct IDIs to understand patterns of HIV disclosure among siblings.

**Methodology:** We conducted 26 IDIs between 9th of August 2017 and 16th November 2017 with 2 main groups of respondents selected among the Karonga Health and Demographic Survey Site (KHDSS) population aged 18 years to 49 years. The first group consisted of 8 (5 males and 3 females) People Living with HIV who have at least one known surviving maternal sibling. The second group of respondents included 9 females and 9 male individuals who are maternal siblings of PLWH who have died at adult ages over the past 8 years prior to the study. Each IDI was recorded, transcribed at verbatim and translated into English. All IDI transcripts were read several times and NVivo 10 was used for systematic data management. The constant comparison method was used to develop codes to capture emergent themes

**Results:** We found that siblings provide significant levels of support to help to manage HIV infection, and cope with the consequences of the illness. Siblings frequently reported observing signs of illness and symptoms among their brothers and sisters, but rarely reported directly discussing these signs with their ill siblings. This also applied to risky behaviours that were observed among maternal siblings. These behaviours rarely formed the basis of discussions and interaction among maternal siblings. Direct disclosure of HIV status was rare among our sample. Several respondents reported inferring HIV status from checking health passports, noticing bottles of ART or observing frequent illness among infants born to HIV positive mothers.

**Conclusion:** Siblings and immediate relatives of an HIV positive play significant roles in management of HIV infections, however such roles could be limited in the context of limited HIV status disclosure among siblings and immediate siblings. We recommend family focus HIV interventions that promote direct HIV status disclosure in order to maximise the impact of HIV treatment programmes.

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### Medication safety issues associated with currently used first-line antiretroviral regimens in Uganda

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**Background:** Clinically significant drug-drug interactions (CSDIs) affect 26.7% of Ugandan outpatients taking antiretrovirals (ARVs). Drug-drug interactions (DDIs) may either increase the risk of drug toxicity, or reduce clinical effect of one or both of the drugs. In sub-Saharan Africa, recognition and management of DDIs is restricted by patients accessing medicines via separate silos of care, and un-regulated purchase of medicines. Adverse drug events (ADEs) may be under-reported in this setting, or tolerated due to lack of alternative regimens. These data originate from an ongoing longitudinal study (SAPU) in adult outpatients taking current ARVs at three diverse clinics in central Uganda. The study enrolled 868 patients, with this analysis describing an initial 416 patients taking first-line regimens, and the prominent medication safety issues of public health importance.

**Materials & Methods:** Medication histories were taken by trained pharmacy technicians, including current side effects. Remote sites transferred information to a central medicines information centre using Android tablet devices. DDI screening and medication safety feedback was given to prescribers for each patient. Via structured questionnaires, prescribers gave feedback on the utility of DDI screening via the mobile feedback loop. Clinical significance of DDIs was assessed by the study team based on the therapeutic index of the drugs, and likelihood of impact on care ([www.hiv-druginteractions.org](http://www.hiv-druginteractions.org)).

**Results:** Of 416 patients on 1st line regimens, 25% had  $\geq 1$  CSDDI. Of 37 women on 1st line ARV regimens who reported using hormonal contraceptives, 9 women were exposed to a DDI which put them at risk of contraceptive failure. Of 149 patients taking antimicrobials (antimalarials, antibiotics, antifungals, antivirals) 40.3% had a CSDDI. 14.4% of 416 patients had a CSDDI between 1st line ARVs and antimicrobials (accounting for ~40% of all CSDDIs). Prescribers were aware of only 3.5% of CSDDIs ( $n=144$ ). Prescribers reported that DDI checks provided new information in 56.1% of cases ( $n=214$ ), with prescribers reporting changing management of patients as a result of the feedback in 53.1% of cases ( $n=309$ ). DDI checks saved time in 68% of cases ( $n=200$ ), and added benefit in 72% ( $n=200$ ).

Of the patients on 1st line regimens, 43.3% had a current ADE at the time of interview, with 252 ADEs reported. 72.6% of ADEs were possibly or probably related to EFV. 56.7% of ADEs were nervous system/psychiatric disorders, 83.7% of which were not recorded in the clinical notes. Median duration was 22 months, (IQR 9-35.3 months) ongoing at the point of analysis. Some ADEs were not evaluable due to lack of baseline/routine laboratory monitoring.

**Conclusions:** Roll-out of newer ARVs with lower potential for DDIs and debilitating ADEs (such as dolutegravir) may: reduce risk of contraceptive failure, reduce risk of antimicrobial treatment failure and microbial resistance and reduce significant morbidity due to ADEs. Patients experiencing, or at high risk of ADEs or CSDDIs should be prioritised for switching to dolutegravir. Health systems may be unaware of the magnitude of sub-optimal prescribing and need to continually evaluate, and promote safer prescribing to minimise patient harm.

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### Changes in disclosure, adherence and healthcare interactions following the Introduction of immediate ART initiation: a descriptive analysis of patient experiences in Swaziland

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**Background:** There are concerns that immediate ART initiation (regardless of CD4 count) affects HIV status disclosure, ART adherence and healthcare interactions. We assessed changes in disclosure, adherence and patient experiences following the expansion of HIV testing and ART initiation as part of 'Early access to ART for all' (EAAA), an immediate ART intervention study (MaxART) in Swaziland.

**Materials & Methods:** We recruited two samples of participants between 2014 and 2017 from the MaxART study. One group was interviewed before the intervention was implemented (control); the second group was interviewed at the implementation of the intervention and six months thereafter (intervention). We present bivariable analyses comparing responses in the control and intervention groups, and comparing responses at start of intervention and six months later.

**Results:** All respondents reported high levels of disclosure to their partner (controls and intervention: 94%) and family (controls: 78%, intervention: 79%), and high levels of adherence (85% did not miss a dose among the controls, and 84% in the intervention group). More respondents were worried about unintended disclosure during the intervention, compared to the control group (controls: 9%, intervention: 16%,  $p=0.012$ ). Fewer respondents felt ill when they initiated ART in the intervention group (controls: 33%, intervention: 22%,  $p=0.008$ ). There were no changes in patients reporting feeling pressured to initiate ART (controls: 10%, intervention: 11%,  $p=0.875$ ). We found that the quality of interaction with healthcare workers improved following the intervention. Healthcare workers explain more often the choice of ART initiation and test results: (controls: 88%, intervention: 93%,  $p=0.032$ ; and controls: 15%, intervention: 49%,  $p<0.001$ , respectively). In addition, more patients reported receiving test results: (controls: 13%, intervention: 46%,  $p<0.001$ ). We observed no changes in disclosure, adherence or patient experiences six months into the intervention compared to its start.

**Conclusion:** Our results suggest that both reported adherence and disclosure levels continue to be high following the introduction of immediate ART in Swaziland. We observe an improvement in the interactions with healthcare services, possibly due to the extensive training available at participating facilities which will be an important element for a successful roll-out of immediate ART.

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### Single-Dose Fed Bioequivalence Study of Emtricitabine, Tenofovir Alafenamide and Dolutegravir Tablets (200mg/25 mg/50 mg) versus DESCovy® Tablets (200/25 mg; Gilead Sciences) and TIVICAY® Tablets (50mg; ViiV Healthcare) in Healthy Adults

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**Background:** The combination of Dolutegravir (DTG) with the fixed dose combination (FDC) of emtricitabine (FTC) and tenofovir alafenamide (TAF) is one of the most frequently used recommended combinations for the treatment of HIV in high-income countries. WHO and several national guidelines recommend DTG as an alternative first- and third-line. The use of TAF is currently not recommended by WHO, also due to open questions on dosing in TB co-infection and pregnancy, however the positioning of the combination of DTG, TAF and FTC is still evolving. The objective of this study was to compare the relative bioequivalence and safety profiles of Mylan's FTC/TAF/DTG 200mg/25mg/50mg FDC tablets (T) with the reference combination (R) of DESCovy® (200/25 mg) and TIVICAY® (50 mg) tablets.

**Methods:** In this open label, randomized, two-period, two-treatment, cross-over, single dose evaluation, the relative oral bioequivalence was tested in 33 healthy adult human subjects under fed conditions. In each period, each subject received a single, oral dose of either Mylan's FTC/TAF/DTG tablets or R. Serial blood samples were collected pre-dose and at 21 timepoints until 72 hours post dose. Subjects were monitored for safety and tolerability. The 90% confidence interval for the LSMeans ratio of CPEAK, AUCL, and AUCINF for the T and R products should be between 80.00% and 125.00%. Single-dose pharmacokinetic parameters for FTC/TAF/DTG were calculated using non-compartmental techniques.

**Results:** Statistical analyses of these data reveal that the 90% confidence intervals are within the acceptable bioequivalent range of 80.00% and 125.00% for the natural log transformed parameters LNAUCL, LNAUCINF, and LNCPEAK for emtricitabine, tenofovir, tenofovir alafenamide, and dolutegravir.

#### **FTC**

AUCL [LSMEANS Ratio (T/R) / 90% CI] 1.00 / 98.14%–101.40%  
AUCINF [LSMEANS Ratio (T/R) / 90% CI] 0.99 97.82%–100.91%  
CPEAK [LSMEANS Ratio (T/R) / 90% CI] 1.04 96.67%–111.00%

#### **TAF**

AUCL [LSMEANS Ratio (T/R) / 90% CI] 0.95 / 88.43%–101.53%  
AUCINF [LSMEANS Ratio (T/R) / 90% CI] 0.95 / 88.41%–101.07%  
CPEAK [LSMEANS Ratio (T/R) / 90% CI] 1.00 / 84.47%–119.20%

#### **DTG**

AUCL [LSMEANS Ratio (T/R) / 90% CI] 1.00 / 95.69%–104.44%  
AUCINF [LSMEANS Ratio (T/R) / 90% CI] 1.00 / 95.37%–104.52%  
CPEAK [LSMEANS Ratio (T/R) / 90% CI] 1.00 / 96.83%–102.72%

The AEs were mild in severity. Overall both R and T were well tolerated when administered as a single, oral dose under fed conditions.

**Conclusions:** This study demonstrates that Mylan's FTC/TAF/DTG tablets are bioequivalent to a combination of DESCovy® (200/25 mg) and TIVICAY® (50 mg) as separate tablets following administration of a single, oral dose administered under fed conditions.

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### Single-Dose Fed Bioequivalence Study of Lamivudine, Tenofoviridisoproxilfumarate and Dolutegravir Tablets (300mg/300mg/50mg) versus EPIVIR® (300mg; ViiV Healthcare), VIREAD® (300mg; Gilead Sciences) and TIVICAY® (50mg; ViiV

### Healthcare) Tablets in Healthy Adult Volunteers

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**Background:** Dolutegravir (DTG) is one of the most frequently used recommended antiretrovirals for the treatment of HIV in high-income countries. WHO and several national guidelines recommend DTG/3TC/TDF as an alternative first- and third-line in low-and middle-income countries. The objective of this study was to compare the relative bioequivalence and safety profile of Mylan's lamivudine, tenofoviridisoproxilfumarate and dolutegravir tablets, 300 mg/300 mg/50 mg FDC tablets (T) with the reference combination (R) of EPIVIR® (300 mg), VIREAD® (300 mg) and TIVICAY® (50mg).

**Methods:** In this open label, randomized, two-period, two-treatment, cross-over, single dose evaluation, the relative oral bioequivalence was tested in 33 healthy adult human subjects under fed conditions. In each period, each subject received a single, oral dose of T (Mylan's 3TC/TDF/DTG tablets) or R. Serial blood samples were collected pre-dose and at 21 timepoints until 72 hours post dose. Subjects were monitored for safety and tolerability. The 90% confidence interval for the LSMeans ratio of CPEAK, AUCL, and AUCINF for the T and R products should be between 80.00% and 125.00%. Single-dose pharmacokinetic parameters for FTC/TAF/DTG were calculated using non-compartmental techniques.

**Results:** All statistical analyses of these data reveal that the 90% confidence intervals are within the acceptable bioequivalent range of 80.00% and 125.00% for the natural log transformed parameters LNAUCL, LNAUCINF, and LNCPEAK for lamivudine, tenofovir and dolutegravir.

#### **3TC**

AUCL LSMEANS Ratio (T/R) / 90% CI: 0.98 / 96.41%–100.29%  
AUCINF LSMEANS Ratio (T/R) / 90% CI: 0.99 / 96.94%–101.15%  
3CPEAK LSMEANS Ratio (T/R) / 90% CI: 0.94 / 88.17%–100.59%

#### **TNF**

AUCL LSMEANS Ratio (T/R) / 90% CI: 1.01 / 98.10%–103.80%  
AUCINF LSMEANS Ratio (T/R) / 90% CI: 1.01 / 98.69%–104.32%  
CPEAK LSMEANS Ratio (T/R) / 90% CI: 1.11 / 104.08%–119.12%

#### **DTG**

AUCL LSMEANS Ratio (T/R) / 90% CI: 1.00 / 95.64%–104.78%  
AUCINF LSMEANS Ratio (T/R) / 90% CI: 1.01 / 96.51%–105.45%  
CPEAK LSMEANS Ratio (T/R) / 90% CI: 1.03 / 99.05%–107.71%

The AEs were mild in severity. Overall both R and T were well tolerated administered as a single, oral dose under fed conditions.

**Conclusions:** This study demonstrates that Mylan's 3TC/TDF/DTG 300 mg/300 mg/50 mg tablets are bioequivalent to a combination of EPIVIR® (300 mg), VIREAD® (300 mg) and TIVICAY® (50 mg) as separate tablets following administration of a single, oral dose administered under fed conditions.



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### How health workers motivated People living with HIV (PLHIV) to initiate antiretroviral treatment (ART) at high CD4 counts - patient folder reviews and interviews in three HPTN 071 (PopART) health facilities in the Western Cape, South Africa

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**Background** In 2016 South Africa adopted WHO recommendations of ART regardless of CD4 count for PLHIV. In 2016, ART coverage in South Africa was estimated at 56%. A shift toward increased uptake of ART at higher CD4 counts is required. Historically, health-messaging about starting ART have highlighted side effects, risks of acquired resistance, and triage of available treatment. CD4-count eligibility criteria and pre-ART counselling has reinforced a perception that PLHIV must be 'sick enough' to initiate ART. A shift in messaging is critical to increase uptake and ensure adherence. The study provides insight on ART messaging pre-national ART policy shift. How can we explain this policy shift to PLHIV and motivate them to initiate?

**Methods:** HPTN 071 (PopART) was a community-randomised trial in Zambia and South Africa. Patients at three health facilities in one arm of the trial in the Western Cape Province, were eligible for ART regardless of CD4 count outside of guidelines between June 2014 and September 2016. We conducted 134 randomly selected clinical patient folder reviews to characterise the sociodemographic profile of ART initiators under these conditions. We interviewed key informants (nurses, counsellors, post basic pharmacist assistants, data captureurs and health management staff; n=12) about their experiences explaining initiating ART at high CD4 counts. The evaluation design was exploratory through case descriptions.

**Results:** The mean age of patients initiating ART at CD4 count >500 was 34.6 (range: 17-65; SD = 9.13) and most were women (74.7%), married (65.3%), and employed (42%). These sociodemographic characteristics were very similar to patients initiating ART at CD4 counts ≤500. Key informants indicated no radical shift was necessary to explain ART regardless of CD4 count. Rather, they (i) used a variety of metaphors to emphasize the importance of building a strong foundation and not waiting until HIV weakened the body, (ii) reiterated that ART prevents opportunistic infections, and (iii) emphasized that management of HIV through ART is comparable to other chronic diseases.

**Conclusion:** Motivating patients to initiate ART at high CD4 counts is possible even in high burden settings. Messaging about reduced risk of onward transmission was not a core component of health workers' narratives.

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### Nigeria's effort and progress towards fast-track milestone 2020

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**Background:** In 2016, there were 3,200,000 PLHIV, 160,000 AIDS-related deaths, 220,000 new infections and only 51% of all PLHIV are on antiretroviral treatment (ART), even though deaths have declined since 2005 (NACA).

In 2014 there was a UN declaration to end AIDS by 2030 and fast-track milestones targets were set for 2020 which include the 90-90-90 target for treatment, 500,000 or fewer new infections and zero HIV discrimination. Fast tract cities were asked to make country specific plans to achieve the 2020 target.

Consequently, West and Central African health ministers held a consultative meeting at the UN general assembly special session on AIDS to address the lack of a rapid progress against AIDS in west and central Africa.

**Methodology:** On 90-90-90 target the minister of health convened several meetings to develop a plan to contribute to the attainment of 90-90-90 target, high level steering committee was inaugurated to mobilize resources and provide guidance and direction for the implementation arm of the fast tract plan. Technical expert team also inaugurated to develop semi-annual implementation plans and provide technical support to the implementation of the interventions included in the plan.

For the reduction of fewer new infections. The national Prevention team held Consultative meetings with stakeholders at National and zonal levels to agree on the priority fast-tract pillars (2017). The agreed priorities was conveyed at the global consultative meeting.

**Result:** Fast tract document developed and disseminated (2016) to contribute to the 90-90-90 with an implementation lifespan of 18 months to place 500,000 PLHIV on treatment, test 3,000,000 pregnant women, and place 75000 positive of them on treatment, place 135, 000 new TB/HIV co-infections on TB treatment and ART with a budget of (USD130,636,684).

Priorities for reducing new infection are focused on 4 pillars: Adolescent girls, youths and women (AGYW), Key Populations (KP), condoms and Pre-exposure prophylaxis (PrEP) contributing toward reducing new infections to 500 000 by 2020.

On zero discrimination, under the leadership of NACA a national action plan to remove the legal and human right barriers to access to service, developed (2017-2022), this and stigma reduction strategy (2016) will support the fast-tract plan in the area of reduction of stigma and discrimination and improve access to service especially regarding the use by health care workers of ethics standard.

**Conclusion:** Nigeria is on track with the achievement of the 2020 milestone and ultimately end AIDS by 2030 with its current strategies, effort and commitments however implementation needs to be intensified.

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### Do differences in training site locations yield different knowledge outcomes?

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**Background:** Swaziland introduced updated HIV Management Guidelines in 2015. As part of the guidelines dissemination, the Ministry of Health coordinated separate national trainings on three key topic areas: HIV treatment guidelines, Test and Start (HIV treatment initiation regardless of CD4 count), and viral load (VL) monitoring. Trainings were hosted through a combination of venues including onsite within health facilities with one facility team or offsite at conference centers blending multiple health facility teams. This evaluation explores healthcare worker (HCW) preference for training venue and compares knowledge outcomes between HCWs that attended national trainings at different venues.

**Methods:** An evaluation was conducted as a secondary analysis to a mixed-methods assessment that was completed in August 2017. After obtaining informed consent, a quantitative and qualitative questionnaire was administered to a representative sample of HCWs from 53 health facilities distributed proportionally across Swaziland. The paper-based assessment asked questions on guidelines topics, whether HCWs received training on these topics and the venue in which they were trained (i.e. onsite mentoring or offsite workshop). Included in the questionnaire were qualitative questions with a free response option about preferences for training venue. Descriptive statistics and qualitative data were analyzed in Stata 12 and Microsoft Excel to investigate differences in scores of individual survey questions and broader thematic areas.

**Results:** The assessment reached 172 HCWs across all four regions of Swaziland. Overall, HCWs trained onsite scored a weighted average of 68.7% and those trained offsite received a weighted score of 63.6%. Though knowledge on key guidelines messages was higher among HCWs trained onsite, there was no statistically significant differences between the training scores for both groups ( $p=0.078$ ). However, comparing weighted average scores between HCWs that attended any training (66.9%) and HCWs that reported not attending a formal training (59.2%), a statistically significant difference was observed on scores between the two groups in all three national trainings ( $p<0.05$ ). Furthermore, through the qualitative analysis, it was determined that the majority of HCWs preferred to be trained offsite due to the “relaxing environment” and “ability to share experiences”. Clinical mentors, who routinely support facility staff, cited the benefits of onsite training for HCW knowledge of guidelines.

**Conclusions:** The results demonstrate that while offsite venues tend to be the preferred method of training, the evaluation found no statistically significant difference in guidelines knowledge scores among HCWs by training venue for the majority of assessed trainings. The benefits of the onsite approach to training for all cadres is confirmed through the overall weighted average score differentials showing that offsite training is not superior to onsite training. Additionally, qualitative data from clinical mentors highlight the benefit of onsite trainings. The two training venues analyzed do not yield significant differences in scores; however, different levels of knowledge are seen when comparing HCWs who received any formal training versus no formal training. Therefore, it is expected that a training strategy emphasizing training for the

maximum number of HCWs will boost HCW knowledge of guidelines messages.

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### Emphasis on training for expert clients, especially on topics related to their scope of work, yields improvements in knowledge of national Integrated HIV Management Guidelines.

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**Background:** Swaziland introduced updated Integrated HIV Management Guidelines in 2015. Aiming to achieve optimal guidelines knowledge among all staff and inform improved training strategies, an assessment was distributed to evaluate healthcare worker (HCW) knowledge of the guidelines, comparing scores among different cadres such as nurses and expert clients (ECs). Expert clients do not provide clinical management but should remain abreast on topics covered in the national guidelines to adequately direct clients through the antiretroviral therapy (ART) process i.e. prepare clients initiating on ART, provide adherence support, refer clients for necessary care, and recognize treatment failure. Nurses, however, provide clinical management and prescribe medicines. This assessment evaluated the guidelines knowledge of ECs to inform the design and implementation of more effective training plans, contributing to improved quality of care for clients seeking HIV treatment services.

**Methods:** A secondary analysis of a programmatic assessment was conducted in August 2017 in 53 health facilities proportionally distributed across the four regions of Swaziland. After obtaining informed consent, paper-based multiple-choice assessments were administered by regional clinical mentors to available HCWs at chosen facilities. The assessment, uniformly given to each cadre, asked questions about key messages in the guidelines and whether HCWs were trained on these messages. Descriptive statistics and two-sample t-tests were analyzed in Stata 12 to investigate differences in assessment scores based on training received.

**Results:** One hundred and twenty-five (125) nurses and 14 ECs participated in the assessment. The average total score on the 21 assessment questions for nurses and ECs was 64.4% and 57.8%, respectively. The difference in assessment scores between cadres was not statistically significant ( $p=0.107$ ). Additionally, when analyzing assessment scores for HCWs that attended and participated in all three national trainings, nurses ( $N=54$ ) and ECs ( $N=9$ ) scored 67.8% and 61.4%, respectively; these results were also not statistically significant ( $p=0.204$ ). The analysis also considered questions on the assessment that are specific to an EC's scope of work (only 17/21 assessment questions). The average difference between nurse and EC scores decreased from 7% to 4% when considering only this group of questions.

**Conclusions:** The results demonstrated that nurses and ECs fail to correctly respond to nearly 40% of the guidelines assessment questionnaire. Moreover, knowledge of the 2015 Integrated HIV Management Guidelines did not statistically differ between the nurses and ECs interviewed. It was further observed that guidelines knowledge improved for both groups after receiving training on guidelines messaging. Thus, stronger emphasis on

training, especially topics directly related to cadre scope of work, during the release of upcoming guidelines could show continued improvements in knowledge.

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### An eight-year review of independent predictors and trends of mortality among HIV Positive patients on ART in North central Nigeria

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**Background:** Information on factors contributing to mortality among people living with HIV that are on treatment in Nigeria is still growing. Such information remains important in the fight to end HIV. We examined the trends and predictors of mortality among HIV positive patients on ART across 6 comprehensive HIV treatment facilities in North central Nigeria.

**Methods:** We retrospectively reviewed records of all patients ever enrolled to receive antiretroviral therapy (ART) between August 2008 and 31st January 2017 across the treatment facilities being supported by the USG/CDC funded Integrated Programs for Sustainable action against HIV/AIDS in Nigeria (IPSAN) project in 3 states of North central Nigeria. We obtained data on age, sex, CD4 count and WHO disease staging at enrollment, current status in care, dates of enrollment into care and initiation on ART, and regimen type from the electronic medical records in the facilities. Data was exported into excel, de-identified and transferred into STATA® version 11, StataCorp. 2009 for analysis. We expressed our socio-demographic characteristics using descriptive statistics. We estimated time to death between patients <15 years and those >15 years using Kaplan Meier survival curve and conducted multivariate analysis to examine the relationship between socio-demographic variables and mortality using Cox regression model. Significance level was set at p<0.05.

**Results:** We reviewed the records of 9,888 patients of which 70% were females. Ninety-five percent were above 15 years with a median age was 34 years. The median and mean CD4 estimates at enrollment on ART were 299 and 357 cells/milliliter respectively. Most of the clients were on Zidovudine (53%) and 45% were on Tenofovir based regimens. Mortality among all clients was 5.5% (n=547) and those ≤15 years accounted for 3%. Log rank test did not show any significant difference in time to event between the two groups;  $\chi^2$  0.33 p = 0.6. Clients with a WHO stage 2 disease and above -[stage 2 (HR 2.1; 95% CI, 1.6 to 2.8), stage 3 (HR 2.8, 95% CI, 2.1 to 3.8), stage 4 (HR 2.7, 95% CI, 1.6 to 4.4)], p<0.05 and those on Zidovudine based regimen (HR 1.6; 95 CI 1.3 to 2.1), p<0.05 were more likely to die.

**Conclusion:** There were no significant differences in time to death between patients aged 15 years and below and those above 15 years. Being enrolled with WHO disease staging above 2 and on Zidovudine based regimen are the major predictors of mortality.

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### Factors affecting duration before ART initiation in North Central Nigeria

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**Background:** As guidelines for initiation antiretroviral therapy (ART) in HIV positive patients change so have patient dynamics and ART initiation process. Regardless of prevailing guidelines however not all patients initiate therapy as and at when due. Understanding the factors that influence this is important for both clinical and programmatic decision making.

**Methods:** This is a retrospective study of all patients ever enrolled onto ART between August 2008 and 31st January 2017 across 6 comprehensive HIV treatment facilities being supported by the USG/CDC funded project in 3 states of North central Nigeria. Patients who test positive to HIV are enrolled into care and go through a treatment readiness process before being initiated on ART. We assessed the facilities' electronic medical records for patient level information since activation of the facilities. These include patients' age, sex, CD4 count at enrollment, WHO stage at enrollment, current status in care, dates of enrollment into care and initiation on ART and regimen type. The anonymized data was extracted in csv format and exported into Microsoft Excel before being transferred into the STATA statistical software for analysis. Socio-demographic characteristics were expressed in simple percentages while Chi Square test was used to determine association between variables. STATA version 11, StataCorp. 2009. Stata Statistical Software: Release 11. College Station, TX: StataCorp LP was used for the analysis.

**Results:** Out of a total of 9,888 patients ever been enrolled on ART; 60.3% were still active on care while 28.8% have had their care ended at various times during the 8 years review period. Mean age was 34.8 years with 5% of patients being <15 years of age while 41% were between the ages of 30 to 39 years. Ninety per cent (90%) of patients were initiated on ART within 9 months of enrolment on the program; 80% initiated ART within 3 months while 3% initiated ART after 24 months post enrolment into the program. We found significant relationships between duration before initiation of ART and patients' age (Chi 53.27; p= 0.025), Patients' gender (chi 16.55; p = 0.021) and CD4 cell estimate at enrolment (chi 219.41; p= 0.000). A further linear regression analysis of the relationship between the duration and all 3 variables demonstrated significance only with CD4 estimation at enrolment p<0.05.

**Conclusion:** The study demonstrates that there exist some relationships between Age, sex and duration between enrolment in care and initiation on therapy. It also buttresses expectedly the role of CD4 estimate on ART initiation. While we did not adequately demonstrate the strength of the relationships; it will be important for clinicians to pay close attention to gender and age as influencers of ART initiation while more research is carried out to measure the strength of this relationship among PLHIV in Nigeria.

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**Case management approach as a tool for improving services along the HIV cascade**

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**Background:** To attain the 90-90-90 targets, leakages along the HIV treatment cascade need to be plugged. Critical steps in the cascade include linkage of persons testing HIV positive to treatment and retention of those on treatment. These two steps have proven problematic in the era of test and start where there is reduced time to prepare clients for lifelong treatment. In this abstract, we present our experience with implementing a case management approach to link and retain clients receiving HIV services.

**Method:** We structured case management rollout into a six-step process including; stakeholder engagement (working with MOH staff, health facility workers and organized PHIV groups to understand case management process), case managers recruitment and training (developed person description and training curriculum and recruited collaboratively with stakeholders), case load structuring and assignment (a set of client characteristics/needs were used to define priority clients. Using data from the project-supported eMR - LAMIS, case managers were assigned a mix of client characteristics such that the case load for each CM had a fair share of high, medium and low priority clients), client contact and needs assessment (a "meet-and-greet" in the facility during scheduled clinic visits or drug pickups helped to introduce case managers to their clients and provided a platform for subsequent contact), delivering case management services (core services include linkage between service delivery points, adherence reinforcement using calls and home visits, clinic appointment reminders, ensuring viral load assays as at when due, tracking of defaulters, support for documentation), and monitoring and evaluation (at different levels – client needs monitoring, client satisfaction, case manager performance monitoring, impact of the approach on program performance).

**Results:** Within the first three months of introducing project-wide case management, 2177 case managers had been recruited, trained and deployed to 368 health facilities in 13 SIDHAS supported states. A case management module was developed as part of LAMIS to track performance and more than 200,000 clients on ART had been assigned to CMs. During the first quarter of implementation Oct -Dec, 2017, 76% of clients tested HIV+ were linked to treatment within month of diagnosis, 85,750 clients were reached by case managers through phone calls, home visits and during clinic visits while 20% of 19,109 clients declared lost to follow up were successfully tracked and brought back to treatment.

**Conclusion:** Early results show that case management approach is improving linkage and client engagement with services.

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**Addressing the 90 90 90 among children (0-14) years at Mityana hospital, a case study of 12 months retention, that is children****identified and initiated on ART in October-December 2016.**

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**Background:** In order to achieve the ambitious UNAIDS global goal 90 90 90, children cannot be left out of the struggles, the "unfinished business" ELMA, under mildmay Uganda came up with three basic objective; diagnosis, treatment and retention of children and adolescents to join in the struggle to end the HIV epidemic by 2030. Mildmay Uganda employed and attached a counselor at Mityana hospital to ensure that children and adolescents get services that would lead to diagnosis, treatment and retention.

**Method:** Review of 20 children (0-14) years enrolled into HIV care and treatment in the quarter of October to December 2016 at Mityana hospital, the data was extracted from the ART register and this quarter well updated.

**Results:** 20 children: 0-14 years were identified HIV positive and were all enrolled in care at the facility successfully. 13 were still active, and 2 transferred to another facility and 3 are lost to follow, 2 children passed on. 8 children have suppressed viral load.

3 Unsuppressed, of which one child was switched to 2nd line and under monitoring, another is under intensified adherence counseling, and one completed and awaits to repeat the viral load. Two children have not yet been bled for viral load, because of some social factors.

**Lessons learnt**

No health worker should go to rest when there is a positive DNA PCR test that is not started on ART.

For all children started on ART, monitoring should critically be done through the care takers, in order to attain viral load suppression since these care takers play an important role in the lives of these children and 90% of treatment is at home.

A separate clinic for pediatrics and adolescents is very key in the care and treatment of these age groups, for better results.

**Conclusion:** Hospital health workers engagement enhanced ownership and implementation of the project and provision of quality care and services. Continuous medical education have greatly improved screening, diagnosis and treatment of all HIV positive children and adolescents at the hospital.

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**An analysis of Retention and Viral Load suppression rates in a high-Volume site in Lagos.**

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**Background:** Retention of HIV patients in care has been cited as an important factor to ensuring successful clinical outcomes amongst People Living with HIV (PLHIV). In addition, retention may depict the quality of service being provided by the health care givers. Evidence have shown that Viral Load Suppression is more strongly associated with high retention rate. Hence, Medication Adherence and Retention in Care would help to

achieve and sustain Viral Load suppression, prevent interruptions of medication, maintain immunologic benefits, prevent HIV resistance, and monitor the efficacy of therapy. United States Agency for International Development (USAID) has been funding the HIV/AIDS service delivery at Ajeromi General Hospital in Lagos state since 2011 till date through the Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS) project implemented by Family Health International (FHI) 360. We analysed retention and viral suppression rates among patients receiving ART in this hospital.

**Methods:** We analyzed data of patients who initiated ART between October 2011 and September 2017 using client level data collected using the Retention and Audit Determination Tool (RADET), an excel-based tool developed by PEPFAR Nigeria to validate clients currently on ART. Retained patients were those alive and on treatment as at September 2017. HIV viral suppression was defined as HIV-1 RNA <1000 copies/mL. Descriptive and bivariate analysis were performed using Stata.

**Results:** Of the 4,545 patients, 94% (4,289) were adults aged 15 years and older, 69% (3,134) were females. Retention rates among children aged 0-14 years and adults were 68% (175) and 63% (2,703) respectively ( $p=0.09$ ). Retention rates within a year on ART, 1-2 years, 2-3 years among children and adults were 74% vs. 72%, 70% vs. 60%, 66% vs. 74% and 65% vs. 55% respectively. Of 2,194 patients who had viral load testing, 82% were virally suppressed. Viral suppression rates differ significantly among children (48%) and adults (84%) ( $p<0.001$ ). Viral suppression rates for children and adults who have been on ART at 6 months, 6 months -1 year, 1-2 years and >2 years were 50% vs. 86%, 47% vs. 89%, 34% vs. 85%, 56% vs. 80% respectively.

**Conclusions:** Retention rates were similar among children and adults. However, viral suppression rate was lower among children aged 0-14 years. This finding suggests that medication adherence may be sub-optimal among this population. Hence, it underscores the importance of adherence education, support and assessment among caregivers.

## 219

### Characterization of RBC morphologies in HIV-infected patients in Cameroon

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**Background:** Hematological abnormalities have been documented as strong independent predictors of morbidity and mortality in HIV infected individuals. Distinct ART regimens appear to promote different alterations in erythropoiesis. Are HIV-infected patients have a high prevalence of abnormal red blood cells (RBC) regardless of the clinical, biological and therapeutic circumstance? The objective of the study is to identify and characterize RBC morphological changes that occur in HIV infected patients.

**Materials/Methods:** Between June 2015 and December 2015, a total of 232 consecutive blood specimens, all HIV-1 positive, submitted to the hematology departments of the Douala General hospital in Cameroon for RBC abnormalities detection were collected. RBC abnormalities prevalence were evaluated using a full blood counts (FBC) and blood film among 215 HIV patients taking part of antiretroviral therapy (ART) program including 28 on co-trimoxazole and 17 ART naïve. Two technicians reviewed

the slide to make the diagnosis. Clinical data from patients were anonymously collected. We used the Chi square test for the comparison of proportions of variables and we considered  $p$ -value <0.05 to be statistically significant.

**Results:** Three quarter of patients, had at least one quantitative or qualitative RBC abnormality, giving a prevalence of 77.5%. The mean value of hemoglobin was 11.9 g/dl with a prevalence of anemia at 61.2% for all participants. The main RBC morphological abnormalities diagnosed were anisocytosis (43.1%), anisochromia (34.5%) and poikilocytosis (12.5%). These RBC morphological abnormalities concerned the size, stain and shape and are statistically significant depending to hemoglobin concentration, ART duration/regimen and WHO disease stage ( $p$ -values <0.05). The lowest prevalence of abnormal RBC is among those with clinical stage 1/ART duration above 7 years, and the highest prevalence is among those ART naïve, with severe anemia and in stage 4 disease. These all abnormalities demonstrate graded associations.

