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Abstract Book

9th International Workshop on HIV Treatment, Pathogenesis
and Prevention Research in Resource-Limited Settings

INTEREST

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**9th International Workshop on HIV Treatment,
Pathogenesis and Prevention in Resource Limited
Settings – INTEREST**

**Abstracts
Oral Presentations**

Abstract: 1**Optimising uptake of prepex circumcision among adult males through a mobile caravan in chitungwiza town:Zimbabwe**

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Introduction: Zimbabwe, like several of its neighbors, has not reached its target for uptake of voluntary medical male circumcision (VMMC) services. Innovative measures are necessary to encourage VMMC especially among out-of-school males. Therefore, we piloted a mobile site (caravan) to increase uptake of a non-surgical VMMC device (PrePex), in Chitungwiza, Zimbabwe, an urban area 25km from Harare. PrePex VMMC has been available in Chitungwiza at Zengeza static clinic since March 2014. We review trends in PrePex uptake among adult males and explore reasons why men access caravan-based VMMC services to inform service replication and modification.

Materials & methods: In June 2014, to complement PrePex static-site insertions, a VMMC caravan was deployed in Chitungwiza for information dissemination and PrePex placements at male-friendly venues including community halls, bus terminals, shopping malls and small business enterprises. The caravan team is comprised of two nurses providing PrePex services and four demand creation staff disseminating VMMC messages through interpersonal and printed communication. As part of program monitoring, all clients who came for services at the caravan were asked

about their perceptions on mobile VMMC services.

Results: From June to October 2014, 76% (581/769) of all adult men chose PrePex over forceps-guided surgical VMMC at Zengeza clinic (Graph 1). Of these, 379 received PrePex circumcision at the caravan, an 88% increase over the 202 PrePex VMMCs completed at Zengeza static clinic during this period. This demonstrates clear trends towards preference for PrePex circumcisions and for caravan –based PrePex insertions among adult men. Among reasons cited by clients for preferring caravan-based placement were; accessibility to areas they patronize, friendly atmosphere, discrete service provision and minimum interruptions with daily activities. Other caravan clients noted that the non-hospital environment of the caravan was more appealing than the clinic for the same service.

Conclusions: In Chitungwiza, men over age 18 prefer device-based over surgical VMMC. Provision of PrePex circumcision through a mobile caravan dramatically increased uptake. Expansion of PrePex, complemented by this mobile demand creation and service provision strategy, has great potential to scale up VMMC services for adult males in urban and peri-urban areas of Zimbabwe.

No conflict of interest

Abstract: 2

Pediatrics

Delays in initiation of antiretroviral therapy among HIV-infected children in rural Zambia

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Introduction: While care and treatment are available to many HIV-infected infants and children, initiating and adhering to ART is a life-long process that requires significant emotional, physical, and financial resources on the part of the family. Consequently, barriers remain that can delay or inhibit ART initiation. Few studies have documented delays in ART initiation once children eligible for treatment are receiving care. Minimizing these barriers is critical for efforts to begin ART at earlier ages.

Materials & Methods: Reasons for delay were evaluated among 200 children enrolled in a prospective cohort study and initiating treatment in an HIV clinic in rural Zambia between 2011 and 2013. Reasons for delay were abstracted from medical records and classified as family-related, clinic logistics, health-related or other.

Results: After being determined eligible, 60% of children delayed ART initiation for a median of 28 days (IQR: 14, 75). Primary reasons for delay included the need to wait for test results (32%), adherence issues (26%), and concurrent treatment for tuberculosis (23%). When reasons for delay were categorized by type, 36% of children had family-related delays (e.g. family unpreparedness or adherence issues), 32% had delays due to clinic logistics (e.g. need for treatment preparation, awaiting test results, or abnormal test results needing to be repeated), 27% had health-related delays (e.g. concurrent treatment for tuberculosis or clinical instability), and 6% had other (e.g. pharmacy error) or no identified reasons for delay. The median time between eligibility and ART initiation was shortest for children with delays due to clinic logistics (median: 18 days; IQR: 14, 35) and significantly longer for children with family-related (median: 51 days; IQR: 21, 131) and other reasons for delay (median: 80 days; IQR: 16, 581). Children with family-related delays were more likely to be older and orphaned. Children with delays due to clinic logistics were more likely to be younger and children with health-related delays were more likely to have more advanced disease. In the first year of ART, no association was found between adherence and type of delay. CD4⁺ T-cell percentages and weight-for-age z-scores were lower for children with health-related delays.

Conclusions: Reasons for delaying the start of ART among eligible HIV-infected children

were distributed across family issues, clinic logistics and co-morbidities, with no single cause or category of causes predominant. Strategies to reduce delays in ART initiation will need to address a diverse set of issues (family, clinic, comorbidities) so children can benefit from earlier treatment.

No conflict of interest

Abstract: 3

Antiretroviral Treatment and HIV Care

Retention and long-term virologic outcomes in children and adolescents receiving HIV/ART care at a public sector tertiary level hospital in Zimbabwe

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Introduction: The burden of pediatric HIV infection is largely in sub-Saharan Africa where growing numbers of children will require long term ART. Successful outcomes on ART for children and adolescents will require life-long retention in care, and adherence to ART with successful virologic outcomes.

Methods: To assess long-term retention in care, we conducted a retrospective review of medical records for HIV positive children and adolescents (age 0-19 years) who were

enrolled in care at Parirenyatwa Hospital, a public sector tertiary level hospital, between January 2004 and December 2011. To determine clinical and virologic outcomes in care we conducted a cross sectional evaluation of children and adolescents in care and on ART. Genotypic analysis of isolates from a sub-set of children with evidence of virologic failure was obtained.

Results: 2293 children and adolescents (0-19 years) were enrolled into care. The median age at enrollment was 5.9 years (17 months IQR: 22-120 months). Among the children who were linked and enrolled in care, 32.8% dropped out of care within the first 3 months of enrollment. Infants were at greatest risk of early program attrition with 44.2% dropping out of care within the first 3 months. Factors associated with early program attrition included a history of tuberculosis (HR=2.76; 95%CI: 1.33-4.56; p=0.004) and advanced clinical stage (WHO stage III/IV disease) (HR=2.34; 95% CI: 1.64-3.34; p=<0.001). ART was initiated in 1256 (54.8%) children, at a median age of 7.7 years (IQR, 2.9-12). The median duration on ART was 2.8 years (IQR, 1.4-4.3). Long term retention in care at 12 months was 90% among children on ART, declining to 67% at 5-years. The virologic failure rate was 33% in 753 children who had been on ART for at least 12 months. The highest failure rate of 36.8% was observed in adolescents. Severe immunosuppression at enrollment was associated with increased odds of virologic failure (OR 5.09, 95%CI (2.29-11.28), p<0.001). Among 125 isolates that were assessed for genotypic resistance mutations, 39 had no clinically significant mutation, while 86 (69%) had at least one mutation conferring resistance to available ART. Prolonged failure is associated with the accumulation of multiple mutations; 2-5 mutations were detected in 62% and more than 5 mutations in 17% of isolates.

Conclusions: Early program attrition and poor long-term retention rates threaten the success of public ART programs for children and adolescents. The observed high virologic failure rates with the presence of clinically significant resistance mutations is concerning for long-term outcomes and may limit therapeutic options for HIV infected children in resource limited settings.

No conflict of interest

Abstract: 4

Antiretroviral Treatment and HIV Care

Adherence assessment techniques in adolescents receiving protease inhibitor based antiretroviral therapy in a resource limited setting

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Introduction: There are different methods for assessing adherence and the level of adherence is specific not only to places and patient groups but also to the method of adherence measurement used. Adherence measurement methods include direct methods such as biologic markers and body fluid assays, or indirect methods such as self-report, interview, pill counts, pharmacy records, computerized medication caps, and viral load monitoring. While a combination of these methods may be employed, patient self-report is the most widely used given its ease of implementation. Use of computerized medication caps and monitoring of surrogate markers seems reliable and less prone to respondent bias. For youth with HIV infection, successful adherence to a medication regimen requires the caregiver to take responsibility and the child to be cooperative. Increasing attention is being paid to ways of supporting patients in the task of taking all medications as prescribed. In the adolescent population psychosocial factors contribute greatly to non-adherence to ART and often adolescents are given independence in taking medications despite not fully understanding the needs of their regimens. This study was undertaken to ascertain the overall adherence of HIV infected adolescents to ART. The study was also conducted to compare self-report / pill counting adherence measurement techniques against

the medicine event monitoring system cap device technique.

Materials & methods: This was a prospective cohort study in adolescents (aged 12 to 21) receiving either boosted atazanavir (ATV/rtv) or lopinavir (LPV/rtv) as part of an antiretroviral regimen. This study was conducted at Newlands Clinic in Harare, Zimbabwe. Study participants received a medicine event monitoring system cap (MEMS cap) to assess adherence to the PI. Participants were taught on how to use the MEMS cap. During subsequent clinic visits MEMS bottles would have data downloaded from before medicine was refilled. At each of the subsequent visits during the study period a pill count and a self-report by the participant was also conducted to measure adherence. Current viral load measurements and CD4 counts were also recorded against the adherence data.

Results: Twenty-six participants with a median age of 18 (range 12 – 23) years participated in the study with 65% being female. Utilizing a pill count to assess adherence, 22 participants had a greater than 95% adherence to their protease inhibitor regimen. However using the MEMS cap only 9 participants had a greater than 95% adherence. Eleven of the 26 participants had a viral load greater than 50 (median = 63,525 cells/ml; range = 52 – 707,060) with a median adherence level of 100% (range = 94 – 100%) as determined by a pill count and a median adherence level of 83.3% (range = 0 – 100%) as determined by the MEMS cap.

Conclusions: Pill counts and self-reported adherence overestimated adherence in adolescent patients on PIs as part of an antiretroviral regimen. Newer adherence assessment techniques need to be developed which can more accurately assess adherence in populations with adherence challenges.

No conflict of interest

Abstract: 5

Antiretroviral Treatment and HIV Care

Pretreatment HIV Drug Resistance Increases Regimen Switch in Sub-Saharan Africa

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Introduction: After the successful scale-up of antiretroviral therapy (ART) in Africa, there are concerns about emerging drug-resistant HIV and an increasing need for more costly second-line regimens. We investigated the impact of pretreatment drug resistance (PDR) on 2 and 3 year ART outcomes and switch to second-line in the first 3 years of ART within the Pan-African Studies to Evaluate Resistance Monitoring (PASER-M) cohort.

Material & Methods: The PASER-M cohort followed HIV-1 infected individuals initiating first-line ART for 2 years (13 sites) or 3 years (5 sites) in 6 African countries. Viral load (VL) and *pol* genotypic testing (if VL>1000 cps/ml) was performed at ART initiation and annually thereafter. PDR was defined as a decreased susceptibility to at least one prescribed drug, using the Stanford algorithm and IAS-USA mutation list. The effect of PDR on (I) switch to second-line with acquired drug resistance, (II) virological failure (VL>400 c/ml) and (III) acquired drug resistance during the first 3 years of ART was assessed using cumulative incidence plots, multivariate cox-models and multilevel logistic regression. Unnecessary switch was defined as switch with VL<1,000 cps/ml or VL>1,000 cps/ml with wild-type virus.

