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4th Asia Pacific AIDS & Co-Infections Conference:
Translating Science into Clinical Practice

27 - 29 June 2019, Hong Kong
4th Asia Pacific AIDS & Co-infections Conference

Translating Science into Clinical Practice

Abstracts
Oral Presentations
Practical perspective of the use of point-of-care testing for supporting the delivery of HIV pre-exposure prophylaxis

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Background: A pilot study for prescribing pre-exposure prophylaxis (PrEP) to men who have sex with men (MSM) at high risk of HIV infection was set up in Hong Kong to assess their acceptance and adherence. To facilitate screening and monitoring at each visit, point-of-care testing (POCT) was adopted. We aimed to assess the practicality of POCT in such setting.

Methods: Over a 30-week PrEP prescription period, participants were scheduled to attend six visits for behavioural monitoring, sexually transmitted infections/creatinine screening, medical consultation and receiving prescription. POCT was performed on blood samples collected on-site either by phlebotomy or fingerprick to achieve a reading time of about 20 minutes. At every visit, 4th generation HIV antigen/antibody (Alere HIV Combo) was performed. HBsAg (SD BIOLINE HBsAg) was screened at baseline, and creatinine (Abott i-STAT Crea) was tested at baseline and two time points following PrEP. Syphilis serology was tested at baseline, week 12 and week 28 using a POCT simultaneously testing for both treponemal and non-treponemal antibodies (Chembio DPP Syphilis Screen & Confirm Assay). Parallel laboratory testing was done for baseline HIV, serum creatinine and HBsAg for validation of results.

Results: A total of 74 MSM were screened; three tested positive for HBsAg by laboratory test and were excluded from the study. Two of them tested positive in POCT. Specificity and negative predictive value of the POCT was 100% and 99%, respectively (95% confidence interval: 95-100%, 93%-100%). A total of 84 paired creatinine results were evaluated; the median difference was +7.74% (interquartile range: 2.41-14.18%, p<0.001 by Wilcoxon signed-rank test) between POCT and laboratory testing. Of 71 MSM enrolled in the study, 16 (23%) had positive treponemal results at baseline. Three participants tested positive for syphilis in follow-up visits over 1688 person-weeks, giving an incidence of 9.24 per 100 person-years; two of whom were re-infections.

Discussion: POCT provided reliable results on-site within 20 minutes, allowing medical advice to be given on the same day, facilitating the process of PrEP prescription. POCT gave higher estimates of creatinine and thus a more conservative estimated glomerular filtration rate. In view of the high prevalence of prior syphilis, the use of both treponemal and non-treponemal rapid tests is essential to distinguish between previously treated syphilis and re-infection. For hepatitis B screening, laboratory confirmation is important to minimise false negative results.
A mathematical model of HIV prevention strategies in Japanese MSM

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**Background:** HIV prevalence in Japan continues to increase. The majority of new infections occur in MSM, with approximate prevalence and incidence of 3% and 3.2/100PY. However, Japan has not yet achieved 90-90-90 targets and pre-exposure prophylaxis (PrEP) has not been licensed. We assessed the epidemiological impact and cost-effectiveness of enhanced test-and-treat strategies, pre-exposure prophylaxis (PrEP) and combinations of these interventions among MSM in Japan using a comprehensive mathematical model of the HIV epidemic.

**Methods:** We built a compartmental, deterministic mathematical model that describes the full disease transition process, and divides the population into those who know their serostatus as well as those who are in and out of treatment. The model included a compartment for acute infection and compartments describing the PrEP process. We ran the model forward in time 30 years from 2017, using data from a clinical cohort in four HIV clinics in Japan and previous reports on sexual health in Japan to estimate infectiousness, treatment outcomes and costs and calibrating the model against surveillance data for the period 2007-2016. We estimated HIV prevalence, total cases of HIV, and cost of treatment and interventions for a base case in which testing and treatment remains at current levels, a scenario where Japan achieves UNAIDS 90-90-90 targets, and three PrEP scenarios defined by different coverage levels of 25%, 50%, and 75% among the 20% of MSM with the highest risk behavior, as well as combinations of these scenarios.

**Results:** Under the base case, with no change in interventions, prevalence of HIV among MSM will rise to 11.9% before dropping to 5.8% in 2047. If Japan achieves full UNAIDS 90-90-90 targets, prevalence will peak at 9.6% before declining to 5.4%. Under the 75% PrEP scenario without no expansion of testing and treatment, prevalence will peak at 11.1% and 5150 HIV infections would be prevented over 30 years (4.1% of all HIV infections over this time). If UNAIDS 90-90-90 goals are achieved in combination with this 75% coverage PrEP program, 70,910 HIV infections would be prevented over 30 years (56.7% of the total infections under the base case) and the intervention would be highly cost-effective, with an average cost-effectiveness ratio (CER) of 554 international dollars per QALY relative to the base case. All PrEP interventions tested in this model were cost-saving relative to the base case.

**Conclusion:** Our model shows that introducing PrEP with coverage of at least 25% of the population of high-risk MSM is cost-effective, and that if Japan is able to scale-up its testing program for MSM and introduce PrEP, huge gains can be made in the struggle against the HIV epidemic, with the potential of effectively eliminating new infections in the next 30 years.
Starting PrEP during acute HIV infection: what is the risk for antiretroviral drug resistance?

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Background: Pre-exposure prophylaxis (PrEP) has proven very effective at preventing HIV infection among high-risk populations. However, there is risk for antiretroviral drug (ARV) resistance if the 2-drug PrEP regimen is given to individuals with HIV infection.

Methods: Individuals at risk for HIV infection were screened with 4th generation HIV antibody/antigen (4thG) testing at the Thai Red Cross Anonymous Clinic (TRCAC) from 2014 to 2018. PrEP (TDF/FTC) was offered as part of a combined HIV prevention package to individuals who tested 4thG nonreactive, and could be started the same day through the PrEP-30 service. Screening for acute HIV infection (AHI) was done on all nonreactive specimens by qualitative HIV RNA (Aptima HIV-1, Hologic, USA) in pooled samples of up to 17 specimens/pool, with results available in 24-48 hours. Samples positive on the qualitative screen then had quantitative HIV RNA testing with a limit of detection of <40 copies/mL. HIV testing and counselling was repeated after 1 month. Subsequent HIV testing was done 2 months later and then every 3 months.

Results: Through October 2018, a total of 2,442 people were prescribed PrEP through the TRCAC PrEP-30 service; 93% were male and 83% of the total were men who have sex with men (MSM). Median (range) age was 32 (17-78) years. Of these, 7 individuals, or 1 in 350 PrEP users, were found to have AHI at the time of starting PrEP. All 7 with AHI were MSM (age range 22-39 years). AHI was identified by positive pooled qualitative HIV RNA in 5 cases; median (range) HIV RNA was 317 (32-16,780) copies/mL. The remaining 2 cases were diagnosed by reactive HIV serology at the 1-month visit; in both cases the pre-PrEP pooled qualitative testing was negative, but quantitative HIV RNA performed on stored pre-PrEP specimens showed detectable HIV RNA at 58 and 86 copies/mL. PrEP was used for a median (range) of 14 (2-121) days. ARV resistance data were available for 6 cases: 3/6 cases had single resistance mutations M184V/I, conferring high-level resistance to FTC. No cases had resistance mutations to TDF or to non-nucleoside reverse transcriptase inhibitor drugs. The 3 cases that developed FTC-resistance had taken PrEP for 30, 34, and 121 days. The 3 cases that did not develop any resistance mutations took PrEP for 2, 7, and 14 days.

Conclusions: AHI at PrEP initiation is not common, occurring in 1 of out 350 high-risk PrEP users at the TRCAC. Screening for AHI using qualitative HIV RNA on pooled samples will identify most, but not all cases of AHI, and is recommended for individuals with recent high-risk behavior. If AHI is identified early, immediately stopping PrEP and initiating antiretroviral therapy (ART) can prevent the emergence of ARV drug resistance. FTC resistance begins to emerge after 2-4 weeks of PrEP use. Resistance to TDF seems less likely to occur. In all cases of HIV infection that occurs during PrEP use, ARV drug resistance testing should be performed, with selection of ART that maintains efficacy in the presence of potential resistance to the PrEP drugs.
Factors associated with transitioning from post-exposure prophylaxis to pre-exposure prophylaxis at the Thai Red Cross Anonymous Clinic in Bangkok, Thailand: A five-year observational cohort

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Background: Post-exposure prophylaxis (PEP) and pre-exposure prophylaxis (PrEP) are highly effective antiretroviral-based measures in the combination HIV prevention package. While PEP is offered to individuals within 72 hours of risk exposure, PrEP is a preferred choice for those with on-going HIV susceptibility. However, how an individual makes a decision to use PEP or PrEP, and especially to transition from PEP to PrEP, have not been well investigated. This study aimed to look at proportions of PEP users who transitioned to use PrEP after PEP completion, as well as to examine factors correlated with this transition among clients at the Thai Red Cross Anonymous Clinic (TRCAC), the largest stand-alone, HIV and sexual health clinic in Bangkok, Thailand.

Methods: Data were obtained from PEP clients of the TRCAC from January 2014 to December 2018. PrEP service was introduced into the TRCAC in December 2014. PEP and PrEP were offered as fee-based services, and were prescribed per national guidelines. Demographic and behavioral information were self-reported during service registration. Descriptive analysis was conducted to assess the number of PEP and PrEP users, and proportions of PEP users who transitioned into using PrEP. Logistic regression was performed to determine factors associated with transitioning from PEP to PrEP.

Results: From January 2014 to December 2018, 9047 clients were prescribed PEP at the TRCAC. Half (51.7%) of them were men who have sex with men (MSM), 35.7% were heterosexual males, 11.65% were females and 0.98% were males who refused to disclose their sexual orientation. Majority were Thai (89.55%). A total of 528 clients (5.8%) switched to PrEP after completion of PEP.

Since the integration of PrEP service into the TRCAC in December 2014, we saw 36/558 (6.45%) in 2015, 135/1794 (7.5%) in 2016, 176/2875 (6.3%) in 2017 and 181/3889 (4.65%) in 2018 transitioned from PEP to PrEP (p<0.001). The median time of transition after first day of receiving PEP was 257 days (IQR 86-546.5) in 2015, 130 days (IQR 29-412) in 2016, 91 days (IQR 32-241.5) in 2017 and 35 days (IQR 29-92) in 2018 (p<0.001).

Factors associated with transitioning from PEP to PrEP were: repeated PEP use (aOR: 4.46; 95%CI 3.69-5.41, p<0.001), being MSM (aOR: 5.57; 95%CI 4.16-7.45, p<0.001), males who refused to disclose their sexual orientation (aOR: 4.00; 95%CI 1.73-9.26, p=0.001) females (aOR: 1.97; 95%CI 1.27-3.06, p=0.002), being a foreigner (aOR: 1.81; 95%CI 1.38-2.37, p<0.001) and clients older than 25 years (aOR: 2.00; 95%CI 1.59-2.52, p<0.001).

Conclusions: Number of PEP users has continued to rise after the introduction of PrEP. Proportions of clients who switched to PrEP have been low and declining over the years. Interventions to enhance PrEP awareness among clients who are younger than 25, heterosexual males and Thai may be needed to increase the transition. Nevertheless, time to transition has become shorter over years, likely reflecting increasing PrEP clinical service skills among counselors and PrEP awareness among certain groups of clients.
Demographic characteristics and risk behaviors of transgender women using free versus fee-based pre-exposure prophylaxis (PrEP) services in Bangkok, Thailand


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Background: HIV disproportionately affects transgender women (TGW) worldwide. Pre-exposure prophylaxis (PrEP) is a safe and effective HIV prevention method but is underutilized by TGW. We examined differences in characteristics and HIV risk behaviors between TGW who accessed free PrEP and those who accessed fee-based PrEP.

Methods: The Tangerine Community Health Clinic in Bangkok provides HIV, sexual health, and gender-affirming hormone treatment services for transgender people. PrEP is offered as a free or fee-based service based on clients’ self-reported ability to pay. Fee-based PrEP is delivered for approximately US$30 per month. Demographic and sexual behavioral characteristics of TGW who received services between November 2015 and October 2018 were collected by self-administered questionnaire. Chi-square tests were used to compare characteristics between TGW who accessed free PrEP and those who accessed fee-based PrEP.

Results: Of 1,886 TGW who attended the clinic during the study period, 143 (7.5%) were prescribed PrEP. Of those, 85 (59.4%) received free PrEP, and 58 (40.6%) received fee-based PrEP. The median ages of TGW using free and fee-based PrEP were 26.5 and 25.6 years, respectively (p=0.24). Those using fee-based PrEP were more likely than those using free PrEP to use amphetamine-type stimulants (13.5% versus 2.8%, p=0.045), and to have had sex with HIV-positive partners in the past three months (47.4% versus 4.6%, p<0.001). The groups did not differ statistically in education level, employment status, monthly income, or reported sex work. The retention rate at one month was 47.4% for TGW using free PrEP and 53.6% for TGW using fee-based PrEP. It was 35.3% at three months and 25.6% at six months for TGW using free PrEP, and 37.5% at three months and 32.7% at six months for those on fee-based PrEP.

Conclusions: The availability of fee-based PrEP service responds to the needs of TGW at substantial risk of HIV acquisition. PrEP can be scaled up through affordable fee-based scheme. Certain TGW subpopulations can and will pay for PrEP. However, PrEP uptake and retention among TGW remains a concern. Strategies to address barriers in accessing and continuing PrEP among TGW need to be urgently explored.
A quality improvement learning network approach to the reduction of HIV-related stigma and discrimination in healthcare settings

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Background: HIV-related stigma and discrimination (S&D) in healthcare settings represent a formidable barrier to achievement of UNAIDS’ 95-95-95 targets in Southeast Asia. Globally validated tools to measure HIV-related S&D exist, but there is a critically need to explore how these tools can be incorporated into national HIV prevention and treatment programming and, moreover, how quality improvement (QI) methods can be leveraged to accelerate uptake of effective stigma-reduction interventions at the facility level.

Methods: With support through the Health Resources and Services Administration as part of the U.S. President’s Emergency Plan for AIDS Relief, HEALTHQUAL at the University of California, San Francisco, implemented a multi-country learning network (“Network”) to accelerate implementation of national- and facility-level S&D-reduction activities in Cambodia, Lao People’s Democratic Republic, Thailand, and Vietnam. As part of Network activities, health facilities in participating countries measure HIV-related S&D among healthcare workers (HCW) on a continuous basis using 8 common indicators from a validated survey tool. In addition, these facilities routinely collect data on patients’ experience and treatment literacy through structured questionnaires, patient fora, and clinical encounters. Using data from HCW surveys, patient feedback, and clinical performance data, facilities apply QI methods (e.g., Ishikawa diagramming, process mapping, Plan-Do-Study-Act cycles) to identify root causes of suboptimal outcomes and implement contextually appropriate interventions to improve identified gaps. To share successes and challenges and co-create implementation strategies, teams from participating Ministries of Health are convened on a quarterly basis.

Results: As of March 2019, 4 multi-country network meetings have been convened, 83 facilities across participating countries have initiated S&D-reduction activities, and over 8,000 healthcare workers have completed baseline surveys. 87% of respondents agreed that there were adequate supplies in their facility to protect against occupational exposure, 57% agreed that their facility had anti-discrimination guidelines, 52% reported trepidation about getting HIV by drawing blood from people living with HIV (PLWH), 51% disagreed that pregnant women living with HIV should be allowed to have babies, 34% reported wearing double gloves when providing care to PLWH, 22% have ever observed colleagues unwilling to provide care to PLWH, 15% have ever observed colleagues providing poorer care to PLWH, and 12% reported avoidance of physical contact when providing care for PLWH. Since the inception of Network activities, participating facilities have tested 27 distinct strategies and interventions for addressing HIV-related S&D in the healthcare setting, spanning 5 domains (care delivery system, knowledge management and decision support, performance measurement and information systems, people-centered care, and health system).

Conclusion: Reducing HIV-related S&D in healthcare settings is a key strategy for optimizing the quality of HIV care and treatment services and facilitating achievement of UNAIDS’ 95-95-95 targets in Southeast Asia. Implementation of a multi-country learning network represents a novel approach to stimulate the identification, testing, adoption, and scaling of data-driven S&D-reduction interventions through application of quality improvement methods and co-creation of implementation strategies.
Trends of Genotypic Sensitivity Scores of HIV-1 in Taiwan: Potential Application in the Selection of Single-Tablet Antiretroviral Regimens

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Background: Increasing trends of resistance-associated mutations (RAMs) of HIV-1 to non-nucleoside reverse transcriptase inhibitors (nNRTIs) have caused concerns about the effectiveness of the nNRTI-containing antiretroviral regimens in Taiwan. According to the national HIV treatment guidelines in Taiwan, four single-tablet regimens (STRs), coformulated TDF/FTC/EFV, TDF/FTC/RPV, ABC/3TC/DTG, and TAF/FTC/Cobi/EVG, are recommended as the first-line regimens in the antiretroviral-naive HIV-1-infected patients. A multicenter surveillance study of genotypic resistance of HIV-1 among antiretroviral-naive and treatment-experienced patients was conducted to determine the prevalence of transmitted drug resistance (TDR) and to evaluate whether all STR could be considered as the first-line regimen when access to pre-treatment drug resistance testing remains limited in Taiwan.

Materials & Methods: Genotypic resistance assays were performed in the HIV strains from antiretroviral-naive and -experienced patients receiving HIV care in the designated hospitals around Taiwan from 2016 to 2018. Resistance mutations were identified using the HIVdb program of the Stanford University HIV Drug Resistance Database. Genotypic Sensitivity Scores (GSS) were determined based on the RAMs detected in each specimen.

Results: Of 1,529 blood specimens from treatment-naive patients, the overall prevalence of TDR was 15.4% (n=235), which included 4.6% (n=70), 11.1% (n=169), 1.4% (n=22), and 1.4% (n=10; N=731) RAMs to NRTIs, nNRTIs, protease inhibitors, integrase inhibitors, respectively, and 1.6% (n=25) with multi-drug resistance. Annual changes in the susceptibility to STR by GSS were observed among treatment-naive and treatment-experienced patients. In treatment-naive patients, a significant increased percentage of GSS <2.5 was observed for two nNRTI-based STR since 2016, from 6.7% to 11.4% for TDF/FTC/EFV (P =0.01) and 2.2% to 5.5% for TDF/FTC/RPV (P=0.008), while the percentage of GSS <2.5 for two INSTI-based STR remained relatively low (0% ~2.7%). In treatment-experienced patients, an increase percentage of GSS >2.5 was observed between 2016 and 2018 for all STRs, probably reflecting the effectiveness of STR in preventing emergence of RAMs as compared to non-STRs. Significant increases in the percentage of GSS >2.5 were observed for two INSTI-based STRs (46.8% to 73.0%; P<0.001). Although both INSTI-based STRs showed a decreased percentage of GSS <2.5, there is a qualitative differences between these two STRs. For TAF/FTC/Cobi/EVG, a significantly higher percentage of 1.75≤GSS<2.5 was observed as compared to that for ABC/3TC/DTG (P<0.001). Such a difference was likely derived from the INSTI backbone in the STR (TDF/FTC vs ABC/3TC) and a similar trend of GSS changes was also observed between TDF/FTC and 3TC/ABC. While an increasing trend of GSS ≥1.75 for TDF/FTC (63.9% to 74.6%) and ABC/3TC (63.9% to 74.1%) was observed, 17.1~26.4% of GSS for TDF/FTC ranged between 0.75-1.5, and 22.9~35.5% of GSS for 3TC/ABC ranged below 0.5.

Conclusions: Our findings suggested that, for treatment-naive patients who are to initiate nNRTI-based STR as the first-line regimen in Taiwan, a drug resistance testing should be performed at baseline, while drug resistance testing is not required for those in whom INSTI-based STR is to be initiated as the first-line regimen. For treatment-experienced patients, TDF/FTC-based backbone is preferred as compared to 3TC/ABC-based backbone based on the recent changes of GSS.
Early Mortality After Late Initiation of Antiretroviral Therapy in the TREAT Asia HIV Observational Database (TAHOD) of IeDEA Asia-Pacific

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Background: Despite the recommendations for universal HIV treatment, people living with HIV (PLHIV) in resource-limited settings continue to initiate antiretroviral therapy (ART) with advanced stages of HIV infection. Early mortality in those initiating late remains high. We aimed to investigate risk factors associated with early mortality in PLHIV starting ART at low CD4 levels in the Asia-Pacific.

Methods: PLHIV enrolled in the TAHOD cohort who initiated ART with CD4 cell counts <100 cells/μL between 2003 – 2018 were included in the analysis. Early mortality was defined as death within one year after ART initiation. PLHIV in follow-up for more than one year were censored at 12 months. Cause of death was assessed using a standardized review process based on D:A:D methods. Risk factors for early mortality were analysed using competing risk regression with loss to follow-up included as a competing risk.

Results: A total of 1813 PLHIV from 21 sites in 12 Asia-Pacific countries who started ART with CD4 cell counts <100 cell/μL were included of which higher proportion of patients initiated treatment between 2008-2012 (64%) compared to 2003-2007 (28%) and 2013-2018 (8%). The median age was 35 (IQR 29-41) years, with majority being males (74%) and reporting heterosexual HIV exposure (64%). The median CD4 cell count was 34 (IQR 14-60) cells/μL and median BMI was 19.6 (IQR 17.6-21.8). After one year of initiating ART, there were 73 (4%) deaths, of which 38 (52%) were AIDS-related, 10 (14%) related to immune reconstitution inflammatory syndrome (IRIS), 13 (18%) non-AIDS-related, and 12 (16%) due to unknown causes. The overall mortality rate in the first year of ART was 4.27 per 100 person-years (/100PYS). In the multivariate model, risk factors for early mortality one year after ART initiation included being underweight (BMI <18.5) (SHR=2.91, 95% CI 1.60-5.32) compared to normal weight (BMI 18.5 – 24.9), positive for HCV co-infection (SHR 2.67; 95% CI 1.40-5.11), elevations of alanine aminotransferase (ALT) ≥ 5 U/L (SHR=6.14, 95% CI 1.62-23.20) compared to ALT elevations <5 U/L, being anaemic (haemoglobin <13.0 g/dL for males and <12.0 g/dL for females) (SHR=2.33, 95% CI 1.15-4.74) compared to non-anaemic (≥ 13.0 g/dL for males and ≥ 12.0 g/dL for females), and ever adherent to ART (<95%) (SHR=3.38, 95% CI 1.11-10.36) compared to always adherent to ART (≥95%). Higher CD4 cell counts (51-100 cells/μL, SHR=0.28, 95% CI 0.14-0.55; and >100 cells/μL, SHR=0.12, 95% CI 0.05-0.26) were associated with reduced hazard for mortality compared to CD4 cell counts ≤ 25 cell/μL.

Conclusion: More than half of early deaths in this Asia-Pacific cohort with advanced immune suppression at ART initiation were due to AIDS-related causes. Considering the significant benefit on short term survival, aggressive effort should be put into early diagnosis and linkage to treatment, and careful monitoring of BMI, liver function, severe anaemia, HCV co-infection, and ART adherence among those initiating ART at lower CD4 counts to reduce the risk of early mortality.
Rapid antiretroviral initiation among Thai HIV-infected youth through the National AIDS program in the era of treatment at any CD4

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Background: The Thai National AIDS Program (NAP) is a universal health coverage program providing care for people living with HIV. Since 2014, Thai national guidelines recommend initiating treatment at any CD4. We aimed to assess the linkage from HIV diagnosis to treatment initiation of HIV-infected youth in the period 2014-2018 compared with the period from 2008-2013. We also assess factors associated with rapid antiretroviral treatment initiation within one month after registration.

Methods: We studied HIV-infected youth aged 10-24 years under the NAP program during period of 2008-2018. Date of registration and date of first ART prescription were surrogates for the date of diagnosis and treatment, respectively. The database was provided by the National Health Security Office (NHSO) and linked with the National Death Registry. Lost to follow-up (LTFU) was defined as not in active in care ≥ 12 months. The outcome of interests included time from registration to start ART, mortality and LTFU rates prior to ART initiation. We compared outcomes by year of registration between 2008-2013 and 2014-2018. Crude LTFU and mortality rates and their 95% confidence intervals (CIs) were calculated by using Poisson analysis. We used logistic regression to assess factors associated with rapid ART initiation within one month after registration.

Results: Overall, 51,607 HIV-infected youth (YHIV) aged 15-24 years registered in the NAP; 21,825 YHIV during 2008-2013 and 29,782 YHIV during 2014-2018. Median (Interquartile range, IQR) age was 21 (20–23) years [16% aged 15-18 years, 84% aged 19-24 years]; 64% were male. The majority of
Dual therapy with lopinavir/ritonavir plus lamivudine could be a long-term viable alternative for antiretroviral-therapy-naive adults in resource-limited settings: 144-week results from a randomized, open-label, non-inferiority study from China

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Background: Dual therapy with lopinavir/ritonavir (LPV/r) plus lamivudine (3TC) is increasingly considered as a viable alternative strategy for HAART-naive HIV-1 infected patients. However, no studies were reported about the long-term effectiveness and safety of dual-therapy of LPV/r plus 3TC compared with the first-line triple-therapy regimen containing tenofovir (TDF), 3TC plus efavirenz (EFV) in resource-limited settings.

Methods: This randomized, controlled, open-label, non-inferiority trial was conducted in China. ART-naive HIV-1 infected patients with CD4+ cell count over 200 cells/mm3 were randomized to receive a dual-therapy regimen of LPV/r plus 3TC (DT group) or a triple-therapy regimen of TDF, 3TC plus EFV (TT group), and followed-up 144 weeks. The primary endpoint was the proportion of patients with plasma HIV-1 RNA<50 copies/ml at week 144.

Results: 196 patients were screened from 274 patients and randomized into DT group (n=99) or TT group (n=97). 86 patients (86.9%) in the DT group and 78 (80.4%) in the TT group achieved primary endpoint (P<0.001#). Among patients with baseline HIV-1 RNA>100,000 copies/ml, 92.9% (13/14) in the DT group and 77.8% (7/9) in the TT group achieved primary endpoint (P=0.026). Among patients with baseline HIV-1 RNA>10,000 copies/ml, 88.6% (62/70) in the DT group and 83.3% (60/72) in the TT group achieved primary endpoint (P<0.001#). Mean changes in CD4+ cell count during 144 weeks were similar in both groups (+247 cells/mm3 in the DT group vs. +204.5 cells/mm3 in the TT group, P=0.074). Meanwhile, the ratio of CD4+ and CD8+ cell counts at 144 week were similar in both groups (0.45 in the DT group vs. 0.46 in the TT group, P=0.968). Furthermore, the safety profile was similar between two groups and no secondary HIV resistance was observed.

Conclusions: Dual-therapy of LPV/r plus 3TC could be a long-term viable alternative regimen for ART-naive adults in resource-limited countries including China.
Prognostic factor for natural eradication of acute hepatitis C infection in HIV positive patients

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Background: High reinfection rates after direct acting antivirals (DAA) therapy in HIV positive MSM have been reported from several countries. In clinical settings, it is difficult to determine whether initiate DAA therapy or not for sexually active MSM patients during their early stage of hepatitis C virus (HCV) infection considering natural eradication and reinfection of HCV. Our aim of this study is to find a prognostic factor of HCV natural eradication during early stage of HCV infection in HIV coinfected patients.

Material & Method: We included HIV positive patients with acute HCV infection (AHI) in Tokyo and Taipei. We retrospectively collected clinical information with medical records and confirmed their clinical outcome as natural eradication (NE) or chronic infection (CI). We assessed general clinical information, sexuality, HIV status, HCV-GT, IL28B, ALT, and HCV-RNA. A definition of AHI is a patient with ALT elevation, HCV-Ab seroconversion, and HCV-RNA detection. A definition of NE is HCV-RNA viral load (VL) undetectable for 6month without interferon or DAA therapy. For statistical analysis, noncategorical variables were compared using a Mann-Whitney U test and categorical variables were compared using Chi-squared test.

Results: Of 46 patients confirmed as AHI, all patients were male and 2 had not been initiated antiretroviral therapy for HIV at diagnosis of AHI. Genotype (GT) distribution was as follows: GT 1b 30 GT2a 10 GT6a 1, and unknown 5. Seventeen patients were NE and 29 patients were CI. Among NE patients, 5 had natural eradication beyond 6month after a diagnosis of AHI. Of HCV-RNA positive patients at 6 month, HCV-RNA VL <5.0logIU/mL at 6month and HCV-RNA >1.2logIU/mL reduction in VL at 6month could be a prognostic factor of AHI outcome in HCV/HIV coinfected patients.

Conclusions: Natural eradication can occur even though HCV-RNA is positive at 6 month after AHI diagnosis. HCV-RNA VL <5logIU/mL at 6month and HCV-RNA >1.2logIU/mL reduction in VL at 6month could be a prognostic factor of AHI outcome in HCV/HIV coinfected patients.
HCV Seroepidemiology among HCV-Seronegative, HIV-Positive Patients in Northern Taiwan: an Expanding Epidemic

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Background: HIV and hepatitis C virus (HCV) infections are major global public health problems with overlapping modes of transmission. UNAIDS estimated that, as of 2017, about 36.9 million people were living with HIV and 1.8 million were newly infected. Moreover, World Health Organization (WHO) estimated that, in 2017, about 170 million people were infected with HCV. Approximately 2.3 million people living with HIV are co-infected with HCV globally. Our previously study has shown an increasing trend of HCV infection among HIV-positive patients between 1994 and 2010. We aimed to reexamine the current status of HCV infection among HCV-seronegative, HIV-positive patients in northern Taiwan between 2011 and 2017.

Materials & Methods: Between 2011 and 2017, consecutive HIV-positive patients at the National Taiwan University Hospital were prospectively observed. Anti-HCV IgG ELISA kit (Dia. Pro, Italy) was used to determine the HCV seroprevalence and seroincidence. The blood specimens tested HCV-seropositive were further confirmed by detection of HCV RNA load (COBAS® AmpliPrep HCV Test, v2.0, Roche, USA) and their HCV genotypes were determined by NS5B PCR and sequencing. For those who were HCV-seropositive with undetectable HCV VL, a recombinant immunoblot assay (RIBA) kit (Mikrogen Diagnostik, Neureid, Germany) was used to confirm the HCV antibody responses. All patients were followed until 31 March, 2018.

Results: Among 4,995 HIV-positive patients, 3,938 were included in the study between 2011 and 2017. The overall HCV seroprevalence was 12.2%, which increased from 11.2% in 2011 to 14.3%, in 2017. During the 7-year study period, a total of 233 incident cases of recent HCV infection, defined as HCV seroconversion within the preceding 12 months, were identified during a total of 14,583.58 PYFU, giving an overall incidence rate of 15.98 per 1000 PYFU. The seroincidence increased from 14.22 per 1000 PYFU in 2011 to 23.94 per 1000 PYFU in 2017. The mean plasma HCV RNA load of those patients at HCV seroconversion was 5.6 log10 IU/mL and their HBsAg prevalence was 13.2%. Compared with 3,309 patients without acquiring HCV, patients with recent HCV infection were more likely to be male (100.0% vs 96.2%, P<0.01), younger (mean age, 35 vs 40 years, P=0.132), and men who have sex with men (89% vs 82.5%, P<0.001) and to have prior syphilis (64.5% vs 33.3%, P<0.001) and AST >37 U/L (79% vs 11.1%, P<0.001) and ALT >41 U/L (85.4% vs 15.4%, P<0.001). Of the 208 (89.3%) HCV RNA-positive specimens, the most prevalent HCV genotype was genotype 2a (n=92, 44.2%), followed by genotype 1b (n=70, 33.7%), 6a (n=25, 12.0%), 1a (n=14, 6.7%), 3a (n=6, 2.9%) and 6n (n=1, 0.5%).

Conclusions: Our study highlights an expanding epidemic of HCV co-infection among HIV-positive patients in northern Taiwan. Improvement in access to testing and treatment with efficacious direct acting antivirals are needed to curb the expanding HCV epidemic among HIV-positive patients in Taiwan.
Interim analysis of a randomized clinical trial: HBV revaccination among HIV-positive MSM born in the era of neonatal immunization

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**Background:** The prevalence of hepatitis B virus (HBV) has declined among the individuals born in the era of the universal neonatal vaccination program against HBV. To prevent incident HBV infection among people who have lost their immunity against HBV, revaccination is recommended among the high-risk population, such as men who have sex with men (MSM). However, the optimal strategy of revaccination remains unknown. In this randomized controlled trial, we aimed to compare the efficacy of HBV revaccination with standard- (20 µg) versus double-dose (40 µg) of HBV vaccine among HIV-positive MSM.

**Materials & Methods:** HIV-positive who were born after 1 July 1986 and tested negative for HBsAg and anti-HBc with anti-HBs titer <10 mIU/ml were eligible for revaccination. Subjects who were aged <20 years, allergic to any component of the vaccine (Engerix-B®), receiving chemotherapy, steroids, or immunosuppressants, and having severe chronic kidney disease were excluded. Participants were randomized to receive standard- or double-dose HBV vaccine (1:1 ratio with a block size of 4). For HIV-positive participants, the randomization was stratified by CD4 count. HBV vaccine was administered at weeks 0, 4, and 24. The primary endpoint was the proportion of people achieving serological responses, defined as anti-HBsAb titer ≥10 mIU/ml, at week 28. The secondary endpoints were the proportion of high-titer responses (anti-HBsAb titer ≥100 mIU/ml) at week 28 and week 48, the proportion of serological responses at week 48, and solicited adverse events rates after each injection.

**Results:** From September 2017 to March 2019, 78 HIV-positive MSM were enrolled with 39 in the standard-dose arm and 39 in the double-dose arm. The serological response at week 28 was 88.2% for the standard-dose group and 96.9% the double-dose group (p=0.357). The proportions of high-titer responses (anti-HBs >100 mIU/ml) at weeks 28 was 70.6% for the standard-dose group and 84.4% the double-dose group (p=0.244). The geometric mean titers were statistically significantly higher for the double-dose group, 554 mIU/ml vs 171.1 mIU/ml (p=0.001), respectively. All participants with baseline anti-HBs titer higher ≥1 mIU/ml achieved high-titer response after revaccination, regardless of the assigned regimen. In multivariate analysis, double-dose revaccination (adjusted odds ratio [aOR], 4.89; 95% CI, 1.4-18.2) and baseline anti-HBs titer ≥ 1mIU/ml (aOR, 13.0; 95% CI, 3.4-49.3) were associated with high-titer responses at week 4. One severe adverse event occurred in an HIV-positive participant, which resolved without sequelae. The double-dose regimen was associated with more local adverse events (35.1% vs 10.8%, p=0.025).

**Conclusions:** Revaccination with standard- or double-dose HBV vaccine results in similarly high serological responses among HIV-positive patients receiving HAART. Baseline anti-HBs titer ≥1 mIU/ml and double-dose vaccination achieved high-titer responses after the first dose of HBV revaccination.
Long-term virological and serologic responses of chronic hepatitis B virus infection to tenofovir disoproxil fumarate-containing regimens in patients with HIV and hepatitis B coinfection

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Background: Data regarding the durability of HBV viral suppression with combination antiretroviral therapy (cART) containing tenofovir disoproxil fumarate (TDF) combined with lamivudine (3TC) or emtricitabine (FTC) in HIV/HBV-coinfected patients are scarce in hyperendemic areas of chronic HBV infection. This study aimed to assess the long-term responses of HBV to TDF-containing cART in HIV-positive patients in Taiwan, where HBV seroprevalence was estimated 18-20% among HIV-infected patients born before implementation of nationwide neonatal HBV vaccination in 1984.

Methods: Between 2004 and 2016, HIV/HBV-coinfected Taiwanese with available baseline HBV DNA load were retrospectively reviewed. Determinations of plasma HBV DNA load, HBV serologic markers (HBsAg, anti-HBs, HBeAg, and anti-HBe), and liver function were performed after initiation of cART. Factors associated with time to undetectable HBV DNA load were explored. The primary end-point was the proportion of patients who achieved undetectable plasma HBV DNA load before year 5, and the secondary end-points were the proportions of patients who had seroconversion of HBeAg and those with loss of HBsAg before year 5.

Results: A total of 366 HIV/HBV-coinfected patients, with a mean age of 39 years (SD, 9.3) and 85% being men who have sex with men, were included and categorized into 3 groups according to their cART history: Group 1 (3TC group), 3TC as the only anti-HBV therapy (n=73); Group 2 (TDF group), TDF-containing cART as initial therapy (n=127); and Group 3 (3TC-TDF group), switch of 3TC-based to TDF-containing cART (n=166). Genotype B (43.1%) was the predominant HBV subtype in all three groups, and the overall prevalence of HBeAg positivity at baseline was 21.1%. At year 5, HBV suppression was achieved in 77.8%, 95.7%, and 95.7%, respectively, in Groups 1, 2 and 3. Among the patients receiving TDF-containing cART as the first-line or second-line anti-HBV treatment, 9.6% (25/293) had persistent HBV viremia after 1 year and 3.1% (9/293) after 2 years of therapy; and 10.6% (31/293) developed episodes of viral rebound after ever achieving an undetectable plasma HBV DNA level. In multivariate Cox regression analysis, TDF (± 3TC or FTC) but not 3TC alone as initial anti-HBV therapy was significantly associated with HBV suppression (adjusted hazard ratio [aHR] 2.635; 95% CI 1.720-4.037), while HBeAg positivity at baseline was associated with failure to achieve HBV suppression (aHR 0.293; 95% CI 0.178-0.482). Loss of HBsAg occurred in 15 patients (4.1%), with 7 (1.9%) seroconversion to anti-HBs positivity, while HBeAg seroconversion occurred in 11 of 65 (16.9%) HBeAg-positive patients. The proportions of patients with HBeAg seroconversion were similar between TDF group and 3TC-TDF group (33% [7/21] vs 22% [6/27], p=0.39).

Conclusions: TDF-containing cART achieved durable HBV viral suppression in HIV/HBV-coinfected patients and HBeAg positivity at baseline was associated with failure to achieve HBV suppression despite long-term TDF-containing cART. Despite long-term TDF therapy with sustained suppression of HBV replication, seroconversion of HBsAg remained infrequent among HIV/HBV-coinfected patients in a country of hyperendemicity of HBV infection.
HCV reinfections after viral clearance among HIV-positive patients with recent HCV infection in Taiwan

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Background: A high rate of hepatitis C virus (HCV) reinfection after viral clearance among HIV-positive men who have sex with men (MSM) has been well described in Europe. However, whether the high rate of HCV reinfection also occurs in the Asia-Pacific region remains unknown. Given the observation that patients with recent HCV infection had a higher incidence of HCV reinfection than those with chronic infection and the concerns about onward HCV transmission if left undiagnosed, this study aimed to assess the incidence rate of HCV reinfection after HCV viral clearance, to identify the factors associated with HCV reinfection, and to examine different testing strategies for timely diagnosis of HCV reinfection among HIV-positive Taiwanese patients with recent HCV infection.

Materials & Methods: Among HIV-positive patients with negative baseline anti-HCV antibody who sought medical care at the National Taiwan University Hospital between 1 January 2011 and 30 September 2018, we retrospectively identified the patients with recent HCV infection that was defined as HCV seroconversion within the past 12 months. Patients who had cleared their recent infection, either spontaneously or via treatment, were observed until 28 February 2019. HCV reinfection was defined as recurrence of HCV viremia after achievement of sustained virologic response (SVR) with anti-HCV treatment or after spontaneous clearance.

Results: During the study period, 219 HIV-positive patients (90.4% being MSM) were diagnosed with recent HCV infection. Viral clearance with successful treatment was achieved in 106 patients (48.4%) and spontaneous clearance occurred in 20 (9.1%). Of these patients with viral clearance, 15 (11.9%) acquired HCV reinfections, resulting in an incidence rate of 7.7 per 100 person-years of follow up (95% CI, 4.7-12.8). The median time to reinfection was 1.39 year (IQR, 0.62-1.98) after the clearance of recent HCV infection. Compared to patients without HCV reinfection, those with reinfection were younger (28.5 vs 33.0 years, p=0.04) and more likely to have syphilis (93.3% vs 44.4%, p=0.007). HCV RNA testing, if performed only following incident syphilis and elevated aminotransferases (any higher than upper normal limit), might miss 46.7% and 26.7% of HCV reinfections, respectively.

Conclusions: Similar to the findings in Europe, we observed a high incidence of HCV reinfection among HIV-positive Taiwanese with recent HCV infection, which was significantly associated with younger age and syphilis. To identify HCV reinfections, annual HCV RNA testing should be instituted instead of testing driven by symptoms, syphilis, or elevated aminotransferases.
The relationships between anal intraepithelial neoplasia, oncogenic HPV and microbiota in gay, bisexual, and other men who have sex with men and have HIV infection

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Background: The incidence of anal cancer is rising in the era of highly active antiretroviral therapy, especially among gay, bisexual, and other men who have sex with men (GBMSM) and have HIV infection. This study aimed to assess the relationship between anal intraepithelial neoplasia (AIN), oncogenic HPV, and anal microbiota among GBMSM who have HIV.

Methods: We designed an observational study in the setting of a regional referral hospital, Taoyuan general hospital. All the participants who have HIV infection were enrolled between Aug 2018 and Dec 2018. HPV genotype 16, 18 and 12 other oncogenic HPVs (31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, 68) were detected by PCR methods (Cobas HPV). Thin preparation anal Pap smears were interpreted according to the 2001 Bethesda System. The 16S rRNA gene amplification and library construction were performed according to Illumina's recommended protocols.

Results: In total, 15 cases had anal cytology shown AIN, and 23 cases had normal or inflammatory anal cytology. Their mean ages (±SD) were 35.7 (±8.2) years, and all were GBMSM. All of the subjects had antiretroviral therapy. Their recent mean (±SD) CD4 T+ cell counts were 513 (± 259) cells/µL, and 85% of their viral load were fully suppressed. Among cases with AIN, 93.3% (14/15) had oncogenic HPV detection (including 4 cases of genotype 16, and 5 cases of genotype 18). Compared to cases, 30.4% (7/23) patients in control group had oncogenic HPV detection (including 2 cases of genotype 16, and 1 case of genotype 18) (p<0.05). Compared to control subjects, alpha diversity of anal microbiota was significantly lower (Wilcoxon rank sum test, p=0.028) in AIN cases.

Permutational multivariate analysis of variance (PERMANOVA) showed significant beta diversity by weighted UniFrac, variance adjusted weighted UniFrac, and GUniFrac with alpha 0.5 (adonis function p=0.012, P=0.030, and p=0.002 respectively; multivariate homogeneity of group dispersions analysis by betadisper function, p=0.474, p=0.565, and p=0.327, respectively). Differential abundant bacterial taxa between cases and controls were determined with linear discriminant analysis (LDA) effect size (LEfSe), and there were 47 significantly discriminative features with a LDA score > 3.0. Cases with AIN were associated with higher Fusobacteria (p=0.0004; LDA = 4.71). Control subjects had higher Firmicutes (p=0.022; LDA = 4.63) and Clostridia (p=0.009; LDA = 4.70).