**Conclusions:** The prevalence of RBC abnormalities is high during HIV infection and increased after the introduction of ART, with the presence of anemia and in advanced WHO disease stage. The study of RBC morphology on blood films is useful for detecting HIV-infected patients with low hemoglobin and real deficiency in HIV clinic.

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### Viral load testing and the use of test results for clinical decision making for HIV treatment in Cameroon: An insight into the clinic-laboratory interface

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**Background:** The viral load (VL) in patients receiving antiretroviral therapy (ART) is the best predictor of treatment outcome. The anticipated benefits of VL monitoring depend on the actual uptake of VL test results for clinical decisions. The objective of this study was to assess the uptake and utilization of VL test results for clinical decisions on HIV treatment in Cameroon, from 2013 to 2017 and the factors associated with VL suppression.

**Methods:** This was a retrospective cohort analysis of data from files of patients receiving ART at Buea, Limbe, Bamenda and Bafoussam regional hospital HIV treatment centers. Files of patients who have been followed up for a minimum of 2.5 years were randomly selected. The content of the files was reviewed and the information needed for the study entered into a structured questionnaire. The data collected was recorded in Epi Info (version 7.1.5.2), and analyzed using STATA (version 12.1; StataCorp LP).

**Results:** Eight hundred and thirty files were reviewed. The mean duration of ART was 39.4±12 months. Viral load testing uptake was 24.33% among ART patients and only one VL test had been done by patients on ART. Approximately 65% of the patients did the first VL after more than 24 months on ART. The median turnaround (TAT) time for VL testing was 6 days (Interquartile range (IQR) 3-7days). Among 201 patients who did a VL test after starting ART, 94.55% had VL suppression. Approximately 54% of the patients with virologic failure were switched to a second-line regimen. Age (adjusted Hazard Ratio (aHR): 1.02 (95% Confidence Interval (CI), 1.00-1.03) and baseline CD4 count (aHR: 1.24(95%CI, 1.01-1.52) were associated with VL suppression in multivariate analysis.

**Conclusions:** The uptake of viral load testing is low after enrolment in ART in North West, South West and West Regions of Cameroon. The current TAT for VL testing is plausible. The rate of switch to the second-line regimen is low for cases of virologic failure. It is time to strengthen the scale-up of VL testing and improve the rate of switch to second-line ART among cases of virologic failure in Cameroon.

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### Laboratory Evaluation of INSTI HIV-1/2 Rapid Antibody Screening Test for HIV Testing in Kenya

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**Background:** A diverse range of rapid assays for detection of HIV antibody have been developed and promoted for HIV screening and diagnosis over the past couple of years. Most of these assays are simple and do not require use of instruments and special skills. Among these is INSTI™ HIV-1/HIV-2 Antibody Test, a qualitative immunofiltration rapid diagnostic test for combined detection of HIV-1/2 antibodies in human serum/plasma and capillary/venous whole blood specimens. This kit has not previously been used in Kenya. This evaluation was aimed at assessing performance and suitability of Insti HIV-1/2 rapid antibody test in Kenya.

**Methodology:** A cross-sectional laboratory based evaluation of Insti HIV-1/2 rapid antibody test for detection of HIV-1/2 antibodies using characterized laboratory plasma panels and 10 member of fivefold dilution series. The performance characteristics of INST HIV-1/HIV-2 antibody test was evaluated against Enzyme Immuno assay (EIAs) as gold standard using serial testing on Bioelisa and Murex alongside Kenya national HIV testing algorithm (serial testing of determine and first response). Result interpretation, were read independently by three laboratory officers. Two out of three reading results determined final outcome of results. Analysis was performed using STATA version 12.0.

**Results:** Out of 252 (n= 252) specimens, Insti HIV-1/2 assay had a sensitivity (95% CI), of 99.7 % (96.5 -100) with a specificity (95% CI), of 100% (96.6 -100) in comparison to Enzyme immunoassay. The INSTI had both PPV and NPV of 100%. Comparing to the Kenya national algorithm, 95% CI the sensitivity was 100% (98.7

-100) and specificity 95% CI of 100% (99 -100).The performance accuracy was 100% with a kappa of 1.000. Lot-to- evaluation was 100% comparable among five lots tested, with 0% both invalid and indeterminate result. There was an inter-reader variability of ≤ 1%. INSTI test had an end- point sensitivity mean index of - 1.8 in comparison to determine and reference assay of 0.0.

**Conclusion:** This evaluation demonstrates evidence that Insti HIV-1/2 antibody assay has good performance characteristics as a clinical diagnostic assay in HIV. Insti assay had a good agreement with both Enzyme immunoassay and the Kenya national testing algorithm. Despite good agreement, Insti indicated low endpoint sensitivity; hence Insti may be desired as good second line test in HIV testing strategy.

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### Allele-Specific PCR (ASPCR) for the Detection of Point-Mutations associated with HIV-1 Drug Resistance in N'Djamena, Chad

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**Background:** Allele-Specific Polymerase Chain Reaction (ASPCR) is used to detect bi-allelic single nucleotide polymorphisms. Of note, a known mutation is detected by designing three specific primers: two forward primers (one for the wild-type and the other for the mutant allele) and a reverse primer that is common to both forward primers. For each mutation, PCR is realised in two different tubes and results are interpreted based on different curve appearances.

**Objective:** To evaluate the performance of ASPCR in detecting point mutations associated with HIV-1 resistance to commonly available drugs in sub-Saharan Africa.

**Methods:** A total of 44 samples from HIV-1 infected patients were extracted from 140µl of plasma using QiAamp Viral RNA mini kit. Random hexamers were used for reverse transcription, and RT-PCR (Outer) was performed using LightCycler® FastStart DNA MasterPLUS SYBR Green I (Roche, Mannheim, Germany) on thermal cycler AB 9700 Geneamp (Applied Biosystems). Point mutations (K103N, Y181C, M184V, TAMs) were detected on Roche LightCycler®480 automated system, with dilutions from 0.01 to 100%. Comparison of differences in threshold (Ct) or crossing points (Cp) between the mutant and mixed-type was done for each mutation detected by Sanger sequencing (gold standard).

**Results:** Specificity of ASPCR was 100% on subtypes D, J and CRF02\_AG, even at levels of 0.02% for minority point mutations. Though M184V mutation was detected in subtypes A, D, F, J and CRF02\_AG, the sensitivity in detecting K103N, Y181C, M184V and T215F was higher for subtypes J and CRF02\_AG, with 100% sensitivity in detecting M184V in subtype F. However, detection of K70R and T215Y was poor for subtype D. ASPCR also detected minority variants down to 0.01%, with coefficients of variation <0.50.

**Conclusions:** ASPCR appears suitable in detecting point mutation related to HIV-1 drug resistance. Thus, this technology could serve for the screening of patients harbouring drug resistant HIV in resource-limited settings.

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### Development and validation of an HPLC-UV multiplex assay for monitoring antiretroviral drugs in resource limited settings.

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**Background:** Therapeutic drug monitoring (TDM) is successfully used in resource-rich settings thereby optimizing ART for HIV-infected patients at risk of too low drug level, with possible consequent risk of treatment failure, or too high, with potential experience of antiretroviral toxicity. Although ART is administered as multiple drug regimens, most available drug analytical procedures target not more than three analytes, with cost implications that make TDM unachievable in resource limited settings. A multiplex assay for simultaneous determination of seven antiretroviral drugs including those in current use in Uganda (nevirapine, efavirenz, lopinavir and atazanavir) and those predicted to be recommended soon (darunavir, raltegravir and etravirine), was developed and validated.

**Materials & Methods:** The method was developed at the Infectious Diseases Institute with mentorship from experts at the University of Zurich. Sample processing involved protein precipitation from serum, followed by high performance liquid chromatography with a phenylhexyl column and detection at 210 and 254nm. The method was validated over a concentration range of 1-15mg/L for nevirapine, efavirenz, lopinavir and darunavir and 0.2-3 mg/L for raltegravir, etravirine and atazanavir.

**Results:** The protein precipitation method was successfully developed with a run time of 60 minutes. The assay was accurate (98-109.6 %) with inter and intra-day coefficient of variation less than 11%. Stability could be shown for 48 hours on the autosampler, 8 hours on the bench, and when the samples were frozen at -20°C and thaw for three cycles. There was no interference with endogenous compounds and with co-administered drugs.

**Conclusions:** It is feasible to develop new methods for simultaneous determination of antiretroviral drugs in resource limited settings. Collaboration with other institutions and senior technicians have been key for the success of this study. In Uganda with a treatment failure rate of >10% and confounding treatments for infections such as TB and malaria, this method of measuring drug level is of great importance.

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### Usability characteristics of HIV self- tests in Kenya

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**Background:** Self-testing has the potential to circumvent constraints associated with approaches such as lack of confidentiality, stigma and discrimination, shortage of counselors and long distances to testing sites. Kenya's HIV testing service guidelines revised in 2015 recognize the potential of HIV self-testing to catalyze improved access to and coverage of HIV testing. However, there is no HIV self-test currently in approved for use in Kenya, and the usability of the tests available in other markets has not been determined. Thus, we sought to evaluate the usability characteristics of HIV self-test in Kenya.

**Method:** This was a cross sectional study conducted amongst participants from both urban and rural settings in Busia, Western Kenya. After being consented and enrolled in the study, a simple questionnaire was administered. The open-ended questionnaires contained usability characteristics of interest such as steps to result, sample type, time to results, waste generated and perception.

**Results:** A combined total of 279 participants were enrolled into usability studies for one OMT and one capillary test. For the capillary test, 210 participants were recruited; 82% (172) of participants found it easy to prick the finger and to collect the sample. Ninety three percent 93 % (195) of the participants found result interpretation to be easy. There were six steps to the final result; the median period to test results was 20 minutes. Perception of test varied across the study population. 85% (179) of the participants perceived the test as good and 93 % (195) recommended it for use. For the oral mucosal transudation test, the study recruited 69 participants. Of those, 97% (67) found it easy to understand the instructions for use while 92% (63) found it easy to collect the oral mucosal transudation with the swabs. 93%, (64) of the participants found result interpretation to be easy. There were seven steps to the final result; the median period to test results was 20 minutes. Perception of test varied across the study population - 75%(52) of the participants preferred the test due to its ease of use, short time of test, portability, confidentiality, use of oral brush, lack of pricking, pain and blood. In both studies, 83 % (232) of the participants had no problem with the absence of a counselor. After testing, the amount of waste generated was perceived to be little by 60 % (167) of the participants; 28 % (78) thought it moderate. If the tests were to be sold, 84 % (234) of the participants would consider purchasing them at various prices between 1-5USD.

**Conclusion:** Most of study participants find self-tests highly usable without assistance. For this reason, self-tests might be highly acceptable when introduced in the market

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### Estimating HIV Incidence in Akwa Ibom AIDS Indicator Survey (AKAIS) Population-Based Study in Nigeria Using the New Limiting Antigen Assay Method

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**Background:** The measurement of HIV incidence provides understanding of new human immunodeficiency virus 1 (HIV-1) infections from those infected for longer periods in a population over time. It can elucidate transmission dynamics of new HIV infections and allow tracking of epidemiological trends. Additionally, incidence measurements can help target prevention programs in reducing HIV infections. Here, we describe detection of Recent HIV-1 Infection using a single-well limiting-antigen avidity enzyme immunoassay (LAG-Avidity EIA) in Akwa Ibom AIDS Indicator Survey (AKAIS), a cross-sectional population-based survey.

**Materials & Methods:** In 2017, AKAIS study was conducted at the household (HH) level in all the 31 Local Government Areas in Akwa Ibom state. A total of 8,306 consenting participants aged 15 years and older were administered questionnaires to obtain demographic and behavioral data, and tested for HIV. Whole blood specimens was collected from HIV positive-individuals aged 15 years and above at the HH and sent to Satellite laboratories for CD4 testing using BD FACSCount flow cytometer and later processed into Plasma. The samples were then shipped to Central Quality Laboratory of University of Uyo Teaching Hospital, Uyo for HIV confirmatory test using Biorad Geenius HIV 1 / 2 kit (Biorad, France) and also tested for HIV-1 RNA Viral Load using Cobas Roche Ampliprep / Taqman. Of the 394 confirmed HIV- sero-positives, 370 eligible were further tested for HIV Incidence using Sedia Limiting Antigen Avidity Assay kit (LAG) (Sedia Bioscience Inc. Portland Oregon USA). HIV incidence was therefore estimated using the Sedia LAG data management sheet and HIV incidence calculator developed by CDC.

**Results:** The mean age, Plasma Viral load and CD4 cells count were 36.4 years, 50,204 copies/ml and 492 cells/μl respectively. Eleven specimens were identified as LAG – Avidity EIA recent and 359 were determined as long-term infections after adjusting for low viral load < 1,000 copies/ml. The weighted un-adjusted HIV-1 incidence estimates was 0.72/100 PY while the adjusted HIV-1 incidence after viral load exclusion (<1000 copies/ml) was 0.41/100 PY. This translates to 13,000 new cases of HIV infections annually in persons 15 years and older. The HIV incidence rate was marginally similar in females and in males (females: 0.41% and males: 0.42%). The Incidence rate was higher among participants aged 15- 19 years (0.84%) translating to 5,000 estimated new infections, thus accounting for nearly half of the new infections occurring in the population. There were no new infections found in ages 20-24 years. HIV incidence in age 25- 29, 30-34, 35-39, 40-49 and 50 years were 0.28%, 0.35%, 0.76%, 0.53% and 0.31% respectively. HIV incidence in persons aged 35-39 years was second highest with about 2000 new infections.

**Conclusion:** The burden of HIV infection is of concern among the growing population of persons aged 15-19 years. This calls for HIV programming that is more focused on this age group. These data also corroborate the assertion that HIV is an epidemic primarily of young people and the need to target new generation of young persons with HIV prevention and treatment services.

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## Improving access to HIV viral load monitoring test through strengthening integrated delivery of HIV/AIDS service (SIDHAS) supported facilities

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**Background:** HIV viral load assay using the targeted evaluation group (TEG) algorithm to generate evidence for generalizing findings for public health intervention was initiated at some health facilities in Nigeria since 2005. Following the strong recommendations for viral load as the monitoring assay to detecting virologic failure or treatment failure by WHO 2013 consolidated guidelines, Family Health International through the SIDHAS project funded by USAID, scale up viral load test at supported facilities in phases. HIV-1 viral load (VL) assay were carried out at tertiary health facilities (teaching hospital and federal medical centers) located mostly in cities, which limits access for most patients. This paper seeks to show the improvement of access to VL testing across the facilities.

**Method:** Three phase approach was used in scaling up viral load test, namely; phase 1: Identification and linkages of collection sites; advocacy; training and activation of sites (<1hour radius) from the testing laboratory. Phase 2: Focused on activating collection sites >1hour radius to the testing laboratory; Procurement and installation of solar refrigerators for proper sample storage. Phase 3: Establishment of viral load testing laboratories in 2 states (Rivers and Cross Rivers) to increase testing coverage; Increased sample processing time through procurement and installation of higher capacity centrifuges in sample collection sites, and increased equipment utilization capacity and reduce turnaround time TAT of test results by means of using laboratory information management system (LIMS) at the testing laboratories.

**Results:** Following the phases of initiative, viral load test coverage and access has been on the increase across SIDHAS supported facilities through fiscal year (FY) 2015-6,632 VL test, FY 2016-29,749 (78% increase from previous year) and FY 2017-114,672 VL test done (74% increase from previous year).

**Conclusion:** Strengthening the laboratory system by applying strategic approaches to support infrastructure, human resource, laboratory information management and standardized laboratory workflow will continue to ensure viral load test optimization and increased access to monitor viral suppression amongst HIV/AIDS patients.

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## HIV-1 Drug Resistance in Patients Failing First-line and Second-line Therapy in Kenya an Overview

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**Background:** The prevalence of HIV-1 infected individuals in Kenya is 5.9%, of which 60% are on antiretroviral therapy (ART) with 81% suppressed; treatment failure is defined by a persistently high viral load  $\geq 1000$  RNA cps/ml after at least 6 months of using ART. In Kenya there is access to first-line ART as well as second-line ART; for patients failing first-line ART. For individuals aged 15 and above the preferred first-line regimen is TDF+3TC+EFV. In Kenya there was an increase of ART coverage by 37% between the years 2013 and 2015, however with increased coverage comes a corresponding increase in Drug Resistance. As such there is need to investigate drug resistance mutation patterns among patients that are failing first-line and second-line therapy. Such information is needed for strategic planning and developing alternative second-line therapies as well as preparation for third-line therapies.

**Methodology:** Sixty four (64) unlinked anonymous plasma samples with viral loads  $\geq 1000$  cps/ml drawn sequentially from HIV-1 infected patients under treatment were genotyped to identify mutations to NRTIs, NNRTIs and PIs. Sanger sequencing was carried out using the ABI 3500 (Thermo fisher Inc., San Francisco, California) System. The sequences were analyzed using web ReCall (UBC CFE, Vancouver, Canada).

**Results:** Out of 64 samples from non-suppressed patients, 56 (88%) samples were successfully sequenced and analyzed, of which 57% were female, 36% male and 7% of unknown gender; 18% were aged between 15-25, 32% (26-40), 29% (41 and above) and 23% of unknown age. The commonest regimen was TDF+3TC+EFV seen in 29 (52%) patients, TDF+3TC+NVP in 5 (9%) patients, AZT+3TC+NVP in 6 (11%) patients, AZT+3TC+EFV in 2 (4%), ABC+3TC+EFV in 2 (4%), ABC+3TC+NVP in 1 (2%) patient, ABC+3TC+LPVr in 1 (2%) patient, TDF+3TC+ATVr in 2 (4%) patients, AZT+3TC+LPVr in 1 (2%) patient and 13% of unknown regimen. Major NRTI resistance associated mutations (RAMs) were demonstrated in 40 (71%), NNRTI RAMs in 45 (80%) and PI RAMs in 2 (4%) of participants. The most common NRTI mutation observed was M184V, NNRTI was K103N and mutations for PI observed were I50IF and L10F. The HIV-1 Drug Resistance interpretation for PI showed that all patients were fully susceptible to Lopinavir and Atazanavir. For NNRTIs high level of resistance was predicted for 45 (80%) to Nevirapine and 43 (77%) to Efavirenz. For the NRTIs high level of resistance was predicted for 20 (36%) to Abacavir, 4 (7%) to Tenofovir, 4 (7%) to Zidovudine and 36 (64%) to Lamivudine.

**Conclusion:** Major mutations conferring Drug Resistance to first-line and second-line therapy are an important cause of failure to achieve viral suppression in Kenya. Further studies are necessary to determine optimal therapy combinations for patients on second-line and third-line regimens.

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## Evaluation of Loop Mediated Isothermal Amplification assay for the Rapid Diagnosis of Trichomonas Vaginalis in Women Attending a Sexually Transmitted Disease Clinic in Uganda

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**Background:** Trichomoniasis, caused by the protozoan parasite, *Trichomonas vaginalis* (TV), is the most common, curable sexually transmitted infection worldwide affecting approximately 35% women in Sub-Saharan Africa (SSA). Currently, the mostly used method for TV diagnosis is wet-mount microscopy. Unfortunately, due to low sensitivity this test can miss up to 60% of TV infections. A novel nucleic acid amplification technique (NAAT), called the loop-mediated isothermal amplification (LAMP), was shown to be highly sensitive, specific, much simpler, faster to perform and requires no intense technical training and expensive equipment than conventional NAATs whose platform is complex, expensive and difficult to implement in rural resource-limited settings. This study evaluated the performance of the LAMP technique compared to Polymerase chain reaction (PCR) and culture methods for the diagnosis of TV infection using clinical samples from women attending a Sexually Transmitted Disease clinic in Mulago National Referral Hospital, Uganda.

**Materials & Methods:** This was a diagnostic study carried out from January to December 2017. Two high vaginal swabs were collected from each participant; one was used for culture method to detect growth of TV pathogen and the other was used to extract DNA for detection of TV using both LAMP and PCR assay. Statistical analysis was performed using STATA V.14.2. Demographic characteristics, clinical and treatment history were analyzed using frequencies and percentage while continuous variables were analyzed using median and interquartile range. The primary outcomes included sensitivity (SN) and specificity (SP) of the LAMP assay compared to the PCR and culture. These were computed along with the 95% confidence intervals. Positive and negative predictive values (PPV and NPV) with the 95%CI were computed.

**Results:** A total of 167 suspected cases of TV participants were enrolled, 164 (98.2) cases were analysed. Of those enrolled, median age was 28 years (IQR= 27- 30), 50% had secondary level education, 52.4% were married. With regards to clinical symptoms at admission/diagnosis, 75.6% reported only 1 or 2 signs with slightly less than half (49%) reporting duration of symptoms for 3+ days. Only 10.4% reported to have received TV treatment and more than 31% received other treatment. Overall, 18 (11.6) samples were positive for TV based on PCR, 9 (5.8%) LAMP and 8 (4.9%) culture. When we compared the performance of LAMP assay and PCR (reference standard), the LAMP assay had a SN (29.4%, 95%CI:10.3% – 56.0%), a SP (97.1% 95%CI:92.7% – 99.2%), a PPV of 55.6% and NPV of 91.7%. When compared with culture (gold standard), LAMP assay had a SN (71.4% (29% – 96.3%) and SP (97.3% (93.2% – 99.3%) however, the PPV did not differ from the comparison with PCR, with a NPV of 98.6%.

**Conclusion:** The evaluated LAMP assay has a lower positive predictive value as compared to PCR and culture methods for the diagnosis of TV infection. Because Integration of PCR platforms at point of care has so far not been successful in especially resource limited settings, future studies should evaluate ways of improving the diagnostic performance of the LAMP assay in resource limited settings.

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### Performance comparison of Gene Xpert with cobas ampliprep TaqMan for early infant HIV-1 diagnosis and HIV-1 viral load monitoring in Rwanda

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**Background:** Rwanda Ministry of Health launched "Treat all" strategy recommending initiation of antiretroviral treatment, for HIV-infected individuals irrespective of their CD4 counts. World Health Organization guidelines recommends routine viral load testing for patients on antiretroviral therapy and Rwanda adapted it as well as nucleic acid testing for infants from HIV infected mothers.

**Materials & Methods:** Cepheid quantitative and qualitative HIV nucleic acid based kits uses GeneXpert platform. The Xpert HIV-1 viral load automates test process including RNA extraction, purification, and reverse transcription and cDNA real time quantitation in one fully integrated cartridge; the Xpert HIV-1 Qual provides a total nucleic acid based test for RNA and proviral DNA in one fully integrated cartridge in whole blood and dried blood spots (DBS). The test does not require PCR settings. 50 GeneXpert machines have been distributed in hospitals for diagnosis of TB only. They could dually serve for HIV. The aim of the study was to evaluate feasibility of Xpert for VL monitoring and early infant diagnosis.

**Results:** Roche COBAS TaqMan HIV-1 Test V2.0 HI2CAPCTM was considered gold standard for Gene Xpert tests, validation of Xpert HIV-1 Qual kit was conducted on 187 samples, including:

- 114 samples collected on Whatman 903 filter paper, from adults, 66 were HIV positive and 48 were HIV negative;
- 32 DBS samples collected from HIV infected mothers; 15 were HIV positive; 17 were negative with COBAS TaqMan HIV-1 Qual test.
- 41 blood samples collected from 26 HIV positive and 15 HIV negative adults.

Overall, GeneXpert was able to correctly diagnose 65 of the 66 DBS samples collected from HIV positive adults (98.5% sensitivity; 95% CI: 91.9-99.7), 25 of the 26 HIV whole blood samples collected from HIV adults (96.2% sensitivity; 95% CI: 81.1-99.3), all 17 of the 17 DBS samples from HIV infected people (100% sensitivity; 95% CI: 81.2-100.0). No false positive result was observed, implying 100% specificity. Linear relationship between Viral load Gene Xpert and Roche VL quantification was used for analysis, Pearson correlation coefficient (r) was calculated, Viral load values below Lower Limit of Quantification were classified as not detected and imputed as 39 copies/ml for the Gene Xpert VL assay and 19 copies/ml for Roche technique. An excellent correlation between two methods was found; correlation coefficient (R) was 0.82 when using absolute values, 0.95 when using log transformed values.

**Conclusions:** Our data shows that performance of Gene Xpert assays for detection of HIV among HIV-infected mothers and infants, and VL correlated highly with reference standard. We recommend extending X-pert assays for HIV diagnosis and monitoring of VL suppression rates to reduce turn-around time of results in Rwanda.

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### Laboratory evaluation of EID POC technologies in Kenya

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**Background:** Globally, the HIV burden among infants is expected to be 1.94 by 2020 going as per the current trends. In Kenya, HIV transmission rates for infants born to HIV positive mothers remain above 5% despite the PMTCT scale up. The country has a centralized laboratory system of HIV Early Infant Diagnosis (EID). With this kind of system, only 67% of HIV Exposed Infants (HEIs) are currently accessing DNA PCR testing. Furthermore, two additional PCR test at 6 and 12 months, coupled with the introduction of birth testing by PCR, it is expected that the number of EID tests will escalate to over 250000 tests. In view of this statistics, the referral system does not meet the current EID demand in Kenya and there is need to bridge this gap towards attaining the 1st 90 UNAIDS target among children. Innovative point-of-care (POC) nucleic acid testing (NAT) technologies can now be used for early infant HIV testing and has the potential to decentralize testing and markedly reduce the time taken for results to be available. However, there are some limitations including very limited in country experiences in quality control and evaluation. In this report we highlight evaluation of Alere Q HIV 1 / 2 Detect and Cepheid GeneXpert® HIV 1 Qual assays to assess their performance in local settings and to ascertain the manufacturer's claims on their sensitivities and specificities.

**Method:** The evaluation involved comparing the laboratory experience of Alere-Q and Cepheid GeneXpert® to the existing 'gold' standard (Roche Cobas TaqMan assay) at the National HIV Reference Laboratory, Kenya using routinely collected EDTA whole blood from 200 infants attending the Kenyatta National Hospital eMTCT clinic. Statistical analysis was done using SAS version 9.4 to assess the sensitivity, specificity and the kappa value of Alere Q and GeneXpert® HIV 1 Qual assay in comparison to the EID gold standard.

**Results:** Alere Q and GeneXpert® achieved acceptable sensitivity of 97.6% and 99.1% respectively while the specificity was 100% and 98.9% respectively. The assay time to result for Alere Q was 55 minutes and that of Gene expert® was 90 minutes while that of the SOC is 5 hours The kappa value was 0.967 and 0.988 for Alere Q and the GeneXpert HIV 1 respectively. The sample type for Alere Q is whole blood while GeneXpert® utilizes both whole blood and DBS. The two POCs are a closed system just like the SOC. POCs do not require a lab skilled personnel unlike the SOC. Alere Q has an alternative power source which can last 8 hours.

**Conclusion:** The two EID POCs reported a good laboratory performance making their upcoming implementation a great initiative for Kenya in trying to race towards the UNAIDS 90-90-90 targets. Their ability to relay results to the patients in a single visit could greatly improve the treatment outcomes, provide better linkage to care and minimized loss to follow ups (LTFUs).

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### National HIV Point of Care testing implementation roadmap in Kenya

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**Background:** While Kenya has a robust HIV laboratory network, POCT has been identified as helpful in complementing conventional laboratory practice and bringing services closer to patients in urgent need. In this regard, the NPHLS through partner and stakeholder involvement provides The National Point of Care testing implementation roadmap in Kenya. This document is intended for use by various stakeholders including national and county health policy makers and program managers, development partners, investors, implementing partners, logistics and procurement personnel, laboratory and health care service providers.

**Methods:** Development of key thematic areas in POC programming and a road map necessary for implementation which include establishing leadership and governance structure at national and county levels for point of care technologies; regulatory requirements for registration and approval of technologies for specific country needs; establishing an efficient service delivery system for POCT; capacity building of healthcare service providers to ensure successful implementation of the POCT; advocacy for POCT to sensitize and create demand for the POCT; define a robust and comprehensive quality management system to monitor and track the quality of the results being generated in compliance with ISO 22870 standards and set up information systems for both logistical and testing data management.

**Results:** Successful development and launch of a comprehensive national Point of Care business plan in Kenya that now allows for POC implementation

**Conclusion:** The newly developed national Point of Care Business plan is a promising government initiative that will clear the path to the availability and final roll out of the POCT technologies that will eventually result in a higher proportion of HEI diagnosed and linked to care; improved retention of HIV infected infants and minimized attrition (death and loss to follow up); reduced TAT for EID and VL; better treatment outcomes to PLWHAs with the overall goal in using innovative technology to attain the KASF 90-90-90 targets.

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### Utilization of multi-disease testing platforms for optimizing early infant diagnosis in Kenya

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**Background:** Early infant diagnosis (EID) is a critical component of prevention of mother-to-child transmission (PMTCT) in ensuring timely confirmation of an infant's HIV status. Kenya being one of the priority countries for the global agenda on elimination of mother-to-child transmission of HIV (eMTCT) has made tremendous effort in rolling out EID as a national intervention since 2009. It has established strong national programs for HIV, TB and laboratory systems that essentially led

to the gains made in TB/HIV diagnostics, care and treatment. A joint initiative by NASCOP, NLTP and NPHLS together with partners has been proposed to optimize in-vitro diagnostics through the use of point of care diagnostics to improve EID testing using existent systems. As a result, the team has developed a Utilization of multi-disease testing platforms for optimizing early infant diagnosis in Kenya document. The intention of this plan was to put in place key considerations for integrating HIV and TB testing within the existent POCT platforms rolled out by NPHL and NLTP.

**Methods:** The plan was developed with the following key thematic areas: Leadership and coordination, Regulatory approval and validation; Product and site selection; Integrated specimen referral systems; Ensuring capacity for supervision, monitoring and conducting trainings; Clinician training and demand generation; Inventory management, including procurement; Quality management systems and Data management and integration

**Results:** development of an all-inclusive utilization of POCT for multi-disease testing plan in Kenya that now allows for integration of EID, Viral load and TB testing

**Conclusion:** The implementation of the multi-disease testing platform not only aims at providing universal access to diagnostic services for PLHIV but in addition, aims at improving health systems to support the linkage to care, improved treatment outcomes and cost save at county level.

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### Sero-prevalence of hepatitis B and C at commencement of antiretroviral therapy: Assessing the treatment outcomes in HIV infected patients in Abuja Nigeria

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**Background:** Nigeria has the second highest HIV burden globally with a HIV prevalence of 3.0%. Transmission of Hepatitis B and C is similar to that of HIV therefore co-infection with HIV is not unusual. Abuja in the north central region of Nigeria has a prevalence of 5.8% following the recently released sentinel survey in Nigeria. This study aims to explore the prevalence of hepatitis B and C in our HIV population and the impact of HIV on virological treatment outcomes.

**Methods:** We hypothesised that virological response to ART could be worse in HIV/HCV and HIV/HBV co-infected patients. We conducted a retrospective desk review utilizing clinical and laboratory data (HBsAg, anti-HCVab and HIV-1 VL) of n=1489 patients from April 2016 to January 2018. Primary end point was VL< 1000 copies/ml after 6 months of ART. Baseline sociodemographic data and ART regimens was collected. Data was analysed using descriptive, chi square and binary logistic regression on the SPSS version 20.0

**Results:** The mean age of the participants is 38.4 years. Of the 1489 HIV infected patients, 29(1.9%) were HBV/HCV co-infected. 1274(85.6%) patients had viral suppression (481 males 37.74%, 793 females 62.24%). 107 (21%) out of the 510 clients with liver function test (AST and ALT) had raised transaminases, 85(79.4%)

of these results had viral suppression while 22(20.6%) had viral load results greater than 1000 copies/ml.

**Conclusion:** Co-infection of Hepatitis B/C and HIV, and the consequences on progression of severe liver diseases is a global public health issue. Better treatment outcomes in female with Hepatitis B and C co-infection in HIV infected population, however, data on HCV and HBV DNA would be needed to buttress these findings. Insights into the pathogenesis and immune dysfunction are needed to reduce morbidity and mortality associated with Hepatitis B/C virus co-infection.

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### Phenotypic profile of pulmonary Aspergillosis and associated cellular immunity among people living with HIV at Maiduguri, Nigeria

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**Background:** Pulmonary aspergillosis (PA) is a debilitating fungal disease that occurs as opportunistic to Human immunodeficiency virus (HIV) as a result of CD4+ lymphopenia. Majority of HIV and aspergillosis comorbid patients go undiagnosed. This study aimed to isolate and identify the etiologies, and determine the prevalence of PA among HIV infected persons with acute productive cough (<2 weeks) at HIV clinics of the University of Maiduguri Teaching Hospital, Nigeria.

**Materials & Methods:** After ethical approval, 3 consecutive early morning sputum samples were collected from subjects with tuberculosis negative results. The samples were individually studied using standard mycololcal procedure. CD4+ cell counts were determined using flow cytometry. Self-administered questionnaires were used to assess subjects' demographic data. All subjects were antiretroviral naïve.

**Results:** Of the 150 subjects, the prevalence of pulmonary aspergillosis was 12.7%. *Aspergillus fumigatus* (26.3%), *Aspergillus flavus*, 4 (21.1%), *Aspergillus terreus*, 2 (10.5%). Based on the assessment of the functionality of the cellular immunity, HIV participants whom were negative for pulmonary aspergillosis (131/150) had significantly higher mean±SD CD4 T-cells, 245.65 ±178.32 cell/mm<sup>3</sup> than those with HIV infected persons with pulmonary, aspergillosis 126.13±105.27 cell/mm<sup>3</sup> (p =0.0051). PA was relatively highest among subjects with CD4+ cell counts <200 cells/mm<sup>3</sup> [12 (63.1%)], followed by those with CD4+ cell count between 200- 350 cells/ mm<sup>3</sup> [5 (26.3%)] and least among those with CD4+ cell counts >350 cell/mm<sup>3</sup> [2 (10.5%)]. There was significant association between the prevalence of PA with CD4+ cell count, age, gender of subjects (p<0.05) but not with occupation and education level (p> 0.05) of subjects.

**Conclusion:** Findings from this study indicated *Aspergillus* spp to be significant etiology of acute productive cough in people living with HIV and this is related to CD4+cell count of co-infected persons.

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### Prevalence of isosporiasis and cryptosporidiosis among human immunodeficiency virus (HIV)-positive patients in Northwest, Nigeria

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**Background:** Parasitic infections in HIV-infected patients are common in many regions and populations across Nigeria<sup>1,2</sup>. This study determine the prevalence of isosporiasis and cryptosporidiosis among human immunodeficiency virus (HIV)-positive patients in Northwest, Nigeria.

**Materials & methods:** This is a descriptive cross – sectional study which spanned nine months. The study was carried out at the Prof Sadiq Wali treatment center in Aminu Kano Teaching Hospital northwestern, Nigeria. A total of 272 consecutive adult male and female between twenty years and sixty-five years were recruited comprising of 182 HIV seropositive patients HIV seropositive and 90 HIV seronegative patients recruited from the General Outpatients Department with symptom of diarrhoea. Stool sample was collected from the patients for analysis. Consent form and Interviewer-administered, structured questionnaires were used as study tool. Antigen test using ELISA test (DIAGNOSTIC AUTOMATION, INC. CALABASAS, USA) was used to determine the presence of *Isospora belli* and *C. parvum*. Data were analyzed using SPSS 19.0 software. P- values of <0.05 was considered as statistically significant. The study was approved by the ethical committee of Aminu Kano Teaching Hospital, Kano.