Results: For 2,579 (94.2%) of 2,737 participants genotypes were available at ART initiation; in 5% (n=139) PDR was present. After 3 years, 112 (4.3%) participants had switched to second-line regimen of whom 78 (69.6%) had VL results and genotypes available; 33.3% (n=26) switched

unnecessarily. Most switches with drug resistance took place after 1 year of ART. Incidence density of switch was 1.1 per 100 person-years. PDR increased the risk of: (I) switch with drug resistance, subhazard ratio 7.8 (95%CI 3.9-15.6) during 3 years; (II) virological failure, odds ratios (OR) 2.9 (95%CI 1.4-5.8) after 2 years and 2.8 (95%CI 1.1-7.2) after 3 years, and (III) acquired drug resistance, OR 2.5 (95%CI 1.2-5.4) after 2 years and OR 5.0 (95%CI 1.8-14.3) after 3 years of first-line ART. PDR was not associated with mortality or new AIDS events.

Conclusions: PDR is strongly associated with switching to second-line ART, but does not cause excess mortality or AIDS related events. VL monitoring can enable timely detection of therapy failure and avoid unnecessary switches. In view of rising PDR levels in Africa, these findings have important implications for allocation of ART resources and renders mitigating PDR a priority.

No conflict of interest

Abstract: 6

Antiretroviral Treatment and HIV Care

Delays in confirming suspected treatment failure and in switching to second line antiretroviral therapy in Kenya

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Introduction: While current recommendations support the use of routine viral load for monitoring patients on antiretroviral therapy (ART), many resource-limited settings prioritize viral load to confirm suspected treatment failure before switching to second line ART, or to rule out treatment failure before making single-drug substitutions. There is limited data

on delays in confirming treatment failure and switching to second line ART in sub-Saharan Africa. This study evaluated delays in time to conduct viral load testing and in switching to second line medication.

Materials & methods: We analyzed data from a retrospective cohort of patients enrolled in HIV care between 2005 and 2011 in 24 facilities supported by Family AIDS Care and Education Services (FACES) in Kenya, who had viral load test results to confirm clinical or immunological treatment failure. Demographic, clinical and laboratory characteristics were abstracted from patient files. Cox proportional hazards regression was used to explore associations between patient characteristics and time from clinical or immunological failure to viral load testing, and from viral load testing to switch to second line ART.

Results: A total of 203 patients were included, with a mean time on first line ART of 2.4 years (standard deviation (SD):1.6) and median CD4 count of 124 cells/ μ l (Interquartile Range (IQR):62,213) at the time of clinical or immunological failure. The median time from clinical or immunological failure to viral load testing was 70 days (IQR: 28,160). In multivariate analysis, every additional year on first line ART decreased the delay in confirming treatment failure (adjusted hazard ratio (AHR):1.12(95%CI: 1.01-1.25)). Every time a patient missed a scheduled clinic visit on first line ART increased the delay in confirming treatment failure (AHR: 0.93(95%CI: 0.88-0.99)). There were no significant associations with CD4 count, adult versus pediatric patients, type of treatment failure (clinical versus immunological), or distance that the patient had to travel to reach the clinic. The median time from viral load testing to treatment switch was 56 days (IQR: 41, 84). None of the predictor variables had a significant association with time from viral load testing to switch. A review of patient files for reasons for delay in confirming treatment failure or switching to second line revealed that 47% of delays were attributable to clinicians' delay in noting a patient was failing (either clinically, immunologically, or virologically), 18% were attributable to long turn-around-time for viral load results, and 17% were attributable to patients defaulting from care.

Conclusions: This retrospective analysis found concerning delays in confirming suspected treatment failure and in taking

action once treatment failure was confirmed. With the scale-up of routine viral load monitoring for patients on ART in Kenya, the use of viral load for confirming clinical or immunological failure will reduce but there will be an increased demand for taking timely action for patients with virological failure. Investments in staff training, in improving laboratory systems, and in patient retention systems may reduce the delays in switching patients to second line ART.

No conflict of interest

Abstract: 7

The Aetiology of STD Syndromes and Association With HIV Infection in Zimbabwe

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Introduction: In Zimbabwe, as in other developing countries, sexually transmitted infections (STI) are treated syndromically. Thus, males with urethral discharge (MUD), females with vaginal discharge (FVD), and males and females with genital ulcer disease (MGUD and FGUD) are treated with a combination of antibiotics using algorithms provided by the Zimbabwe Ministry of Health and Child Care. However, periodic surveys into the aetiology of STI-associated syndromes are necessary to inform these guidelines. We report on an ongoing STI aetiology study in Zimbabwe.

Materials & methods: On the basis of STI statistics accumulated by the Zimbabwe Ministry of Health and Child Care, we selected 6 regionally diverse clinics with high numbers of MUD, FVD, and MGUD/FGUD cases, including two clinics in Harare, two clinics in Bulawayo, one clinic in Beitbridge (a busy border town between Zimbabwe and South Africa), and one clinic in rural Gutu. We deployed a mobile unit comprised of 3 trained nurses to visit these clinics sequentially and enroll approximately 100 consecutive patients with MD, FD, or GUD at each clinic. A standardized questionnaire was used to collect STI history and risk behaviors. Data were entered on a hard copy and subsequently transferred to an electronic hand-held device and then uploaded to a web-based database. Discharge and ulcer specimens were taken for testing on various nucleic acid amplification platforms for the presence of *N. gonorrhoeae* (NG) *C. trachomatis* (CT), *M. genitalium* (MG) and *T. vaginalis* (TV) among patients with MUD and FVD and *T. pallidum*, *H. ducreyi*, and herpes simplex virus for patients with MGUD/FGUD. Consenting patients had blood samples taken for HIV and treponemal syphilis testing. Enrollment will be completed in March 2015. Laboratory testing is ongoing.

Results: At the end of December 2014, a total of 376 patients were enrolled at 4 clinics: 135 MUD; 137 FVD; 52 MGUD; and 52 FGUD. Of 294 patients tested thus far, 102 (34.7%) were positive for NG and 49 (16.7%) for CT. Specifically, respective NG and CT positivity rates were 62.4% and 21.5% for MUD, 21.9% and 12.5% for FVD, 15.4% and 11.5% for MGUD, and 28.9% and 21.2% for FGUD. Patients with either NG or CT, were significantly ($p < 0.01$, Chi square test) more likely to be infected with the other organism; 31 of 120 (25.8%) CT or NG infected patients were dually infected. None of the study groups had a combined NG/CT positivity rate $< 23\%$ and patients with FGUD had a higher combined rate (36.5%) than women with FVD (27.1%). Among patients with FGUD, 77% did not meet criteria for syndromic management that would have covered NG/CT infections. Of patients consenting to syphilis and HIV serologic testing, 8.3% had a positive treponemal test and 39.1% tested positive for HIV.

Conclusions: 1. Gonorrhoea is one of the main causes of male urethral discharge in

Zimbabwe. 2. the high rate of NG/CT among patients with FGUD calls into question the appropriateness of syndromic management for patients with FGUD as it does not cover for CT or NG infections.

Conflict of interest:

Dr. Rietmeijer is a paid consultant to the University of Zimbabwe, Department of Community Medicine, for the Aetiology of STI Syndromes in Zimbabwe project

Abstract: 8

Laboratory monitoring / diagnostics

Early Infant Diagnosis Data Transmission System Using Mobile Phones in Zimbabwe

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Introduction: The timely diagnosis and treatment of HIV exposed infants is critical in achieving the full impact of Prevention of Mother to Child Transmission of HIV programs (PMTCT) in Zimbabwe. The whole process of sample collection, completion of testing at a specialized laboratory, return of a hard copy of results to the facility and receipt of results by the client takes 120 days which creates a significant delay in treatment. Absence of a sample tracking mechanism and a standardized client notification process is a major barrier in timeliness of service delivery and enrollment for the PMTCT program.

Materials & Methods: The country implemented a cellphone based data transmission system to relay early infant diagnosis (EID) results from laboratory to clinic. this system is based on an open source software *FrontlineSMS* www.fronlinesms.com implemented at 1,225 of the 1,600 health facilities across the country. The overall goal was to improve turnaround time (TAT) between sample collection and issuing of results to clients utilizing mobile technologies. The reported TAT was measured from the day of

sample collection to the date the sample result was received at the health facility (HF).

Results: In the roll-out phase, the cellphone EID system sent out 45,100 HIV results out of a total 71,404 (63%) tested between April 2013 and October 2014. A total of 7,034 SMS notifications were sent from 1225 HF to the laboratory. The TAT has been reduced from a median 94 days to a median of 57 days from results released in August 2014. The outstanding delays are related to work back log at the National Microbiology Reference Laboratory.

Conclusion: The cellphone system is efficient in reducing TAT for EID results for HIV exposed infants. The system improves communication and accountability between facilities, laboratory and client thus reducing loss to follow-up and ensuring timely initiation of treatment. Target TAT is 28 days and areas for enhancement include sample transportation, improved LIMS and reducing TAT for testing.

No conflict of interest



**9th International Workshop on HIV Treatment,
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Abstracts

Poster Discussion Presentations

Abstract: 9*Antiretroviral Treatment and HIV Care***Assessing Linkage between HIV-testing and care/treatment, by mode of HIV testing in Public Hospitals in South-rift Kenya***J. Mutugi M'Muriithi¹, J. Saitabau Kipees¹, J.A. Onyalo¹, J.M. Kamau¹, J.K. Kiprop¹*¹*FHI360, Aphiaplus - clinical services, Nakuru, Kenya*

Introduction: Clinical management of HIV/AIDS involves a series of interconnected services ranging from testing, referrals, linkage/enrollment into care, to antiretroviral therapy (ART). Failed linkage can cut short this continuum and negate the benefits of ART. Many barriers to enrollment have been documented but few studies in Sub-Saharan Africa have evaluated the differences in patient enrollment by the mode of HIV testing. Increasing adoption of provider-initiated testing and counseling (PITC) as an alternative to voluntary counseling and testing (VCT), has improved patients' access to HIV testing. However, whether this has increased the proportion of HIV-positive patients linked to care is not fully established.

Objective: To determine the proportion of HIV positive patients that enroll for care/treatment after diagnosis, by modes of HIV-testing.

Materials & methods: This was a retrospective cohort analysis of patients diagnosed with HIV between October and December 2012 in four hospitals in South-rift region of Kenya.

A total of 519 patient records from all HIV testing points, grouped by two common testing modalities, VCT and PITC were analyzed. All patients were followed up, retrospectively, for a period of 12 months. Patients that were enrolled into care were further followed up to determine time to CD4-testing. Two outcomes variables; enrollment and CD4-testing, and six independent variables were used. Univariate and multivariable Cox proportional hazard regression models were used in the analysis. Kaplan-Meier survival method was used in the analysis of time-to-enrollment, and time-to-

CD4 testing. Patients who did not enroll, and those who did not get a CD4 test by the end of follow up period were right-censored.

Results: Only 212 (40.8%) out of the 519 patients enrolled into care within a year. Of the patients who enrolled into care, majority 152(72%) did so within the first month translating to 29% of all the patients. Enrollment at three, six and twelve months was 178(34.3%), 191(36.8%) and 212(40.8%) respectively. Enrollment rate was 54% and 34% in the VCT and PITC groups respectively. The median time to enrollment was 15 days (IQR 2-39) while the median time to CD4 (after enrollment) was a day (IQR 1-16). The likelihood of enrolling into care was significantly higher in the VCT group (aHR 2.0, $P<0.001$), among adults 25 years and above (aHR 1.6, $P=0.02$) and patients who were evermarried (aHR 1.5, $P=0.03$). However there was no difference in enrollment between female and male patients (aHR 0.95, $P=0.8$). Among the patient who enrolled into care, 163(77%) got a CD4 test. However there was no significant difference in CD4-testing between the VCT and PITC groups (aHR 1.09, $P=0.6$) or between young patients 15-24 years and adults 25 years and above (aHR 1.3, $P=0.2$)

Conclusions: The findings corroborates those of other studies in the region. Enrollment was significantly better among patients testing on their own volition (VCT) rather than PITC ($P<0.001$). The first one month after diagnosis of HIV is critical in the continuum since majority of patients enroll then. PITC providers should focus on linkage to care as a major bridge to completing the continuum of care.