In conclusions, these data suggested both oncogenic HPV and the altered bacterial microbiota were related to AIN. Whether the changes in bacterial microbiota predispose or result from HPV infection and/or AIN remains to be elucidated in future studies. This study explored the new aspect of anal precancerous lesions.
Incidence, persistence and factors associated with high-risk human papillomavirus infection among male adolescents with perinatally acquired HIV infection in Thailand

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Background: Infection with high-risk human papillomavirus (HR-HPV) has been shown to be more prevalent and persistent over time in female adolescents with HIV. However, data among male adolescents with perinatally acquired HIV (PHIV) are limited. Moreover, while there are multiple HPV vaccines available, there is insufficient government commitment to establishing HPV immunization programs in Asia. We aimed to evaluate the incidence and persistence of high-risk HPV in anogenital compartments and associated factors among PHIV in comparison to HIV-uninfected (HU) male adolescents in Thailand.

Methods: We conducted a prospective cohort study at two sites in Bangkok. PHIV and HIV-uninfected (HU) males aged 12-24 years were matched by age group and lifetime sexual partners. At baseline and three subsequent annual study visits, specimens from the anus, penis, and scrotum were obtained for HPV and other testing. The participants completed a study-specific sexual behavior questionnaire by audio computer-assisted self-interview tool (ACASI). Incidence was defined as detection of any HR-HPV genotype(s) after participants tested negative. Persistent HR-HPV infection was defined as having the same HR-HPV genotype(s) at any compartment(s) for ≥2 consecutive visits. Generalized estimating equations models were used to assess predictors for persistence HR-HPV.

Results: From June 2013 to October 2017, 49 PHIV and 47 HU male adolescents with a median age of 18 (interquartile range [IQR] 17-20) years were enrolled. Median follow-up was 2.73 (IQR 1.87-2.77) years. Prevalence of anogenital infection with any HR-HPV was detected in 67% of PHIV and 47% of HU adolescents (p=0.04). PHIV had significantly higher incidence of any HR-HPV infection than HU adolescents (37% vs. 19%, p=0.042). The incidence rates among PHIV and HU participants were 33.05 per 100 person-years [95%CI, 20.82-52.46] and 15.73 per 100 person-years [95%CI, 8.18-30.22]; (p= 0.04), respectively. The incidence of the 7 HR-HPV genotypes associated with anogenital cancer included in the nonavalent vaccine was higher in PHIV group (31% vs. 15%, p=0.058). Among those with prevalent HR-HPV infection (PHIV, n=16; HU, n=13), 16% of PHIV and 11% of HU adolescents had persistent infection detected at 48 weeks. Having ≥3 sex partners in the past 6 months (adjusted prevalence ratio [aPR] 2.39, 95% CI 1.14-5.05; p=0.02) and co-infection with other sexually transmitted diseases - syphilis, Chlamydia trachomatis and/or Neisseria gonorrhoeae in the past 12 months - were associated with persistent HR-HPV infection (aPR 6.21, 95% CI 2.87-13.41; p <0.001). Having a history of sex with males (MSM) was associated with persistence of the 7 HR-HPV nonavalent vaccine genotypes (aPR 2.60, 95%CI, 1.00-6.77, p=0.05). From the sub-group analysis of PHIV, participants who had CD4 at baseline less than 350 cell/mm3 was associated with persistence of the 7 HR-HPV nonavalent vaccine genotypes (aPR 1.61, 95%CI, 1.03-2.50, p=0.03).

Conclusions: Thai PHIV male adolescents had a higher incidence and persistence of HR-HPV infection than those without HIV. These data demonstrate the need for PHIV, especially with CD4 <350 cell/mm3, to be included in scaled-up regional HPV vaccination programs, and for inclusion of adolescent catch-up vaccination opportunities.
Paradoxical Immune Reconstitution Inflammatory Syndrome associated with Talaromyces marneffei Infection among ART-Naïve Population

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Background: Patients with advanced HIV disease and disseminated talaromycosis are known to develop immune reconstitution syndrome (IRIS), similar to patients with tuberculosis and cryptococcosis, as they initiate antiretroviral therapy (ART). Unmasking IRIS refers to the flare-up of previously undiagnosed infection; paradoxical IRIS refers to unexpected worsening of previously controlled infection. To date, data on the clinical features, incidence, risk factors, and outcomes of talaromycosis-IRIS are lacking. In addition, it is clinically difficult to differentiate between talaromycosis IRIS and talaromycosis relapse. This study aims to fill these knowledge gaps and to improve the management and outcomes of patients with talaromycosis-IRIS.

Methods: We conducted a prospective sub-study of all patients who participated in the Itraconazole versus Amphotericin B for HIV-associated Talaromycosis (IVAP) trial to determine the incidence, clinical characteristics, risk factors, and outcomes of paradoxical talaromycosis-IRIS over six-month follow up period. The IVAP trial recruited culture-confirmed talaromycosis adult patients from five referral hospitals across Vietnam between October 2012 and December 2016. Patients were followed monthly, and IRIS and relapse events were adjudicated by a clinician expert panel who were independent from the trial. We used multivariate Cox regression model and multivariable joint models of longitudinal and survival data to identify predictors of paradoxical talaromycosis-IRIS.

Results: Amongst 440 patients who participated in the IVAP trial, 215 patients were ART-naïve; of whom eleven developed paradoxical talaromycosis-IRIS over 6 months (incidence rate 8.7 cases per 1000 person-months, IQR: 4.3-15.5). Some presented with inflammatory skin lesions and painful interphalangeal joint synovitis. The median time from ART initiation to talaromycosis-IRIS was 3.8 months (IQR: 1.8-4.8). The median CD4 count went from 9 cells/µL (IQR: 4-11) at baseline to 106 cells/µL (IQR: 50-130) at time of talaromycosis-IRIS. Six patients were hospitalized for amphotericin B therapy; the remaining five patients continued outpatient itraconazole therapy. All eleven patients survived at the end of six months. In both the Cox model and in the joint models, induction therapy with itraconazole compared to amphotericin B was an independent predictor of paradoxical talaromycosis-IRIS (adjusted HR=23.58, 95% CI: 19.63-28.34, p<0.001, in the joint models considering survival as a competing risk). The other pre-determined covariables including age, baseline CD4 counts, time to ART initiation, baseline blood fungal colony forming units (CFUs), and rate of blood fungal CFUs decline did not predict talaromycosis-IRIS. Amongst 440 patients participated in IVAP trial, fifteen developed talaromycosis relapse (incidence rate 6.7 cases per 1000 person-months, IQR: 3.7-11). The following laboratory values were helpful in the differentiation between paradoxical talaromycosis-IRIS and talaromycosis relapse: Hemoglobin 11.8 (IQR: 10.7-13.1) versus 7.4 (IQR: 6.5-9.5), p<0.001; Platelet 245 (IQR: 232-337) versus 68 (IQR: 30-238), p=0.02; AST 38 (IQR: 25-44) versus 113 (IQR: 87-210), p=0.05 (Mann-Whiney-U tests).

Conclusions: Paradoxical talaromycosis-IRIS occurs between 2-5 months after ART initiation and is characterized by inflammatory clinical features, a CD4 count rise of ~100 cells/µL, and normalized laboratory values. The incidence is strongly driven by suboptimal induction therapy with itraconazole. The hemoglobin, platelet, and AST levels offer an objective way to differentiate between paradoxical talaromycosis-IRIS and talaromycosis relapse.
A Prospective Study of the Talaromyces marneffei Mannoprotein Mp1p Enzyme Immunoassay for Early Detection of Talaromyces marneffei Infection in Patients with Advanced HIV Disease in Vietnam

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Background: Talaromycosis (penicilliosis) is a systemic fungal infection endemic in Southeast Asia and is a common cause of HIV-associated death. Delay in culture diagnosis is associated with high mortality and is the most challenging clinical problem. Here, we reported preliminary results of a prospective diagnostic study of a novel Talaromyces marneffei (Tm) mannoprotein Mp1p enzyme immunoassay (EIA) in the detection of talaromycosis in an ongoing cohort of hospitalized patients with advanced HIV disease in Vietnam.

Methods: We evaluated the diagnostic performance of the Mp1p EIA in a prospective cohort of HIV-infected patients aged ≥18 years with CD4 ≤100 cells/µL who were admitted to the Hospital for Tropical Diseases (HTD) in Ho Chi Minh City with any symptoms. Serum, plasma, and urine samples were collected for Mp1p testing at the same time blood cultures and other routine tests were performed on admission. Treatment for HIV and for culture-positive talaromycosis patients were according to Vietnam Guidelines. All patients were followed monthly over 6 months. The diagnostic sensitivity, specificity, accuracy (area under the curve or AUC), positive predictive value (PPV), and negative predictive value (NPV) were calculated using positive cultures as the gold-standard reference.

Results: Between June 2017 and December 2018, 521 patients meeting the inclusion criteria were recruited. 78.6% were male; median age was 34 years (IQR: 29-30), and median CD4 count was 17 cells/µL (IQR: 6-36). Over the six-month follow-up period, 80/521 (15.4%) patients developed culture-positive talaromycosis. The mean optical density (OD) values in serum (N=517), plasma (N=306), and urine (N468) samples between culture-positive talaromycosis and non-talaromycosis patients were, respectively, as follows: Serum: 1.9 (95% CI: 1.7-2.2) and 0.04 (95% CI: 0.03-0.05), P <0.001 (T-test); Plasma: 2.3 (95% CI: 1.9-2.7) and 0.07 (95% CI: 0.06-0.08), P<0.001 (T-test); Urine: 2.7 (95% CI: 2.4-2.9) and 0.04 (95% CI: 0.02-0.06), P<0.001 (T-test). The receiver operating characteristic curves (ROC) were generated for each specimen types. Based on the OD cut off values (generated by the Youden indexes) of 0.17 for serum, 0.23 for plasma, and 0.39 for urine, the diagnostic values of the Mp1p EIA for serum, plasma, and urine, respectively, were as follows: Sensitivity 87.1%, 97.6%, 93.1%; Specificity 97.3%, 96.6%, 99.0%; AUC 97.5%, 98.5%, 96.6%; PPV 84.8%, 81.6%, 94.4%; and NPV 97.7%, 99.6%, 98.7%. The diagnostic performance of the assay when testing serum, plasma, and urine in combination was as follows: Sensitivity 77/80 (96.3%); Specificity 426/441 (96.2%); PPV 77/94 (81.9%); NPV 424/427 (99.3%). In 12 patients the Mp1p EIA could detect talaromycosis 1 to 16 weeks before culture turned positive.

Conclusions: The Tm Mp1p EIA has excellent diagnostic accuracy in detecting talaromycosis. Urine performed the best, followed by plasma and serum specimens. The Mp1p EIA can detect talaromycosis up to 4 months before cultures turn positive. Our large prospective study demonstrated that the Mp1p antigen test can be used to make an early diagnosis of talaromycosis, thus enabling early treatment which should substantially reduce mortality. A commercial version of this test has just been approved in China and should be validated for clinical use.
The effects of human papillomavirus (HPV) vaccination on the persistence of high-risk HPV infection and abnormal cervical cytology among sexually active female adolescents with and without perinatally acquired HIV

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Background: A study monitoring human papillomavirus (HPV) infection among sexually active adolescent and young adult females with and without perinatally acquired HIV (PHIV) was performed between 2013-2017 in Thailand and Vietnam. While all youth were unvaccinated at enrollment, some subsequently received HPV vaccine outside of the study. This analysis examines the impact of HPV vaccination in our cohort.

Material & Methods: A total of 93 PHIV and 99 uninfected (HU) female study participants between 12-24 years of age and matched by age and lifetime number of sexual partners were enrolled. During study follow-up, 25 PHIV and 22 HU youth received HPV vaccination after at least one year of study follow-up. All participants had baseline (enrollment) and annual follow-up visits that included assessments of sexual and other risk behaviors, blood and urine testing, and oral and anogenital HPV testing. Infection with any high-risk (HR)-HPV infection was defined as having >1 HR-HPV genotype (i.e., 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68) detected in any anogenital site (anus, cervix, vagina). Persistence was defined as detection of the same HR-HPV genotype(s) at any anogenital compartment over >2 consecutive visits. Factors associated with persistence were assessed using generalized estimating equations (GEE) with Poisson distribution and calculated prevalence ratio (PR). GEE with logistic function was used to calculate odds ratios (OR) for factors associated with abnormal cervical cytology (ranging from atypical squamous cells of undetermined significance to high-grade squamous intraepithelial lesion).

Results: Of the 192 females enrolled, median age was 19 (interquartile range [IQR] 18-20) years. Among PHIV at enrollment, the median CD4 was 593 (IQR 392-808) cells/mm3 and 65% had HIV-RNA <50 copies/ml. The median pre-vaccination follow-up was 2.63 (IQR 1.04-2.74) years for 192 participants and post-vaccination follow-up was 2.74 (IQR 1.72-3.18) years for 47 HPV-vaccinated participants. Infection with any HR-HPV genotype was detected in 81% (86% PHIV vs. 76% HU, p=0.07) of youth before vaccination, and after vaccination the prevalence was 70% (84% PHIV vs. 55% HU, p=0.03). There were no differences in incidence before and after vaccination (63 [95%CI 50-78] vs. 62 [95%CI 44-88]/100 person-years [PY]). The persistence of any HR-HPV infection before HPV vaccination was higher in PHIV than HU (49 vs. 26, p=0.001). Overall, not being vaccinated (adjusted PR [aPR] 1.19, 95% CI 1.06-1.33) and being HIV-positive (aPR 2.31, 95% CI 1.45-3.67) were significantly associated with persistent infection with >1 HR-HPV genotype; the association with not being vaccinated was also observed in a sub-group analysis of PHIV youth (aPR 1.50, 95% CI 1.24-1.82). The incidence of abnormal cytology was 13 (95%CI 10-18)/100 PY pre-vaccination and 14 (95%CI 8-24)/100 PY post-vaccination. Being HIV-positive (aOR 2.95, 95%CI 1.77-4.92) and infection with >1 HR-HPV genotype (aOR 2.59, 95%CI 1.65-4.06), but not HPV vaccination, were associated with abnormal cytology.

Conclusions: Despite not receiving HPV vaccination until after initiating sexual activity, vaccinated female youth in our study had significantly reduced persistent infection with HR-HPV genotypes. HPV vaccination should be promoted for all children and adolescents, and prioritized for those with HIV.
We are ready! Willingness to pay and preferred delivery point of service for HIV self-testing kits among men who have sex with men and transgender women in Thailand

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Background: As HIV self-testing (HIVST) rolls out globally as an additional HIV testing option, public health stakeholders have been asking how best to deliver HIVST and how much people would be willing to pay for the kit. HIVST is not yet officially endorsed in Thailand, but research was conducted in Bangkok, Chiang Mai and Pattaya to explore the acceptability of oral fluid-based HIVST (OraQuick®) among men who have sex with men (MSM) and transgender women (TGW) from April 2017 and October 2018. Quantitative and qualitative data were collected to address these questions.

Methods: Data on participants’ most preferred point of HIVST kit delivery, and their willingness to pay for a HIVST, were collected through a quantitative questionnaire administered to all participants (N=2,000 MSM and 1,248 TGW). Qualitative semi-structured interviews (SSIs) were conducted with a random sample of enrolled participants (n=52). In the SSIs, participants were asked about their preferred delivery point for HIVST kits, their willingness to pay and how much they would pay.

Results: Quantitative findings revealed that most of the participants (97.8% MSM; 97.8% TGW) reported that they were willing to pay for an HIVST kit. The median price they would be willing to pay was US$ 9.4 for an HIVST kit while 43.3% of the participants (40.3% MSM; 48.2% TGW) were willing to pay a maximum of US$ 12.5, which is the projected sale price for marketing OraQuick® in Thailand in the future. If the price was perceived as too high, about two-thirds of the participants (65.6% MSM; 66.6% TGW) said they would instead get tested at community-based organizations (CBO) or government facilities offering free services or from private paid services. Qualitative data supported the willingness of the participants to pay for HIVST. However, participants added they would not trust the quality of the test kit if the price were too low and suggested that the price should not be higher than the HIV blood test currently offered at private health facilities.

Quantitative findings underlined that the top three preferred points of HIVST kit delivery were pharmacies (28% MSM; 28% TGW); clinics run by CBOs; (22% MSM; 23% TGW); and government health facilities (14% MSM; 14% TGW). The qualitative results revealed that pharmacies were the most preferred delivery point as they are widely available, convenient, viewed as reliable sources of health commodities, and offer options to speak to a pharmacist about how to use the kit. Health facilities were also preferred as participants emphasized that they found them trustworthy, reliable, convenient and liked the care provided by staff at CBO clinics. Some participants wanted the anonymity and convenience of ordering kits online.

Conclusions: A variety of HIVST delivery points are preferred to suit the differing needs of MSM and TGW. Participants are also ready and willing to pay for HIVST as long as prices are not higher than current HIV tests. Our findings will allow program planners to make appropriately-informed decisions on HIVST delivery and price points when HIVST is rolled out in Thailand.
Acceptability and experiences of assisted and unassisted oral fluid testing among men who have sex with men and transgender women in Thailand: Implications to roll out and scale-up


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Background: While diverse options for HIV testing are available for men who have sex with men (MSM) and transgender women (TGW) in Thailand, HIV testing coverage remains sub-optimal for MSM and TGW: 31% and 34% in 2014, respectively. Current HIV testing policy and other regulatory frameworks in Thailand do not include the implementation of HIV self-testing (HIVST). The aim of this study was to explore the acceptability of assisted and unassisted HIVST using oral fluid-based kit (OraQuick®) to inform policy changes supporting the introduction of HIVST in Thailand.

Methods: A community-based cross-sectional study was conducted between April 2017 and October 2018 among MSM and TGW who were recruited and enrolled with informed consent during routine physical and virtual outreach activities implemented by MSM and TGW community-based organizations (CBOs) in Bangkok, Pattaya and Chiang Mai. Participants were offered three options for HIV testing: assisted HIVST; unassisted HIVST; and routine referral to facility. Participants who opted for unassisted HIVST could receive the HIVST kit from community-based supporters, at the community-based organization clinic, or via express mail service. Qualitative semi-structured interviews (SSIs) were conducted with a random sample of participants (n=52) enrolled in the community- and facility-based components of the study to assess the HIVST experiences of participants.

Results: Of the 1,422 MSM enrolled, 1,148 (81%) opted for assisted HIVST, 263 (18%) for unassisted HIV testing, and 11 (1%) for referral to facility. Of the 1,082 TGW enrolled, 947 (87%) opted for assisted HIVST, 128 (12%) for unassisted HIVST, and 7 (1%) for referral. Among all those who opted for unassisted HIVST, a significant proportion requested to receive the HIVST kits via express mail service: 190 (72%) MSM and 60 (47%) TGW, respectively. Acceptability, defined as participants reporting their intention to use oral-fluid based HIVST in the future, was 81% for both MSM and TGW. Most participants in the SSIs reported that they intend to use HIVST in the future as there is no pain with using the HIVST, it is quick to administer and can be done confidentially. A minority of participants preferred to do the HIV blood test as the blood test is familiar to them, they perceive the blood test to be more reliable, and they can do the blood test even if they had just eaten/drank. The reactivity rate was 6.2% (MSM) and 7.3% (TGW) for those who selected assisted HIVST, and 9.5% (MSM) and 2.3% (TGW) among those who selected unassisted HIVST. Of those who screened reactive or invalid, 60% were linked to facilities for HIV confirmatory testing, and 88% of those confirmed HIV positive were linked to care and treatment services.

Conclusions: Unassisted and assisted HIVST are highly acceptable and safe options for MSM and TGW and seen as complementary to the HIV testing options traditionally offered. Moreover, unassisted HIVST may be suitable for specific segments of populations that are underserved by routine HIV services. However, strong follow-up of reactive cases should be conducted by organizations offering HIVST for optimizing personal and public health benefits.
Increased HIV testing and case finding targeting young men who have sex with men in Bali through private & government partnership.

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**Background:** Indonesia is one of the few countries in the Asia Pacific region where HIV infections continue to rise. Among MSM in Indonesia, the rates of HIV have increased from 5.35% in 2007 to 25.8% in 2015, with HIV prevalence reaching 36% among MSM in Bali.

HIV testing and care services in Indonesia have barriers such as cost, inconvenient clinic hours, stigma, confidentiality, discriminatory from health care workers, unsupportive cultural and religious values.

**Description:** Integrated clinical services for predominantly young MSM Bali were developed in a physician’s private practice with support from government health facility. Services provided are free included HIV rapid tests with confirmation, syphilis testing, simple lab for rectal and urethral samples, hemoglobin, blood chemistry, CD4 testing, viral load and PCR for chlamydia/gonorrhea (Xpert).

HIV+ clients initiated ART in less than 3 days. An SMS reminder support adherence and follow-up testing for negatives. Staff were trained to provide non-judgmental services regardless of sexual orientation/practices. Clients were encouraged to refer friends to the clinic and services were marketed through websites and social media.

**Lesson Learned:** Clinic attendance remains high with over 100 new predominantly young MSM clients testing monthly. From Jan 2018 to Desember 2018, 796 patients enrolled with 4,060 visits (include follow up visits) documented. 1,045 clients were tested HIV, of which 120 were diagnosed HIV+ (11.48%). 106 patients were started on ARV. Total 1,093 Syphilis serological screening test were performed, 60 (5.48%) were early syphilis & 81 (7.41%) were latent syphilis. 550 cases of other STIs were diagnosed and treated. Most clients reported attending via peer and friend referrals, not through a paid peer outreach worker.

**Conclusions:** Free, friendly, efficient, one-stop services can create demand and attract high numbers of young MSM, even in settings where social and religious norms are not conducive to overt community mobilization. Demand-generating characteristics were shown to be successful in a variety of clinical settings such as a private doctor’s clinic & government partnership. Such settings can provide youth-friendly MSM services by following a recipe of stigma-free and convenient services coupled with cost-efficient peer referral and use of social media.
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Unassisted HIV Self-Testing in Vietnam

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Background: HIV stakeholders in Vietnam are working intensively to increase the number of people living with HIV who are aware of their status. Efforts are especially needed to accelerate HIV case-finding among men who have sex with men (MSM). A significant proportion of MSM are believed to remain “hidden”, and reluctant to access either facility-based testing services or outreach by lay testers. On-demand HIV self-testing is one potential means to help such key population members screen for HIV.

Material and Methods: The USAID SHIFT program worked with government-affiliated institutions to offer on-demand, unassisted HIV self-testing targeting MSM, starting in April 2018. To hone the offering, MSM were targeted through online advertising and outreach via closed MSM Facebook groups and Facebook fanpages affiliated with MSM organizations. An online HIV risk assessment helped filter service offerings to those at elevated risk for HIV. Once identified as high-risk, individuals were recommended to access HIV testing through their choice of modality, including extant testing services or by ordering an OraQuick self-test kit. Those who opted to receive an OraQuick kit could request that it be mailed to their home. To maximize cost-efficiency and increase client accountability, recipients were responsible for covering the nominal shipping fee, but could receive reimbursement for this cost if they registered their test result through an anonymous online platform within one week of receiving the kit. OraQuick test kit recipients were also provided with detailed instructions on how to administer the test accurately, understand their test results, obtain counseling and support for confirmatory testing if found reactive, and link to treatment if confirmed HIV-positive.

Results: Between April 2018 and March 2019, a total of 1,720 individuals received OraQuick HIV self-test kits through the service. Of these, 1,293 (75.2%) reported their screening test results. Of these, 41 (3.2%) reported reactive tests and 20 HIV cases were confirmed. Eighteen of these confirmed cases had enrolled on treatment by late March 2019. The proportion of clients reporting results in Hanoi was less than half that of Ho Chi Minh City (42% versus 93%). The effort required intensive virtual follow-up from community-based supporters, including to convince those with reactive tests to access confirmatory testing.

Conclusions: MSM in Vietnam can be reached and provided with HIV screening services, including at-home HIV self-testing using OraQuick, through online platforms. The self-testing service package resulted in a relatively high proportion of clients reporting their test results. However, the service resulted in relatively fewer reported HIV diagnoses than other testing methods already deployed in Vietnam and required intensive follow-up to ensure clients with reactive tests accessed confirmatory testing. The volume of testing uptake was also lower than expected. Given these results, the project has continued offering the service but is no longer actively promoting it.
Photographic verification of self-reported HIV self-testing results among Chinese men who have sex with men: An interim analysis

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Background: HIV self-testing (HIVST) is a promising strategy to improve HIV test uptake among men who have sex with men (MSM); however, challenges remain in confirming test results. This study explores the feasibility of a return-of-deposit approach to collecting results from self-test kits using photographic verification through social media.

Materials & Methods: Men who were 16 or older, born biologically male, and who had ever had sex with another man were eligible. They could order up to 5 HIV self-test kits by clicking banner ads (with a limit of one order per three-month period) on a secure social media platform. Applicants who applied for the kits were asked to pay a deposit ($14.7/kit) which would then be refunded after the submission of a photograph of the completed test kit in which the results window was clearly visible. Test results were verified by trained study staff who examined the results window of the photographed test. Those who were improperly used and caused difficulty in reading were considered invalid. Additionally, participants were also asked to interpret their test results. Over-the-phone linkage services were provided to men whose results were verified as positive.

Results: Between June and December 2018, 427 men applied for at least one kit (Mage = 29.0, SD=7.1) and 759 self-tests were distributed. A total of 606 test results were returned with photographic evidence, yielding a return rate of 79.8%. Among them, 586 were valid, of who 234 also provided self-interpreted result. We found that 91.9% results were interpreted correctly. Compared to the previously tested MSM, newly tested men were less likely to interpret the result correctly (80.0% vs 95.2%, P<0.05).

Conclusions: A model for HIVST results verification that uses a refundable deposit and photo verification of a completed test may be a promising approach. Further operational research is needed.
Back To ART (B2A) Initiative in Yunnan Province, China

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Background: Antiretroviral therapy (ART) to treat HIV reduces morbidity, mortality, and transmission. Treatment dropout undermines effects which ART results in significant improvements to individual health and a virtual elimination of HIV transmission. Yunnan, one of China’s provinces with the earliest HIV transmission and also the most people living with HIV who receive ART, has also been confronted with the increasing dropout in recent years with the ART scale-up. The dropout incidence was 4.1%(1,350/32,927) in 2012, more 1 per cent than in 2011(720/23,226), and abruptly reached 5.7%(3,087/54,158) and 4.6%(2,865/62,283) respectively in 2014 and 2015. So, Yunnan AIDS Authority has developed the "Back To ART" (B2A) Initiative and integrated it to province-wide AIDS program since 2016.

Material & Methods: B2A Initiative focuses on the technological support, coordination and performance evaluation on re-engagement of ART. 1) Add a new indicator to annual evaluation on ART performance, namely re-engaging at least 15% ART cumulative dropout cases back to ART. The tracing action is pushed and coordinated by the local health authority and practiced by clinicians of ART clinic, health care workers of public health facilities and the community groups. The dropout patients were contacted by the clinicians first. If they could not reach, the public health facilities and the community groups would follow up. Outreach services are encouraged, including conveying the dated ART policies, counseling and mobilization with specific skills trained, and providing the social support if needed. 2) Advocate ART clinics to add the role of case manager. After serial trainings on individualized counseling service, case managers focus on the patients who are newly engaged and re-engaged, or experience treatment failure, or have poor adherence. 3) Develop and promote the application of the management software. The information system can remind the clinicians on the ART patients’ critical events, such as the due or overdue time of medical visiting or specific lab testing, and the abnormal lab indicators and like these.

Results: The interim findings are primarily analyzed after implementing B2A Initiative for three full years. Between 2016 and 2018, the annual dropout incidence were 3.7%(26,81/77,324), 3.1%(2,475/79,839) and 2.7%(2,401/88,926) respectively. And during 3-year period, out of 11,724 dropout people (male: female=1.89:1) who were traced, 921 people(7.9%)were identified death, 107(0.9%) were transferred out of Yunnan, and 3,494(29.8%)cases returned to ART, and 3,601(30.7%)were not reached or found, and the rest who were contacted finally declined to take ART again. Among the returning 3,494 cases, the retention rates of ART cohorts of 6-, 12-, 18-, 24-, 32- and 36-month were 88.7%(3,098/3,494), 89.4%(1,946/2,177), 92.1%(1,518/1,648), 92.8%(1,141/1,230), 92.8%(808/871) and 96.1%(472/491). After 6-month’s ART, there were totally 2421 person-time results of viral load testing among the reengaged people, and averagely 65.3% reached the undetectable viral-load(VL) and 18.5% cases were VL> 1000 copies/ml.

Conclusion: The 3-years’ development of B2A Initiative is effective to curb the increasing dropout trend in the context of universal ART in Yunnan. The coordination of tracing team is important. The sizable dropout patients are re-engaged and stay in treatment, which helps to suppress the viruses and achieve better health outcomes.
A dual analysis of loss to follow-up for perinatally HIV-infected adolescents receiving combination antiretroviral therapy in Asia

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Background: Perinatally HIV-infected adolescents (PHIVA) are an expanding population vulnerable to being lost to follow-up (LTFU). A definitive understanding of the epidemiology of and factors for LTFU are complicated by varying LTFU definitions. We aimed to evaluate LTFU using traditional and novel LTFU definitions in an Asian regional PHIVA cohort.

Methods: Data from PHIVA (aged 10-19 years) who received combination antiretroviral therapy (cART) between 2007 and 2016 within the TREAT Asia Pediatric HIV Observational Database of the IeDEA Asia-Pacific network were used to analyse LTFU via two Methods: (i) an IeDEA method which determined LTFU as more than 90 days late for an estimated next scheduled appointment without subsequently returning to care (IeDEA LTFU); and (ii) the absence of patient-level data for more than 365 days prior to last data transfer from clinic sites (365-day absence LTFU). Descriptive analyses, Kaplan-Meier survival analyses, and competing risk-regression analyses (with death as a competing event) were used to evaluate LTFU epidemiology and associated factors when analysed using each method.

Results: A total 3,509 PHIVA were included in the analysis, of whom 275 (7.8%) met IeDEA and 149 (4.3%) met 365-day absence LTFU criteria. There were 134 PHIVA who met IeDEA but not 365-day absence LTFU criteria, of whom 88 (65.7%) were aged 15-19 years and 106 (94.0%) managed in non-rural clinic settings; 106 (79.1%) had a CD4 count ≥500 cells/µL and 93/135 (70%) had an undetectable viral load at their last clinic visit. The cumulative incidence of IeDEA LTFU was 24.4% [95% confidence interval (CI) 20.9, 28.3] and cumulative incidence of 365-day absence LTFU was 14.1% [95%CI 11.4, 17.3]. Consistent risk factors for LTFU across both criteria included: age at cART initiation of <5 years compared to age ≥5 years (for IeDEA LTFU: age 5-9 years adjusted subdistribution hazard ratio [aSHR] 0.4 [95%CI 0.3, 0.6], age ≥10 years aSHR 0.3 [95%CI 0.2, 0.4]; for 365-day absence LTFU: age 5-9 years aSHR 0.5 [95%CI 0.3, 0.8], age ≥10 years aSHR 0.5 [0.3, 0.8]), rural clinic settings compared to urban clinic settings (for IeDEA LTFU: aSHR 1.9 [95%CI 1.2, 3.1]; for 365-day absence LTFU: aSHR 3.0 [95%CI 1.6, 5.5]), and high HIV viral loads (for IeDEA LTFU: ≥10,000 copies/mL compared to <400 copies/mL aSHR 1.9 [95%CI 1.4, 2.7]; for 365-day absence LTFU: >1,000 copies/mL compared to <400 copies/mL aSHR 2.4 [95%CI 1.3, 4.2] and ≥10,000 copies/mL compared to <400 copies/mL aSHR 2.3 [95%CI 1.5, 3.8]). Age 10-14 years compared to age 15-19 years was another risk factor identified using 365-day absence criteria (age 15-19 years aSHR 0.2 [95%CI 0.1, 0.5]) but not IeDEA LTFU criteria.

Conclusions: Between 14% and 24% of PHIVA in our cohort were estimated to be LTFU during adolescence. Similar challenges relating to treatment fatigue and rural treatment settings were identified for LTFU using either definition. Better tracking, particularly for older adolescents, is required to provide a more definitive understanding of LTFU and establish evidence-based models of care to optimise outcomes for adolescents living with HIV.
Differentiated care delivery through Telemedicine for PLHIV in the Philippines

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The Philippines has the fastest growing HIV epidemic in the Asia Pacific Region. A third of the newly diagnosed persons come from the metropolitan Manila area while the rest come from all over the country. Geographical barriers both in the urban centres due to gridlock traffic and in rural areas due to the archipelagic nature of the country make access to HIV care a challenge. The social stigma attached to HIV is another barrier to care; patients are uncomfortable to disclose their status to healthcare workers other than their primary attending physician.

In response to the above challenges, we started to provide in 2014 ART refill delivery and electronic consultation (ART-EC). Eligibility included clinical stability (defined as having CD4 count greater than 300 within the last year, undetectable viral load in the last 12 months, and no medical issues in the last 6 months), historical compliance greater than 90%, and no history of being lost to follow up. ART refills were done via Grab Express for same-day delivery within the city, and regular courier service for up to 3-day provincial delivery. Electronic medical consultation was done using Zoom Meetings.

ART-EC uptake was documented for two months, utilizing a grant from the International AIDS Society. Prior to documentation, there were 29 who received their refills through courier, usually due to logistical emergencies, and even fewer patients who were able to consult online.

There were 113 patients eligible for ART-EC, but only nine had visits that fell between documentation period of May-July 2018.

Their characteristics represent the average SHIP Clinic patient: MSM, single, at least high school level of education, no medical issues currently. There was generally a good feedback from the participants of ART-EC, they found it efficient, reliable and useful.

The openness of the clinic staff and clients to the idea of formally establishing the ART refill delivery service and telemedicine program is an important factor for the relatively modest success of this differentiated care model. While telemedicine is not new in the Philippines, this is possibly the first time that this service is formally offered to PLHIV. The past experiences of the SHIP clinic in providing similar services helped inform the establishment of protocols that the clinic staff should follow for the ART refill delivery service and telemedicine program.

Challenges seen at this point include confidentiality in medication delivery, self-sufficiency, and precision. Only those who are confident in receiving medications at their homes are able to engage in this service. If clients are not disclosed to people they live with, they are more likely to refuse the service. There is an option to pick-up refills at the courier branch nearest them if home delivery is not an option. Clients also need to be responsible in fulfilling laboratory tests requested of them prior or after the e-consultation. The coordinator must also be keen on the timing of contact with clients vis a vis their medication supply. The success of the program rests on time and cost efficiency.

Differentiated care is very much needed in the Philippines, where the healthcare system is struggling to catch up with the rate of new infections and fallouts occurring at each step of the care cascade. ART-EC is just one of the many venues where bringing access closer to the patient breaks down barriers.
Enhanced ART Retention Strategy and Outcomes in 11 Provinces of Vietnam

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Background: Vietnam is rapidly transitioning antiretroviral therapy (ART) from external to local financing and operation, including through social health insurance (SHI). However, utilizing SHI for ART has required significant changes which threaten ART retention, including patient transfers to SHI-eligible facilities and providers and enrollment in and use of SHI. The USAID SHIFT program worked with national HIV authorities to develop and implement an Enhanced ART Retention Strategy to maximize ART retention amid these shifts.

Material and Methods: The Enhanced ART Retention Strategy includes standardized retention indicators and thresholds; a curriculum to facilitate implementation, with clear roles and responsibilities for facility and provincial health system actors; procedures to mitigate patient loss and investigate attrition and mortality factors; and tools to support data collection, reporting and analysis through online data dashboards. The strategy was implemented in 91 HIV treatment facilities across 11 provinces, starting in October 2016. Average monthly attrition and mortality were compared for the periods immediately before and after implementation. Feedback on the causes of patient drop-out and death were collected from patients, their families and providers, and simple summary statistics generated to inform program improvements.

Results: Average monthly attrition (including loss to follow-up and death) fell by 27.4% across the 91 sites for which the Enhanced ART Retention Strategy was implemented, from 0.59% in April-September 2016 to 0.43% in April-September 2018. This included a 25.0% decrease in loss to follow-up (from 0.43% to 0.32%) and 33.8% decline in mortality (from 0.16% to 0.10%). A total of 2,266 ART patients were lost to follow-up (LTFU) and 765 ART patients died between October 2016 and September 2018. Over the same period, information on contributors to drop-out were collected from 606 patients, their families and/or their providers lost between October 2016 and September 2018. The most significant reported contributors were that patients were working outside of their home districts (37%), followed by a lack of transportation or too ill to travel to reach a given HTF (13%). The majority of deaths were attributed to causes other than HIV, including motor vehicle or other accidents. In addition, a total of 1,187 patients who had been LTFU were successfully re-engaged in treatment between October 2016 and September 2018.

Conclusions: The Enhanced ART Retention Strategy was feasible to implement in Government of Vietnam HTFs. Provincial health system leadership buy-in helped facilitate implementation and facility attention to attrition. Results have been used to prioritize and advocate for accelerating improvements in ART services, including allowing patients to access ART at commune health stations and enabling multi-month scripting. Based on results, Vietnam’s national HIV authorities have adopted the strategy for use across provinces.
Use and outcomes of antiretroviral monotherapy and treatment interruption in perinatally HIV-infected adolescents in Asia

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Background: Adolescents with perinatally acquired HIV (PHIVA) face multiple challenges maintaining effective combination antiretroviral therapy (ART), potentially requiring management strategies including antiretroviral monotherapy and treatment interruption. This study aimed to assess the use and impact of these management practices in an Asia regional PHIVA cohort.

Methods: Data from 2001 to 2016 from PHIVA (aged 10-19 years) enrolled in the TREAT Asia Pediatric HIV Observational Database of the IeDEA Asia-Pacific network were analysed to describe PHIVA who experienced two or more weeks of lamivudine monotherapy or interruption of all ART, and trends in CD4 count and HIV viral load during and after episodes. Survival analyses were used for WHO stage III/IV clinical and WHO stage III/IV immunologic event-free survival during monotherapy or treatment interruption. A Poisson regression was used to determine factors associated with monotherapy or treatment interruption.

Results: There were 3,448 PHIVA included in the analysis with a median follow-up of 4.7 [interquartile range (IQR) 2.3, 7.1] years, of whom 84 (2.4%) experienced 94 monotherapy episodes (at a median age of 15.0 [IQR 12.9, 16.5] years) and 147 (4.3%) experienced 174 treatment interruptions (at a median age of 14.5 [IQR 12.5, 16.4] years). The median duration of monotherapy was 198 [IQR 117, 365] days and median duration of treatment interruption was 182 [IQR 65, 343] days. Monotherapy was associated with age 15-19 years compared to 10-14 years, current HIV viral load ≥400 copies/mL compared to <400 copies/mL, age at ART initiation of <3 years compared to ≥5 years, and prior exposure to at least two combination ART regimens. Treatment interruption was associated with a current CD4 count <350 cells/µL compared to ≥500 cells/µL, current HIV viral load ≥1,000 copies/mL compared to <400 copies/mL, an ART adverse event, and commencing ART at age ≥10 years compared to <3 years. WHO clinical stage III/IV one-year event-free survival was 96% for monotherapy and 85% for treatment interruption. WHO immunologic stage III/IV one-year event-free survival was 52% for both groups. For the monotherapy group, the median CD4 count increased from 213 to 498 cells/µL by 18 months after re-commencing combination ART. For the treatment interruption group, the median CD4 count increased from 197 to 491 cells/µL by 24 months after re-commencing combination ART. Among those with HIV viral load testing, around 60% of both the monotherapy (n=49 at 6 months, n=28 at 24 months) and treatment interruption (n=89 at 6 months, n=38 at 24 months) cohorts had achieved HIV viral load <400 copies/mL up to 24 months after re-commencing combination ART.

Conclusions: We observed monotherapy in clinically stable PHIVA with extensive ART exposure and poor virologic control, while treatment interruptions were encountered in PHIVA with poor immunologic and virologic control. Treatment adherence, engagement in care, and access to durable/tolerable combination ART regimes are key to minimising the need for temporizing interventions such as monotherapy and treatment interruptions and their associated poor outcomes.
4th Asia Pacific AIDS & Co-infections Conference

Translating Science into Clinical Practice

Abstracts
Poster Presentations
Background: Increased prevalence of antiretroviral resistance threatens the expansion of effective coverage of antiretroviral therapy (ART) and viral suppression. Reported virologic failure (VF) rates among those on second-line ART vary widely. Broader understanding of second-line ART durability and emerging HIV drug resistance-associated mutations (RAMs) would support projections of third-line regimen needs and inclusion into national treatment guidelines in the Asia-Pacific.

Methods: Adults >18 years, on second-line ART for at least 6 months, and under care at 12 Asia-Pacific sites were eligible to participate. Viral load (VL) and genotypic resistance testing was conducted between June 2016-May 2017 on eligible participants at sites not providing these tests routinely. Available VL and genotype resistance data between July 2015-December 2016 was collected from the medical records of eligible participants at sites routinely performing these tests. VF was defined as a HIV-1 RNA >1000 copies/ml, and a second VL>1000 within one year. A sensitivity analysis was performed on those with a single VL >1000. FASTA files were submitted to Stanford HIVdb for genotyping and REGA HIV-1 for subtyping. RAMs were compared to IAS-USA 2017 mutations list and reported descriptively. Risk factors for VF were analyzed using logistic regression analysis.

Results: Of 1378 patients, 74% were male and 70% acquired HIV through heterosexual exposure. Median age at switch to second-line ART was 37 years (IQR 32-42), median CD4 cell count at switch was 103 cells/µL (IQR 43.5-229.5), 63% switched due to VF only and 93% received NRTI+PI as second-line ART. Ninety nine patients (7%) had VF. A CD4 count >200 cells/µL at second-line switch was associated with reduced odds of VF (OR=0.38, 95%CI 0.18-0.79 vs. CD4 ≤50). VF was less likely in men who have sex with men (OR=0.21, 95%CI 0.07-0.70), and injecting drug users (OR=0.34, 95%CI 0.14-0.80), compared to heterosexual HIV exposure. Of 32 patients with FASTA files available, 21 (65%) had at least one RAM. Of 29 patients with RT gene region available, 16 (55%) had at least one NRTI RAM and 20 (69%) an NNRTI RAM. Of 31 patients with a PR gene region available, 5 (16%) had a PI RAM. Of 6 patients with integrase gene region, no INSTI RAMs were present. In our sensitivity analysis of the 248 (18%) with at least one VL >1000, the effect of mode of HIV exposure was similar to the VF analysis. Those with a prior AIDS diagnosis were more likely (OR=1.49, 95%CI 1.12-1.99), and those living in high-income countries were less likely to have a VL>1000 (OR=0.35, 95%CI 0.16-0.78). Of the 248 patients, 54 had FASTA files available: 37/54 (69%) had at least one RAM, 27/50 (54%) had at least one NRTI RAM, 35/50 (70%) at least one NNRTI RAM, 15/53 (28%) had at least one PI RAM, and no one had an INSTI RAM.