**Result:** From the 182 subjects, the prevalence of cryptosporidiosis and isosporiasis among HIV seropositive clients was 31.9% (58 vs182) and 15.3% (29 vs 182) respectively. The prevalence of cryptosporidiosis and isosporiasis among HIV seronegative clients was 7.7% and 2.2% respectively. There were 74 males (40.7%) and 108 females (59.3%) seropositives with mean age of 26 ± 14.7years while 45 males and 45 females for seronegatives with mean age of 32 ± 13.6years. Out of the 74 males investigated, 21(28.3%) and 7(24.1) were positive with *C. parvum* and *I. belli* respectively, representing 36% and 24.1% of the total seropositive population while 37(34.2%) and 22(75.9) females tested positive for *C. parvum* and *I. belli* respectively, representing 63.7% and 75.9% of seropositive population. There was a significant relationship between the parasites and gender (For *C. parvum*, OR=10.368, 95% CI= 3.687–45.292, P=0.0006 and OR=13.368, 95% CI= 2.787–35.322, P=0.00004 for *Isospora belli*). In relation to the CD4 counts, 69(37.9%) of the 182 recruited for this study had CD4 counts of less than 200cells/cmm, 77(42.3%) and 36 (19.8%) for counts between 200 and 500cells/cmm and greater than 500cells/cmm respectively. Of this, 38(55.0%) and 19(27.5%) *C. parvum* and *I. belli* respectively, were obtained from subjects with CD4 counts of less than 200cells/cmm; 12 (15.6%) and 5(7.2%) of the *C. parvum* and *I. belli* respectively from subjects with CD4 counts of 200-500cells/cmm while 8(22.1%) and 5(7.2%) *C. parvum* and *I. belli* respectively, with counts greater than 500cells/cmm. These differences were statistically significant (p=0.001, Pearson Chi-Square= 35.167, df= 2, positive Spearman Correlation= 0.340 for *C. parvum* and p=0.000, Pearson Chi-Square= 25.127, df= 2, positive Spearman Correlation= 0.215 for *I. belli*).

**Conclusion:** There were no clients with both parasites in the stool. The Prevalence rate of *C. parvum* and *I. belli* were higher

than other study<sup>3,4,5</sup>. There was significant relationship with gender and CD4 counts.

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### Molecular epidemiology of HBV and co-infection with HIV and HCV among drugs users in three majors cities in Kenya

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Drug users act as reservoirs and transmission channels for HBV, HIV and HCV infections to the general population worldwide. In sub-Saharan Africa molecular studies of these infections in high risk groups including drug users to inform on interventions are limited and chronic HBV infection has been implicated in development of liver cancer.

The objective of this study was to determine the prevalence of HBV, HCV and HIV infections and to characterize HBV and HCV genotypes among drug users in Mombasa, Nairobi and Kisumu cities in Kenya. A cross-sectional study was conducted in three Kenyan cities among drug users between January 2011 and September 2012. Blood samples were collected and analyzed for HBV, HIV and HCV prevalence and HBV genotypes.

The overall prevalence of HBV, HCV and HIV among drug users was 4.3%, 6.5% and 11.1% respectively with evidence of HBV/HIV, HCV/HIV, HBV/HCV/HIV co-infections. Molecular analysis also revealed the presence of HBV subgenotypes A1 and D6 and HCV genotypes 1a and 4a.

The genetic diversity exhibited by both HBV and HCV is consistent with previous genetic studies and co-infection with HIV and/or HCV requires urgent intervention strategies including HBV vaccination campaigns and implementation of harm reduction strategies to reduce liver-associated diseases and complications due to HBV and HCV infections.

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### Evaluation of TB/HIV Care integration under Routine HIV/AIDS Program Condition in Rural Health Facilities in Northern Nigeria

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**Background:** Tuberculosis (TB) is the most common opportunistic infection seen in HIV patients as well as a leading cause of death in these patients. Integration of TB and the HIV epidemics pose new public health challenges. The collaboration between HIV and TB in co-infected persons is bi-directional and synergistic; on one hand, HIV-1 infection predisposes to the

advancement of active TB, and, on the other, the course of HIV-related immunodeficiency is worsened by active TB infection. Ongoing monitoring of implementation and scale-up of collaborative TB/HIV activities and evaluation of their impact is critically important to assess service quality, effectiveness and coverage.

This study seek to evaluate the implementation of integrated TB/HIV services in AIDS Healthcare Foundation Facilities in the Northern Nigeria.

**Methods:** A retrospective descriptive cross sectional study of HIV positive patients being managed for Tuberculosis between 2014 to 2015. Data extracted by chart review of sampled 765 TB suspect from six health facilities. Indicator variables were used to measure TB case finding and management practices after converting into scales (0 or 1) and weighed to show levels of TB/HIV service integration. Specialists' opinion was used to set a cut off level (85%) to weigh each indicator variable to scale of 0 or 1 and classify the level of integrated care provided by facilities into "adequate" or "inadequate". Analytic and descriptive statistics were used.

**Result:** Of the 765, 98% of HIV positive patients were screened for TB at baseline and at subsequent encounter at the clinic while 33% were TB positive. 91% of TB/HIV co-infected patients were given anti-TB treatment, Co-trimoxazole and Antiretroviral Therapy (ART), but only 45% of HIV positive individuals without active TB were treated with Isoniazid. TB case finding and management in HIV/AIDS clinics was in the facilities were adequate. Being on ART was found to be a strong positive predictor of TB case finding APOR 6.443 (1.112 – 18.524).

**Conclusion:** There was adequate integrated TB/HIV care in the HIV clinics. However, provision of Isoniazid was low, demonstrating a greater emphasis on TB treatment than prevention. There was high TB case finding among HIV patients with adequate HIV care to TB/HIV co infected patients. More focus should be given to TB prevention; avail one stop service or enhanced referral linkages, and wide distribution of HIV/AIDS resources to other HIV entry points such as TB clinics.

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### Prevalence of anti- HDV antibody among patients with Hepatitis B Viral infection in Cameroon: 2012- 2017

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**Background:** Hepatitis Delta caused by the hepatitis D virus (HDV) is a satellite virus to hepatitis B virus (HBV) that uses the latter's envelope for survival. In Cameroon, data on the prevalence of HDV infection are patchy and very heterogeneous according to the authors, the population studied and the study period. The most recent study, based on samples from the 2011 Demographic Health Survey (DHS), reported a national prevalence of anti-HDV (anti-HDV) antibodies of 13.8% (95% CI = 12.2-15.6%). The objective of our study was therefore to determine the current prevalence of HDV infection in Cameroon through the analysis of samples obtained from 2012 to 2017.

**Materials & Methods:** We conducted a cross-sectional and retrospective study during the period from January 2012 to September 2017. The HDV serology was performed for HBsAg positive patients received at Centre Pasteur of Cameroon between 2012 and 2017 using HDV Ab (Dia.pro Diagnostic Bioprobes.S). Socio-demographic data were also obtained. Logistic regression was used to evaluate risk factors and the T-test used for the comparison of means. The significance level was set at  $p < 0.05$  and the confidence interval was set as 95%.

**Results:** A total of 426 HBsAg positive patients were enrolled. Of these, 183 (43%) were female with a mean age was  $28.69 \pm 12.1$  [range: 6 – 83 years]. Overall, the prevalence of anti-HDV antibody from 2012 to 2017 was 16.48% (95% CI: 11.76-18.77%) ranging from 22.9% in 2012 to 16.4% in 2017 with the minimum in 2014 (9.2 %) and the maximum in 2013 (23.5%). People over 40 years or living in the regions of East and South Cameroon, with the HDV prevalence of 66.7%, 50% , and 40% respectively, had significantly high anti- HDV antibodies ( $p \leq 0.05$ ) and were at risk of HDV (OR > 1).

**Conclusion:** Cameroon remains an endemic country to HDV infection with an average prevalence of 16.48% from 2012 to 2017. Aging and areas in the dense forest may be risk factors for Hepatitis D.

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### Incidence of adverse events associated with Isoniazid Preventive Therapy in adults on stable antiretroviral therapy in Blantyre, Malawi.

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**Background:** Isoniazid preventive therapy (IPT) reduces tuberculosis incidence in people living with HIV. After Malawi's Ministry of Health introduced IPT in patients on antiretroviral therapy (ART) in 2017, numerous adverse events (AEs) suspected to be related to IPT were reported. High-quality data on IPT toxicity in sub-Saharan African settings are sparse because side effect monitoring is often unreliable. We observed AEs among Malawian adults on ART who started IPT and had stringent clinical follow-up as participants in a randomized, open-label controlled trial of daily trimethoprim-sulfamethoxazole or weekly chloroquine.

**Methods:** The trial enrolled adults on ART ( $\geq 6$  months) with CD4 count  $\geq 250$  cells/ $\mu$ L and HIV-1 RNA  $\leq 400$  copies/ml, followed them every 4–12 weeks and encouraged additional clinic visits in case of any illness. Six-monthly viral load, CD4 count, liver enzymes, renal function and complete blood counts were collected. Using the WHO standardized case-causality assessment tool, we categorized AEs into “certainly”, “probably” and “possibly” related to IPT. We calculated incidence rates of AEs after initiation of IPT.

**Results:** 853 participants initiated IPT (651 females, 76%) and accrued 310.8 person years of observation (PYO) on IPT, with a mean observation time of 3 months per individual. Mean age was 41.9 years, mean CD4 569 cells/ $\mu$ L, 98.1% had HIV-1 RNA  $< 400$  copies/ml. 35.1% of participants on IPT experienced at least one IPT related AE. Of 425 IPT related AEs, 26.1% were certainly related to IPT (96.4% mild/moderate, 3.0% severe), 52.9% were probably related (98.7% mild/moderate, 1.3% severe), and 20.9% possibly related (all mild/moderate). The most common events involved gastrointestinal (30.6%), dermatological (12.9%), hepatic (10.8%), peripheral nervous (6.4%), central nervous (5.5%) and reproductive (1.1%) systems. Events that led to IPT discontinuation (51 participants) included pellagra, peripheral neuropathy, hepatotoxicity, gynecomastia, impotence, vomiting, dizziness and confusion.

The overall crude incidence of IPT-related AEs was 1.37/PYO (95% CI 1.24-1.50) with 1.35 /PYO (95% CI: 1.22-1.48) mild and moderate and 0.02 /PYO (95% CI: 0.0-0.46) severe. Incidence of certainly related events was 0.36 /PYO (95% CI: 0.29-0.43) with 0.34 /PYO (95% CI: 0.28-0.42) mild and moderate and 0.01 /PYO (95% CI: 0.00-0.33) severe. Incidence of events probably related to IPT was 0.72 /PYO (95% CI: 0.63-0.82) and 0.71 /PYO (95% CI: 0.62-0.81) were mild and moderate and 0.01 /PYO (95% CI: 0.00-0.28) were severe. Incidence of possibly related events was 0.29 /PYO (95% CI: 0.23-0.35) and all were mild and moderate.

**Conclusions:** We observed high incidence of IPT related AEs within a 3 month period. Although few AEs were severe, 6% of individuals discontinued IPT. We recommend careful monitoring and reporting of IPT toxicity to ensure maximal benefit of IPT.

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### Detection frequency of opportunistic pathogens Pneumocystis jiroveci and tubercle bacilli in HIV infected patients at Jamot Hospital in Yaounde, Cameroon

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**Introduction:** Many opportunistic diseases have been reported to be strongly associated with HIV/AIDS infection such as tuberculosis (TB) and pneumocystosis. In Cameroon, frequency data for these two HIV-associated diseases are limited or absent for pneumocystosis. This study was undertaken to determine the frequency of bacteria and microscopic fungi in general, and in particular tubercle bacilli and Pneumocystis jiroveci (PCP) in HIV-infected and non-infected individuals in Yaounde, Cameroon.

**Methodology:** This work was done from January to November 2017 at the pneumology department of Jamot Hospital, the main center for the management and treatment of respiratory diseases in the city of Yaounde and its surroundings. The study population consisted of HIV positive and negative subjects with respiratory tract infection (RTI). Enrolled subjects were submitted to a questionnaire to collect sociodemographic and clinical data. All the samples (nasopharyngeal swab, bronchial aspiration, pleural fluid and sputum) were subject to bacterial culture and RT-PCR (FTD33) targeting 10 bacteria and PCP. At the

same time, specimens from suspected TB patients were analyzed for tubercle bacilli (direct examination, culture and/or GeneXpert). Data analysis was performed with SPSS 22.0 software and p-values < 0.05 were considered statistically significant.

**Results:** A total of 230 subjects with RTI were enrolled, of whom 72 (31.3%) were HIV-infected. The median age of the study population was 41.25 years (31.08-54.9 years) with a gender ratio m/f of 1.45. The median duration of clinical signs at the time of diagnosis was 30 days (14-90 days) and the most reported were cough (83.9%), dyspnea (78.3%), shortness of breath (76.1%), asthenia (71.3%), fever (54.3%) and chest pain (52.6%).

The frequency of detection of non-tuberculous bacteria was 19.1% (44/230) by culture and 36.5% (84/230) by RT-PCR ( $p = 0.023$ ). *S. pneumoniae* and *Haemophilus* spp were most detected pathogens with 3.5% and 7.8% by culture; and 13.5% by RT-PCR, respectively. No statistically significant differences were observed for these pathogens between HIV positive and negative subjects. The overall detection rate of TB bacilli was 12.2% (95% CI, 8.2-17.1) and was statistically higher in HIV-positive subjects (20.8%) compared to HIV-negative subjects (8.2%) ( $p = 0.014$ ). PCP was detected only in HIV-positive patients at 6.9% (95% CI: 2.3-15.5).

**Conclusion:** Although TB remains the predominant RTI in HIV-infected individuals, PCP infections should also be investigated in HIV positive patients.

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### Increase in MTB/Rifampicin-resistant TB detection in HIV-positive cases in a country-owned HIV/AIDS programme: a looming danger or a call for solution?

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**Background:** HIV is a major cause of immunosuppression, increasing markedly the risk of tuberculosis (TB). TB/HIV coinfection further increases mortality in the affected persons. Nigeria ranks number one in Africa and third in the world in TB burden. In the Nigerian HIV/AIDS programme, drug resistant (DR) TB detection has hitherto been "quiet" and treated as mere suspicion. However, the recent deployment of GeneXpert machines across Nigeria has now made diagnosis of DR-TB definitive and easier. This study looked at the process of enrolment as well as the data of HIV-positives with MTB (*Mycobacterium* TB) and Rifampicin-resistant TB in Abia and Taraba states.

**Methodology:** A total of 13 GeneXpert machines (5 in Abia and 8 in Taraba states) were installed in comprehensive sites. All patients accessing ART services with presumptive TB were screened in year 2016, 2017 and beyond using the GeneXpert machine. An algorithm for strong referral network for GeneXpert in the states and a local directory listing MTB and rifampicin-resistant TB test centres were developed and placed in all states facilities for easy patient referral, sputum transfer and results retrieval. For all suspected rifampicin-resistant TB cases, the states' TB control officers and focal TB officers worked

harmoniously for proper documentation and delivery of their mandate. Patients were informed of their results. If positive, MTB patients were treated, and the Rifampicin-Resistant TB positives referred for enrolment and proper management at the designated centres. Records of line lists of rifampicin-resistant TB diagnosed patients in the states were kept for easy follow up and tracking. Hospital and community management of these patients was done based on the national guidelines.

**Results:** In Abia State, 2640 HIV-positive persons were tested for TB in 2016 and 2017. For year 2016, out of 1184 HIV-positive persons tested for TB, 326 and 16 were positive for MTB and rifampicin-resistant TB respectively. In 2017, out of 1456 HIV positive persons tested, 298 and 10 were MTB and rifampicin-resistant TB positive respectively.

In Taraba state, for years 2016 and 2017, a total number of 5949 HIV positive persons were tested for TB. In 2016, a total of 1702 HIV positive, were tested for TB and 460 were positive for MTB and 32 for rifampicin resistant TB. However, in 2017, out of a total of 4247 HIV positive persons tested for TB, only 847 and 51 were MTB and rifampicin-resistant TB positive. These results reveal an increase in MTB and rifampicin-resistant TB case detection, more in Taraba than Abia state for both years.

**Discussions:** The increase in MTB detection and rifampicin-resistant TB detection may be a pointer to looming Multidrug-Resistant (MDR-TB). These increase in detection is associated with patients' poor adherence to anti TB regimen in both states. There have been recurrent communal clashes and insurgencies in some parts of Taraba state, affecting treatment outcomes.

**Conclusion:** This is a call for urgent strategic plan to scale up and strengthen TB prevention and control activities and recommendation to plan for a nationwide survey to ascertain the prevalence of resistant TB.

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### Socio-economic Disparities across Regions and their effect on risk of Sexually Transmitted Infections in Uganda

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**Background:** In low-income countries (LIC), sexually transmitted infections (STIs) account for about 17% of economic losses related to health. And are more dynamic than other diseases prevailing in communities. Although the epidemiological profile of STIs varies by country and region depending on ethnographic, demographic, socio-economic and health factors related to transmission, these factors are poorly understood. We examined within-country socio-economic disparities in Uganda and their effect on risk of STIs.

**Methods:** We used data from the nationally representative Uganda Demographic and Health Survey (UDHS 2011), and included sexually active men and women aged 18-49, across geographical regions; Central, Northern, Eastern, and Western. The primary outcome (described here as STI) was self-reported

STIs and/or associated symptoms in the 12 months preceding the survey. Socio-economic status was defined using wealth index, a composite measure of each household's cumulative living standard, using household asset data. We used principal component analysis to construct wealth index, and divided it into five quintiles (poorest, poor, middle, rich, and richest). We used proportions and Pearson Chi-square tests to examine socio-economic disparities across geographic regions. A log-binomial regression model was used to examine associations between socio-economic status and risk of STIs. We further examined linear trend effects of education levels, and effect modification of region on risk of STI across wealth index quintiles.

**Results:** A total of 7,428 women (median age 28 years, interquartile range [IQR] 23 - 36) and 1,828 men (median age 30 years, IQR 23 - 37) were included in the analysis. There was a strong association between geographic region and wealth index ( $p < 0.01$ ). Central region had the highest proportion of people in highest wealth quintile followed by western region, whereas northern had the highest proportion of people in lowest wealth quintiles. In unadjusted analyses, there was a strong evidence of association between wealth index and risk of STI ( $p < 0.01$  for all comparisons). However, after adjusting for region, only the highest wealth quintile (richest) remained significant ( $p < 0.01$ ). Being in the highest wealth quintile was associated with a 24% lower risk of STI compared to being in the lowest wealth quintile (adjusted relative risk, [ARR] 0.76; 95% CI: 0.63 - 0.93;  $p = 0.01$ ). Compared with northern region, the relative risks of STI in central, western and eastern regions were 4.05, 3.53, and 2.70, respectively. There was also a declining risk of STI with increase in the educational level attained (test for no departure from linear trend,  $p = 0.55$ ). Having multiple partners and sexual activity in the last 4 weeks prior to the survey were associated with higher risk of STI (ARR 1.53; 95% CI: 1.36 - 1.72, and ARR 1.21; 95% CI: 1.07 - 1.37, respectively).

**Conclusions:** Regional disparities in socio-economic status in Uganda were associated with STI risk among sexually active adults in Uganda. Higher socioeconomic status was independently associated with lower STI risk. These findings together contribute to the complicated understanding of STI epidemiology and can identify target populations for attention in Uganda (i.e. poorer residents of wealthy regions).

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### Risk factors for sexually transmitted infections among adult men and women in Rwanda: Analysis of 2015 Rwanda Demographic and Health Survey Data

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**Background:** The World Health Organization reports that 85% of sexually transmitted infections (STIs) are found in developing countries. Given the differences in STI symptomology and prevalence between men and women, there is a need to understand the biological, behavioral, and socio-demographic risk factors for contracting an STI separately for men and women. Gaining a better understanding of gender-specific differences could inform STI control strategies and can be used to create targeted interventions for the prevention, diagnosis, and

treatment of STIs. The aim of this project was to generate information on the STI risk and protective factors for men and women in Rwanda.

**Methods and Materials:** Data from the 2015 Rwanda Demographic and Health Survey were used. Cross-sectional data for 9,738 women aged 15 to 49 years and 4,617 men aged 15 to 54 years who reported ever having sex were considered. The relationship between of STIs or STI symptoms and key socio-demographic, biological, and behavioral characteristics were determined. Separate statistical analyses were run for men and women to identify risk and protective factors specific to each gender. Bivariate logistic regression models were first fit and factors associated with STIs or STI symptoms at  $p < 0.10$  were included in the multivariate logistic regression models.

**Results:** The prevalence of STIs or symptoms of STIs was 14.6% among women and 4.7% among men. results from the multivariate model indicated that women with two or more sex partners were nearly 4 times as likely to have an STI or symptoms of STIs compared to those with one sex partner (OR=3.83;  $p < 0.001$ ). Additional risk factors for women included being HIV positive (OR=1.54;  $p < 0.05$ ), reporting age of first sex below 15 years (OR=1.51;  $p < 0.05$ ), being widowed/divorced/separated (OR=1.36;  $p < 0.05$ ), and making 1 to 9 (OR=1.52;  $p < 0.001$ ) or 10 to 19 trips away from home during the previous year (OR=1.90;  $p < 0.05$ ). Protective factors for women included being below 30 years old (ORs=0.65 to .072;  $ps < 0.05$ ), having knowledge of STIs (OR=0.55;  $p < 0.001$ ), not having a sex partner (OR=0.62;  $p < 0.001$ ), reporting not having an occupation (OR=0.60;  $p < 0.001$ ), and having higher than primary school education (ORs=0.42 to 0.78;  $p < 0.05$ ) or no education (OR=0.77;  $p < 0.01$ ). Risk factors for men in the multivariate model included being HIV positive (OR=3.51;  $p < 0.01$ ), being widowed/divorced/separated (OR=3.01;  $p < 0.01$ ) and having paid for sex in the past 12 months (OR=2.75;  $p < 0.05$ ). Men in the middle wealth index classification were less likely to report an STI or STI symptoms compared to men in the lowest wealth index classification (OR=0.39;  $p < 0.05$ ).

**Conclusions:** This analysis identified STI risk and protective factors for men and women in Rwanda. Targeted interventions for women could focus on individuals engaging in sex with multiple partners, those who are widowed/divorced/separated, and women with HIV. Interventions targeting men should also focus on individuals with HIV and those who are widowed/divorced/separated as well as men who pay for sex. Combined, these results could indicate that female sex workers and men who pay for sex are most at risk of contracting STIs and constitute key populations for future interventions.

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### Antiretroviral Therapy (ART) Contribution in reduction of Tuberculosis (TB) Presumptive and TB cases in People Living with HIV (PLHIV) in Swaziland.

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**Background:** Despite being preventable and curable, TB remains the leading cause of Human Immunodeficiency Virus (HIV)-related morbidity and mortality in Swaziland. All persons diagnosed with HIV should be screened for TB at every visit to health facilities. Similarly, all patients diagnosed with TB should be tested for HIV and managed according to the standard of care. In 2016 approximately 70% of TB cases were co-infected with HIV and TB/HIV mortality rate was 14%. Eligibility criteria to start ART



changed over the years from CD4 count based (<350 in 2010 and <500 in 2015) to treating all in 2016. IPT coverage has remained low in PLHIV (<10%). In this assessment, we look at the cascade of patients who enters through HIV diagnosis and care system and then tested for TB. We reviewed the occurrence of TB symptoms and TB disease using data from Swaziland National HIV Semi-Annual Reviews (NaHSARs).

The objective of this assessment was to systematically review the possible effect of antiretroviral therapy on incident of TB symptoms and TB disease in HIV positive patients.

**Description:** Data for NaHSARs were retrospectively collected from client registers and also extracted from electronic medical records for the period October 2014 to June 2017. Pooled data analysis was conducted to describe the TB screening to diagnosis cascade. results from each NaHSAR were used to describe the trend shown in the occurrence of TB symptoms and TB disease among HIV infected individuals.

**Lessons Learned:** From 2014 to 2017, ART initiation for eligible clients increased from 71% to 89%. There was a progressive increase in the number of clients screened for TB in PreART (4,748 (98%) to 8,946 (96%)) and ART clients (58,320 (96%) to 179,830 (99%)). While the number of patients screened increases, there is a decrease in the proportion of presumptive TB cases from PreART clients (from 17% to 7%). The proportion of TB presumptive among ART clients remained stable at 1%. The TB diagnostic yield among TB presumptive ART patients fell from 473 (70%) to 73 (6%). However, the number of TB diagnosed patients slightly decreased despite increased proportional yield in Pre ART patients from 192(29%) to 162(43%).

**Conclusion:** Occurrence of TB symptoms among PLHIV decreased indicating the possible role of ART in reducing the burden of TB. A possible background risk for developing TB symptoms still exist in HIV infected clients regardless of ART status as shown by the constant proportion of TB symptoms among those on ART. TB disease risk is more pronounced in the Pre-ART population. ART reduces new HIV infections and increasing ART coverage in PLHIV will contribute to lower the population TB incidence. We urgently have to scale up provision of ART to PLHIV for TB and HIV dual epidemic control.

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### Bridging Human Resource Gap for Effective TB/HIV Integration Services in Rivers State, Nigeria: The Role of Referral Coordinators

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**Background:** The Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS) program provides high quality integrated HIV/AIDS and TB Services across supported sites in 13 States in Nigeria. A major gap in implementation of facility-based TB/HIV integrated services is the human resources required to ensure effective referrals and linkages between the HIV and TB service delivery points. This study reviewed TB and ART service level data prior to and after intervention aimed at improving TB/HIV integrated service delivery.

**Materials & Methods:** This is a Pre-and Post-Intervention study conducted in Rivers State. The Pre-Intervention Phase (PIP1) covers the period January 2014 – December 2015 while the Post Intervention Phase (PIP2) was from January 2016 – December 2017. International policies and guidelines for infection control were available in the state for both phases however, at PIP2, the Project recruited technical support staff as TB/HIV referral coordinators, one in each three scale-up Local Government Area. The aim was to support TB/ HIV integrated services delivery in facilities, in Rivers State to ensure provision of technical, programmatic and laboratory support for the implementation of high quality TB/HIV integrated services

**Results:** At PIP1, of the 1,645 PLHIV newly started on ART and eligible for IPT, only 0.6% (11) were placed on IPT. At PIP2, 30.7% (1,533) PLHIV started on IPT out of the 4,983 newly started on ART and eligible for IPT. For TB/HIV integration, the total number of registered new and relapsed TB cases with documented HIV status increased from 779 during PIP1 to 3,227 in PIP2, a representation of active case finding. The total number of registered new and relapsed TB cases was 806, out of which 267 were newly registered TB cases with documented HIV positive status, 280 had started or continued ART in PIP1. In PIP2, total number of registered new and relapsed TB cases was 3408 of which 167 were newly registered TB cases with documented HIV positive status and 1075 started or continued ART in PIP2.

**Conclusions:** The engagement of facility-based TB referral coordinators has shown promising results for effective TB/HIV integration services, active case finding, completion of treatment, documentation and reporting across supported sites in the State. More people have accessed comprehensive TB/HIV services as a result of the engagement of the TB referral coordinators

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### Incidence and outcomes of invasive salmonella infection among HIV positive malawian adults on ART

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**Background:** Worldwide, non-Typhoidal salmonellosis (NTS) is a common cause of community-acquired sepsis in HIV-positive populations, especially with low CD4 counts. Following ART scale-up, the burden of NTS sepsis has declined. We describe the incidence, etiology and outcomes of invasive salmonellosis in HIV infected adults on ART.

**Methods:** In an ongoing clinical trial we recruited Malawian adults on ART with CD4 count >250 cells/mm<sup>3</sup> and undetectable HIV viral load (VL). We reviewed participants every 4 to 12 weeks and whenever sick. CD4 counts and VL's were measured 6-monthly. We collected a blood culture for fever or suspected severe bacterial illness. Antimicrobial susceptibility was tested using disc diffusion.

**Results:** We enrolled 1499 participants (1125 female, 76%) and accrued 3180 years of follow-up. We collected 339 blood cultures in 263 participants. Cultures in 26/339 (8%) were positive. Pathogens isolated were *Salmonella typhi* (n=11), *Escherichia coli* (n=7), *Streptococcus pneumoniae* (n=7) and *Staphylococcus aureus* (n=1). No NTS was isolated. Typhoid fever incidence was 3/1000 person-years (95% CI: 2-6). The mean age of participants with typhoid fever was 43 years and 82% were female. The mean CD4 count before and after typhoid fever episodes were 377cells/mm<sup>3</sup> and 352cells/mm<sup>3</sup> respectively. All 11 participants with typhoid fever had undetectable VL before the event and 8/11 after. All *Salmonella typhi* strains were sensitive to ceftriaxone and ciprofloxacin. Resistance to ampicillin (10/11), chloramphenicol (10/11), cotrimoxazole (10/11) and gentamicin (11/11) was common. All participants with typhoid fever recovered fully after one antibiotic course, without relapses or complications.

**Conclusions:** *S. typhi* was the most common cause of bacteremia in adults on established ART in our study, reflecting an ongoing Malawi epidemic. Study results provide additional evidence of the shift in invasive salmonellosis burden from NTS sepsis to typhoid fever among people living with HIV. Typhoid vaccination should be considered for vulnerable groups.

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### Impact of HIV status on Tuberculosis treatment success rate among Tuberculosis patients registered in University of Port Harcourt Teaching Hospital, Nigeria.

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**Background:** Human Immunodeficiency Virus (HIV) associated Tuberculosis (TB) infection is one of the leading causes of morbidity and mortality amongst TB/HIV co-infected patients worldwide. Assessing TB treatment outcomes of TB/HIV co-infected patients is essential in determining the effects of HIV on TB treatment success rate. Treatment success is an indicator of the performance of National Tuberculosis and Leprosy Control Program (NTBLCP). In addition, successful treatment of infectious cases of TB is essential to prevent the spread of the infection. This study aimed at evaluating the impact of HIV status on TB treatment success rate among TB patients registered in University of Port Harcourt Teaching Hospital (UPTH), Nigeria.

**Materials & Methods:** a two-year retrospective study was conducted to review data of TB patients registered in the directly observed treatment short-course (DOTS) clinic in UPTH. Data were abstracted from TB treatment register for the period of July 2015 to June 2017. Treatment outcome indicators: cure, treatment completed, treatment failure, died, lost to follow up and not evaluated were assessed. Treatment success rate was calculated as the percentage of TB cases cured plus treatment completed. Data was analyzed using statistical package for social sciences (SPSS) version 24. Descriptive (frequency, percentages and mean) and inferential (chi-square) statistics were performed. Statistical significance was considered at p-value <0.05.

**Results:** of the 266 eligible TB patients, 110 (41.4%) were HIV co-infected while 156(58.6%) were non-HIV infected TB patients. Majority (91.7%), were new TB cases, 52.6% males and mean (standard deviation) age was 29.9 (±18.5) years. Overall TB treatment success rate was 60.9%, treatment failed 2.6%, died 16.5%, lost to follow up 11.3% and not evaluated 8.6%. TB treatment success rate was significantly lower in HIV co-infected TB patients as compared to non-HIV infected TB patients (47.3% versus 70.5%, p<0.0001). Cure rate was significantly lower in HIV co-infected compared with non-HIV infected TB patients (18.2% versus 37.8%; p = 0.001). mortality rate was significantly higher among HIV co-infected TB patients (29.1%) as compared to 7.7% amongst non-HIV infected TB patients. (p<0.0001).

**Conclusions:** This study revealed that HIV infection is prevalent among TB patients and has significant negative impact on TB treatment success rate. Therefore, provision of good quality services and close monitoring of HIV co-infected TB patients is highly recommended.

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### Prevalence of HBV and HCV infections in screened people in Rwanda during WHD 2017 campaign

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**Background:** The Rwandan government has shown continued commitment to expanding its capacity to screen, diagnose and treat patients with chronic hepatitis B (HBV) and hepatitis C (HCV) infection. However, both public awareness of VH and existing data on the epidemiology of chronic HBV and HCV infection in Rwanda is limited.

**Methods:** The decision to conduct campaigns was prompted by a need to raise awareness and drive demand for screening and to kick-off long-term scale-up of access to screening, diagnostics and treatment for HBV and HCV. Screening include general population targeted individuals aged >45 years in lower socio-economic groups and lasted for one week at one designated location per district. Number of screens per district was allocated based on population and sensitization was done through multimedia announcements and local church leaders. Healthcare workers were introduced and trained in VH screening, diagnosis and patient counseling. Bivariate and multivariate logistic regressions were used to assess factors associated with HBSAg in screened people.

**Results:** A total of 181,454 individuals were screened in Rwanda during the campaign. Number of individuals who screened positive for HBs Ag in different populations were 7254(4.1%). Number of individuals who screened anti-HCV positive were 14561(8.2%). Among people screened positive for HCV, 52.8% of them were confirmed positive for chronic HCV. The high prevalence of HCV for both Ab and VL was found in aged people.

**Conclusions:** The campaign resulted in one of the largest number of individuals screened for HBV and HCV in the region and built capacity for routine hepatitis testing. Population sensitization helped raise general awareness for VH. results from the campaign serve as preliminary evidence for variations in prevalence across different populations. Rwanda's experience serves as important evidence for other low and middle-income

countries. Furthermore, campaign results will be used to plan national services for future integration and decentralization of screening into routine care at lower-level health centers.

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### Integrated testing and integrated diagnostic platforms of Hepatitis B and C with HIV and TB in Rwanda

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**Background:** In 2015, HBV and HCV resulted to respectively 887,000 and 399,000 deaths mostly from complications (cirrhosis and hepatocellular carcinoma), adding significantly to the global disease burden.

The national prevalence of HBV and HCV infection in Rwanda is not well documented, and the mortality related to these infections is poorly characterized. Current estimates compiled from a variety of different studies provided an HBV surface antigen (HBsAg) prevalence ranging between 1.9% and 7%, while HCV studies have suggested an anti-HCV seropositivity varying between 0.8% and 5.7%.

Access to screening, care, and treatment, in Rwanda, has been limited due to multiple reasons, including the high costs, the complexity of therapy, and limited access to diagnostics services. The national guidelines lay out the service package that should be available at each health facility level. These levels include referral, provincial, district hospitals and, health centers. All these facilities should be offering different HBV/HCV services integrated within existing HIV services countrywide and discussions are in progress for integration of HBV/HCV services in TB services especially performing HCV VL by GenExpert platform.

**Methodology:** For EIA testing, the first stage of the screening is the blood collection, labelling and blood decantation. This activity is being done by lab technicians and nurses from different 500 HFs in DH catchment zone and sent to 15 sites having ELISA platform through sample transportation vehicles. Results obtained, patients with HCV Ab positives are invited for samples collection for HCV VL and then resend for HCV VL in the 9 sites performing viral load for confirmation through also sample transportation vehicles and tested there they are tested and results are sent back to health facilities.

Data obtained were analysed using SPSS 21. Bivariate and multivariate analysis were done to find factors associated with HCV and HBV.