No conflict of interest

Abstract: 10*Prevention of Mother to Child Transmission***Sex Differences in Uptake of HIV Services in Nigeria: Implications for Future Programming***H. Khamofu¹, E. Oladele¹, M. Saleh¹, I. Mogaba², O. Adedokun², T. Badru², K. Green³, O. Chabikuli⁴, K. Torpey⁵**¹Family Health International, Prevention Care and Treatment, Abuja, Nigeria; ²Family Health International, Monitoring and Evaluation, Abuja, Nigeria; ³Manitoba University Nigeria, Programme Management, Abuja, Nigeria; ⁴Family Health International, Programme Management, Pretoria, South Africa; ⁵Family Health International, Technical Director, Abuja, Nigeria*

Introduction: The gender-based barriers to accessing health services and outcomes have been documented. As part of an essential baseline process of designing and implementing the USAID funded strengthening integrated delivery of HIV/AIDS services (SIDHAS), we examined sex disaggregated service data from the global HIV/AIDS initiative in Nigeria (GHAIN) implemented by FHI360 across all states in Nigeria. We presents sex differences in service utilization and outcomes; and discusses the implications of these for targeted service delivery.

Material & Methods: We reviewed HIV service data of 2,057,014 pediatric and adult clients seen between September 2008 and August 2011 at 242 health facilities supported by the USAID funded Global HIV/AIDS Initiative in Nigeria (GHAIN) Programme. Fourteen of the sites collected electronic medical records (EMR) while the remaining used paper based records.

Results: In the 3-year period, 988,325 females (48.0%) and 1,068,689 males (52.0%) were tested for HIV. There was no difference in the sex-specific HIV positivity for children under 15 years of age while for adults (>15years), HIV positivity in females (17.9%) was more than double that in males (8.6%) (OR: 2.08 95% CI: 2.06 – 2.10). This was also the pattern for enrolment into care and treatment (F: M = 2:1). At the 14 EMR sites, 15,975 persons (F=9,813, M=5735) were started on antiretroviral therapy

(ART). Mean age at enrolment was 31.8 (±8.9) years for females and 38.5 (±9.6) years for males (p<0.001). A significantly higher proportion of adult males presented with advanced disease (male=52.3% and female=47.7% with stages III & IV disease, p<0.001) and had poorer outcomes (Loss to follow-up – 11.6% females and 15.3% males; p<0.001, 6.4% male deaths and 4.0% female deaths; p<0.001). Median baseline CD4 count for female patients was 161.5 (IQR 79 – 251) and for males 129 (IQR 53 - 204).

Conclusions: This study shows there are age dependent differences in HIV positivity, uptake of HIV testing, enrolment and retention in HIV care and progression of HIV disease in HIV care and treatment settings in Nigeria. The use of sex-disaggregated data is a significant first step towards understanding underlying gender differences in HIV programming. Qualitative studies are required to further explore sex-specific vulnerabilities, patterns of illness, barriers to accessing care and how men and women's responses to ill-health determine health outcomes in Nigeria. In designing and delivering HIV interventions these differences need to be taken into account to ensure equitable programming, particularly in reaching more men.

*No conflict of interest***Abstract: 11***Women and HIV***Cervical cancer screening programmes: A case of an antiretroviral access programme in a resource limited setting.***T. Mudzviti¹, C. Chimbetete², M. Pascoe², S. Bote², S. Gavi³**¹University of Zimbabwe, School of Pharmacy, Harare, Zimbabwe; ²Zimbabwe Aids Care Foundation, Newlands Clinic, Harare, Zimbabwe; ³College of Health Sciences, Department of Clinical Pharmacology, Harare, Zimbabwe*

Introduction: Invasive cervical cancer is the third most common cancer among women worldwide. The study was conducted to determine the proportion of HIV infected women developing precancerous cervical lesions as determined by a validated visual inspection with acetic acid and digital cervicography (VIAC) method. The study was also conducted to identify factors associated with the presence of cervical lesions.

Materials & methods: This was a cross-sectional study in HIV infected women who underwent cervical cancer screening at Newlands Clinic, Harare, Zimbabwe in 2011. Eight hundred and eighty – nine women between the ages of 18 and 65 years of age were screened for pre-cancerous cervical lesions using VIAC. The method involved the liberal application of a 3% - 5% acetic acid solution to the cervix. After at least three minutes of the acetic acid bathing the cervix then an evaluation of the cervix was done initially with the naked eye then digital cervicography was done to ensure that the examiner could get a magnified view of the cervix.

Results: Positive cervical lesions were identified in 307 women (34.5%). The age group most affected by pre-cancerous cervical lesions was that between the ages of 31 – 40 years of age accounting for half the cases. The data also showed that there was a greater prevalence of pre-cancerous cervical lesions in patients who had been diagnosed of HIV within the preceding 2 year period (44% vs 32%). CD4 counts were lower within the group of patients who had pre-cancerous cervical lesions (median nadir CD4 149 vs 169 and median CD4 at the time of VIA test 388 vs 424). The odds of a VIA positive result were greater for women with low CD4 cell counts at the time of VIAC ($p < 0.05$). Patients 40 years of age or greater had a lower odds of having a positive VIAC test ($p < 0.05$).

Conclusion: The prevalence of cervical lesions is more than a third in HIV infected women. Data also showed that the prevalence of the lesions was less in patients with higher CD4 counts. Introduction of critical interventions in prevention of cervical cancer needs to be rapidly scaled in the HIV infected population.

No conflict of interest

Abstract: 12

Health systems and HIV

ARISE: Africa Research Initiative and Support – Network

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Introduction: It has been recognized by the global infectious diseases research community, including the European & Developing Countries Clinical Trials Partnership (EDCTP) that, in order to be able to address the most important outstanding questions with respect to HIV, malaria and TB, investment in African research capacity was urgently needed. In 2012 the Africa Research Initiative and Support – Network (ARISE) was founded as a consortium with the objective to develop a network of Research Support & Training Centers (RSTCs) to improve research capacity within 4 regional RSTCs in the College of Health Sciences/College of Medicine of the universities of Malawi, Uganda, Rwanda and Zimbabwe. This network has additional technical support from a Northern partner; the Amsterdam Institute for Global health and Development (AIGHD).

Materials & Methods: The key concept of the RSTCs is based on benchmarking, synchronizing and twinning successful models of training and research capacity strengthening

through exploiting opportunities provided by north – south and south – south partnerships. ARISE has utilized the unique collaborative strengths across the institutions to develop a functional network with harmonized training methodology, international accreditation and a standardized evaluation system. The individual RSTC's were further developed into units capable of addressing national health problems as they emerge and delivering a service portfolio based on research disciplines. Emphasis has been placed on strengthening capacity in the field of grants administration, data and IT management and improved communication strategies with the aim of increased know-how, income generation and visibility. The ultimate goal is to create financial sustainability not enforced by donor funding.

Results: The main result of ARISE over the past 2.5 years has been the establishment and stabilizing of institutional-embedded RSTC structures, both as recognized hubs of clinical research capacity and expertise as well as physical expert centers of research support and training. These research institutions are respected and coordinated one-stop centers where faculty and students can easily access information and support related to any aspect of research. The 4 RSTC's have created a strong network that benefits from exchange and sharing of knowledge, skills and harmonization of existing and newly developed materials. In total >50 applied courses in the fields of ICH-GCP, data management, clinical trial monitoring, grant management and statistics were conducted within and across the RSTC's. This has resulted in an increase in successful grant applications and scientific publications. In addition, >10 (multicenter) clinical trials are coordinated and/or monitored in the area of HIV, TB and malaria. ARISE has improved collaboration between the researchers and ethics committees as well as IRB functioning and strengthening through review of SOPs.

Conclusions: ARISE has created a unique research-enabling environment proofing the RSTC model is successful and can be replicated across other institutions in Africa to support research in HIV/AIDS and emerging infectious diseases such as Ebola. The existing research support centers provide a functional and quality platform for multicenter studies in Africa.

No conflict of interest

Abstract: 13

The Mobile Unit: A Model for STI/HIV Surveillance and Capacity Building in Resource Restricted Countries

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Introduction: The development of STI surveillance systems, including assessments of aetiology and antimicrobial resistance is hampered in many developing countries by the lack of clinical and laboratory infrastructure, staff, and training. To implement a study into the aetiology syndromes in Zimbabwe, we deployed a mobile unit comprised of three trained nurses to collect data and samples from patients in a regionally diverse sample of clinics.

Materials & Methods: The study team collected data related to STI/HIV history and risk behaviors using a standardized questionnaire. In addition, samples were collected from 600 patients at clinics in Harare (Mbare and Budiro), Bulawayo (Khami Road and Nkulumane), Beitbridge (Dulivadzimu) and Gutu presenting with STI syndromes, including males with urethral discharge (MUD), females with vaginal discharge (FVD), and males and females with genital ulcer disease (MGUD and FGUD respectively). Data were entered on a hard copy and subsequently transferred to an electronic hand-held device and then uploaded to a web-based database. Discharge and ulcer specimens were taken for testing on various nucleic acid amplification platforms for the presence of *N. gonorrhoeae* (NG) C.

trachomatis (CT), *M. genitalium* (MG) and *T. vaginalis* (TV) among patients with MUD and FVD and *T. pallidum*, *H. ducreyi*, and herpes simplex virus for patients with FGUD/MGUD. Consenting patients had blood samples taken for HIV and syphilis testing. All specimens were kept under appropriate conditions at the clinic and shipped on a weekly basis to a central study laboratory that coordinates all testing and data management. Regular site visits by study supervisors were conducted to assure protocol adherence and observe operations.

Results: As of December 2014, the team has completed enrollment in Harare and is close to completion in Bulawayo. Respectively, 152 patients have been enrolled at Mbare, 55 at Budiriro, 86 patients at Khami Road and 83 at Nkulumane. Measures in the field and at the central laboratory indicate high quality of specimens and associated documentation. Observations during field site visits and discussions with regular clinic staff, also indicate high acceptance of team nurses in local clinics as they are not only seen as researchers collecting important information from clinic patients, but also as a resource both in professional development of clinic care providers and assisting them with other tasks when not enrolling patients.

Conclusions: Periodic deployment of a mobile surveillance team rotating through participating clinics serves the dual purpose of systematic collection of relevant surveillance data and capacity building at the clinic. Potential future expansion of team activities include point-of-care testing for STI pathogens such as treponemal rapid tests for syphilis and real-time PCR testing for gonorrhoea and chlamydia using devices such as GeneXpert that could be part of the mobile team's assessment tools. Highly-trained mobile teams are an efficient and effective method for STI surveillance and clinic capacity building in resource-restricted countries.

Conflict of interest: Dr. Rietmeijer is a paid consultant for the University of Zimbabwe, Department of Community Medicine for this project.

Abstract: 14

Laboratory monitoring / diagnostics

Evaluation of the Sysmex-Partec CyFlow® mini-POC against the reference CD4/PLG method in South Africa

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Introduction: The National Health Laboratory Service (NHLS) of South Africa adopted an integrated tiered service model (ITSDM) that makes provision for Point-of-Care (POC) either at small POC Hubs (multiple POC testing) or as stand-alone facilities in hard-to-reach clinics. As such, POC instruments with CE marking are currently validated for accuracy, reproducibility, ease of use and capacity to analyse current external quality control material. The Sysmex-Partec CyFlow® mini-POC instrument was validated at the NHLS reference CD4 testing laboratory against the predicate Pan-leukocyte CD4 methodology. Ethics clearance was obtained for using remnant laboratory CD4 samples.