Conclusions: The prevalence of NRTI, PI and INSTI RAMs among our cohort of adults on second-line ART with virologic failure, supports the need for broader access to third-line regimens and integrase strand transfer inhibitors in the Asia-Pacific region.
Transmitted Drug Resistance to Rilpivirine among Antiretroviral-naïve People Living with HIV in Central Taiwan

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Background: Given increasing use of combination antiretroviral therapy (cART), which effectively suppresses viral replication and reduces the risk of human immunodeficiency virus (HIV) transmission. Free cART has been provided since 1997 in Taiwan. Owing to increasing medical expenditure and budgetary constraints, Taiwan CDC implemented regulations on the regimens of cART and recommended the preferred regimens of non-nucleoside reverse-transcriptase inhibitor (NNRTI) plus 2 nucleoside reverse-transcriptase inhibitors (NRTIs) in antiretroviral-naïve patients be initiated on 1 June 2012. This ended on 31 May 2016. After 1 June 2016, the first-line recommended regimens of cART have to start with 4 single-tablet (STR) regimens, including coformulated efavirenz/emtricitabine (FTC)/tenofovir disoproxil fumarate (TDF), rilpivirine (RPV)/FTC/TDF, dolutegravir/abacavir/lamivudine (LAM), and elvitegravir/cobicistat/FTC/tenofovir alafenamide. The transmission of drug-resistant HIV-1 virus may affect treatment outcomes. We aimed to observe the prevalence of transmitted drug resistance (TDR) among antiretroviral-naïve people living with HIV in Central Taiwan.

Material & Methods: For the study, we performed genotypic resistance assays on samples of HIV isolates from 185 antiretroviral-naïve people living with HIV in Central Taiwan from 2015 to 2018. Genotypic resistance mutations were interpreted using the Stanford University HIV Drug Resistance Database.

Results: A total of 185 people living with HIV were included, with 181 (97.8%) being male and 160 patients (86.5%) harboured subtype B virus, 9(4.9%) had CRF07_BC, 5 (2.7%) had CRF01_AE, and 11(5.9%) had unique recombinant strains. The patients infected with CRF07_BC were people who inject drugs (PWID). Fifteen patients (11.4%, 21/185) had NRTIs, NNRTIs, or protease inhibitors (PIs) resistance. The resistance rates of NRTIs, NNRTIs, NRTIs plus NNRTIs, and PIs resistance were 2.7%, 6.5%, 2.2%, and 1.0%, respectively. Among major NRTI resistance mutations, only one strain harbouring the (0.5%) M184V mutation was detected.

For the analysis of major NNRTI resistance mutations, the results showed that 6.3% (10/160) men who have sex with men (MSM) had V179D/E mutations. In addition, three MSM living with HIV (1.2%, 3/160) had E138A mutation, hence reducing RPV effectiveness. This mutation has never been reported in Taiwan’s TDM studies among antiretroviral-naïve patients. Only, two PWID (1.0%, 2/185) harboured Q58E mutation, a major drug resistance mutation to PI. We did not perform Integrase resistance mutations in our analysis.

Conclusions: The prevalence of TDR in people living with HIV is not high and is not increasing. In Taiwan, in antiretroviral-naïve patients receiving first-line recommended regimens of cART with 4 STR regimens, drug resistance mutation to NNRTIs should be carefully monitored.

Genotypic Resistance to Integrase inhibitor: a cross-sectional study during 2014-2018 in Bangkok, Thailand

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Background: Surveillance of drug resistance to integrase inhibitors (IN) has not been systematically
performed in Thailand due to its limited use as a result of its high cost. Currently IN is primarily used in patients with treatment failure. However, it is expected that IN will be used increasingly as the first-line regimen when the cost of IN is markedly reduced. In this study, we reported the patterns of genotypic resistance to IN among patients who sought IN resistance testing at the Thai Red Cross Anonymous Clinic in Bangkok.

Materials and Methods: HIVDR to IN was performed using in-house technique which covers integrase amino acid position 36-247. The drug resistance mutation was interpreted using Stanford database (sierra2.stanford.edu/sierra/servlet/JSierra). Our laboratory has been participating in the EQA proficiency panels for HIV drug resistance provided by NRL, Australia since 2006 for quality assurance purpose.

Results: During 2014-2018, 334 plasma samples were submitted for HIVDR to IN. Among these, 208 were ARV-naive, 50 were ARV-experienced and another 76 did not give the history of ARV treatment (‘ARV-unknown’). For ARV-experienced group, 9 had been on IN-containing regimens, 5 on RAL and 2 each on EVG and DTG. IN drug resistance mutations (DRM) were found in 9 ARV-experienced patients; 3 (N155H) in RAL-experienced (RAL/ATV/r, RAL/3TC/TDF, RAL/DRV/r/FTC/TDF), 1 (Q148H) in EVG-experienced (EVG/FTC/TDF/Cobi), 5 in patients not treated with IN (Y143C in 3TC/ABC-treated; Y143R in ARV-unknown; Q148R in 1 FTC/TDF/MVC-treated and 1 ARV-unknown; H51Y and P145S in EFV/FTC/TDF-treated). However, no IN DRM was detected in any of ARV-naive patients.

Conclusions: DRM to IN was found mainly in IN-treated patients as expected. Frequency of IN DRM in each IN cannot be implicated from our study due to the limited number of IN-treated patients. Presence of IN DRM in patients treated with non-IN containing regimens is somewhat worrisome. If this is further confirmed by other studies, IN DRM may be needed for every patient failing any ARV regimens before switching to IN. Nevertheless, lack of IN DRM among ARV-naive individuals supports WHO recommendation for the use of IN as first-line treatment regimen which will avoid the need for NRTI/NRTI resistance testing prior to ART initiation in the setting of increasing baseline resistance to NRTI and NRTI.

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Transmitted drug resistance to integrase inhibitors is uncommon in both acute and chronic HIV infection in Bangkok

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Background: Integrase strand transfer inhibitors (INSTI) are a class of antiretroviral (ARV) drug that have been used extensively in developed countries for over a decade, but have had slower uptake in low- and middle-income countries (LMIC) due to higher cost and limited distribution. However, new WHO guidelines that endorse INSTI as first-line antiretroviral therapy (ART) and availability of low-cost generic INSTI produced in India have resulted in rapidly increasing use of INSTI in LMIC. To date, there have been very few published surveys of transmitted drug resistance (TDR) to INSTI in Asia.

Methods: ARV-naive participants with HIV infection who were enrolled in clinical trials at the Thai Red Cross AIDS Research Centre 2013-2018 were included in the analysis if INSTI resistance testing was performed prior to initiating ART. Resistance testing was performed by commercial assay (GenoSure PRL®; Monogram Biosciences, USA) or by a validated in-house assay at Chulalongkorn University Hospital. All participants gave informed consent.

Results: INSTI genotype results were available from 186 participants, of whom 99% were Thai. Median (IQR) age was 26 (23-31) years, 88% were male, and 82% were men who have sex with men (MSM). Median (IQR) HIV RNA was 5.5 (4.6-6.5) log_{10} copies/mL and CD4 was 337 (260-463) cells/mm³. HIV subtype was 76% CRF01_AE, 12% B, 9% CRF01_AE/B recombinant, and 3% others. Most (70%) were enrolled during acute HIV infection, while 30% had chronic HIV infection. Only one major INSTI mutation, E138K, was detected in one participant (0.5%) with chronic HIV infection who
enrolled in 2013. Overall prevalence of TDR was 5.9%, declining from 11.4% for participants (n=44) enrolled in 2013 to 4.2% in participants (n=142) enrolled 2017-18 (p=0.18). The most common resistance mutations detected were to the non-nucleoside reverse transcriptase inhibitors (NNRTI) at 3.8% (most frequent was K103N, 2.7%), followed by nucleoside reverse transcriptase inhibitors (NRTI) at 3.3% (M184V/I, 1.6%; D67N, 1.1%) and protease inhibitors (PI) at 0.5% (M46L, 0.5%).

**Conclusions:** TDR to INSTI drugs is uncommon in Bangkok. The only major mutation found was E138K, which alone does not reduce sensitivity to currently available INSTI drugs. Overall TDR was 5.9%, and appears to be declining since 2017.

The impact of antiretroviral drug resistance in Taiwanese HIV-1-infected MSM population between 2015 and 2018

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**Background:** Antiretroviral therapy (ART) and prevention (e.g., pre-exposure prophylaxis) strategy are beneficial for controlling HIV-1 infection. In response to the UNAIDS and WHO’s goal of achieving “90–90–90” by 2020; at the end of 2017, Taiwan has reached 79-87-90. Here, we aimed to characterize transmission clusters among men having sex with men (MSM) in Taiwan and presented the acquired drug resistance (ADR) mutations after treatment failure in first-line regimens.

**Methods:** A total of 113 individuals were selected by the following criteria: treatment failure in first-line regimens with biologically relevant changes in viral load (VL). Blood specimens were collected from the hospitals in Northern Taiwan. Full-length HIV-1 pol gene was successfully amplified by reverse transcriptase polymerase chain reaction (RT-PCR) and nested PCR followed by sequencing. MEGA X program was used to find the best-fit nucleotide substitution model and to construct phylogenetic trees. Finally, we submitted all sequences to the Stanford HIV Drug Resistance Database and investigated the presence of ADRMs.

**Results:** Among 109 amplified pol sequences, 92.7% (101/109) of them belonged to subtype B. The overall prevalence of mutations conferring high-level resistance to protease inhibitors (PIs), nucleoside reverse transcriptase inhibitors (NRTIs), non-nucleoside reverse transcriptase inhibitors (NNRTIs), and integrase inhibitors (INIs) were 5.9%, 49.5%, 37.1%, and 17.7%, respectively. Approximately 40% of MSM carried resistance mutations to multiple drug classes (i.e., 23 NRTI+NNRTI, 10 NRTI+INI, 5 PI+NRTI+NNRTI, 4 NRTI+NNRTI+INI, and 1 PI+NRTI+INI). Most frequent mutations occurred in MSM were M46I (2.0%), I54L (3.0%) to PIs, M41L (8.6%), M184V (46.7%) to NRTIs, K101E (7.6%), K103N (12.4%) to NNRTIs, and G140A/S (10.8%), Q148H/R (9.8%) to INIs. Phylogenetic trees revealed that those who carried ADRMs in multiple drug classes were clustered with other MSMs (e.g., failed in any single class / non-drug resistance cases).

**Conclusions:** Poor treatment compliance, drug abuse, and unprotected sex were identified as the risk factors for drug resistance in the MSM population. Our findings provided important information for understanding ADRM among Taiwanese MSM population. In addition, we showed that drug resistance-associated mutations in the HIV-1-infected MSM population were increased significantly after ART.
Predictors of long-term survival in the TREAT Asia HIV Observational Database Low Intensity TransfEr (TAHOD-LITE)

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Background: HIV outcomes have improved since the implementation of guidelines to start antiviral therapy (ART) at higher CD4 counts. We compared survival by CD4 count pre-ART, at five years and at ten years on ART, and assessed factors associated with survival five and ten years after starting ART in the Asia-Pacific.

Materials & Methods: People living with HIV (PLHIV) in the TREAT Asia HIV Observational Database Low Intensity TransfEr (TAHOD-LITE) cohort who started ART between 1992-2017 were included if they were in follow-up >5 years after ART initiation. Kaplan-Meier curves and log-rank tests were used to compare survival by CD4 count. Competing risk regression was used to investigate factors associated with mortality after five years on ART, with loss to follow-up treated as a competing risk. Analyses were repeated after ten years post-ART initiation.

Results: Of 13,495 patients included patients, 70% were male and median age at five years post-ART initiation was 40 years (IQR 35-47). The median follow-up from five years after ART initiation was 3.1 years (IQR 1.4-5.5), and 279 (2%) patients subsequently died (0.56 per 100 pys). Survival was similar across pre-ART CD4 count categories. Patients with CD4 <350 cells/µL at five years post-ART initiation had poorer survival than patients with higher CD4 count (log-rank p <0.001). In multivariable analysis, increased mortality was associated with older age (41-50 years: sHR 1.35 95%CI 1.00-1.82, and >50 years: sHR 2.32, 95%CI 1.64-3.27, compared to ≤40 years), HIV exposure through injecting drug use (sHR 2.19 95%CI 1.36-3.55, compared to heterosexual contact), having switched ART regimen (second-line regimen: sHR 2.16, 95%CI 1.55-3.02, and third-line regimen: sHR 2.82 95%CI 1.98-4.03, compared to first-line regimen), ≥3 treatment interruptions (sHR 1.79 95%CI 1.14-2.81, compared to no interruptions), positive hepatitis B surface antigen test (sHR 2.17 95%CI 1.45-3.23), higher current HIV viral load (400-999 copies/mL: sHR 2.21 95%CI 1.08-4.50, and ≥1000 copies/mL: sHR 1.89 95%CI 1.30-2.74, compared to <400 copies/mL), current fasting plasma glucose (FPG) ≥126 mg/dL (sHR 2.76 95%CI 1.65-4.64). Improved survival was associated with HIV exposure through male-to-male sex (sHR 0.40 95%CI 0.20-0.79) and higher current CD4 (200-349 cells/µL: sHR 0.45, 95%CI 0.33-0.62, 350-499 cells/µL: sHR 0.23, 95%CI 0.15-0.34, 500-649 cells/µL: sHR 0.20 95%CI 0.12-0.32, and ≥650 cells/µL: sHR 0.14, 95%CI 0.08-0.24, compared to <200 cells/µL). Risk factors for mortality after ten years on ART were similar, but most associations did not reach statistical significance.

Conclusions: Our findings suggest low mortality among PLHIV in Asia-Pacific who were retained in care five years post-ART initiation. Pre-ART CD4 was not associated with long-term survival, while higher CD4 after five years was protective of mortality. To further improve long-term survival outcomes in PLHIV, it is crucial to carefully monitor and manage common lifestyle risk factors such as glucose levels and kidney function next to preventing HIV treatment failure.
Efficacy of dolutegravir (DTG) plus lamivudine (3TC) versus DTG plus tenofovir/emtricitabine (TDF/FTC) in antiretroviral treatment-naive adults with HIV-1 infection: 48-week subgroup results from the GEMINI studies in participants from Asian centers

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Background: The requirement for lifelong antiretroviral therapy of HIV infection has highlighted interest in 2-drug regimens (2DRs) to minimize cumulative drug exposure. In the GEMINI-1 and GEMINI-2 studies, the 2DR of dolutegravir (DTG) plus lamivudine (3TC) was shown to be noninferior at Week 48 compared with the 3-drug regimen DTG + tenofovir disoproxil fumarate (TDF)/emtricitabine (FTC) in achieving plasma HIV-1 RNA <50 c/mL in treatment-naive adults.

Material & Methods: GEMINI-1 and GEMINI-2 are identical, global, randomized, double-blind, multicenter, phase III studies evaluating the efficacy and safety of DTG+3TC once daily in treatment-naive HIV-1-infected adults with Screening HIV-1 RNA ≤500,000 c/mL (NCT02831673/NCT02831764). Participants were randomized 1:1 (stratified by Screening plasma HIV-1 RNA and CD4+ cell count) to DTG+3TC or DTG+TDF/FTC. The primary endpoint was the proportion of participants with plasma HIV-1 RNA <50 c/mL at Week 48 (Snapshot algorithm). A post-hoc analysis was conducted to look at outcomes in participants recruited from Asian centers.

Results: A total of 1433 adults were randomized and treated across the 2 GEMINI studies, including 123 (8.6%) participants treated at 13 sites from 2 Asian countries: Taiwan (n=116; GEMINI-1 and GEMINI-2) and Republic of Korea (n=7; GEMINI-1). For the overall population, based on a 10% noninferiority margin, DTG+3TC was noninferior to DTG+TDF/FTC with regard to the proportion of Snapshot responders at Week 48 in both GEMINI-1 and GEMINI-2 and the pooled analysis (DTG+3TC, 91% [655/716]; DTG+TDF/FTC, 93% [669/717]; adjusted difference, −1.7 [95% confidence interval (CI): −4.4 to 1.1]). In participants from Asia, responses were high and generally consistent with the overall study results, noting the small participant numbers at these centers; 95% (56/59) of participants randomized to DTG+3TC and 94% (60/64) of participants randomized to DTG+TDF/FTC were responders, according to the snapshot analysis (unadjusted difference, 1.2 [95% CI: −7.0 to 9.3]). Across the pooled population, 6 participants taking DTG+3TC and 4 taking DTG+TDF/FTC met protocol-defined virologic withdrawal criteria through Week 48 (1 from Taiwan); none had treatment-emergent primary integrase strand transfer inhibitor or nucleoside reverse transcriptase inhibitor resistance mutations. Overall rates of adverse events (AEs) were similar between arms, with low rates of AEs leading to withdrawal for both DTG+3TC and DTG+TDF/FTC (2% in each arm). More drug-related AEs were reported with DTG+TDF/FTC. Across participants from Asian centers, low rates of AEs leading to withdrawal were observed at Week 48: 1 (2%) and 2 (3%) participants for the DTG+3TC and DTG+TDF/FTC arms, respectively—consistent with the overall study population.

Conclusions: DTG+3TC demonstrated noninferior efficacy to DTG+TDF/FTC in treatment-naive adults with Screening HIV-1 RNA ≤500,000 c/mL at Week 48. Both regimens were well tolerated. Subgroup analyses of efficacy and safety in participants randomized and treated across Korean and Taiwanese sites were consistent with overall study results. These results further demonstrate DTG+3TC as an option for initial treatment of HIV infection across different geographies, including Asia. The studies are ongoing to explore long-term durability and safety.

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Background: This study was designed to evaluate the efficacy and safety of Lopinavir/ritonavir (LPV/r)-based antiretroviral therapy (ART) among HIV infected adults in China in whom the first-line treatment failed.

Methods: This was a large-scale, multi-center retrospective cohort study performed using treatment data from a national database covering HIV-infected adults receiving LPV/r-based second-line treatment from 2009 to 2016 across seventeen clinics in China. This study aims to evaluate the effectiveness and safety of LPV/r-based ART. The following were considered failures: patients with viral load at least 400 copies/ml at week 48, non-completers at week 48 for any reason and those who switched ART before week 48 for any reason such as side effects. Treatment effectiveness was assessed by the rate of CD4+T cell recovery which was defined as >500 cells/mm3 and the proportion of patients achieving viral suppression, which was defined as <400 or <50 copies/ml due to different methods used during treatment. Safety was assessed by rates of LPV/r-related adverse events including lipid disorder, severe abnormal liver function, myelosuppression, and renal function.

Results: Between 2009 and 2016, 1196 participants (median 36 years, IQR 30–43 years) were finally enrolled. All had been on LPV/r -based second-line ART treatment for more than one year after any first-line ART regimen had failed. Overall CD4+T cell counts increased from 138 cells/mm3 to 475 cells/mm3 and 37.2% of all participants reached CD4 recovery. Viral suppression rates dramatically increased at the end of the first year (<400 copies/ml: 88.8%, <50 copies/ml: 76.7%) and gradually increased during follow-up (<400 copies/ml: 95.8%, <50 copies/ml: 94.4%). The most frequently reported AEs were LPV/r-induced lipid disorder and abnormal renal function.

Conclusions: This is the first real-world LPV/r-based second-line treatment study to cover such a large population in China. It provides clinical evidence that LPV/r-based second-line ART is effective in increasing CD4+T cell counts and viral suppression rates with tolerable side effects in HIV-infected adults in China in whom first-line treatment had failed.

Efficacy and Safety of Doravirine in Treatment-Naive Asian Adults with HIV-1

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Background: HIV-1 infection continues to present a significant burden to healthcare in the Asia-Pacific region. Doravirine (DOR) is a novel NNRTI for the treatment of HIV-1 infection, developed as a single entity and as a fixed-dose combination with lamivudine and tenofovir disoproxil fumarate (DOR/3TC/TDF). Three randomized controlled trials of DOR were conducted in treatment-naive adults (Protocol 007, DRIVE-FORWARD, and DRIVE-AHEAD). This report describes the efficacy and
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safety of DOR 100mg among Asian participants in the treatment-naïve trials.

**Methods:** Antiretroviral-naïve adults with pre-treatment HIV-1 RNA ≥1,000 copies/mL were randomly assigned to once daily DOR 25-200 mg or efavirenz (EFV), both with FTC/TDF, in P007; to DOR 100mg or ritonavir-boosted darunavir (DRV+r), both with FTC/TDF or ABC/3TC, in DRIVE-FORWARD; and to DOR/3TC/TDF or EFV/FTC/TDF in DRIVE-AHEAD. Randomized participants who received ≥1 dose of study therapy were included in the analysis. Due to critical differences in the Phase 2b (P007) study design, the overall efficacy population was limited to the Phase 3 trials (DRIVE-FORWARD and DRIVE-AHEAD). Missing efficacy data were handled with the Observed Failure (OF) approach. For the overall safety population, DOR data from P007 was limited to the Phase 3 dose (100mg).

**Results:** A total of 1710 participants from P007, DRIVE-FORWARD, and DRIVE-AHEAD were treated with DOR 100mg (N=855), DRV+r (N=383), or EFV (N=472). Of the 145 Asian participants, 71 received DOR 100mg, 7 received DRV+r, and 67 received EFV. Demographic and prognostic characteristics at baseline were similar between the overall population and the Asian subgroup, except for the expected differences in race, geographic region, and HIV-1 subtype (clade B in 40% of Asian participants vs 69% of the overall population). Due to the low number of Asian participants in the DRV+r group, this report will focus on comparisons between the DOR and EFV groups. At Week 48, the proportion of participants with HIV-1 RNA <50 copies/mL (OF approach) in the DOR and EFV groups, respectively, was 96.9% vs 90.0% in the Asian subgroup and 88.5% vs 88.8% in the overall efficacy population. The mean increase in CD4+ T-cell count from baseline to Week 48 in the DOR and EFV groups, respectively, was 198 vs 199 cells/mm3 in the Asian subgroup and 196 vs 188 cells/mm3 in the overall efficacy population. Adverse events reported by >10% of Asian participants in either treatment group were dizziness (DOR 16.9% vs EFV 61.2%), headache (11.3% vs 9.0%), rash (4.2% vs 14.9%), insomnia (5.6% vs 10.4%), and nausea (1.4% vs 10.4%). In the overall safety population, AEs reported by >10% of either treatment group were dizziness (DOR 7.1% vs EFV 35.4%), headache (13.3% vs 12.3%), diarrhea (12.4% vs 13.1%), abnormal dreams (3.4% vs 12.9%), and rash (3.0% vs 11.0%).

**Conclusions:** While the DOR Phase 2/3 studies were not designed to allow direct comparison across subgroups defined by race, the general patterns of efficacy responses across treatment groups were similar in the Asian subgroup and the overall efficacy population. Likewise, the safety profile of DOR was similar in Asian participants and the overall safety population.

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**40**

**Effectiveness and Tolerability of Switch of Combination Antiretroviral Therapy to Coformulated Elvitegravir/Cobicistat/Emtricitabine/Tenofovir Alafenamide among HIV-Positive Taiwanese**

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**Background:** Clinical trials have suggested that switch of combination antiretroviral therapy (cART) to coformulated elvitegravir (E)/cobicistat (C)/emtricitabine (F)/tenofovir alafenamide (TAF) is efficacious and safe in virally suppressed HIV-positive patients without resistance-associated mutations of HIV-1 to integrase strand transfer inhibitors (InSTIs) or previous failure to InSTI-based regimens. Real-world effectiveness and tolerability of switch to E/C/F/TAF remain scarce in HIV-positive patients in Asia-Pacific region.

**Materials and Methods:** HIV-positive Taiwanese adults aged 20 years or older were included after switch to E/C/F/TAF who had been receiving cART with plasma HIV RNA load (PVL) <200 copies/ml, estimated glomerular filtration rate (eGFR) ≥30 ml/min/1.73m² and no known virological failure to prior InSTI-based regimens or allergies to any component of E/C/F/TAF. Determinations of PVL, CD4 count, serum creatinine, lipids, and eGFR were performed subsequently every 3-6 months after switch.

**Results:** Between March and July, 2018, 1194 patients (mean age 42.3 years, 96.0% male and 89.7% men who have sex with men) were included for analyses. The four leading regimens before...
switch were TDF/FTC plus efavirenz or nevirapine (n=436), TDF/FTC plus protease inhibitor (n=279), and DTG-based triple therapy (n=248), and TDF/FTC/rilpivirine (n=168). After a median follow-up duration of 39 weeks (IQR, 31, 52), virological response (PVL <50 copies/ml), virological non-response (PVL ≥50 copies/ml), and no data was observed in 94.4%, 1.2%, and 4.4% of the patients, respectively. Before and after switch, there were no statistically significant differences in maintaining PVL <50 copies/ml in the on-treatment populations across all pre-switch regimens before and after switch: TDF/FTC plus efavirenz or nevirapine, 97.8% vs 98.6%; TDF/FTC plus protease inhibitor, 97.5% vs 99.6%; DTG-based therapy, 97.1% vs 97.5%; and TDF/FTC/rilpivirine, 100% vs 100%. Discontinuations of E/C/F/TAF were occurred due to virological failure in 6 patients (0.5%), adverse effects 24 (2.0%), death 5 (0.4%), loss to follow-up 12 (1.0%) and drug-drug interactions 3 (0.3%). Minimal eGFR decrease was noted, from 91.5 (IQR, 80.5, 104.6) to 90.9 ml/min/1.73m² (IQR, 79.6, 103.3), and the percentage of eGFR <60 ml/min/1.73m² decreased from 4.4% to 3.9% after switch. The proportion of patients with elevated urine total protein:creatinine ratio (UPCR >150 mg/g) has significantly decreased from 17.7% before switch to 15.8% after switch, while that of urine β2-microglobulin:creatinine ratio (>300 µg/g) has significantly decreased from 44.1% before switch to 32.0% after switch. After switch, triglyceride, total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), and TC:HDL-C ratio, has increased by 31.8%, 17.0%, 17.0%, 9.1%, and 6.6%, respectively. At baseline, 6.7% of the patients were receiving lipid-lowering agents (mainly statins); after switch, lipid-lowering agents were initiated in an additional 6.3% of the patients.

Conclusions: Among virally suppressed HIV-positive Taiwanese patients while receiving other antiretroviral regimens, switch to coformulated E/C/F/TAF was effective in maintaining viral suppression and well-tolerated, but with increases of lipid profile in the short-term follow-up.

**41**

The efficacy and safety of two-drug regimen including dolutegravir plus a boosted protease inhibitor in highly experienced HIV-infected patients

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**Objectives:** Two-drug regimen (2-DR) with dolutegravir (DTG) and boosted protease inhibitor (bPI) is an option of salvage antiretroviral therapy (ART) for drug experienced patients in Taiwan for drug simplification or ART resistance.

**Methods:** Information on demographics, clinical presentations and serial laboratory data were collected retrospectively from the medical records of the patients who had used dolutegravir plus one bPI at the 11 participant hospitals around Taiwan between September 2016 and March 2019.

**Results:** A total of 67 adult patients were included with a mean age of 37.6 years (range 23.8 - 67.0 years). The reasons for using 2-DR included drug simplification (30, 44.8%), ART resistance (18, 26.9%), intolerance (15, 22.3%), comorbidities (4, 6.0%). About half patients were already on 2-DR therapy before switching to DTG + bPI regimen and the other half switched to DTG+bPI directly from conventional regimens. Fifty-four patients (80.6%) had drug resistance test before switching to 2-DR. Four patients had integrase inhibitor associated resistance mutation including E157Q, E92Q, T66AT, F121N and L74I and only one had potential low-level resistance to DTG. One patient had low-level resistance against the used bPI(DRV/r). Five patients discontinued DTG+bPI regimen including one was dead of anal cancer, one had both jaundice and insomnia, one had co-morbidities and two had hyperlipidemia. For the efficacy, 93.4% (57/61) achieved plasma viral load <40 copies/ml at week 24 and 100% (28/28) maintained viral suppression at week 48. The 4 patients without viral suppression included 2 patients had poor drug compliance including one patients had low-level resistance to...
darunavir and one had low-level viremia (plasma viral load between 40 and 50 copies/ml). After the switch, cholesterol level increased among 66.0% of patients (n=31/47).

**Conclusion:** The 2-DR including DTG plus bPI was efficacious in highly experienced HIV-infected patients but associated with metabolic impact on dyslipidemia.

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**42**

**Low prevalence of HLA-B*5701 and abacavir intolerance in HLA-B*5701 negative Thais with acute HIV infection**


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**Background:** Presence of HLA-B*5701 allele strongly predicts abacavir (ABC) hypersensitivity reaction (HSR). However, the test is not always accessible in resource-limited settings and HLA-B*5701 prevalence data are scarce in Thailand.

**Methods:** Participants were enrolled into the RV254/SEARCH01 cohort in Bangkok, Thailand. Between 2009-2016, the most common regimen was tenofovir (TDF) plus lamivudine (3TC) or emtricitabine plus efavirenz. From 2017 onwards, ABC/3TC/dolutegravir (DTG) was used in HLA-B*5701 negative participants for simplification. Here we report the prevalence of positive HLA-B*5701, and in HLA-B5701-negative participants, the incidence of ABC HSR 6-weeks post-switch and AEs resulting in ABC discontinuation.

**Results:** Of 506 participants, seven (1.4%) had positive HLA-B*5701 allele and did not use ABC. 457 HLA-B*5701 negative participants were switched to ABC/3TC: 107 (23%) were newly treated (switched to ABC after 2 weeks on TDF and 350 (77%) were switched to ABC after a median time on TDF of 123 (2-419) weeks.

Six (6%) of the newly treated and 6 (2%) of the switch groups discontinued ABC. The most common symptoms for discontinuation (newly treated and switch groups respectively) were dizziness (0.6%,0%), rash (0%,0.6%), nausea (0.2%,0.4%), abdominal pain (0%,0.2%), alopecia (0.4%,0%), palpitations (0.2%,0.2%), chest pain (0%,0.2%), insomnia (0%,0.2%), headache (0.2%,0%), diarrhea (0%,0.2%), dyspnea (0%,0.2%) and fever (0%,0.2%). One (0.3%) case in the switched group had typical ABC HSR symptoms after the first dose of ABC. Symptoms improved within a few days of switching back to TDF.

**Conclusions:** HLA-B*5701 is uncommon in Thailand (1.4%). Screening for HLAB5701 resulted in low ABC discontinuation. Although ABC HSR symptoms were rare (0.3%), patient education and close monitoring during the first 6 weeks of ABC switch are required to ensure patient safety.

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**43**

**Evolution of weight and lipid profiles in HIV-positive patients switched to coformulated elvitegravir/cobicistat/emtricitabine/tenofovir alafenamide**

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**Background:** Weight gain and dyslipidemia have been reported as possible adverse effects of combination antiretroviral therapy (cART). We aimed to evaluate the evolution of weight and lipid profiles before and after switch to coformulated elvitegravir/cobicistat/emtricitabine/tenofovir alafenamide (E/C/F/TAF) among HIV-positive Taiwanese who had achieved viral suppression.

**Methods:** Between March and July 2018, HIV-positive patients switched to E/C/F/TAF were included. We collected information on demographics, weight, CD4, plasma HIV RNA load, prior cART, and lipid profiles (triglyceride [TG], total cholesterol [TC], high-density lipoprotein [HDL-C], low-density lipoprotein [LDL-C]).
cholesterol [HDL-C], and low-density lipoprotein cholesterol [LDL-C]). Weight measurement and blood testing for lipid profiles were performed at an interval of 12±4 and 24±4 weeks respectively. Weight and lipid profiles at 270 days before and after switch to E/C/F/TAF were analyzed to identify the associated factors using generalized estimating equation.

**Results:** Of 557 included patients with 36 weeks or longer of follow-up after switch, weight gain from baseline was noted after switch at Week 12 (mean, +0.66 kg), Week 24 (+1.26 kg), and Week 36 (+1.67 kg) (all, p<0.0001). The changes of weight after switch was significantly greater than those observed within the preceding 270-day period before switch (+0.62 vs +1.75 kg, p<0.0001). Weight gain was significantly correlated with later clinic visit (coefficient 0.24), baseline weight (coefficient 0.99), diabetes mellitus (coefficient -0.68), and age (coefficient -0.14) (all, p<0.005). There was no statistically significant correlation between switch to E/C/F/TAF and weight gain among patients having received InSTI-containing antiretroviral regimens prior to switch.

At Week 24, there were significant increases of TG (mean +50.13 mg/dl), TC (+28.80), LDL-C (+15.21), HDL-C (+4.58)(all, p<0.0001), but not TC/HDL-C ratio (+0.20, p=0.09). The differences of lipid profiles within the 180-day interval before and after switch were statistically significant for TG (-1.92 vs +50.13 mg/dl), TC (+4.74 vs +28.80), LDL-C (+1.53 vs +15.15), and HDL-C (+0.38 vs +4.13) (all, p<0.005).

**Conclusions:** HIV-positive patients with sustained viral suppression gained weight and had significant increases of lipid levels after switch of prior CART to E/C/F/TAF. After switch, weight gain was positively correlated with later clinic visit and baseline weight and inversely correlated with diabetes mellitus and age.

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**44**

**Raltigravir was non-superior to Lopinavir/ritonavir for treatment-experienced Chinese patients with HIV-1 infection: a 48-week randomized multicenter control study**

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**Background:** The raltegravir salvage regimen for treatment-experienced patients was reported non-inferior to standard second-line regimen in some regions outside of Asia. This study aimed to explore the efficacy and safety of raltegravir as a second-line regimen for treatment-experienced patients with human immunodeficiency virus-1 (HIV-1) infection in China compared with the only available standard second-line antiretroviral therapy of two nucleoside reverse-transcriptase inhibitors (NRTIs) and a protease inhibitor.

**Methods:** A total of 212 patients with HIV-1 infection having a viral bound more than 400 copies/mL after first-line antiretroviral therapy were included in this open-label, multicentered, randomized clinical trial. The patients were randomized into two groups (2:1, 142, 70): Raltegravir plus standard therapy group received raltegravir, tenofovir, lamivudine, and lopinavir/ritonavir as salvage therapy, and Standard therapy group received the standard second-line therapy(tenofovir, lamivudine, and lopinavir/ritonavir). The primary outcome was virologic response at weeks 48 (HIV-1 RNA<50 copies/mL).

**Results:** The baseline mean HIV-1 RNA was 4.79 log10 and 4.59 log10 copies/mL, median baseline CD4 cell count was 197 and 174 cells/mL in Raltegravir plus standard and Standard therapy groups, respectively. At weeks 12, 24 and 48, 68%, 73.4%, and 79.2% patients in Raltegravir group and 47%, 71%, and 84% in Standard therapy group achieved viral suppression, respectively. At weeks 24 and 48, the median CD4 cell count was 285 and 372 cells/mL and 273 and 278 cells/mL respectively. At weeks 24 and 48, the median variation of HIV-1...
DNA to baseline HIV-1 DNA was -240.26 and -186.85 in Raltegravir group and -153.14 and -335.93 in Standard therapy group, respectively.

**Conclusion:** Raltegravir combined with protease inhibitor and NRTI was non-superior to the standard second-line treatment. It might be helpful in providing a rapid viral suppression before week 24.

**45**

**Impact of point-of-care pharmacist counseling at late refills of antiretroviral therapy: A Study Following the Early Warning Indicators of World Health Organization Recommendations**

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**Background:** With increasing global use of antiretroviral therapy (ART), World Health Organization (WHO) has developed HIV drug resistance (HIVDR) Early Warning Indicators (EWIs) to optimize prevention of HIVDR. Recent studies have reported on time pharmacy refills, the fourth EWI, to be the strongest predictor of clinic-level viral load suppression. The primary objective of this study was to assess the impact of pharmacist counseling at the point of late ART refill and identify modifiable predictors for refill non-adherence. We also sought to determine the percentage of patients with on-time drug pick-up as described by WHO.

**Method:** A cross-sectional study was conducted among 751 Malaysian HIV-infected individuals receiving ART from November 2017 until February 2018. Patients with late refills were actively absorbed for a comprehensive counseling session. Follow-up pharmacy refills after the counselling was then evaluated using medication possession ratio (MPR) for duration of 6 months. MPR of more than 90% was categorized as optimal refill adherence according to published conventions. Paired T-test was used to test the effectiveness of counselling at late refills whilst multivariate regression models were used to examine predictors of late refills.

**Results:** Of 751 HIV-infected patients, 91% had on-time refills. Patients with late refills (n=65) were predominantly male (85%), of Malay ethnicity (45%) and age 35 years old and above (65%). Mean duration on ART was 4 years. Being outstation accounted for the highest reasons for late refills (32%) followed by 23% due to work commitments. Identifying patients with late refills and providing concurrent counseling increases MPR or refill adherence significantly in patients who had previously poor MPR scores (MD=14.76; SD= 18.04; p=0.001). Multivariate binary logistic regression analysis found history of self-reported non-adherence (AOR= 4.506; 95% CI [1.822-11.143]; P=0.001) and travelling more than 20km to the hospital (AOR= 4.749; 95% CI [1.966-11.474]; P=0.001) were significant predictors of late refills.

**Conclusion:** Although the proportion of patients with on-time drug pick up was desirable, our study further suggests identifying and counseling patients with late refills as part of the dispensing process as it increases pharmacy refill adherence significantly. This simple targeted intervention could serve as an early proxy of retention in care especially in resource-limited settings.

**46**

**Weight-based ART regimens in adults can achieve viral suppression and save costs**

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**Background:** Although children receive ART at weight-based dosages, adults receive it as fixed strength dosage irrespective of weight. Barring few exceptions like stavudine, didanosine and lower dose efavirenz, the efficacy of reduced dosage ART regimens in adults remains largely uninvestigated. Few studies including one
randomized control trial has shown the non-inferiority of the TDF/FTC/EFV fixed-dose combination on alternate-days versus standard regimen in virologically suppressed patients. Here, we share our experience with half the dose of tenofovir disoproxil fumarate, lamivudine and efavirenz (called TLE-50% hereafter who were initiated on such a dosing usually for lower body weights (≤40kg) until their weights increase, or as lead-in for efavirenz. Some of these patients chose to continue on this regimen subsequently for various reasons despite being advised to take full dose. We evaluate the efficacy of this reduced dosage ART regimen in this group of patients.

Methods: We retrospectively analysed patient records from January 2008 to December 2018 at an HIV centre in a city in India. Adult patients taking TLE-50% with good adherence (>90%) and regular follow-ups with CD4 and viral load records were included. They were evaluated for immunological and viral load response.

Results: Forty-four patients (36 females, 8 males) were included with the following characteristics at ART initiation [median (range)]: Age 36.2 years (22-62), weight 34.2 kg (29-62); 4 were >45 kg), CD4 counts 189 cells/µL (29-345). Baseline viral loads were available for six, ranging from 1.1X106 to 4.9X106 copies/ml. Patients received TLE-50% for median duration of 59 months (range 20-144). The median weight increased to 44.8 kg (range 32-65). Median CD4 at their last visit was 722 cells/µL (range 310-1450). 39/44 showed viral load suppression (< 400/ < 34 copies/mL depending on assay) at their last follow-up visit. Three out of the 5 with detectable VL showed no drug resistant mutations and suppressed 6 mon after receiving TLE. The remaining 2 out of the 5 could not do HIV-DR testing; one received full dose TLE, other received TL+ATZ/r; both had their VL suppressed subsequently. The main reason given for which patients continued on TLE-50% despite being advised to switch to full dose TLE was affordability and/or better tolerability (for which they switched back to TLE-50% after briefly trying full-dose regimen).

Conclusions: Reduced-dose ART regimen is efficacious and may be one strategy to save costs and adverse effects, at least for the patients with lower body weights. Although further evaluation with larger randomized studies is needed, this is a proof of concept to evaluate the efficacy of lower dose ART regimens and to bring weight based regimens for adults. Such strategies may especially be beneficial in several Asia-Pacific countries with a lower average weight of population and also being resource limited economies.

47 Pharmacoeconomic evaluation of JUŁUCA (DTG/RPV) for human immunodeficiency virus (HIV-1) infection treatment in virologically-suppressed adults in Taiwan.

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Background: Whilst the efficacy of traditional three-drug regimens (3DR) for the treatment of HIV is well-established, tolerability and toxicity concerns remain across all classes of antiretrovirals (ARV). Two-drug regimens (2DR) are an important new treatment option for PLHIV, offering non-inferior efficacy versus 3DR, whilst reducing cumulative drug exposure and potentially long-term toxicities and drug-drug interactions.

JULUCA is a 2DR [dolutegravir(DTG)/rilpivirine(RPV)] for the treatment of HIV-1 in virologically suppressed adults (HIV-1 RNA <50 copies per mL), that demonstrated non-inferior efficacy vs traditional 3DRs in two large randomized controlled trials (SWORD-1&2 studies). Here, we assess the cost-effectiveness of JULUCA for the treatment of HIV-1 for virologically-suppressed adults in Taiwan vs commonly used comparators, with the evaluation tailored to reflect the local population, healthcare and treatment costs.

Material & Methods: A hybrid decision tree and Markov cohort state transition model was used to evaluate the expected economic costs and clinical outcomes associated with JULUCA (DTG/RPV) and four comparators commonly used in Taiwan (RPV/emtricitabine(FTC)/tenofovir disoproxil(TDF), DTG/abacavir (ABC)/lamivudine(3TC),
elvitegravir (EVG)/cobicistat (c)/FTC/tenofovir alafenamide (TAF) and efavirenz (EFV)/FTC/TDF). Model health states were defined by viral load and CD4 cell count. Patients transitioned between six therapy lines reflecting clinical practice in Taiwan, with efficacy and safety data informed from SWORD 1 & 2 studies: Juluca’s efficacy was taken from the DTG+RPV arm and comparator regimens from the CAR arm (current antiretroviral therapy). The risk of developing long-term toxicities (cardiovascular disease, bone fractures and chronic kidney disease) was also captured in the model. Current branded drug acquisition prices were included for all ART regimens. To inform the cost of healthcare utilisation in Taiwan, a bespoke costing study using NHID data was performed and complemented with literature data. Costs and benefits were discounted at 3.5% annually.

Results: JULUCA was found to be a cost-effective and cost-saving regimen compared to three comparators (RPV/FTC/TDF, DTG/ABC/3TC and EVG/c/FTC/TAF), falling in the south-west quadrant of the cost-effectiveness plane where Juluca is generating significant savings with only a negligible, non-clinically significant decrement in lifetime QALYS (−0.005), reflecting the non-inferiority finding of the SWORD trials. As such, the use of these comparator regimens in Taiwan is not a cost-effective approach, incurring additional costs vs JULUCA for only a very negligible gain in QALYS (0.005). The resulting ICERs suggest that it would cost NT$1,550,000 to get 1 incremental QALY using these three comparators versus JULUCA.

Conclusions: JULUCA is cost-saving and cost-effective versus the majority of comparators considered here, and provides comparable efficacy with reduced cumulative drug exposure (and potentially associated long-term toxicities) versus three drug regimens.

Predictive effect of Body Mass Index on Immune Reconstitution among HIV-Infected HAART Users in China

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Background: Body mass index (BMI) contributes somewhat to drug metabolism, thus affecting the efficacy of highly active antiretroviral therapy (HAART). In a large cohort of HIV-infected Chinese patients, we estimated the frequency of underweight/overweight patients as well as their associated factors and elucidated the prospective effect of BMI on immune reconstitution.

Methods: We performed a longitudinal cohort study to analyse the effect of BMI on immune reconstitution after HAART in HIV-infected Chinese patients. Multiple linear regression was used to evaluate the relationship between baseline BMI and the increase in CD4+ T lymphocytes 12 months after starting HAART. In addition, Cox proportional hazard modelling was used to assess how BMI affected time to immunologic reconstitution (reaching CD4+ T lymphocytes more than 500 cells/μl) during follow-up.