**Results:** We have Existing 15 ELISA test sites and 9 VL test sites with Roche platform across the nation and these are distributed according to Provinces with additional platform. Discussions with TB division to upgrade 47 GeneXpert platforms distributed in different health facilities (one health center, district hospitals, 4 provincial and 8 referral hospitals and for HCV testing. In recent screenings performed in Rwanda, 117,258 HIV-positive individuals were screened for the presence of HBsAg and anti-HCV. The prevalence of HBsAg and anti-HCV were 4.3% and 4.6% respectively. 182 (0.2%) HIV+ individuals were co-infected with both HBsAg and anti-HCV. The prevalence was higher in males; HBsAg, 5.4% vs. 3.7%; and anti-HCV, 5.0% vs. 4.4%. Moreover, it increases with age, 17.8% in people aged ≥65 years; and varied geographically.

**Conclusion:** Integration of Hepatitis testing in existing HIV and Hepatitis testing have been a success to the program of viral hepatitis in Rwanda, this made Rwanda an example in prevention and management of viral hepatitis in the region. However a lot need to be done in matter of testing and management of viral hepatitis by availing viral hepatitis services in all health facilities.

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### The cascade of Tuberculosis (TB) and Human Immunodeficiency Virus (HIV) co infected patients in TB facilities in Swaziland.

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**Background:** The number of deaths associated with TB and HIV coinfection remains high in Swaziland. HIV testing and Counselling Services (HTS) and TB screening is offered at all entry points in public health facilities. For the past four semi-annual review meetings, it has been observed that the highest HIV positivity yield in HTS comes from the TB clinics. We reviewed HIV testing and ART initiation activities in TB clinics and explored the extent of integration of TB/HIV collaborative services. The objective of this assessment was to systematically review HIV cascade in TB/HIV co infected patients.

**Descriptions:** Data for National HIV Semi-Annual Review Meetings (NaHSARs) and TB Quarterly Review Meetings (QRM) were retrospectively collected from client registers and also extracted from electronic medical records for the period October 2015 to September 2017. Pooled data analysis was conducted to describe HIV yield by point of HTS entry, HTS in TB patients, ART and cotrimoxazole (CTX) initiations as well as mortality in TB/HIV co-infected patients. Frequencies and proportions were used to describe HIV testing, and ART initiation during the period.

**Lessons Learned:** For every reporting period, TB clinics yielded the highest HIV positivity rate among the fifteen listed HTS entry points. In average HIV positivity rate was highest at the TB treatment entry points (14.5%). This was followed by Sexual Transmitted Infections (STI) clinics (10.75%), Voluntary Counselling and testing (VCT) sites (9.5%) and inpatients testing (8.75%). The HTS among confirmed TB patients is very high (97% - 99%), co-infection rates ranges from 68% to 72%. ART initiation in co-infected patients ranges from 91% – 94% and CTX initiation ranges from 94% - 99%. The mortality rate ranges from 11% to 15%.

In 2017, from January to September, 2480 TB patients were registered. Among those 1215 (49%) were known to be HIV positive at the start of TB treatment; of those eligible for HIV testing, 1232 (97%) were tested on site and 467 (37.9%) were HIV Positive. The total TB/HIV co infected patients were 1682 (68%). A total number of 1569 (93%) and 1674 (99%) co infected patients were initiated on ART and CTX respectively.

**Conclusion:** There is a high rate of TB/HIV co-infection and the country is achieving high levels of HIV testing, ART and CTX initiations. We need to explore more initiative for early diagnosis and treatment of TB and HIV to lower mortality rate of these patients. Strengthening of the HIV treatment cascade for presumptive TB and TB patients needs to be coordinated with initiatives to early finding of undiagnosed TB and HIV cases within the health system and more broadly in the community. More

research into the causes of death among HIV-positive TB patients is therefore required to identify and understand the causes of death in order to properly assess its usefulness as a TB/HIV indicator.

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### Seroprevalence of hepatitis C and HIV coinfection in rural Cameroon

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**Introduction:** Co-infection of hepatitis C virus (HCV) with the human immunodeficiency virus (HIV) is a public health concern. Data on the prevalence of the co-infection between these viruses in rural Cameroon are sparse. This study was conducted in a border town with a high commercial turnover, and hence an increase in risky sexual behaviours. We sought to evaluate the prevalence of HCV and HIV co-infection, and the prevalence of the risk factors of hepatitis C transmission in this rural community.

**Methods:** This was a descriptive cross-sectional study conducted between November 2014 and April 2015, in Abang Minko'o; a border town in the South Region of Cameroon. Following administrative and ethical approval, consenting participants aged  $\geq 12$  years, and regularly resident in Abang Minko'o for at least three months were consecutively sampled. Blood samples collected from the participants were screened for HIV antibodies using DETERMINE® HIV1/2a (Alere; Bedfordview, South Africa) and then IMMUNOCOMB® II HIV 1&2 BiSpot (Organics, Yavne, Israel) on site. All sample were then retested using MUREX HIV Ag/Ab Combo (DiaSorin; Saluggia, Italy). Samples were also tested for HCV antibodies using IMMUNOCOMB® II HCV (Organics, Yavne, Israel), followed by Architect anti-HCV qualitative assay (Abbott, Wiesbaden, Germany). Data collected onto a pre-structured questionnaire were analysed with Epi Info version 3.5.3. Categorical variables were presented as frequencies, proportions or bar charts, while continuous variables were presented as means or median where appropriate.

**Results:** A total of 174 participants were included in this study. The mean age was 30.34 (SD = 13.26) years (age range = 12 – 77 years). The seroprevalence of hepatitis C virus was 6.3% (95% CI = 2.9 – 10.3) with a remarkable increasing trend with age. The prevalence of HIV was 6.9% and predominated in women. The prevalence of HIV among the reproductive age group was 6.4% (95% CI = 5.2 – 11.3). In addition, the prevalence of HCV/HIV co-infection 1.7%. History of multiple sexual partners, scarification and sexually transmitted diseases were the commonest risk factors reported among the study participants. Meanwhile, risk factors such as histories of non-medicalised tattooing and blood transfusion were rare. No participant used illicit intravenous drugs.

**Conclusion:** The co-infection of HCV with HIV in this rural community is low, even though a high prevalence of HCV and HIV infections were noted. Risky sexual behaviours and traditional practices are the commonest risk factors of HCV in this rural and should be targeted for disease control and/or eradication.

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### Clear CSF meningitis in HIV: epidemiological, clinical, therapeutic and prognostic aspects

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**Background:** Clear CSF meningitis (CCM) is a common condition. The difficulties in terms of diagnosis and management in countries with limited resources are mentioned in the literature. The purpose of the present work was to describe the epidemiological, clinical, therapeutic and prognostic aspects of light-fluid meningitis in a series of hospitalized HIV-infected patients in Cameroon.

**Materials & Method:** We conducted a retrospective study of HIV positive patients hospitalized in two services (neurology and infectious diseases) of Central Hospital Yaoundé from 2011 to 2016. Epidemiological, clinical, therapeutic and prognostic data were captured using Epi software version 3.5.3 and exported to an Excel database. The data obtained was analyzed using the SPSS software version 22.

**Results:** We collected 171 cases including 101 women (sex ratio F/M: 1.4). The mean age was 38.2  $\pm$  8.7 years (15-66). The mean duration of symptoms before admission was 17.7  $\pm$  17.1 days. Before admission, 28.1% of patients had received antibiotics. CD4 measure was available in 52 patients with an average value of 94.1  $\pm$  115.8 / mm<sup>3</sup>. The most common symptoms were: headache (76%); fever (60.8%); vomiting (31.6%); convulsions (25.7%). The most observed neurological signs were: stiff neck (95.9%); Kernig sign (44.4%); Brudzinski sign (39.8%) and focal signs (15.8%). In the CSF biology, the white blood cell differential was available in 89 patients. A lymphocyte predominance was noted in 80.8% of cases. The TB PCR was positive in 5/93 patients (5.3%) and the India ink was positive in 72/162 patients (44.4%). In our series, the diagnoses were established only in half of the patients, either directly (diagnosis of certainty on CSF), or on indirect arguments (epidemiological and clinical arguments, favorable evolution on treatment). Other causes of these MLC (indirect arguments) were decapitated bacterial meningitis, viral meningoencephalitis (herpetic, HIV-related). As for antimicrobial therapy, antibiotics were prescribed in 62% of patients, antifungals in 45.6% and antituberculosis drugs in 20.5%. In terms of evolution, 38.6% of patients died, and 39.2% were cured, 12.3% had complications and sequelae; 9.95 % patients were lost to follow-up (discharged against medical advice). There was no significant difference in mortality between patients with or without confirmed diagnosis. While mortality rate was statistically lower in patients who were prescribed antifungal treatment and in those on antituberculosis treatments.

**Conclusion:** Our work suggests that in HIV positive patients presenting with clear CSF meningitis, a rapid initiation of treatment for the most common neurologic opportunistic infections may have a positive impact on mortality while there seems to be no benefit in administration of antibiotics.

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### Improving tuberculosis case detection in art clinical settings using care checklist

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**Background:** Tuberculosis is one of the oldest infectious diseases known to mankind. It is one of the commonest opportunistic infections associated with HIV infection and accounts for more than a third of AIDS related morbidities. Though deadly, it is completely preventable and curable. With one in every four TB patients co-infected with HIV, screening for TB has become increasingly important. With funding from the United States Agency for International Development (USAID) FHI360 implemented the Strengthening Integrated Delivery of HIV and AIDS Services (SIDHAS) Project in 13 States in Nigeria (Including Lagos State) The objective of the project is to increase access to high-quality comprehensive HIV/AIDS and TB prevention, treatment and care and services.

**Objective:** To access the effectiveness of administering chronic care checklist in tuberculosis detection in people living with HIV.

**Methods:** The chronic care screening checklist is a standardized tool developed to screen for HIV associated co-morbidities and other conditions associated with the quality of life of people living with HIV/AIDS (PLHIVs) in all SIDHAS supported facilities it was introduced in 2015, to particularly increase TB case finding among this population. This is a cross sectional retrospective study that was conducted in six high TB and HIV burden hospitals in Lagos State (General Hospital Ajeromi, Orile Agege GH, GH Randle, GH Apapa, GH Badagry and Sango PHC) . Routine health facility TB and HIV service uptake data reported for the period of October 2014 to September 2015 from the District Health Information System (DHIS) platform was collated and analyzed. Clients screened for presumptive TB and actual TB were isolated. Correlation between screening patients for presumptive tuberculosis and actual TB was determined using linear regression analysis.

**Result:** A total of 7,708 patients were screened for presumptive TB within the study period. A total of 1,365 clients were screened for presumptive TB in 2014; while 6,343 clients were screened for presumptive TB in 2015; 2,130 actual TB cases were identified in 2014; 2,180 actual TB cases were identified in 2015. Regression analysis revealed a significant, positive relationship between screening clients for presumptive tuberculosis and identifying clients with actual tuberculosis (Pearson's  $r(11) = 0.83$ ; and a  $p$ -value of  $<0.00013$ .

**Conclusion:** Administration of a care checklist increases TB case detection amongst PLHIVs accessing ART services. Efforts should be made to scale up the use of the tool to adequately identify presumptive TB cases and link them for definitive TB diagnosis and treatment.

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### Comparative Performance of GeneXpert test by CD4 count for Diagnosis of Tuberculosis (TB) in People Living with HIV (PLHIV) in Swaziland: A Cross Sectional Diagnostic Study

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**Background:** Swaziland has made significant progress in controlling the dual TB and HIV epidemic through the implementation of TB/HIV collaborative activities by the Swaziland National AIDS Programme and the National Tuberculosis Control Programme. Through the collaboration, over 90% of People Living with HIV (PLHIV) are now routinely screened for TB. However, case detection remain a challenge despite increasing median CD4 count among those initiating ART. We therefore conducted a study to evaluate diagnostic performance of Xpert-MTB/RIF (GeneXpert), stratified by CD4 count level, against the gold standard of using sputum culture.

**Methods:** A cross-sectional study was conducted from April and September 2015 at 4 health facilities. Participants living with HIV attending ART clinics were screened for TB using the WHO recommended 4 symptom-based screening tool. Participants who screened positive were enrolled for TB diagnostic evaluation. Two sputum samples were collected for Xpert MTB/RIF (GeneXpert) and TB culture using MGIT. Blood was collected for CD4 testing using FACS Calibur. All samples were tested at the National Reference Laboratory. Sensitivity and specificity analyses were done to evaluate GeneXpert. Logistic regression was done to determine factors associated with a true-positive GeneXpert (GeneXpert MTB-detected+ culture-positive). All analyses were done in STATA 12. Proportions, adjusted odds ratios (aOR) with 95% confidence intervals (95% CI) and  $p$ -values ( $p$ ) were reported.

**Results:** There were 390/417 (94%) participants with sputum collected, 367 (94%) and 365 (94%) had valid culture and GeneXpert results respectively. Thirty (8%) had TB culture-positive results Of the 30, 15 (50%) had MTB-detected by GeneXpert. The sensitivity, specificity, positive predictive value and negative predictive value of GeneXpert was 50% (31- 69%), 110% (98- 100%), 94% (70-100%) and 96% (93- 98%) respectively. Within CD4 strata, the sensitivity of GeneXpert was 78% at CD4<100 but decreased to 67% and 27% at CD4 100-<200 and CD4≥200 cells/mm<sup>3</sup> respectively. The specificity was consistently at 100% at all CD4 levels and positive predictive value was 100% for CD4<200. There was 100% concordance in rifampicin resistance not detected between GeneXpert and MGIT culture. In multivariable analysis, GeneXpert was more likely to be truly-positive among those with CD4<100 compared to those with CD4 ≥200 (aOR=16.47 (95% CI=1.69-36.34),  $p<0.001$ ). Those who were underweight (BMI<18.5) were more likely to have a true positive GeneXpert compared to those with normal BMI of 18.5- 25 (aOR=5.67 (1.50-21.45),  $p$ -value=0.011. Sex was not a significant factor.

**Conclusions:** In Swaziland, CD4 count was an independent factor associated with true-positive GeneXpert test. Therefore as the HIV epidemic is controlled, efforts to improve and increase the pace of new TB diagnostic technologies should be prioritised to maximise TB case detection.

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### Meeting the Needs of Target Populations in East Africa: Opportunities and Vulnerability Through Information Super Highway

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**Background:** The study is part of Cross-Border Health Integrated Partnership Project (CB-HIPP) designed to extend quality, integrated health services to key, vulnerable and mobile populations in border and transport corridor sites in East Africa. In Tanzania, the study covered Holili cross-border site and Kironwe fishing landing/wet border site. This paper describes existing innovative technologies and practices that can inform health and HIV/AIDS programming along transport corridors to meet the health needs of the target populations.

**Methods:** A multi-methods approach was applied, using largely qualitative approaches supplemented by quantitative approaches in extracting secondary data from documents. Key informant interviews, focus group discussion and document reviews were carried out to describe innovative practices that support meeting health needs of target populations.

**Results:** The study shows that the two sites of Holili and Kironwe are well networked by different mobile phone companies with majority of key, vulnerable and mobile populations connected across the borders. While the network is good, prices remain exorbitant. Even with this, target populations reported they rarely receive health-related messages thus presenting unexplored opportunity. Choice of network provider among target populations is variant and contextual depending on mobility and activities of the specific population group. The newly emerging Health Management Information System (HMIS) is comprehensive but providing no categorical information for key populations. The existence of information super highways was also reported to expose key populations to vulnerability through different ways. In their own words, target populations call for tailor-made services through information super highways.

**Conclusion:** Our findings underscore the fact that innovative technology is vital in informing health and HIV/AIDS programming for target populations. It is paramount to note that availability of technology can also be a vehicle to more vulnerability among target populations.

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### Barriers and facilitators to consistent engagement in HIV care under Test and Treat in Malawi

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**Background:** The expansion of ART to all people living with HIV in sub-Saharan Africa (Test and Treat) holds promise for curbing the HIV epidemic, but its success depends on individuals' lifelong adherence to HIV care. We examined barriers and facilitators to retention in care for clients in Malawi who struggled with retention under the Test and Treat policy.

**Methods:** In-depth interviews were conducted with ART clients in Central and Southern Malawi at government clinics. Eligibility criteria include: first-time ART initiates under Test and Treat, 314-days late for an ART appointment in the past year, currently engaged in care, and 318-years of age. In total, 45 individuals were interviewed: 22 men and 23 non-pregnant/breastfeeding women. Thematic coding was used for analyses.

**Results:** Respondents demonstrated a strong dedication to their HIV treatment, a belief that treatment adherence is critical, and a desire to adhere to medication even in the face of competing life priorities. The dominant barrier to maintaining ART appointments was unexpected travel away from home. Other barriers included being unable to reach facilities due to flooding during the rainy season, lack of transportation, and, to a lesser extent, simply forgetting the appointment date. Clients reported that limited clinic hours or inflexible appointment schedules constrained their ability to adapt their HIV care to unexpected life events.

The dominant facilitators to timely ART appointments were support from family and friends to help read and remember appointment dates and pick up ART refills. Surprisingly, tangible support in the form of transportation or child care emerged less frequently. A majority of clients reported sharing medication with other ART clients, while a minority received emergency refills from another facility in order to remain adherent when unable to attend ART appointments.

**Conclusions:** HIV+ clients who missed ART appointments were deeply committed to ART adherence, but were unable to regularly engage in HIV care due to unexpected and competing life circumstances. Social support systems are critical, but are insufficient to address all obstacles. Increased flexibility in HIV care, such as extended hours, flexible appointment schedules and client-centered counseling may facilitate ART retention. Innovative, community-based strategies to distribute ART are also needed.

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### Characteristics of vulnerable women and girls and risk-taking behavior along the cross-border sites: experience from CB-HIPP Project, Kenya

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**Background:** The Cross-Border Health Integrated Partnership Project (CB-HIPP), funded by USAID/KEA is designed to extend quality, integrated health services to key, vulnerable and mobile populations in strategic border areas in East, Central and Southern Africa focusing on Burundi, Kenya, Rwanda, Tanzania and Uganda.

**Objectives:** One of the focus areas for CB-HIPP is to explore the drivers of HIV risk-taking behavior among each target population within cross-border settings. This paper focuses on vulnerable women and girls within the study sites along the Kenya borders.

**Methods:** The study, approved by local (AMREF) and FHI 360 ethics boards collected qualitative and quantitative data. Quantitative survey tools were administered to 1027 VWGs from three sites. Nine focus group discussions (FGDs) with VWGs, 9 (FGDs) with community health volunteers and 18 key informant interviews (KIIs) were conducted in four sites. We analyzed data on VWGs from a cross-sectional survey along Kenyan borders (Busia, Malaba and Taveta). We assessed characteristics of VWGs that were likely to increase their vulnerability to STIs including HIV. Thematic and content analysis was conducted on KIIs and FGDs in four sites.

**Results:** Majority of VWGs interviewed reported low level of education with only 14.5% having completed secondary education. About half (48%) of those interviewed reported to be involved in income generating activities and 34% of them in businesses. Most of the VWGs were married (79.4%) and majority had dependents (83.9%). Self-reported HIV prevalence among VWGs was 2.2% and 7.7% reported to have received money in exchange for sex. Data from KIIs and FGDs with VWGs revealed that because of their vulnerability, they engage in risk taking behaviors including multiple sexual partners, sex for fish, unprotected sex with older men referred to as 'sponsors' for money to meet their needs. Exchange of sex for money exists even though they do not consider themselves as female sex workers. The qualitative interviews also revealed that these women were often exposed to gender based violence.

**Conclusion and recommendations:** The characteristics of VWG along the Kenyan borders increase their vulnerability to STIs. The formative findings suggest that VWGs' poor social and economic conditions increase their vulnerability and it is therefore imperative to formulate targeted programs that are empowering thereby mitigating the risks and reducing their overall vulnerability.

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### Addressing the Sexual and Reproductive Health needs of Adolescent Boys and Young Men in Zimbabwe: The SHAZ! HUB youth drop-in-centre

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**Background:** Globally it has been noted that less men than women access health facilities for various reasons, mainly due to cultural beliefs and the fact that most health care workers in facilities are women thus men don't feel comfortable discussing their issues with the health care workers. As such young men avoid accessing health services such as HIV testing until it is too late. According to the SADC Gender Protocol 2017 Barometer, men have low health seeking behaviours and these are compounded by the limited health care facilities that are "male friendly".

However, the situation was found to be different in Zimbabwe at the SHAZ! HUB - a youth drop-in-centre in Chitungwiza. The centre provides a "safe space" for adolescents and also offers free Sexual and Reproductive Health Services, life skills training, vocational training and recreational activities for young people.

The majority of the clients accessing services are male. We explored factors contributing to this high uptake of services among young men.

**Methods:** Data from 1,393 intake forms for male clients frequenting the HUB was analysed by demographics.

Four focus group discussions, two with males aged 16-19 years, two with males aged 20-24 were held, on topics related to health seeking behaviours, facilitators and barriers to accessing services.

**Results:** From July 2016, the SHAZ! HUB provided sexual health and HIV services to a total of 2,147 clients, 1,393 (64.88%) were males. Of those males, one thousand and fifty (75.33%) sought HIV testing, with nine hundred and eighty-four (70.64%) being between the ages of 16-19 years. When asked about favourable aspects of the SHAZ! HUB, participants cited friendly attitudes by health care workers for example the young men were not judged when disclosing having engaged in sexual or other risky behaviour (e.g. using alcohol or drugs), were given factual information and support on risk reduction, privacy provided by the HUB, being allowed to express themselves freely and not being victimised for "misbehaving." Other appealing aspects of the HUB included being able to access wi-fi, relax with friends whilst watching DSTV, and access workshops on life skills and financial literacy.

**Conclusions:** These findings suggest that it is critical for programs to come up with facilities that address the holistic needs of young men so that they are able to learn and access health services in a conducive environment that is youth friendly. Having youth friendly spaces create opportunities for young men to health care.

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### Nutrition assessment, a quality improvement approach

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**Introduction:** Nutrition assessment is a vital component in the general care of HIV infected people. With access to highly active antiretroviral therapy (HAART), HIV infection may become a chronic, manageable disease. Nutritional and metabolic complications associated with HIV infection like hypertriglyceridemia, low levels of high-density lipoprotein (HDL) cholesterol and weight loss usually occur. However abnormalities like regional alterations in body shape (fat redistribution syndrome or HIV-associated lip dystrophy), increasing body weight, high levels of low-density lipoprotein (LDL) cholesterol, insulin resistance, and other metabolic derangements occur if clients are not screened. In addition, as patients are living longer, they may be susceptible to other age-related diseases such as diabetes, cardiovascular disease, and obesity. This quality improvement project aimed at making sure each HIV client receives nutrition assessment at each visit so as to reduce the burden of disease and promote an enhanced quality of life in HIV-infected individuals.

**Method:** Beginning June 2016 to June 2017 all clinicians at ndejje health Centre IV was encouraged to carry out body mass index (BMI) to all clients who visit the clinic. Continued medical education was carried out every month, BMI charts were provided as well as weighing scales and height boards. Random sampling

was used each month to retrieve client's files to find out how many had their BMI done.

**Results:** One in five PLHIVs was found to be under nourished. At the end of June 2017 there was an improvement of nutrition assessment for all clients living positively at ndejje health Centre IV from 30% to 89.2%.

**Conclusion:** Nutrition interventions should form an integral part of HIV care programs, understanding the presence of OI, decline in CD4 count, and advancing WHO clinical stages as risk factors can be helpful in preventing under nutrition and over nutrition.

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### Evaluation of neutralizing anti-HIV-1 response in individuals infected by C,B and F1 subtypes in relation to genetic and biochemical characteristics of the env gene

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It is expected that an HIV vaccine/aids be able to induce specific response in CD8+ T cells and neutralizing antibodies (nAb). However the high genetic variability of the virus envelope gene (env) is one of the factors that can influence the ability of a vaccine. Thus, in order to assess humoral immune response against immunogens, HIV-1 neutralizing antibody detection assays have been used. Therefore, this study aims to evaluate the humoral immune response in individuals with different AIDS progression profiles and map the env gene characteristics of HIV-1 subtypes prevalent in Brazil.

To this end, we performed a comparison between two neutralization assays, one using the viral isolate HIV-1IIIB in primary lymphocytes and the other neutralization with TZM-bl cells tested against eight pseudovirus (psVs). In these assays were tested 10 plasma samples obtained from individuals with typical profile of progression to aids and 10 from long-term non progressors (LTNP). In the first analysis, we observed 44% of neutralizing antibody titers against psVs and 50% for HIV-1 IIIB. The plasma samples from progressors showed broad and potent neutralization.

From these results, we noted the importance of continuous antigenic stimulus in inducing humoral response and their influence for viral factors. Thus, we evaluated the genetic and phenotypic characteristics HIV-1 env subtype-specific and associated them to the induction of neutralizing activity. For this purpose, we selected 60 plasma samples from individuals infected with HIV-1 subtypes prevalent in Brazil and perform neutralization assay with psVs (same HIV-1 subtype). We observed a greater breadth and potency of anti-Env neutralizing response in individuals infected with the F1 or B HIV-1 subtypes compared with the C subtype and variant B/Bbr. We observed that the regions V1 from B/Bbr subtype had greater number of amino acids than the other subtypes and V4 region from F1 subtype had fewer amino acids ( $p < 0.005$ ). We also observed that some subtype-specific signatures of F1 subtype and B/Bbr samples located in regions C2, V3 and gp41 may have influenced in the neutralizing response difference between them.

These results indicate that a single amino acid substitution in the V3 loop may lead to a distinct conformational exposure or load,

in association domain of trimer of gp120, and interfere with the neutralizing response potency and has a significant implication for the vaccine design.

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### Implementation of a Classic Nested PCR DNA for HIV Diagnosis in Kinshasa

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**Background:** The interest in the technique of HIV diagnosis by Polymerase Chain Reaction (PCR) is in: (i) primary infection by Human Immunodeficiency Virus (HIV), where it is necessary to identify patient in tome, (ii) screening of newborns from HIV-positive mothers, and (iii) the accuracy and reliability of the technique.

**Objective:** This study aims to assess the feasibility and performance of the Nested PCR of Dextroribose Nucleic Acid (DNA) for HIV diagnosis in Kinshasa in order to improve the detection and management of HIV Infected patients.

**Methods:** The present work is an experimental cross-sectional study in collaboration with 3 centers (C1, C2 and C3) in Kinshasa. The samples consisted of 171 people who have mare voluntary testing for HIV. Five milliliter of blood was collected in tubes with anticoagulant EDTA, centrifuged for separation into 3 phases. Five hundred microliter of buffy coat was collected in a pre-labeled tube. The DNA extraction was done from 200ul of buffy coat using the QIAamp DNA Mini kit from QIAGEN. Classical HLA PCR and Nested PCR gag and pol were performed to determine the proviral DNA. Nested PCR on env was performed in cases of discordant **Results:** on gag and pol. The revelation was made under UV after electrophoretic migration on 1% agarose gel. The data were collected in confidentiality in a form conceived and pre-tested for the study, entered on Windows Excel and analyzed using SPSS 17.0 for Windows. The statistical significance was set at  $p < 0.05$ .

**Results:** For C1, 22 samples were positive, 18 negative and 6 indeterminate for HIV. For C2, 55 positive samples served as control for the study. For C3, 30 samples were positive, 25 negative and 15 indeterminate for HIV. This gives a total of 107 positive samples, 43 negative and 21 indeterminate for HIV. After amplification by Nested PCR DNA, 112 samples were positive and 59 were negative. Of the 21 indeterminate samples, 3 were confirmed positive and 18 negative by PCR. Two samples were negative by RDT but positive by PCR.

**Conclusion:** The Rapid Diagnosis Test (RDT) results and those of Nested PCR DNA allowed to evaluate and validate the technique of HIV diagnosis in Kinshasa by this new technique. This method provides a more reliable alternative for HIV diagnosis in Kinshasa.

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### Comparison of an In-House Quantitative Real-Time PCR and COBAS AmpliPrep/TaqMan Roche for determination of Viral Load for HIV type-1 non-B



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**Context:** The In-House technique or experimental methods are increasingly recommended for their low-cost reagents for determination of Viral Load (VL) in resource-limited settings. The objective of this study was to compare the determination of VL for HIV-1 non-B samples by an In-House technique with the COBAS AmpliPrep/TaqMan version 2.0.

**Methods:** In this experimental study, 39 plasma samples from patients infected with HIV type 1 non-B from N'Djamena and Kinshasa were used to determine VL using the 2 techniques.

**Results:** The mean values of VL were respectively  $4.68 \pm 1.26$  and  $4.58 \pm 1.33$  log<sub>10</sub> RNA copies/ml for the COBAS AmpliPrep/TaqMan assays and the In-House assays. A good correlation (Spearman Correlation) was obtained, with a coefficient (R<sub>2</sub>) of 0.9452.

**Conclusion:** This study demonstrated that there is no significant difference between the results of VL determined by the COBAS AmpliPrep/TaqMan assays and In-House assays used.

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### A cross sectional study of the impact of human immunodeficiency virus, hepatitis B virus and hepatitis C virus on rheumatoid factor production

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**Background:** Rheumatoid factor (RF) is an autoantibody most often involved in many autoimmune diseases including rheumatoid arthritis which is the most common inflammatory and disabling rheumatism. In order to understand the occurrence of opportunistic diseases amongst people infected by human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV), we carried out a study in five regions of Cameroon including Center, East, Far North, Littoral and West region. This study aimed to investigate how these viruses may affect the production of IgM-RF.

**Methods:** Voluntary participants aged 3 to 88 years old were randomly recruited by a consecutive sampling technique in the main health facilities of five regions of Cameroon. Blood samples were collected and used for serological analyses. We sought for human immunodeficiency virus (HIV) antibodies: the core antigen (HBc-Ag), the surface antigen (HBs-Ag), and the replicative antigen (HBe-Ag) of hepatitis B virus (HBV), HCV-Ag of hepatitis C virus (HCV) and the IgM-RF.

**Results:** A total of 405 participants were involved in the study, and comprised 266 (65.7%) female and 139 (34.3%) male. The prevalence of HIV-Ag was 7.61% (31/405), 38.7% (158/405) for HBcAb, 5.43% (22/405) for HBsAg, 1.26% (02/158) for the HBe-Ag and 6.41% (26/405) for IgM-RF in the study population. The Far North region had the highest prevalence of IgM-RF (9.8%)

and the Littoral region the lowest prevalence (3.2%). The prevalence of RF was 6.7% and 5.7% for women and men, respectively, and corresponded to a sex ratio of 2.25(18/8) for women. The IgM-RF prevalence was 9.7%, 8.9%, 9.1%, and 27.8% in participants with positive serological results for HIV, HBcAb, HBsAg, and HCV, respectively.

**Conclusions:** Infections by HIV and HBV were shown to poorly stimulate IgM-RF production, and the latter factor was instead stimulated by HCV infection. This increased IgM-RF production may contribute to cytotoxicity in tissues or organs of HCV – infected patients, leading to the onset of autoimmune diseases.

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### HIV-1 replication, compartmentalization and persistence in the urinary tract

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**Objectives:** HIV-1 infects different anatomical sites and tissues which may result in autonomous replication and generation of unique viral populations at each site. Here we molecularly characterized HIV-1 viruses in urine and plasma samples collected longitudinally from HIV-1 infected individuals to investigate HIV-1 replication, compartmentalization and persistence in the urinary tract.

**Methods:** Prospectively collected urine and blood samples collected over 12 - 36 months from 20 HIV-1 infected individuals were analysed including sampling points from prior to and after ART initiation. HIV-1 pol gene RNA and DNA from urine supernatant and urine pellets respectively were amplified and sequenced followed by phylogenetic analysis and comparison to plasma RNA viruses from the same individual.

**Results:** HIV-1 NA was detected in urine samples from at least one time point in 8/20 (40%) treatment-naïve subjects compared to 1/13 (7.7%) individuals on antiretroviral treatment (ART) during periods of plasma viral suppression and 1/7 (14.3%) individuals with virological failure. HIV-1 RNA was undetectable in urine samples after ART initiation but HIV-1 DNA was detectable in one patient more than 6 months after treatment initiation. There was co-clustering of urine-derived pol sequences indicating viral compartmentalization but some urine-derived sequences were interspersed among the plasma-derived sequences.

**Conclusions:** Suppressive ART reduces HIV-1 replication in the urinary tract but HIV-1 DNA may persist in these cells despite treatment. Our data suggests viruses in the urinary tract arise from autonomous replication in the urinary tract and also importation from blood.

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### Understanding molecular mechanisms underlying mycobacterium tuberculosis persistence

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**Introduction:** Tuberculosis (TB) is responsible for 1.3 million fatalities each year with a further 0.4 resulting from co-infection with HIV. A minimum of 6 months with a cocktail of antibiotics are required to effectively treat the disease. This usually results in poor patient compliance leading to development of drug resistant and multi-drug resistant strains.

This long duration is necessary to eliminate a sub-population of bacterial cells called persisters which display phenotypic drug tolerance. Persisters are known to be responsible for treatment failure and disease relapses. Specific mechanisms underlying this phenotype remain poorly understood. Recent studies have demonstrated the role of DNA methylation in gene regulation in prokaryotes. Additionally, DNA methylation has been shown to impact expression of several genes under hypoxia in *Mycobacterium tuberculosis* (Mtb). This study sought to investigate the role of epigenetic mechanisms specifically DNA methylation in Mtb persistence

**Methods:** By extracting DNA from a solid Mtb culture, we use Single Molecule Real Time (SMRT) sequencing to characterize the Mtb DNA methylome during persistence. Using bioinformatics data analysis, we analyze the methylomes of 15 Mtb clinical isolates belonging to Mtb lineage 1 (Indo-Oceanic) and lineage 4 (Euro-American).

**Results:** We find no compelling correlation between DNA methylation and persistence. However, in this study we demonstrate the diversity of DNA methylation within the Mtb lineages. Using deep sequencing we confirm presence of three different methylated motifs and their cognate methyltransferases in Mtb. We further report lineage specific mutations responsible for partial or complete loss of methyltransferase activity.

#### Conclusion:

We demonstrate the potential of SMRT sequencing to completely characterize the genome and epigenome of Mtb. Understanding the complete biology of Mtb is key to strategies of developing shorter treatment options for Mtb.

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### Determining mode of transmission amongst South African adolescents: A validation procedure assessing the use of ARV initiation age for determining HIV transmission mode

### using a community-traced sample of HIV-infected adolescents in South Africa

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**Background:** Adolescents are the only age group whose HIV incidence is not falling, highlighting the need to provide evidence-based interventions for this population. Research in child and adolescent HIV have either used facility-based populations where good record keeping allows determination of participants' transmission methods through clinic records or do not assess mode of infection (MOI) at all. Vertically- and horizontally-infected sub-groups may have different socio-economical, psychological, and clinical care factors that translate into different HIV care needs. In settings where stigma is high, the healthcare system is overloaded, and records are not centralized, MOI is difficult to determine. However, incorporating MOI and assessing the difference in HIV experience between the subgroups may be critical to providing necessary differentiated care for adolescents' long-term survival. This study examines the predictive power of a mode of infection algorithm for adolescents and its potential impact in future research.