Materials & methods: 194 random EDTA samples from the CD4 laboratory were prepared and analysed on the automated Beckman Coulter CellMek/MPL cytometer. All samples were re-prepared on the mini-POC for analyses on the same blood samples within 2 hours of reference testing, using remnant EDTA blood. Samples were manually pipetted into a lyophilized labelled tube and incubated for 15 minutes before adding two separate pre-filled buffers into each tube. The prepared samples were aspirated by syringe and analysed on the mini-POC. Daily start-up and quality control was done as per manufacturers recommendations prior to daily patient sample testing. This included cleaning procedures, Count Check Beads, Lymphosure Normal and Low samples. Statistical analyses was done using GraphPad Prism 6 and included the

percentage similarity with correlating coefficient of variation (CV) for absolute CD4 count (CD4#) and CD4 percentage (CD4%) of lymphocytes. Bland-Altman (BA) analyses and direct comparison using the t-test with non-parametric Mann-Whitney post-testing was done for both CD4# and CD4% of lymphocyte.

Results: Absolute CD4 counts showed significant differences between instruments ($p = 0.0239^*$). No significant differences were however noted for CD4% of lymphocytes values ($p \text{ value} = 0.2643$). After correcting %similarity for samples with a CD4# count <100 , CV's of 6.98 for CD4# and 24.52 for CD4% was obtained. Bland-Altman revealed a bias of 73.16 ± 81.07 for CD4# and -1.627 ± 3.807 for CD4%. Results were also categorized into different CD4# criteria (<350 , $350-500$ and >500) for subset analyses. BA for CD4# <350 had a bias of 20.72 ± 28.04 , for $350-500$ had a bias of 82.72 ± 52.6 and >500 had a bias of 161.7 ± 83.38 . CD4% for these groups all had a negative bias of 1.051 ± 2.924 , 2.430 ± 4.573 and 2.105 ± 4.483 respectively.

Conclusions: The miniPOC CyFlow instrument under-estimated absolute CD4 count and over-estimated CD4% values. The system is very labor intensive and requires skilled staff to operate as well as needing a cold chain for reagents. The mini-POC is not a true POC system, but better suited to a low - medium throughput laboratory or research applications.

No conflict of interest

Abstract: 15

Pediatrics

False positive HIV tests in infancy and management of uninfected children receiving antiretroviral therapy

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Introduction: Despite highly valid diagnostic tests, the current practice of initiating ART in HIV-exposed infants after a single positive test will lead to misdiagnosis, particularly as programs to prevent mother-to-child transmission (PMTCT) become more effective. This report summarizes two children misdiagnosed with HIV infection in a clinic in rural Zambia and discusses the implications of false positive HIV DNA tests in HIV-exposed infants, including the potential magnitude of the problem.

Materials & Methods: Within the context of a prospective cohort study of HIV-infected children at Macha Mission Hospital in rural Zambia, files were reviewed to identify infants with a possible misdiagnosis of HIV infection. The details of cases identified were abstracted from medical records. To evaluate the magnitude of the problem, HIV estimates for Zambia were obtained from the World Health Organization. Estimates of the validity of HIV DNA testing were obtained from published studies.

Results: Three of 470 infants tested in 2011 and 2012 had discrepant HIV test results and appear to be uninfected but receiving antiretroviral therapy (ART). The first infant was born in 2011, received PMTCT, was breastfed, and tested negative at 6 weeks of age. The infant tested positive at 7 months of age and was initiated on ART. Confirmatory HIV DNA tests at 10 months and 2.7 years of age were both negative. ART was discontinued at 3.1 years of age and was lost to follow up when the child moved out of the study area. The second infant was born in 2012, received PMTCT, was breastfed, and tested negative at 8 weeks of age. The infant tested positive at 6 months of age and was initiated on ART. Confirmatory HIV DNA tests at 10 and 12 months of age were both negative. ART was discontinued at 13 months of age. HIV antibody testing at 17 and 20 months of age were negative and the child was discharged from the clinic in March 2014.

In Zambia, there were an estimated 79,000 HIV-infected pregnant women in 2012, with $>95\%$ reported coverage of treatment to prevent mother-to-child transmission, leading to an estimated 2,293 HIV-infected and 76,707 HIV-exposed but uninfected children born in 2012. Reported specificity of HIV DNA testing from published studies ranged from 97.1% to 99.8%. This would lead to positive predictive

values of 50% to 94% and an estimated 153 to 2,225 HIV-uninfected children diagnosed with HIV infection and started on treatment in 2012.

Conclusions: As mother-to-child transmission and the prevalence of infection among HIV-exposed infants decreases, the number of false positive HIV DNA test results will increase. The potential misdiagnosis of HIV infection in exposed infants raises important management issues in terms of procedures for correcting the diagnosis, monitoring the child, and counseling for the family and community. Recommendations and policies are needed to address the management of children receiving antiretroviral therapy but suspected of being HIV-uninfected.

No conflict of interest

Abstract: 16

Prevention of Mother to Child Transmission

Improving PMTCT services through a participatory Continuous Quality Improvement (CQI) approach in Nyanza region of Western Kenya

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Introduction: Despite Prevention of Mother to Child Transmission (PMTCT) progress in reducing pediatric HIV incidence, vertical transmission remains the most common way children acquire HIV in sub-Saharan Africa.

Ensuring quality PMTCT service delivery is essential to averting new infections in infants. This study examined the impact of a Continuous Quality Improvement (CQI) approach to improving health care capacity for PMTCT service delivery.

Materials & methods: In 2012, Family AIDS Care and Education Services (FACES) program in Nyanza, Kenya, introduced the CQI approach to improve PMTCT performance on key indicators captured at 123 sites. The CQI involved randomly selecting patient files guided by a sample matrix for select indicators at each site during six-month intervals. The baseline CQI was carried out in January – June 2012 with follow up every six months through June 2014. Performance at $\geq 90\%$ was good and $\leq 90\%$ was targeted for improvement. The Plan Do Study Act (PDSA) cycle along with a multidisciplinary team (MDT) approach was used to design and implement strategies for improvement. To assess the CQI approach, we focused on priority variables at baseline and annual follow up: exclusive breastfeeding (EBF), appropriate antiretroviral (ARV) regimen, Early Infant Diagnosis (EID) testing within 8 weeks of birth, baseline CD4 at first antenatal clinic visit(ANC), family and partner HIV testing and pediatric timely CD4 and growth monitoring. Pre-and-post cohort analysis was used to compare baseline with annual follow up periods using STATA 12. Risk ratio (RR) (95% Confidence Interval) was reported and p-value < 0.05 considered significant.

Results: EBF increased from 82% at baseline to 94%(RR=1.15; 95% CI 1.11-1.19) at first year follow up, then to 95%(RR=1.16; 95% CI 1.12-1.20) during second year follow-up. ARV prophylaxis uptake increased from 83% to 95%(RR=1.15; 95% CI 1.11-1.18) after first follow-up and then to 91%(RR=1.10; 95% CI 1.06-1.13) in the second follow-up. Highly active antiretroviral therapy (HAART) increased from 86% to 97%(RR=1.13; 95% CI 1.09-1.17) at first follow-up and then to 95%(RR=1.11; 95% CI 1.07-1.15) for the recent follow-up. EID uptake increased from 88% to 89%(RR=1.01; 95% CI 0.98-1.04) at first year follow-up and then increased significantly to 91%(RR=1.04; 95% CI 1.01-1.06) during the second year follow-up. CD4 at first ANC increased from 57% to 76%(RR=1.32;95% CI 1.26-1.39) immediately and further increased to 81%(RR=1.41;95% CI 1.34-1.47) in the last follow-up. In the first follow-up year, family and partner testing relatively increased from 71% to

73%(RR=1.03;95% CI 0.99-1.06) and then increased significantly to 74%(RR=1.05;95% CI 1.01-1.08) in the second follow-up. Timely pediatric CD4 increased from 78% to 83%(RR=1.07;95% CI 1.02-1.13) in the first follow-up and further increased to 89%(RR=1.14;95% CI 1.09-1.20) in the last follow-up. Growth monitoring increased from 60% to 82%(RR=1.36;95% CI 1.29-1.43) during the first follow-up and then to 87%(RR=1.44;95% CI 1.38-1.52) in the second follow-up.

Conclusions: The CQI approach, inclusive of MDT and PDSA, focused strategies for improvement and enabled teams to identify, measure, and address underperforming indicators with sustained improvements in PMTCT. This approach is scalable in similar settings and can potentially boost quality PMTCT service delivery.

No conflict of interest

Abstract: 17

Antiretroviral Treatment and HIV Care

Beyond IRIS TB, how common is tuberculosis among patients on ART?

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Introduction: There is paucity of literature on factors that may predispose patients on combination antiretroviral therapy (cART) to develop tuberculosis (TB). Based on significant numbers of patients in the local HIV program started on TB treatment, we identified and evaluated three categories of TB patients; those in the pre-ART phase (before starting ART); those with immune reconstitution inflammatory syndrome (IRIS-TB phase,

occurring within 3 months of starting ART) and those with TB occurring more than 3 months after starting cART. The aim was to better understand the timing of TB diagnosis relative to these three phases.

Materials & methods: We used a retrospective cross-sectional design. Data was extracted for patients aged 15 years and above that were newly started on TB treatment at 12 high volume ART sites in Zambia between October, 2011 and September, 2012. We extracted data from patient TB cards, files, TB and ART registers that included baseline CD4 count, sex and type of TB (pulmonary or extra pulmonary TB). We compared median baseline CD4 counts at start of TB treatment among the three phases using the Wilcoxon rank sum test.

Results: There were 446 TB patients, of which 142 (31.8%) were pre-ART; 80 (17.9%) had IRIS-TB; 182 (40.8%) had TB after 3 months of starting cART and 42 (9.4%) that were eligible for cART that were not yet started on cART at the time of data collection, and therefore could not be fitted in the three phases. Of the 404 TB patients that fitted in the three phases, 219 (54.2%) were males and 348 (86.1%) had pulmonary TB. The median age for starting TB treatment among the 404 TB patients was 37.7 years [interquartile range (IQR): 32.5–45.3]. The median baseline CD4 counts was 205 (IQR: 95–321). The median baseline CD4 count for TB patients in pre-ART was significantly lower than the median for those that were on cART for more than 3 months (150 versus 236 cells/ μ L respectively, $P = 0.0012$). Also, the median baseline CD4 count for patients with IRIS-TB was significantly lower than the median for those that were on cART for more than 3 months (159 versus 236 cells/ μ L respectively, $P = 0.0004$). There was no significant difference in median baseline CD4 count between pre-ART TB and IRIS-TB (150 versus 159 cells/ μ L respectively, $P = 0.5986$).

Conclusions: We found significant differences showing that TB after 3 months of starting cART develops at a higher median baseline CD4 count compared to TB in pre-ART and IRIS-TB. Prospective research is recommended to better understand the implications of these findings both clinically and programmatically given the gravity of TB associated morbidity and mortality.