Results: Among 1,612 enrolled patients, 283 (17.6%) were overweight/obese (BMI≥25 kg/m2); and 173 (10.7%) were underweight (BMI<18.5 kg/m2). At baseline, prior to HAART, subjects who were overweight were more often older, male and had higher CD4+ T lymphocytes and lower viral load (p<0.01 for all). Baseline BMI was not independently associated with 12-month CD4+ T lymphocyte recovery on HAART (p=0.130). However, Cox proportional hazard modelling, with baseline BMI as an independent variable, indicated that BMI was correlated with a higher probability of immunologic reconstitution (hazard ratio [HR] 1.03; 95% confidence intervals [CI] 1.01-1.06; p=0.011) after adjusting for baseline age, sex, CD4+ T lymphocytes, CD4/CD8 ratio, viral load and WHO stage.

Conclusions: In HIV-infected patients, higher baseline BMI could predict better immune reconstitution after HAART.
Low muscle mass is the body composition parameter most predictive of pre-frailty and frailty in Asians living with HIV

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Background: In Caucasian people living with HIV (PLWH), central obesity, low muscle mass and osteoporosis were associated with frailty. Body composition differs between Asians and other ethnic groups. There is paucity of data evaluating correlation between various body composition parameters and pre-frailty or frailty in Asian PLWH.

Methods: A prospective observational cohort study was performed. Adult HIV-infected patients aged ≥18 years, followed in an HIV metabolic clinic in Hong Kong were recruited. Anthropometric measurements and dual-energy X-ray absorptiometry (DXA) scan were performed to measure various components of body composition. Measurements included body weight and body mass index, measures of adiposity (waist circumference, percentage total body and trunk fat, fat mass index [fat mass/height2], and fat mass ratio [percent trunk fat/percent leg fat]), muscle mass (appendicular skeletal muscle index/ASMI [lean mass of extremities/height2]), and bone mineral density (BMD) at femoral neck and lumbar spine.

Frailty and pre-frailty were determined using Fried phenotype (characterized by unintentional weight loss, exhaustion, low physical activity, and diminished gait speed and grip strength). Presence of 1-2 and ≥3 criteria indicated pre-frailty and frailty respectively. Multivariable binary logistic regression model was performed to determine association between body composition parameters and pre-frailty/frailty.

Results: A total of 137 participants were recruited: mean age 59±11 years, 14% female, 95% Chinese, 40% ever-smoker, and 43% diabetes. Duration of HIV diagnosis was 13(IQR 8-19) years, current CD4 527±272 cells/mm3, and 97% had viral load <20 copies/mL. All were taking anti-retroviral therapy (25% NNRTI, 37% protease inhibitors, and 38% integrase inhibitors). Among this cohort, 72 (52.6%) had pre-frailty, and 10 (7.3%) had frailty.

On univariate analysis, older age (61±9 vs. 55±11 years, p<0.001), ever-smoker (48% vs. 27%, p=0.015), lower body weight (64±13 vs. 69±13 kg, p=0.022), lower femoral neck BMD (0.691 [IQR 0.609-0.766] vs. 0.763 [IQR 0.683-0.822]g/cm2, p=.0001), and lower ASMI (6.7±1.2 vs. 7.4±1.2 kg/m2, p=0.002) were associated with pre-frailty/frailty. None of the HIV-related variables nor measures of adiposity had association with pre-frailty/frailty. On multivariable analysis, age, ever-smoker, and lower ASMI (adjusted odds ratio 0.70, 95%CI 0.51-0.97) were associated with pre-frailty/frailty.

Conclusion: In a cohort of Asian PLWH, low muscle mass was the predominant body composition parameter associated with pre-frailty/frailty.

Higher proportion of abnormal nutritional status among HIV-infected Asian elderly with chronic virological suppression compared to HIV-negative individuals

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Background: Longevity of people living with HIV (PLHIV) has dramatically improved due to the advances in antiretroviral treatment (ART). However, little is known regarding the nutritional status among PLHIV, especially among elderly PLHIV who are at higher risks for comorbidities.

Methods: A cross-sectional study was done among PLHIV with HIV viral load < 50 copies/mL and HIV-
negative participants aged > 50 years from Bangkok, Thailand. The nutritional status of elderly PLHIV and HIV-negative participants was screened by using the Mini Nutritional Assessment (MNA). Abnormal nutritional status was defined by those who had malnutrition or at risk of nutrition from MNA tool. Different markers for the nutritional status including calcium, albumin, vitamin D, phosphate and hemoglobin levels were compared between groups of different nutritional status. Multivariate logistic regression model was used to explore the factors associated with abnormal nutritional status among both PLHIV and HIV-negative individuals.

**Results:** A total of 358 PLHIV and 104 HIV-negative participants with median age of 55 (IQR 52 – 59) years were recruited. PLHIV had significantly higher proportions of abnormal nutritional status (18.05% vs. 6.8%, p=0.018), compared to HIV-negative individuals. Moreover, participants with abnormal nutritional status had lower hemoglobin level (median, 13.5 mg/dL (IQR, 12.3-14.9) vs. 14.2 mg/dL (IQR, 13-15.2), p=0.039), compared to those with normal nutritional status. There were no significant differences in the levels of vitamin D, calcium, albumin and phosphate between the groups. In the multivariate model, older age (adjusted odds ratio [aOR], 1.07, 95% confidence interval [CI], 1.02-1.13, p=0.01), positive HIV status (aOR, 2.45 (95% CI, 1.01-5.98, p=0.049), diabetes mellitus (aOR, 2.51, 95% CI, 1.23-5.12, p=0.01) and lower body mass index (BMI) (aOR, 0.77, 95% CI, 0.66-0.9, p<0.001) were independently associated with abnormal nutritional status, after adjusting age, sex, HIV status, smoking, diabetes mellitus, BMI, waist circumference, hemoglobin and vitamin D levels.

**Conclusion:** Almost one fifth of elderly PLHIV had abnormal nutritional status in this Asian cohort. The nutritional status among PLHIV should be routine screened and monitoring of the long-term outcomes of PLHIV with poor nutrition is warranted.

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**HIV-associated Neurocognitive Disorder in the Philippines: A Preliminary Study**


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**Background:** Among people living with HIV (PLHIV) under effective anti-retroviral therapy, comorbidities have shifted from infectious conditions to non-AIDS defining disease which includes the spectrum of neurocognitive, behavioral and emotional health impairment called HIV-associated neurocognitive disorder (HAND). Its severity is based on neuropsychological performance and how it interferes with activities of daily living. Before the anti-retroviral therapy (ART) era, majority of PLHIV presented with HIV-associated dementia. With ART, PLHIV usually present with milder forms - asymptomatic and mild neurocognitive disorder. Currently, the burden of HAND among virally-suppressed HIV-infected Filipinos is not well described. Thus, we aimed to address this gap by determining the neuropsychological performance and by assessing depression and anxiety of HIV-infected compared to HIV-negative controls in the Filipino population.

**Materials and Method:** We recruited 50 HIV-infected, ART-experienced virally-suppressed patients and 50 HIV negative controls age-, sex- and education-matched from the Philippine General Hospital in Manila, a tertiary university government hospital. Clinical, demographic and immunologic parameters were collected. All participants underwent neuropsychological (NP) testing battery measuring HIV-related cognitive dysfunction composed of the following domains: learning and memory, psychomotor speed, working memory and executive function. All raw scores were transformed to standard z-scores using standard demographically adjusted Asian normative data. The Hospital Anxiety and Depression Scale – Filipino Version (HADS-P) was also administered to assess depression and anxiety among Filipinos.
**Results:** To date, 45 HIV-infected and 31 HIV-negative controls are available for evaluation. The HIV-infected group had a mean current CD4 count of 529, mean nadir CD4 count of 190, and averaged 4 years on ART (SD=1.9). Cognitive testing showed that the HIV-infected group (mean age = 32 years) had lower NP performance in majority of the tests compared with the HIV negative controls (mean age=31 years). Specifically, the HIV infected group had significantly poorer scores (p < 0.05) in digit span sequencing (mean 8.7, SD 2.3) vs. HIV negative controls (mean 9.9, SD 2.5); total visual learning score (HIV+ mean = 26.3, SD 5.9 vs. HIV negative = 28.9, SD 4.0) and non-dominant finger tap score (mean HIV+= 48.4, SD 6.7 vs. HIV negative = 53.1, SD 7.3). Furthermore, subanalysis of the HIV-infected according to NP performance score showed that significantly lower nadir CD4+ count and current CD4+ count (p<0.05) were observed in the lower NP performance score cluster than in higher NP performance score cluster. HADS-P scores showed that 11 (31%) in the HIV-infected group had borderline abnormal anxiety score and 1 (2.8%) had borderline abnormal depression score.

**Conclusion:** We have shown that HAND exists among HIV-infected Filipino population and is more evident among those with lower nadir CD4 counts. HAND screening among HIV patients should be included in the holistic management of PLHIV in the Philippines.

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**The effects of tenofovir on bone mineral density and vitamin D metabolism in HIV positive Chinese MSM**

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**Background:** HIV infection and antiretroviral therapy (ART) are associated with bone mineral density (BMD) loss. The pathogenesis of HIV-associated osteoporosis is complex and may be multifactorial. Our aim was to determine the prevalence of low bone mass (LBM) in HIV positive gay men who have sex with men (MSMs) and to explore the possible mechanisms of tenofovir (TDF) on BMD and vitamin D metabolism changes.

**Methods:** Data from 315 HIV-1 infected MSM patients at the time of enrollment into the ongoing antiviral therapy (ART) cohort study were analyzed. BMD exam was performed before ART. Patients were divided into three groups based on BMD results (osteoporosis, osteopenia, normal). Each group of patients was further divided into TDF and No-TDF subgroup based on the treatment of TDF. The differences between the BMD data and Vitamin D metabolism indicators (serum calcium and phosphorus, 25(OH)D, PTH) were compared at 24- and 48-weeks following ART.

**Results:** Of the 315 patients, 45.9% had normal BMD, 42.5% had bone loss, and 11.6% had osteoporosis. Patients in the osteoporosis group had the highest value in mean age, smoking rate, time since HIV diagnosis, the proportion of patients with HIV-RNA ≥ 105 copies/ml, and PTH levels; while their BMI, serum calcium, and 25(OH)D levels were the lowest as compared with those of the other two groups prior to ART. During long term follow-up of ART, serum calcium decreased in all three groups in TDF subgroup at 48 weeks. Importantly, serum calcium decrease was accompanied by a significant BMD decline in the TDF subgroup of both osteoporosis and osteopenia group at 48 weeks as compared with those in the No-TDF subgroup. Notably, an earlier BMD decline was detected at 24 week of TDF treatment in the osteoporosis group. Within group comparisons, a significant elevated 25 (OH)D levels were found in both TDF and Non-TDF treated osteoporosis group as compared to their baseline at 48 week, but no difference was observed in other groups. Interest, the levels of serum PTH were increased in TDF subgroup of both osteopenia and BMD normal group but not in that of the osteoporosis group at 48 weeks. PTH level remained stable in patients without TDF at any time point. There was no change in serum phosphorus in all patients.

**Conclusions:** Our findings suggest that HIV infected MSM patients have a high incidence of osteopenia and osteoporosis with an early onset age. Vitamin D and mineral metabolism dysregulations may contribute to long term TDF therapy associated with significant BMD decline BMD exam should be included as routine practice when patients receive TDF therapy, Non-TDF based drug regimens may provide a better option for patient with high risk of osteopenia or osteoporosis to preserve bone health while continuing suppressive ART.
Association between plasma pentraxin 3 levels and age-related diseases in HIV-infected individuals.

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Background: Pentraxin 3 (PTX3) is an acute-phase protein that is produced by a variety of cells, such as adipocytes, neutrophils, monocytes and macrophages in response to proinflammatory stimulation. PTX3 plays an anti-inflammatory role by producing anti-inflammatory cytokines and downregulating proinflammatory cytokines. It is also involved in bone formation and improvement in insulin resistance. Recently it has been reported that plasma PTX3 levels are reduced in some chronic inflammatory states such as obesity, osteoporosis and metabolic syndromes. HIV infection induces chronic inflammation and causes certain age-related comorbidities such as bone disease and metabolic disorders. The aim of this study was to evaluate the association between plasma PTX3 levels and age-related comorbidities, and to examine which biological variables determined the PTX3 levels in HIV-infected individuals.

Methods: Two hundred and seventy-five HIV-infected individuals on stable antiretroviral therapy (ART) for >6 months who achieved a viral load of <20 copies/ml were enrolled in this study. No individual had active infectious diseases including opportunistic infections. Plasma PTX3 levels were measured using an enzyme-linked immunosorbent assay. We assessed several variables associated with HIV infection (CD4+ T cell counts, plasma HIV-RNA load), ART (duration, regimen), and others (age, smoking, body mass index, hypertension). We also examined the relationship between plasma PTX3 and various age-related comorbidities. Variables associated with plasma PTX3 in univariate analyses were incorporated into multivariate models.

Results: Plasma PTX3 levels were low in individuals with obesity, carotid artery stenosis and osteopenia. Simple linear regression analysis showed that obesity, smoking, low ratio of HDL-cholesterol to triglyceride and duration of ART were significantly correlated with low PTX3 levels. Multivariate regression analysis indicated that obesity and low ratio of HDL-cholesterol to triglyceride were independently correlated with low PTX3 levels. HIV-related variables such as CD4+ T cell counts, HIV-RNA load before ART and the type of ART did not correlate with plasma PTX3 levels.

Conclusions: Our results show the correlation between low plasma PTX3 level and certain age-related comorbidities in HIV-infected patients. As plasma PTX3 levels can be affected by complex processes and pathways, it is important to elucidate the precise mechanisms of the decrease in plasma PTX3 during chronic inflammation, including HIV infection. Weight reduction, habitual exercise and dietary modification have been reported to increase PTX3 levels, but no studies to date have examined whether modulation of PTX3 levels can improve outcomes among HIV-infected individuals on stable ART. Further studies are needed to clarify whether PTX3 levels may represent a prognostic surrogate biomarker for age-related comorbidities in HIV-infected patients.

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Depression and associated factors in stable People Living with Human Immunodeficiency Virus (PLWH) who undergoing long-term efavirenz-based therapy

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Background: Since antiretroviral globally available, Human Immunodeficiency Virus infection is now considered as a chronic disease instead of a death sentence. Aside from biologic nature of the disease...
and social stressors of HIV positive status, depression, which considered as crucial psychiatric comorbid for affecting the outcome and therapy adherence, also might be resulted from the drug adverse effects. Even though efavirenz was widely known for the neuropsychiatric adverse effect, particularly depression, it has been the first choice of non-nucleoside reverse transcriptase inhibitor in Indonesia since 2012. Special concern should be given to people living with HIV (PLWH) in long-term efavirenz antiretroviral therapy.

**Aim:** To determine the prevalence of depression in PLWH in long-term EFV therapy and associated factors.

**Method:** A cross-sectional study of 251 HIV-infected adults was conducted at the HIV Integrated Clinic in Cipto Mangunkusumo Hospital from June to September 2018. The eligible subject was screened for depression using Indonesian version Beck Depression Inventory-II (BDI-II). A structured interview according to Diagnostic and Statistical Manual of Mental Disorder-5 (DSM-5) was used for diagnostic. Multivariate analysis using logistic regression test was done in variables with p-value < 0.25 in bivariate analysis to defined factors associated with depression.

**Result:** The prevalence of depression among 251 eligible subjects was 23.5% (95% CI 18.25%-28.74). Gender, education level, incomes, social supports, nadir CD4 level, history of central nervous system infection and substance abuse did not associate with depression among PLWH in long-term EFV. Bivariate analysis showed variable consisting of age (36-55 years), EFV duration, and homosexuality were associated with depression. Meanwhile, multivariate analysis showed only age of 36 to 55 years old (OR=0.454; 95% CI 0.244-0.845, p 0.021) and EFV duration were associated independently with depression (OR=0.843; 95% CI 0.755-0.940, p=0.002).

**Conclusion:** One fourth of people living with HIV in long-term efavirenz therapy had depression. Middle-aged adult was tend to have lesser depression than younger adult. The longer duration of EFV was also associated with lesser tendency of depression.

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**Fat percentage is associated with inflammatory biomarker among chronic virologically suppressed Aisan elderly living with HIV**

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**Background:** People living with HIV (PLHIV) are at risks of atherosclerotic or cardiovascular diseases even with virologically suppressed conditions. There are limited data regarding the cardiovascular risks or outcomes among Asian PLHIV. We investigated the relationship of body fat composition with inflammatory and cardiac biomarkers among aging Thai PLHIV.

**Methods:** A cross-sectional study was done among PLHIV with HIV-RNA level <50 copies/mL and aged ≥50 years from HIV-NAT 006 cohort; HIV-negative participants matched by age and sex were recruited from the aging cohort study. Body fat mass, fat percentage and visceral fat rating were determined by bioelectrical impedance analysis, and anthropometrics (body mass index [BMI], waist to hip ratio) were evaluated. Biomarkers for generalized inflammation and cardiac biomarkers including high-sensitivities C-reactive protein (hs-CRP), interleukin-6 (IL-6), high-sensitivity cardiac troponin T (hs-cTnT) and N-terminal pro brain natriuretic peptide (NT-proBNP) were also evaluated. Linear regression analyses were carried to explore the factors associated with these biomarkers.

**Results:** A total of 349 PLHIV and 103 HIV-negative individuals with median age of 55 (IQR 52 – 59) years were included in the study. PLHIV had higher waist to hip ratio than HIV-negative participants [median, 0.93 (IQR, 0.88-0.97) vs. 0.9 (0.87-0.95), p=0.07] despite having lower BMI. Moreover, PLHIV had significantly higher hs-cTnT [median, 5.68 (IQR, 3.84-9.15) vs. 4.96 (3.52-6.70) ng/L, p=0.009] and
Background: Dyslipidemia is a common complication among HIV-infected individuals brought about by the sustained immune activation, traditional risk factors and adverse effects of antiretrovirals (ART). The atherogenic index of plasma (AIP) is a good marker to predict the risk for atherosclerosis and cardiovascular diseases. However, very few studies have investigated this stratification index among HIV-infected individuals. We aimed to compare the AIP between ART-experienced HIV-infected individuals and HIV-negative controls and correlate AIP with clinical and laboratory factors.

Materials and Method: Fifty (50) HIV-infected, virologically suppressed, ART experienced patients and 50 HIV-negative controls, age-, sex- and education-matched were recruited as part of the immune activation study in the Philippines. Anthropometric indices, blood pressure, CD4 count and viral load were determined. Lipid profile was done using the stored plasma samples from the study. The atherogenic index of plasma was computed as the logarithmic transformation of TG/HDL ratio. We performed T-test for independent samples to determine significant differences in AIP between 2 groups and Pearson’s correlation to determine the factors correlated with AIP.

Results: Majority were males (96%) with a mean age of 32.5 (SD 4.8) in the HIV-infected group and 30.6 years (SD 4.7) in the HIV-negative controls. Mean BMI was significantly higher (P<0.02) in the control group (24.1, SD 3.6) compared to the HIV infected group (25.9, SD 3.7) with a greater percentage of the HIV negative controls in the obese category. There was no significant difference in the proportion of smokers and alcohol beverage drinkers. The mean duration of HIV infection was 4.5 (SD 1.9) years with mean nadir CD4 count of 182 (SD 172) cells/mm3 and mean latest CD4 count of 518 (SD 243) cells/mm3. The mean duration of ART use was 4.0 (SD: 1.9) years. Only 10% of the HIV-infected group were on protease inhibitor-based ART. Analysis of lipid parameters showed no significant differences in the mean total cholesterol (TC), triglyceride (TG), LDL-C and HDL-C but with elevated levels of triglyceride and LDL-C in both groups. The mean AIP of the HIV-infected (0.58, SD 0.27) and HIV negative (0.61, SD 0.26) groups did not differ significantly. Upon risk stratification, majority (91%) were at high risk for CVD complications (AIP > 0.24) but with no significant difference in low, moderate and high-risk AIP between the HIV+ and HIV- groups. Among the HIV-infected group, factors correlated with abnormal AIP included CD4 count (R=0.31, p=0.02), nadir CD4 count (R=0.31, p=0.03) and TG level (R=0.9, p<0.001). Among the HIV negative controls, TC (R=0.41, p=0.02) and TG (R=0.91, p<0.001) correlated with abnormal AIP. HDL was negatively correlated with AIP for both groups (HIV+ R=-0.53, p=0.001; HIV- R=-0.79, p<0.001).
**Conclusion:** Using AIP as a marker, the risk for CVD complications of ART-experienced HIV patients approximates that of the HIV negative group. Screening for and management of dyslipidemia are important cornerstones to decrease the risk for CV complications in this relatively young cohort of patients.

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**Xpert HCV viral load assay utilizing plasma and finger stick whole blood can be used as a point of care testing in Thailand**


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**Background:** Patients infected with hepatitis C virus (HCV) can be cured with direct acting antiviral drugs (DAAs). In order to achieve HCV cure, we would need to provide treatment to those who need it and scale up HCV testing, particularly among targeted population. Hence, it is essential to improve the strategy to test and diagnose HCV. Abbott Real Time HCV RNA assay is the current and gold standard test but it need to perform in batch and longer turn around time. Therefore, a rapid HCV RNA test or point-of-care (POC) test would be extremely helpful in diagnosing the infection. We therefore, validated a POC assay to detect HCV RNA.

**Material and Methods:** Blood samples were collected from 42 HIV-infected and 67 noninfected people from Bangkok, Thailand. There were 40 plasma samples and 69 finger stick capillary whole-blood samples. Our POC test was the Xpert HCV RNA test and Finger stick Xpert HCV RNA test (FS-Xpert HCV RNA). We compared the agreement of testing of the Xpert HCV RNA test using plasma and finger stick samples to the gold standard test. Bland–Altman plot and diagnostic test were used to analyze the results.

**Results:** 14/14 HCV viral loads were detected in the plasma and 26/26 HCV RNA were undetectable by both the Xpert HCV RNA (mean 2.46 log (95% CI 1.75-3.17)) and Abbott Real time HCV RNA assay (2.55 log (1.84-3.27)). As for the finger stick samples, 28/28 samples were detected by FS–Xpert HCV (3.03 log (2.42-3.64)) and Abbott Real time HCV RNA assay (3.20 log (2.57-3.84)). 41 samples were undetectable by both assays. The sensitivity (100%) and specificity (100%) for the Xpert HCV RNA assay and FS-Xpert HCV RNA assay were the same as the gold standard test.

**Conclusion:** The performance of the Xpert HCV RNA assay and FS-Xpert HCV RNA assay were equal to the Abbot Real time HCV RNA assay. Thus, the Xpert HCV RNA tests using either plasma sample or finger stick capillary whole-blood samples can be used in place of the gold standard test. This mobile POC can effectively help scale up HCV testing and it could link the patients to treatment and care without any delay.

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**Reagent reduction strategy to reduce cost in CD4 monitoring**

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**Background:** Of the three budget heads involved for direct costs in patient care- consultation, laboratory support and medicines (ART and other), cost of ARVs has been consistently decreasing. However, no efforts have been made to decrease the cost of laboratory assays for monitoring. Although viral load monitoring is becoming standard of care, CD4 testing still has a role in those with CD4 counts less than 350 cells/µL and also in developing countries like India where viral load testing is not universally available yet. Testing only for CD4 instead of both CD4/CD8 reduced reagent costs by 25%. In this study, we evaluated the potential of further reducing the cost of CD4 cell count tests by halving the amount of reagent used for CD4 testing.
**Methods:** In an HIV centre in India, CD4 counts in 200 patients obtained on BD FACSCount using manufacturer’s instructions with standard reagent quantity was compared with results using 50% of the sample and reagent. The samples were selected to include a wide range of CD4 counts and clinical status.

**Results:** The mean CD4 count by standard method was 440.22 cells/µl (range=8-1314, standard deviation= 280) and by 50% method was 447.15 cells/µl (range= 12-1243, Standard deviation=286). The concordance correlation coefficient between the two techniques was 0.982. The sensitivity and specificity for identifying CD4 counts less than 50 CD4 cells/µL was 100% and 93.8%, at CD4 count less than 200 CD4 cells/µL was 97.2 % and 97.6%, at CD4 count less than 500 was 96% and 93.2%, and at CD4 count greater than 500 CD4 cells/µL was 95.2% and 92.2 %. Bland-Altman analysis did not demonstrate significant bias between the two methods.

**Conclusions:** This strategy of using half the reagents for CD4 testing saves 50% of the reagent cost with comparable accuracy. Using two strategies- only CD4 testing (instead of CD4/CD8) and reagent reduction by 50%, the total cost of CD4 testing can be brought down to 37.5%. CD4 monitoring at counts less than 350 is all the more precise even with reagent reduction.

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**Depression and virologic failure in perinatally HIV-infected adolescents**

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**Background:** With the advance and availability of highly active antiretroviral therapy(HAART), perinatally HIV-infected children are growing up to adolescents, the period of many changes in life, e.g. from dependence on caregivers to own responsibilities including maintenance of treatment and vulnerability to development of depression. There is no information on the prevalence of depression and it’s association with virologic failure in Thai perinatally HIV-infected adolescent.

**Material and Methods:** Perinatally HIV-infected adolescents (age > 12 years old) who were disclosed to their HIV status, were assessed for depressive disorder using DSM-5 (Diagnostic and Statistical Manual of Mental Disorders) criteria by psychiatrists who were unaware of the patients’ HIV viral load result. Demographic data including age, gender, the most severe CDC clinical classification ever experienced, duration of treatment, most recent HAART regimens, CD4, viral load, level of education, parental status and type of caregiver were collected. The most recent CD4 and viral load were the results within 3 to 6 months of psychologic evaluation. Virologic failure was defined as plasma HIV-1 RNA > 1000 copies/ml. Factors associated with virologic failure were evaluated by using univariate and multivariate analysis with level of significant at p<0.05.

**Results:** There were 82 patients enrolled in this study. The median age was 17.5 years old (IQR 14.9-18.9) and 46 (56.1%) were male. The median duration of HAART was 11.9 years (IQR 9.5-14.4) and the most recent median CD4 count was 634 cell/mm3(IQR 465-747). The HAART regimens included first line, second line and third line in 48.8 %, 32.9% and 18.3%, respectively. The highest level of education included primary school, secondary school and higher than secondary school in 18.3%, 73.2% and 8.5%, respectively. The most severe CDC clinical classification ever experienced were N/A, B and C in 28.1%, 52.4% and 19.5%, respectively. Nine patients had virologic failure (median 15829, IQR 3680-90295, min-max 1034- 472447).

Fourteen patients (17%) were diagnosed as having depressive disorders which included major depressive disorder (1case), persistent depressive disorder or dysthymia (7 cases), 3 cases each of other specified depressive disorder and unspecified depressive disorder. Variables that were found to be associated with virologic failure by univariate analysis were education higher than secondary school and depression, OR 6.75 (95% CI, 1.21-37.63) and 8.89 (95% CI, 2.01; 39.38), respectively, but the OR were 3.75 (95% CI, 0.12-120.58) and 11.38 (95% CI, 0.91-142.05), respectively by multivariate analysis.

Three patients with depression were treated with antidepressant and all had VLs less than 1000 copies/ml at their next visit.
Conclusion: Depression is not uncommon in HIV-infected adolescents. When an HIV-infected adolescent started to have virologic failure despite previous history of good virologic response, a physician should be aware of mental disorder especially depression and should seek appropriate intervention.

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Virological failure and treatment switch after ART initiation among patients with and without routine viral load monitoring in Asia


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Background: The HIV treatment cascade is often used to assess the effectiveness of HIV treatment programs. Viral load (VL) testing is commonly used to monitor treatment response and switching classes of antiretroviral therapy (ART). Annual VL testing is not routinely performed among people living with HIV (PLHIV) in several countries in the Asia-Pacific region with limited resources. We aimed to assess the effect of routine VL testing (RVL) on first-line virological failure (VF), and to determine factors associated with switching major drug classes after treatment initiation.

Methods: Among 21 sites from the TREAT Asia HIV Observational Database (TAHOD), PLHIV ≥ 18 years initiating ART after 2003 were included and followed-up during first-line therapy. To determine sites with RVL testing, we calculated the average number of VL tests per patient per year between the date of ART initiation and the recent visit date. If the median of the average number of VL tests was above 0.80 per patient per year, the site was classified as RVL sites and a median of less than 0.80 was classified into the no routine VL testing group (NRVL). Factors associated with VF were analysed using generalized estimating equations with Poisson distribution. VF was defined as VL ≥ 1000 copies/mL during first-line therapy. Factors for switching major drug classes after ART initiation were analysed using competing risk regression with death and lost to follow-up considered as a competing events.

Results: Of 5147 persons starting ART after 2003, 70% were male, median age at ART initiation was 35 years, and 88% were on NNRTI-based regimen. 3095 persons (60%) were from 12 RVL testing sites and 2052 persons (40%) from 9 NRVL testing sites. The median follow-up was 7 (Interquartile range,IQR 4-10) years. The median pre-ART CD4 count in patients from RVL sites was higher compared to NRVL sites (150 vs 131 cells/mm3, P <0.001). Overall, 805 experienced VF at a rate of 2.51 [95% confidence interval (CI) 2.35-2.69] per 100 person-years (PY). VF was more frequent at NRVL sites [Incidence rate ratio, aIRR 1.94 (95% CI 1.65-2.27)] compared to RVL sites. Other factors associated with an increased rate of VF were high-income countries, age < 50 years, heterosexual mode of HIV exposure, unknown pre-ART CD4 and year of ART initiation. A total of 847 (16%) patients switched regimen at a rate of 2.52 [95% CI 2.35-2.69] /100 PY. The switching rate among patients at RVL sites was 3.48 /100PY (95% CI 3.24-3.75) compared to 1.07 /100PY (95% CI 0.91-1.26) at NRVL sites (P <0.001). Patients at sites with RVL monitoring were at higher risk of switching compared with those at NRVL sites [Sub-hazard ratio, aSHR 1.68 95%CI (1.36-2.08)]. Other factors associated with increased risk of switching were high-income countries, age < 50 years, heterosexual mode, and initiating with PI-based regimen.
Conclusions: PLHIV from NRVL sites had a higher incidence of VF, reflecting possible targeted VL testing within these sites. However, switching of drug classes was less likely to occur in NRVL sites, suggesting that second-line ART options may be limited.

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Not a walking piece of meat with disease”: becoming undetectable as status achievement among HIV-positive gay, bisexual and other men who have sex with men in the U=U era

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Background: Gay, bisexual, and other men who have sex with men (GBMSM) represent a key population disproportionately affected by HIV in various settings. HIV remains heavily stigmatized globally, which may subsequently negatively impact the quality of life of people living with HIV. While past studies have investigated how individuals negotiated their identities following their diagnoses of HIV, an emerging area of inquiry considers the implications of viral suppression, or becoming undetectable, as a status achievement on identity and well-being in an undetectable=untransmittable (U=U) era. This study attempts to interrogate the role and meanings of becoming undetectable as a status achievement, and its subsequent impact on the quality of life among GBMSM living with HIV.

Materials and Methods: We conducted 24 semi-structured in-depth interviews with a purposively recruited sample of GBMSM living with HIV in Singapore from October 2017 to July 2018. Topics explored included experiences surrounding their diagnosis of HIV, linkage to care, with formal and informal support systems, and with healthcare institutions and staff. Interviews were audio-recorded, transcribed, coded, and analyzed through thematic analysis adopting elements of the grounded theory approach.

Results: Participants viewed viral suppression as a clinical objective, and contrasted this with becoming undetectable as an identity and aspiration in the U=U era. Many participants saw becoming undetectable as a turning point for them post-diagnosis, and expressed a sense of achievement upon attaining the status. Participants shared that being undetectable was associated with several positive outcomes in the context of their identities; firstly, becoming undetectable was a symbol of health that served to counter narratives and discourses of illness and death surrounding HIV, and was perceived to be the best stage of health one could achieve in the absence of a cure; secondly, it symbolized personal and social responsibility for participants, and presented opportunities to engage in HIV-related advocacy; thirdly, it meant that they could have romantic or sexual relationships with a sense of equity; and finally, it meant that they were liberated from an illness experience.

Conclusions: The results of this study underscore the significance of achieving an undetectable viral load, or becoming undetectable, among GBMSM living with HIV. Given the counter-narratives and positive impact that undetectability as a status achievement offers GBMSM living with HIV, greater efforts need to be made by public health institutions and governments to endorse U=U as an evidence-based paradigm, and lead countries and communities towards destigmatizing HIV among GBMSM.
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The outcomes of antiretroviral treatment among male HIV-infected by different sexually transmission in China: A retrospective cohort study

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Background: Transmission through sex has been rising exponentially in china, but it is lack of comparison of outcomes of ART between different sexually transmission.

Methods: A nationwide retrospective cohort study was conducted and the data collected from the China National Free Antiretroviral Treatment Program. The patients older than 15 years between January 1, 2010 and December 31, 2010 initiating standard antiretroviral therapy were included and followed up to Dec 31, 2015. Kaplan-Meier analysis and COX proportional hazard regression model was used to evaluate the differences of survival time and retention in treatment, and Logistic regression models was applied to estimate the impact of virological suppression between HIV-infected patients by male-to-male sexual contact and heterosexual contact.

Result: 20273 male patients (5428(26.8%) Male-to-Male sexual contact and 14845(73.2%) heterosexual contact) met eligibility criteria. HIV-infected patients by heterosexual contact were significantly more likely to death (adjusted hazard ratio [aHR] 2.77, 95%CI: 2.32-3.31, p<0.001) and loss to follow-up (aHR 2.46, 95%CI: 2.19-2.76, p<0.001) than by male-to-male sexual contact in ART. Also, HIV-infected patients by heterosexual contact were less likely to achieve virological suppression than by male-to-male sexual contact at 12 months after initiating antiretroviral treatment (aOR 0.71, 95%CI: 0.63-0.79, p<0.001).

Conclusion: In China, HIV-infected patients by heterosexual contact were significantly more likely to death, loss to follow-up and less likely to achieve virological suppression than by male-to-male sexual contact in ART. Indicating we should pay close attention to socio-behavioral factors of patients in ART. Future studies could take more socio-behavioral factors into analysis to clarify the influence factors.

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Antiretroviral Therapy Dropout among People Living with HIV in Yunnan, China, 2010-2017

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Background: Antiretroviral therapy (ART) has been rapidly scaled up as recent HIV treatment guidelines have recommended universal ART, but treatment dropout occurs across populations and geographic regions. This analysis aims to describe and analyze factors associated with ART dropout among people living with HIV in Yunnan, China.

Material & Methods: In this observational study, longitudinal data from January 1, 2010 to December 31, 2017 were extracted from the China National Free Antiretroviral Treatment program, including demographic and clinical characteristics at baseline and regular follow-up visits. A Cox proportional hazards model was used to identify factors associated with dropout.

Results: This analysis included 64,201 people (≥15-year-old, male: female=1.48:1) initiating ART between 2010-2016, 42,749(66.58%) were 31-60-year-old, 43,191(67.26%) were married or cohabitating, 48,664(75.80%) were heterosexual, and 20,691(32.23%) had a CD4 count <350 cells/μL. Out of a total 8,921(13.90%) patients dropped out, 50% occurred within the first year of treatment initiation and declined in later years, 2,939 cases(32.94%) in the first 6 months and 16.69% in months 7-12. With 204,711.3 person-years(PY) of follow up, the overall dropout rate was 4.36 per 100 PY. Male sex, single status, history of intravenous drug using, higher CD4 count (≥350 cells/µL), and longer time from diagnosis to treatment (≥3 month) were associated with increased risk of ART dropout [male:aHR=1.21, 95% CI=1.15-1.27; no partner/spouse: aHR=1.39, CI=1.33-1.45; IDU: aHR=2.03, CI=1.92-2.15; baseline CD4 350-500 cells/ml:...
aHR=1.19, CI=1.13-1.26; CD4>500: aHR=1.28, CI=1.20-1.36; time from diagnosis to ART 3-12 months: aHR=1.24, CI=1.18-1.31; ≥12 months: aHR 1.06, CI=0.91-1.22. Older age (30-60 years old, aHR=0.77, CI=0.73-0.81), WHO III/IV (aHR=0.84, CI=0.80-0.89) and gays (aHR=0.41, CI=0.35-0.48) lowered the risk of ART dropout. The dropout predictors stratified with the ranges of baseline CD4 count <350, 350-500, >500 were different, but all showed that aged 30-60 year-old and being gays lowered risk of attrition, and without partner/spouse and transmitted by intravenous drug use increased the risk to dropout.

Conclusions: Targeted interventions are required to address risk factors for dropping out of treatment, particularly for people with a history of injection drug use, those who are younger, and those who choose to wait longer to initiate ARVs after diagnosis. Immediate initiation of ARV is not only clinically-indicated to maintain strong immune function and health, but also is a sound strategy to reduce the risk of falling out of care.

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Assessment of HIV care continuum in Korea using the National Health Insurance System data

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Background: Antiretroviral therapy (ART) has been shown to significantly reduce the likelihood of transmission to other people by reducing the amount of virus in the body as well as promoting the health of people living with HIV/AIDS (PLH). The purpose of this study was to assess the HIV care continuum of Korea using the National Health Insurance System (NHIS) data.

Material & Methods: From 2006 to 2015, ART prescription/laboratory test claim data and enlisted accompanying comorbidities were extracted from the NHIS database. Utilizing these data, study cohort of people receiving ART prescription with the International Classification of Diseases-10 code of B24 was constructed and proportion of PLH on ART among those who registered to Korea Centers for Disease Control and Prevention (KCDC), HIV viral load testing, prescription trends of ART, proportion of days covered (PDC) of ART, and accompanying comorbidities were reviewed. Factors related with PDC>90% was also investigated among demographic factors, ART prescription, and accompanying comorbidities.

Results: During the observation period, study cohort of individuals receiving ART prescription with the diagnosis code of HIV infection increased from 2076 in 2006 to 2015 and mean age also increased from 42.9 to 44.6. While mean age of male was greater by 0.1 year in 2006, females were older by 4.2 years in 2015. The proportion of PLHs who received ART prescription among those who officially reported as PLH to the KCDC increased from 55.4 to 87.6% during the study period. Regular measurement of HIV viral load, more than two times per year at least sixty days apart, was considered as equivalent of viral suppression and it was 73.6% among study cohort in 2015 while it was 64.1% in 2010 (The HIV viral load test had not been officially registered to NHIS until July 2009). The median value of ART PDC increased from 92.3 (IQR 71.5, 100) to 99.2% (IQR 92.3, 102.5) during the study period and the proportion of individuals with PDC>90% increased from 54.3 to 78.2%. Regarding the prescription trends of ART, PI to NNRTI ratio was relatively consistent between 1.7 and 2.3 during the study period besides NRTIs. However, INSTI became the most frequently prescribed antiretroviral drugs in 2015 (42.6%) and 53.5% were single tablet regimen (STR) among INSTIs. The commonly accompanying comorbidities were hyperlipidemia (55.7%), osteoporosis (16.3%), hypertension (15.7%) and diabetes (13.7%) in 2015. The proportion of PLH with two or more comorbid conditions increased from 22.0 to 31.6% during the study period. Age more than 30 year old, being under coverage of regular medical insurance, hyperlipidemia of accompanied comorbidity, and taking STR were independently associated with PDC>90%.

Conclusions: The proportion of PLHs who received ART prescription and median PDC of ART increased during the last 10 years. However, proportion of individuals with PDC>90% was 78.2% in 2015 and there are still much room for improvement in the aspect of adherence optimization.
The trend of late presenters’ entry to HIV care in in Non-governmental Hospital in Cambodia

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Background: HIV was known as a major public health concern globally. It is noted that HIV infected patients continued to die and hospitalize from HIV related diseases, mostly because of their HIV advanced stage. With the universal access of ART and national strategies toward Test and Treat, there was a very limited data about the trend of late presentation of HIV infection in Cambodia. We aim to describe the proportion and trends of late HIV patients at care entry point over three study periods: 2003-2007, 2008-2012 and 2013-2018.

Methods: We conducted a retrospective descriptive analysis of HIV program data in a non-governmental hospital in Phnom Penh, Cambodia. We included all ART naïve adult (age ≥ 18 years old) who enrolled in HIV program from 1st January 2003 to 31st December 2018 into the analysis. According to WHO guideline, HIV late presenter or advanced HIV disease is defined as the presence of CD4 cell count < 200 cell/ mm3, or WHO clinical stage 3 or 4 event. Data was analyzed by using STATA version 13.

Results: From 2003 to 2018, 3449 HIV patients were enrolled. Among those, 1307 (38%), 1288 (37%) and 854 (25%) were enrolled in the period of 2003-2007, 2008-2012 and 2013-2018 respectively. There were 75% (977/1307), 71% (917/1288) and 71% (606/854) presented with advance HIV disease with CD4 cell count < 200 cell/ mm3, or WHO clinical stage 3 or 4 event. Moreover, Opportunistic infections (OIs) episode were increased in period 2003-2007 then declined from 2008-2012 and in 2013-2018, 1253/2904 (43%), 1084/2904 (37%) and 567/2904 (20%) respectively (P<0.001). Compare to non-late, the late presenter were 963/1253 (77%), 839/1084 (77%) and 492/567 (87%) the about respective period.

Conclusion: Late presenter was remain high in the three period of study. High episode of OIs were high among late presenter. More effort need to be done to improve health provider initiated testing and counseling approach and linkage system from HIV testing to ART care among PLHIV to prevent severe OIs and death.

Delays in Seeking Health Care among Gonorrhea Patients in Guangdong, China: A Cross-sectional Study

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Background: Delays in seeking health care can increase transmission risk and worsen sequelae of gonorrhea infection. We aim to investigate the delays in seeking health care and its correlates among patients with gonorrhea in Guangdong, China.

Methods: A cross-sectional study was conducted among patients with gonorrhea who presented to health clinics in 21 cities of Guangdong Province from June 1 to July 30, 2017. All participants completed a structured questionnaire that included information about socio-demographics, sexual behaviors, clinical symptoms associated with care seeking, and health-seeking behaviors. A delay in seeking health care was defined as seeking health care after seven days of notified symptoms.

Results: We enrolled 1808 symptomatic patients with a mean age of 31 years (±10 years) and most were men (1665, 97%). The median time in health care seeking was 3 days (interquartile range 2 to 6 days), with 18% of participants reporting delays in
seeking health care. Patients who delayed in seeking health care were significantly more likely to have sex after having symptoms and before seeking health care, either with a regular partner (OR=8.80, 95%CI 6.19-12.61) or with a casual partner (OR=9.39, 95%CI 5.83-15.13). After adjusting for covariates, delays in health care seeking were significantly associated with being female (OR=2.54, 95% CI 1.75-3.68), inconsistent condom user with a regular partner (OR=1.51, 95%CI 1.08-2.11), and clients of sex worker from high-tier venues (OR=1.80, 95%CI 1.10, 2.96).

Conclusion: A significant proportion of patients from Guangdong with symptomatic gonorrhea reported delays in seeking healthcare and ongoing sexual activity despite symptoms. Strategies to improve timely management in key populations may help reduce onward transmission.