**Methods:** Data from two waves of a South African cohort of HIV-infected adolescents (N=1025) was used to test the algorithm. First, MOI was determined using ARV initiation age: participants who started <10 years were categorized as vertically-infected; ≥10 years as horizontally-infected. These initial MOI determinations were evaluated for consistency against social, health, and clinical factors associated with each MOI type based on evidence from literature in a branching structure, testing the most highly correlated factors first. Participants who exhibited factors contradictory to the initial MOI determination and strong evidence for the opposite determination were recoded. Those who reached the end of the branching structure without exhibiting any contradictory or affirmatory evidence were examined individually. Pseudo positive and negative predictive powers based on the initial determination were calculated.

**Results:** The initial MOI determination designated 375 participants as horizontally-infected and 650 participants as vertically-infected. After validation branching using two sets of factors for each of mode of infection, MOI determination using only ART initiation age of <10 years could only be validated for 84.7% of the sample (99.1% vertically, and 59.7% horizontally), with n=152 of the original determinations being recoded to the other MOI category due to contradictory evidence of the original MOI determination and confirmatory evidence for the alternative MOI. Of the 152 non-validated cases, 146 were due to lack of confirmatory evidence for horizontal infection and affirmatory evidence arising later in the branching sequence for vertical transmission, indicating these participants were likely to be slow progressors—vertically-infected children who do not exhibit symptoms until a decade or more after birth.

**Conclusion:** The findings support the use ART initiation date in adolescent HIV research as a proxy measure of mode of infection. However, to improve the accuracy of this cut-off, additional factors should be taken into account to validate the presumed mode of infection. This would allow for more accurate analyses, which can inform tailored, evidence-based programming for adolescents and young adults. More accurate mode of infection—applied to large cohort data—can support to identify the specific

needs and pathways of intervention most appropriate for both vertically- and horizontally-infected adolescents.

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### Optimal staffing models in large clinics to address quality of care in view of 90:90:90 targets and sustainable long term delivery of ART

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**Background:** There have been few attempts to describe suitable staffing models for clinics with more than 1000 patients on antiretroviral therapy (ART) globally yet this has a major cost implication in health care financing models. Volunteers, who are a cheap source of labor in these clinics are not sustainable with the country employment policies and labor legislation that make them expensive in the long run. There is a need for staffing models that will inform the scale-up of WHO'S test and treat recommendation.

**Description:** Survey looked at 251 facilities owned and supported by AIDS Healthcare Foundation (AHF) in 11 countries in Africa. For each clinic, we collected data on the number of government staff (who offer direct care to ART patients), full time staff and volunteers that are hired by AHF to work in ART clinics, active patients in care, average number of patients seen on each clinic day, 6 quality benchmarks and how many times a week that the clinics are operational. Administrative and support staff were excluded from this survey. Clinics were placed under 5 categories based on the number of active patients they had in care. We calculated an optimal patient to staff ratio for each category based on the number of government and AHF staff working in these clinics and good performance in the quality benchmarks. this ration was also used to classify clinics as either overstaffed, understaffed and optimally staffed.

**Lessons learned:** The patient to staff ratio helped generate the average number of staff needed in each clinic category by staff cadre as seen in table below. A staff range was generated for each category to address the clinic needs of each clinic based on services being provided. This model helped us structure and plan for human resource needs in clinics with varying patient numbers and in new clinics that we were planning to support that had human resource gaps. AHF was able to cut the number of volunteers and transition them to full time staff to cut costs. We were also able to redistribute staff in different clinics based on whether they were classified as understaffed, overstaffed or optimally staffed.

**Conclusion:** Changing guidelines for ART management shows that staffing needs required to deliver services for different categories of patients on ART are diverse. Sustainable and cost effective staffing models are paramount and beneficial in the planning process.

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### Supporting Antiretroviral Therapy (ART) Growth and Scale Up: Forecasting Patient

### Need for ART in Resource-Constrained Settings

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**Background:** As national HIV programs across Africa seek to achieve 90-90-90 UN targets, there is a need to forecast growth in patient demand for later lines of treatment. This abstract discusses the development of a model that reflects the key influencing factors that determine whether HIV patients are linked to care, remain in treatment, and are switched to later lines of treatment.

**Materials & Methods:** Our modeling project focused on developing a five-year, country-level forecasting tool to assist national governments plan for evolving HIV treatment needs. The model incorporates available national, regional, and global data and includes adjustable inputs.

Our forecasting model uses a novel combination of qualitative and quantitative methods. We identified the main influencing factors that determine whether an HIV+ individual is linked to appropriate care and treatment – including the patient journey, clinical dimensions of switching, and treatment delivery in resource-limited settings – and organized them into a “pathway” that provided the conceptual basis for an algorithm to generate a forecast. Excel-based and arithmetic, the algorithm uses the latest available data for those factors with the largest impact on patient estimates: treatment coverage; routine viral load (VL) testing; VL non-suppression; confirmed treatment failure; and patient loss to follow up. The output was aggregate annual patient estimates by treatment line.

**Results:** After applying the model to several African countries with public data, a few key trends emerged: for patient distribution across treatment lines to remain similar to current distributions at the national and global levels, rates of patient loss incorporated into the model are not as high as reported in the current literature; stakeholder input suggests that a dynamic forecast is preferred over a static forecast as it allows for real-time adjustments as programs evolve; and deriving a growth trajectory for treatment failure remains challenging due to data limitations, particularly for pediatric cohorts.

**Conclusions:** As countries work to reach all HIV+ individuals in need of treatment, our patient forecasting model can add value to HIV policy and planning processes. The model could be used to complement commodity forecasting, particularly for second- and third-line ARVs. Additionally, policymakers could use the model to think creatively about potential patient need that they have not yet identified within their current programs.

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### Abstract on Comparative Evaluation of two Paradigms for Tuberculosis Case Detection in Nigeria.

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**Background:** Nigeria has the third highest Tuberculosis (TB) burden in the world, and the highest in Africa. Effective TB surveillance will enhance early detection of cases and treatment. We comparatively assessed the effectiveness of two paradigms for TB case detection across target population in Nigeria.

**Method:** We conducted a cross sectional study which employed two different Paradigms to targeted population in same geographical area. In the first paradigm, we interviewed all age groups in the targeted communities. While in the second paradigm, we visited health facilities in the communities, identified suspected or confirmed TB cases, and then traced and interviewed all possible contacts of these cases. We obtained history of cough, fever and weight lost using an interviewer administered, structured questionnaire. We collected sputum samples from symptomatic individuals and performed Sputum microscopy for Acid-fast Bacilli (AFB). We collected data for the first and second paradigms in November 2015 and June 2016 respectively. We calculated and compare proportions for both paradigms.

**Results:** Of the 21,144 individuals interviewed within a three-month period using the first paradigm, 2,746(13%) (95% CI 12.5-13.5%) had symptoms of TB. Also, 84(3.1%) (95% CI 2.5-3.8%) were confirmed AFB positive. Using the second approach, Of the 1,531 persons interviewed using the second approach, within the same period, 1,033(67.5%) (95% CI 65.1-69.8%) had clinical signs of TB. About 55(5.3%) (95% CI 4.1-6.8%) samples were confirmed AFB positive.

**Conclusion:** Our study showed higher proportion of TB cases detected by screening contacts of TB patients compared to screening the whole target population. Because, less samples were collected for analysis, screening contacts of TB cases was less expensive. Tuberculosis surveillance and case detection was more effective using the second paradigm.

terms of stigma reduction, gender equality and human right in creating access to HIV/AIDS services for all.

**Method:** Thirty (30) nascent KP led CBOs comprising of 11 People Who Inject Drugs (PWID) led CBOs, 11 Men who have Sex with Men (MSM) led CBOs and 8 Female Sex Workers (FSW) led CBOs were assessed using partnership development and assessment framework (PADEF) tool. Subsequently, 15 nascent KP led CBOs (5 MSM led, 5 PWID led and 5 FSW led) in Anambra, Enugu, Imo, Lagos and Oyo States were selected and engaged for organisational capacity building; to enhance their skills in providing non-discriminatory HIV prevention services to community members. These engaged CBOs were exposed to trainings and in-house mentoring based on organisational training needs using a home-grown training and mentoring curriculum. Mentoring log was designed to encourage one-on-one mentor and mentee interaction and weekly feedback was provided.

**Results:** Seven months post embedment, nascent KP led CBOs have grown to adolescent stage duly registered and recognised by State and National Agencies. They were able to provide support for HIV prevention and treatment services to community members with 30 documented paralegal services and over 2000 KPs linked to HIV testing services with accompanied escort services provided by the KP led CBOs.

**Conclusion:** Building capacity of KP led CBOs is critical to successful home-grown solution for national HIV response that improves access of KPs to HIV prevention and treatment services in line with UNAIDS 90,90,90 goal. There is need to build organisational capacity for nascent KP led CBOs as it will lead to reduction in incidence of HIV and other STIs among KPs and provide a sustainable foundation on which to build and expand HIV services for KPs.

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### Sustainable capacity building for nascent Key Population (KP) Led Community Based Organizations in South Eastern and Western Nigeria- ECEWS Approach

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**Background:** Nigeria's HIV/AIDS epidemic has been described as generalized but there are concentrated epidemics among Key Populations (KPs). HIV prevalence is considerably higher among KPs than in the general population - 19.4% in brothel-based female sex workers (BBFSW), 8.6% in non-brothel-based FSW (NBBFSW), 22.9% among Men who have Sex with Men (MSM) and 3.4% in People Who Inject Drugs(PWID)- (IBBSS, 2014). KPs in Nigeria are daily confronted with harsh sociocultural and legal environment limiting their access to HIV preventive and treatment services. Hence, the need to strengthen the capacity of KP led Community Based Organizations (CBOs) to enable them advocate and lobby duty bearers for enabling environment in

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### Task shifting increased Isoniazid Preventive Therapy uptake and completion among people living with HIV in Secondary Health Facilities South-East Nigeria

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**Background:** People living with HIV (PLHIV) have a 20-fold higher risk of developing Tuberculosis (TB), which is responsible for over 33% mortality in People living with HIV. Although Isoniazid (INH) Preventive Therapy (IPT) is effective in the prevention of active TB in these people, a retrospective review of 2014/2015 INH data from 9 secondary health facilities in south-east Nigeria, revealed poor uptake and completion of the six months course. This was mainly due to workload on the physicians who often fail to initiate INH for People living with HIV. We introduced task shifting to address this gap.

**Method:** In March 2015, ECEWS (LOCATE project) trained, supported and provided Job Aids for non-physicians including Pharmacy technicians and Treatment Support Staff on identification, initiation and completion of Isoniazid Preventive Therapy for People living with HIV. Pharmacists and other

pharmacy staff were mentored on adverse drug reaction monitoring. We educated People living with HIV (during Support group meetings) on benefits of Isoniazid Preventive Therapy, adherence, 6 months completion; and the need to prompt dispensers when INH was omitted.

**Results:** The percentage of eligible People living with HIV initiated on Isoniazid Preventive Therapy increased from 8% (n=3459) before intervention to 85% (n=2181) 9 months post-intervention. Similarly, 99.5% of them completed the 6 months course as against 0% completion rate recorded pre-intervention. Isoniazid Preventive Therapy was discontinued in 3 (0.2%) People living with HIV due to side effects, while 6 (0.3%) clients declined medication.

**Conclusion:** Task shifting was found to be effective in Isoniazid Preventive Therapy uptake and completion. This demonstrates the value of using non-physicians to optimize HIV care and support services, especially in resource limited settings if we are to achieve the UNAIDS 90,90,90 goal

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### Clustered Rotational Mentoring (CLUSTROM): A Cost-Effective Health Facility Support System for PMTCT Program implementation in South East Nigeria

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**Background:** The National rapid scale up of PMTCT service from 11 tertiary hospitals in 2002 to now over 5000 sites including Primary Health Centers with enhance access at the rural areas come with huge challenges (NASCP, 2014). Specifically, programmatic and logistics challenges due to large number of health facilities to be supported. With only one project vehicle per state and reduction in funding by 30% (PEPFAR), Local Capacity Enhancement (LOCATE) project had challenges providing support for 209 health facilities (HFs) in South East Nigeria. Consequently, there was need for an innovative cost-effective approach to deliver right on target without compromising on quality.

**Methodology:** In 2014 ECEWS LOCATE Project introduced Clustered Rotational Mentoring (CLUSTROM) approach. This is a meeting platform that ensures transfer of needed capacity to health care providers across several supported facilities during routine site support visit. It is a site support system where HFs were clustered per local government area. Meeting venue was rotated among participating facilities monthly. Within each cluster, participants were grouped into thematic micro-clusters facilitated by relevant project staff (PMTCT, laboratory, M&E etc.) using simulation of PMTCT-related scenarios through discussions and brainstorming. The platform was also used for skill transfer; experience sharing and commodity distribution/re-distribution. Findings from the meeting informed strategic facility visit, subsequently. We estimated savings in terms of trip frequency; transportation (TP) cost, i.e. fuelling project vehicle; and travel time associated with CLUSTROM as against traditional facility visits.

**Results:** Compared to traditional approach, CLUSTROM achieved 71% savings in trip frequency; TP cost; and travel time as shown in table below:

Approach	Trips	HFs Reached	HCWs Reached	TP cost	Travel Time
CLUSTROM	21	144	144	\$385.4	38hrs, 30min.
Traditional	72	144	288	\$1321.3	132hrs

A total of 51 trips; \$935.9 TP cost; and 93 hours, 30 minutes travel time were gained. Other benefits not readily 'costed' include skills transferred; experience shared; commodity redistributed; possible less fatigue among project staff from reduced trips; and vehicular wear and tear.

**Conclusion:** Although there could be some limitations to using CLUSTROM, this novel approach enables for efficient health facility PMTCT support and optimization of available donor resources to achieve the UNAIDS 90,90,90 target .

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### Parental predictors to uptake of HIV testing among children and adolescents in the context of index case testing strategy in Cameroon

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**Background:** Targeting children born to people living with HIV/AIDS (PLHIV) for HIV testing also known as index case HIV testing is emerging as a priority strategy to reduce the current gap in pediatric and adolescents' antiretroviral treatment coverage, especially in Sub-Saharan Africa. This study aimed at identifying parental factors associated with HIV testing uptake among children of PLHIV in Cameroon.

**Methods:** This was a cross sectional study conducted from June-December 2016 in two district hospitals (Abong-Mbang and Ndong) in Cameroon. During this period, socio-demographic information of PLHIV in care and consenting to participate in the study were collected using standardized questionnaires. In addition, they were invited to have their biological children aged 6 weeks - 19 years tested for HIV. Logistic regression was performed using SPSS and significance set at 5%.

**Results:** 645 parents were included in the study through whom 1438 children were enrolled for HIV testing. The parents were predominantly females (81.5%) and the age ranged from 17 to 59 years with a median of 35 years. 57.8% (373/645) of parents tested at least one child and 57.6% (829/1438) of children enrolled were tested for HIV. Factors associated with HIV testing uptake among children included: female gender (OR=1.49; p=0.049), higher education level (OR=1.61, p<0.0001), single parent (OR= 1.91; p<0.0001), and student occupation (OR=3.62; p=0.001). When adjusting for confounders we found that female

gender (aOR=1.79, p=0.023), age older than 40 years (aOR=1.47, p=0.013), higher education level (aOR=1.46; p<0.0001) and single parents (aOR= 1.77; p<0.0001), were parental predictors associated for HIV testing uptake among children and adolescents.

**Conclusion:** PLHIV of male gender, less than 40 years, less educated and married were less likely to test their children for HIV. This suggests the need to enhance HIV counselling and testing for children among these sub-groups, especially among males and married parents in order to optimize the outcome of the index case testing strategy among children and adolescents.

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### Costs and Effectiveness of Integrated Stigma Mitigation Interventions for Female Sex Workers in Senegal.

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**Background:** HIV prevention 2.0 (HP2) was an implementation science study which sought to evaluate Integrated Stigma Mitigation Interventions (ISMI) for female sex workers (FSW) and men who have sex with men (MSM) in Senegal. The interventions included a peer-based community component to reduce perceived stigma and a clinical component to reduce enacted stigma. We evaluated the costs and effectiveness of this intervention from a health care sector perspective.

**Methods:** FSW were enrolled into a 24-month prospective cohort using respondent driven sampling (RDS) and purposive sampling in the cities of Dakar, Mbour and Thies in 2015. Information on personal stigma experiences was collected through interviewer-administered questionnaires on a quarterly basis. Logistic generalized estimating equation models (LGEE) were used to estimate the percentage decrease in anticipated and enacted stigma among FSW. The cost (in 2014 US dollars) of the intervention was estimated using a micro-costing approach. The co-primary outcomes were the incremental cost of the program and the estimated reduction in anticipated and enacted stigma.

**Results:** A total of 198 FSW were followed for 3708 person-months. In the multivariable LGEE model, each additional intervention visit was associated with a 10% (95% CI: 0% – 23%) and 13% (95% CI: 0% – 29%) decrease in the prevalence of anticipated and enacted stigma, respectively. The total cost of the intervention was \$195,000, corresponding to \$27 per participant per month. Of this cost, 8% reflected training of staff, 82% design and implementation of the intervention, and 10% evaluation of the intervention.

**Conclusions:** This ISMI was both inexpensive and effective in reducing both anticipated and enacted stigma among FSW. These findings may help to inform resource allocation related to interventions for stigma mitigation in Senegal and other similar settings.

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### Sex differences in the uptake of HIV Services in Rivers State, Nigeria

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**Background:** Women continue to account for more than half of the world's population living with HIV, especially in Sub-Saharan Africa. HIV remains one of the leading causes of death among women of reproductive age group. Uptake of health care and HIV services by male and female is influence by several sociocultural and religious factors. We examined sexual differences in the uptake of HIV services in 3 PEPFAR supported three local government areas (LGAs) in Rivers State.

**Materials & Methods:** A retrospective review of HIV service data collected from health facilities across the three local government areas (LGAs) in Rivers State from October 2015 to September 2016. The three LGAs were supported by the USAID-funded Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS) project. Within the review period, the 3 LGAs had an increase in HIV prevention and treatment services with intensive community mobilization and health education amongst gatekeepers. Special attention was given to adolescent and women of reproductive age. HIV testing and ART commencement uptake data were analyzed on SPSS using chi square test to compare access by sex.

**Results:** Within the period of review, 217,584 (50.2%) females and 215, 796 (49.8%) males were tested for HIV. HIV positivity rate was significantly higher in females 5591 (2.6%) than in males 3292 (1.6%) (p<0.001). Total of 4,115 women (74%) were newly commenced on ART within the period compared to 2,254 men (68%). There was a significant association between the ART uptake and sex as more female were likely to commence treatment than male (p < 0.001).

**Conclusions:** This study shows significant association in uptake of HIV testing, HIV positivity and ART commencement among males and females. Significant number of positives were also enrolled into ART treatment. In designing and delivering HIV interventions, sex differences need to be considered to ensure equitable programming.

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### An assessment of a Community Defaulter tracing Project among women in option B in Malawi

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#### Background

Malawi was the first country to adopt Option B plus approach in 2012 in which all HIV positive pregnant women regardless of baseline cd4 count. The challenge with this approach is adherence and retention as women start treatment when they are not sick. DREAM program carried out project to trace and bring back to care Women who had been lost to follow up in 26 health facilities in four districts in Malawi. We evaluated the effectiveness of the defaulter tracing program in the 26 health facilities in the four districts of Mangochi, Machinga, Balaka and Blantyre.

**Method:** Defaulters are defined as those patients who missed more than one month of appointment. A group of expert clients (mothers who underwent treatment with excellent adherence and volunteered to this task) has been trained for tracing the defaulters in each facility. They were given the list of the defaulters to follow up and report to the facility the results of the tracing. The results of the tracing were recorded in the register and categorized as brought back to care, self-transferred, death, refused care and lost to follow up. Data from the registries are analyzed retrospectively.

**Results:** Out of 1513 women who classified as defaulters, of those that were followed up 8.9 % (135/1513) were noted to have self transferred and 2.3 % (35/1513) had died. Of those that were true defaulters 67 % (900/1343) were brought back to care, 19.3 % (260/1343) were either not found or refused to come back. Urban dwellers were less likely to return to care (OR=1.3, CI, 1.121-1.699) than women living in the rural areas even if the latter were less likely to be located (OR=0.602 CI, 0.441-8.821). There was no significant difference in the refusal risk between the two settings (OR 0.8, CI 0.543-1.365) and in death (OR 0.9, CI 0.489-1.896). The cost of bringing back to care each mother was 37 USD.

#### Conclusion / Interpretation

The project successful in returning mothers to care. However, Urban Women had more negative outcomes in than rural areas. More adherence counseling is needed in urban setting before starting therapy. Further studies need to be done to understand why urban areas have more negative outcomes

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### Scale-up of a passive referral model of HIV Index Case Testing to accelerate case identification in Mangochi, Malawi

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**Background:** Timely identification of people living with HIV (PLHIV) is a critical first step towards the elimination of HIV/AIDS. Index case testing (ICT) can be a high yield strategy to identify PLHIV. Malawi's national HIV Testing Services (HTS) guidelines recommend ICT through passive referral using family referral slips (FRS). However, only 40% of newly diagnosed PLHIV received FRS in the last quarter of 2016. We describe the scale up of ICT via passive referral and its impact on HIV case identification in Mangochi, Malawi (estimated HIV prevalence 10.1%).

**Materials & Methods:** A total of 753 HTS and antiretroviral therapy (ART) providers from 33 health facilities supported by the Tingathe Program in Mangochi district, received a 2-hour on-site training on ICT and how to issue FRS to clients from May-June 2017. "Index cases" defined as clients either newly diagnosed with HIV or known to be HIV-infected and on ART were educated on the importance of ICT. Those who consented to index testing were given a FRS for each household contact with unknown HIV status. FRS contained information inviting the individual to the facility for family health education. We conducted a descriptive analysis of routinely collected program data from these facilities to examine the number of index cases screened as well as the proportion of and yield amongst contacts tested over a 6-month period post-training.

**Results:** Between June-November 2017, 4177 index clients were screened. There were 7956 FRS issued; a 50% increase from the 4028 issued from December 2016 to May 2017. Of the FRS issued, 1315 (17%) were for sexual partners and 6641 (83%) for children. There were 1035 (13%) contacts who reported for HTS; 159 tested HIV-positive (15.4% yield). Among those returning for HTS, 228 (22%) were sexual partners, 745 (72%) children and 62 (6%) guardians. Of sexual partners tested, 135 (59%) were male.

**Conclusion:** Facility-based ICT through passive referral using FRS is scalable with a brief targeted training. Further, it is a high-yield strategy for identifying PLHIV. To optimize the impact of this intervention on case identification, additional efforts are needed to increase the proportion of contacts reporting for HTS.

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### Moving from CD4 counts to HIV Viral load measures; policy, practice and patient experiences in rural Tanzania and Malawi. A mixed-Methods: case study

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**Background:** In 2014 the WHO suggested a changing role for CD4 monitoring in clinical care, recommending routine viral loads (VL) to monitor adherence, and using CD4 counts to screen for opportunistic infections. However, roll-out VL testing has been slow in many settings and little is known about how the switch from CD4 counts to VL monitoring is taking place in practice. We used mixed methods in Tanzania and Malawi to i) document the evolution of national policies, ii) assess health facility level implementation; and iii) understand health provider and patient perspectives on the utility of these tests.

**Methods:** Guidance on the use of CD4 and VL were extracted from National HIV policies covering the period 2013-17. A facility survey was conducted in 2017 in health facilities in Malawi (n=5) and Tanzania (n=11) within two health and demographic surveillance sites (HDSS). Eight indicators on CD4 counts and VL testing were extracted. In-depth interviews with 3-6 health workers and 7-11 PLHIV across countries explored understanding and experience of the tests. Interviews were recorded and

transcribed. Thematic analysis was conducted and findings compared across settings.

**Results:** Unlike Tanzania, Malawi did not adopt a policy requiring CD4 testing for ART eligibility. However both countries adopted VL testing in 2014 (Malawi) and 2015 (Tanzania). The majority were government owned and hospitals or large facilities in Tanzania (72%) and dispensaries or small facilities in Malawi (60%). Few facilities had the capacity to offer CD4 testing (18% of facilities in Tanzania and none in Malawi) or on site VL testing (18% in Tanzania and 20% in Malawi), however all others tested through referrals. The frequency for VL testing was well aligned with national policy. Turnaround times for VL testing were longer than government recommendations in both countries (30 days).

In-depth interviews suggested that health workers were aware of the guidance for VL testing and recognised its utility to give a "better picture of the health of our patients". However, in Tanzania health workers preferred CD4 counts, where available, reporting that the turnaround time was quicker. In both countries some PLHIV that recalled having undergone tests generally referred to CD4 counts and valued it as a measure of their health status. However many pregnant women were not aware of these tests, they said they may have been tested but did not receive results.

**Discussion:** Although CD4 counts are being phased out, the coverage of VL testing has not matched national policy. The slow scale up of VL testing and corresponding health worker training and delays in processing test results may undermine PLHIV engagement in HIV care. If pregnant women are given an understanding of these markers earlier it may assist them as they transition to routine care post pregnancy. Increased focus is needed on how better to support health systems to increase their capacity to offer this service and satisfy patient demands.

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### Treat All Retention Cascade: Care seeking and 12 month retention among Zimbabwe's Treat All Inception Cohort

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**Background:** Following ART initiation, adherence and retention in care are recognized as central to achieving sustained viral suppression. Little is known about retention rates of patients initiated under HIV test and treat (Treat All) guidelines in routine public health settings in sub-Saharan Africa. We present data on 12-month care-seeking and retention among the first cohort of patients initiated on ART during the Treat All learning phase in Bulilima and Mutare Districts of Zimbabwe.

**Materials & Methods:** We conducted a retrospective cohort analysis of routinely collected facility data among all clients initiated on ART from June-July 2016, at 18 purposively selected health facilities. Selected sites were the first sites to begin implementation of HIV Test and Treat in Zimbabwe's Treat All Learning Phase. Analysing client characteristics and access to HIV care from June16-August17, retention was defined as remaining alive and in care(≤90days) at facility of initiation.

**Results:** A total of 416 patients were initiated on ART from June-July16, majority were: female(61.8%), median age 34(IQR:27-43). From day of initiation, 7.7%(n=32;95%CI:5.4-10.9%) of clients had no subsequent HIV care or ARV pickups documented. Median days to first HIV care following ART initiation was 28(IQR:14-44d). The proportion of clients with all clinic visits up to date was 35.3%(n=147), though majority had documented care 0-6(88.9%;n=370) and 6-12(83.4%;n=347) months post-initiation. Among the 22.6%(n=94) of clients with documented viral load, 94.7%(n=89) were virally suppressed, median VL result of 168 copies/mL (IQR:31-487). At 12 months, 71.9% of clients (n=299;95%CI:67.4-76.0%) were alive and in care. Among those not retained at 12 months, 9.3%(n=10;95%CI:4.7-16.7%) of clients were deceased; 8.3%(n=9;95%CI:4.1-15.6%) confirmed transferred on follow up.

**Conclusions:** We demonstrate that while care-seeking patterns are not guideline concordant, the majority of clients initiated on ART in first month of Treat All in Zimbabwe had evidence of HIV care at 12 months. In the era of Treat All, these findings support investments to support universal access to VL for all PLHIV and differentiated strategies to reduce visits for stable clients. Future research is required on effective interventions to reduce early attrition, strengthen defaulter tracing and documentation of true outcomes.

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### Known Positive Re-testers: Retrospective cohort analysis of clients HIV testing with known positive status

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**Background:** Tracing progress towards 90-90-90 requires accurate health information system reporting of the proportion of new HIV positive tests conducted, and subsequent linkage of PLHIV to care and treatment. Documented linkage to HIV Treatment/ART is a key performance indicator in HIV Programs. Our objective was to establish the proportion of clients testing HIV positive who fail to have documented ART initiation due to subsequent identification as having re-tested with already known HIV positive status.

**Materials & Methods:** We conducted a retrospective cohort analysis of routinely collected facility data among all clients testing HIV positive from Oct-Dec 2017 at 7 purposively selected health facilities in 5 districts of Zimbabwe. Selected facilities were those with < 85% linkage of new HIV positive clients to ART initiation in aggregate program data. Client characteristics, ART initiation, and reasons for no ART initiation were recorded. De-identified data were entered into MS Access and analysed using STATAV12.

**Results:** Among the 894 patients diagnosed HIV positive, 70.7%(n=632) were confirmed as initiated on ART. Of the 262 not initiated, 46.4% (n=124) had no documented reason or outcomes, while 29.0% (n=76) of clients were documented as having a known HIV positive status prior to current HIV test. Known positive re-testers disclosed this information only after receiving HIV testing, during pre-ART counselling, with 23.4% (n=19) of known positive re-testers recorded in source HIV testing service registers as having received HIV testing for the



first time. The majority of known positive re-testers were female (n=61; 73.5%), median age 35yrs (IQR:31-43yrs), tested in high volume outpatient or PMTCT entry points (46.9% and 33.3% respectively).

**Conclusions:** We demonstrate a high proportion of clients failing to link to HIV care following recent HIV positive diagnosis as having tested with a known HIV positive status, already on treatment. Identification of known positive re-testing dependent on client disclosure during pre-ART counselling, together with the majority of unlinked clients with undocumented outcomes indicate this figure may be underrepresented. Known positive re-testing has important implications for accurately tracking 90-90-90 progress using public health information systems. Further research is required to determine the reasons why PLHIV with known positive status uptake repeat HIV testing in health facilities. Required program actions include strengthening of pre-test counselling and ensuring accurate and timely updating of health information sources.

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### Are you ready? Patient readiness for ART in Treat All era, Zimbabwe

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**Background:** In the era of HIV test and treat, failure to link to treatment following HIV positive diagnosis accounts for the greatest leakages across the HIV care cascade. With an adult prevalence of 14.6%, linkage to HIV treatment is a key performance indicator in Zimbabwe's HIV Care and Treatment Program. However, aggregate data precludes routine reporting of reasons clients fail to initiate ART after diagnosis. Our objective was to establish the reasons for failure to start ART among clients newly testing HIV positive.

**Materials & Methods:** We conducted a retrospective cohort analysis of routinely collected facility data among clients testing HIV positive from Oct-Dec 2017 at 7 purposively selected health facilities in 5 Districts of Zimbabwe. Selected facilities had < 85% linkage of new HIV positive clients to ART initiation in aggregate program data. Client characteristics, ART initiation, and reasons for no ART initiation were entered into MS Access and analysed using STATAV12. A facility survey of perceived facilitators and barriers to patient readiness for ART was conducted with health care workers and PLHIV to identify key operational themes.

**Results:** Among 894 patients diagnosed HIV positive, 29.3%(n=262) had no documented ART initiation. There was no reason or final outcome documented for 46.4% (n=124) of clients not initiated. The most commonly documented reason for no ART initiation was client subsequently identified as already on ART with known HIV positive status during pre-ART counselling 29.0% (n=76). 'Not ready' factors (psychosocial readiness, disclosure or refusal) accounted for 6.5% (17/262) of documented reasons for failure to link to ART.

Men were more likely than women to have not initiated ART due to existing opportunistic infections or TB treatment/investigations (13.3% vs. 2.3%; p= 0.002). In the context of Treat All, enhanced pre- and post-test counselling, assisted problem solving and more 'take away' information for newly diagnosed clients were key themes among interventions to enhance patient preparedness for early ART.

**Conclusions:** 'Patient readiness' factors were infrequently cited reasons for failure to start ART following HIV positive diagnosis. The high proportion of undocumented reasons for failure to link has resulted in programmatic actions, including weekly identification of unlinked clients and active follow-up for return to care and outcome documentation. Future research should identify cost-effective interventions to strengthen early presentation, particularly among men, and intra-facility testing to treatment linkages in routine public health settings.

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### Is the whole greater than the sum of it's parts? Using narrow age bands in routine adult HIV surveillance for enhanced programme targeting and planning.

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**Background :** Zimbabwe has an adult HIV prevalence of 14.6%. Since 2011 the National HIV & AIDS surveillance system has been tracking HIV prevention and control activities amongst older adults receiving services at public health facilities using a single broad age band (25-49 years). However, results from the 2016 Zimbabwe Population-Based HIV Impact Assessment showed noteworthy disparities of HIV prevalence by age and sex amongst persons between the age of 25 and 49 years. These results prompted the FACE-HIV programme to pilot a surveillance system collecting routine public health facility data on HIV prevention and control activities using narrower age bands (25-29, 30-34, 35-39, 40-49) amongst adults to solicit for enhanced HIV prevention and treatment program decision-making.

**Methods:** and **Materials:** A passive facility-based HIV surveillance system was implemented among 368 health facilities in 12 Districts from Oct-Dec 2017. Routine age and sex disaggregated service uptake and outcome data amongst adults (25-49) receiving HIV services at public health facilities were collected within narrow age bands.

**Results:** A total of 82,683 clients within the 25-49 year age group were tested for HIV, 4,641 were newly identified HIV positive giving a yield of 5.6%. Amongst women and men, the HIV test yield was 4.7% (2,721/57,556) and 7.6% (1,920/25,127) respectively. When the same data were analysed using narrower age bands, noteworthy disparities by volume of tested clients and yield were observed. Across all age groups, absolute numbers of women tested and testing positive for HIV was greater than men, with the exception of men aged 40-49, the only age and sex disaggregated group with more men identified positive. This was also the age and sex disaggregated group with the highest test yield (11%; 578/5249). For both women and men, as age increased, the volume of clients tested for HIV decreased, but the yield increased. The increase in yield was more marked in men (from 4.6% for 25-29 to 11% for 40-49) vs. women (from 3.9% for 25-29 to 5.5% age 40-49),

**Conclusions:** The observed findings confirm the urgent need to collect and analyse increasingly granular routine facility HIV surveillance data for better understanding of HIV program performance. More detailed information is required for improved geographic and priority group targeting as Zimbabwe's

HIV Care and Treatment Program reorients towards the 'last mile' for meeting the UNAIDS 90-90-90 2020 targets.

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### Feasibility and clinical impact of integrating point of care testing in a tertiary hospital in Lilongwe, Malawi.

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**Background:** TB and Cryptococcal meningitis remain leading causes of hospitalization and death amongst HIV infected. Efficiency of diagnosis of TB and cryptococcal meningitis for hospitalized patients may reduce length of hospitalization and mortality. Although the rapid point care testing (Determine TB Urinary LAM lateral flow assay (urinary LAM), Urinary Xpert MTB/RIF assay (urinary Xpert), Serum Cryptococcal antigen test (CRAG) are recommended, they are not implemented as routine in hospitalized individuals in many resource limited setting. We aimed to demonstrate, train and put specific pathways in the medical ward for provision of the point care diagnostic testing for TB and Cryptococcal meningitis.

**Method:** From 01 August 2016 to 31 January 2017 all consecutive HIV-positive adults admitted in the medical wards at Kamuzu central Hospital, a tertiary referral hospital in Lilongwe, Malawi were offered point of care testing as follows: CD4 count, serum CRAG, urinary LAM and Xpert MTB/RIF assay. Tests were integrated into the ART and TB drugs dispensing room in the ward. Test results were recorded in the patient's files.

**Statistical analysis:** We used frequencies for categorical variables and medians for continuous variables to describe the characteristics of the patients who enrolled in the study. Fisher's exact test and Wilcoxon rank-sum test were used to assess differences in the distribution of categorical variables and continuous variables respectively between participants who had confirmed TB diagnosis and those who had non-confirmed TB diagnosis.