No conflict of interest

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**9th International Workshop on HIV Treatment,
Pathogenesis and Prevention in Resource Limited
Settings – INTEREST**

Abstracts

Poster Presentations

Abstract: 18*Antiretroviral Treatment and HIV Care***Feasibility of using mHealth to improve early infant diagnosis of human immunodeficiency virus infection in rural southern Zambia**C.G. Sutcliffe¹, J.H. van Dijk^{2,3}, C. Sinywimaanz², S. Mweetwa², P. Thuma², W.J. Moss¹¹Department of Epidemiology, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD, USA;²Macha Research Trust, Macha Hospital, Choma, Zambia;³Department of Immunology and Infectious Diseases, Erasmus University Rotterdam, the Netherlands

Introduction: Early infant HIV diagnosis and treatment is challenging in rural Zambia, as the necessary technology is not available on site and caregivers travel long distances to access care. Previous studies indicate that there is approximately 3 months between sample collection and providing results to caregivers, with the longest delay found for reporting the results to the caregiver. This study was undertaken in Choma District to evaluate the feasibility of using mobile phone technology to contact caregivers about the status of their child's HIV test results and provide reminders of clinic appointments.

Materials & methods: A prospective study was initiated in April 2013. Children younger than 18 months and evaluated at the HIV ART Clinic at Macha Hospital, Choma District are eligible. Caregivers are administered a questionnaire about cell phone use and, if they agree, are contacted by cell phone to return to the clinic to receive test results when available. Preliminary results are reported.

Results: As of February 1, 2015, 388 infants (51% male; median age: 9 weeks) and their mothers (median age: 31 years; 24% have at least some secondary school education) were enrolled. Only 30% of mothers ever used a cell phone. Of those who have, 94% own a phone and 72% have sent and 89% received a text message. Among phone owners, 70% had a fully functional phone (battery charged and network coverage) during the last week. 29% of phone owners share their phone with others,

primarily their spouse who knows their HIV infection status. All phone users agreed to be contacted by study staff when their child's test results became available. 88% preferred to be called rather than sent a text message. As an alternative, 99% of mothers agreed to be contacted through their rural health center when test results became available.

Conclusions: Many caregivers bringing infants for early HIV diagnosis at Macha Hospital do not have access to mobile phones. Contacting caregivers through rural health centers may be more feasible as a strategy to improve early infant diagnosis and treatment.

No conflict of interest

Abstract: 19**Chronic ulceration of the nose**T. Maphosa¹, G.E.L. van den Berk², J.W.M. Engelen³¹St Joseph Mission Hospital, Mutare, Zimbabwe;²Departments of Internal Medicine; ³Dermatology, Onze Lieve Vrouwe Gasthuis, Amsterdam, Netherlands

A 16 year old young man presented to our department in Mutare, Zimbabwe, with ulcers and crusts covering his nose and upper lip for 2 years. (Figure 1) The skin lesions started as a small pimple which spread to involve his nose and upper lip causing nasal congestion and breathing difficulty. The patient was HIV positive and on first line antiretroviral therapy for 6 years. At presentation he had weight loss, intermittent fever and general body weakness; he had no history of tuberculosis treatment and contact.

Assuming he had a severe fungal infection he was treated with a topical antifungal cream and griseofulvin. Because of lack of improvement he was re-diagnosed having a chronic herpes simplex virus infection with bacterial superinfection and treated with cloxacillin and acyclovir. Instead of improving the condition was deteriorating.

Based on the clinical picture and failure on antiviral, antifungal and antibacterial treatment lupus vulgaris (LV) was suggested after teleconsultation. X-ray of the chest was normal and because of lack of ways for further

investigation (histopathology or culture) antituberculous treatment (ATT) was started; the first improvement was seen after two weeks. LV is a cutaneous form of tuberculosis, usually associated with pulmonary disease. The acral areas are favoured and the lesions are usually solitary and very slow-growing. The clinical presentation can be very diverse with the most destructive type being an ulcerative form which may erode cartilage and bone.

Although tuberculosis (TB) being the main cause of death amongst HIV infected patients in Zimbabwe, cutaneous TB is a diagnosis rarely made. Lack of awareness about extra pulmonary cases leads to delayed diagnosis as in this case where the patient remained undiagnosed for 2 years.

No conflict of interest

Abstract: 20

WITHDRAWN

Abstract: 21**HIV Infection Among Patients With Sexually Transmitted Infections in Zimbabwe**

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Introduction: Sexually Transmitted Infections (STI) are known co-factors in HIV transmission and STI among persons with HIV infection may be a marker of high risk for ongoing transmission.

Materials & Methods: As part of an ongoing study into the aetiology of STI-associated syndromes, we are enrolling 600 study patients from six regionally diverse clinics in Zimbabwe, including males with urethral discharge (MUD), females with vaginal discharge (FVD), and males and females with genital ulcer disease (MGUD and FGUD respectively). A standardized questionnaire was used to collect STI/HIV history and risk behaviors. Data were entered on a hard copy and subsequently transferred to an electronic hand-held device and then uploaded to a web-based database. Discharge and ulcer specimens were taken for testing on various nucleic acid amplification platforms for the presence of *N. gonorrhoeae* (NG) *C. trachomatis* (CT), *M. genitalium* (MG) and *T. vaginalis* (TV) among patients with MUD and FVD and *T. pallidum*, *H. ducreyi*, and herpes simplex virus for patients with MGUD/FGUD. Consenting patients had blood samples taken for HIV and treponemal and non-treponemal syphilis testing. Enrollment will be complete in March 2015 and laboratory testing is ongoing.

Results: Through December 2014, a total of 376 patients were enrolled at 4 clinics: 135 MUD; 137 FVD; 52 MGUD; and 52 FGUD. Of patients consenting to HIV testing, the study reference laboratory has completed 175 HIV tests to date (the remainder is pending). Of these, 69 (39.4%) tested HIV positive: FVD: 37.7%, MUD: 36.8%; FGUD: 44.8%; MGUD: 41.7% (differences not statistically significant). HIV positivity was significantly higher among patients with a positive treponemal test (10/14; 71.4%, $p < 0.01$, Fisher Exact Test) and patients who tested positive for gonorrhoea (26/49, 53.1%, $p < 0.05$) and significantly lower among patients testing positive for chlamydia (4/21, 19.0%, $p < 0.05$). Of patients testing positive for HIV, 7/51 (13.7%) had reported their HIV status to be negative at study intake, and 23/78 (29.5%) had reported their HIV status as unknown. By contrast, 6/44 (13.6%) of patients who reported their HIV status as positive were negative when tested. Investigations into these discrepancies are ongoing.

Conclusions: HIV prevalence in our study population is very high. The significant association of HIV with syphilis and gonorrhoea indicates: 1) high risk sexual behaviors that are antecedent to all 3 infections and 2) high risk for ongoing transmission. While self-reported HIV status may be biased by willingness to disclose, our data indicate that many patients with STI in our study may be unaware of their HIV status. Given high levels of HIV infection, and the high prevalence of STI pathogens associated with risk behaviors and HIV transmission, patients presenting with STI-associated syndromes comprise a critically important population in the continued spread of HIV and should be a major focus of HIV prevention efforts.

Conflict of interest: Dr. Rietmeijer is a paid consultant for the University of Zimbabwe, Department of Community Health on this project.

Abstract: 22**Prevalence of *Treponema pallidum* Infection among HIV-Seroreactive Patients in Kano, North Western, Nigeria.***Y. Mohammed¹*¹*Bayero University Kano Nigeria, Medical Microbiology and Parasitology, Kano, Nigeria*

Introduction: Sexually transmitted infections (STIs) have continued to be a major public health problem in sub-Saharan Africa especially with the recent resurgence of syphilis. Syphilis is a systemic disease caused by the bacterium, spirochete *Treponema pallidum* and has been reported as one of the common sexually transmitted infections (STIs) in Nigeria. Presence of genital ulcer disease from syphilis facilitates human immunodeficiency virus (HIV) transmission and their -diagnosis is essential for the proper management. Venereal Disease Research Laboratory (VDRL) test is used as a screening test for the diagnosis of syphilis. However, unusual VDRL test results have been reported in HIV-infected persons with syphilis. There are reports showing higher than expected VDRL titers as well as biological false positive in most of the studies. A negative Rapid Plasma Reagin (RPR) test or VDRL test result may not rule out syphilis in patients with HIV infection. For laboratory confirmation of syphilis, one specific Treponemal test, namely, Fluorescent Treponemal Antibody Absorption (FTA-ABS) test or Treponema Pallidum Haemagglutination Assay (TPHA) should be done along with VDRL.

Materials & method: A prospective cross sectional study was conducted for 2 years from Jun, 2012 to Jun 2014 to determine the prevalence of syphilis in HIV-seroreactive patients at 5 selected HIV/AIDS treatment and counseling centers in Kano State, North Western, Nigeria. New HIV-Seroreactive patients who gave informed consent to participate in the study were recruited. Venereal Diseases Research Laboratory (VDRL) test for Syphilis screening was performed on the same sera samples which were collected for HIV testing. A total of 238

patients, 113 (47%) males and 125 (53%) females, were enrolled

Results: In the present study, 238 HIV-seropositive patients were screened for syphilis by VDRL test. Out of these 238 cases, 72 (32%) patients were positive for TPHA and 8 (3.4%) patients were reactive for VDRL in various titers with an overall prevalence of 3.4%. All the eight patients who were reactive for VDRL test were also positive for TPHA test.

Conclusion: With high prevalence of syphilis among HIV-infected people from this study, it is recommended that serological testing for syphilis should be carried out in all patients with newly diagnosed HIV infection. Detection and treatment of STI should have a central role in HIV prevention and control. This will help in proper management of patients having STIs and HIV co infection.

No conflict of interest

Abstract: 23**Incidence of nephropathy in HIV infected patients receiving highly active anti-retroviral therapy at Newlands Clinic. [A Retrospective Study]***T. Shamu¹, M. Wellington², L. Gwanzura³, C.E. Ndhlovu⁴*¹*Newlands Clinic, Laboratory, Harare, Zimbabwe;*²*Newlands Clinic, Data Management, Harare, Zimbabwe;*³*University of Zimbabwe College of Health Sciences, Department of Medical Laboratory Sciences, Harare,*⁴*University of Zimbabwe College of Health Sciences, Department of Medicine, Harare, Zimbabwe*

Introduction: HIV infected patients on antiretroviral therapy (ART) are at risk of developing nephropathy. If not monitored, they are at risk of receiving medications that potentially quicken deterioration to end-stage renal disease (ESRD) unnoticed. We set out to determine the incidence of nephropathy in HIV infected patients on antiretroviral therapy (ART)

at Newlands Clinic and determine the associated risk factors.

Materials & methods: We performed a retrospective cohort study at Newlands Clinic which consisted of 1,986 HIV-1 infected participants who commenced on ART between January 2007 and December 2013. All participants were aged 18 or older at ART commencement. Excluded were participants with pre-existing nephropathy at baseline. Nephropathy was defined as two consecutive calculated creatinine clearance (CrCl) less than 60ml/min by the Cockcroft-Gault equation, or two consecutive urine dipsticks positive for protein (≥ 30 g/L albumin). Data collected during routine patient visits were exported from the clinic's database and analysed using STATA 12.0.

Results: During the follow-up period, 93(4.7%) of the 1,986 participants developed nephropathy. The estimated incidence rate (IR) of nephropathy was 1.45/100 person years (CI: 1.17 – 1.78). In the multivariate analysis, statistically significant risk factors were baseline age > 45 (HR 2.30, CI: 1.50 – 3.55), diabetes (HR 4.12, CI: 1.75 – 9.69), pulmonary tuberculosis (HR 2.00, CI: 1.28 – 3.12), and HIV wasting syndrome (HR 2.72, CI: 1.30 – 5.68). The median time to development of nephropathy was 96 weeks (IQR: 48 – 182) from ART commencement

Conclusion: The incidence of nephropathy was low in this cohort. Traditional risk factors; older age and diabetes emerged significant as well as wasting syndrome and pulmonary tuberculosis. ART care should be complimented with proper diabetic care and patients that develop pulmonary tuberculosis, wasting syndrome or present for ART at ages above 45 need close monitoring for nephropathy.