Variability of plasma level of integrase inhibitors in virologically suppressed HIV-infected patients

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Background: Currently, integrase strand transfer inhibitor (INSTI)-based regimens are recommended as the first-line antiretroviral therapy for the treatment of HIV-1 infection, due to their potent antiviral activity and limited drug-drug interactions. INSTIs generally display favorable pharmacokinetic profiles. This study aimed to determine the plasma concentration of INSTIs in virologically suppressed HIV-infected patients, and to examine their inter-individual variability compared to non-nucleoside reverse transcriptase inhibitor (NNRTI)-based and protease inhibitor (PI)-based regimens.

Methods: This retrospective study involved the therapeutic drug monitoring (TDM) of antiretrovirals in HIV-infected patients who had achieved optimal virologic control with undetectable viral load levels. Spot plasma samples were taken at pre-dose or mid-dose from patients on INSTI – either raltegravir (RGV), elvitegravir (EVG) or dolutegravir (DTG) based, and others on efavirenz (EFV) or atazanavir/ritonavir (ATV/r)-based regimen, during routine clinical visits. Quantification of plasma antiretroviral concentrations were determined by high performance liquid chromatography. Inter-individual plasma concentration variability was evaluated and expressed as the coefficient of variation (CV). For patients who had switched regimen and undergone successive TDM, inter-individual variability was assessed based on the measurement of the first antiretroviral compound, i.e. either an INSTI or EFV or ATV prescribed.

Results: Overall, 1,228 patients were included: 595 (48.5%) initiated on INSTI-based regimen (106 were treated with RGV, 258 with EVG and 231 with DTG), 523 (42.6%) on EFV-based regimens, and 110 (9%) on ATV/r-based regimens. The mean (± standard deviation) plasma concentrations of RGV, EVG, and DTG were 1.37 µg/mL (±1.66), 1.23 µg/mL (±0.76), and 4.11 µg/mL (±2.34), respectively. Levels below minimum concentration (Cmin) were observed in 58 (9.7%) patients on INSTI, compared to 89 (17%) and 24 (21.8%) for EFV- and ATVr-based regimen respectively. Inter-individual variability was lower for DTG and EVG (CV 56.9% and 62.1% respectively) but not RGV (CV 121.4%). Patients receiving non-INFSt-based regimens gave a higher variability of antiretroviral level (CV 77.0% for EFV and 84.1% for ATV/r).

Conclusions: Variability of plasma INSTI concentration was generally lower compared to NNRTI or PI-based regimens. Among the 3 INSTIs, RGV in virally suppressed HIV-infected patients was characterized by higher inter-individual variabilty, whereas DTG and EVG demonstrated less inter-individual variations and compared favourably with NNRTI- and PI-based regimens. The pharmacological profile of antiretrovirals varled both within and between classes, and should be taken into consideration when interpreting the results in clinical contexts.
Presence of sexual transmitted infection has low sensitivity to identify candidates for PrEP among MSM in Tokyo

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Background: Identification of people at substantial risk of acquiring HIV is crucial for preexposure prophylaxis (PrEP) implementation. We evaluated an HIV risk screening tool, HIV Incidence Risk Index for Men who have sex with men (HIRI-MSM) and presence of sexual transmitted infection (STI) as indicators to identify optimal candidates among a MSM cohort, Sexual Health Clinic (SHC) established in Tokyo, in January 2017.

Method: Non HIV-infected MSM with aged 16 and over were included in SHC. The participants were examined HIV infection and STI including syphilis and rectal Chlamydia trachomatis and Neisseria gonorrhoeae every 3 months. Incidence rate of HIV and STI were evaluated as of December 2018. As indicators, sensitivity and specificity of HIRI-MSM score according to >9, >14, >19, >24, and presence of rectal STI and status of syphilis for HIV seroconversion were evaluated.

Results: 408 MSM were included into SHC as of September 2018. Of 408 MSM, 11 were diagnosed with HIV infection at the enrollment and excluded from the study. Of 397 subjects, 326 were followed at least twice, with 266.1 person-years during the study period[mean age (SD), 33.8 years (9.8)]. HIV incidence was 3.83 cases per 100 person-years (10 seroconversions). MSM with HIRI-MSM score >9, >14, >19, >24 were 83.7%, 72.7%, 21.2%, 8.8%, respectively. Prevalence of rectal STI and status of syphilis for HIV seroconversion were evaluated.

Results: 408 MSM were included into SHC as of September 2018. Of 408 MSM, 11 were diagnosed with HIV infection at the enrollment and excluded from the study. Of 397 subjects, 326 were followed at least twice, with 266.1 person-years during the study period[mean age (SD), 33.8 years (9.8)]. HIV incidence was 3.83 cases per 100 person-years (10 seroconversions). MSM with HIRI-MSM score >9, >14, >19, >24 were 83.7%, 72.7%, 21.2%, 8.8%, respectively. Prevalence of rectal STI at the enrollment was 17.5%. Prevalence of active and previous syphilis infection were 3.3% and 18.9%. The sensitivity/specificity of HIRI-MSM score >9, >14, >19, >24 for HIV seroconversion was 90/16.5, 80/27.5, 50/79.7, 40/92.1, respectively. On the other hand, the sensitivity/specificity of rectal STI, active and previous syphilis for HIV seroconversion was 30/82.9, 30/79.7 and 20/97.5, respectively. Although active syphilis and HIRI-MSM score >14 were significantly associated with HIV seroconversion, these sensitivity were low.

Conclusion: Presence of STI had low sensitivity to identify candidates for PrEP among MSM in Tokyo. MSM who consider themselves at substantial risk and want to take PrEP should be included into PrEP services regardless of presence of known risk factors in the implementation of PrEP in Japan.

Post-exposure prophylaxis: Uptake over a 5-year period at the largest HIV testing clinic in Thailand

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Background: Post-exposure prophylaxis (PEP) has been an effective additional tool to prevent HIV acquisition after risk has occurred. Thailand’s first-line PEP regimen per national guidelines consists of a combination of tenofovir disoproxil fumarate, emtricitabine and rilpivirine (TDF/FTC/RPV). This study aims to observe the proportions of clients retaining in care after PEP completion and seroconversions among those who came back for HIV testing at the Thai Red Cross Anonymous Clinic (TRCAC). TRCAC is the largest HIV testing clinic in the Thailand which also provides fee-based combination HIV prevention services and sexually transmitted infection screening and treatment.

Material and Methods: Clients who came in for PEP services at the TRCAC during January 2014 – December 2018 were evaluated. PEP was offered if any risks of HIV acquisition within 72 hours were identified. Counselling was done per national guidelines, stressing the importance of adherence to PEP and HIV testing at day 0 and day 60 after PEP completion. Pre-exposure prophylaxis (PrEP) was introduced into the TRCAC in December 2014. Baseline demographics were self-completed during registration. Descriptive analysis was conducted to
assess the proportions of clients coming back for HIV testing and proportion of HIV seroconversions.

**Results:** The number of PEP users increased from 21 in 2014 to 558 in 2015, 1,794 in 2016, 2,785 in 2017 and 3,889 in 2018. Among a total of 9,047 individuals who were prescribed PEP, 52% were MSM, 36% heterosexual male, 12% female, and 0.98% undefined gender. The majority (50%) aged 26-35 years, followed by 19-25 (27%), >35 (25%) and ≤18 (0.72%) years. Of all clients, 5,499 (61%) came back for follow-up visits within 360 days after PEP completion. Of 5,499 clients, 4,584 (83%) had their first follow-up visits 0 to 60 days after PEP completion, 610 (11%) 61 to 180 days, and 305 (5.5%) 181 to 360 days.

Among 5,499 clients who came to follow up within 360 days after completion, HIV seroconversion was presented in 14 clients (0.25%). Of these 14 cases, 1 individual (7.1%) had HIV seroconversion within 60 days after PEP completion, 7 individuals (50%) upon 61 to 180 days after, and 6 individuals (43%) upon 181 to 360 days after. Moreover, 7 PEP clients were found to have HIV seroconversion upon their first follow-up visits that were more than 360 days after PEP completion. All seroconverted individuals were MSM.

**Conclusion:** An observed exponential increase in PEP use over the most recent 5-year period at the TRCAC is suggestive of increased PEP awareness and may be related to the introduction of our fee-based PrEP-30 service in December 2014. Just over half of completed PEP users came back for HIV testing which points to the major gap in retaining individuals at high risk of HIV infection in HIV testing and prevention services. Only 0.25% of those retained in services seroconverted within a year. Using TDF/FTC/RPV PEP regimen, we only observed one case of HIV seroconversion which occurred within two months after PEP completion and could be PEP failure.

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**Awareness and possible cost of out-of-pocket for pre-exposure prophylaxis among HIV-negative MSM cohort in Japan**

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**Background:** Pre-exposure prophylaxis (PrEP) is strongly recommended for people at substantial risk of HIV acquisition. However, who should pay for PrEP and how much for are still big issues. We have established an HIV-negative MSM cohort at National Center for Global Health and Medicine in Tokyo since 2017. This study aimed to explore level of the knowledge and possible cost of out-of-pocket for PrEP in this cohort.

**Methods:** To conduct face-to-face interviews, we used a semi-structured standardized questionnaire. Willingness of PrEP was divided into 4 categories: “Yes definitely”, “Yes probably”, “No probably” and “No definitely”. Possible cost of self-payment for PrEP was set three situations. 1) 515 USD every 3-month including PrEP monitoring fee of 110 USD/3 months. This price is equal to that of the branded TVD in Japan. 2) 380 USD every 3-month including the same monitoring fee. This price is equivalent to standard one of generic TVD. 3) 245 USD every 3-month including the same fee. This price is the cheapest one among generics. When participants had any questions during the interviews, we provided the information about PrEP.

**Results:** A total of 234 MSM completed the interviews from November 2017 through November 2018. The median age was 35 years (range: 18-70). Among participants, 60.7% had the proper knowledge that PrEP was a preventive method with antiretroviral drugs and 65.0% had positive thought of PrEP. Among those who had the positive thought, 15.1% was able to manage 515 USD for PrEP every 3-month, 30.9% was able to pay 380 USD, and 77.6% was 245 USD. Some MSM had a fear of low quality upon too cheap generics.

**Conclusions:** Only 60% of MSM had the proper knowledge about PrEP in our cohort. In order to
expand PrEP, it is necessary to provide more information about PrEP and reduce the self-payment cost to less than 245 USD every 3-month in Japan. Endorsement of quality of the generic is warranted.

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Dolutegravir plus Tenofovir Disoproxil Fumarate/Emtricitabine as HIV post-exposure prophylaxis: efficacy and safety results from real world study

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Objective: Dolutegravir (DTG) plus Tenofovir Disoproxil Fumarate / Emtricitabine (TDF/FTC) has been recommended as non-occupational HIV post-exposure prophylaxis (PEP) regimen since 2016 in US CDC guideline. But few data have been reported in China. We evaluated the tolerability, treatment completion and occurrence of HIV seroconversion associated with this regimen in occupational and non-occupational PEP in real world.

Methods: We conducted an observational, prospective, non-randomized study in Kunming third people’s hospital—the biggest HIV treatment site in Kunming. This study involved adults with HIV exposure risk from 1st Jan 2017 to 7th Jan 2019. Adults requiring PEP according to US CDC guideline were prescribed DTG+TDF/FTC two pills once a day for 28 days. Gender, age, occupation, education level, marital status, exposure mode, exposure source, exposure duration to the beginning of medication, duration of medication, and HIV screening results at the time of exposure were collected at the first counseling. Adverse events and HIV seroconversion results were collected after 1 month/ 3 months/ 6 months of exposure.

Results: 197 adults were prescribed PEP. There were 176 males (89.3%) and 21 females (10.7%). The median age was 29(25,34) years old, the maximum age was 62, and the minimum age was 16. Three were occupational exposure; 172 were sexual exposure [133 (77.3%) heterosexual and 39 (22.7%) MSM]; 6 were mucosal exposure; 16 were injection syringe exposure. Median exposure duration to the beginning of medication was 24 (12,30) hours. All exposed adults were initially HIV negative at exposure. 181 adults (92%) completed the 28 days PEP regimen, and 2 (1%) stopped PEP after one day because the source person was HIV uninfected, 5 (3%) were lost to follow-up and 8 (4%) didn’t continue to take pills after the first counseling (for personal reasons, not bad tolerance). All the 6 adults with HIV positive exposure source completed 28 days treatment, and all of them were HIV negative after 1 month and 3 months; 4 were HIV negative after 6 months. Two of these 6 adults haven’t done test for 6 months’ follow up yet,. Among the 175 adults with unknown HIV infection status exposure source, 119 of them completed HIV antibody test at 1st month of exposure, 89 completed at 3rd month of exposure, and 63 completed at 6th month of exposure, none of the HIV seroconversion occurred. Overall, 10.2% of participants declared at least one adverse event, mostly were gastrointestinal reaction (3.6%), dizziness (2.6%), fatigue (2.0%). All of them were grade I and transient. All the adverse events were recovered with symptomatic treatment, or without special treatment.

Conclusion: DTG+TDF/FTC were effective, and well tolerated for HIV post-exposure prophylaxis.

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HIV/STI testing among men who have sex with men in Hong Kong

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Background: While previous studies had investigated factors associated with HIV testing among men who have sex with men (MSM), comparison between HIV testing alone and HIV/STI (sexually transmitted infection) testing have not yet been examined. This study aims to evaluate the HIV/STI testing pattern and its implications among MSM in Hong Kong.
Methods: Prevalence and Risk behavioural Survey of MSM (PRiSM) was a community-based cross-sectional survey conducted in 2017 by the Hong Kong Government's Department of Health. Individual level data were retrospectively accessed, which included socio-demographics, recent high risk sexual behaviours, HIV and STI testing, pre-exposure prophylaxis (PrEP) usage, and results of HIV urine test. MSM recently tested for HIV alone were compared with those tested for both HIV and STI in simple logistic regression model.

Results: A total of 3044 MSM who were sexually active in the preceding 6 months were included in the analysis. Among them, 84% and 99% have ever tested for HIV and STI, respectively. In the preceding one year, 40% of MSM were tested for both HIV and STI, 19% for HIV alone, and 4% for STI only. HIV self-testing was reported by 9%, of which 2% have self-tested for both HIV and STI. After excluding self-reported HIV infection, 1688 MSM were included in analysis. MSM who had recently tested for both HIV and STI were more likely to have diagnosed STI in the past year – syphilis (OR=4.33), gonorrhoea (OR=4.14), chlamydia (OR=4.01), and genital wart (OR=4.59), but not HIV. There was no association between different forms of HIV/STI testing and the practice of unprotected anal sex. A total of 200 (12%) MSM had engaged in chemsex, the practice of which was positively associated with HIV self-test (OR=1.93). Chemsex engagement in the past 6 months was associated with both recent HIV and STI testing. PrEP was reportedly used by 88 (8%) MSM, who were more likely to have been tested for both HIV and STI (OR=2.01).

Conclusions: In Hong Kong, varied forms of HIV/STI testing was common among MSM especially those with high risk sexual behaviours, including chemsex. HIV/STI testing provided an opportunity for MSM to be targeted for implementing interventions for achieving HIV prevention.

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Genetic connectedness by segment of HIV sequence and its association with sex-networking profiles

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Background: The pattern of HIV transmission varies with the network characteristics of people exposed to the virus and their practice of risk behaviours. Considering the growing number of HIV recombinations, we aimed to identify possible genetic connection patterns and their associations with sex networking profiles.

Methods: The first 1400bp of HIV pol sequences collected from newly diagnosed patients from all four HIV specialist clinics in Hong Kong between 2016 and 2018 were analysed. With a sliding window of 300bp shifted by 100bp, aligned sequences were subsetted and TN93 pairwise distance was calculated for each window. Pairs with <1.5% distance were used to generate a network for each window. A separate network was constructed using the entire 1400bp-sequence. Men who have sex with men’s (MSM) sex networking and risk factors in the year before HIV infection were tested with their genetic connections.

Results: Of 438 sequences analysed, 344 (79%) were connected with another in at least one of twelve 300bp-window. Median number of nodes and density of the 300bp-window-network was 232 (interquartile range [IQR] 224-244) and 3% (3-5%), respectively. MSM were more likely be connected in 10 out of 12 windows. MSM who used an international app for sex networking were connected in all windows while mainland Chinese app users were less likely to be connected in 6 windows. No statistical significance was found between MSM who frequented sauna or not in the
Diversity of HIV-1 subtypes in Asian part of Russia

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Background: During the last 30 years HIV-1 has been spreading rapidly in the Russian Federation. The dominating sub-subtype A6, recently known as A1 variant FSU or IDU-A, was originally distributed among injecting drug users, but later began to spread through sexual contacts. Subtype B viruses circulated among different risk groups in Russia with most of them found in MSM group. In the last 15 years we observed the circulation of recombinant forms CRF02_AG and CRF63_02A. The aim of this study was to analyze the HIV-1 subtypes diversity in Asian part of Russia in 2009-2019.

Methods: In this work we analyzed 1038 HIV DNA samples collected with informed consent in 2009-2019 in 11 cities of Asian part of Russia (Vladivostok, Khabarovsk, Barnaul, Yuzhno-Sakhalinsk, Nizhnevartovsk, Surgut, Khatyn-Mansiysk, Krasnoyarsk, Irkutsk, Blagoveshchensk, Noyabrsk). The collection included 43.7% IDUs, 39.9% heterosexuals, 1.25% MSMs and 5.1% cases with unknown route of transmission. The sequences of pol gene fragment coding protease and part of reverse transcriptase were obtained by ViroSeq HIV-1 genotyping System v. 2.0 or by in-house method. Genotyping analysis was carried out by COMET HIV-1/2v.2.3 (https://comet.lih.lu/). For phylogenetic analysis, we obtained GenBank reference sequences of pol gene fragment both worldwide prevalent and sequences from bordering countries such as China, Japan, Kazakhstan and Korea. Phylogenetic analysis was carried out by MEGA X (https://www.megasoftware.net/) and IQ-TREE (http://www.iqtree.org/).

Results: The distribution of subtypes was as follows: sub-subtype A6 – 76.9% (49.3% IDUs and 43.7% heterosexuals), subtype B – 7.1% (45.4% IDUs, 30.3% heterosexuals and 24.3% MSM), CRF63_02A – 7.2% (46.1% IDUs and 48.6% heterosexuals), CRF02_AG – 0.48%, and other subtypes including URFs resulted from the recombination between A6, CRF02_AG and CRF63_02A.

The phylogenetic analysis demonstrated that the samples formed the clusters within their subtypes. Samples of sub-subtype A6 formed the common cluster with other sequences from European part of Russia. Samples of subtype B clustered with sequences typical for Europe and America but not Japan.

Different cities were characterized by different HIV-1 subtypes prevalence. In Surgut, Khanty-Mansiysk, Irkutsk and Nizhnevartovsk only samples of sub-subtype A6 were found. In Vladivostok subtype B had the dominant position, with the main risk group being IDUs but not MSM. The variant of subtype B found in Vladivostok was typical for IDUs in Ukraine, and not for MSM in Russia. No HIV strains characteristic for bordering countries such as China, Japan and Korea were identified. The increase of the number of HIV infection cases caused by CRF63_02A recombinant was noted. The same situation was also characteristic for the European part of Russia, where the increase of the HIV recombinant populations was also observed.

Conclusion: The results demonstrated a wide variety of different subtypes in the Asian part of Russia. Almost all viral variants were characteristic for the European part of Russia. There were no HIV strains characteristic for bordering countries such as China, Japan and Korea, with the exception of the
HIV risk behaviors and its correlates among street adolescents in Kathmandu, Nepal

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Background: Street adolescents are considered vulnerable to sexually transmitted infections (STIs), including Human Immunodeficiency Virus (HIV) infection, due to their day-to-day involvement in risky behaviors. Despite rise in the number of street children in resource-constrained settings such as Nepal, very little is known about the prevalence and determinants of HIV risk behaviors among this population. This study was conducted to determine the prevalence of HIV risk behaviors among street adolescents and to identify the factors associated with the risky sexual behaviors.

Material and Methods: A community based cross-sectional behavioral survey was conducted among 135 street adolescents (aged 10-19 years) of Kathmandu. Hotspots, locations where street adolescents frequently gathered, were identified by coordinating with an organization called Child Workers in Nepal (CWIN). With the help of community mobilizers of CWIN, street adolescents were approached and recruited in the study. Data were collected via interview using semi-structured questionnaire. The questionnaire included questions on socio-demographics, family background, survival activities, sexual risk behaviors, substance use, and knowledge on HIV. Prevalence of risk behaviors were assessed using descriptive statistics and binary logistic regression was applied to assess the relationship between predictor variables and prevalence of sexual risk behaviors. Data were analysed using Statistical Package for Social Sciences (SPSS) version 20.0. Ethical approval was obtained from Institutional Review Board of Kathmandu University School of Medical Sciences.

Results: Among 135 sample included in the study, 103 (76.3%) were males. One-third of participants were involved in at least one type of survival activities, such as rag picking (35.6%), begging (25.6%), and working as porters (16.7%). Nearly 89% were smokers, 54.8% consumed alcohol, and 85.2% had used drugs at least once in their lifetime. The mean age of sexual debut was 12.8 years for males and 13.9 years for females. Overall, 63.0% had initiated sexual intercourse and among them, 80.2% used condom inconsistently, 69.4% had multiple sexual partners, 24.7% had exchanged sex for money, and 82.4% had unsafe sex in past 30 days. Male-to-male sexual relationship was reported by 6.8% of boys and 13.6% reported having both males and females as their sexual partners. The proportion of respondents having correct knowledge on modes of HIV transmission was 59.3%. Considerable levels of HIV risk behaviors were found, including injecting drug use among 19.3% of the sample and 60.7% were found to have at least one risky sexual behavior. In multivariate analysis, age, relationship status and intravenous drug use emerged as significant predictors of risky sexual behaviors among street adolescents in Kathmandu (p<0.05).

Conclusions: The street adolescents engaged in a number of high risk behaviors, including unprotected sex, multiple partners and intravenous drug use, putting them at significant risk of contracting HIV and other STIs. This group initiates risk behaviors at early stages, and does not appear to have adequate knowledge on HIV transmission and prevention. This study supports the need for enhanced and targeted HIV prevention interventions for street adolescents in Nepal.
Risk factors of small-for-gestational age in HIV-positive pregnant women: a case-control observational study

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Introduction: Standard antiretroviral therapy (ART) in HIV-positive pregnant women reduces mother-to-child transmission (MTCT). According to Taiwan CDC regulation, HIV screening of all pregnant women in prenatal exam had been implemented since 2005. By 2017, the coverage of screen is 98.6%. However, according to Taiwan CDC, still seventeen cases of MTCT developed. Most of mothers of MTCT cases missed their prenatal exam due to illicit intravenous drug use or homeless. From 2011 to 2018, over 50 pregnant HIV-positive were under follow up at Taoyuan General Hospital and 45 delivered. We aim to compare obstetrics complications and small-for-gestational age with HIV-negative controls.

Methods: This case-control observational study was conducted at Taoyuan General Hospital (TYGH), an HIV center in northern Taiwan. Inclusion criteria of case group were HIV-positive females aged over 18 years old, with delivery taken in TYGH from 1st January, 2011 to 15th December, 2018. Mothers who delivered outside hospital were not included in case group, but the babies born were included in fetal analysis. Control group of mothers were selected in mothers delivery in TYGH, matched by maternal age (±5 years), parity (nulligravida and multigravida before this delivery) and delivery methods (normal spontaneous delivery(NSD) or Cesarean’s section(C/S)). Fetus delivered were compared with birth body weight, SGA was defined as below 10% of birth weight by gestational age.

Results: From 2011 to December 2018, 45 HIV-positive pregnant women delivered at our hospital, 22 underwent NSD and 23 underwent C/S. Seventeen percent of case group were under ART, with 24% viral suppression by first prenatal exam. Hemogram and body mass index were non-statistically significant. Anemia were observed in HIV-positive individuals underwent NSD than HIV-negative (11.4g/dL vs 12g/dL, p=0.005), but not observed in C/S group. Perineal laceration in NSD group also milder in HIV-positive mothers, which may related to small size of infant delivered. On fetal group analysis, HIV-positive group had a smaller gestational age while delivery (37.7 weeks vs 39 weeks, p=0.007) and lower body weight (2665 grams vs 3010 grams, p<0.001). The rate of small of gestational age (SGA) were also higher in HIV-positive mothers(28.89% vs 8.82%, p=0.003). Multivariate analysis showed no statistically significance regarding to anti-HCV seropositivity, history of illicit drug use, CD4 count (either stratified by 200 cumm/m3 or 350 cumm/m3) or HIV viral load (stratified by 200 copies/ml).

Conclusion: HIV-positive mothers had a trend of low gestational week and a small size of infant delivered. Further and larger studies are needed to stratify risks of SGA.

History of sexually transmitted infection (STI) before HIV diagnosis among attendees of STI clinics in Hong Kong

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Background: Sexually transmitted infections (STI) is an indicator of past condomless sex, and patients with STI represent an identifiable group with high HIV infection risk. In the past decade, men who have sex with men (MSM) had been disproportionately affected by HIV epidemic in Hong Kong. This study aims to evaluate the STI incidence rate before HIV diagnosis in MSM, compared to heterosexual male and female.

Material & Methods: This was a retrospective study on the attendance records of patients attending Social Hygiene Clinics (SHC) in Hong Kong. SHC are responsible for the management, prevention and control of STI in the public sector.
Each attendance record contains date of attendance, year of birth, gender, sexual orientation, STI diagnoses and unique pseudocode for each person. Retrospective STI diagnosis rates were calculated by measuring the total number of STI episodes of patients subsequently tested HIV-positive over an interval from the beginning of 2009. Consecutive attendances within 31 days were considered as the same STI episode. The STI rates were expressed per 100 person-years (py) with exact Poisson confidence intervals (CI) for comparison between MSM, heterosexual male and female.

**Results:** Over the 8-year period between January 2009 and December 2016, a total of 636 patients attending SHC had ever tested positive for HIV. Of these, 132 (20.8%) had been diagnosed with an STI at least once at SHC prior to HIV diagnosis, giving an overall STI diagnosis rate at 6.63/100py (95%CI = 5.75–7.60). One fourth of HIV-positive MSM (114/460; 24.8%) had a history of STI diagnosis before HIV diagnosis, while a significantly lower proportion was observed among heterosexual male (16/128; 12.5%) and female patients (2/48; 4.2%) respectively. MSM patients also had the highest retrospective STI diagnosis rate at 7.64/100py (95%CI = 6.56–8.84), which was significantly higher than those for heterosexual male patients (3.87/100py; 95%CI = 2.42–5.86) and female patients (2.22/100py; 95%CI = 0.60–5.68).

**Conclusions:** History of prior STI was not uncommon among HIV-positive patients attending STI clinics. Some HIV infections might theoretically be prevented if effective interventions could be in place for STI patients. The higher retrospective STI diagnosis rate and proportion of STI history before HIV diagnosis among MSM suggested a close relationship between STI epidemiology and HIV epidemic in this at-risk population. The difference in infection patterns of STI found in this study also implies a differential risk of HIV acquisition across different communities.

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**Relationship between Mental Health and Sexual Health Outcomes among Female Sex Workers in Pattaya, Thailand**

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**Background:** Depression is a major public health concern with implications that challenge the HIV care continuum (i.e., testing, medication adherence, and viral suppression). The contributors and consequences of depression among female sex workers (FSW) are less understood, including the relevance of depression for FSW’s sexual health and HIV-related risks. Research to address these gaps is important for FSW, who suffer disproportionately high rates of HIV infection in Thailand and globally. This analysis estimates the prevalence of depressive symptoms (DS) in FSW in Pattaya, Thailand and evaluates the relationship between DS and various HIV-related health outcomes, including alcohol use before sex, sexually transmitted infections (STI) symptoms, and experience of violence from clients.

**Methods:** Venue-based FSW (n=401) were recruited via proportional-to-size venue-based sampling in Pattaya, Thailand. Consenting FSW who were over 18, spoke Thai, were born female, and had sold sex in the past three months were surveyed by trained interviewers at FSW venues. A secondary analysis was conducted using cluster-adjusted multivariable logistic regression to examine the association between depressive symptoms (measured through the validated PHQ-2 scale) and HIV-related health outcomes: recent (<3 months) HIV testing, binge drinking (3 or more drinks) before sex with clients, STI symptoms, experience of violence from clients, and consistent condom use.

**Results:** Overall, 13% (51/401) of FSW screened positive for depressive symptoms (DS). Over half (57%) reported having an HIV test in the past three months, with similar HIV testing proportions among FSW with and without DS (51% vs. 58%, p=0.33). In
adjusted analysis, FSW with DS were more likely to report binge drinking before sex with clients (43% vs. 24%, adjusted odds ratio (aOR)=2.65, 95% confidence interval (CI)=1.29-5.47), be more likely to report STI symptoms in the past three months (31% vs. 14%, aOR=3.18, 95% CI=1.60-6.33), and were more likely to experience any violence from clients in the past three months (35% vs. 22%, aOR=2.27, 95% CI=1.17-4.42). Consistent condom use with a client in the past three months was high (97%) and was not significantly related to DS.

Conclusion: Depressive symptoms among venue-based FSW in Pattaya were common and associated with negative HIV-relevant sexual health outcomes. Our findings suggest that there is a need to address the mental health of FSW for health promotion generally as well as to improve sexual health and reduce HIV risk among this important population. The integration of mental health and sexual health services may be of particular relevance in addressing these dual needs among FSW in Pattaya.

High acceptability of a partially self-financed pre-exposure prophylaxis delivery model among men who have sex with men in Hong Kong

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Background: A pilot study was conducted to assess the acceptability of partially self-financed pre-exposure prophylaxis (PrEP) among men who have sex with men (MSM) at high risk of HIV infection in Hong Kong. We aimed to evaluate their preferences of mode of PrEP service delivery.

Methods: A PrEP service was introduced which required participants to pay an average of HK$25/tablet (USD1=HKD7.8) or 13% of the cost of daily tenofovir disoproxil fumarate/emtricitabine over a 30-week period. The same charge was collected every time, but the number of tablets given increased in later visits, constituting an incentivised approach for improving adherence. At each visit, self-administered questionnaires, and HIV and sexually transmitted infections tests were conducted, before medical consultation and receiving PrEP prescription. Upon completion of or default from the study, participants were contacted and invited to complete an exit survey, on which subsequent analyses were founded. Chi-squared test was performed to assess association between dichotomised variables.

Results: Of 71 MSM who joined the study between Oct 2017 and Dec 2018, 57 (80%) completed the study and the exit survey. Together with 8 completed exit surveys out of 14 defaulters, 65 responses were analysed. The most prevalent default reasons were: not engaging in high risk sexual behaviours (63%), concern about side effects (50%) and low perceived HIV risk (50%). No one disliked participating in a research project, considered the clinic too far away, or were afraid of blood and various testing. They all responded that they would take PrEP again if the issues were solved or if their risks increased in the future. Price was the most common factor affecting PrEP-using decision (83%), followed by perceived efficacy (46%) and concern for side effects (42%). Half (51%) considered HK$500 or below a reasonable monthly cost for PrEP while no one would pay over HK$2000. Most (91%) felt comfortable (a score of >5 in a scale of 1 to 10) in the research setting, and the pilot clinic was the most preferred setting for future PrEP access (78%), followed by non-government organisations (67%). Some 61% considered daily regimen suitable and they, compared with those who did not prefer daily regimen, felt it was easier to remember (p=0.005) and more confident about ensuring protection (p=0.008) though less flexible (p=0.003). Compared with baseline, participants’ perceived HIV risk was lower upon completion of study (p=0.001, by Wilcoxon signed-rank test) and almost all (96%) would like to continue using PrEP. A large proportion (80%) desired to take PrEP for another year.

Discussion: PrEP and the research setting were well accepted by MSM in Hong Kong. Although the drug cost had been subsidised, further price reduction would reduce the access barrier. Behavioural dynamics and changes in risk level may cause fluctuations in adherence to PrEP, which calls for flexibility in the mode of service delivery. As the perceived HIV risk may fall after experiencing PrEP,
continued behavioural monitoring and counselling are warranted to upkeep a low actual risk.

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Transitioning from post-exposure prophylaxis to pre-exposure prophylaxis among transgender women in the Tangerine Community Health Center in Bangkok, Thailand

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Background: Current studies on post-exposure prophylaxis (PEP) have focused on general populations and men who have sex with men. However, transgender populations, especially transgender women (TGW), are disproportionately affected by HIV, while limited evidence exists on their uptake of HIV prevention services, including PEP and pre-exposure prophylaxis (PrEP). This study aimed to characterize TGW PEP users in Bangkok, Thailand, including those who transitioned to PrEP after PEP completion.

Methods: We evaluated data from Tangerine Community Health Centre (Bangkok, Thailand), which provides HIV and other sexual health services integrated in gender affirmative hormone therapy (GAHT) services by a multidisciplinary team of trans-competent doctors, nurses, and transgender staff. TGW who presented for PEP during November 2015–October 2018 were included. Baseline demographics and self-completed sexual behavior questionnaires were collected.

Results: Of 1886 TGW seen at the Tangerine clinic, 173 (9.2%) presented for PEP. Their median age was 25, and 37 (21.4%) reported sex work. Within three months of PEP completion, 87 TGW (50.3%) returned for HIV testing; another 15 (8.7%) returned within one year. No seroconversions were observed. Thirty (17%) women transitioned to PrEP after completing PEP (n=17 to free PrEP services and n=13 to self-paid services). Those who transitioned to PrEP reported sex work more often compared to those who did not (47.6% vs. 23.3%, p=0.02), were more likely to earn >600 USD/month (68.4% vs. 41.9%, p=0.035), and more often reported multiple sex partners (66.7% vs. 15.8%, p=0.03). There were no other differences in demographics or risk behaviors.

Conclusions: HIV prevention services integrated in GAHT services provided by trans-competent staff play a pivotal role retaining PEP clients in care, with 59% retention among TGW who completed their PEP course. Only 17% of TGW transitioned to PrEP, the majority of whom used free PrEP services. Further strategies to increase PrEP uptake among TGW, e.g., utilizing social media and educational campaigns targeting TGW, should be urgently explored. Moreover, incorporating PrEP into the universal health care scheme in Thailand has the potential to increase PrEP transition and uptake and should therefore be accelerated.

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Multiple psychosocial health conditions measuring a syndemic construct for sexual risk behaviors among men who have sex with men in China

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Background: As a sexual minority, men who have sex with men (MSM) encounter multiple psychosocial health conditions, i.e. syndemics. However, few studies were conducted to measure the underlying syndemic construct that represented the association among the multiple health issues.

Material & Methods: A cross-sectional study was conducted to recruit MSM in Guangzhou, China to collect data on syndemic factors and sexual risk
behaviors. Structural equation model was applied to examine the hypothesized relations between syndemic factors and sexual risk behaviors.

Results: Among the 976 MSM included, the proportions of syndemic factors depression, childhood sexual abuse (CSA), intimate partner violence (IPV), alcohol use and rush popper use prior to sex were 43.24%, 26.95%, 13.22%, 31.86%, and 43.84%, respectively. Participants having unprotected anal intercourse (UAI) and multiple sexual partners (MSP) in the last 6 months accounted for 47.95% and 61.68%, respectively. A syndemic latent variable was measured by depression, CSA, IPV, alcohol and rush popper use before anal sex. The syndemic latent variable contributed to a sexual risk behaviors latent variable which was measured by UAI and MSP ($\beta=0.94$, $P<0.001$). The paths from the observed variables to the latent variable were all statistically significant ($P<0.01$). The model fitted the data well and explained 88.49% of the variance in sexual risk behaviors.

Conclusions: An underlying syndemic construct that represented the association among a number of health issues was measured as the syndemic theory posited. Interventions targeting multiple psychosocial health conditions should be tailored to addressing the needs for the sexual health of MSM.

Husband’s Willingness-to-pay for Sexually Transmitted Infection Screening at Antenatal Care Clinic under the Thai Universal Coverage Scheme

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Background: Screening for sexually transmitted infection (STI) especially HIV as early detection and treatment have been financially supported under the Thai Universal Coverage (UC) scheme since 2009 (THB140 for HIV). However, there has been no evidence-based strategic risk-based implementation nor economic evaluation whereas husbands who accompanied the pregnant women are likely to have lower risk than those who did not come along. This study aimed to explore if the accompanying husbands have higher willingness-to-pay (WTP) for HIV and syphilis screenings at antenatal care (ANC) clinic than the expense covered by the Thai UC scheme.

Methods: A survey of 200 randomly selected husbands of pregnant women was conducted at King Chulalongkorn Memorial Hospital from April to June 2018. A pilot study using an open-ended question was conducted to estimate the mean and standard deviation of WTP for HIV and syphilis screenings. Then, two contingent valuation methods (bidding and payment scale) were performed for the final WTP assessments, using the mean WTP identified from the pilot study as a starting WTP with $\frac{1}{4}$ SD step up/down. Multivariate linear regression was used for exploring potential determinants of the average amount that the husbands are willing to pay.

Results: During the study period, 597 pregnant women received their first ANC. Of 368 accompanying husbands, 200 were enrolled in the study. Their median age was 31 (IQR 27-36) years old and 67% had a first child. Eighty-eight percent of the participants were willing to test for STIs. Based on the bidding method, they were willing to pay THB450 (380-450) and THB300 (300-353) for HIV and syphilis, respectively. The payment scale method suggested lower WTP for both: THB310 (170-450) and THB230 (160-300), respectively. The numbers of children in families and education level have been significantly associated with the willingness to pay for HIV and syphilis screenings.

Conclusions: The husbands who accompanied their pregnant women at ANC clinic are willing to pay at least two times the cost of the STI screenings. The financial support to promote STI screenings should be reconsidered to cover other groups with higher sexual behavior risks and less willingness-to-pay.
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Barriers to Accessing Quality Care for HIV and Substance Use in the Philippines: In-Depth Interviews with PLHIV Who Use Drugs

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Background: The Philippines’ HIV epidemic is one of the fastest-growing globally. Drug use is one driver of growing infection rates. Among people who inject drugs in Cebu city in 2015, HIV prevalence was 43%. With government’s “war on drugs” launched in 2016, accessing care has become more challenging because of fear of legal implications, stigma/discrimination, and, at worst, being killed. This study explores the underlying personal and structural factors affecting access to healthcare for PLHIVs who use drugs.

Methods: Key informant interviews were conducted with 13 respondents from 4 provinces/regions. Respondents were 11 males, 2 females, HIV+, used recreational drugs, and were recruited via local NGOs. The interview guide asked about drug use history, healthcare seeking behavior, and access to care. The interviews were recorded, transcribed, translated to English, and a qualitative thematic analysis was done.

Results: Shabu (methamphetamine) is the most common drug used by the informants; Cannabis, Ecstasy, Nubain (Nalbuphine), Valium, and Benadryl are other drugs of choice reported by respondents. Majority of the respondents (12) have stated to still continue using drugs even after HIV+ diagnosis, and more than half of them (7) claimed to have injected drugs. Among those injecting, 100% reported sharing needles. Eight informants did not disclose their drug use to their HIV doctors and did not plan to due to fear of being judged, scolded or taken to rehabilitation centers. This reluctance to disclose impacts ART adherence – only 4 informants reported good adherence, other informants missed doses regularly, one reported stopping ART for six months, and another for three years.

Fear of the war on drugs is a barrier to healthcare, especially for overdose. The majority of respondents had experienced overdose, and most stated that they were reluctant to or certainly did not want to be brought to hospital if they overdosed.

Conclusion: Due to fear of the war on drugs in the Philippines, access to clean needles and syringes becomes a barrier, forcing people who inject drugs to share non-sterile needles. This may become a major barrier to HIV prevention strategies in the future. Ultimately, lack of trust in healthcare providers is a key barrier for PLHIVs who use drugs in accessing quality care. Therefore, it is important to build capacity and create policies in healthcare settings to ensure that there are safe, stigma-free spaces for PLHIV who use drugs.

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Transgender social media influencers identify different transgender women subpopulations for HIV testing

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Background: Transgender women (TGW) are disproportionately affected by HIV. Their vulnerability to HIV can be attributed to multi-level factors that influence linkage to the HIV care continuum. Although Thailand has increased its efforts to control the HIV transmission, the HIV testing uptake among the TGW remains low. Many programs have depended on the traditional offline approaches to identify, reach and link these individuals to HIV testing. As TGW are shifting to social media platforms to access information about HIV and find potential sexual partners, these platforms have been adopted to deliver HIV interventions. Yet, the understanding of social
media influencers in online TGW community remains unclear, creating the uncertainty to the degree of these influencers’ positive influence. The Tangerine Community Health Clinic utilized different transgender social influencers to promote health awareness and facilitate the HIV testing uptake among TGW in Thailand.

Materials & Methods: The Tangerine Community Health Clinic in Bangkok, Thailand, provides integrated hormone and sexual health services. Beginning of August 2017, the Tangerine Community Health Clinic conducted Facebook live sessions with transgender social media influencers to share information about HIV/STI testing, prevention, treatment and other TGW-specific health issues to their social networks and refer their members for HIV testing. They also interspersed with other popular topics to keep these sessions interesting and engagement levels high. Information regarding socio-demographic characteristics and HIV/STI services uptake of the clients reached online were obtained.

Results: Of 1,544 who attended the Tangerine Community Health Clinic between August 2017 and February 2019, 1,195 (77.4%) were reached through Tangerine Facebook Live sessions. Through the different types of transgender social media influencers, we successfully reached out to unique subpopulations of TGW. The transgender influencers who engaged in sex work discussed the importance of HIV testing and PrEP. They were able to reach 47,576 views and subsequently recruit 153 TGW involved in sex work. Of those, 151 (98.7%) received HIV testing with HIV-positive yield of 8.61%. Of those tested negative, 14 (10.1%) received PrEP for HIV prevention. The beauty pageant TGW and highly educated TGW whose sessions focused on gender-affirmative hormone therapy (GAHT) successfully reached 141,771 views and recruited 1,042 TGW. The majority of TGW recruited are young TGW aged <25 years (482, 46.3%), 26.3% obtained bachelor’s degree or above education, and 37.6% were employed. Of those recruited, 667 (64.0%) cited GAHT as their primary visit and 976 (93.7%) received HIV testing. Of those tested, 344 (35.2%) were first-time testers and 59 (6.05%) were tested positive.

Conclusion: The Tangerine Community Health Clinic’s innovative use of transgender social media influencers successfully identify the high-risk TGW subpopulations from online platform to offline HIV testing services. These transgender influencers significantly contribute to the increased HIV testing uptake with comparatively high rates of HIV-case findings. This model of online reaching has high potential for scale-up, but need true engagement with the TGW communities to get the ‘right’ influencers.

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Prevalence and correlates of amphetamine-type stimulant use among transgender women in Cambodia: findings from a national survey

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Background: The use of amphetamine-type stimulants (ATS) is associated with increases in HIV infections and several other negative health outcomes in HIV key populations, including transgender women – individuals who self-identify as female despite being assigned as male at birth. In addition, transgender women are among the most vulnerable to HIV due to their stigmatized and hidden nature, and scientific data on this key population are scarcely available globally. We therefore conducted this cross-sectional large scale study to explore the prevalence and correlates of ATS use among transgender women in Cambodia.