**Results:** Over the 6 months of the study, we enrolled 438 HIV positive participants. The majority were male (224(52%)) and had a previous HIV diagnosis (335(76%)). Notably 60 % had a CD4 count below or equal to 200 cells/mm<sup>3</sup> and 28% had a BMI below 18.5kg/m<sup>2</sup>. Of the 335 patients who had previous HIV diagnosis, 306 (90%) were already on ART.

Of the 339 patients who had CRAG testing, 29(8.6%) tested positive with 13 (44.8%) confirmed Cryptococcal meningitis by lumbar puncture (LP). 8 (80%) participants started antifungal therapy within 2 days of LP. TB discharge diagnosis in this cohort was 64 (15%). TB diagnosis confirmed in 51 (80%) and 13(20%) presumptive based on clinical and imaging studies. Of the Confirmed TB diagnoses, 50% were by the use of point of care diagnostic test. TB diagnosis was not related to patient BMI, age, gender or CD4 count levels. Majority of the participants with positive Urinary LAM (50/70) started TB treatment on the same day of diagnosis. The inpatient mortality was 28% and did not differ between those who had confirmed TB diagnosis and those who had presumptive diagnosis

**Conclusion:** Point of care tests can easily be incorporated into the clinical care of hospitalized patients in a low resource setting.

Despite the increase in the confirmed diagnosis of TB and early start of TB therapy, inpatient mortality of hospitalized TB patients remains unacceptably high. There is urgent need to identify and modify risks of death from TB in hospitalized patients. Serum CRAG screening in hospitalized patient may increase early diagnosis of cryptococcal meningitis and reduce mortality.

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### Facility-based HIV self-testing in Malawi: an assessment of characteristics and concerns among clients who opt-out of testing

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**Background:** HIV testing must increase to achieve UN 90/90/90 targets in sub-Saharan Africa. A recent cluster randomized trial demonstrates that facility-based HIV self-testing (HIVST) among outpatient clients dramatically increases testing. However, a portion of clients offered facility-based HIVST still opted-out of testing. To improve HIVST strategies, programs will require a greater understanding of why individuals refuse to test. We examined characteristics and concerns of outpatient clients in the trial who were offered and opted-out of HIVST in Malawi.

**Materials & Methods:** Exit surveys were conducted with outpatients ≥15 years at 15 facilities in Central/Southern Malawi. Surveys included sociodemographic information and reasons for opting-out of HIVST. We analyze survey data from clients who were offered HIVST and eligible for HIV testing (not tested HIV-positive and tested <3 months ago). Multivariate logistic regression models were used to assess factors associated with opt-out. We then explore the primary concerns listed by clients who opted-out of facility-based HIVST. The independent t-test was used to calculate p-values.

**Results:** A total of 1,418 outpatients were offered HIVST. Among those offered, 218 (15%) tested < 3 months ago and 81 (6%) previously tested HIV-positive. Both groups were excluded from analyses. Among those eligible for testing, 454 (34%) opted-out of facility-based HIVST (median age 29 and 39% men). Men (OR:1.41, p-value=0.004) and adolescents (OR:1.32, p-value=0.05) were more likely to refuse HIVST compared to women and adults, respectively. Among men, having fewer sexual partners was associated with opting-out of HIVST (OR:0.82, p-value 0.01). Primary reasons for opting-out were perceived low-risk of HIV-infection (42%), feeling unprepared to test (30%), not seeing the HIVST demonstration (14%), and being too busy (9%). Less than 2% did not understand HIVST instructions and only 1% wanted more privacy to perform HIVST. Men were more likely than women to report being too busy to use HIVST (OR:2.1, p=0.03).

**Conclusion:** Facility-based HIVST is largely acceptable – primary concerns are not related to characteristics of the intervention. Concerns regarding facility-based HIVST are similar to concerns for other testing strategies. Future testing strategies should include extensive community sensitization to increase client preparedness for testing and their awareness of HIV-risk. Targeted HIVST strategies for men and adolescents may be warranted.

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### Establishing a Standard HIV molecular diagnostic unit in private laboratories through sustainable financial initiative (SFI)

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**Background:** Private laboratories across Nigeria provide medical laboratory services through guidance and monitoring by medical laboratory science council of Nigeria. Most private laboratories provide rapid testing to identify client HIV status as the only service package for HIV diagnosis; while few have capacity to provide other tests such as HIV viral load monitoring and/or CD4 count. However, among the private laboratories with viral load assay capacity, most Platforms and test method used are yet to be pre-qualified by World Health Organization (WHO) and United States Food and Drug administration (FDA), with high cost per test which is usually too expensive for clients. With the plan to provide alternative testing mechanisms that are pre-qualified by WHO and FDA, and to increase VL testing efforts through FHI 360 sustainable financial initiative SFI project in partnership with Abbott molecular diagnostic and 2 selected private laboratories. This was aimed toward placement of a WHO pre-qualified test method using Abbott M2000 PCR system for HIV viral load test at two private laboratories to increase access to VL testing for PLHIV. This also seeks to ensure sustainability of viral load testing through public private partnership. FHI 360 team acted as a mediator on the entire agreement.

**Method:** Advocacy and assessment of 21 private laboratories in two states (17 in Rivers and 4 in Lagos). Standard laboratory checklist was administered across the 21 laboratories. Laboratory selection was based on scores recorded during the assessment and finally reviewed to ensure quality services are provided at such laboratories. One laboratory emerged in each state and further engaged on commitment to enter the business agreement. The collaboration was initiated through a reagent agreement plan (RAP) which is cost effective and sustainable. The partnership was established according to a business model of equipment consortium purchasing for volume based discount that bundles equipment maintenance with reagent pricing for 5 years contractual agreement between Abbott diagnostic and the 2 private laboratories. Pre-installation assessment followed by machine installation, laboratory set up and trainings, were performed at the 2 selected laboratories. The laboratories were also linked for services with other public/private facilities through expanded marketing.

**Results:** Two selected PCR laboratories were established in an existing diagnostic center, one each at Lagos and Rivers state, on reagent agreement plan for annual volume of 4,000 test at 15,500 Naira cost per viral load test. working on the existing agreement, the laboratory at Lagos entered an expanded agreement to include other assay such as HBV/HCV test at 2,000 tests per annum.

**Conclusion:** This arrangement is a way to increase access for HIV viral load monitoring and promote public-private partnership through inter-laboratory collaboration, in the most cost-effective and sustainable way to ensure effective monitoring and quality service delivery for both service provider and clients; considering the reduced funding on international aid for HIV/AIDS Global programs.

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### Youth and HIV in Rwanda: a nationwide prevalence and risk factors survey

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**Background:** Globally there are approximately four million young people aged 15 to 24 living with HIV, and 29% of those are adolescent aged 19-24(Bekker & Hosek 2015). Rwanda like other countries is experiencing a growing share of HIV positive adolescent aged 15-19 years. A subpopulation analysis of young adults who are not married nor cohabitating with partners (15-24 years) was analyzed focusing on HIV prevalence and factors associated with high risk sexual behaviors.

**Methods:** This subpopulation analysis leveraged descriptive statistics to analyze the data and generate relevant summary statistics. Further, multivariate logistic regression analyses were used to identify factors associated with high risk sexual behavior among youth. Finally, appropriate goodness of fit tests, including Hosmer and Lemeshow, Deviance and Pearson's Statistics, were performed to assess the model diagnostics.

**Results:** This analysis had a total sample size of 4,843 youths aged between 15 to 24 years who participated in the RAIHS study, of which 1,083 (22.36%) were sexually active. The analysis found that HIV prevalence among Rwandan youth aged 15-24 was less than 1 percent (0.56%). The inconsistent condom use: males vs females, odds 0.53 (0.38, 0.74). For age of sexual debut, the odds of having sex before age 15, males vs females 1.95 (1.37, 2.78). Primary education vs no education, odds is 2.31 (1.32, 4.03). HIV Comprehensive knowledge vs those without knowledge was 1.99 (1.27, 3.11). Youth from rich family vs poor family 1.75(1.14, 2.67).

**Conclusions:** In conclusion, the findings provide interesting insights into sexual activity among youth in Rwanda that have concrete implications for current and future HIV response strategies. Early sexual debut and inconsistent condom use among young adults are the two high risk factors described in this study. Further, this survey found that Rwanda national HIV prevalence is low among youth. The findings recommend to establish the special HIV programs of young adults and adolescent to better lead to a HIV free generation.

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### Homebased index case HIV testing modality incurs similar risk of testing known HIV positives as the Provider Initiated HIV Testing modality: Results: from two provinces of Zimbabwe

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**Background:** Innovative approaches like homebased index case testing have been adopted in selected districts of Zimbabwe as a way of closing the gap towards the first 90-UNAIDS target which focus on HIV case detection. Findings from Malawi and Kenya on index case testing have shown high yield rates (ranges 40-60%). FHI360 Zimbabwe started implementing homebased index case HIV testing (HIHT) in March 2016 and average yield has been 40%. However, the general impression with these high yields was that most of clients tested were previously known HIV positive clients. We report here findings from a targeted assessment of characteristics of newly identified HIV positive clients from HIHT and facility (PITC) modalities.

**Methods:** A retrospective cohort assessment of registers of clients who tested positive between September 2016 – December 2016 in Manicaland province and December 2016 to March 2017 in Midlands province of Zimbabwe, at 13 purposively selected health facilities in 6 Districts was done. We compared the rates of testing known HIV positive clients who would not have disclosed their status to the services providers between the two modalities. Facility and HIHT registers were reviewed to determine previous documented evidence of enrolment into HIV care services. Data analysis was conducted using descriptive statistics in Microsoft Office's Excel program.

**Results:** Overall, a total of 2 332 people diagnosed with HIV over a four-month assessment period through facility testing services which is PITC and HIHT based services. Individuals diagnosed included 104 children 0-14 years of age, 2 215 adults 15 years and above and 13 individuals had missing ages. Among these clients diagnosed, 1.9% (16/822) and 1.3% (19/1510) ( $p=0.248$ ) were previously known HIV positive clients as evidenced by dates of enrolment in HIV care in facility registers from HIHT and PITC respectively. Overall, more females 1.1 % (26/2332) were tested as known positive when both modalities are combined.

**Conclusion:** HIHT has a similar risk of testing already known HIV positives clients when compared with the tradition facility based testing modality (PITC). We recommend homebased index case HIV testing to be scaled-up to other districts because of its high yields and comparable risk with PITC on testing known positives who would not disclose to providers. Efforts should be made to address issues which results in the few known positives retesting for HIV.

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### Reaching the 3rd 90, HIV viral load (HVL) testing in resource constrained settings: early experience from tanzania peoples` defence forces (TPDF) & pharmaccess internationa (PAI),Tanzania

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**Background:** PharmAccess, through PEPFAR/DOD funding, supports HIV/AIDS services at 72 TPDF clinics and the surrounding communities since 2006. In 2014 UNAIDS and partners launched the '90-90-90' HIV/AIDS targets to be reached by 2020. HVL testing as a new approach for monitoring progress of HIV clients on ART was introduced in Tanzania in 2016. In 2016

five army clinics located near Mbeya and Mwanza started sending HVL samples to zonal hospitals of Mbeya and Bugando; 2 of the 3 hospitals in Tanzania that started routine HVL testing. Lugalo Military Hospital started routine HVL testing by end of 2016. Introduction of HVL services in Tanzania has posed major challenges, including availability of test storage capacity, data-handling and long turnaround time (TAT) for test results or no results at all. As of early 2017, there was sample backlogs for >5 months in the 7 HVL testing laboratories in Tanzania. Currently, 6 army clinics send a limited number of samples to nearby zonal and regional hospitals. Given the limited availability of HVL test capacity across the country, it was decided to organize HVL plasma samples transportation in a cold chain by roads, marine and air from all 36 TPDF Care and Treatment Clinics, located all over Tanzania, to Lugalo. Starting April 2017 transport was organized via 7 hubs, equipped with freezer and power back-up.

**Methods:** A review of HVL documents-laboratory request forms, manifest forms, Clients HVL register, high HVL register and enhanced adherence counselling (EAC) forms for the period from April-September, 2017 at 36 military clinics was done. The HCWs were interviewed using a structured questionnaire on HVL sample and result management. Focus group discussion with 15 expert patients (EPs) to find out the best ways of implementing HVL services was conducted.

**Results:** From April-September 2017, 91 health care workers were trained on HVL services; and 9692 samples (F: 6597, M: 3095) from 36 clinics were collected, transported in a cold chain, tested at Lugalo laboratory- representing 83% of all 11,669(F: 7946, M: 3723) clients tested during October 2016-September 2017 in 36 clinics. 7923 (82%) clients had low HVL test results whereas 3,882,473 cps/ML was the highest recorded result. The TAT for samples at Lugalo laboratory was 15 days. The farthest clinic participated in sample shipment is 1,366km away from Lugalo testing laboratory. The test results were as follows: TND: 3966, <20: 1302, 20-999 cps/ML: 2595 and 1724 results was  $\geq 1000$  cps/ML. 37 samples were rejected, 99 failed, 38 invalid and 3 with error results. A total of TSH 5,542,500/= (US\$ 2,519.32) was used for samples and results transportation.

**Conclusion:** Facilitated sample transportation increases HVL testing coverage. For sustainability, government and stakeholders should join hands to equip regional laboratories with capacity to conduct HVL testing. In the absence of such capacities, there is need for facilitated testing to save lives. The quality of the sample should be maintained at all levels from collection point to testing laboratory to avoid failures.

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### Evaluation of an HIV/AIDS workplace policy for a selected oil company in Zambia

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The main objective of this study was to evaluate the extent to which employees perceived the HIV/AIDS policy of a selected oil company in Zambia to have been successfully implemented. The level of perception was elicited by questions dealing with awareness about the policy in the company, the extent to which employees felt the HIV/AIDS policy and its programmes/activities at the workplace had been effective, and the perceived successes and failures associated with the implementation of HIV/AIDS related activities in the workplace.

The sample size of 85 (25 supervisors and 60 non-supervisors) was randomly selected from a population of around 420 employees using stratified random sampling method to ensure proportional representation. Self-administered questionnaires containing both structured and unstructured questions were distributed to all 85 sampling units.

Overall, the implementation of the HIV/AIDS policy and related programmes/activities were judged to be ineffective in contributing to managing the spread of HIV/AIDS in the workplace. The main findings revealed that there was a generally low perceived awareness of the existence of the HIV policy, its programmes, and activities. Most employees said that the policy was not being displayed at strategic points signifying little awareness and publicity activities. The majority of the (mostly junior) employees also revealed that they had been not involved to participate in HIV/AIDS related programmes/activities.

The findings showed there were more HIV/AIDS related activities perceived as failures in terms of its implementation than successes in the workplace. The HIV/AIDS related activities perceived as failing to be successfully implemented included, among other, (1) a lack of mechanisms related to dealing with employees found to be discriminating against those who are perceived to be HIV-positive, (2) a lack of autonomy by the HIV/AIDS Committee, (3) infrequent HIV/AIDS programmes/activities, and (4) lack of champions to advocate the implementation of the policy.

On the other hand, the HIV/AIDS related activities perceived as being successfully implemented included, among other: (1) the promotion of open discussion on the development of HIV intervention, (2) enhanced confidentiality and non-discrimination regarding employees' HIV statuses, and (3) management's commitment to fighting HIV/AIDS at the workplace.

On how to improve the effectiveness of the policy and its implementation, most participants stated that employees needed to be involved in the review of the policy, and the policy needs to be reviewed more often. Other suggestions included (1) encouraging learning from other employees' and companies' experiences, and (2) enhancement of the HIV committee.

The findings pointed to, among other, the following recommendations: (1) employees to be involved in implementation and review of the policy, and (2) programmes to be extended to include prevention, and care and support for employees living with HIV.

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### Influence of decision making process on uptake of HIV testing among women in Uganda

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**Introduction:** Self-respect and self-determination, one of the ethical principles influences decision making process among women to take up health care decisions. However, women have not been empowered to independently make decisions concerning their own health in Uganda since 2006. Two in ten married women (22 percent) independently decided on their own health care including HIV testing. We assessed the impact of

involving women between the age of 14-49 years in the decision-making process on HIV testing in Uganda.

**Methods:** We analyzed data from the 2011 Uganda Demographic and Health Survey, women dataset excluding women that have never had sex. Frequency distributions and binary logistic regression were used to assess the association between decision-making status of the woman and socio-economic factors accrued to the woman (education status, marital status, residence, occupation and wealth index), HIV testing and receipt of results among women of reproductive age.

**Results:** Out of 8,674 enrolled women, we included 7,364 women of reproductive age in this analysis with mean age of 30 years. Majority of the women were aged 20-39 years 5,176/7,364 (70.4%); had attained up to primary education 4,077/7,364(55.4%); were married or cohabiting 5,352/7,364(72.7%); of working occupation status 5,758/7,364(78.2%); and residing in rural areas 5,194/7,364(70.5%). We found that, only 3,446/7,364(46.8%) of the women were involved in the decision making regarding their health and these were more likely to test for HIV.

At the multivariable logistic regression analysis, after adjusting for decision making status, marital status, education level attained, occupation status, wealth index and residence; women who were involved in decision making regarding their health had increased odds of testing for HIV [OR=1.33 (95% CI: 1.02-1.75)] when compared to their counter parts that were not involved in the decision making. In addition, women with primary education and those with post primary education had increased odds of testing for HIV [OR=1.3 (95% CI: 1.1-1.5) and [OR=1.3 (95% CI: 1.1-1.5)] respectively] when compared to women with no education attained at all. It was noted that marital status, occupation status, wealth index and residence did not influence whether a woman tested for HIV or not (p>0.05).

**Conclusion:** Married women who jointly participate in decision making regarding their health with their spouses are more likely to test for HIV. Therefore, men involvement in health care especially during antenatal visits should be promoted as this will help empower women to make decisions regarding their health.

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### Achieving 90-90-90 targets in Nigeria - User Fees, A Barrier

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**Background:** Three years to 2020, the deadline for UNAIDS ambitious 90-90-90 targets, Nigeria's progress on the UNAIDS 90-90-90 country scorecard leaves much to be desired. As at December 2017, of all the Nigerians living with HIV, only 34% knew their status, only 30% have access to HIV treatment and only 24% of them are virally suppressed. Critical to changing this trajectory for Nigeria is universal access to HIV treatment. User fee is a barrier to universal access. User fees, with its negative impact on clinical and public health, is still a part of Nigeria's health system financing. In a country with poverty head count ratio of 53.5% at \$1.90 per day and considering the economic impact of HIV/AIDS on an individual or family, it is important to address the issue.

**Methodology:** The National Agency for the Control of AIDS (NACA) in its capacity as the coordinator of the national HIV response decided to engage key stakeholders on crafting a way forward. A rapid assessment of fees charged in a sample of facilities across the 36 states of Nigeria was done. Data was collected from 108 facilities on 10 services - registration card, consultation, PCV/Hb, Electrolyte/Urea (E/U), Creatinine, Alanine Transaminase, Viral Load (VL), CD4 count and drugs for opportunistic infections. An equal number of public, private and faith-based facilities were assessed. Due to the skewed nature of the data, the median fee charged was determined for each service. Representatives of the FMOH, network of People living with HIV (PLHIV), UN agencies, US' President Emergency Plan For AIDS Relief and NACA were present to deliberate on the issue with the data providing some basis for the discussion.

**Results:** The fees ranged between 55cents and 5dollars 51 cents. There were no fees charged for donor supported services - VL, CD4 except in a few private facilities. The least fee was Consultation (55 cents) and the highest was E/U (\$5.51). The least fees were from the Northern Eastern and central zones of Nigeria and highest from the North Western zone. Sustainability, equity and efficiency were identified as challenges of the National HIV response, which is a reflection of the national health system. The need for alternative financing mechanisms and greater ownership by Nigerians while advocating for abolition of user fees was also highlighted. Efforts being made by NACA were also shared with stakeholders – engagement with the National Health Insurance on enrolling PLHIVs, advocacy to state (districts) to allocate of 0.5 - 1 % of their budget to support the response. The Vice President has ordered that PLHIVs be enrolled by the National Health Insurance Scheme however an appropriate premium needs to be arrived at.

**Conclusion:** The UNAIDS 2014 document on Fast Track identifies innovative financing as a key strategy to ending AIDS epidemic by 2030. Nigeria as a country needs to evolve its own innovative financing mechanism. This should include income generating activities for PLHIVs, enrollment of PLHIVs in health insurance across all levels of governance and greater domestic funding.

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### Ensuring the Sustainability of HIV Services: The Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS) - Sustainable Financing Initiative (SFI) Model in Rivers State.

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**Background:** In Nigeria, funding for HIV/AIDS has been heavily donor-driven and largely aimed at the public sector. With decreases in funding however, sustaining HIV services has become challenging. Sustainable Financing Initiative (SFI) which is being implemented by SIDHAS was established by PEPFAR/USAID to increase private sector funding for HIV/AIDS services in Rivers and Lagos States. In Rivers State, 36 private health facilities (PHFs) were engaged to increase access to high-quality HIV services to clients willing and able to pay for them. These services excluded the cost of PEPFAR commodities. This paper aims to establish the contribution of SFI supported facilities to overall HIV services provided. We analyzed routine

HIV Testing Services data to show an existing capacity in clients of private-for-profit health facilities to pay for HIV services in Rivers State. This is to showcase alternative financing options to ensure the sustainability of HIV care and treatment amidst a changing donor environment.

**Materials & Methods:** A cross-sectional review of routinely collected data on the number of clients receiving HIV testing services at 183 (69 public and 114 private) health facilities from January 2017 through December 2017. Specifically, the proportion of individuals who received HIV testing services and people living with HIV (PLHIV) currently receiving antiretroviral therapy (ART). In addition, the number of clinical visits made by PLHIV to the 36 SFI supported PHFs in the State was collected, and this was used to calculate the PEPFAR return on investment (ROI). The source of these data was DHIS 2.0.

**Results:** A total of 142,093 individuals received HIV testing services from both private and public health facilities in Rivers State. Of the 47,770 individuals who received HIV testing services from all private facilities, the SFI supported facilities contributed 45% with 21,646 individuals. A total of 23,056 clients received care in both private and public facilities. Of the 1,161 clients who received care in private facilities, the SFI supported facilities contributed 67% with 779 PLHIV currently receiving treatment at SFI supported facilities within the state. These clients in SFI supported facilities made a total of 4,776 clinical visits between January through December 2017 which resulted in a return on investment (ROI) of \$544,989 within that period.

**Conclusions:** SFI supported facilities contributed significantly to total HIV service provision in SIDHAS supported facilities in Rivers State. This study demonstrates that there are HIV positive clients willing and able to pay for their treatment. Next steps include demand creation to identify more PLHIV willing and able to pay for services. Additional efforts to reduce the out of pocket burden for private HIV services are needed.

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### The untold story of Economics of HIV/AIDS in Resource limited settings: externalities of HIV investment in Zambia.

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**Background:** Zambia has received increased resources for HIV/AIDS programs by major Global Health partners over the past decade, most of which has been integrated in public healthcare financing to strength health systems and delivery healthcare services. There is limited evidence of the economies and diseconomies HIV investment. In this paper we examine the externalities of HIV investment in Zambia.

**Method:** We used a mixed method approach do record evidences; interviews, field observations and literature reviews. We also used expert opinion based on our experience of working in economics of HIV/AIDS for 10 years. The analysis was drawn from field work for a multiple studies which we recently conducted. Each discussion is supported by an illustration from one of these studies.

**Results:** A study sponsored by IEAN through Avenir health reviewed that HIV investment in Zambia is heavily financed by external partners and has progressively increased over the past

2 decades. Local financing is still below Abuja declaration (15%) (figure1). Conversely, though HIV services are free, patients incur costs as noted from HPTN 071-PopART and these can be barriers to accessing healthcare services.

#### Figure 1: Healthcare Budget Allocation

During economic evaluations of HTN 071-PopART (funded by PEPFAR, NIH and BGMF) and ACTA (funded by MRC) trials, we observed that there are a lot of positive spill over from HIV investment; healthcare infrastructure and workforce development, and health service management. These spill overs were more evident in laboratories, pharmacies, mother and child, and ART department including commodity storage and supply chain management system. But, there was a concern that HIV service delivery was managed by NGO staff which could lead to lack of sustainability. Facility staff were also overwhelmed by duplicative reporting processes and monitoring systems from multiple partners.

**Conclusion /recommendations:** The current HIV investment strategy must continue and strengthened. Positive spill overs from HIV investment outweighs its negative spill overs. Current HIV/AIDS debate should include discussions on best ways of investing in HIV care to also strengthen the overall health system. In the era of shrinking Donor Funding, efforts by Zambian government and its development partners should focus on utilise positive synergy between HIV investment and other health programs

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### HIV financing as a pathfinder for Universal Health Coverage? An extended cost-effectiveness analysis of the AIDS Trust Fund in Uganda

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**Background:** HIV is a disease of inequality. This necessitates “leaving no one behind” if the 2030 Agenda for Sustainable Development’s goal to end the AIDS epidemic as a global health threat is to be realised. Current global policy discourses on universal health coverage (UHC) have focussed attention on the need for increased government funding for health care in many low and middle-income countries. To this end, recognising that fast-tracking HIV/AIDS responses is key to progress towards universal health coverage – owing to its significance in terms of fiscal and burden of disease terms – Uganda has, since 2014, approved the establishment of an AIDS Trust Fund. The growing commitment to UHC notwithstanding, there is paucity of empirical evidence on how disease-specific funding can be leveraged to progress towards UHC. The objective of this paper is to empirically analyse how the AIDS Trust Funds can be leveraged for financing UHC through the National Health Insurance Scheme, including an explicit quantification of the ensuing health and poverty alleviation benefits and distributional consequences of this health financing policy.

**Materials & Methods:** To integrate equity and financial protection considerations into traditional cost-effectiveness analysis (CEA), this paper uses state of the art “extended cost-effectiveness analysis” (ECEA). This provides a methodological framework of economic evaluation to determine the distributional and financial risk protection consequences of UHC financing policy in Uganda. Specifically, the benefits explored

span over four dimensions: health benefits, direct costs, financial risk protection and, distributional consequence over income quintiles. Additionally, the basic principles that any decision rules should embody are articulated. The incidence, health service utilisation and expenditure related to UHC per national income quintiles was obtained from multiple data sources.

**Results:** The ensuing health benefits of the AIDS Trust Fund in financing priority health programs towards UHC and reducing out-of-pocket (OOP) expenditure are distributed fairly evenly across quintiles. This, in turn, could bring substantial health gains and financial risk protection benefits. However, poverty alleviation benefits are concentrated among the poorest populations groups. Finally, the AIDS Trust Fund, as a revenue stream – in the absence of integration into health financing systems – may result in inefficient spending allocations.

**Conclusions:** This paper calls for an overhaul of the health economist’s methodological toolbox owing to two distinct features of the AIDS epidemic and response that make application of standard economic evaluations methods altogether unsatisfactory. ECEA builds on standard cost-effectiveness analysis (CEA) in three dimensions, all of which enhance the ability of stakeholders to evaluate health financing policy. The methods we developed and employed in this study can therefore be a useful application in further analyzing public policy across a wide range of health financing policy instruments and places. Also, this paper discusses the role of trust funds of financing priority health programs in the practice of and the policy discourse on the sustainable financing of UHC, and also draws lessons from the non-health-specific literature on earmarked taxes and extrabudgetary funds.

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### A mathematical modelling analysis to improve the allocative efficiency of the response to HIV/AIDS in Uganda

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**Background:** The global response to HIV/AIDS is at a crossroads. The global HIV funding landscape is changing as international investments in the response have stagnated and plateaued and its future prospects face an uncertain outlook. In Uganda, the quest to “end the AIDS epidemic as a public health threat by 2030” will be won or lost depending on how optimally HIV resources are used. Consequently, focused HIV/AIDS responses design, better targeting of resources, and efficiency in program delivery are essential to ensure that programs can do more with less. This paper presents an allocative efficiency analysis to answer the following policy question: how can HIV funding be optimally allocated to the combination of HIV response interventions that will yield the highest impact in Uganda?

**Materials & Methods:** This analysis is undertaken through an application of the mathematical modelling tool called Optimization and Analysis Tool (Optima) version 2.0. Optima 2.0 is a mathematical model of HIV transmission and disease progression, which uses an integrated analysis of epidemic, program and cost data to determine an optimal distribution of investments. Calibrated to Uganda’s HIV epidemic and response data, this population-based and flexible model provides a formal method of optimisation and determines optimal allocations of

HIV resources across numerous HIV programmes, target populations, and funding levels. Finally, novel in this paper is an embedded political economy analysis of the ensuing recommended policy and programmatic shifts.

**Results:** We find evidence of large potential gains in efficiency. These are largest in reallocating funds from general population to antiretroviral therapy (ART) and key populations programming, particularly focussing on female sex workers and men who have sex with men. Reallocating expenditure to priority geographic areas, more efficient community oriented service delivery models, further task shifting, and integration could help improve the efficiency of HIV spending. Policy tools to realise these identified potential efficiency gains are identified.

**Conclusions:** Resources devoted to the HIV/AIDS response in Uganda are currently not being used as efficiently as they could. This paper has identified areas where Uganda can increase the allocative efficiency of its HIV intervention programs. However, allocative efficiency gains are constrained by “locked-in costs” (owing to the long period over which fiscal costs of the AIDS response evolve). Thus, realizing these identified potential efficiency savings requires a painstaking focus on implementation processes and methods. Finally, insights from political economy offer a better understanding of the dynamics underpinning power and resources (re) allocation and the attendant contestations to assure maximum impact of implementing the study recommendations and consequently leverage the same to expand fiscal space for the national HIV/AIDS response.

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### At what cost? An estimation of resource needs for HIV and AIDS epidemic control in Uganda

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**Background:** Following the adoption of the Global Goals seeking to end the AIDS epidemic as a public health threat by 2030, the national government, donors, and international organizations are all anxious to forecast the resources needed to achieve this goal in Uganda.

**Materials & Methods:** This paper, using a novel methodology that takes potential efficiency gains into consideration, uses time-variant flexible unit costs and fairly apportions costs of enablers and development synergies to HIV response, provides an empirical analysis of net financial resource needs to “end the AIDS epidemic” by 2030 in Uganda. Additionally, this study is the first application of the standards and principles of the Global Health Costing reference case in Uganda.

**Results:** In absolute terms, over a 15-year period (i.e. 2016 – 2030), the total gross resource needs (GRN) amounts to US\$ 11,222 million and US\$ 14,360 million for the Fast-Track and Business-As-Usual scenarios respectively. Thus, by strategically choosing the Fast-Track scenario over the Business-As-Usual scenario, US\$ 3,138 billion is saved. Antiretroviral therapy (ART) accounts for over one-half of all projected expenditures. As the economy will also benefit from productivity gains as people who are too sick to work due to HIV can recover their productivity through ART, the discounted value of these productivity gains is

equal to about US\$1,863 million compared to the discounted incremental costs of US\$ 1,435 million. From a micro-macro perspective, efficiency savings of 24.7% are estimated. Consequently, this translates into a net financial resource need (NRN) of US\$ 9,672,341,383.

**Conclusion:** Scaling-up to meet the Fast-Track goals - to near universal coverage of key prevention and treatment interventions - will be a good investment but it will also require a significant increase in resources devoted to HIV/AIDS. To marshal the efficiencies identified and move the country towards realising the needed resources, using insights from behavioral economics literature, tools and practice, we present nascent ideas to encourage a range of desired behaviors to realize the identified potential efficiency gains.

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### Role of onsite mentorship and coaching in reducing viral load sample rejection rates: a case study of Kabarole district in western Uganda

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**Background:** To attain the third 90 in line with the UNAIDS strategy, Uganda has scaled up the use of Viral load monitoring for all ART patients, however VL sample rejection remains one of the major hindrances to the achievement of VL coverage. Kabarole district registered a high rejection of VL samples at 43%. Poor quality of samples and incomplete filing of the VL requisition form were main causes for rejection. A project was started to assess the impact of quality improvement on reducing VL rejection rates through mentorship and coaching.

**Methodology:** 15 sites with VL rejection rates above 5% were selected for the project, a team of competent clinical mentors in VL monitoring were identified, paired and assigned to the 15 health facilities. 5 teams each comprising of a clinician and a laboratory technician were formed. Each site was mentored for three days. The onsite mentorship process involved each team working the health workers in the HIV clinics. Coaching was done for skills in phlebotomy and filing in of the VL requisition form. Each facility received 4 rounds of mentorship. Data on VL sample rejection rates were monitored using the national VL system and reviewed quarterly for 9 months.

**Results:** There was a decline in the rejection of VL samples from 43% to 3%. The decline was different across the 15 health facilities and was gradual over time. Health workers were more competent in sample collection and VL requisition. Non laboratory health care workers were able to do DBS phlebotomy which reduced client waiting time. An increase in the rejection rates was observed when new staff attempted to do DBS VL phlebotomy for the first time, this improved with coaching and mentorship.

**Conclusion:** Mentorship and coaching is critical to building skill and capacity in the collection of VL samples using DBS and filing of the sample requisition VL form. Follow up of is critical to the effectiveness of the mentorship and acquisition of skill to address the capacity gaps of newly enrolled staff.



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### Progress on Uptake and Impact of Remote Sample Log-in System on Early Infant Diagnosis for HIV in Western Kenya – Laboratory Perspective

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**Background:** Online remote login of Early Infant Diagnosis (EID) Human Immunodeficiency Virus (HIV) test order at health facilities is a strategy by the Kenya Ministry of Health through National AIDS & STI Control Program (NASCOP) to improve accuracy in data capture and turn-around-time at testing laboratory. This analysis assessed the uptake and impact of health facility remote login of EID HIV test requests.

**Methodology:** Health facilities from western Kenya networked to KEMRI HIV-R laboratory for EID HIV testing were assessed for uptake and impact of remote login. Test requests (21,716) entered into the NASCOP database between January through October 2017 (excluding September) were extracted. A questionnaire was also administered to data clerks at the testing laboratory to obtain data on system efficiency and entry correctness. The findings have been reported in frequency percentages and average counts.

**Result:** Of the 595 health facilities, 12.3% (73/595) had embraced remote log in. Kisumu County had the most (30/73) facilities that remotely logged EID samples. Uptake of remote login of samples remained approximately constant at 5.7% facilities monthly. Data verification for entries of remotely logged samples at test lab took approximately 30% less time compared to entries made at the testing laboratory. However, errors made from remote entries required approximately 30% more time to rectify. Both remotely logged and test-lab entered samples had average turn-around time (TAT) of 4 days from reception to dispatch of results. Ninety percent (37/41) of rejections on remotely logged entries were due to double entries, and inaccurate patient demographic information.

**Conclusion:** Uptake of remote login remained generally low and therefore did not impact much on TAT. There is need for continuous training, mentorship and supportive visits to ensure accuracy and efficiency of the system.

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### Social dimensions of Returnee PLHIV Lost to Follow-Up Clients who returned to care – Perceptions and correlates

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**Background:** Although a remarkable progress has been made over the past decade on increasing access to ART; failure of retention of HIV-infected individuals in treatment programs due to losses to follow-up (LTFU) in HIV programs is common and a challenge in Sub-Saharan Africa including Nigeria.