No conflict of interest

Abstract: 24

Psychiatric Disorders and adherence to antiretroviral therapy among a population of adults with HIV infection in Nigeria

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Introduction: Psychiatric disorders are common among HIV patients in Nigeria. Adherence is necessary to optimize the outcome of antiretroviral therapy. In this study, we aimed to identify associations between antiretroviral adherence measured by 1-week and 1-month self-reported missed doses, and psychiatric illness in a cohort previously assessed for psychiatric disorders using the Composite International Diagnostic instrument (CIDI).

Materials & Methods: The study participants comprised 151 adults with major depression, anxiety or suicidal symptoms, and 302 participants of corresponding gender and education, selected by stratified random sampling. We compared participants with (WPDs) and without psychiatric disorders (NPDs) on selected demographic and clinical variables in addition to adherence.

Results: There was no statistically significant difference between WPD and NPD groups on either 1-week or 1-month adherence, or on age, gender, marital status, education, occupational

class, viral load at enrolment or current CD4. However, participants with 1 or more missed doses in the preceding month had twice the odds of having a major depressive episode as those with no missed doses during this period ($p = 0.04$; OR 2.22, 95% CI: 1.03-4.79). This association remained significant after adjusting for selected risk factors.

Conclusions: Among Nigerian adults with HIV, suboptimal antiretroviral adherence is associated with, and could be a significant pointer to depression. Routine self-report adherence assessments have potential utility for identifying individuals at risk among this population.

No conflict of interest

Abstract: 25

Depression and health related quality of life in patients on anti-retroviral therapy in the Mbengwi health district, North West Cameroon

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Introduction: Depression in people living with HIV/AIDS (PLWHA) negatively affects HIV

transmission behaviour, disease progression to AIDS and drug adherence hence posing a risk for the development of drug-resistant strains. Studies suggest that depression may also be associated with poor QOL. However; the paucity of data in this area of research in our setting limits intervention. This study sought to assess the relationship between depression and HRQOL while identifying psychosocial, clinical and socio-economic factors associated with depression.

Materials & Methods: A quantitative analytic cross sectional study was carried out from September 2013 to November 2013 in the Mbengwi district hospital of the North West region of Cameroon. Included were 202 patients on ART at least 21 years old, who gave their consent to participate. Using structured pre-tested questionnaires, depression (PHQ-9), HRQOL (WHOQOL-BREF), stigma, social support, clinical and demographic characteristics of patients on antiretroviral therapy (ART) were measured. Proportions and means were used to describe participants' characteristics while the association between QOL and depression was assessed with ANOVA. To identify predictors of depression, a logistic regression stepwise model was used.

Results: Of the 202 recruited patients, 58 (28.7%) had a positive depression screen. Mean QOL scores for all domains but the environmental domain in bivariate analysis were significantly and inversely correlated ($p < 0.05$) with depression implying that patients with depressive symptoms had poorer HRQOL. The independent predictors of depression were found to be monthly income less than 20,000FCFA (around 40US\$), (aOR=2.48; 95% CI= 1.06-5.82) CD4 count < 200 cells/ μ l (aOR=4.26; 95% CI=1.31-11.96) and presence of AIDS symptoms (aOR=2.58; 95% CI=1.26-5.29). There was no significant correlation between stigma, social support, duration on ART, marital status, age, gender and depression.

Conclusions: Depression is associated with poor quality of life in HIV/AIDS patients especially in patients with low income, who are symptomatic and have CD4 count < 200 cells/ μ l. Early diagnosis and treatment of depressed patients need to be incorporated into intervention programs which might improve patient outcomes, QOL and success of health promotion activities. Such programs are quite

rare in Cameroon with Psychiatrists almost non-existent in rural areas like our study setting. More research is needed to investigate the impact of antidepressant therapy in PLWHA on the evolution of treatment and QOL.

No conflict of interest

Abstract: 26

Epidemiology

HIV-1 genotypic resistance spectra and variability in plasma and peripheral blood mononuclear cells from treatment naïve and treatment experienced individuals.

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Introduction: The development of resistant mutants and the genetic variability of HIV-1 contribute to its evolution, global spread and treatment and immune response failure. Plasma is usually the specimen of choice for HIV drug resistance testing but in light of virus compartmentalization in different reservoirs, antiretroviral resistance results from plasma viruses may not give a complete picture of an individual's resistance profile. Peripheral blood mononuclear cells (PBMC) have been described as a latent viral reservoir containing productive HIV DNA. Archived proviral DNA in PBMCs may also retain earlier forms of the virus which may sometimes re-emerge. We investigated differences in genetic and resistance spectra between circulating plasma variants and proviral DNA in peripheral blood mononuclear cells from treatment naïve and treatment experienced individuals.

Materials & Methods: Plasma and PBMC HIV variants from both treatment naïve and treatment experienced individuals were molecularly characterised and compared for differences in genetic and resistance spectra. Whole blood was collected for plasma and PBMC isolation followed by nucleic acid

isolation, amplification and sequencing of the pol gene and phylogenetic analysis.

Results: Paired plasma and PBMCs from 43 treatment naïve and 10 treatment experienced individuals were tested for HIV resistance associated mutations and genetic variability. In the treatment naïve group, no variants with major ARV resistance mutations were identified in the protease gene but some protease inhibitor minor mutations K20M and T74S were detected in 9.3% of patients. In the reverse transcriptase (RT) gene resistance associated mutations were detected in 4.7% of plasma derived variants from treatment naïve individuals but the figure increased to 9.3% when both plasma and PBMC derived sequences were considered. There were differences in resistance spectra between plasma derived and PBMC derived HIV sequences in 29% of all participants. No distinct pol gene genetic markers associated with PBMC derived variants compared to plasma variants were identified.

Conclusions: These data highlight intra-host differences in resistance spectra that may exist in HIV cellular reservoirs prior to and during treatment. Transmitted drug resistance is not common in Sub Saharan Africa and the results of this study are consistent with the less than 5% prevalence that has been reported in the region. This figure may be on the increase following the increased roll out of antiretroviral therapy over the last decade. Monitoring HIV resistance and transmission patterns and HIV genetic diversity therefore remain a critical aspect in our efforts to curb the disease.

No conflict of interest

Abstract: 27

Epidemiology

Impact of non-governmental health organizations on HIV awareness and testing in Kenya.

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Introduction: According to the World Health Organization Fact Sheet No.360 concerning HIV/AIDS, Sub-Saharan Africa is the most affected region, with 24.7 [23.4–26.2] million people living with HIV in 2013. It accounts for almost 70% of the global total of new HIV infections.

Survey results from the 2008/09 Kenya Demographic Health Survey (KDHS) indicate that 6.3 percent of Kenya adults age 15–49 are infected with HIV. HIV prevalence in women age 15–49 is 8.0 percent, while for men age 15–49 it is 4.3 percent. This female-to-male ratio of 1.9 to 1 is higher than found in most population based studies in Africa.

The Kenyan Government has in the recent past collaborated with organizations like *The Academic Model of Providing Access to Health Care* (AMPATH). AMPATH -KEN is a consortium that operates in western Kenya with its main activities aimed at promoting HIV/AIDS awareness, prevention and management. With its headquarters in the Moi Teaching and Referral Hospital (MTRH) and branches in various health centers within its environs, its operations cover quite a large area in the region. HIV/AIDS and reproductive health promotion is done through carrying out community awareness campaigns, counseling, health education and provision of drugs to the infected population.

Objectives of the study: To compare the level of HIV awareness and testing between areas with AMPATH influence and those without AMPATH influence in the past four years.

Justification of the study: There were approximately 35 million people living with HIV globally by the end of 2013 with 2.1 million new infections in the same year. In terms of HIV awareness, the Kenya Demographic Health Survey (KDHS) indicate that there is still low awareness. There is collaboration between the government and AMPATH -KENYA in various areas to increase HIV awareness and encourage testing within the community.

For the reasons above, it is justifiable that this study is significant and that if it shows impact of HIV/AIDS awareness, campaigns and advocacy, it can be a reason to scale up the strategies in combating this pandemic in the world.

Materials & Methods: The research sites were identified from 20 health stations in Western Kenya. The stations were then grouped into those with AMPATH influence and those lacking out of which 5 were sampled

randomly from each category. In each station a systematic review of reports between the year 2011 and 2014 was done. The data was analyzed using Statistical Packaging for Social Sciences (SPSS).

The ethical requirements for conducting research according to the Moi University/MTRH institutional research and ethics Committee (IREC) were adhered to.

Results: An average of 79.75% of the respondents had done an HIV test in AMPATH stations in 2011, 86% in 2012, 86.5% in 2013 and 80.75% in 2014. The awareness levels of stations having AMPATH influence was 49%, 55.5% and 65.5% respectively. In Non-AMPATH stations an average of 62% were tested. Through the years from 2012 to 2014, 76.2% tested and 46% aware, 74.6% tested and 48.8% aware, 76.5% tested and 54.4% aware.

Conclusions: The HIV awareness and testing levels were significantly higher compared to uptake in NON-AMPATH sites.

No conflict of interest

Abstract: 28

Health systems and HIV

Use of Satellite Clinics to Improve the Health Outcomes of HIV Clients at Chilonga Mission Hospital, Zambia

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Introduction: Chilonga Mission Hospital located in Mpika District of Muchinga province in Zambia has been offering ART services since 2006. It has a wide catchment area with a catchment population of 70,000. As at 30th September 2014, the facility had 1,602 clients on antiretroviral therapy (ART) and 3,090 on care. Majority of the people in the area are subsistence farmers. This coupled with long

distances and poor state of roads has been an issue towards continuity of care and access to health services. In order to improve access to ART services and to improve the health outcomes, the facility decentralized HIV service delivery through the following strategies:

Materials & methods:

- Identified six satellite clinics
- Trained one Health worker per satellite in HIV testing and counseling (HTC) and ART management
- Trained 25 community volunteers in HIV
- Sensitized and engaged traditional leaders in HIV/AIDS
- Conducted community sensitizations in all the satellites
- The hospital ART team visits each satellite clinic at least once every quarter

Results:

- Adherence to ART improved leading to an improvement in the mean CD4 count for the October 2013 cohort from 304 to 424 after a period of 12 months
- Facility has a retention rate of 86% and a low LTFU of < 5%
- Static clinics are decongested leading to better quality of service provision

Conclusions: Decentralization of HIV services and community involvement is critical towards improving the health outcomes of HIV clients in resource limited settings.

No conflict of interest

Abstract: 29

Health systems and HIV

Accessing truck drivers and sex workers: Recruitment and data collection experiences from South African sites

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Introduction: Evidence of increased risks of HIV acquisition and transmission among truck drivers and sex workers has led governments to prioritise these populations in their National Strategic Programmes. To tailor services for these populations, donor-funded implementers such as North Star Alliance (NSA) have established roadside wellness clinics (RWCs). The overall goal of this service delivery model is to improve access and acceptability of services. As part of an ongoing evaluation of NSA RWCs in South Africa, we are documenting access to and acceptability of RWCs among truck drivers and sex workers. This requires identifying and addressing specific challenges encountered in recruiting and interviewing these priority populations.

Materials & methods: Our target sample size was 60 sex workers and 60 truck drivers from six RWCs across six South African provinces. Interview duration was estimated at 45-60 minutes. Data collection by male and female interviewers was planned for October to December 2014. We engaged with RWC staff to facilitate access and recruitment, basing recruitment dates and times on clinic utilization patterns.