Material & Methods: In 2016, a National Integrated Biological and Behavioral Survey was conducted among transgender women in Cambodia. Using the Respondent-Driven Sampling method, transgender women were recruited from the capital city of Phnom Penh and 12 other provinces with high burden of HIV and a large population size of transgender women. These study sites were selected by the research team and approved by the HIV national technical working group. We collected information on demographic characteristics, sexual behaviors, substance use, depressive symptoms, stigmatization and social support, gender-based violence, and adverse childhood experiences.
Weighted multivariable logistic regression analysis was conducted to identify independent correlates of recent ATS use. This study was approved by the National Ethics Committee for Health Research (No. 420 NECHR). A written informed consent was obtained from each participant prior to the data collection.

Results: This study included 1375 transgender women with a median age of age of 25.8 (SD= 7.1). Of total, 165 participants (12.0%) reported having used at least one form of illicit drugs in the past three months. Of the total, 10.4% of the survey participants reported ATS use in the past three months. After controlling for potential confounders, recent ATS use remained negatively associated with living in rural areas (AOR= 0.47, 95% CI= 0.26-0.84) and having higher level of formal education (AOR= 0.34, 95% CI= 0.13-0.88). For HIV risks, recent ATS use remained positively associated with involvement in transactional sex in the past three months (AOR= 2.70, 95% CI= 1.83-3.98). Recent ATS use also remained positively associated with other substance use including higher frequency of binge drinking (AOR= 5.37, 95% CI= 2.77-10.42) in the past three months. Regarding mental health problems, recent ATS use remained negatively associated with a feeling that co-workers or classmates were supportive regarding their transgender identity (AOR= 0.49, 95% CI= 0.30-0.78) and positively associated with having depressive symptoms (AOR= 1.80, 95% CI= 1.21-2.66) and experiences of emotional abuse during childhood (AOR= 2.12, 95% CI= 1.33-3.39).

Conclusions: ATS was the most common illicit drugs among transgender women in Cambodia. Our findings suggest that developing and implementing additional harm reduction strategies tailored to ATS use among transgender women are needed. Integration of HIV and mental health interventions into harm reduction programs should be more focused.

Establishing standard operation procedure in emergency department for post-exposure prophylaxis

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Objectives: Since the post-exposure prophylaxis (PEP) for HIV infection should be initiated within 72 hours after exposure, many hospitals provide the service in the emergency department (ED). However, the PEP completion is still a concern, and therefore, this study aimed to evaluate the effectiveness of the access to PEP in the ED in a medical center in southern Taiwan.

Methods: PEP has been available as occupational or non-occupational (oPEP or nPEP) since Jan 1, 2018, in the ED of the medical center. After the prescription of the three-day doses of TDF/FTC+DTG in the ED, the patients are referred to the ID outpatient department (OPD) for the completion of a 28-day PEP course. We retrospectively collected the demographic and laboratory data, regimen of PEP and the follow-up seroconversion of the PEP users from the ED and ID OPD from January to December of 2018. The outcome was defined as the comparison of the PEP completion rate in the ED and OPD.

Results: A total of 67 patients received PEP in the medical center in 2018, and 22 subjects (36.8%) were from the ED. The mean age of the patients who seek help at the ED is 30.1 ± 7.8, and 91% (20/22) of them are male. Most (86%, 19/22) of them come for nPEP, and all of them received TDF/FTC+DTG as PEP according to the SOP. However, only 16 patients (73%) finished a 28-day course of PEP. Two oPEP users received only three days of medication as the risk of exposure was excluded afterward. One of the nPEP users was later referred to PrEP service at the OPD, but three patients were lost follow-up. For those who received PEP initially at the OPD, 91% (41/45) completed the PEP course and most of them (91%)
were prescribed with single-tablet regimens (30 patients with ABC/3TC/DTG and 11 patients with TAF/FTC/EVG/r) rather than TDF/FTC+DTG (3 patients). None of them who completed the PEP and follow-up showed HIV seroconversion in the cohort.

**Conclusion:** About one-third of the people requested for PEP received their first dose at the ED in the area. Most people are young man and most sought for nPEP. Through continuous education and communication, we established the SOP of prescribing PEP in the ED for the urgent need of PEP. However, proper risk evaluation and active follow-up are needed to provide more comprehensive care in the HIV prevention cascade.

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**Prepared for PrEP: Preferences for HIV pre-exposure prophylaxis among Chinese Men Who have Sex with Men from an online national survey**


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**Background:** Despite WHO recommendations and a strong evidence base, pre-exposure prophylaxis (PrEP) has not been widely available in China. Previous studies reported low awareness and inconclusive findings on the acceptability of oral PrEP among Chinese men who have sex with men (MSM). However, long-acting injectable PrEP could potentially increase acceptability. To better inform future HIV biomedical interventions using PrEP, this study compares the interests and preferences for oral and injectable PrEP among MSM and their correlates with HIV risk behaviors.

**Methods:** This is a secondary analysis of an online national survey of Chinese MSM conducted in 2017.

Individuals born biologically male, above 16 years, reported ever had sex with a man, and without HIV infection were recruited. Following a brief introduction on PrEP and its different modalities, men were asked whether they were interested in the modalities (i.e., oral, long-acting injectable, and rectal microbicides) and which one they preferred most. Data on sociodemographic characteristics, sexual behaviors, and HIV testing history were also collected. Logistic regression models were used to identify correlates with the interests and preferences for oral and injectable PrEP, adjusting for age, education, and income.

**Results:** A total of 1045 men completed the survey and 979 men responded to the PrEP survey questions. Most men were under 30 years old (78.9%), unmarried (85.3%) and had never heard of PrEP (81.9%). Most men were interested in using both oral PrEP (76.7%) and injectable PrEP (85.7%). More participants chose injectable PrEP (36.3%) as their preferred modality than oral PrEP (24.6%). Having ever heard about PrEP (aOR = 1.57, 95% CI: 1.02, 2.41), seeking partner online (aOR = 1.64, 95% CI: 1.18, 2.29), having multiple sexual partners in the three months (aOR = 1.81, 95% CI: 1.30, 2.52), and having at least twice HIV tests last year (aOR = 1.45, 95% CI: 1.06, 1.98) were associated with increased odds of being interest in oral PrEP. These sexual behavior variables and having at least twice HIV tests last year were also associated with higher odds of being interest in injectable PrEP. Men who had ever heard about PrEP (aOR = 1.55, 95% CI: 1.11, 2.17) and who had tested HIV at least twice (aOR = 1.36, 95% CI: 1.04, 1.78) more commonly ranked injectable PrEP first as their preferred modality.

**Conclusion:** Most Chinese MSM were unaware of PrEP. MSM with more frequent HIV tests may prefer the long-acting injectable modality of PrEP. Future PrEP promotion could be integrated with HIV testing services to better target Chinese MSM with specific need for PrEP.
The Patient Voice: Worries and anxieties during health system transition in HIV services in Viet Nam

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Background: Viet Nam is now shifting toward integrating HIV services into the public health system using social health insurance (SHI), and decentralizing service delivery system. This study evaluates patients’ concerns regarding the system transition among HIV-infected patients in Hanoi, Viet Nam.

Material & Methods: A survey of 1,348 HIV-positive patients was conducted at HIV outpatient clinic in a central-level hospital, National Hospital for Tropical Diseases (NHTD), in Hanoi in October and November 2018. The insurance coverage, reasons for not purchasing SHI card, concerns with receiving HIV treatment at SHI-registered local health facilities, desire to continue regular visits to NHTD were self-reported in the survey.

Results: The coverage of SHI was 78.0%. Those without SHI card reported “burdensome” (44.4%), “don’t know how to get it” (20.9%) “cannot afford” (17.1%) as reasons for not purchasing SHI card (multiple choice). Most of patients (86.6%) were some kinds of concerns with receiving HIV treatment at SHI-registered local health facilities; “HIV disclosure to neighbors in their communities” (84.2%), “low quality of HIV services at local facilities” (53.0%), “cannot get along with staff at local facilities” (14.8%) were the major concerns reported (multiple choice). Furthermore, 91.4% of patients showed willingness to continue regular visits to NHTD to “keep contact with NHTD” (81.5%), “receive result of viral load regularly” (79.9%), “meet NHTD staffs” (58.9%) (multiple choice).

Conclusions: Although the SHI coverage among HIV population has been progressing, the decentralization of HIV service delivery is posing new psychosocial challenges to HIV patients. Strengthening coordination between higher-level and lower-level facilities in HIV services, rather than radical transition of service delivery system, is needed to promote healthy society where HIV patients can receive good quality of HIV services and comfortably live in.

Acceptability and Feasibility of a Crowdsourced Social-media Based Physician Finder Prototype for Men Who Have Sex with Men in China

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Background: Sexual health services seeking among men who have sex with men (MSM) is suboptimal. Social-media based HIV/sexual health services hold promise for facilitating healthcare utilization among MSM. We developed a prototype of a sexual health services online platform to link MSM to local gay-friendly physicians, based on submissions to a crowdsourcing open contest. The purpose of this study was to evaluate the acceptability of the prototype using focus group discussions among MSM in two Chinese cities.

Materials & Methods: The open contest was held from March 1st to March 25th, 2018. Open contests solicit creative contributions from the target populations, evaluate submissions, celebrate finalists, and implement finalist ideas. Specifically, we solicited submissions about the name, logo, slogan, and functions of the platform which were then incorporated into the prototype design. The prototype included a local gay-friendly STI physician finder tool and online psychological consulting services. Focus group discussions were conducted with MSM. We assessed usability through a 10-item survey. We used thematic analysis and two independent individuals developed a codebook.
Results: A total of 34 men (mean age=27.3, SD=4.6) joined four focus group discussions. Thirty-two (94.1%) obtained at least university education. Our data revealed that the prototype was acceptable and feasible to local MSM. Usability data suggest that men felt confident that they could easily use the prototype. There was a high demand for gay-friendly healthcare services. Men felt that the prototype could bridge gaps in the existing HIV/STI service delivery system, specifically by linking MSM to local gay-friendly physicians and psychological counselors, providing online peer support, and referring for pre-exposure prophylaxis (PrEP).

Conclusions: Crowdsourcing can help develop a community-centered online platform linking MSM to local gay-friendly HIV/STI services. Such social media based platforms may be a promising approach to satisfy unmet health needs among MSM in other low- and middle-income countries.

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An integrated approach for the HIV task shifting/sharing policy formulation: Building and retaining key population lay providers in Thailand

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Background: Key population (KP) community-based organizations (CBOs) have been actively involved in the HIV response in Thailand since the 1990s. In the early days, their roles focused on outreach, recruit, and provision of community and home-based care, and recently have been expanded to include HIV and sexually transmitted infections (STIs) screening and testing, and antiretroviral treatment (ART) and pre-exposure prophylaxis (PrEP) dispensing under implementation research. However, there is no policy/regulation supporting task shifting/sharing for lay providers to perform medical practices in Thailand.

Methods: Since October 2017, the USAID Community Partnership Project, led by the Thai Red Cross AIDS Research Centre (TRCARC) and CBOs, has employed an integrated approach to HIV task shifting/sharing policy formulation: 1) developed competency-based training modules, platform and certification system for training and retaining of KP lay providers; 2) in collaborations with relevant government agencies and CBOs, established quality standards for HIV/STIs service delivery and key competencies for KP lay providers to ensure service quality provided; 3) organized policy dialogues with high-level policy makers, implementers and key stakeholders to sensitize and generate support for task shifting/sharing; and 4) provided evidence-based data on feasibility, effectiveness, and impact of KP-led health services by LINKAGES Project and site visits to assist policy decisions.

Results: Through collaborative efforts made by TRCARC, CBOs, and Ministry of Public Health (MOPH), a committee to formulate task shifting policy was established and MOPH’s regulation is being revised to allow trained KP lay providers to perform HIV counseling, specimen collections for HIV/STIs rapid/point-of-care tests, and ART and PrEP dispensing. The national quality HIV/STI standards for KP lay providers and certification steps are in the process for endorsement by the National AIDS Committee and the MOPH. The competency-based training is being considered as “certified training curricula”.

Conclusions: Training and retaining of lay providers are solid building blocks for task shifting/sharing. Quality service delivery standards are safeguards to ensure quality of healthcare services. Evidence-based data and site visits are powerful tools to generate policy dialogues to support policy change. Integrated and collaborative approach among key stakeholders, implementers, and policy makers are key to HIV task shifting/sharing policy formulation.
Evaluating The Role Of Pharmacists In A Multidisciplinary HIV Care Team In Singapore

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Background: Internationally, pharmacists play an integral role in the multidisciplinary care of people living with HIV (PLHIV). However, there is a paucity of data to evaluate HIV pharmacists’ contributions in Asian healthcare settings. We aimed to characterize and evaluate the effectiveness of pharmacist interventions in the inpatient and outpatient care of PLHIV at a HIV specialty center in Singapore.

Description: The National University Hospital, Singapore, provides care to approximately 450 PLHIV annually and utilizes a multidisciplinary model with integrated pharmacist services. From January-December 2017, we performed a quantitative assessment of pharmacists’ in- and out-patient interventions and measured their acceptance rate by clinicians and PLHIV. We classified pharmacists’ interventions relating to: 1) clinicians (by type and category); and 2) PLHIV. Interventions with clinicians were assessed for the following potential outcomes: prevention of adverse events, optimization of therapy, improved health maintenance and cost avoidance. Patients received counseling on antiretroviral therapy (ART) and adherence. The primary outcome studied was virologic suppression (HIV-1 RNA <50 copies/ml) one year post antiretroviral treatment (ART) initiation for PLHIV newly-diagnosed in the previous year.

Lessons Learned: During the study period, 270 clinician interventions were performed in 2346 patient encounters (Table 1). All (100%) were accepted by clinicians. Majority of intervention types were dosage modification (n=93, 34.4%) and drug modification (n=82, 30.4%). The top three intervention categories were ART (n=92, 34.1%), opportunistic infection prophylaxis or management (n=78, 28.9%) and co-morbidities (n=67, 24.8%). Potential outcomes were primarily the prevention of adverse events (n=124, 45.9%) and optimization of therapy (n=112, 41.5%), followed by improved health maintenance (n=26, 9.6%) which mostly consisted of immunization recommendations. Ninety-six newly-diagnosed PLHIV initiated ART in 2016, all of whom accepted and received pharmacist counseling. Of these, 91 (94.8%) achieved virologic suppression at one year.

Conclusions/Next steps: Pharmacists’ interventions were clinically significant and uniformly accepted by clinicians and PLHIV. Benefits included prevention of adverse events and optimization of therapy. Collaborative prescribing between HIV physicians and pharmacists can be explored, especially in the care of PLHIV with multiple co-morbidities and complex medication regimens.

Abstract 94 has been withdrawn.

HIV-related Stigma and Discrimination among Health Workers in Vietnam

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Background: Stigma and discrimination (S&D) is a major barrier to reaching 90-90-90 and HIV epidemic control. In Vietnam, HIV-related S&D has been shown to affect uptake of HIV testing, linkage to care, and adherence to antiretroviral therapy. However, studies measuring S&D in the healthcare setting are lacking. The purpose of this study was to understand the extent of S&D existing in hospitals in Vietnam and to inform design of appropriate interventions.
Methods: Between September and November 2018, we surveyed healthcare workers (HCWs) in Vietnam about HIV-related S&D over the prior 12 months using a previously validated tool. Nurses, physicians, other staff (technicians, cleaners, receptionists) were recruited randomly from 10 hospitals in 3 provinces in proportion to the size of each HCW group in the hospital. Participating HCWs completed self-administered questionnaires covering 6 domains (fear of infection, use of unnecessary precautions, observed discrimination, attitude towards co-workers with HIV, attitude towards PLHIV, facility policies). Proportions and mean (range) of the key indicators in each domain were calculated and presented.

Results: Of the 916 HCWs recruited, 833 completed the questionnaire. Of these, 74% were female and the mean age was 35 (range 22-62). Study participants included nurses (54%), physicians and physician assistants (22%) and other staff (24%). Overall, 81% reported at least some fear of HIV infection, including 50% reporting worry about HIV infection when touching the bedding or belongings of PLHIV and 73% worrying about HIV infection when drawing blood. Seventy percent reported use of double gloves or other special prevention measures when caring for PLHIV. Forty-four percent reported observing colleagues unwilling to care for PLHIV or providing poorer quality of services. Fifty-five percent did not believe their facility had policies to protect PLHIV from discrimination, 29% believed they would not get in trouble if they discriminated against PLWH, and 25% reported that it was acceptable to test for HIV without consent in their facility.

Conclusions: HIV-related S&D is common among HCWs in Vietnam. Lack of knowledge, fear of HIV transmission, insufficient hospital policies, and lack of mechanisms to redress episodes of discrimination are potential contributors. These findings will inform the design and implementation of facility-level interventions to reduce healthcare associated S&D in Vietnam.

Hepatitis B stigma among men who have sex with men in China: a secondary analysis of a crowdsourced intervention to decrease stigma

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Background: stigma against people living with hepatitis B virus (HBV) is a barrier to the prevention, diagnosis, and treatment of HBV in China. In this study, we examined the effectiveness of an innovative intervention for reducing HBV stigma among men who have sex with men (MSM) in China.

Methods: we conducted a secondary analysis of a randomized control trial, where the intervention consisted of images and videos created by the public for promoting HBV testing and decreasing HBV stigma. HBV stigma was assessed using a 20-item scale at enrollment and at three weeks after the intervention. A per-protocol analysis was conducted to compare the change in stigma between the participants who were exposed to the intervention and those who were not. Linear regression was used to determine the associations between baseline stigma and sociodemographic characteristics and healthcare behaviors.

Results: data were collected from 556 MSM in China in May of 2018. Mean participant age was 26 years old and 56% had an education of high school or less. More than half of the participants felt that persons with HBV should not work with children (52%, 290/556), and many felt that persons with HBV were undesirable as spouses (29%, 162/556) or as employees (15%, 84/556). In the per-protocol analysis, the crowdsourced intervention led to a small but significant reduction in HBV stigma (adjusted beta = -2.22, 95% CI = -4.32 to -0.11; p =
0.03). Greater HBV stigma was associated with not having a recent doctor’s visit (adjusted beta = 3.90, 95% CI = 0.08 to 7.73; p = 0.04).

**Conclusion:** HBV stigma among MSM in China is common. Crowdsourcing appears to be effective in decreasing HBV stigma among Chinese MSM, and may be useful to create anti-stigma campaigns in other low- and middle-income countries.

**Integration of Hepatitis C services in existing HIV care within the public sector; HEAD Start, Punjab, India.**

**Background:** The Mukh Mantri Punjab Hepatitis C Relief Fund (MMPHCRF) was established in 2016 to provide HCV care in Punjab State to the general population. MMPHCRF to date has put over 60,000 HCV RNA+ persons on treatment and with achievement of 92.3% cure rate. From 1st September 2018, MMPHCRF is funded under National Viral Hepatitis Control Program (NVHCP), Punjab.

In 2018 The Foundation for Innovative New Diagnostics ( FIND), as part of the Unitaid funded HEAD (Hepatitis Elimination through Access to Diagnostics) Start program, has partnered with the Ministry of Health & Family Welfare, Punjab to expand HCV care to PLWHA (People living with HIV/AIDS). This work is done in collaboration with the Punjab State AIDS Control Society (PSACS). HEAD Start Punjab has integrated HCV services into all existing ART centers across the state of Punjab to increase the reach of the existing NVHCP, Punjab, to PLWHA. The goal of this project is to provide HCV screening to all 31602 persons attending the ART centers.

**Methods:** This project provides screening for HCV using Rapid diagnostic test (RDT) in 13 ART centers. These centers are linked to four laboratories for HCV RNA confirmatory testing by GeneXpert. Patients are screened for presence of HCV antibodies when they visit the ART Centres for their routine HIV care. A reflex testing approach is used wherein if a patient is found positive for HCV antibodies the same blood sample is used for confirmatory HCV RNA testing. Once a patient is found HCV RNA+, they are entered into the NVHCP care pathway.

**Results:** From 22nd October 2018 to 15th March 2019, 10212 PLWHAs have been screened for HCV with Antibody test. The majority (68%) of persons screened were above 30 years of age with 38.6% identifying as female, 61.1% as male and 0.3% as transgender. Self-reported risk factors amongst those screened for HCV Antibody included unprotected sexual practices (41.6%), not reported (30.7%), unsafe injections (14.9%) intravenous drug use (9.4%), blood transfusion (2.9%), surgery (0.4%) and dental (0.1%)

Out of 10212 PLWHAs those screened, 1836 (18%) where found positive for HCV antibodies, 1785 of those received HCV RNA testing, out of which 1428 (80%) were confirmed positive for HCV RNA. The 1836 persons found anti-HCV Ab+ represents 5% of the total estimated PLWHA who are co-infected with HCV in Punjab state, and 36% of the estimated co-infected persons who attend for ART care.

Screening results were made available to the patient within 4 hrs. of blood draw. HCV confirmatory results were made available to the care provider within 24 hrs.

Of those with confirmed HCV infection (RNA+) among PLWHA, 86.5% were male, 13.4% were female and 0.1% were transgender. The rate of HIV-HCV coinfection (HCV RNA+ among PLWHA) was 61.3% among injecting drug use, 24.6% in those with history of unsafe injections, 8.3% those having undergone surgery 7.6% not specified and 6.3% as unprotected sexual practice. Patients confirmed with HCV are initiated on pangenotypic treatment.

**Conclusions:** Utilizing a hub and spoke model maintains demonstrated rapid turnaround time and rapid linkage to care amongst PLWHA entering the HCV diagnostic care cascade and has helped further expand the reach of NVHCP, Punjab program to PLWHA. Outcome of this intervention will facilitate National AIDS Control Organization.
Comparison of early serologic response of early syphilis to treatment with a single-dose benzathine penicillin G between HIV-positive and HIV-negative patients: a cohort study

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Background: Serologic response of early syphilis to treatment has been reportedly poorer in HIV-positive patients compared with HIV-negative patients; however, the interpretation of the published data is limited by the differences in study design, subjects with different stages of syphilis included, definition used for serologic response, treatment administered, and follow-up frequency and duration. We aimed to compare the early serologic response to a single dose of benzathine penicillin G (BPG) 2.4 MU during the monthly follow-up for 3 consecutive months between HIV-positive and HIV-negative patients with early syphilis.

Materials and Methods: Since January, 2015, adult patients aged 20 years or older who presented with early syphilis (primary, secondary, and early latent syphilis) with baseline rapid plasma regain (RPR) titres of 4 or greater and positive Treponema pallidum particle agglutinin assay (TPPA) were included in this prospective observational study after the patients received a single dose of BPG for early syphilis according to the STD Treatment Guidelines 2015 of US CDC. RPR titres were determined at baseline and thereafter every 4 weeks until 12 weeks, followed by every 12 weeks. Serologic response was defined as a decline of RPR titre by 4-fold or greater at each time point compared with baseline. Serologic failure was defined as an increase of RPR titre by 4-fold or greater during follow-up after ever achieving a decline of the titre.

Results: Between January 2015 and December 2018, 170 HIV-positive and 57 HIV-negative patients were included; all were men who have sex with men. Compared with HIV-positive patients, HIV-negative patients had a younger age (30.3±7.3 vs. 36.9±8.7, p<0.001), more cases of secondary syphilis (47.4% vs. 29.4%, p=0.016) and fewer cases of early latent syphilis (47.4% vs. 63.5%, p=0.042), prior syphilis (19.3% vs. 69.4%, p<0.001) and immunity against hepatitis B virus (anti-HBs positivity, 15.8% vs. 65.9%, p=0.039). HIV-negative patients achieved faster serologic response than HIV-positive patients: 62.0% vs 35.9% (p=0.002), 95.2% vs 70.9%, (p=0.001), 93.3% vs 82.4% (p=0.098), and 92.3% vs 87.1% (p=0.579) at week 4, week 8, week 12, and week 24 following BPG treatment, respectively, in the per-protocol analysis. In multivariate analysis to examine the factors associated with 12-week serologic response to BPG treatment, we found that the response was statistically significantly associated with prior syphilis (adjusted odds ratio [AOR], 0.22; 95% confidence interval [CI] 0.08-0.61) and per 1-log2 increase of RPR titer at baseline (AOR, 1.01; 95% CI, 1.00-1.01).

Conclusions: HIV-negative patients had better early serologic response of early syphilis to BPG than HIV-positive patients during the first 12 weeks of follow-up. Prior syphilis infection was associated with a poorer response while a higher RPR titre was associated with a better response to BPG.

Analysis on 48 HIV/AIDS patients with cytomegalovirus infection

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Background: To investigate the clinical features and the characteristics of T lymphocytes subsets of
cytomegalovirus (CMV) infection in patients with HIV-1 infection.

Methods: We recruited 48 cases of HIV/AIDS coinfected with CMV hospitalized patients in Peking Union Medical College Hospital from Jan 2010 to Aug 2017. The clinical features and immune function of these patients were retrospectively analyzed. Monoinfecction of HIV/AIDS patients in previous study were recruited as control.

Results: 48 cases were at C3 stage, with 36 men and 12 women. Five of them were less than 30 years old, 3 of 31 ~ 50 years old, and 11 more than 50 years old. The number of patients with CD4+ T lymphocyte ≤50 cells/μl were 35, and with CD4+ T cells 51 ~ 100/μl of 7 patients, 101 ~ 200/μl of 3 patients, > 200/μl of 3 patients. Clinically there were 31 cases of CMV viremia, 1 case of CMV encephalitis, 1 case of CMV enteritis, 1 cases of CMV pneumonia, and 9 cases of CMV retinitis. These patients suffered from other opportunistic infections including 16 cases of Pneumocystis Pneumonia, 9 cases of tuberculosis, 5 cases of syphils, 18 with digestive tract fungal infection, 8 with pulmonary fungal infection, 2 cases of EBV infection, 2 with HIV encephalopathy/PML, 3 with cryptococcal meningitis, 1 with toxoplasma infection. In the CMV and HIV/AIDS coinfected group, 100% patients had inversion of CD4+/CD8+. One immune activation marker (CD8+CD38+/CD8+) was higher (61.6%~98.8%) with a median value of 91.2% in 40 patients. Another immune activation marker (HLA-DR+CD8+/CD8+) was 25.5%~98.0% with a median value of 60.3% in 44 patients; 36 patients had both positive immune activation. There was no significant difference in numbers of B cell, NK cell , CD4+ T cells, CD8+ T cells and immune activation subsets stratified by gender, age, HIV-RNA viral load (p>0.05). Meanwhile, neither serum HIV viral load serum HIV viral load nor serum CMV viral load had correlation with HLA-DR+CD8+/CD8+, CD38+CD8+/CD8+, CD4+/CD8+ in the CMV and HIV/AIDS coinfection group. While HIV vira load of monoinfection group of HIV/AIDS was significantly correlated with HLA-DR+CD8+/CD8+, CD38+CD8+/CD8+, CD4+T cell count, CD4+/CD8+(p<0.05).

Conclusions: CMV infection occurred in HIV patients with advanced stage. CMV infection can cause multiple organ lesions, with life threat, especially in those patients with CD4+ T cell less than 100/μl. It is of great importance to screen CMV-IgM, pp65 antigen, CMV-DNA to make early clinical diagnosis and treatment.

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APRI for Determining Cirrhosis in HIV-HCV Coinfected Patients

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Background: Hepatitis C virus (HCV) infection is global health problem increasing morbidity and mortality in HIV-infected patients on stable antiretroviral therapy (ART). Since 2017, free Direct Acting Antiretroviral (DAA) program had been provided in Indonesia, including for HIV infected patients. A pangenotypic combination using Sofosbufir and Daclatasvir showed a high efficacy in HIV-HCV coinfected patient with minimal interaction with ART. Ideally, transient elastography (FibroScan) used to determine length of treatment for cirrhotic and non-cirrhotic patients, but it is not widely available in many health care centers. APRI (AST Platelet Ration Index), a simple and cheap tool might be a good alternative method to determine cirrhosis in this condition. This study aimed to assess APRI performance for determining cirrhosis in HIV-HCV coinfected patients before starting DAA treatment.

Material and Methods: A cross-sectional study was conducted at a HIV Integrated Clinic, Cipto Mangunkusumo Hospital among HIV-HCV coinfected patients underwent examination before anti-HCV treatment. All patients had already on stable ART with detectable HCV-RNA. Transient elastography was done by trained experienced operators according to the manufacturer’s protocol. The APRI score was calculated using the formula: APRI = [(AST level/ULN)/platelet count (109/L)] x 100. The reference upper normal limit for AST used in our hospital was 44 IU. The diagnostic performances were analyzed separately and in combination according to sensitivity (Se), specificity

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(Sp), positive likelihood ratio (LR+), negative likelihood ratio (LR-), accuracy (Ac), and AUROC.

**Results:** Among 214 HIV-HCV coinfected patients enrolled, 195 (91.1%) were males with a median age 37 (28-52) years, median CD4 count 470 (15-1638) cells/mm³, and median HCV RNA 6.36 (2.95-8.36) Log10 IU/mL. FibroScan evaluation show 55 (25%) of them were cirrhosis (F≥4). Using FibroScan as a gold standard, the low APRI threshold, high APRI threshold, and APRI 1.5 cut-offs, had fair performances for the diagnosis of cirrhosis (Se: 54.5, 27.2, and 43.6%; Sp: 88, 92.4, and 91.1%; AUROCs = 0.71, 95%CI: 0.62-0.80, 0.59, 95%CI: 0.5-0.69, and 0.67, 95%CI: 0.58-0.76; Ac: 79.4, 75.7, and 78.9)

**Conclusion:** In this study, the low APRI threshold, high APRI threshold, APRI 1.5 cut-offs had fair performances for the diagnosis of cirrhosis in HIV-HCV coinfected during ART.

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**The prevalence of parasites, bacteria and sensitivity patterns of pathogen intestinal bacteria in HIV patients in RSUP dr. Sardjito, Yogyakarta, Indonesia**

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**Background:** Opportunistic infections in HIV patients such as intestinal infections (diarrhea) which are mostly caused by parasites and pathogenic bacteria that can affect morbidity and mortality.

**Objective:** to identify the prevalence of parasites, bacteria and sensitivity patterns of intestinal pathogenic bacteria in HIV patients.

**Method:** This study was descriptive analytic and used bivariate and multivariate analysis. The subject were HIV patients who came to Sardjito hospital at the period of August-October 2017.

Examination of stool samples using the Ritchie Formol-Ether method (identification of intestinal protozoa), Harada Mori and Kato Katz (helminths identification) methods while in bacteria using gram staining and inoculation on culture media (BAP & Mac conkey media). Antibiotic susceptibility test used the Kirby-Bauer Disk Diffusion method and its interpretation based on the Clinical and Laboratory Standards Institute (CLSI) guidelines.

**Results:** The prevalence of intestinal protozoa that infected HIV patients was Cryptosporidium sp (76.47%), Entamoeba histolytica (7.84%) and Isospora sp (5.88%). The types of helminths were Ascaris lumbricoides (28.57%), Hookworm (28.57%), and Trichuris trichiura (28.57%). The prevalence of infection with pathogenic bacteria in the intestine was Klebsiella sp. (35.48%). Most bacteria were resistant to Ampicillin (79.97%), followed by Cephalosporin gene I, Cotrimoxazole, Amoxiclav and Ciprofloxacine. Associated factors with intestinal pathogenic bacterial infections were monthly income, WHO clinical stage and number of partners.

**Conclusion:** The most commonly found of parasite and intestinal pathogenic infections were cryptospordium sp and klebsiella sp. Cotrimoxazole and other antibiotic resistance suggests that antibiotic resistance needs to be examined to provide appropriate treatment and reduce the risk of co-infection caused by intestinal pathogenic bacteria in HIV patients.

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**Thai MSM with acute HIV infection had higher prevalence of anal high-risk HPV infection but lower prevalence of anal high-grade precancerous lesion than those with chronic HIV infection**

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**Background:** Thai MSM with acute HIV infection had higher prevalence of anal high-risk HPV infection but lower prevalence of anal high-grade precancerous lesion than those with chronic HIV infection.
Background: Infection with human papillomavirus (HPV) can cause genital warts and anal cancer in men who have sex with men (MSM). Anal cancer is preceded by anal high-grade squamous intraepithelial lesion (HSIL), induced by persistent high-risk HPV (HR-HPV) infection, which can be screened for by anal Pap smear.

Methods: MSM participants in the SEARCH010/RV254 acute HIV infection (AHI) cohort gave consent for a separate study to measure the prevalence and incidence of anal HPV infection and HSIL. Participants had physical exam, including anogenital exam and high-resolution anoscopy (HRA). Suspicious lesions identified by HRA were biopsied. Anal swabs were taken for HPV, cytology, and sexually transmitted infections (STI). Blood tests included CD4 and syphilis serology with TPHA and/or RPR. HPV genotyping was done by LINEAR ARRAY HPV Genotyping Test (Roche Molecular Systems, Inc, USA) which could detect 37 HPV genotypes. Cytology was read by a cytopathologist using the 2001 Bethesda system. Anal histologic abnormalities were categorized as i) low-grade squamous intraepithelial lesion (LSIL) which included histologic reading of anal intraepithelial neoplasia (AIN) I and AIN II with negative p16 staining or ii) HSIL which included AIN II with positive p16 staining and AIN III. STI screening for Neisseria gonorrhoea (NG) and Chlamydia trachomatis (CT) was done by PCR on anal, urine, and pharyngeal samples. All procedures were completed within 30 days of diagnosis of acute HIV infection.

Results: 71 participants with AHI were screened from May 2017 to February 2019. Median (IQR) age was 26 (23-33) years. Median (IQR) CD4 was 348 (252-468) cells/mm3 and HIV viral load was 6.2 (4.7-6.8) log10 copies/mL. Anal HPV infection with any genotype was detected in 54 (77%), of whom 46 (66%) had at least one of the 13 high-risk HPV types (HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68). The most common high-risk HPV types were 52 (16%) and 16 (13%). Abnormal finding on HRA was diagnosed and treated during AHI.

Conclusion: MSM with AHI had very high prevalence of anal STIs, including HPV infection. Longer term data on high-risk HPV persistence/clearance and HSIL progression/regression are needed to guide anogenital cancer screening practice in MSM diagnosed and treated during AHI.

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Sexual Behaviour Change, Prevalence And Incidence of STIs Among High Risk Men Who Have Sex With Men PrEP Users in Kuala Lumpur, Malaysia

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Background: Previous studies have shown that STI prevalence and incidence among Pre-Exposure Prophylaxis for HIV users to be high. The MyPrEP project is a pilot project evaluating the acceptability and feasibility of PrEP use during a 12-month study period for MSM at high risk of HIV infection.

Methods: Recruitment process was conducted through gay dating apps, social media, and with local NGO from March to October 2018.
Participants must be ≥18 years old, tested negative for HIV, normal eGFR reading, and reported high-risk behaviours (condomless anal intercourse, history of STI, commercial sex, chemsex, or used PEP) within past 6-months. Socio and sexual behavioural data were collected during baseline, along with blood testing for syphilis, HBV, HCV and anal swabs for gonorrhea and chlamydia NAAT. Participants were required to complete a once-weekly diary throughout the study follow-up which looks into the compliance level of PrEP along with condom usage during anal sex. Self-administered surveys that looks into number of partners and participation in group sex were repeated during month 3 and month 6 follow-ups. RPR level and TPHA for syphilis, along with anal swabs for gonorrhea and anal chlamydia were repeated during month-6 follow-up. We report the sexual behaviour changes, baseline STI prevalence and 6 month STI incidence.

Results: A total of 150 participants were enrolled from March to October 2018 where they are being followed up for a year at month 1, 3, 6, 9 and 12. Participants were given free 1 year supply of daily PrEP. Until March 3rd, 2019, 116 (77.33%) participants returned for their month-6 follow-up. Based on the weekly diary, median condomless sex reported during baseline-month-3 and month 3-month-6 periods remains the same with 4, while the median total partners remained with 3. However, ranges of total condomless anal sex increase from 0-49 during baseline–month 3, compared to 0-63 from month 3–month 6. Participation in group sex remains high despite a slight decrease, with 33 (28.4%) participants reported during month 6 follow-up survey, compared to 34 (29.3%) participants during month 3 follow-up survey. Of those 116 participants who completed their month-6 follow up, incidence rates remains high with 14 (12.06%) for syphilis, 12 (10.34%) for gonorrhoea and 18 (15.51%) for chlamydia. Re-infection rates for syphilis, gonorrhoea and chlamydia remains high, with 5 out of 13 (38.46%), 5 out of 12 (41.66%) and 3 out of 19 (15.78%) respectively. Of those who were tested negative for syphilis, gonorrhoea and chlamydia during baseline, 9 (8.73%) new infections of 103 participants, 7 (6.73%) of 104 participants and 15 (15.46%) of 97 participants were reported respectively.

Conclusions: High prevalence and incidence rates of STIs particularly rectal chlamydia and gonorrhoea in this cohort of high risk MSM warrant for regular screening and treatment for STIs including extragenital STIs and should be implemented as essential component of PrEP programmes. Risk reduction counselling, reinforcement of condoms and partner notification remain an important control measures in the era of biomedical HIV prevention strategies.

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High incidence and prevalence of syphilis among HIV-infected MSM in Thailand

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Background: Syphilis is a common sexually transmitted infection among men who have sex with men (MSM). It has been reported to increase HIV viral load (VL) and decrease CD4+ cell counts among HIV-infected persons. We report on syphilis prevalence and incidence in a cohort of HIV-infected individuals on antiretroviral therapy (ART) in Thailand and evaluate VL, CD4+, CD4+/CD8+ ratio pre and post-syphilis infection.

Material and Methods: Syphilis diagnosis was analyzed during 2009-2018 in participants enrolled in the RV254/SEARCH 010 cohort of acute HIV infection (AHI) in Bangkok, Thailand. VDRL was performed routinely at baseline and every 24-48 weeks on all participants and when clinically indicated. Positive results are confirmed with RPR titer and TPHA. CD4+ and CD8+ testing, VL testing and clinical evaluation are performed every 12 weeks.

Results: Among 579 participants with AHI median age was 26 (IQR 22-31) years at enrollment, 97.4% were male and 94% were MSM. Syphilis prevalence at baseline was 14.3% (n=83), rising from 4.4% in 2010 to 20% in 2017 and declining to 14.3% in 2018 (Chi-square test for trend p=0.003) (Figure 1). Overall incidence (per 100 person-years) was 10.2%, increasing from 3.1 in 2010 to 16.5 in 2015 and remaining in the range 11-14% through 2018 (Chi-square for trend p=0.03) (Figure 2).
Cumulatively, 39.2% of the cohort had at least one episode of syphilis and 30.9% had reinfection during follow-up. On multivariable analysis, participants with syphilis were more likely to be MSM (HR 3.68, 95% CI 1.16-11.62), use methamphetamine (HR 2.31, 95% CI 1.51-3.54) and have hepatitis C coinfection (HR 2.63, 95% CI 1.59-4.34). Syphilis was not associated with age, being a student, group sex, alcohol use, drug injection or hepatitis B.

Among 155 participants with 222 episodes of syphilis and who had VL <50 copies/mL pre-syphilis diagnosis, and data available before syphilis, at syphilis diagnosis and after treatment, 6 participants had VL >50 copies/mL at syphilis diagnosis, increasing to 9 after treatment (p=0.03, pre vs. post syphilis). Median (inter-quartile range, IQR) detectable VL (log10copies/mL) were 3.8 (1.9-5.2) and 2.6 (2.2-4.1), respectively. Median (IQR) CD4+ counts (cells/mm3) were higher before syphilis at 663 (491-840) vs. 624 (501-774) at syphilis diagnosis (p=0.07), rising to 660 (547-826) post syphilis treatment (p=0.001, at syphilis diagnosis vs. post syphilis). Median CD8 counts (cells/mm3) were 607 (460-837) at syphilis diagnosis, a decline from 639 (491-840) pre-syphilis (p=0.42), and rebounded to 679 (527-870) post-syphilis treatment (p=0.0007, at syphilis diagnosis vs. post syphilis). CD4+/CD8+ ratio was stable at three time points [1.02 (0.78-1.38) vs. 1.04 (0.80-1.39), p=0.28 vs. 1.00 (0.77-1.31), p=0.03].

**Conclusions:** Syphilis appears to have a minimal effect on HIV VL among participants on ART with viral suppression but is associated with a transient and modest decline in CD4 count. Syphilis prevalence is high among MSM in Bangkok at AHI diagnosis. Moreover, syphilis incidence is extremely high during ART follow-up. Routine syphilis screening and behavioral risk reduction counseling must be implemented at diagnosis and every 6-12 months for MSM with HIV infection in Thailand.

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**Seroprevalence of and associated factors with amoebiasis among newly diagnosed HIV-positive patients in Taiwan, 2009-2018**

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**Background:** Emtamoeba histolytica infection is an emerging sexually transmitted disease among men who have sex with men in Asia-Pacific region. The trends of seroprevalence of and associated factors with amoebiasis among HIV-positive patients have not been fully understood.

**Methods:** We reviewed medical records of newly diagnosed HIV-positive patients who received HIV care at the National Taiwan University Hospital between 2009 and 2018. Patients who had tests for indirect hemagglutination antibody (IHA) within 6 months before or after their HIV diagnoses were included for analyses. The demographics, clinical presentations, and baseline laboratory test results were collected retrospectively and analyzed for the association with positive IHA and high IHA titer (defined by an IHA titer ≥8 and ≥128, respectively) in multivariable regression models.

**Results:** Among 1816 newly diagnosed HIV-positive patients in the 10-year study period, 965 (53.1%) had IHA titers determined. The proportion of patients undergoing IHA testing had increased from 29.9-37.8% in 2009-2011 to 75.4-87.3% in 2015-2018. Overall, 90 (9.3%) patients tested positive for IHA and 65 (6.7%) had high IHA titers. The annual prevalence of high IHA titers fluctuated over the 10-year study period, ranging from 2.5 % in 2012 to 13.6% in 2009. While baseline CD4 lymphocyte counts or plasma HIV RNA loads were not associated with IHA positivity, patients who had high IHA titers were more likely to have positive rapid plasma reagin (RPR) titers ≥4 (adjusted odds ratio [aOR] 1.05, 95% confidence interval [CI] 1.01-1.09) and symptoms of diarrhea (aOR 1.13, 95% CI 1.09-1.17). In addition, an older age and being men
who have sex with men (MSM) were also independent factors associated with positive IHA (aOR 1.002, 95% CI 1.000-1.004; and aOR 1.07, 95% CI 1.01-1.14, respectively). Patients included in this study, compared to those without IHA titers, were more likely to be MSM, less likely to have HBV coinfection, had higher baseline plasma HIV RNA loads and lower CD4 lymphocyte counts, and were diagnosed later in the study period.

Conclusions: Seropositivity for E. histolytica was not uncommon among newly diagnosed HIV-positive individuals in Taiwan. To facilitate early diagnosis and appropriate management of amoebiasis, IHA testing should be included in the routine HIV care of HIV-positive patients, particularly those who are MSM and present with diarrhea and RPR titers ≥4.

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A Clinical scoring model to predict mortality in HIV/TB co-infected patients at end stage of AIDS in China: An observational cohort study

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Background: To construct and validate a non-invasive clinical scoring model to predict mortality in HIV/TB patients at end stage of AIDS in China.

Methods: 1007 HIV/TB patients admitted to Beijing Ditan Hospital from August 2009 to January 2018 were included in this study, who were randomly assigned to form derivation cohort and validation cohort. A clinical scoring model was developed based on predictors associated with mortality identified with Cox proportional hazard models. The discrimination and accuracy of model were further validated using the area under the ROC curves.