LTFU impacts epidemic control by reducing retention across the care-continuum thus limiting optimum health outcomes for PLHIV and distorting global evidence for the preferred outcome of HIV treatment in an era of rapid ART scale up.

People living with HIV (PLHIV) are constantly faced with social and psychological issues such as lack of social support, non-disclosure of HIV status, food insecurity and stigma, that impacts on their level of adherence to clinic visits or antiretroviral treatment causing negative health outcomes.

This study categorized the opinions and experiences of PLHIV who returned to care, with respect to barriers to retention in HIV care and explored its associations.

**Methods:** This was a cross sectional survey of PLHIV presumed LTFU from 99 PEPFAR supported healthcare facilities (HCF) across 10 states in Nigeria that were encouraged to return into care after tracking. Demographic and social factors affecting care including stigma, disclosure and access to care amongst other variables were analyzed to determine the predictors of difficulty in accessing HCF.

**Result:** Of the 7483 clients tracked, 1386(18.5%) were confirmed active and in care while 2846 (38%) were LTFU. Tracking helped return to care 562 and discovered 514 deaths. A total of 843 had voluntarily discontinued care on a claim of being healed and 538 had wrong addresses. 438 of 562(77.9%) agreed to participate in the review.

About 50% returnee PLHIV had difficult HCF access, 30% had a previous LTFU event, while 23.5% reported experiencing or suspecting stigmatizing behavior. 54.1% complained of low financial support and 19.9% signified need for emotional/psychological support. Bad/risky roads, cost of transportation, far distance to facility and long working hours are all strongly associated with difficulty in accessing the health facility,  $\chi^2(4) = 294.00, p < 0.001$ . Those who reported difficult access to health care facilities were twice as likely to have had a prior LTFU (OR 2.5 [95%CI 1.3-4.8],  $P=0.008$ ), twice more likely to have had a history of being stigmatized (OR 2.1 [95%CI 1.1-3.8],  $P=0.02$ ), about three times more likely to have lacked support (OR 2.8 [95%CI 1.3-6.0],  $P=0.01$ ) and about four times more likely to have perceived in-adequate HCW support (OR 3.8 [95%CI 1.2-11.2],  $P=0.02$ ).

**Conclusion:** Our study has clearly demonstrated that untoward psycho-social realities of PLHIV exists which interact extensively with health systems gaps to impede linkage of HIV infected individuals to treatment amplifying poor clinical and epidemiologic outcomes that may affect HIV program effectiveness and efficiency.

There is an urgent need to build social constructs and dimensions into HIV service delivery models to improve retention in care of PLHIV. Such constructs would include home visits, community-based care services, transportation subsidies and strong social support systems which have been demonstrated in previous studies to reduce the likelihood of LTFU.

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### Effects of mentoring on documentation practices in health facilities in Center region of Cameroon

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**Background and Objectives:** Reliable data are essential to track progress towards health objectives such as the UNAIDS 90-90-90 targets. Poor data quality makes it difficult to make timely decisions and track progress towards targets. Studies have demonstrated that peer clinical mentoring is essential to improving quality of HIV care in low-resource settings. CHAI in collaboration with MOH adopted clinical mentoring as part of a PMTCT program deliver package. The objective was to improve quality of services and quality of data in health facilities supported by the program.

**Methods:** Clinical mentors who were experienced nurse/midwives were assigned to health facilities. Prior to mentoring, service providers benefited from didactic training and practical exercises on documentation tools. Post-training mentorship was conducted to improve quality of PMTCT services and documentation of health services. Mentoring consisted of observation of service providers and provision of coaching and feedback through demonstrations. High volume facilities were mentored on a monthly basis and mid-low volume facilities quarterly. Remote phone support was provided to service providers on demand. Variables were collected at baseline in 2014; two data quality assessments were conducted in 2015 and 2016 in select health facilities to assess progress in data quality.

**Results:** All variables experienced an increase in performance over time; completeness at baseline was 54% and 88% at end line, accuracy at baseline was 66% and 90% at end line, consistency at baseline was 55% and 72% at end line, availability at baseline was 65% and 95% at end line and timeliness at baseline was 57% and 85% at end line. Of all six variables, completeness scored highest (63%) increase in performance over the period of implementation while consistency scored lowest (31 %) Mean increase for all variables was 15% with each DQA.

**Conclusion:** These results were obtained in a program setting with significant resource investments. To ensure sustainability, mentoring needs to be incorporated in routine service delivery models and the role of mentors assimilated into MOH service delivery models.

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### "Learning partners for improved service delivery: An experience of reducing viral load rejection rates in Rwenzori region of Uganda through targeted mentorship and coaching"

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**Background:** Viral load monitoring, VL is a key component to the 90-90-90 strategy to improve viral suppression among people with HIV on ART. High VL rejection rates 5.30% in Rwenzori region, remains one of the hindrances to the attainment of the third 90 in Uganda. The objective of the study was to assess the impact of capacity building of health workers through targeted mentorship and coaching focusing on VL sample requisition and collection.

**Description:** A team of exemplary health workers were trained on VL sample requisition, collection and the skills of mentorship. Health workers were certified as mentors and paired with clinicians providing ART services 125 health facilities in the 8 districts of Rwenzori

region in Uganda. Mentors worked with clinicians in the ART clinics on days of ART refills during which health workers were mentored and coached on VL requisition and sample collection using DBS and plasma phlebotomy. A mentor-mentee relationship was created to allow for peer-peer learning. Mentors worked with mentees (clinicians) bi monthly for 12 months. VL rejection rates were monitored using the national online VL data platform, results rejected were audited by the mentors and the clinicians to re-enforce corrective learning. The same mentors were maintained for each health facility for the 12 months

**Lessons learned:** There was a marked reduction in the VL rejection rates from 5.30% in January 2017 to 0.19% in December 2017 across the 8 districts in the 12 months of the follow up mentorship and coaching. Health workers acquired knowledge and skill on VL sample requisition and collection through mentorship and coaching. Rejection of samples due to incomplete form filing and poor quality samples reduced. Non laboratory staff were more receptive to DBS phlebotomy and this reduced client waiting time and improved viral load coverage as well.

#### Conclusions/Next steps:

Targeted mentorship and coaching can be used to build the capacity of health workers to competently request for and collect VL specimen. The mentor and mentee relationship once established and maintained through continuity of mentorship will ensure that newly recruited staff acquire the knowledge and skill.

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### Building the capacity of front-line health workers to provide HIV/AIDS care through onsite facility based trainings. An experience of the rolling out the revised test and treat guidelines in western Uganda

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**Background:** There is no published evidence on the effectiveness of onsite facility based trainings to build the capacity of health workers that provide HIV/AIDS care in Uganda. To effectively roll out the revised HIV/AIDS consolidated treatment guidelines recommended by the Ministry of Health Uganda, Baylor-Uganda developed a regional training and scale up plan. The training plan involved regional training of trainer trainings (TOTs) and facility based trainings. Targeted participants for the facility based trainings were all clinical and non-clinical providers of HIV/AIDS care/support services. A total of 162 health facilities received onsite facility based trainings on the revised HIV/AIDS treatment

guidelines that recommend ART initiation for all HIV positive persons. The purpose of this assessment was to determine the effectiveness of facility based trainings in building the capacity of health workers to provide HIV/AIDS services in accordance to national guidelines.

**Methods:** Training data of 1445 trained health workers with complete paired pre and post test results were extracted and analysed. A paired t test was done using STATA to determine the statistical significance in the knowledge gain between the pre and post test results.

Changes in the behaviour of the trained participants was determined from the results of the clients initiating on ART and the decline of clients from the pre-ART pool. Changes in the trends of number of clients initiating ART and declines in the number of clients active on ART was assessed for statistical significance using ANOVA in excel.

**Results:** A total of 162 Health facilities were trained, 1445 clinical and non-clinical health workers completed the facility based trainings. The average mark scored in the pre-test was 44. 17 %. The average mark scored by participants in the post test was 69.20%, showing the participants performed better in post-test compared to pre-test. Further analysis to determine whether there is a significant difference between the average pre-test mark and post-test mark. From the results, we reject the null hypothesis that there is no significant difference between the average pre- test and post-test marks.  $P - \text{Value} < 0.0001$ . Changes in the number of clients newly initiated on ART and decline in the numbers of clients active on pre-ART was tested for statistical significance showed that the changes in both new ART initiations and numbers of clients active on ART was significant demonstrated by a negative trend slope using ANOVA and p value  $< 0.0001$ .

**Conclusion:** Facility based trainings are an effective training approach to build the capacity of frontline providers of HIV/AIDS clinical care and support. Through facility based approach a bigger pool of clinical and non-clinical care personnel which builds the critical mass of knowledgeable health workers to implement effective HIV/AIDS services.

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#### Mapping, size estimation, and validation for microplanning: linkages/Swaziland's approach to accelerating reach among key populations

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**Background:** The World Health Organization recommends that key population (KP) programs conduct hot spot mapping, size estimation, and validation (MSV) to determine the number of eligible spots to be served against which actual program coverage can be measured. We present experience from conducting MSV to guide program start-up for female sex workers (FSWs) and men who have sex with men (MSM) by the USAID- and PEPFAR-supported, FHI 360-led LINKAGES/Swaziland project.

**Methods:** We used a snowball sampling method to map, validate, and conduct size estimations of initial hot spots for FSWs and MSM in Hhohho, Lubombo, Shiselweni, and Manzini regions between April and June 2017. Interviewing teams comprised KP outreach workers from FHI 360 LINKAGES and KP-led community-based organizations. Semi-structured interviews were employed; FSWs and MSM were contacted and asked to identify existing and new spots, estimated number of KPs, number of FSWs visiting hot spots/MSM safe spaces on a usual day and peak days and estimated sizes. The identified spots were independently validated and compared to a predetermined list of hot spots reported by KPs. Quantitative data were collected using LINKAGES program tools. The Swaziland Ethics Committee determined that no ethical approval was required for project implementation.

**Findings:** A total of 246 hot spots (218 FSWs, 28 MSM) were identified with an estimated 4,264 FSWs and 287 MSM. Sixty percent (n=130) were new spots, 72% (n=179) were bars, 7% (n=16) street-based, and 21% (n=51) others, including (n=12) brothels. Friday through Sunday are the peak days. Hhohho region had the highest estimated number of FSWs (35%; n=1,491) and Shiselweni had the lowest number of FSWs (8%; n=361). **The Methods:** used were successful in obtaining data for FSWs but not MSM.

**Conclusion:** Mapping and validation of hot spots is essential for microplanning to inform KP HIV interventions at program start-up. Snowball sampling appears to be an appropriate method in mapping and validating hot spots for FSWs; however, it has limitations in mapping MSM networks due to network dynamics in Swaziland.

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#### Peer and economic influences on men's decision to attend antenatal care clinics including HIV testing: a qualitative study from Blantyre, Malawi

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**Background:** The literature identifies a number of barriers that deter men from being involved in antenatal care attendance (ANC) together with their partners during pregnancy including fear to test for HIV, poor attitude of health workers. However, there is limited data on the role that peers and perceived economic impact play as key barriers for male involvement. In this qualitative analysis we focus on peer and economic influences as main barriers identified from a formative study for a cluster randomized trial in urban Blantyre, Malawi.

**Materials & Methods:** A descriptive qualitative analysis using simple thematic analysis was performed on data from a formative study conducted before implementation of the partner-provided self-testing and linkage (PASTAL) trial which investigated testing and linkage to care or prevention for male partners of antenatal care clinic (ANC) attendees. The data from this formative study were previously published but focused on acceptability of proposed interventions for the PASTAL trial. Six focus group discussions (FGDs) and twenty in-depth interviews

(IDIs) were translated and transcribed before the coding process was undertaken. Participants in these FGDs and IDIs were purposively sampled from ANC attendees and their male partners although these did not need to be necessarily couples.

**Results:** Three people inductively coded the data manually and identified the two themes: peer influences and economic worries. Firstly, men were more inclined to follow the line of thinking and action dictated by their friends in the community, and would not attend ANC together with their partner at the expense of this strong peer bond. Negative experiences of some men who attended ANC with their partners was used as a strong example to discourage each other from attending ANC. There was a feeling of perceived stigma around ANC attendance among men in the light of peer views.

Secondly, in extremely poor settings, ANC attendance was down ranked in terms of priority because men as bread winners could not spend money to get to ANC. More importantly men felt that time spent at ANC could best be used on income generating activities to meet pressing economic needs of the household. There was a gendered view regarding ANC attendance with men feeling that ANC responsibility was for women whereas economic burden was theirs.

**Conclusions:** Our analysis suggests a multi-pronged approach for addressing key worries expressed by men to get them involved in ANC activities. These may include: financial incentives to mitigate economic impact and educational interventions.

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### Impact of Task Shifting and Multipoint Testing on increasing access to HIV testing: A Comparative Study across Health Facilities in the 3 PEPFAR Priority LGAs in Rivers states, Nigeria.

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**Background:** About 13.4 of the 36.9 million people estimated to be living with HIV globally remain undiagnosed. The first of UNAIDS 90-90-90 target focuses on increasing access to HIV testing services. Governments have struggled to deploy new health workers to meet needs for human resources for health. Task shifting among existing personnel has been proposed as a strategy to help increase access to services. We compared the impact of task shifting and multipoint testing in the attainment of UNAIDS first 90 across the 3 priority LGAs (Eleme, Obio Akpor and Port Harcourt) in Rivers State.

**Materials & Methods:** A pre-and post-intervention study: pre-intervention phase from October 2014 to September 2015, post intervention phase from October 2015 to September 2016. The routine standard for HIV testing prior to the intervention was testing by professional laboratory staff. The intervention addresses efficiency of laboratory services and increase of HIV testing services. Task shifting was introduced, less specialized workers trained on quality HIV counseling engaged to carry out testing to increase access. Multipoint testing was also adopted to increase coverage through provider initiated testing and

counseling at different service delivery points. We reviewed HIV testing service (HTS) data of all health facilities supported by the Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS) project across the three priority LGAs in Rivers State. Chi square statistical analysis was carried out using SPSS to test the effect of the intervention.

**Results:** A total of 98,459 and 109,502 individuals visited the facilities during the pre-intervention phase and post intervention phases respectively, of these, 50,266 and 90,219 were counseled and tested for HIV at the pre-intervention phase and post intervention phase. There was a statistically significant difference between HTS uptake before and after the intervention, with 51% uptake pre-intervention as against 82% uptake post intervention [ $p < 0.001$ ]. HIV positivity rate at post intervention (5%) was significantly higher than HIV positivity rate at pre-intervention (3%) [ $p < 0.001$ ].

**Conclusion:** Our study demonstrates that task shifting and multipoint testing are effective strategies for optimizing HTS towards achieving UNAIDS 1st 90 target.

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### Understanding the impact of policies for delivering universal antiretroviral therapy on the health workforce in Tanzania and Malawi: Evidence from repeated health facility surveys from 2013-2017 and qualitative interviews

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**Background:** Policies for universal antiretroviral therapy (ART) may negatively impact on the health workforce in African settings if task-shifting and training efforts are outpaced by growing patient numbers and evolving guidelines. Our study examines the impacts of universal ART policies on the health workforce in Malawi and Tanzania from 2013-2017.

**Methods:** Three rounds of facility surveys were conducted (2013, 2015, 2017) in health facilities serving the populations of rural demographic surveillance sites in Malawi (n=5) and Tanzania (n=10). Data were collected on HIV counseling and testing (HCT), ART and prevention of mother-to-child transmission (PMTCT) services. In-depth interviews were conducted with HIV providers to understand their experiences of offering care in the context of changing ART guidelines. Interview transcripts were coded and analyzed thematically.

**Results:** In both sites, increasing patient numbers in HTC, PMTCT and ART services were not always met with corresponding increases in providers and this resulted in progressively higher patient loads per provider in both sites. Malawi registered a more than 3-fold increase in number of patients accessing HTC services in the sampled health facilities per month between 2013 and 2017 while in Tanzania this increase was much higher from an average of 288 HTC clients per month to 3270 in the same time period. The total number of providers involved in HTC services in the facilities increased from 21 to 27 in Malawi and from 24 to 104 in Tanzania. The results also showed a nearly 4-fold increase in patient load per provider for ART providers in Tanzania.

The cadre mix of providers varied by site and changed over time, with a higher and growing proportion of lower cadre staff (lay counsellors, nursing assistants) in Malawi. Overall, a higher proportion of HCT providers reported undergoing refresher training compared to PMTCT or ART providers. The proportion of PMTCT providers undergoing refresher training peaked in 2013 in Malawi and 2015 in Tanzania, following Option B+ implementation.

Providers in both sites reported that high patient loads and insufficient training hampered the quality of care, with HTC providers in Malawi reporting that the high number of HTC clients prevented them from following some policy guidelines that required them not to provide HTC services to not more than a stated number clients per day to ensure quality services. Furthermore, training was more often described as being “on the job” in Tanzania, which some providers felt hindered their learning. In Malawi, the introduction of lay counsellors eased the workload of HCT providers, but challenges included their integration within clinics.

**Conclusion:** Although increasing patient numbers in both settings bodes well for achieving the first two 90 targets, the quality of care may be undermined by increased workloads for many providers. Task-shifting strategies are helping to address workload concerns in Malawi but should be carefully monitored to ensure effective implementation.

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### Sustaining WHO Regional office for Africa (AFRO) recognition in five Laboratories supported by FHI360 / Strengthening Integrated Delivery of HIV /AIDS Services (SIDHAS) project in Nigeria

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**Background:** Sustaining a culture of quality measures by attaining and improving on certain benchmarks remains a challenge in medical laboratory settings in Africa. In 2010, Nigeria like other countries in Africa adopted the World Health Organization Regional Office (WHO AFRO) recognition process based on Stepwise Laboratory (Quality) Improvement Process Towards Accreditation (SLIPTA) framework. The process provides formal recognition by WHO AFRO after a successful certification audit and the Laboratories are rated using a five-tiered approach (zero star – five star) based on the audit findings. The recognition certificate issued by WHO AFRO is valid for a period of two years after which a re-certification audit is expected. Here, we present the performance improvement scorecard of five Laboratories supported by USAID through FHI 360 SIDHAS project.

**Materials & Methods:** Five Laboratories pre-qualified for the recognition process were audited and certified by African Society for laboratory Medicine (ASLM) auditors on behalf of WHO – AFRO in 2013/2014. The Laboratories received on site-mentoring by qualified in – country mentors and participated in centralized Quality Management System (QMS) trainings. Laboratory QMS documents were newly developed or reviewed as required in accordance with ISO 15189 standard and SLIPTA checklist requirements. Key laboratory staff received specialized training on internal auditing process, biosafety, risk assessment, root

cause analysis and corrective action. The team of auditors used the WHO/AFRO– SLIPTA checklist for the re-assessment in 2017. Laboratories were classified using a zero to five-star rating, based on the WHO/AFRO quality improvement stepwise approach. Critical interventions include advocacy and sustained stakeholders’ engagement, capacity building, mentorship and implementation of quality improvement projects.

**Results:** The Laboratories attained recognition and improved / sustained the recognition after a period of three years. At the end of the initial certification audit: one of the laboratories attained 3- star, one attained 2 – star and the remaining three were at 1- star. At the re -certification audit about three years later, two of the labs on 1 – star rating improved their quality status and now attained 3-star, the third lab initially on 1 – star rating demonstrated a quantum leap and was rated 4-star, the lab on 2 – star also improved to 3- star while the fifth laboratory initially on 3 – star dropped a ‘star’ at re-certification audit and was rated 2 – star.

Some of the improvement projects carried out by the Laboratories were: reduction of specimen rejection rate, improvement of inventory management, equipment management, implementation of safety audit and strengthening the documentation process.

**Conclusions:** The sustained engagement and intervention on Quality Management system resulted in the measurable improvement in the five Laboratories using the international benchmark. The use of in - country Laboratory mentors as well as centralized trainings are instrumental to the achievement as well as cost effectiveness of the Quality Improvement exercise. Change of leadership /lack of continuity of QMS process could result in decline of quality status.

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### To prevent HIV transmission, 90% of people living with HIV must know their status. A mixed-Methods: study to explore the translation of HIV policy to practice between 2013-2017 in Malawi and Tanzania.

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**Background:** Modelled 2017 UNAIDS estimates show that in eastern and southern Africa, progress towards the 90-90-90 targets (90% of people living with HIV to know their HIV status, 90% of them to be on effective antiretroviral treatment (ART), 90% of those on ART to have viral suppression) is slowest for the first 90, e.g. 52.5% in Tanzania and 72.7% in Malawi.

We examine changes in national HIV testing and counselling (HTC) policies and corresponding service delivery indicators in Tanzania and Malawi over the period 2013-2017 to investigate the relatively low achievements for the first 90.

**Methods:** We reviewed 10 national HTC policies using a framework-guided policy extraction tool covering the periods 2013-15; 2015-2016 and 2017-18. National policies were categorised by explicit or non-explicit adherence to 14 HTC policy

indicators and compared with World Health Organisation (WHO) guidance.

Cross-sectional surveys were conducted in the same three time-periods in health facilities serving the populations of rural health and demographic surveillance sites in each country. The survey tool included the delivery of HTC services. Facility-level implementation of each HTC indicator was categorised as high (>70% of facilities), moderate (30-70%) or low (<30%) to assess the degree of implementation of each national policy. Average monthly number of tests by HTC service was collected over the last three-month period and compared over time.

**Results:** In general, both countries' HIV testing policies were explicit and well-aligned to WHO guidance. Malawi had non-explicit policies on mobile outreach in all rounds, and both countries' policies on anonymous testing procedures were implicit in all rounds. There was poor implementation of outreach and key and vulnerable populations HTC services (implemented by <30% of facilities) in all rounds in both countries.

Facility-average total number of clients tested per month increased strongly over time (from < 100 to > 300 in both countries), with notable differences between settings in the increases per HTC model. HTC for couples increased from 9 in round 1 and 2 to 53 in round 3 for Malawi and remained at 10 for Tanzania, i.e. remained low overall in both settings.

**Conclusions:** Both countries had several gaps in HCT service delivery, despite generally explicit national policy directives. These implementation gaps are likely to undermine efforts to reach the first 90 and reduce HIV transmission if the key and vulnerable population is not reached. Further policy research should explore the underlying reasons for gaps in policy implementation.

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### Reaching the third 90 with a simple viral load quality improvement program in health facilities in Malawi

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**Background:** The UNAIDS 90-90-90 goals call for 90% of HIV-infected individuals on antiretroviral therapy (ART) to have a suppressed viral load (VL) by 2020. Scale-up efforts have largely focused on laboratory systems, with less attention on facility-level strengthening of staff who facilitate VL testing. To address this gap, we implemented a quality improvement (QI) program at 14 health facilities in Malawi supported by Partners in Hope-EQUIP, a PEPFAR/USAID mentorship program.

**Methods:** In April 2016, we performed an assessment in health facilities in Central/Southern Malawi to identify facility-level barriers to VL testing. Findings informed the development of VL tools used in a QI program that focused on patient and provider VL knowledge and clarification of site-level roles and

responsibilities, including the designation of a VL "Focal Person" to oversee all VL activities. Tools include: (1) standard operating procedures for VL testing that incorporate the Focal Person; (2) VL educational materials; and (3) job aids for the Focal Person. Orientations lasting 3-4 hours were conducted by clinical mentors in May 2017 in 14 health facilities representing both rural/urban hospitals and health centres. Monthly follow-up visits were performed to provide mentoring. We compared the number of VL tests performed at these sites before (November 2016-April 2017) and after (May- November 2017) implementation of the QI program. P-values were calculated using independent t-tests.

**Results:** The average number of VL tests performed increased by over 135% after implementation of the QI program (p-value = <0.001). Increased VL testing was sustained during the 6-months of follow-up. By mentoring facility staff on a monthly basis and appointing a Focal Person, VL procedures were optimized and streamlined, improving systems for client identification, sample collection, and results reporting. Increased education among patients allowed for "demand creation" while increased awareness among providers improved their ability to navigate the VL cascade.

**Conclusions:** A simple QI program focused on improving VL knowledge among patients and providers and clarifying staff roles at a facility-level doubled VL testing over an extended period of time. Further investigation is needed on whether this program can be scaled in different settings across sub-Saharan Africa and on the duration of follow up required for sustained improvements in VL testing.

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### The role of escort services in ensuring complete referrals of identified presumptive TB cases among People Living with HIV (PLHIV) in Braithwaite Memorial Specialist Hospital

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**Background:** Tuberculosis is a major public health problem in Nigeria, with the country ranking 10th among the 22 high TB burden countries of the world and fourth highest in Africa. In 2015, there were an estimated 10.4 million new tuberculosis (TB) cases, 1.2 million (11%) of these were among people living with HIV. Early identification of TB cases among PLHIV is key to timely treatment and management. This study seeks to assess the effectiveness of TB referral coordinators escort services system in ensuring all identified TB presumptive cases access TB diagnosis in the directly observed treatment short course (DOTs) clinic.

**Materials & Methods:** This is a pre-and post-intervention study conducted in Rivers State. The pre-intervention phase (PIP1) covers the period: March 2015 – December 2015 while the post intervention phase (PIP2) was from March 2016 – December 2016. The study reviewed service data of presumptive TB cases referred to the DOT clinic. Prior to the intervention, identified presumptive TB cases were given referral forms and allowed to go to the DOTs alone. The intervention focuses on the engagement of trained facility based TB referral coordinators

with a clear job description to ensure intensified case finding, documentation and reporting with provision of technical support to implement high quality TB/HIV integrated service. Escort services was adopted as the means of referral of all presumptive TB cases to DOTs. This was achieved by walking down every TB suspect at any point of identification to the DOTs unit for further diagnosis.

**Results:** At PIP1, a total of 450 PLHIV were screened for TB. Of the 95 presumptive TB cases identified and referred to the DOTs using referral forms, 45 got to the DOTs (47%) and 50 were missing in transit (53%). Of the 45 that got to the DOTs, 15 (33%) were diagnosed of TB and commenced on TB treatment. At the PIP2 under the coordination of the facility based TB referral coordinators, a total of 3,816 were screened for TB. Of the 597 presumptive TB cases identified and provided with escort services, 560 got to the DOTs for diagnosis (94%) and only 37 persons couldn't get to the DOTs (6%). Of the 560 that had a diagnostic testing, 320 (57%) were diagnosed of TB and started on TB treatment accounting for an increased case notification among PLHIV.

**Conclusions:** The engagement of facility based referral coordinators has been very effective both in optimizing TB screening and increasing case finding. Escort services among other methods of referrals have proven to be very effective in increasing case detection and ensuring complete referral. The role of escort services as an effective referral system cannot be underestimated in TB-related interventions.

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### Pharmaceutical care satisfaction survey in general hospital, Akwanga, Nasarawa state, north central Nigeria

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**Background:** Patients on antiretroviral (ARV) medication are on it for life which could lead to the possibilities of non-adherence to medication and worsen to resistance issues. Pharmaceutical Care (PC) which is the responsible provision of drug therapy with the aim of achieving definite outcome which improves the quality of life of the patients seeks to address this problem. - Adherence to ARV medication, which ultimately improves the health of the patient. PC has been largely embraced across all quarters where best practices are the norm by over 95%. This emergence has however been bedevilled by the ratio of available pharmacist to patients for quality service, especially in the hinterland. This has necessitated the need for training and retraining of support staffs in the pharmacy unit to assist the PC process, in addition to the pharmacist. A number of pharmacists, pharmacy technicians, community health extension workers and other support staff in 3 supported comprehensive sites were trained on PC. We carried out this assessment to evaluate client satisfaction with the PC in the facilities.

**Material & Method:** Deployed the skill of a trained staff, a 27 item pre-tested structured quantitative questionnaire was administered to a sample size of 328 patients and the generated data entered into an IBM SPSS Data Editor for analysis. The inclusion criteria; Patients living with HIV (PLHIV) more than 1

year on Antiretroviral (ARV)/Opportunistic infections(OI) medications as well as patients who were above 18 years of age. Study was conducted between January 2016 to July 2016 post PC training. Patients had their consents received and documented.

**Result:** A total of 328 patients were sampled with 99% participation. Females constituted 70% of the population. Only 20% had post-secondary education and 99% received their medication onsite indicating good commodity security. Seventeen percent (17%) of the population knew the names of their regimen however 93% could differentiate their ARVs from OIs medications. Over 95 % of the participants understood the implications of non-adherence to the medications. The appropriateness of the pharmacy location and its conduciveness was also rated high. 22% of the patients were displeased with the waiting time while 45% felt it was adequate. Six percent (6%) of the population felt the waiting time amounted to loss of income for them.

**Conclusion:** The responsible provision of drug therapy in the management of patients living with HIV is critical. Premium should be placed on the need for pharmaceutical care with emphasis on counselling at every point of contact during patient visits

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### Health Connectors: Personalised health system navigation for young people to achieve the second 90 in two South African health sub-districts

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**Background:** Loss to follow-up is a substantial problem in adolescent HIV patients, and greatest between HIV diagnosis and treatment initiation. Among adolescents that do initiate antiretroviral treatment (ART), good adherence in the first six months is associated with longer term retention and better viral load suppression rates. Contact with peer navigators reduce barriers for people to link and be retained in care. Peer navigators help orientate adolescent patients to the health care system in a youth-friendly way, and positively influence treatment initiation and retention, as well as uptake of HIV prevention practices.

**Methods:** Wits RHI's USAID-funded Adolescent Innovations Project (AIP) designed and implemented a package of peer-led linkage, retention and return-to-care support interventions for adolescents. One of the innovations is Health Connectors (HC). HCs work in public health facilities across a range of activities targeting 12-24 year old patients including identifying patients new to the health care system and patients who have defaulted ART, linking new and returning patients to supportive retention services such as adherence support Youth Care Clubs, and other clinical and support services. HCs also support HIV-positive adolescents and youth to initiate and maintain ART in the first months, and help HIV-negative patients to access HIV prevention and sexual and reproductive health services. HC services are delivered in-person, through SMS and 'WhatsApp', and telephonic consultations. Since March 2017, HCs have been embedded in primary health care quality improvement teams in

two health districts: Sub-District F, in City of Johannesburg and Matlosana sub-district, in North West Province.

Weekly communication summaries and progress along the 90-90-90 cascade are captured into a REDCap database. Data for one-year from the programme inception (03/2017-02/2018) were analysed using MS Excel and STATA v. 13 to describe the programme's impact.

**Results:** Ten HCs provided services to 558 patients from 29 clinics, representing 3118 person-weeks of patient-HC interaction. Median patient age was 21 years, and 83% were female. At the time of initiating interaction with the HC, 91% of patients were HIV infected and 64% of these were on ART. At the end of the study period, 76% of pre-ART patients (62/82) had initiated treatment. One third of eligible HC patients were enrolled in a Youth Care Club (YCC) for comprehensive group HIV care and management, 22% of patients who were not in a YCC at HC start were later enrolled in a club (106/482). The average length of time of patient-HC interaction was 6 weeks and most patients communicated once weekly with their HC, primarily discussing support and adherence.

**Conclusion:** The HC innovation presents a promising model to achieve the second 90 for adolescents and youth. HCs have also proven useful in linking HIV positive patients to long term care by enrolling them in Youth Care Clubs, which support retention in care. Patient profiles demonstrate that even adolescents already initiated on ART need peer support. However, despite personalised peer support one-quarter of young patients are still not initiating on ART, and further clinical and social support is needed to increase initiation rates.

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### Risk factors for impaired fasting glucose or diabetes among ART patients on the Copperbelt province of Zambia

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**Background:** Africa has a high prevalence of both Human Immunodeficiency Virus and Non Communicable Diseases (NCDs) but in Zambia there are few data on co-morbid NCDs like Diabetes Mellitus (DM) among HIVinfected individuals. We aimed to identify risk factors for impaired fasting glucose or diabetes among HIV-infected Zambians on long-term Combined Antiretroviral Treatment (cART).

**Methods:** This was a cross sectional study of adult HIV patients in five health facilities of Copperbelt Province in Zambia. HIV/AIDS patients aged 18 years and above, enrolled in care at those health facilities and had been on cART for more than 2 years were included. All patients known to have Diabetes mellitus were excluded from the study. Participants underwent assessment of random blood sugar levels at enrolment and returned the following morning for fasting glucose measured by glucometers. The primary outcome was proportion with impaired fasting glucose or DM. Multivariable logistic regression was used to examine if demographics, time on ART, type of ART regimen, body mass index and baseline CD4 count were predictors of impaired fasting glucose.

**Results:** Overall (n = 270) there were 186 females (69%) and 84 males (31%). The prevalence of impaired fasting blood sugar or diabetes after 8 h of fasting was 15% (95%CI: 11.1, 20.0). Ten percent (26/270) had impaired fasting glucose and 5 % (14/270) had diabetes. Impaired fasting glucose was higher in males than females [AOR = 3.26, (95% CI: 1.15–9.25; p-value = 0.03)]; as well as among patients on second line treatment than those on first line [AOR = 3.87 (95% CI 1.16–12.9); p-value = 0.03]. In contrast those with less likelihood of impaired fasting glucose included patients with a normal BMI (18.5–24.9) than overweight or obese patients [AOR = 0.09 (95% CI 0.03–0.31; p-value < 0.001)]; and participants who had less than 4 diabetes symptoms than those with more than 4 diabetes symptoms [AOR = 0.04 (95% CI 0.02–0.12); p-value < 0.001].

**Conclusion:** We have found high levels of impaired fasting glucose or diabetes among ART patients compared to what is reported in the general population suggesting missed care and support opportunities associated with metabolic imbalance management. There is thus a need to re-package HIV programming to include integration of diabetes screening as part of the overall care and support strategy.

## 315

### Clinical characteristics and determinants of Kaposi Sarcoma in the course of HIV infection: a 16 year-retrospective case-control study from Yaoundé, Cameroon

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**Background:** HIV infection has totally changed the patterns of Kaposi sarcoma (KS), which subsequently reached epidemic proportions and became more aggressive than before the HIV era. Although sub-Saharan Africa carries the heaviest burden of HIV-infection, the clinical features and driving factors of KS remain direly unexplored in the region, especially during the course of HIV-infection. This study aimed to determine the epidemiological and clinical characteristics of KS as well as its driving factors among HIV-infected patients residing in Cameroon, a sub-Saharan African country.

**Methods:** We conducted a 1:3 retrospective case-control study at the HIV day care unit of the Yaoundé Central Hospital, Cameroon. Cases were HIV-infected patients followed-up at the study site from January 2001 to December 2016 and diagnosed with KS after histological confirmation. Controls were HIV-infected patients followed-up during the same period, naive of KS and paired to cases according to age and sex. Data collection used a standardized questionnaire, and logistic regression analyses served to investigate potential risk factors for KS.