Results: By December 2014, 50 interviews with 46 truck drivers and four sex workers had been conducted, with an additional 14 sex worker interviews completed by February 2015. Among sex workers, weather, time of day (during the afternoon or early evening), RWC security, location, and lack of incentives to participate were identified as factors contributing to the low recruitment rate. Further, unreliability after confirming attendance was a major obstacle to participation. The following changes were needed to increase recruitment: 1) extending the data collection period, 2) widening the recruitment catchment area to towns nearest the RWCs, and 3) adjusting recruitment times to late evenings. Truck drivers were more likely to participate than sex workers. However, key challenges to recruitment were a reluctance to be interviewed for 45 minutes and declining to

participate unless the interviews were conducted with a group of colleagues. In response, we adapted the recruitment procedure. Changes included: 1) conducting some of the interviews from inside the truck while the trucks were in a line up for cargo loading/off loading at the depots and 2) limiting the interview time. The change in interview duration decreased the depth of information obtained.

In both groups, tape recording was highlighted as a barrier to participation. When this was raised, the interviewer proceeded with the interview but recorded the information through notes only. This tended to make the interviewers appear less engaged as they had to ask questions and write simultaneously. Finally, the gender of the interviewer did not seem to influence interviewees' willingness to participate.

Conclusions: Our experiences highlight the challenges in reaching mobile populations to document their preferences in order to inform the delivery of appropriate healthcare packages. Detailed planning and stakeholder communication does not guarantee timely recruitment of truck drivers and sex workers for interviews. Researchers need to be flexible in their recruitment plans and anticipate delays in the recruitment process. Sharing experiences and lessons learned when recruiting hard-to-reach populations can help researchers find solutions to increase their participation.

No conflict of interest

Abstract: 30

High Risk Populations: prevention and treatment challenges

Human Immunodeficiency Virus Type-1 and Hepatitis B Virus Co-infections among

Injecting Drug Users in Malindi, Kenya

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Introduction: There is currently no published data addressing the burden of Human Immunodeficiency Virus (HIV) and Hepatitis B Virus (HBV) co-infection among injecting drug users (IDUs) in Kenya. These two viruses share similar routes of transmission, with illicit drug use by injection being one of the major routes of infection. Injecting drug use has been identified as one of the growing problems in coastal towns of Kenya, just as is sex tourism. In this study, we aimed to determine the prevalence of HBV in HIV positive IDUs within the coastal town of Malindi and correlate the findings with socio-demographic factors of the study population.

Materials & methods: A cross-sectional study was carried out, where structured questionnaires were administered and laboratory testing of blood from the participants was done. For laboratory investigations, 5 ml of venous blood was drawn from each participant and used to test for HBV surface antigen (HBsAg) and HIV-1 antibodies using rapid test algorithms and finally using Hepanostika and Vironostika test kits, for HIV and HBV, respectively. The CD4+ T-cell count was determined by flow cytometry.

Results: The prevalence of HBV infection was 14.3% (13/91). The mean age of detection was 33.2 (SD ± 8.1) years. The mean CD4+ cell count in the HIV/HBV co-infected individuals was significantly lower ($p=0.001$) compared to those with only HIV infection. Needle sharing and duration of active injection of drugs were significantly associated with infections of HBV mono and HIV/HBV co-infections ($p=0.000$).

Conclusions: This study reveals a high prevalence of HBV infection in HIV positive injecting drug users in Malindi. This preliminary finding warrants an expanded serological survey of HIV/HBV co-infection in IDUs in the coastal area of Kenya so as to determine the true prevalence of this co-infection. These findings will aid in developing major

intervention strategies for this high risk group in order to prevent the flow of viral infections from the IDUs into the general population.

No conflict of interest

Abstract: 31*Laboratory monitoring / diagnostics***Validity and feasibility of an ultrasensitive p24 antigen enzyme immunoassay for early infant diagnosis of HIV infection in rural southern Zambia***C. Sutcliffe¹, H. Matakala², M. Michael², J.H. van Dijk², P.E. Thuma², W.J. Moss¹*¹Johns Hopkins Bloomberg School of Public Health, Epidemiology, Baltimore, USA; ²Macha Research Trust, Clinical Research Lab, Choma, Zambia

Introduction: Early infant diagnosis of human immunodeficiency virus (HIV) infection is a challenge in resource-limited settings. Samples must be transported to central laboratories for testing, delaying diagnosis and early treatment. The ultrasensitive p24 antigen enzyme immunoassay (Up24) requires fewer resources and less expertise than nucleic acid testing, and could be performed at district hospitals with the capacity to perform HIV antibody testing. This study evaluated the feasibility and validity of the Up24 enzyme immunoassay at a district-level hospital in rural southern Zambia.

Methods: A prospective study was conducted between April 2013 and December 2014. Children younger than 18 months of age and evaluated at the HIV ART Clinic at Macha Hospital, Choma District were eligible. Dried blood spots (DBS) were collected from infants and transported to a laboratory in Lusaka for testing using a standard diagnostic test based on HIV DNA detection. An additional DBS card was collected and transported to the local research laboratory at Macha Hospital for testing using the Up24 enzyme immunoassay (Perkin Elmer).

Results: 355 infants (48% female; median age: 8.7 weeks) were enrolled and tested 510 times using both the Up24 enzyme immunoassay and HIV DNA test. 44 samples (8.7%) were positive and 4 were invalid by HIV DNA testing. Median OD values for the Up24 assay for samples positive and negative by HIV DNA testing were 0.11 (range: 0.051, 3.705) and

0.072 (range: 0.049, 1.476), respectively. Using the previously established cutoff of 15 times the standard deviation of negative controls, the sensitivity and specificity of the Up24 assay were 56.8% and 95.7%, respectively. In this setting of low prevalence, the positive and negative predictive values were 55.6% and 95.9%. Median turnaround time from specimen collection to return of results to the clinic for HIV DNA testing was 44 days (range: 7, 134). Samples tested by the Up24 assay were batched and run approximately every three weeks. The median time from sample collection to testing was only 20 days (range: 3, 77). Fifty-eight (10%) samples required re-testing due to errors in testing (e.g. sample IDs washing off, contamination of negative controls).

Conclusions: This is the first study to demonstrate the feasibility and validity of an ultrasensitive p24 antigen enzyme immunoassay in rural Zambia. Results suggest this assay can be performed in a district hospital research laboratory and would reduce the turnaround time for test results and potentially the time to treatment initiation. The sensitivity was lower than previously reported. Adjustment of the Up24 assay threshold for positivity would improve specificity but would further reduce sensitivity.

*No conflict of interest***Abstract: 32***Pediatrics***Measles and rubella seroprevalence among HIV-infected and uninfected Zambian children and adolescents***C.G. Sutcliffe¹, K. Searle¹, H. Matakala², M. Greenman¹, K. Rainwater-Lovett³, P.E. Thuma², W.J. Moss¹*¹Johns Hopkins Bloomberg School of Public Health, Epidemiology, Baltimore, USA; ²Macha Research Trust, Clinical Research Lab, Choma, Zambia; ³Johns Hopkins School of Medicine, Pediatrics - Infectious Diseases, Baltimore, USA

Introduction: Measles and congenital rubella syndrome remain significant causes of morbidity and mortality despite the availability of safe and effective vaccines. HIV-infected children and adolescents may be at increased risk of measles because of waning immunity following vaccination. At a population level, these children constitute a potentially large pool of adolescents susceptible to measles and rubella. Data on immunity to vaccine-preventable diseases among older HIV-infected children and adolescents in sub-Saharan Africa are needed to guide vaccination policy and control strategies.

Materials & methods: A retrospective study was conducted between 2009 and 2013 within the context of ongoing studies of malaria and HIV in the catchment area of Macha Hospital, Choma District, Southern Province, Zambia. During this period, measles vaccine was administered at 9 months of age and through mass vaccination campaigns while rubella vaccine was not routinely administered. HIV-infected and uninfected children aged 5 to 15 years with dried blood spot samples available for testing were eligible. Three groups of children were sampled: 1) HIV-uninfected children participating in a community-based study of malaria; 2) HIV-infected treatment-naïve children enrolled in a cohort study at the HIV clinic; and 3) HIV-infected children receiving antiretroviral therapy (ART) for 12 to 24 months. IgG antibodies to measles and rubella viruses were measured at the Clinical Research Laboratory at Macha Research Trust using an enzyme immunoassay (Enzygnost®, Siemens). Optical density (OD) values greater than 0.2 were considered positive and OD values 0.1-0.2 were considered equivocal according to the manufacturer's instructions

Results: Seroprevalence was measured in 625 HIV-uninfected children (median age: 9.5 years; male: 47%), 144 HIV-infected treatment-naïve children (median age: 8.3 years; male: 45%), and 127 HIV-infected children receiving ART (median age: 7.9 years; male: 53%; median duration of ART: 12 months). Measles seroprevalence was 92% among HIV-uninfected children, 74% among HIV-infected treatment-naïve children ($p < 0.001$ for comparison with HIV-uninfected children), and 72% among HIV-infected children receiving ART ($p < 0.001$ for comparison with HIV-uninfected children). In contrast, rubella seroprevalence was 54% among HIV-

uninfected children, 42% among HIV-infected treatment-naïve children, and 50% among HIV-infected children receiving ART, with no significant differences between groups. For both measles and rubella, HIV-infected children (treatment-naïve and receiving ART) were significantly more likely than HIV-uninfected children to have equivocal results, suggesting lower antibody concentrations.

Conclusions: Measles seroprevalence was lower among HIV-infected than uninfected children and adolescents, regardless of antiretroviral therapy. Consequently, all HIV-infected children would likely benefit from revaccination against measles. Half of all children and adolescents in rural Zambia, regardless of HIV infection status, were susceptible to rubella and may need to be targeted for catch-up rubella campaigns when measles-rubella vaccine is introduced.

No conflict of interest

Abstract: 33

Prevention of Mother to Child Transmission

How PMTCT services have been organised in Guiglo regional hospital in post-election period in Ivory Coast?

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Introduction: Post-election crisis in 2011 in Ivory Coast caused military conflicts in several cities, disturbing health facilities activities. Guiglo, one of the important cities in the West of country, was located in military conflict zone. The aim of this paper is to describe how provisions of PMTCT services

have been organized in Guiglo Regional Hospital (RH) in a context of war.

Materials & methods: It is a prospective study which reports activities of mother and child unit in the Guiglo RH. Study period was from December 2010 to November 2011. Data has been collected from regional health direction monthly reports. It concerned socio-demographic characteristics, origin of the client and then existence or not of care provision in different steps of PMTCT. It also talked about strategies of tracking used to retain women and their children in care after delivery. Namely; reception of clients, group counseling, individual pre-test, HIV test and post-test or test result, ARV prophylaxis, the pre therapeutic biological test for HIV infected women and ARV treatment delivering.

Results: In the period of the study, 779 pregnant women have been seen in 109 antenatal visits, any rank (less than 240). 592 clients have received counseling and testing. 18 of them were tested HIV +. Because of looting that the laboratory suffered during the war, only (5) 26% of HIV + clients have benefited from pre-ARV biological test. Only 02/05 clients declared eligible for ARVs treatment, have got it. Due to the difficulties in drug supply management and the absence of medical staff related to insecurity, there has been a high rate (40%) of lost of follow in the different step of PMTCT services. Thus, it was noted that only 61% of women received ARV prophylaxis for them and even 42% for their child. For the all clients who have recently given birth to the maternity unit of this hospital, only 01 child started ARV prophylaxis within 72 hours of birth. In the same period one year before (December 2009 to November 2010), it was noted that the main indicators were much better. It has been recommended to track at any point of care, exposed and infected newborn for their PCR test.