Results: The derivation and validation cohort consisted of 807 and 200 patients in 8:2 ratio, respectively. In derivation cohort, anemia (HGB<90g/L), Tuberculous meningitis, severe pneumonia, hypoalbuminemia, unexplained infections or space-occupying lesions, and malignancies remained independent risk factors of mortality in HIV/TB co-infected patients, and included in this clinical scoring model. The model indicated good discrimination, including AUC=0.858 (95% CI: 0.782-0.943) in the derivation cohort, and AUC=0.867 (95% CI: 0.832-0.902) in validation cohort, respectively. The predicted scores were categorized into two groups to predict the mortality: low-risk (0-2 points with mortality with 3.6-9.1%) and high-risk (4-16 points with mortality with 26.42-74.62%), in which 54.55% and 74.62% of patients with score of 5 to 11 and 12-16 were died among high-risk group. Kaplan-Meier curve indicated a significant difference in the cumulative mortality in the two groups by log-rank test (p<0.001).

Conclusions: A clinical scoring model to assess the prognosis in HIV/TB patients at end stage of AIDS was constructed based on simple laboratory and clinical features available at admission, which may be an easy-to-use tool for physicians to evaluate the prognosis and treatment outcome in HIV/TB co-infected patients. The model was also applicable for predicting the death of end-stage HIV/TB patients within a 12 months period after discharge.

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Risk factors for HIV and hepatitis C co-infection among people who inject drugs in Cambodia: Findings from a national survey

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Background: Despite the evidence of the relationship between human immunodeficiency viruses (HIV) and hepatitis C virus (HCV) in people who inject drugs globally, studies on the co-
infection among this key population remain scarce in resource-poor countries. This study was therefore conducted to explore the prevalence of and factors associated with HIV/HCV co-infection among people who inject drugs in Cambodia.

Materials & Methods: This study was conducted as part of the National Integrated Biological and Behavioral Survey among people who use drugs in 2017. The Respondent Driven Sampling method was used to recruit participants in the capital city and other 11 provinces for face-to-face interviews and HIV and HCV testing. Weighted multivariable logistic regression analysis was conducted to identify risk factors associated with HIV/HCV co-infection. This study was approved by the National Ethics Committee for Health Research. A written informed consent was obtained from each participant prior to the data collection.

Results: This study included 286 people who inject drugs with a mean age of 31.6 (SD= 7.5) years. The prevalence of HIV and HCV was 15.2% and 30.4%, respectively. Almost one in ten (9.4%) of the total study population were co-infected with HIV and HCV. After adjustment, the odds of HIV/HCV co-infection was significantly higher among participants who were female (AOR= 2.17, 95% CI= 1.03-6.08), were in the older age group of 35 and older (AOR= 3.67, 95% CI= 1.04-9.80), were widowed/divorced/separated (AOR= 3.25, 95% CI= 1.76-13.94), were living on the streets (AOR= 4.83, 95% CI= 1.23-9.02), and had received methadone maintenance therapy in the past year (AOR= 4.02, 95% CI= 1.13-18.96) compared to their respective reference group. The odds was significantly lower among participants who reported having attained ≥10 years of formal education compared to those who had attained only primary education or lower (AOR= 0.68, 95% CI= 0.15-0.96).

Conclusions: The prevalence of HIV/HCV co-infection among people who inject drugs in Cambodia is considerably high, particularly in older and more vulnerable subgroups. Tailor-made interventions are required to increase access to culturally sensitive harm reduction interventions to prevent both HIV and HCV infection. In addition, there is an opportunity to expand HCV screening, diagnosis, and treatment in this key population given its small population size and the availability of new directly-acting antiviral agents in the country.

Gonorrhea and Chlamydia Prevalence and Incidence by Anatomic Site Among Thai MSM with Acute HIV Infection

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Background: Individuals with an active sexually transmitted infection (STI) are at risk for acquiring and transmitting HIV, and STIs should be monitored to track epidemics in high-risk populations. We evaluated the prevalence and incidence of Neisseria gonorrhoeae (NG) and Chlamydia trachomatis (CT) in an acute HIV cohort of Thai men who have sex with men (MSM), a group with high STI burden.

Material & Methods: Since study initiation in 2009, adult study participants were enrolled in the RV254/SEARCH010 cohort with acute HIV infection (AHI). From October 2014 onwards, NG and CT were tested by nucleic acid amplification testing (NAT) regularly at baseline and every twelve months thereafter, with additional testing when clinically indicated. Sample collection was based on sexual behavior: rectal swabs for participants reporting receptive anal intercourse, pharyngeal swabs for participants reporting receptive oral intercourse, and urine samples for all participants. All positive test results were offered treatment. Prevalence in MSM participants was calculated in anatomical sites by year and by time enrolled in cohort through the end of 2018. Because testing was repeated yearly and all positive results were treated, STI detected at annual testing after the baseline visit were considered as incident cases. Statistical comparisons were made using Pearson’s chi-squared test.

Results: By December 2018, 580 study participants enrolled in the cohort and 89% were MSM. Of 519 MSM participants, the mean participant age (interquartile range [IQR]) was 27 (22 – 30) years at enrollment.
For the time period between 2015 and 2018, the overall NG prevalence was 35%. Prevalence of anorectal infection was 27%, 21% for pharyngeal infection, and 5% for urethral infection. Gonorrhea point prevalence was 20% in 2015, 16% in 2016, 15% in 2017, 14% in 2018, and declined over time (p=0.047). Overall CT prevalence between 2015 and 2018 was 41%, with 38% prevalence for anorectal infection, 9% pharyngeal infection, and 10% urethral infection. Chlamydia point prevalence was 18% in 2015, 19% in 2016, 19% in 2017, and 19% in 2018 (p=0.818).

Evaluating by time observed in the study, GC prevalence was 25% at baseline and ART initiation. Gonorrhea incidence was 15% at week 48, 14% at week 96, 10% at week 144, and 11% at week 192. Baseline CT prevalence was 25%, with incidence 17% at week 48, 16% at week 96, 13% at week 144, and 16% at week 192. Over a 4-year period on study and after ART initiation, the prevalence and incidence declined for gonorrhea (p<0.0001) and chlamydia (p=0.001).

Conclusions: Among MSM diagnosed with AHI in Bangkok, gonorrhea prevalence was high although showing a declining trend between 2015-2018 while chlamydia prevalence remained high throughout the period. Incidence rates for both gonorrhea and chlamydia decline over time after ART initiation, which may reflect changes in risk behavior. However, annual incidence of 10-17% of new STI through 192 weeks indicates ongoing risk behavior in a subset of the cohort population, and highlights the ongoing need for routine STI screening among MSM in long-term ART care.

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Relationship between the prevalence of maternal syphilis and HIV with the prevalence of congenital syphilis in South-East Asia: a systematic review

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Background: After the development of penicillin, cases of syphilis were almost eliminated. However, today syphilis is becoming the top three rank of sexually transmitted infection (STI) which is most common worldwide. In 2012, approximately 996,000 pregnant women are infected with syphilis resulting in 749,000 congenital syphilis (CS). Positive maternal syphilis (MS) with inadequate treatment is associated with spontaneous abortion, stillbirth, prematurity, clinical manifestations of CS, and late sequelae. As syphilis increases, CS becomes serious global health and economic burden, especially in some of low-income countries where logistical and technical constraints make screening and treatment of MS more difficult. Therefore, WHO launched an initiative for the global elimination of CS in 2007. Our study aims to investigate correlation between the prevalence of MS and HIV with the prevalence of CS by considering antenatal care (ANC) coverage, dual screening syphilis/ HIV coverage and both treatment coverage in South-East Asia (SEA) because these were still minimal compared to other regions.

Material & Methods: We searched published literatures systematically using PICO methods with combinations of the following terms on PubMed and Cochrane libraries: screening, congenital syphilis, maternal syphilis, HIV, ANC and elimination of mother-to-child transmission (EMTCT) starting from 2008. Out of 2278 citations identified, we excluded studies that didn’t focus on MS and HIV, as well as studies that didn’t define CS. Guidelines, review articles, clinical and basic researches were also excluded. Due to the linguistic barrier, all non-English studies were excluded as well. This study was prioritizing sources with high index Scopus. SEA was chosen as our scope of study due to limited accountable sources for larger Asia region. This study was involving four reviewers who conducted

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Abstract 109 has been withdrawn.
weekly selection process using CEBM-Oxford’s critical appraisal tool.

**Results:** From 14 selected citations, there are progress in combating CS in SEA. One of the specific studies shows average ANC-1 coverage escalated from 77 to 87% in 2012 to 2016 and the highest coverage was in Thailand (98%). Screening coverage for syphilis in ANC-1 increased from 59 to 65%. MS prevalence decreased non-significantly from 0.32% to 0.21%. Average treatment coverage for MS and HIV in SEA also increased from 69 to 71% and Thailand still with the highest coverage (94%). The estimated total number of CS decreased from 85,000 to 53,000. On 2017, the estimated HIV case for pregnant women was 45,000 while the pregnant women who received ARV treatment was 23,800 (53%), which shows progress from year 2014 (35%).

**Conclusions:** WHO’s EMTCT program shows good expectancy for the result towards eliminating MS, CS and HIV among pregnant women. Higher number of ANC-1, syphilis screening and treated MS coverage shows positive impact in reducing CS in SEA. Reduction of MS prevalence alone indirectly correlates with decreasing CS case rate. However, this is still considerably low, under WHO target, thus it requires stronger commitment and efforts from SEA countries to eliminate CS, MS, and HIV in pregnant women through EMTCT program with Thailand as model.

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**Persistent chronic immune activation in patients with HIV/HBV co-infection after HAART**

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**Background:** We conducted this study to observe the patterns of change in chronic immune activation and investigate their associated mechanisms in patients with HIV/HBV co-infection after receiving highly active antiretroviral therapy (HAART).

**Methods:** This study enrolled 40 patients with HIV/HBV co-infection (co-infection group), 38 patients with HIV-1 single infection (HIV single infection group), and 20 healthy blood donors (healthy control group). Markers of chronic immune activity (SCD4, SCD13, CD4+HLDR+CD38+ and CD8+HLDR+CD38+) and regulatory T cells (Treg cells) were assessed prior to treatment (baseline) and at week 12, 24, 36, and 48 after treatment.

**Results:** There were no significant differences in age, gender, baseline CD4 count, and HIV viral load between patients with HBV/HIV co-infection and patients with HIV single infection (all p values > 0.05). In both groups, the CD4 count rose after treatment, indicating HIV viral suppression (all p values < 0.05 ), and there was no significant difference in the CD4 count recovery and HIV viral suppression rates between the two groups (both p values > 0.05). There was no significant difference in the baseline chronic immune reactivity indicators and baseline Treg cells (both p values > 0.05) between the two groups. Both groups had significantly higher levels of chronic immune reactivity indicators and Treg cells than the healthy controls (all p values < 0.05 ). After receiving HAART, the SCD13, CD4+HLDR+CD38+ and CD8+HLDR+CD38+ of both groups declined compared to baseline (both p values < 0.05 ), but remained higher than those of the healthy controls at week 48 (both p values < 0.05). In addition, there were no significant statistic differences between the co-infection and single infection groups (both p values > 0.05). The SCD14 of patients with HBV/HIV co-infection and patients with HIV single infection decreased after HAART (both p values < 0.05 ). The SCD14 level of HIV single infection group decreased to that of healthy controls since week 24 but it still remained higher in co-infection group than healthy controls ( p value < 0.05). The variation trends of both SCD14 and Treg cells were the same (p value < 0.05).

**Conclusion:** Compared to patients only with HIV infection, chronic immune activation is more severe in patients with HBV/HIV co-infection even after effective HAART, which is possibly related to Treg cells.
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Care Cascade of HCV infection among HIV-infected patients in Taiwan

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Background: HCV seroprevalence is 2 to 4% in general population and up to 18% among HIV-positive patients in Taiwan. Pegylated interferon plus ribavirin (Peg/RBV) was replaced by directing acting antivirals (DAA) that was reimbursed by the National Health Insurance (NHI) for the treatment of chronic HCV infection in 2017-2018, which necessitated referral of HIV/HCV-coinfected patients to hepatologists. Little is known about the engagement and completion of HCV treatment in HIV/HCV-coinfected patients in Taiwan. We aimed to describe the care cascade HCV infection among HIV-positive patients in Taiwan.

Materials & Methods: We retrospectively reviewed all HIV-infected patients seeking HIV care at the National Taiwan University Hospital (NTUH) from January 2011 to December 2018. HCV-seropositive patients were identified and recognized as "prevalent infections" or "incident infections". Patients with positive anti-HCV antibody in their first blood data in 2011 and those with positive anti-HCV antibody at baseline when a diagnosis of HIV infection was made between 2011 and 2018 were classified as having prevalent infections. Patients testing negative for anti-HCV antibody at baseline followed by subsequent HCV seroconversion were classified as having incident infections. Data on demographic and clinical and virologic responses to anti-HCV treatment were recorded.

Results: Between 2011 and 2018, 4098 HIV-infected patients received care at the NTUH were reviewed. After excluding those who had less than 3 clinic visits, missing data, or were lost to follow-up at the time of enrollment, 304 patients (85% male) were classified as having prevalent infections. Among 3669 patients testing seronegative for HCV at baseline, 212 (100% male) developed HCV seroconversion and were identified as having incident infections. Compared to the patients with prevalent infection, those who had incident infection were younger (33.8 vs 39.2 years, P<0.001) and more likely to be MSM (90.6% vs 51.3%, p<0.001); had a higher CD4 count (602 vs 462 cells/mm³, P<0.001) and were more likely to have syphilis (89.2% vs 48.3%, P<0.001). Among the 304 prevalent infections, 228 (75.0%) had at least one HCV RNA data and 184 (60.5%) were viremic. Of those known to have HCV viremia, 124 (67.4%) had received anti-HCV treatment, and 97 (52.7%) were confirmed to have achieved sustained virologic response (SVR). Among the 212 patients with incident infections, 174 (82.1%) had an HCV RNA data and 154 (72.6%) were viremic. Of those known to have HCV viremia, 132 (85.7%) were treated and 107 (69.5%) achieved SVR.

Conclusions: Our findings suggest that, despite the introduction of NHI-reimbursed Peg/RBV and DAA for HCV infection in Taiwan, improvement in access to HCV viral load testing and initiation of anti-HCV treatment is needed among HIV-infected patients in Taiwan.

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Cost-effectiveness of direct-acting antivirals (DAAs) compared to pegylated interferon (PegIFN) with ribavirin (RBV) in previously untreated hepatitis C virus genotype 1 (GT1) infected patients without advanced liver disease in Hong Kong

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Background: First-line therapy for chronic hepatitis C (CHC) infection in Hong Kong consists of PegIFN+RBV, but low treatment uptake and early discontinuation of therapy highlight the need for more effective and tolerable treatment regimens. DAAs allow for IFN-free, RBV-free treatment for many patients, as well as shorter treatment durations. The objective of this study was to
compare the cost-effectiveness of DAA regimens to PegIFN+RBV in treatment-naïve (TN) patients with GT1 CHC infection and without advanced liver disease (METAVIR F0-2).

Materials & Methods: We constructed a Markov model to estimate the cost and effectiveness of PegIFN+RBV and DAAs over a lifetime time horizon. The target population was patients with CHC GT1a or 1b infection, who were TN and had F0-2 fibrosis at baseline. The model simulates the natural history of CHC and its treatment via 16 health states encompassing METAVIR fibrosis score, treatment success or failure, decompensated cirrhosis, hepatocellular carcinoma, liver transplant, and liver-related death. DAAs included in the model were elbasvir/grazoprevir (EBR/GZR), ledipasvir/sofosbuvir (LDV/SOF), ombitasvir/paritaprevir/ritonavir + dasabuvir (OMB/PAR/RIT+DAS), sofosbuvir/velpatasvir (SOF/VEL), glecaprevir/pibrentasvir (GLE/PIB), and daclatasvir + asunaprevir (DAC+ASN; GT1b only). The proportions of patients achieving sustained virologic response (SVR) were obtained from clinical trials and product labeling. Other inputs were obtained from published literature and local data. The primary outcome was incremental cost-utility ratio (ICUR) for each DAA vs. PegIFN+RBV. ICURs were compared to a cost-effectiveness threshold of HK$360,000/QALY, equivalent to the annual gross domestic product (GDP) of Hong Kong per capita.

Results: All DAAs were more costly and more effective (greater QALYs) compared to PegIFN+RBV in TN patients with GT1a or GT1b CHC and F0-2 fibrosis. All DAAs were cost-effective compared to PegIFN+RBV in GT1a patients, with ICURs of HK$39,368 for EBR/GZR, HK$103,547 for LDV/SOF, HK$143,770 for GLE/PIB, HK$240,206 for SOF/VEL, and HK$244,643 for OMB/PAR/RIT+DAS. In GT1b patients, EBR/GZR (HK$67,959/QALY), LDV/SOF (HK$177,110/QALY), and GLE/PIB (HK$250,461) were cost-effective compared to PegIFN+RBV, while ICURs for other DAAs (OMB/PAR/RIT+DAS, HK$399,216/QALY; SOF/VEL, HK$403,100/QALY; DAC+ASN, HK$535,882/QALY) exceeded the GDP threshold.

Conclusions: DAAs are more costly and more effective than PegIFN+RBV in TN patients with GT1 CHC infection and F0-2 fibrosis. Among the DAAs currently marketed or anticipated to be marketed soon in Hong Kong, EBR/GZR had the lowest cost per additional QALY gained compared to PegIFN+RBV, and thus represents the best value for investment in treatment of patients with CHC.
4th Asia Pacific AIDS & Co-infections Conference

Translating Science into Clinical Practice

Abstracts
Abstract Book Only
Parthenium hysterophorus Leaf Extracts contains Inhibitory Potential of HIV-RT Activity

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The burden of HIV epidemic varies considerably among different geographical regions, with nearly 4.1% adults in the African region, accounting for nearly two-thirds of the people living with HIV in the world. Since, more than 70 million people have been infected and 35 million have been died due to the HIV virus. An average of 31.1-43.9 million people was living with HIV at the end of 2017 with a prevalence of 0.6-0.9% among adults worldwide.

The toxicity of currently available antiretroviral therapy for HIV makes it difficult to maintain patient’s adherence to the therapy. Therefore, the search for safer with less side effects and more cost-effective anti-HIV agents continues, and much attention has focused on plants. Natural products have been found to inhibit viral enzymes and proteins crucial to the life cycle of HIV. The plant species, P. hysterophorus belonging to the family, Asteraceae, was selected to explore its potential as an anti-HIV-R1 agent. The shade-dried and ground into fine powderized leaves of P. hysterophorus were extracted in six different organic solvents (hexane, benzene, chloroform, ethyl acetate, acetone, ethyl alcohol, and water) using Soxhlet apparatus. These extracts were centrifuged, filtered, concentrated and lyophilized. The dried residues were dissolved and reconstituted in dimethyl sulfoxide followed by the evaluation of the extracts for their antiretroviral activity by targeting HIV-RT enzyme using HIV-RT kit (Roche). The reaction mixture consists of template/primer complex, dNTPs, and reverse transcriptase (RT) enzyme in lysis buffer with or without extract. The absorbance of the resulting colored product produced by peroxide enzyme activity, and the color intensity was measured at 405 nm using microtiter plate of ELISA reader. The color intensity is directly proportional to the actual activity of reverse transcriptase. The percentage inhibitory activity of different P. hysterophorus extracts was calculated by comparing to a sample that does not contain plant extract as an inhibitor. Anti-HIV-RT activity was measured at two different concentrations (0.6 and 6.0 μg/ml) of all extracts, which showed low inhibition potential (<50%). About 40% inhibition of reverse transcriptase activity was observed in hexane fraction at 6.0 μg/ml concentration.

The present study showed that P. hysterophorus leaves have certain chemical agents with low to moderate anti-HIV-RT activity. Among all the six extracts only the extracts of hexane, ethyl acetate, and water fractions produced modest anti-HIV-RT activity (about 23-40%). Nevirapine was used as standard with the 99.67% inhibitory activity. Since several phytochemicals are present in the crude extract, it might be possible that isolation and purification of the active ingredients from potential fractions and their bioactivity testing in the future may provide further enhancement of anti-HIV-RT activity.

Impact of LPV/r- based antiretroviral regimens on lipid profiles in Chinese HIV/AIDS patients in a tertiary hospital in Beijing

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Background: Lopinavir/ritonavir (LPV/r) is widely used in China due to drug restrictions, but its impact on lipid profiles in Chinese patients with human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) was rarely studied.

Methods: We carried out a cross-sectional and retrospective study of HIV/AIDS patients 15 years or more who were initially treated with LPV/r-based antiretroviral therapy (ART) from Jan. 2012 to Apr. 2015 in Youan hospital, Beijing China. The clinical data including serum cholesterol (TC), triglyceride (TG), low Density lipoprotein cholesterol (LDL), high density lipoprotein cholesterol (HDL), and HDL subfractions were collected. The data were compared with the Chinese guideline for the prevention and treatment of lipids and lipoproteins. The results were analyzed using the SPSS software (version 14).
cholesterol (HDL) at baseline and up to 3 months to 2 years on ART were collected. Dyslipidemia was defined using the NCEP ATPIII guidelines. A multiple logistic regression model was used to assess for factors related to dyslipidaemia.

**Results:** The study enrolled 308 HIV/AIDS patients, of whom 272 (88.3%) were males, their median age was 31 years (IQR:28-36), 253 (82.1%) of them were on TDF including regime. The prevalence of dyslipidaemia changed from 71.6% on baseline to 82.8% after 24 months of ART (凡是). The median level of CHO, rate of patients with hypercholesterolemia(TC≥5.18mmol/L), median level of TG and rate of patients with hypertriglyceridemia(TG≥1.70 mmol/L) both increased rapidly at first 6 months of ART, and then went up slowly. HDL level increased linearly with duration of ART, and the rate of patients with lower HDL(HDL<1.04 mmol/L) decreased on ART. There were declines in the ratio of CHO/LDL and the percentage of patients with abnormal CHO/LDL ratio(TC/HDL≥ 5). But LDL did not show any obvious changement after ART. Scatter plots showed that elevated baseline CHO, HDL, LDL and CHO/LDL seemed to have some decline at the first 6 months of ART, and then held steady, TG values in patients with hypertriglyceridemia at baseline also increased after ART. For all of the lipid index, patients with high baseline viral load (≥100,000 copies/mL) had lower viral suppression rates in the first 12 months, But all patients achieved HIV-1 RNA <50 copies/mL at 24 months. The immunological response and the adverse events were assessed.

**Conclusion:** LPV/r-based regimens may significantly increase serum CHO, TG level, and the changement mainly happened in the early stage of antiviral treatment. As the most important lipid profile, LDL was almost unaffected during the treament. Baseline hyperlipidemia maybe the most significant risk factor of dyslipidemia after ART.

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**Effectiveness and tolerability of lopinavir/ritonavir plus two NRTIs in HIV-1-infected patients with initial antiretroviral therapy at the Beijing Youan Hospital: a retrospective study**

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**Background:** Lopinavir/ritonavir (LPV/r) is a very important antiviral drug in China, but there are very few available data about the performance of first-line LPV/r-based regimens in treatment-naive patients with HIV-1.

**Methods:** This was a retrospective study of 399 patients who were registered in the China National Free Antiretroviral Treatment Program from July 2012 to January 2017 and followed at the Youan Hospital Affiliated to Capital Medical University (Beijing, China). The primary outcome was the proportion of subjects with HIV-1 RNA ≤50 copies/mL at 6 and 24 months. The immunological response and the adverse events were assessed.

**Results:** The median follow-up was 12 (interquartile range [IQR]:6-24) months. A rapid decline in HIV-1 RNA was observed (91.2% patients were confirmed with<50 copies/mL of HIV-1 RNA at 6 months). Patients with high baseline viral load (≥100,000 copies/mL) had lower viral suppression rates in the first 12 months, But all patients achieved HIV-1 RNA <50 copies/mL at 24 months, irrespective of baseline viral load or regimen. The mean increasement in CD4+ T cell counts from baseline to month 24 was 296 cells/μL. Eight patients (2%) had grade 3 laboratory adverse events. There was no grade 4 laboratory adverse event.

**Conclusion:** Our findings demonstrate a good effectiveness and tolerability profile of LPV/r-containing regimens for treatment-naive patients with HIV-1.
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High survival rate of HIV-infected patients who receiving Free Antiretroviral Treatment in Beijing, China: A ten-year retrospective cohort study

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Backgrounds: Beijing has been offering free antiretroviral treatment for HIV-infected patients since 2005. The research evaluates the impact of free ART in Beijing.

Methods: A retrospective cohort study was conducted and the data were collected from the China National Free Antiretroviral Treatment Program in Beijing.

The patients older than 15 years between January 1, 2005 and December 31, 2015 initiating standard antiretroviral therapy were included and followed up to Dec 31, 2015. Life table method was applied to calculate the survival rate; Kaplan-Meier method was used to calculate the average survival time at the end of observation; COX proportion hazard regression model was performed to identify the factors related to survival time.

Results: 10,077 patients met eligibility criteria. The average survival time was 131.24 months (130.48-132.00), and All-cause mortality was 0.45 deaths/100PY. The accumulative survival rate in 1, 5, 10 years was 99.25%, 98.22% and 96.01%, respectively. The related factors were transmission, age and the CD4+ T cell counts when initial antiretroviral treatment.

Conclusions: The survival rate of HIV-infected patients who receiving Free Antiretroviral Treatment was excellent high in Beijing. Indicating we should pay close attention to improve the quality of life of HIV-infected patients, and monitor the occurrence of drug resistance.

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Efficacy and safety of abacavir/lamivudine plus rilpivirine as a first-line regimen in treatment naïve HIV-1 infected adults

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Background: The use of the antiretroviral (ART) combination abacavir/lamivudine/riplivirine (ABC/3TC/RPV) in treatment-naïve HIV-1 infected individuals is not recommended by most international guidelines. There is little data showing the efficacy and safety of this regimen. However, its component drugs are potent in combination, well-tolerated, and relatively affordable, especially in resource-limited settings. This study evaluates the efficacy and safety of ABC/3TC/RPV as an initial regimen for treatment-naïve HIV-1 infected patients.

Methods: A retrospective study was conducted in the largest HIV care centre in Singapore, with data collected between June 2011 and September 2017. All treatment-naïve HIV-1 infected patients aged 18 and above who were prescribed ABC/3TC as part of their initial ART regimen were included. The third drug was a non-nucleoside reverse-transcriptase inhibitor (NNRTI) such as RPV or efavirenz (EFV), or a boosted protease-inhibitor (PI). Patients were followed up for 48 weeks from initiation of ART. Primary efficacy end-point was the percentage of patients achieving virologic suppression, and was analysed using on-treatment analysis. Secondary outcomes included CD4 count change, treatment discontinuation before 48 weeks and treatment-related adverse events.

Results: 170 patients were included; 66 received ABC/3TC/RPV and 104 received ABC/3TC and EFV or boosted PI. 96% in the RPV arm and 87% in the comparator arm (EFV or boosted PI) (p = 0.28). The time to viral suppression was similar: 16 weeks (IQR 14-26 weeks) in the RPV arm, and 22 weeks (IQR 15-27 weeks) in the comparator arm. 9 out of 66 patients (14%) from the RPV arm had
discontinuation of treatment before 48 weeks, compared to with 31 of 104 patients (30%) from the comparator arm (p=0.053). Of these, 23 discontinuations were due to drug adverse effects, and only 1 was in the RPV arm (p=0.01). There were no fatal or life-threatening adverse effects observed in either arm. 1 patient in each arm had virologic failure.

Conclusions: RPV is effective, safe and considerably more tolerable than compared to NNRTI or boosted PIs in ABC/3TC-containing regimens for treatment-naïve patients. It offers an affordable and attractive option, especially in resource-limited settings.

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Hepatotoxicity of once-daily tenofovir, lamivudine, and efavirenz regimen assessed among MSM HIV infected patients in China

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Objectives: This study aimed to investigate the incidence density of liver injury in men who have sex with men (MSM) primary HIV infection (PHI) cohort. Moreover, we assessed the frequency, dynamic characteristics, and risk factors of hepatotoxicity in MSM HIV infection population initiating tenofovir disoproxil fumarate (TDF)/lamivudine (3TC) plus efavirenz (EFV) regimen.

Methods: From June 2009 to August 2017, PHI and chronic HIV infection (CHI) patients were recruited. We compared liver function parameters between the two cohorts after initiating TDF/3TC plus EFV regimen. Multivariate Cox proportional hazards model was constructed to analyze the risk factors of hepatotoxicity development.

Results: During the study period, 76 PHI and 253 CHI MSM patients were enrolled. Liver injury occurred in 43.2% (n=142, incidence rate 1.99 cases/100 person-months) of the patients. The liver enzymes elevation (LEE) incidence densities were similar between the PHI and CHI cohort (3.06 cases/100 person-months vs. 1.80 cases/100 person-months, p=0.215), but the LEE developed earlier in the PHI cohort (Log Rank test = 29.48, p<0.001). The proportion of LEE higher than 10% mostly occurred within 6 months on therapy. In multiple cox regression analysis, the baseline BMI, ALT, GGT and CD4 levels were associated with increased risk of hepatotoxicity development.

Conclusions: The drug related hepatotoxicity occurred early in MSM PHI patients after taking TDF/3TC plus EFV regimen. The LEE mostly developed within 6 months after treatment. It should be given more attention and prophylactic treatments for MSM HIV infected patients with risk factors.

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Smoking Cessation Program for People Who Are Living with HIV: Risk Score Reduction for Coronary Heart Disease

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Introduction: In Taiwan, approximately 40% of people who are living with HIV (PLHIV) are active tobacco smokers. Tobacco may cause many diseases, included lung cancers, chronic obstructive pulmonary disease, and coronary artery disease, etc. Nevertheless, smoking is the leading preventable cause of death worldwide. In this study, we provided smoking cessation program for PLHIV.

Methods: There were more than 2,000 PLHIV who visited out-patient clinics in Taoyuan General Hospital regularly in 2015. After obtaining informed consents, Framingham Coronary Heart Disease Risk Scores (FRS) were calculated (low risk score: 1-5, moderate risk score: 6-9, high risk score: 10 or above) for each subject. Their age, gender, blood pressure (BP), history of diabetes mellitus, current status of smoking, level of total cholesterol (TC-CHO), and level of high-density lipoprotein (HDL) were recorded.
Smoke cessation program lasting 2-4 months were initiated if the smokers agreed to stop smoking. Smoker participants who were still not ready for quitting cigarette and non-smokers were enrolled for comparison. Thereafter, the subjects were kept follow-up until Dec. 2018.

Results: Totally 152 subjected were enrolled for study. Among them, 139 (91.5%) were male; 47 subjects were in smoking cessation (SC) group, 38 subjects were in smoking uninterruption (SU) group, and 67 subjects were in non-smoking (NS) group. Basic demographic characteristics showed SC group were elder, and had higher BP, higher baseline T-CHO, and higher baseline HDL level. With regard to basic risk for coronary heart disease, 17% subjects of SC group, 5.3% of SU group, and 7.5% of NS group had moderate FRS (6-9). And 4.3% of SC group had high FRS (10 and above). After 3 years of follow-up (intervention with smoking cessation on SC group), 12.8% subjects of SC group, 10.5% of SU group, and 3% of NS group had moderate FRS. And, 0% of SC group had high FRS. In term of the differences between means of FRS on enrolment and follow-up on the 3rd years, there were a significant decrease (from 3.70 to 2.28, p<.005) in SC group, an increase (-0.16 to 1.79, p<.005) in SU group, and a slightly decrease (-0.14 to -0.06, p=.49) in NS group. Accumulated FRS had 38% of decrease (from 174 to 107) during these 3 years after smoking cessation program in SC group. On the contrary, 12 times of increase of FRS were noted in SU group.

Conclusions: In conclusions, smoking definitely increases the risk of coronary heart disease. For the sake of long-term care, life-long antiretroviral therapies provide the longevity, and smoking cessation may promote PLWHIV’s health.

Factors Associated with High Cardiovascular Risk among HIV Infected Patients on Antiretroviral Therapy in Tertiary Hospital in Indonesia

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Background: As HIV combined antiretroviral therapy (cART) made a huge success, the number of AIDS defining illness significantly reduced. This phenomenon shifts the focus of HIV clinical care from treating infectious complications to managing chronic non-communicable diseases. Cardiovascular diseases (CVD) takes significant portion in both morbidity and mortality among HIV infected patients. Extensive data in the last decade showed that cardiovascular diseases among HIV population were more common. Its mechanism and risk factors are different from general population. Immune activation and chronic inflammation as well as cART side effects were thought to play important role in higher CVD risk among this population. Knowing and managing risk factors of HIV patients with high cardiovascular risk are essential both for long-term HIV care and preventive cardiology. This study aimed to determine factors associated with high cardiovascular risk among HIV patients on antiretroviral therapy.

Material and Method: This study was a cross sectional study involving HIV patient on cART for at least 6 months. Sociodemographic and clinical characteristics were collected using physician-administered questionnaire. Antropometric, lipid profile, and fasting blood glucose measurement were obtained using standard protocol. Cardiovascular risk was assessed using Data Collection on Adverse events of Anti-HIV Drugs (D:A:D) risk score and the proportion of high
cardiovascular subject was presented in percentage. Bivariat analysis between nadir lymphocyte CD4 count, adherence, duration of cART use, IMT changes and increased cardiovascular risk were performed using T test or Mann-Whitney test for numerical data and x2 test for categorical data.

Results: One hundred and eighty six subjects were included in the analysis. The proportion of high cardiovascular risk subjects was 14.5%. Subjects with high cardiovascular risk were all men with relatively younger age compared to general population (median age 47 years old). Dyslipidemia and central obesity were very common among subjects with high risk. Most patients with high cardiovascular risk were using PI-based cART (77.8%). Nadir lymphocyte CD4 count <200 cell/mm3 and history of poor adherence were associated with higher cardiovascular risk (OR: 7.072, 95% CI: 0.92 – 54.006, p: 0.032 and OR: 3.364, 95% CI: 1.458 – 7.784, p: 0.003, respectively). Duration of cART use and IMT changes were also associated with increased cardiovascular risk (p: 0.002 and 0.018, respectively).

Conclusion: Lower nadir lymphocyte CD4 count, poorer adherence, longer duration of cART use, and wider IMT changes were all associated with increased cardiovascular risk among HIV patients on cART.

Kidney Function Decline among HIV-infected Thai Adults: Is Low Vitamin D one of the Factors?

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Background: Each respective prevalence of hypovitaminosis D and Chronic Kidney diseases (CKD) are high among Thai HIV-infected adults. HIV patients have generally lower vitamin D level and higher risks of chronic kidney diseases than the general population. Therefore, we examined the association of hypovitaminosis D and kidney function decline among HIV-infected Thai adults.

Methods: We observed retrospectively among HIV-infected adults from HIV-NAT cohort who were on ART and virologically suppressed for 6 months with serum 25 OHD and estimated Glomerular filtration rate (eGFR) above 60 ml/min at baseline. Participants with eGFR measured every 6-months were recruited in the study. The primary outcome was kidney function decline in terms of eGFR decline. The GEE population-averaged models were used for multivariate analyses where age, sex, comorbidities like hypertension, gout, diabetes mellitus, co-infections with HBV or HCV and HIV-related measures like baseline HIV antibody level and viral loads were adjusted.

Results: Total 435 participants were observed longitudinally through observations over mean follow up of 24 (IQR 36) months. Median age of the participants was 46.58 (IQR 16.23) years old. Median serum 25 OHD was 23.4 (IQR 61.3) ng/ml. Mean baseline eGFR was 95.79 (IQR 22.22) ml/min/1.732. Mean eGFR differences to references were resulted in multivariable analyses. The vitamin D insufficiency (I)caused -0.9 (-4.27, 2.47;95CI%, P= 0.60) while vitamin D deficiency (D) caused 2.10 (-1.89, 6.09; 95%CI, P=0.30). Follow up months(F) resulted -0.02 (-0.05, 0.00;95%CI, P=0.10). The interaction of (F) with vitamin D insufficiency was 0.00 (-0.03, 0.03; 95%CI, P=0.89) while with vitamin D deficiency was 0.01(-0.02,0.05,95%CI, P=0.44).The interaction of (D) with BMI (18 through <25) proved -3.06 (-7.10, 0.98;95CI%, P=0.14) while with BMI (25 and more) showed -5.53 (-9.98, -1.09;95CI%, P=0.02).

Conclusion: Hypovitaminosis D alone is not statistically significant factor and of little clinical impact. However, HIV-infected Thai adults with high BMI (25 and above) but who are vitamin D deficient show statistical significance about eGFR decline calling clinical consideration and further studies in large populations with multi-ethnic groups are warranted.
Kidney Function Decline among HIV-infected Thai Adults: What are contributing factors?

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Background: HIV patients also have higher risks of chronic kidney diseases (CKD) than the general population. Literally, causes of CKD are multifactorial. Therefore, we explored factors causing or associated with kidney function decline among HIV-infected Thai adults.

Methods: We observed retrospectively kidney function decline in terms of eGFR decline among HIV-infected adults from HIV-NAT cohort who were on ART and virologically suppressed for 6 months with eGFR 60 ml/min and above at the baseline. The GEE population-averaged models were used in multivariate analyses via repeated measures of eGFR to predict eGFR decline.

Results: Total 435 participants were observed longitudinally over mean follow up of 24 (IQR 36) months. Median age of the participants was 46.58 (IQR 16.23) years old. Median baseline eGFR was 95.79 (IQR 22.22) ml/min/1.732. By multivariable analyses, mean eGFR differences of the following variables to references were obtained. The results were female -19.79 (-20.77, -18.81; 95%CI, P=0.00), age -0.71 (-0.77, -0.67; 95%CI, P=0.00), diabetes -2.02 (-3.43, -0.61; 95%CI, P=0.005), hypertension 0.84 (-0.17, 1.85; 95%CI, P=0.102), vitamin D insufficiency -0.9 (-4.27, 2.47; 95%CI, P= 0.60), vitamin D deficiency caused 2.10 (-1.89, 6.09; 95%CI, P=0.30), follow-up months -0.02 (-0.05, 0.00; 95%CI, P=0.10), Hepatitis B coinfection,0.40 (-7.41,1.55; 95%CI, P=0.49), Hepatitis C coinfection 1.06 (-0.92, 3.04; 95%CI, P=0.29), baseline HIV antibody count 0.00 (-0.00,0.00; 95%CI, P=0.57), baseline viral load (50 and less copies/ml) 0.40 (-0.80, 1.61;95%CI, P=0.51), and (25 and above)BMI 1.13 (-1.82, 4.08; 95%CI, P=0.45).

Conclusions: Age, diabetes and being female are strong factors for eGFR decline among HIV-infected Thai adults.

Clinical Assessment of Peripheral Neuropathy among Children Taking ART at Pediatric Center of Hue Central Hospital

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Background: Peripheral neuropathy (PN) is a common side effect of antiretroviral therapy (ART) in adult patients and is particularly related to the use of nucleoside reverse transcriptase inhibitors, but data on the prevalence of neuropathy in children are scarce. This study aims to determine the symptoms and signs of peripheral neuropathy occur in HIV infected children and to estimate the prevalence of peripheral neuropathy in this population at Hue Central Hospital.

Methods: A cross-sectional study was conducted to ascertain the prevalence of PN in children infected with HIV, who attend Pediatric Center of Hue Central Hospital between 2017 and 2018. After obtaining informed consent from the caregivers and assent from the children, participants were assessed for peripheral neuropathy using the neuropathy symptom score (NSS) and neuropathy disability score (NDS). Peripheral neuropathy was defined as NSS ≥ 5 or NDS ≥ 3. The results were analyzed using SPSS software.

Results: A total of 74 participants at the ages of 5–12 years were assessed. 34 were male and 40 were female. The median age was 6 years. Symptoms of neuropathy were reported in NSS by 20 children (27.0%), and signs were observed in NDS in 11 children (14.9%). A diagnosis of peripheral neuropathy was seen in 26 children (35.1%). Independent risk factors for peripheral neuropathy were co-trimoxazole prophylaxis (OR 2.32; 95%CI 1.31-7.95, p = 0.042), didanosine use (OR 6.47;
95%CI 2.4-16.9, \( p = 0.030 \) and longer time on ART (OR 3.15; 95%CI 1.25-9.92, \( p = 0.037 \)).

**Conclusion:** Peripheral neuropathy as determined by clinical assessment is a common condition in children taking ART.

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**Acceptability and feasibility of real-time adherence monitoring linked to WeChat reminders and notifications to support adherence among individuals living with HIV who are taking ART in China**

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**Background:** High adherence is critical for achieving optimal benefit from antiretroviral therapy (ART) against HIV infection; yet traditional adherence measures have numerous limitations. A novel real-time adherence measurement system that can automatically track the adherence and alert providers when necessary has the potential to improve clinical efficiency and outcome.

**Objective:** The aim of this study was to assess the acceptability and feasibility of real-time adherence monitoring linked to WeChat (a nationwide used app in China) reminders and notifications to support adherence among individuals living with HIV who are taking ART in China.

**Methods:** An adherence management system has been developed and tested among 40 HIV patients who were initiating ART and followed up for 6 months. The system consists of three parts: a smart pillbox that can record each opening and close and automatically upload the record to the cloud wirelessly, a mobile application embedded in the popular smartphone app, WeChat, that allow physicians to view adherence level and interact with patients in a secured fashion; and a website that automatically quantify the adherence level of each patients and display patient record in ascending order.

**Results:** Patients who had participated the pilot study found that the smart pill box was generally acceptable; the predominant feedback was perceived utility—the intervention was beneficial in motivating and reminding patients to take medication. Since the tracking, quantifying the adherence level and flagging out the patients with poor adherence are mostly done by technology, physicians can focus on helping those who need and addressing potential issues timely. The intervention was found to be technically feasible, as data were obtained from most participants as expected most of the time.

**Conclusions:** Real-time adherence monitoring integrated with SMS reminders and social support notifications is a generally acceptable and feasible intervention in China. Our pilot study confirmed the acceptability and feasibility of these monitors and associated interventions.

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**A Descriptive Analysis of Risk-taking Behaviors among HIV Infected Thai Youth at HIV-NAT, the Thai Red Cross AIDS Research Centre**


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**Background:** Youth have their risky behaviors that can result in HIV infection, Sexual Transmitted Disease (STD) and unintended pregnancy. This study aimed to describe risk taking behaviors, getting access to HIV prevention and HIV treatment in a cohort of behavioral risk HIV infected Thai youth.
Methods: We conducted a cross-sectional study of sexually risky behaviors in all HIV infected Thai youth aged 15-24 years at HIV-NAT, the Thai Red Cross AIDS Research Centre, Bangkok, Thailand. Data were carried out between February to June 2018 by interviewed based on questionnaires in each schedule clinic visits and telephone called. Univariate analysis was performed to describe risk-taking behaviors.

Results: Forty-two youths were enrolled with a median (IQR) age of 19 (18-22) years at interview. Median (IQR) time from HIV diagnosed was 1.3 (1.1-2.6) years. 59% were Men who have Sex with Men (MSM), 22% were female, 17% were transgender women and 2% were male. Self-perceived HIV risk rating scores were moderate (57%), high (33%) and low (10%). Twenty-seven (64%) had ≥4 life time sexual partners, regarding using social media to search for partners; there were Facebook (52%), mobile application (29%) and nightclub (19%). Twenty-two (52%) consumed alcohol, five (12%) smoking but substance was uncommon. Only 43% reported always using condoms in the preceding 6 months and 5% had previously used PrEP/PEP prior to HIV prevention. Twenty-four (57%) experienced to STDs, fifteen (36%) were syphilis, nine (21%) gonorrhea/ chlamydia and four (10%) were genital warts.