**Results:** Of 14.220 files reviewed from 2001 to 2016, 316 cases of KS were identified, hence a cumulative incidence of 2.2%. A total of 266 cases (55% males) were considered in our study, to whom 798 controls were paired. Ages of patients varied from 17 to 72 years with a mean of 37.7 ± 9.6 years. At HIV-infection diagnosis, CD4 counts ranged from 1 to 885 cells/mm<sup>3</sup> for cases and from 1 to 1.366 cells/mm<sup>3</sup> for controls with a median of 174 cells/mm<sup>3</sup> (interquartile range 80-290) and 172 cells/mm<sup>3</sup>



(interquartile range 77-274), respectively ( $p = 0.865$ ). KS was the mode of revelation of HIV/AIDS in 89.8% of cases. Lesions were mostly located on the skin (81.6%), followed by the mucosa (15.8%). The major clinical aspects were, by order of frequency: lymphoedema (35%), papulo-nodules (25.8%), and erythematous-angiomatous macules (14.3%). At univariable logistic regression analysis, diabetes (odds ratio (OR) 2.9, 95% confidence interval (CI): 1.2-7.2;  $p = 0.03$ ), history of prurigo (OR 0.3, 95%CI: 0.1-0.8;  $p = 0.01$ ) and a CD4 count  $\geq 500$  cells/mm<sup>3</sup> (OR 0.5, 95%CI: 0.3-0.8;  $p = 0.003$ ) were the 3 factors significantly impacting KS occurrence. In the end, a CD4 count  $\geq 500$  cells/mm<sup>3</sup> (adjusted odds ratio 0.4, 95% (CI): 0.2-0.8;  $p = 0.01$ ) remained the only factor impacting significantly KS occurrence, after multivariable analysis.

**Conclusion:** KS seems frequent among HIV-infected people in Yaoundé (Cameroon), and constitutes a frequent mode of revelation of the disease. Patients with a CD4 count  $\geq 500$  cells/mm<sup>3</sup> may present a lower risk of developing KS. Therefore, HIV-infection should be diagnosed as early as possible.

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#### Depression and quality of life among individuals with HIV infection who are attending a tertiary care hospital in Sri Lanka

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**Background:** Globally, 36.7 million people were living with HIV at the end of 2015. Since identification of the first HIV infected Sri Lankan in 1987, a cumulative total of 2308 of HIV positive individuals have been reported at the end of 2015 with HIV prevalence of less than 0.01%. Depression and impaired quality of life among people living with HIV infection is reported to be significant. However, psychiatric disorders are likely to be under detected in HIV care settings. Still research carried out in this area is scarce in Sri Lanka.

**Objectives:** To assess prevalence of depression, quality of life among individuals with HIV infection. The factors associated with comorbid depression, reasons for delay in seeking treatment and to determine the difference of QOL between individuals with and without depression.

**Methodology:** This is a descriptive cross sectional study conducted with individuals attending STD clinic at Colombo North Teaching Hospital, Ragama. The convenient sampling method was used. The Socio-demographic factors of HIV infected individuals were assessed using an interviewer administered questionnaire. Depression among individuals with HIV infection was assessed using ICD - 10 classification for mental and behavioral disorders. Quality of life was measured with WHO Quality of Life scale - brief version (WHOQOL-BREF). Data analysis were done using SPSS 19th version. Independent t tests were conducted to examine the significance of the quality of life among individuals with HIV infection and those without depression.

**Results:** Eighty one (81) seropositive individuals participated for the study and 65.4% of them were males. Prevalence of depressive disorder is 27.2% (n=22) among HIV zero positive

individuals according to clinical assessment. Depressive disorder is more commonly seen during initial 12 month period after diagnosis of HIV infection. Individuals with low CD4 count (<350 mm<sup>3</sup>) report significant association with depression and impaired QOL as well. Depressive disorder is associated with noncompliance to antiretroviral therapy. Mean Quality of life is 65.3 (SD +/-13.4). The individuals who use anti-retroviral therapy scored better QOL in all domains. Majority (n=9) of the individuals who are depressed found multiple reasons for not seeking treatment for depression including lack of awareness of available psychiatric facility, stigma associated with HIV and poor insight into depressive illness.

**Conclusion:** In this study sample, prevalence of depression is similar to findings from studies in other countries. Factors significantly associated with depression are low CD4 count (<350 mm<sup>3</sup>) and initial twelve months since diagnosis of HIV infection which indicates the importance of screening for depression in the management of such patients. Poor adherence to antiretroviral therapy is observed among individuals who are depressed and QOL is better with the use of antiretroviral therapy. This study shows that the process of detection and treatment of depression in HIV clinics in Sri Lanka should be strengthened. Future research should focus on multi center studies to assess the psychiatric morbidity and related factors in detail.

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#### Assessment of depression and its effect on medication adherence among HIV/AIDS clients attending ART clinic, specialist hospital, Osogbo, Osun-state, Nigeria

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**Background:** Depression is a medical condition characterized by low mood, apathy, fatigue, inability to concentrate, loss of pleasure in activities, changes in appetite and weight, trouble in sleeping and possibly thought of committing suicide. Previous studies have revealed positive association between HIV infection and mental disorders among HIV/AIDS patients.

**Objectives:** The aim of this study was to determine the prevalence of depression and its effect on medication adherence among HIV/AIDS clients attending ART clinic in LASUTH, Ikeja.

**Methodology:** It was a cross-sectional study using multi-stage sampling technique to select 216 respondents was selected using systematic sampling technique. Data were collected using pre-tested self-administered semi structured questionnaire, analyzed using Statistical Package for Social Sciences version 23 and presented using appropriate tables and charts. Level of significance set at 0.05.

**Results:** Majority i.e 158(72.5%) are females, within 35-44 years 106(48.6%), self employed 149 (68.3%), secondary education 91(41.7%), with income between 20,000 and 49,000 68(31.2%), Christians 175(80.3%), Yoruba: 135(61.9%) married 180 (82.6%) and within monogamous settings 143(65.6%), Yoruba 135 (61.9%). Concerning prevalence of depression, it was discovered that 8(4%), 47(21%) and 163 (75%) had severe, mild and moderate depression respectively. Regarding medication adherence, half i.e 144(66%) had poor adherence. There is an association between marital status and religion with medication

adherence. ( $P < 0.05$ ). Also, there is an association between Psychiatric symptoms and medication adherence ( $P < 0.05$ )

#### Conclusion and Recommendation:

HIV/AIDS clients experienced various degrees of psychological distress and psychiatric symptoms which affect their adherence to medication. Thus, early discovery and management of such symptoms will enhance lifestyle changes and quick alleviation. Psychiatrists should collaborate with clinicians to provide psychological services within ART clinics.

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### Castleman's Disease – a Co –morbidity in HIV disease; Case Report and a short review of literature

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**Background:** A lympho – proliferative disorder of varied aetiology with distinct histopathological features. Usually not considered as a neoplasm, but may complicate as a lymphoma. HIV infection is the only described risk factor. We report a case of Castleman's Disease in a 34 year old female (name withheld) of African descent admitted at St Luke Medical Centre, Kisumu Kenya in November 2015. She presented with disseminated varicella infection, generalised lymphoid tissue enlargement including massive splenomegaly; and bilateral lobar pneumonia

**Laboratory Tests:** She had anaemia of 6 grams / dl, HIV test positive and CD4 count of 7 cells /microliter. Lymph node biopsy histopathological features of - angiofollicular hyperplasia with concentric layering of peripheral lymphocytes to give 'onion skin' impression; vasoformative spindle cells in keeping with Kaposi's sarcoma (KS) and; positive immuno histochemistry staining for HHV8 (KSHV8).

**Management Plan:** She was initiated on HAART, antiviral therapy with Acyclovir, corticosteroids for anti –inflammatory and antilymphoid tissue effect. Other treatment included HRZE, high dose Co trimoxazole and Ciprofloxacin for atypical pneumonia. Supportive therapy included blood transfusion and management of constitutional symptoms.

**Conclusion and recommendations:** This case is presented as a rare condition, but probably often confounded with Tuberculosis, Lymphomas, and KS. We observe that localised disease is curable by surgery and / or radiotherapy; and in multicentric CD, therapy can be targeted and specific with favourable alteration in patient survival curves.

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### Integrating Cervical Cancer Screening into routine HIV clinical care for women: A retrospective study of adherence to screening guidelines in an Urban HIV center in Uganda

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**Background:** HIV-infected women remain at higher risk of Cervical Cancer compared to their negative peers (incidence rates of 7.3 vs 2.5 per 1,000 person years). The Uganda Ministry of Health recommends that all HIV-positive women under 50 years of age be screened annually using Visual Inspection with Acetic Acid (VIA) and a screen-and-treat approach where women with positive results immediately receive cryotherapy to remove abnormal cervical lesions. We assessed the rates of cervical cancer screening and adherence to screening guideline at the Infectious Diseases Institute (IDI), a non-profit organization that provides HIV care in Uganda.

**Methods:** The IDI integrated cervical cancer screening into routine HIV care in 2014 among women aged less than 50 years using VIA. Patients with a positive VIA result are referred to Uganda Cancer Institute (UCI) for treatment while those with a negative result are rescreened yearly. We undertook a retrospective cohort analysis of all active patients enrolled at IDI and having at least two clinic visits as of 31st July 2017. Descriptive statistics and frequency distributions were used to describe continuous and categorical variables respectively using STATA 14.

**Results:** Out of 5,604 women, 4,373 were eligible for cervical cancer screening in the study period, 2,028/4,373(46.4%) had ever screened, with median (IQR) time to screening of 2.3 (1.0-3.6) years. Majority of those who screened were married 1,040/2,028 (51.3%), with one to three children ever born 1,080/2,028(53.3%), had two to five lifelong sexual partners 1,458/2,028(71.9%), and were aged 15 to 24 at sexual debut 1,726/2,028(85.1%). Of the women screened, 145/2,028 (7.2%) had a positive result at first screening and were all referred to UCI. Of 1,883/2,028 (92.8%) with a negative first screening result, 1,099/1,883 (58.4%) were eligible for annual repeat screening procedure and 439/1099 (40.0%) received a second VIA test in the study period and 18/439(4.1%) had a positive second VIA test result and were all referred to UCI. Of 421/439(95.9%) that had a negative result at second screening, 140/421(33.3%) were eligible for a third repeat cervical cancer screening and 52/140(37.1%) were rescreened the third time. 2/52(3.8%) had positive results from the third screening and were all referred to the UCI for treatment.

**Conclusions:** The rate of cervical cancer screening in this urban clinic was slightly higher than the estimated national baseline-screening rate of 30% in urban areas but lower than the national guidelines target of 80% screening coverage, despite high referral rates. We hypothesize that some of the challenges accrued to low screening were limited human resources, inadequate space and long waiting times. The findings emphasize need for additional measures geared towards increasing the number of HIV positive females screening for cervical cancer annually in a bid to adhere to the national set guidelines among this vulnerable population.

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### Chronic kidney disease in HIV patients initiating antiretroviral therapy at less than 100 CD4 cell count in Cameroon.

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**Introduction:** Chronic kidney disease (CKD) which has many potential underlying causes is common in patients with human immune deficiency virus (HIV) infection. In many resource limited settings with high HIV burden, routine screening and proper management is not always guaranteed especially in settings with overstretched healthcare systems.

**Methods:** During the "Pre-antiretroviral therapy (ART) Cryptococcal antigen screening (PreCASA)" prospective study for the pre-emption of cryptococcal meningitis in HIV-patients presenting with less than 100 CD4 cells/ml in Yaounde, Cameroon, serum creatinine was measured at baseline, week six, months six and month twelve of ART. The Modification of Diet in Renal Disease (MDRD) study equation was used to estimate glomerular filtration rates (eGFR) at different follow-up times to evaluate its effect on patient outcome. Urine dipstick for detection of proteinuria was also done at baseline and week six of ART. CKD was considered when eGFR was low (< 60ml/min/1.73m<sup>2</sup>) and its association with at least one cross of proteinuria on urine dipstick prompted patient referral.

**Results:** 186 patients were included in the study, mean age was 38.4 ± 10.1 years. Median baseline CD4 was 44 cells/ml (interquartile range [IQR]: 27 – 75). Prevalence of low eGFR was 13.2%, 6.7%, 1.5% and 0.9% at baseline, week six, month six and month twelve, respectively. At base line 26.1% of patients and 14.3% at week six with low eGFR also had detectable proteinuria in dipstick. Median CD4 at month six was 202 cells/ml (IQR:129 – 283), similar in patients with low and high eGFR (p=0.5). There was no difference in mortality between patients with low and high eGFR, hazard ratio (HR): 0.8, 95%CI: 0.1 – 5.6, p=0.7)

**Conclusion:** Altered kidney function is common in HIV-patients with severe immune depression warranting routine screening and follow up. Patient specific optimisation of ART regimen is key to favourable outcome.

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### Evaluation of a cervical cancer screening project in a high HIV burden setting in Malawi -Retrospective Analysis.

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**Introduction:** Malawi is one of the countries with a high burden of HIV and HPV infection. The Dream program, with the support of the Norwegian church Aid, implemented the cervical cancer

screening in 31 health facilities in Phalombe, Balaka, and Mangochi. Aim of this study was to evaluate the impact of the screening project

**Methods:** Women go through Visual inspection by acetic acid (VIA) screening method routinely and through outreach clinics .Data is routinely recorded in Ministry of health registers placed in the health facilities. A retrospective cross sectional analysis of cervical cancer screening data from the routine reports and registers between 2015 and 2017 was conducted across the implementation districts.

**Results:** The percentage of women screened significantly increased from 1.3 % (2439/192928) in 2015 to 4.6 % (9371/205243) in 2017 among the child bearing age women aged 15 to 49 years (OR=3.7, CL, 3.617-3.598). About 60%,were HIV negative and 25% and were HIV positive with 14% with unknown serostatus .Facilities providing screening services increased from 15 % ( 11/72) to 43 % ( 31/72) . Precancerous lesion was 3.6% (339/9362) while suspect cancer was 1.8 % ( 172/9371) of those screened. Of those screened 2.9% (277/9371) had other gynaecological conditions .Of those with precancerous lesions , only 40% (137/339) had access to treatment .The risk for positive VIA test among the HIV positive was three times compared to the HIV negative (OR=3.2, CL, 2.498-4.178). Age<25 years was protective (OR=0.6, CI, 0.506-0.936) of having a VIA+ result. For suspect cancer results ,HIV positive had two times the risk of suspect cancer result than the HIV negative (OR=1.9, CL,1.462-2.618).Age below 25 years was protective for having suspect cancer result compared to age 25 to 49 years (OR=0.5, CL, 0.531-0.770).

**Conclusion:** .The project significantly increased number of women and facilities providing cervical cancer screening services. Younger age and HIV negative status are associated with lower risk of developing pre-cancerous and cancerous lesions. Despite the relatively good project performance, access to cervical cancer services and treatment still remains a challenge generally .There is need for more cervical cancer investment especially in treatment of precancerous lesions and management of suspect cancer.

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### Complete Clearance of HIV-associated Disseminated Kaposi Sarcoma with Liposomal Paclitaxel: a Case Report

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**Background:** Kaposi sarcoma (KS) is one of the commonest malignancies in HIV-infected individuals. The disseminated disease, even when treated with traditional chemotherapeutic agents, is usually associated with recurrences as well as a high morbidity and mortality. Paclitaxel, a taxane, has been found to give better outcomes but with adverse effects such as neuropathy and hypersensitivity reactions. The liposomal preparation is associated with a lower incidence of these adverse effects.

**Methods:** The clinical records of a 34-year old HIV-positive woman with disseminated Kaposi sarcoma successfully treated with liposomal paclitaxel is reviewed.

**Results:** JBM, a 34-year old widow, was found to be HIV-positive about 10 years before presentation. She received antiretroviral drugs (ARVs) (AZT/3TC/NVP) as part of PMTCT during her only pregnancy 4 years before presentation and promptly discontinued same after childbirth. She presented in 2015 with skin lesions on the face, trunk and limbs. Clinical examination revealed multiple hyperpigmented papules, plaques and nodules distributed on the face, trunk and limbs. A skin biopsy confirmed Kaposi sarcoma. She was re-started on ARVs and counselled on KS-treatment. She declined chemotherapy. However, 6 months later, she presented with a progressive increase in the number and sizes of the skin lesions, bawny oedema of the right leg, ulcers on the KS lesions on the leg, cough with sputum, dyspnoea on exertion progressing to dyspnoea at rest, widespread lesions on the face, nose, trunk, limbs and buccal cavity. She had mild anaemia. The sputum culture was negative for tubercle bacilli. She was commenced on liposomal paclitaxel and had a total of 8 cycles of therapy. She also was on HAART with TDF/3TC/ATVr. The only observed side effect was neutropenia after the fourth cycle which responded to a single dose of granulocyte-colony-stimulating factor. She has had complete resolution of all lesions and had since returned to normal activity. On follow up more than a year afterwards, she has remained well with no recurrences of lesions or symptoms.

**Discussion:** Treatment of Kaposi's sarcoma in HIV-positive West-African patients with doxorubicin, bleomycin, and vincristine has been associated with poor outcomes. Reports from some European countries had shown good response to paclitaxel. This has been confirmed by reports from Malawi and South Africa. However adverse effects including neuropathy and hypersensitivity reactions may occur. The liposomal preparation is significantly more expensive, carries a lower incidence of adverse effects. Our patient who had disseminated Kaposi sarcoma with pleural and gastrointestinal involvement responded excellently well to liposomal paclitaxel. At follow up more than a year following completion of therapy, she has remained well. The liposomal preparation is more expensive but with fewer side effects. The major drawback of liposomal paclitaxel is the cost.

**Conclusion:** Our patient experienced complete clearance of lesions with monotherapy with liposomal paclitaxel. More studies with liposomal paclitaxel are needed to ascertain if this could become a single agent providing better safety profile and lesser risk of recurrence and death in African patients with HIV-associated KS.

## 324

### High risk of herbal medicine use in a cohort of HIV patients with comorbidities in a large urban HIV clinic in Uganda.

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**Background:** Herbal medicine use in HIV patients in sub-Saharan Africa has been attributed to side effects of antiretroviral drugs. In this same setting, patients with non-communicable diseases (NCDs) also report use of herbs to treat symptoms yet NCDs are emerging co-morbidities in the HIV population on long term ART. In this study we explored the association between co-

morbidities, drug substitutions and herbal use in large cohort of HIV patients on ART for at least 10 years.

**Methods:** The study included data collected from 1000 patients enrolled between April/2014 to September/2015 in a prospective cohort in their 10th year and to be followed up for another 10 years of ART at the Infectious Diseases Institute (IDI), Kampala, Uganda. We extracted data on patients' demographics, herbal medicine use and comorbidities. We used frequencies and percentages to describe participants' characteristics. We used Pearson chi-square test to assess for associations between presence of comorbidities; drug substitution and herbal use.

**Results:** Of the 1000 HIV patients enrolled, 619(61.9%) were female. The median age of the participants was 45 years (IQR: 40-51), median BMI at enrolment 22.4(IQR: 19.8-25.4). 302 (30.2%) had comorbidities. Of these, 258(85.4%) had hypertension, 49(16.2%) had cardiovascular diseases, 33(10.9%) had diabetes. Ninety one (9.1%) of the participants in the cohort used herbal medicine. Of these, 63(69.2%) were female. The median age of all herbal medicine users was 48(IQR: 43-55) and the median BMI was 22.1(IQR: 20.0-25.8). Of the participants with comorbidities, 36/302(11.9%) used herbal medicine, while among non-comorbid patients, 55/302(7.9%) used herbal medicine. Herbal medicine use was highest among patients with hypertension. 35(38.5) herbal medicine users had hypertension. There were higher proportions of herbal medicine users among those who had comorbidities compared to those without comorbidities ( $p=0.04$ ). Of the 91 herbal medicine users, 18(19.8%) had no history of drug substitutions, 40(44.0%) had 1-2 substitutions, 18(19.8%) had 3-4 substitutions and 15(16.48) had more than 4 drug substitutions. We found no association between drug substitutions and herbal use ( $P = 0.051$ ).

**Conclusion:** Hypertension was the most reported additional disease in the cohort. HIV patients with comorbidities are more likely to use herbal medicine. Even though herbal medicine use is not associated with drug substitutions, history of herbal medicine use in this group of patients should be taken

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### Isn't it appealing getting old with HIV ? Advocacy for more research and action with the aging HIV population

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**Background:** Since some years research community and UNAIDS have been calling attention to the aging of the HIV epidemic. The increased survival in the ART treated population and a relative increase of new infections in the over 50 are driving the epidemic towards older ages. In 2011, it was estimated that 3 million people living with HIV (13% of the global HIV population) in Sub Saharan Africa were over 50 years. These numbers are expected to triple over 30 years, but the issue nevertheless remains neglected.

**Description:** A substantial amount of research has been done in high income countries to describe, understand and manage the

specificities of HIV infection in people over 50. We know that comorbidities and poly-medication become more frequent, functional impairment and disabilities may become the leading worries, while opportunistic infections wain and treatment adherence enters in the routine daily living. Beyond the debate over “premature” aging in HIV infection and its pertinence in low income countries (LIC), the aging of the epidemic will independently bring forwards an increase in the demand of care for non communicable, chronic diseases (NCD) in the already overburdened HIV services.

**Lessons learned:** In LIC, research is at its beginning and data on the aging of the epidemic are scanty. What is known is that we do not know enough to define the prevalence in the over 50, neither we can really define patterns of comorbidities specific for different areas, and worst of all, there are few ideas and very isolated experiences of integrated care for HIV and NCD, therefore we know little about services delivery and priorities for the concerned populations.

**Conclusions/Next steps:** The aging of the epidemic should be recognized as a priority for research and action to anticipate coming needs, define a specific minimum care package and prepare health authorities and services to face the request of integrated care. We are planning a descriptive and operational study in Central and West Africa to better understand and define what can be successful aging in the context of HIV infection.

## 326

### Improving Access to Cervical Cancer Screening Services at Remote Areas in Tanzania

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**Background:** Cervical cancer, an AIDS defining illness is the commonest malignancy affecting women of reproductive age and the commonest cause of cancer related deaths in women in Tanzania. Women living with HIV (WLHIV) are more likely to have precancerous lesions; have higher rates and recurrences of cervical dysplasia; faster progression; shorter survival rates once diagnosed with cervical cancer.

As a partner supporting the Ministry of Health in providing comprehensive HIV prevention, care and treatment services; Tanzania Health Promotion Support (THPS) integrated cervical cancer screening (CCS) among women of reproductive age living with HIV thus increasing access among eligible women in remote areas.

**Materials & Methods:** A total of 43 health facilities initiated cervical cancer screening services in Pwani, Kigoma and Mtwara regions. Health care providers received training, supportive supervision and mentorship sessions. In addition expert clients living with HIV were trained to sensitize PLHIV on having this service annually. Health facilities were equipped with cryotherapy machines and supplied with commodities for CCS, the three regional hospitals were in addition equipped with a loop electrosurgical excision procedure (LEEP) machine for larger lesions not treatable through cryotherapy. Program data of all women including WLHIV from supported sites was analyzed from December 2012 – March 2017. Depending on the outcome of the

screening by Visual Inspection with Acetic Acid (VIA) appropriate management was provided.

**Results:** A total of 48,937 women of reproductive age were screened, and 293 (0.1%) were referred due to large lesion at screening. Among all screened women, 16,673 (34%) tested positive for HIV, 27,562 (57%) were HIV negative and 4,702 (9%) had unknown HIV status. WLHIV had higher rates of VIA positive **Results:** i.e. 7.8%; compared to HIV negative women (4.2%). Among women with unknown HIV status, VIA positivity was five percent (5%). A total of 2,088 (77%) VIA positive women received cryotherapy.

**Conclusions:** Using a simple screening tool, many women were reached for cervical cancer screening services. HIV positive women showed higher rates of early signs of cervical changes suggestive of cervical cancer compared to those without HIV a well-established evidence. We recommend universal availability of this life saving simple screening test among eligible women to prevent morbidity and mortality associated with it.

## 327

### Prevalence and correlates of HIV associated neurocognitive disorders in patients on treatment at a Kenyan hospital

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**Background:** HIV Associated Neurocognitive Disorders (HAND) represent a spectrum of cognitive abnormalities arising from fronto-subcortical damage affecting attention, concentration, learning, verbal and visual memory, executive function, psychomotor speed and dexterity. Advanced neurocognitive impairment negatively impacts on daily living, employment, adherence to prescribed regimens and survival. Our objectives were to determine the prevalence of HAND and the covariates in a Kenyan population.

**Methods:** A cross-sectional study was conducted among persons living with HIV antiretroviral therapy at the Kenyatta National Hospital HIV clinic between July and August 2015. Participants were 18 years of age or older with a documented HIV infection but without a history of traumatic brain injury, mental disorders or substance abuse issues which could affect neurocognition. Eligible participants were screened and those who met the inclusion criteria were offered written, informed consent. Baseline demographics were obtained by means of interviewer administered questionnaires while the clinical data were abstracted from patient records. HAND status was determined by administration of the International HIV Dementia Scale and the Montreal Cognitive Assessment scale. We used logistic regression in R ® to test for the association between a possible HAND diagnosis, demographics and clinical variables. The alpha level was set at 0.05.

**Results:** We enrolled 345 participants, comprising 202 (58.6%) women, with an overall mean age of 42 years (±9.5). Mean duration since HIV diagnosis and on mean duration on HAART was 6.3 (±3.7) and 5.6 years (±3.4) respectively. Median CD4 count was 446 cells/mm<sup>3</sup> (IQR 278-596). Eighty eight percent of the participants screened positive for HAND while 12% were unimpaired. Of the 88%, 12% had minor neurocognitive

disorders, 1% had HIV associated dementia whereas the majority (75%) had asymptomatic neurocognitive disorders. Women were more likely to suffer HAND than men [aOR =2.17, 95% CI 1.02, 4.71; p=0.045], whereas more years in school and a higher CD4 count conferred a lowered risk ([aOR =0.58, 95% CI 0.38, 0.88; p=0.012] and [aOR =0.998, 95% CI 0.997, 0.999; p=0.013] respectively).

**Conclusion:** Neurocognitive impairment is highly prevalent among people living with HIV on treatment. Clinical care for HIV positive patients should include regular screening for neurocognitive disorders with a focus on women, the patient's education level and the latest CD4 counts.

## 328

### The burden of chronic co-morbidities among HIV-infected adults in a large Urban HIV clinic in Uganda

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**Background:** Chronic co-morbidities among HIV infected persons have increased due to increased access to antiretroviral treatment in Sub Saharan Africa. Understanding the epidemiology of such conditions among HIV infected persons is essential in planning for health care interventions and optimizing clinical care. The objective of the study was to determine the prevalence and risk factors of hypertension (HTN) and diabetes mellitus (DM) among HIV infected adults at the Infectious Diseases Institute(IDI), Uganda.

**Methodology:** We included all active HIV positive patients in care at the IDI between 2014 (when a specialized Non communicable Diseases(NCD) clinic was established) and 31st December 2017. We extracted data from the IDI electronic medical database on demographics, clinical events and random blood sugar results. Disease definitions were 1) HTN: systolic<140 mm Hg and diastolic<90 mm Hg; and, 2) DM: blood sugar < 11 mmol/L. Descriptive statistics were obtained using medians (Interquartile range) and frequency distributions for the continuous and categorical variables respectively. Binary logistic regression was used at the multi variable level adjusting for gender, age, ART status, CD4 count, duration in care, ART duration, and ART regimen to estimate Odds Ratios (OR) and 95% Confidence Intervals (CI) to assess factors associated with HTN and DM.

**Results:** Overall 8,449 HIV infected adults were active in care during the study period of whom 5,278 (62.4%) were females and 8,387(99%) were on ART. The overall prevalence of hypertension was 52.1% (females 59.6%, males 40.4%, p < 0.001) while that of diabetes mellitus was 2.5 % (females 59.6%, males 40.4%, p < 0.001). Medium duration on ART was 6.5 years (IQR:3.9-10.9) and 11.3 years (IQR:5.3-12.6) for HTM and DM respectively. Predictors of HTM were; male gender (OR = 1.24, CI: 1.21 – 1.27), age >50 years (OR = 4.68, CI: 4.38 – 5.00), longer duration on ART (OR = 1.01, CI: 1.00 – 1.01), having CD4<500 compared to CD4>500 (OR = 1.02, CI: 0.97 – 1.07), longer duration in care (OR = 0.99, CI: 0.98 – 0.99), being on second line ART regimen (OR = 1.12, CI: 1.09 – 1.14) and third line ART regimen (OR = 3.62, CI: 3.01 – 4.34) compared to first line ART regimen. Further, predictors of DM were; male gender (OR = 0.88, CI: 0.82 – 0.92), age >50 years (OR = 4.68, CI: 4.38 – 5.00), longer duration on ART

(OR = 1.11, CI: 1.10 – 1.12), having CD4<500 compared to CD4>500 (OR = 1.05, CI: 0.92 – 1.19), being on second line ART regimen (OR = 1.10, CI: 1.02 – 1.18) and third line ART regimen (OR = 2.12, CI:1.53 – 2.93) compared to first line ART regimen. 149(1.8%) patients had both HTN and DM.

**Conclusions:** The high prevalence of hypertension and diabetes mellitus indicates an increasing epidemic of these diseases especially among male elderly HIV positive patients. The findings emphasize need for health care intervention and resource to reduce the growing burden of chronic comorbidities.

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### Development and validation of a 19-item screening scale to detect major depressive disorder among adolescents with HIV in rural Uganda: mixed-Methods: study

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**Background:** Depression is a major cause of disability among children and adolescents and is associated with elevated risks for substance abuse, HIV transmission risk behavior, and suicide. Among adolescents living with HIV (ALWH), depression undermines adherence to antiretroviral treatment leading to poorer health outcomes. However, there are few instruments available for depression screening among ALWH in sub-Saharan Africa (SSA).

**Methods:** Using mixed methods we developed and validated a 19-item depression screening scale to be used among ALWH in rural Uganda. First we conducted focus group discussions and in-depth interviews with adolescents and adult caregivers (n=80) in Mbarara to elicit participant perspectives about stressors and mental health challenges facing HIV-affected children and adolescents. We generated an initial pool of 40 items, pilot tested it, and then administered the items to a validation sample of ALWH. Exploratory factor analysis was used to examine the factor structure of the scale. We evaluated the scale for internal consistency, inter-rater, and test-retest reliability; and construct and criterion-related validity.

**Results:** The mean age of the participants in the validation sample was 14.8 years (SD 1.4), with 58% being girls and 48 (21%) orphans. Exploratory factor analysis revealed two factors related to affective and cognitive symptoms of depression. The 19-item depression scale was internally consistent (Cronbach's alpha=0.90) and showed moderate inter-rater and test-retest reliability. Strong evidence of construct validity was demonstrated through its correlation with related constructs like stigma (P<0.001) and bullying (P<0.001). When compared with the criterion standard (diagnosis of major depressive disorder), the depression scale showed excellent discrimination (c =0.83). At the cutoff point that maximized Youden's Index, the depression scale had a sensitivity of 0.78 and a specificity of 0.70.

**Conclusion:** This new 19-item depression scale was reliable and valid for detecting major depressive disorder among ALWH in rural Uganda.

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### Sitting on a live bomb: a close analysis of mental health as malawi's national problem - challenges and perceptions

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**Background:** Going by the study findings of The London School of Hygiene and Tropical Medicine in the UK, The University of Cape Town in South Africa and the University Of Melbourne in Australia on mental health of young people in Europe ,Asia and South Africa versus availability of mental health professionals to assist, a study with comparative elements to the situation on the ground in the three districts of Mangochi, Machinga and Balaka where numbers of mentally challenged persons in the streets and villages are basically high, was conducted to investigate the availability of mental health personnel in public health facilities in these districts, the general public's views, perceptions and approach to mental illness/mentally challenged persons and willingness of young people who have completed secondary education to enrol for mental health education .

**Methods:** REALITY V tool as developed by Engender Health under the ACQUIRE Project was used of which quantitative, descriptive and explorative method was also used to generate and analyse data. In some cases people interviewed were not necessarily a representative sample in statistical terms but key informants and knowledgeable individuals conversant with mental health issues. Sampling was based on the WHO EPI 30 Cluster Coverage Survey Sampling. Formula used:  $N = Z^2(pq)/d^2$ , where  $N$ =Sample Size=Statistical Certainty,  $P$ =Estimated coverage rate to be investigated,  $q$ =1- $p$  and  $d$ = Precision desired.

**Results:** There is severe neglect of peoples mental health hence there is lack of enough qualified mental health nurses and professionals in district hospitals and other health facilities including the only public Mental/Psychiatric Hospital in Zomba which by August 2014 had 1 Psychiatrist, 5 Clinical Officers and 20 Psychiatric Nurses ,this can well be described as having fragmented Mental Health systems .There is low budgetary allocation towards mental Health for instance total expenditure on Health is 6.6% of the Malawi's gross Domestic Product(GDP) from which only 1.5% of the total goes towards the mental Health Budget .

Publics' different attitudes, perceptions and approaches to mental illness some of which are cultural and traditional beliefs attuned don't regard mental illness as an illness at all.

**Conclusion and Recommendation:** There are bunches of unmet needs for mental health services in Malawi of which this evidence points to the need for the government of Malawi and its development partners to re invigorate their investments and programs. There is an urgent need to expedite the public and stakeholders consultations on the mental Act Draft of 2004 which will eventually lead to the enactment of the new Bill replacing the old Legislation of 1960s.

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### Tracking through Teaching: Using schools to reach the first 90 for adolescents living with HIV

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**Background:** It is essential that adolescents living with HIV are reached for treatment, care and support. However, many slow progressors and newly HIV-infected adolescents remain unidentified and disconnected from health systems, especially in high-prevalence settings. This study examines differences in educational outcomes for adolescents living with HIV, in order to i) identify educational markers for targeting HIV testing, counselling and linkages to care, and ii) to identify essential foci of educational support for adolescents living with HIV.

**Materials & Methods:** Quantitative interviews with  $N=1,057$  adolescents living with HIV and  $N=467$  un-infected community control adolescents (10-19 year olds) included educational outcomes (enrolment, fee-free school, school feeding schemes, absenteeism, achievement), physical health, cognitive difficulties (difficulties remembering to take medicine, to concentrate at school and home), internalising issues (depression, stigma), missing school to go to the clinic, and socio-demographic factors. Validated scales and measures were used where available. Voluntary informed consent was obtained from adolescents and caregivers (when adolescent <18 years old). Analyses included multivariate logistic regressions, controlling for socio-demographic covariates, and structural equation modelling using STATA15.

**Results:** adolescents living with HIV reported accessing educational services (enrolment, free schools, school feeding schemes) at the same rates as other adolescents (94%, 30%, and 92% respectively), suggesting that schools are a valuable site for screening and tracking adolescents living with HIV. However, adolescents living with HIV reported poorer attendance: missing >2 weeks in the past term (OR2.1 95%CI1.4-3.2  $p<0.001$ ); achievement: behind >1 grade (OR1.9 95%CI1.5-2.4  $p<0.001$ ); more opportunistic infections OR2.6 95%CI2.1-3.3  $p<0.001$ ; missing school to go to the clinic (OR6.0 95%CI3.4-10.5  $p<0.001$ ); more internalising issues (OR1.6 95%CI1.3-2.0  $p<0.001$ ), and greater levels of cognitive difficulties (OR1.9 95%CI1.5-2.4  $p<0.001$ ). A structural equation model with good model fit (RMSEA=0.027, CFI 0.984, TLI 0.952) indicated that negative educational outcomes were associates with a cascade of poor physical health and cognitive difficulties which led to negative educational outcomes (Figure1).

**Conclusions:** Adolescents living with HIV have high access to schools and educational services such as feeding schemes. Key school-based markers for identifying unreached adolescents living with HIV may be low attendance, frequent sickness, low mood and slow learning. Educational support services for adolescents living with HIV are necessary to support their school achievement and success, by helping them to cope with physical, emotional and cognitive difficulties.





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