Conclusions: The post-election crisis in November 2010 in Ivory Coast has greatly weakened the health system in several health regions. This study which makes an assessment of 12 months of provision of PMTCT services in a regional hospital in West Africa shows that the environment of insecurity can negatively influence the quality of health services.

No conflict of interest

Abstract: 34

Prevention of Mother to Child Transmission

Getting to Zero Mother to Child Transmission (MTCT) of HIV: A Case of Chikuni Mission Hospital, Zambia

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Introduction: Chikuni Mission is a rural hospital located in Monze district in the southern province of Zambia. The hospital serves a catchment population of 25,000 over an area of 5,000 sq kms. The Antiretroviral Therapy (ART)/Prevention of Mother to Child Transmission (PMTCT) program at the hospital was initiated in 2005 and currently has 1,896 patients in care and 1,834 active on ART. The MTCT rate for exposed infants by 18months was 3/24 (12%) in 2011 and 8/24 (33%) in 2012. The main factors contributing to the high MTCT rate were home deliveries leading to low PMTCT coverage, and poor adherence to ART. To reduce the rate of MTCT, the facility implemented the following interventions.

Materials & methods:

1. Implementation of Option B+ since March 2013
2. Trained the Nurse in Charge of Maternal Child Health (MCH)/PMTCT as an ART Prescriber
3. Renovations and expansion of mothers' shelter and labor ward for increased facility deliveries thus facilitating timely implementation of PMTCT intervention
4. Intensive adherence support through use of Community tracking officers and use of the community radio station to send reminders to patients to take their drugs. The radio reminders are read out at prime time (8am and 8pm daily)
5. Ensured that Lost to follow up for pregnant HIV positive women is at zero through use of community tracking officers

Results: The MTCT rate by 18months has consistently remained below 2% for 2013 and 2014, compared to 12.5% (3/24) and 33% (8/24) in 2011 and 2012 respectively.

Conclusions:

Implementation of PMTCT Option B+ is key to attainment of the Elimination of MTCT (EMTCT) goal. Creation of a conducive environment for pregnant women is motivation for facility deliveries, this in turn facilitates for timely implementation of PMTCT interventions

No conflict of interest

Abstract: 35

Prevention of Mother to Child Transmission

DNA PCR of HIV exposed infants in a subregional PMCTC programme in north east Nigeria

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Introduction: Nigeria bears 25% and 10% of global MTCT and paediatric AIDS burden respectively. Efficacious combination ARVs for HIV infected mothers and infant prophylaxes are deployable interventions to eliminate MTCT of HIV. Three states of Gombe, Bauchi and Yobe in North East region of the country have estimated population of 12million with average HIV prevalence of 2.4% among women of childbearing age. In 2013, 40% of pregnant women from the region had no antenatal care visits while only 20% delivered in a health care facility.

Materials & methods: DNA PCR request and report forms from 2009 – 2014 from three states of Gombe, Yobe and Bauchi were analysed in the sub regional PCR laboratory in the federal teaching hospital Gombe.

Results: 2125 PCR DNA request and report forms were analysed; 1067(51%) were females and 1021(49%) male infants. 61.9 % (1273/) of HIV + mothers were receiving HAART before pregnancy, 25.2 % (519) started HAART in pregnancy, 168(8.2%) received no ARVS and 43(2.1%) had unknown ARV status. 52(2.5%) of HIV+ pregnant women received AZT, NVP and SdNVP.

74 % (1442/1932) of infants received NVP prophylaxis, 192(9.9%) infants had no prophylaxis; 129(6.7%) received AZT; 102(5.3%) AZT/NVP and 4.5 % (87) of infants had unknown status.

DBS sampling was done in 45.2 % (938/2073) at age 6-8weeks; 41.4 % (859) at > 12weeks of age; 7.3 % (151) at 8-12weeks of age and 6 % (125) at < 6weeks of age.

By 6-8weeks of age, 40 % (719/1768) and by >12weeks of age 76 % (1354/1768) of infants had received Cotrimoxazole. 37.3% of infants who did not receive cotrimoxazole did not also receive NVP or AZT.

90.2 % (1868/2071) Were ever breast fed and 203/2071(9.8%) had never breastfed. 23 % (493/2125) of infants stopped Breast feeding; 54 % (266/493) by 6 months and 91 % (447/493) by 12 months of age. 96 % (393/406) of infants who repeated DNA PCR 6 weeks after cessation of breastfeeding were negative; 8/406(1.9%) were positive.

Of 2113 HIV DNA PCR results, 96.8 % (2045) were Negative and 3.2 % (68) were Positive. 99.7 % (2106/2113) were requested because of healthy baby; 24 DNA PCR test were repeated because of problem with first test. Of the 68 infants with positive DNA-PCR results 24 % (16/68) of mother-infant pairs received neither ART nor prophylaxis.

16% (16/99) of mother-infant pairs who received neither ART nor prophylaxis had positive DNA-PCR results. Of those infants whose mothers received ART but had no prophylaxis, 8 % (7/88) had positive DNA-PCR; 5.9% (3/51) of infants whose mothers received no ART but who had prophylaxis were positive. Only 1% (28/1570) of mother-infant pairs who received ART and prophylaxis had positive DNA-PCR.

62.5 % (222/355) of infants >9months had a rapid test. 13.5 % (30/222) had a positive HIV rapid antibody test.

Conclusions: There is a high level of attrition in the PMTCT cascade. Infant HIV infection is associated with lack of maternal / infant ARVs.

No conflict of interest

Abstract: 36

Prevention of Mother to Child Transmission

State level data-driven planning for closing the PMTCT coverage gap in Nigeria

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Introduction: Nigeria contributes 29 percent to new pediatric HIV infections globally. In 2012, the Federal Government of Nigeria (GoN) identified 13 high burden states which together contribute 70 percent to Nigeria's prevention of mother to child transmission of HIV (PMTCT) service gap. Reliable data is unavailable for health service planning at the national and sub-national levels. This abstract presents the state-led processes for developing costed elimination of mother to child transmission of HIV (eMTCT) operational plans to guide PMTCT program scale-up in selected states in Nigeria.

Material & Methods: The Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS) is a five year HIV/AIDS project funded by President's Emergency Plan for AIDS Relief (PEPFAR) through the United States Agency for International Development (USAID). SIDHAS is lead implementing partner in eight of the 13 priority states. From February to September 2013, the process for developing scale-up plans included stakeholder engagements, rapid state-wide health facility assessments (R-HFA), state-level data validation, scale-up plan development workshops and dissemination to stakeholders. The state-wide R-HFA aimed to determine the readiness of existing health facilities to deliver high quality PMTCT services. The assessments examined the status of: human resources, service utilization, infrastructure, availability of a maternal and child health (MCH) services, linkages with higher level facilities and community structures.

Results: There were 6571 facilities providing antenatal services across the eight states of which 4176 facilities were assessed. The R-HFA revealed PMTCT coverage ranged from 4-30% while only 10% of facilities met the national human resource criteria. There was an almost complete dependence on donor funding for PMTCT programming. It also showed a preference for home delivery amongst many women.

Conclusions: Using data from the R-HFA, the eight states for the first time set intervention priorities and developed context-specific costed scale-plans which all included strengthened community-based approaches. A state-led scale-up will ensure ownership and sustainability.

No conflict of interest

Abstract: 37

Prevention of Transmission

Understanding community needs when providing Voluntary Medical Male Circumcision services to adolescents: A case of a resettlement area in Mberengwa district, Zimbabwe.

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Introduction: Zimbabwe began implementing Voluntary Medical Male Circumcision (VMMC) in 2009 and is currently scaling-up to rural areas. Uptake has been mainly in adolescents,

who still need parental/guardian assistance with wound care. In June 2014, the Masase District VMMC team conducted 363 circumcisions in one week, far higher than their typical weekly performance. The overall adverse event (AE) rate was 5.5%, which was much higher than any other site with similar performance.

Materials & methods: Chobebele resettlement village in Mberengwa has the 'Varemba' traditionally circumcising tribe. This resettlement is 20km from the nearest clinic; there are no proper roads. 400 clients were mobilized for clinic-based VMMC, including 325 adolescents. The VMMC team reported 18 (5.5%) adverse events (AEs), all being adolescents. A quality assessment visit was conducted by a ZAZIC/CDC quality control team to understand the clinical operation of the facility, management of the cases, systems that contributed to the AE cluster, and follow-up community engagement regarding VMMC.

Results: VMMC commodities were in stock and procedures were reported completed according to national guidelines. However, day-seven patient review was done by a nurse not trained in the national program. Of the 18 clients referred to the hospital, 15 (83%) were admitted on social grounds (distance travelled and poor hygiene at home). All clients were given broad spectrum antibiotics. Traditional medicine was noticed on the wounds of some clients, although their parents denied this practice. Most clients had poor personal hygiene and no underwear. Knowledge of post-op wound care was lacking among the interviewed parents resulting in reported home use of hypertonic saline. Two more boys with AEs were identified during the review of circumcised boys in the community and a nearby school. They had severe AEs and were taken to the hospital. All clients recovered without permanent sequelae.

Conclusions: Specified community engagement before services are provided has been routinized in our VMMC campaigns so as to understand community needs. Commodities which promote hygiene are being dispensed at all VMMC sites. Community structures with focal persons for post-op wound care have been recommended. Camping equipment has been procured and will enable trained teams to perform community-based post-op reviews.

No conflict of interest

Abstract: 38

Women and HIV

Assessing The Knowledge and Use of Contraceptives – Perspective of HIV-Positive Women

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Introduction: Contraceptive use is the most effective approach to avoiding unintended pregnancies and subsequently reducing the number of infants at risk of HIV infection. The current guidelines set up by the World Health Organization (WHO) recommends that dual contraception should be adopted for sexually active women living with HIV to prevent unintended pregnancies and minimize HIV transmission. This study was carried out to understand and describe the knowledge and use of contraceptives amongst HIV-positive women in the teaching hospital.

Materials & methods: A cross-sectional study of 216 sexually active women of reproductive age. The serological statuses of their steady partners were also known. Standardized questionnaire on the knowledge and use as well as sexual activity was issued to the participants at each visit. Multivariate models were used to investigate parameters associated with the use of contraceptive methods.

Results: Women with an HIV-seronegative partner (85%) were more likely to use contraception than women with an HIV-seropositive partner (51%); $P = 0.0001$. Condom use and withdrawal method was higher in serodiscordant couples than in seroconcordant couples (odds ratio [OR] = 5.7, 95% CI = 0.1 - 0.2, $P < 0.001$). Oral contraceptives and intrauterine devices (IUDs) was higher in seroconcordant than serodiscordant couples (OR = 2.8, 95% CI =

1.5 – 2.9, $P < 0.001$). On introduction of Highly Active Antiretroviral Therapy (HAART), the use of oral contraceptives decreased amongst women with an HIV-seronegative partner and was higher in couples with inconsistent condom use.

Conclusions: Our results highlight that contraception counseling should take into account the serostatus of the participants and their partners as well as highlighting the need to improve their knowledge on sexual and reproductive health and rights, transmission of HIV and other Sexually Transmitted Infections (STI). Further efforts are needed to improve uptake of modern methods including dual contraception methods and more accessible options for better combination prevention approaches.

No conflict of interest

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**9th International Workshop on HIV Treatment,
Pathogenesis and Prevention in Resource Limited
Settings – INTEREST**

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