All of participants were initiated on ART with median (IQR) CD4 cell count of 436 (343-549) cell/mm3; 24 (57%) with NNRTI-based regimens; 12 (29%) boosted PI second regimens and 6 (14%) Integrase inhibitors-based regimen. Current median (IQR) CD4 was 599 (450-740) cells/mm3; 91% had current plasma HIV RNA < 40 copies/ml at last visit.

Conclusions: Among behaviors risk HIV-infected Thai youth in this cohort is MSM. We found high risk behaviors to HIV infection. However, HIV transmission is low due to high rate of virology suppression. Yet they are susceptible to other STD due to low rate of condom use. Thus, health care providers should provide more HIV knowledge and open access HIV services to Thai youth.
confounding factors, HIV infection remained positively associated with being female (AOR= 1.88, 95% CI= 1.03-4.04), being in an older age group of ≥35 (AOR= 2.99, 95% CI= 1.33-9.22), being widowed/divorced/separated (AOR= 2.57, 95% CI= 1.04-6.67), living on the streets (AOR= 2.86, 95% CI= 1.24-4.37), and having HCV infection (AOR= 3.89, 95% CI= 1.86-8.15). On the other hand, having completed at least 10 years of formal education (AOR= 0.44, 95% CI= 0.13-0.83) and higher monthly income of ≥US$200 (AOR= 0.20, 95% CI= 0.05-0.74) reduced the odds of HIV infection.

Conclusions: HIV prevalence among PWID in Cambodia remains high, but is reducing compared with the 25% reported in the 2012 national survey. Findings from this study provide critical information for stratifying and developing HIV risk profiles for PWID and tailoring interventions based on identified vulnerabilities and risk factors for HIV. In addition, the findings underline the importance of social structural factors in HIV epidemiology among PWID, which require mitigation.

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“The challenge that I faced with ARV...”: A Qualitative Approach to Developing a Mobile Phone-based Intervention to Support Adherence to Antiretroviral Therapy in Manila, Philippines

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Background: The Philippines has one of the fastest growing HIV epidemics globally. Eighty-three percent (32,099) of 38,114 cases diagnosed occurred from January 2011 to October 2016. In 2016, 87% of diagnoses were among men who have sex with men (MSM). Retaining patients in care and adherent to their antiretroviral therapy (ART) is a priority to reduce mortality, prevent emergence of drug resistance, and reduce transmission. There is good evidence to suggest that mobile health (mHealth) interventions can improve adherence. However, there are gaps in the literature about what makes mHealth interventions effective, and about mHealth adherence interventions targeting MSM in Asia.

Methods: The SHIP Clinic in Manila, serving 750 patients on ART, aimed to develop a locally-tailored intervention using an interactive mHealth adherence support platform. Two focus group discussions were conducted to: 1) elucidate barriers to adherence and, 2) assess the acceptability of a mobile phone intervention.

Results: Focus group discussions were held with 12 MSM with an average age of 32 years – 83% (10/12) reported that they sometimes forget to take their medications and 42% (5/12) had missed a dose within the past 2 weeks. Key elements affecting adherence were habits/behavioral skills, social support, medication side effects, time on ART, substance use, and mental wellness. In the Philippine context, stigma and discrimination were particularly important barriers. Participants expressed fear of disclosing one’s HIV status (or having it disclosed inadvertently) to family/friends/employers and shared experiences where disclosing resulted in personal rejection, loss of housing (multi-generation family homes are the norm), or being dismissed from jobs. Participants did not want to be seen taking medicines by other people at home or work. Participants were very accepting of the prospect an mHealth intervention.

Conclusion: The formative research was key to adapting a pill reminder call service that, to preserve privacy and prevent disclosure, is programmed to days/times specified by the patient, and is PIN protected. The calls incorporate health tips about HIV, and also include information about habit forming, mental wellness, harm reduction for drug use, and sexual risk reduction. An evaluation of the intervention is underway.

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Abstract 129 has been withdrawn.
Factors associated with condom use with non-commercial partners among transgender women in Cambodia: findings from a national survey using respondent-driven sampling

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Background: Globally, the prevalence of human immunodeficiency viruses (HIV) among transgender women is 49 times higher than that of the general adult population. The rate of consistent condom use among this population remains persistently low. Despite the critical needs for data to develop effective strategies for HIV prevention and care for this vulnerable population, studies on transgender women have just started to emerge in most parts of the world. To respond to the needs for the information, we conducted this study to explore factors associated with consistent condom use among transgender women in Cambodia, specifically with their non-commercial partners.

Material & Methods: Data used for this study were collected as part of the National Integrated Biological and Behavioral Survey among Transgender Women in Cambodia 2016. Participants were recruited from the capital city of Phnom Penh and 12 other provinces with high burden of HIV and a large population size of transgender women using the Respondent-Driven Sampling method. Face-to-face interviews were conducted by trained interviewers using a structured questionnaire in a tablet. Weighted multivariate logistic regression analysis was conducted to explore independent factors associated with consistent condom use. This study was approved by the National Ethics Committee for Health Research (No. 420 NECHR). We obtained a written informed consent from each participant prior to the data collection.

Results: This study included 1,202 transgender women who reported having anal sex with at least a male partner not in exchange for money or gifts in the past three months. The mean age of the participants was 26.0 (SD= 7.0) years. Of the total, 41.5% reported always using condoms with male non-commercial partners in the past three months. After adjustment, the likelihood of consistent condom use was significantly higher among participants who resided in an urban community (AOR= 1.7, 95% CI= 1.1-2.6), had attained at least 10 years of formal education (AOR= 1.8, 95% CI= 1.2-2.7), perceived that they were likely or very likely to be HIV infected (AOR= 2.9, 95% CI= 2.0-4.1), reported drinking alcohol two to three times per week (AOR= 3.1, 95% CI= 1.1-8.3), reported using amphetamine-type stimulants (AOR= 1.9, 95%= 1.1-3.8) or other drugs (AOR= 7.6, 95% CI= 1.5-39.5), and reported inconsistent condom use with male commercial partners in the past three months (AOR= 4.3, 95% CI= 1.8-10.4) compared to that of their respective reference group.

Conclusions: This study confirms the persistently low rates of condom use, particularly in non-commercial relationship among transgender women in Cambodia. To address these concerns, efforts towards education about harmful effects of multiple, concurrent relationships, and inconsistent condom use should be reinforced among transgender women.

Quality of Life of patients living with Human Immunodeficiency Virus Infection – Evidence from South India

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Introduction: With anti-retroviral therapy (ART) for human immunodeficiency virus infection (HIV) coming into picture, quality of life (QOL) has gained importance. Knowledge on the factors affecting QOL would be helpful in making important policy decisions and health care interventions.
Aims: The aim of this study is to assess the quality of life of people living with HIV (PLWH) and to identify the factors influencing their QOL.

Materials and Methods: The study was done among 50 PLWH attending a tertiary care hospital, and three Non-Governmental Organizations at Calicut, Kerala, India, from June 2014 to May 2017. QOL was assessed using HIV specific World Health Organization Quality Of Life scale (WHOQOL-HIV) – BREF questionnaire which has six domains (physical, psychological, level of independence, social relationships, environment and spirituality/religiousness/personal belief). Social support and stigma were measured using “Multidimensional Scale of Perceived Social Support” and “HIV Stigma Scale,” respectively, using Likert Scale. Factors influencing QOL were identified using backward stepwise multiple linear regression with the six domain scores as the dependent variables.

Results: Male: Female ratio was 1:1 and 58% were in early stage of the disease (stage I/II). Psychological and SRPB (Spirituality Religiousness and Personal Beliefs) domains were the most affected domains. All the regression models were statistically significant (P<0.05). The determination coefficient was highest for the social relationship domain (57%) followed by the psychological domain (51%). Disease stage and perceived social support significantly influenced all the domains of WHOQOL. Younger age, female gender, rural background, shorter duration of HIV, non-intake of ART and greater HIV related stigma were the high risk factors of poor QOL.

Conclusion: Interventions such as ART, family, vocational and peer counselling would address these modifiable factors influencing QOL, thereby improving the QOL of PLWH.

Prevalence and correlates of HIV infection among people who use drugs in Cambodia: results from a national survey

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Background: In Cambodia, people who use drugs are an important group for HIV prevention and harm reduction programs. The current Cambodia 3.0 framework aims to eliminate new HIV infections in the country by 2025, by accelerating prevention among all key populations. To achieve this goal, a key emphasis in the national response is an aspiration to strengthen the availability of data and strategic information related to the HIV epidemic among people who use drugs. Most of the studies on the relationship between drug use and HIV have largely focused on people who inject drugs. Non-injecting drug use is much more common than injecting drug use, and although it can also predispose people to HIV infection, it is not widely explored. We therefore conducted this study to explore HIV prevalence and identify risk factors for HIV infection among people who use non-injecting drugs (PWUD) in Cambodia.

Material and Methods: This National Integrated Biological and Behavioral Survey was conducted in 2017. Respondent Driven Sampling method was used to recruit the study participants who were interviewed face-to-face using a structured questionnaire. Blood samples were collected for HIV and syphilis testing. A multivariable logistic regression analysis was conducted to identify risk factors associated with HIV infection. All analyses were estimated with sampling weights that corrected for non-response and sample design. This study was approved by the National Ethics Committee for Health Research (NECHR) of the Ministry of Health, Cambodia. Privacy and confidentiality were protected by having the data collected in a private room, and removing all personal identifiers from the study documents. Participants were fully informed about the voluntary nature of the study as well as risks and...
benefits they may expect from their participation in the study. A written informed consent was obtained from each participant.

Results: In total, 1,367 PWUD were included in this study, whose mean age was 28.0 (SD= 7.7) years. The majority of the participants (95.1%) used methamphetamine. The prevalence of HIV was 5.7%, and 35.2% of the identified HIV-positive PWUD were not aware of their status prior to the survey. After adjusting for other covariates, HIV infection remained significantly associated with older age of ≥35 (AOR= 2.26, 95% CI= 1.06-5.89), having lower level of formal education of ≤6 years (AOR= 2.43, 95% CI= 1.08-4.73), living on the streets (AOR= 3.51, 95% CI= 1.32-9.31), perceived higher HIV risk compared to that of the general population (AOR= 4.05, 95% CI= 1.73-9.46), lifetime drug injection history (AOR= 3.84, 95% CI= 1.36-4.56), and a history of genital ulcers or sores in the past 12 months (AOR= 2.48, 95% CI= 1.10-5.58).

Conclusions: The HIV prevalence among PWUD in this study was about 10 times higher than the prevalence in the general population. The findings reveal a higher vulnerability to HIV infection among specific sub-populations of PWUD, such as those who are homeless, who may benefit from tailored interventions that respond to their specific needs. To enhance HIV case finding, stratification of PWUD to facilitate HIV risk profiling based on socio-economic profiles and drug injection history is recommended.

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Laboratory values of transgender women and transgender men at the Tangerine Community Health Center, Bangkok, Thailand

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Background: Approximately 25 million transgender people are living around the world with disproportionate health disparities, including high HIV burdens. Very few guidelines have been issued concerning how laboratory results should be interpreted and what references should be used for this population.

Methods: Data from first-time, HIV-negative clients who attended the Tangerine Community Health Center and the Thai Red Cross Anonymous Clinic in Bangkok between January 2015-December 2018, including hemoglobin, hematocrit, creatinine, serum glutamic oxaloacetic transaminase (SGOT), and serum glutamic pyruvic transaminase (SGPT) were retrieved. Nonparametric test was used to compare laboratory results among cis-men, cis-women, transgender women (TGW), and transgender men (TGM).

Results: Of 10,756 (79.4%) cis-men, 1,755 (12.9%) cis-women, 840 (6.2%) TGW, and 197 (1.5%) TGM, median (IQR) hemoglobin (g/dL)/hematocrit (%) were 15.3 (14.4-15.8)/44.9 (43.0-46.8), 13.0 (12.1-13.6)/39.1 (37.3-41.2), 13.9 (12.9-14.7)/41.4 (38.7-43.8), and 13.6 (12.7-14.6)/41.3 (38.8-43.9). 78.1% (587/752) of TGW and 94.8% (182/192) of TGM were on gender affirmative hormones when samples were collected. TGW had higher hemoglobin/hematocrit than cis-women but lower than cis-men (p-values=0.0001), while TGM had lower hemoglobin/hematocrit than cis-men but higher than cis-women (p-values=0.0001). No difference was seen in hemoglobin/hematocrit between TGW and TGM (p-values=0.12 and 0.77).

Median (IQR) SGOT/SGPT (U/L) were 27 (22-38)/24 (17-36), 23 (19-25)/14 (11-20), 24 (19-26)/16 (12-22), and 25 (19-28)/15 (11-21). Both TGW and TGM had lower median SGPT (p-values=0.0001) than cis-men. TGW had higher SGPT than cis-women (p-value=0.0001). Difference in SGOT was only found between cis-men and cis-women (p-value=0.0001).

Median (IQR) creatinine (mg/dL) were 0.98 (0.89-1.08), 0.71 (0.63-0.80), 0.81 (0.72-0.89), and 0.75 (0.65-0.85). TGW had higher creatinine than cis-women but lower than cis-men (p-values=0.0001), while TGM had lower creatinine than cis-men but higher than cis-women (p-values=0.0001). TGW also had higher creatinine than TGM (p-value=0.0001).

Conclusions: We demonstrated differences in median laboratory values among healthy TGW,
TGM, and cis-gender clients. These preliminary data pointed to crucial need to establish normal laboratory ranges for TGW and TGM. Standard laboratory guidelines for transgender people are urgently needed to support transgender-competent care services to support HIV testing, prevention, and treatment programs in the region.

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Attitudes of HIV Care and Drug Use Care Providers: A Baseline Needs Assessment in Increasing the Quality of Care for PLHIV who Use Drugs in the Philippines

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Background: The Philippines has one of the fastest growing HIV epidemics in the world. Recreational drug use is common among HIV patients. The Department of Health reported in 2011 that 2-4 percent of the population, 2.2 to 4.4 million Filipinos, use illegal drugs. In 2014, a review of records in a Manila HIV primary care clinic found that 75% of patients reported a history of recreational drug use at the time of their enrollment.

The combination of substance abuse and HIV/AIDS poses special challenges for medical providers. Integrated care is the best treatment option, but at present, there are no services in the Philippines catering to the needs of PLHIV who use drugs. Compounding this issue, the developing political and security situation in the Philippines has brought drug use into the center of a public debate, creating an unsafe environment for people who use drugs needing quality care.

To provide a concrete data in pursuing a public health approach in addressing the intersecting issues of HIV and drug use, Sustained Health Initiatives of the Philippines and NoBox Philippines led a research with the goal of identifying baseline needs for increasing access to holistic care for people who use drugs in the country.

Methods: An online survey was sent via email and social media to 140 HIV care and Drug Use Rehabilitation Organization/Facilities, collecting data on health providers attitudes toward providing comprehensive care for PLHIV who use drugs; 47 responses were received. The data gathered was analyzed using descriptive statistics. A complementary key informant interview was conducted to 13 service providers (6 drug rehabilitation centers and 7 HIV treatment hubs) to ask about their experience in providing care to PLHIV who use drugs.

Results: *Drug of Choice
The most common drug used in the Philippine context is methamphetamine, which is usually smoked, and less frequently injected. Almost all respondents (46/47) said that less than 25 percent of their clients inject drugs.

*Access to Treatment and Quality of Care
A majority of respondents (67%) believe that quality of services available to PLHIV who use drugs is “poor” or “very poor,” 28% believe that it is “fair,” and only 3% said that it is “good.” Among those respondents who assess drug use of clients 27% of respondents (7/26) said that they have had clients report being denied access to health services because of their drug use. Among those respondents who assess HIV status of clients 32% respondents (9/28) said that they have had clients report being denied access to health services because of their HIV+ status. None of the respondents had themselves denied services to a client because of HIV+ status.

Conclusion: An issue of concern is that a significant proportion of providers (46%) either supported reporting or were unsure about whether they should report their patients’ illicit drug use to law enforcement. This raises concerns for the safety of patients who access treatment related to their drug use and may discourage them from disclosing illicit drug use to their HIV primary care providers. Therefore, it is a priority to capacitate and create a network of providers who can provide safe spaces and high quality care for PLHIV who use drugs.
Factors influencing self-perceived threat of HIV and other STI acquisition and decision-making around voluntary testing among gay, bisexual and other men who have sex with men: a conceptual framework

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Background: Gay, bisexual, and other men who have sex with men (GBMSM) are disproportionately affected by HIV and other STIs. While past studies have found a positive association between self-perceived risk of HIV and other STI acquisition and rates of HIV or other STI testing among GBMSM, less focus has been accorded to the cognitive processes that underpin, and the factors contributing to risk or threat assessment associated with such health-seeking behaviors. Such findings are supported by theoretical models of health behavior, including the Health Belief Model (HBM). Furthermore, despite the disproportionate burden of HIV among gay, bisexual and other men who have sex with men (GBMSM) in Singapore, there is a paucity of research on the socio-behavioral factors contributing to the epidemic. This may be attributed to social and legal barriers to conducting research among GBMSM in Singapore, as the Singapore penal code continues to criminalize sexual relations between men. This study attempts to address these gaps in the extant literature.

Methods: We conducted a qualitative study exploring the factors influencing self-perceived threat, and the pathways that link threat assessment processes to HIV or other STI testing among GBMSM. Semi-structured interviews were conducted with 35 self-identified GBMSM in Singapore from October 2017 to June 2018, and the data was analyzed through thematic analysis borrowing techniques from the grounded theory approach.

Results: Participants reported drawing on individual, interpersonal, and situational factors in determining their self-perceived threat of HIV or other STI acquisition. These include sexual health knowledge and past experiences of risk as individual factors, physical and non-physical attributes as well as trust and familiarity with sexual partners as interpersonal factors, and venues of sexual activity and familiarity of sexual contexts as situational factors. Participants also described four possible scenarios that followed threat assessment; these included firstly, a re-evaluation of threat following cues to re-evaluate their self-perceived threat such as the availability of new sexual health information, perceived symptoms of HIV or other STIs, or partner notification; secondly, a denial of self-perceived threat; thirdly, assessing moderate levels of self-perceived threat that did not require any immediate action; and lastly, assessing high levels of self-perceived threat and concomitant paranoia or distress that served as a cue to action for testing. These threat levels interact with individual attributes and other modifying factors to delineate various pathways to HIV or other STI testing among GBMSM.

Conclusions: The results of this study are framed through, and expand on the Health Belief Model, and have implications for HIV and other STI risk education and differentiated models of care for individuals who possess different levels of self-perceived risk.

Knowledge, attitude, behaviour and practice survey highlights urgency of promoting condom uptake and PrEP in MSM population in India

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Background: Like in many other countries, MSM remains a marginalised population for HIV awareness and intervention programs in India.
Despite the WHO PrEP guidelines in this population, it neither found place in awareness campaigns nor in Indian guidelines. The gaps in knowledge, attitude, behaviour and practices in this population remain largely unknown and these their evaluation remains critical to design effective preventive strategies for this population.

Methods: We used self-administered, anonymous English questionnaire circulated through social-media platforms that asked questions about sexual behaviors, HIV prevention strategies known and followed, and acceptability for PrEP. Responses received from MSM were analyzed to understand the shortfalls and their needs in this population.

Results: Out of 305 MSM respondents, 76% were homosexuals, 24% were bisexual. 52.8% were between 18-25 years; 41% were between 25-35 years. 84% had multiple sexual partners, 47% having ≥ 10 partners. 84% (158/188) chose at least one partner through dating app; only 3.7% (7/188) found all their partners through conventional places like pubs, bars or specified parks. Although 42.9% (129/301) had 'never asked the partner for HIV status and only made a visual impression', only 31% (40/129) of these always used condoms. 79.5% (237/298) 'never' used condom for oral sex. 50.3% (149/302) had never taken an HIV test. Only 47.8% (143/299) had heard about PrEP, but 80.3% (239/299) denied having enough information to use it. 5.3% (15/283) had taken PEP in the past but only 8% (23/283) were either using or had used PrEP at some point. Most (85%) of the respondents (237/279) were open to the idea of taking PrEP if useful and although 80% of them (190/237) were comfortable with the idea taking daily pills, 62% (148/237) were also open to monthly injectable PrEP when becomes available.

Conclusions: The ease of finding partners over dating apps/social-media platforms, inconsistent condom use, low risk-perception and low HIV testing among young MSMs in India may pose risk of a surge in incidence of HIV and other STDs in the foreseeable years. Strategies to prevent this surge must use exactly these very social-media platforms to create awareness about need for frequent HIV testing, need for consistent use of condoms and accessibility to PrEP as well as early adaptation of WHO PrEP guidelines.

Prevalence and Nature of Gender-Based Violence among Female Entertainment Workers in Cambodia: A Mixed Methods Study

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Background: Gender-based violence (GBV) is strongly associated with an increased risk of HIV, especially, for key populations including female entertainment workers (FEWs). Despite the need for the information, data on GBV among FEWs in Cambodia are scarcely available. This study aims to investigate the prevalence and nature of GBV among FEWs in Cambodia.

Material and Methods: A mixed-method study was conducted in early 2018. Time location sampling (TLS) was used to recruit survey respondent and convenience sampling was used for qualitative. The semi-structured questionnaire explored the intersection of gender and violence, the intersection between entertainment work and violence, and investigated access and availability to health care. A structured questionnaire was used to collect data on prevalence of various forms of physical, sexual, and emotional violence; risk factors for different types of violence and availability and accessibility of post-violence medical, social and legal services. Content analysis was conducted for qualitative data, and descriptive analyses were conducted using STATA 13.0. This study was approved by the National Ethics Committee for Health Research (NECHR) of the Ministry of Health, Cambodia.

Results: 35 in-depth interviews and 652 surveys with FEWs in the municipality of Phnom Penh and six provinces were conducted. Over 10% of participants reported experiencing physical violence in the past 12 months and 7% reported experiencing sexual violence. Women reported that their husband, rather than the clients, was more often the perpetrator of physical violence, whereas the clients rather than their husband, was...
more often the perpetrator of sexual violence. The qualitative interviews, spoke to definitions of violence, which varied across provinces, venue types and individuals. However, women overwhelmingly spoke about feeling degraded through harassment, verbal/abuse violence as well as other forms of violence that they sometimes termed ‘more severe’ such as physical abuse and rape. Of the women who had experienced violence, 25% did not tell anyone, and a much lower percentage sought medical (8%), legal (9%) or social (3%) support. Barriers to seeking care include believing that the experience was not severe enough to warrant care as well as shame, fear of retribution, not trusting the system and loyalty/attachment to the abusing partner/husband. Lastly, women did not know where to seek services or if they existed and overwhelmingly wanted counseling services.

Conclusions: GBV is a major issue faced by women who work in the entertainment industry across all country and across of type of establishments. To truly make strides to reduce GBV, there are needs of a multi-sectoral longitudinal and sustained response with commitments from multi stakeholders. It is critical to highlight that the stories and voices that were shared in the qualitative research point to the diversity of backgrounds, experiences, personalities and dreams of a group who, for programming, research and policy reasons, are often identified simply as ‘entertainment workers’.

However, while there were many stories of feeling degraded and traumatized there were stories too, of women exercising their rights and their autonomy, and selflessly working in an often-degrading business as stepping stone for a better life for themselves and their children.

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Virtual Outreach: A Potential Approach to Engaging Hard-to-Reach Key Populations in Cambodia

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Background: Virtual outreach using social media brandings on Facebook has been adapted nationwide. Virtual tools, such as Mystylekhmer (directed toward men who have sex with men), SMARTgirl (directed toward female entertainment workers), and Sreysros (directed toward transgender women) target key populations (KPs) in order to access information related to HIV testing, sexual and reproductive health, and gender-based violence. This approach aims to promote safer sex practices, decrease rates of unprotected sex, and educate KPs on contraception methods and sexual and reproductive health.

Methods: The virtual outreach approach was developed in consultation with key stakeholders and KP community members under the guidance of the National Center for HIV/AIDS, Dermatology, and STD. Virtual materials, such as photo blogs, video clips, Facebook live broadcasts, and posts shared from other pages/channels, were created/shared to cover topics on STIs, HIV/AIDS, safe sex, contraception use, risks of unprotected sex, drug use, and sexual and reproductive health. Data regarding the extent of outreach were collected regularly to ensure maximum exposure. All content posted was shared across 3 brandings to encourage greater engagement from KPs.

Results: From April to December 2018, approximately 40 virtual materials were posted. An average of 4K [range between1K-8K] audience members from KPs were reached each posted. In total, 108 participants chose to received HIV and Syphilis rapid tests offline. Among those, 23 (21.3%) of the participants were confirmed as HIV-positive, all of whom were initiated on ART, 29 (26.9%) were confirmed as having active Syphilis infections and
10 (9.3%) of the participants were diagnosed with STIs.

Conclusions: Virtual outreach is widely embraced by KPs in Cambodia. This innovative intervention has demonstrated its effectiveness in successfully engaging target KPs and promoting health-seeking behavior. It is an excellent platform to provide KPs with education, health services, and virtual community support.

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Using Participatory Methods to Build an mHealth Intervention for Female Entertainment Workers in Cambodia: A Formative Study of the Mobile Link Project

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Introduction: The HIV epidemic in Cambodia is strongly and disproportionately concentrated among key populations. One important hard-to-reach key population is the expanding community of female entertainment workers (FEWs). Other sexual and reproductive health outcomes including STIs, contraception, and gynecologic health are also substandard among FEWs. To address these concerns, a mobile health intervention (mHealth) using short message and voice message services - the Mobile Link pilot project- was constructed. This paper aims to describe the development of this mHealth intervention that used participatory methodologies and to illustrate how these findings can be useful in future mHealth projects.

Methods: This formative study used an iterative participatory approach to intervention development. Focus group discussions (FGDs) covering SRH topics were conducted and implemented across four provinces. Additionally, in-depth interviews (IDIs) were conducted with HIV-positive women in Siem Reap and Phnom Penh. Data from the FGDs and IDIs were analyzed using rapid analysis methods to identify prioritized themes for messages. Two data validation workshops were organized to present the prioritized health themes, from the FGDs to FEWs and outreach workers for validation. The workshops included activities stimulating participation in order to determine priority health topics. Participants also listened to sample messages to provide feedback on tone and language. Other data used to inform this report include field and meeting notes, the study’s operations manual, notes from conversations with research staff and debrief notes and transcripts from focus group discussions (FGDs) and in-depth interviews (IDIs).

Results: The findings from the 27 FGDs 6 IDIs and 30 revision workshop participants revealed that health priorities such as gynecologic issues (STIs and vaginal infections/irritation) and cancer, outweighed concerns over HIV and family planning. Participants also reinforced a number of misconceptions about contraception- particularly around oral contraceptives and intrauterine devices- and STI/HIV transmission. Furthermore, many participants pointed out the importance of outreach workers and linkages, affirming the emphasis on the link within the Mobile Link project. Lastly, from the IDIs, HIV-positive participants highlighted wanting supportive/messages to address depressive feelings that may stem from their perceived stigma.

Discussion: The results of this participatory development process suggest a high interest in a tailored mHealth intervention among FEWs which would enabling them to easily access health care information and link to a wide range of health services, outside of typical HIV-related services, without fear of discrimination. Utilizing participatory methodologies was demonstrated to be useful in content creation and informing program implementation. As a result of this formative process, the research team gleaned lessons that may be applicable to future mHealth projects.
Designing and implementing an electronic health record system for an integrated chemsex care and HIV prevention service in Taiwan: the HERO experience

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Background: The rising trend of combining the use of recreational drugs during sex (chemsex) in Taiwan has become a critical contributor in the HIV epidemic. The existing health care model that tackles substance abuse, sexual health, and HIV prevention independently is no longer desirable. A model of integrated health services that simultaneously addresses these health issues and provides a safe environment for people under the influence of chemsex may effectively improve HIV prevention and quality of life. HERO integrated service (Healing, Empowerment, Recovery of Chemsex) was established in Kaohsiung in November 2017. An electronic health record (EHR) system was developed to facilitate self-management among clients, and for healthcare providers to monitor the need for intervention for the clients. The objective of this study was to evaluate the effectiveness of the integrated health services and to describe the design and implementation of the EHR system to assist data collection.

Methods: To evaluate the effectiveness of the integrated service, we used an evaluation plan based on the logic model of change at both individual and health service levels. We developed a client portal and a healthcare provider portal in the EHR system. The EHR system is a Java-based WebApp on Microsoft Azure Cloud Platform. At each visit, clients filled out a survey to assess their current depression and anxiety level. PrEP use, sex, and chemsex behavior were also self-reported on the EHR system.

Results: HERO had 1315 visits up to March 2019. There were 101 PrEP users. There was no new HIV diagnosed during the follow-up. PrEP users preferred non-daily dosing schedule over daily dosing schedule. The average age was 30.1 years and the majority were males (91.6%) and self-identified as homosexual or bisexual (69.9%). Among all, 38.5% reported having chemsex in the past month, 19.0% exhibited moderate anxiety or higher and 8.3% exhibited moderate depression or higher in the baseline.

On the client portal, HERO clients can access their medical record, track their changes toward the expected goals related to chemsex and mental health, and receive chemsex first-aid information and PrEP guideline. Clients received direct feedback of their mental health status on the client portal after they filled out the survey to serve as a cue to talk to the healthcare providers regarding mental health issues.

Conclusion: Integration of patient-generated health data is needed to improve care and facilitate communication between patients and healthcare providers in the integrated health service setting to provide better care for chemsex. To replicate the integrated service clinic, stable human resources, sustainable financial support, and systematic planning were crucial. EHR also played an important role to improve the quality of data collection to evaluate the effectiveness of the integrated health services.

The use of video-conferencing for tele-consultation in the provision of patient-centred care for people living with HIV (PLWHIV) in Singapore

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Reviews in Antiviral Therapy & Infectious Diseases 2019_6
**Background:** Differentiated models of care for PLHIV are needed to right-site care and to cater to the diverse needs of a heterogenous group of patients. For PLHIV who are stably virally suppressed and have minimal healthcare needs, frequent clinic visits result in unnecessary time lost from work and income loss. Under these circumstances, traditional clinic visits may be an inefficient use of healthcare resources. Patient-provider telemedicine services have been shown to increase patient satisfaction and improve outcomes in chronic disease management, including HIV.

**Methods:** Teleconsultation utilising video-conferencing software (VidyoMobileTM) was piloted in January 2017 at the Specialist Outpatient Clinic of the largest HIV care centre in Singapore. Selection criteria for patients in this pilot included: stable viral suppression >12 months, history of adherence to treatment and follow-up, and ability to navigate video-conferencing software. Patients and physicians alike were trained in the use of the video-conferencing software, and their satisfaction with the tele-consult was assessed with a survey. Tele-consultation alternated with traditional visits, to allow for physical consults at least once a year.

**Results:** 367 patients were recruited for the service, of whom 22 had tele-consultation visits conducted. Time savings for patients averaged 195 minutes (average tele-consultation time = 15 minutes; average time spent during conventional visits = 210 minutes). The main benefits of the new service came from significant time savings for patients – especially because most virally-suppressed, stable patients do not need lengthy consults, and spend more time waiting than with their physicians. Patient satisfaction was high, with 100% feeling that they were satisfied with the teleconsult (strongly agree/agree that the consult was satisfactory). In addition, tele-consults reduced the stigma experienced by patients in attending HIV clinics in a country where HIV is still a highly stigmatised condition.

**Conclusion:** This tele-consultation pilot demonstrates the efficacy and acceptability, amongst providers and patients alike, of the use of novel technological platforms in the outpatient HIV care setting. The main benefits of the service are time saved and reduced stigma experienced by patients through frequent clinic attendance. Further plans include wider rollout and expansion to other ancillary services like drug adherence and psychosocial counselling for PLHIV.

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**Engaging private practitioners for early HIV screening and treatment initiation of tuberculosis (TB) patients in Maharashtra**

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**Background:** Per World Health Organization’s estimates, India had 2.8 million TB patients in 2016, one-fourth of global incidence. Among notified patients, 87,000 were HIV co-infected of which 12,000 (14%) died. TB patients notified in the public sector go through HIV screening, however there is no information on the HIV status of about 1 million TB patients that would seek care in the private sector who are not notified. From 2014-17, PATH implemented a Private Provider Interface Agency (PPIA) model which notified 40,000 TB patients by engaging private healthcare providers in Mumbai. In 2016, the project began working with private providers to screen TB patients for HIV and refer them to public sector for treatment.

**Material and Methods:** The intervention aimed to screen all TB patients notified by private providers in engaged private facilities of Thane, Mumbai, and Pune for HIV at accredited private laboratories and enable free testing. After HIV screening, Link Counsellors (LCs) accompanied HIV reactive patients to Integrated Counselling and Testing Center (ICTC) for confirmation of HIV and further linkage to public sector’s Anti-retroviral treatment (ART) centres for early treatment initiation. A dedicated cadre of LCs handheld patients throughout the pathway of care along with counseling to decrease loss to follow up. Public sector providers/staff were trained to fast track private-sector patients for HIV testing and treatment in order to build the trust in the patients for government hospitals.

**Results:** From March 2016 to November 2017, out of 12,535 TB patients notified from 135 private facilities, 9,098 (75%) were screened for HIV. Of these, 262 were TB-HIV co-infected patients (2.9% HIV positivity). Of these, 79 (30%) were already on ARV treatment; and of the 183 newly diagnosed
patients, 157 (85%) were linked to ICTCs, of which 147 (94%) were linked to ART centres. The LC model shortened time between linkages compared to the public sector to, on average: 5 days for linkage from private center to ICTC center, 7 days for ART registration, and 14 days for treatment initiation.

**Conclusion:** The intervention demonstrated successful early HIV screening of TB patients in private sector linked with public sector for timely treatment initiation with the link counselor model in the core of operations. The intervention provides an important platform to engage government for scaling up in 100 HIV high-burden districts of India ensuring high yield HIV case finding by outccontracting the HIV screening services and dealing with barriers to seeking care in public hospitals as first point of contact to achieve 100% screening of HIV and early linkages to care through counseling and assisted linkages.

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**Syphilis testing rates among HIV-infected persons in Singapore, 2006–2017**

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**Background:** Co-infection of human immunodeficiency virus (HIV) and syphilis has been flagged as a public health concern in the past decade. The synergistic relationship between these two infections indicates the importance of the integration of prevention and control of sexually transmitted infections into HIV care. In Singapore, the frequency of syphilis testing depends on clinicians’ assessment of the risk profile of HIV patients. The aim of this study was to assess local temporal trends of syphilis testing among HIV-infected persons.

**Methods:** We analysed a clinical database maintained by the Clinical HIV Programme at the National Centre for Infectious Diseases, Singapore. Subjects included in this study were Singapore residents who were diagnosed with HIV and had two or more visits to the national referral centre for HIV between 2006 and 2017. Syphilis testing rates per 100 person-years of follow-up (PYFU) and corresponding 95% confidence intervals (CI) were determined based on the presence of any non-treponemal syphilis test in each given calendar year when a HIV-infected patient was under observation.

**Results:** A total of 3,285 patients were included in the study, and 84.5% had at least one syphilis test during their follow-up period. The overall testing rate was 34.5 per 100 PYFU (95% CI 33.6–35.4). There was a significant increase in testing rate from 27.8 per 100 PYFU (95% CI 25.5–30.3) in 2013 to 47.5 per 100 PYFU (95% CI 44.9–50.2) in 2017.

The rates of syphilis testing were significantly higher among those who were male, Malay, infected with HIV via homosexual/bisexual mode and intravenous drug use, had used recreational or illicit drugs, diagnosed with HIV in the calendar periods later than 2006–2008, and had not been on antiretroviral therapy. The rates of syphilis testing were significantly lower among patients of older age (≥30 years), those who were ever married, had prior AIDS diagnosis and with CD4 <350 cells/mm3 at time of HIV diagnosis.

**Conclusions:** While there was a rising trend of syphilis testing rate in recent years, it remained low. Recent rising incidence rates of syphilis among HIV-infected persons indicate the imperative for routine screening to diagnose initial and repeat episodes of syphilis in sexually active persons with HIV infection.
Comparable efficiency of point-of-care and machine-based NAAT in detecting Chlamydia trachomatis (CT) and Neisseria gonorrhoeae (NG) using pooled vs. individual specimens from oropharynx, rectum and urethra.

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Background: Chlamydia trachomatis (CT) and Neisseria gonorrhoeae (NG) are the most prevalent of all reportable sexually transmitted infections (STIs). Nucleic acid amplification test (NAAT) is increasingly used as an alternative method with faster turnaround time and higher sensitivity, compared to conventional cultures. While machine-based NAAT has to perform on samples in a batch at the same time, the Point-Of-Care (POC) CT/NG testing assay can perform on individual samples. However, these assays are costly and often considered as unaffordable in low- and middle-income countries (LMIC). In order to address this problem, we compared the performance between separate and pooled specimens for detecting CT and NG.

Materials and Methods: Ten men who have sex with men clients who visited the Thai Red Cross Anonymous Clinic for HIV testing were invited to screen for CT and NG infections. Each client had oropharyngeal swab, rectal swab and urethral swab/urine sample collected. Oropharyngeal swab and rectal swab were put in two separate tubes containing 2.5 ml of PBS. To make a pooled sample, we aliquoted an equal amount 500 microliter of samples from individual oropharyngeal, rectal and urethral/urine specimens into one same sterile tube. All individual and pooled specimens were tested by POC GeneXpert (Xpert® CT/NG assay), compared to the Abbott RealTime CT/NG assay.

Results: Of these 10 participants, 5 had rectal CT and 1 had both rectal and urethral CT infection. For NG, 3 had oral NG and 1 had rectal NG infection. Co-infection with CT and NG was not found. Thirty individual specimens and ten pooled specimens were tested by both Xpert® CT/NG and Abbott RealTime CT/NG assay. Results from 39 specimens could be analyzed. One individual oropharyngeal specimen was excluded as Xpert® CT/NG showed an error result while Abbott RealTime CT/NG assay remained negative when repeated. The pooled specimens showed 100% concordance results with individual specimens when tested by Xpert® CT/NG and Abbott Realtime CT/NG assay (p=1.000). One individual oropharyngeal specimen showed positive result by Abbott RealTime CT/NG assay but has negative result by Xpert® CT/NG. However, there was no statistically significant difference from the two methods for CT/NG detection.

Conclusions: Pooled specimens are reliable for detecting CT and NG infections by POC and machine-based CT/NG testing assays, where anatomical sites of infection do not need to be specified for treatment purpose. Utilizing pooled specimens can be an innovative and alternative way to reduce the cost and increase access to STI screening services in LMIC, especially in the era of pre-exposure prophylaxis. Rapid turnaround time and portability of the POC assay could also allow STI screening and treatment to happen on the same day and to be decentralized to non-conventional healthcare settings.
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**Different performances of various rapid enzyme immunoassays (EIA) for Chlamydia trachomatis (CT) and Neisseria gonorrhoeae (NG) to detect asymptomatic CT/NG infections**


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**Background:** Although machine-based and point-of-care (POC) nucleic acid amplification tests (NAATs) provide significantly higher sensitivity to detect Chlamydia trachomatis (CT) and Neisseria gonorrhoeae (NG) infections than enzyme immunoassay (EIA)-based tests, the costs of these NAATs are considered unaffordable by HIV/STI programs in most countries in the Asia-Pacific. We evaluated the performance of different rapid EIA test in detecting CT and NG infections in reference to machine-based NAAT.

**Materials and Methods:** Four rapid CT tests (A; QuickVue, B; Artron, C; ABON and D; SD BIOLINE) and 3 rapid NG tests (X; AMP Rapid test, Y; Artron and Z; ABON), available in Thailand market, were used to evaluate CT/NG infections from leftover samples collected from clients of the Thai Red Cross Anonymous Clinic who requested machine-based NAAT services (Abbott RealTime CT/NG assay) for CT/NG. Sensitivity of each rapid test kit was calculated based on NAAT results. In addition, sensitivity of each of rapid test kit was further evaluated against a panel of dilutions of a stocked culture of CT and NG. Statistical differences between rapid tests were calculated by kappa statistic test.

**Results:** Of the 11 CT NAAT positive specimens, tests A, B, C and D were positive in 36.4%, 9.1%, 63.6% and 36.4%, respectively. Test C demonstrated a statistically higher sensitivity than the other tests (p = 0.048). Of the 13 NG NAAT positive specimens, tests X, Y and Z were positive in 53.8%, 38.5% and 61.5%, respectively. The sensitivity of these 3 rapid NG tests was not significantly different (p > 0.05). All rapid CT and NG EIA tests provided 100% specificity. With the diluted CT stocked culture, tests A, B, C and D were positive at the highest dilutions of 1:20, undilution, 1:100 and 1:20, respectively. For diluted NG stocked culture, X, Y and Z tests were all positive at the highest dilution of 1:50.

**Conclusion:** Although not ideal for CT/NG screening, we revealed that rapid EIA test can be of value in detecting some proportions of clients with asymptomatic CT and NG infections, where access to machine-based or POC NAATs is impossible. However, different rapid EIA tests in the market demonstrated significantly different sensitivity, which users need to know. As sensitivity seemed to vary by the amount of CT/NG, treating asymptomatic clients tested CT/NG positive by rapid EIA tests could likely reduce CT/NG load in the community. However, giving low sensitivity of rapid CT/NG EIA tests, counseling provided to clients with negative rapid CT/NG EIA will be challenging as a chance that a person still has CT/NG infections could be substantial.

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**Prevalence and risk factors for hepatitis C virus antibody among people who inject drugs in Cambodia: Results of a national survey**

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**Background:** Hepatitis C virus (HCV) is a significant global health concern. Despite the evidence of the relationship between injecting drug use and HCV, studies on HCV infection among people who inject drugs in developing countries remain scarce. To
address this need, we conducted this study to explore the prevalence of and factors associated with HCV antibody positivity among people who inject drugs in Cambodia.

**Material & Methods:** Data used for this study were collected as part of the National Integrated Biological and Behavioral Survey among people who use and inject drugs in 2017. We used the Respondent Driven Sampling method to recruit participants in the capital city and 11 other provinces for face-to-face interviews and HIV and HCV testing. Weighted multivariable logistic regression analysis was conducted to identify risk factors associated with HCV antibody positivity. This study was approved by the National Ethics Committee for Health Research (No. 193 NECHR). Before the data collection was started, we obtained a written informed consent from each participant.

**Results:** This study included 286 people who inject drugs with a mean age of 31.6 (SD= 7.5). The prevalence of HCV antibody among participants in this study was 30.4%. Additionally, 31.0% of the participants with HCV were co-infected with HIV. After adjusting for other covariates, the odds of positive HCV antibody was significantly higher among participants who were in the older age group of 35 and older (AOR= 2.67, 95% CI= 1.24-5.71), were in Vietnamese ethnic group (AOR= 5.44, 95% CI= 2.25-13.14), were living on the streets (AOR= 3.01, 95% CI= 1.29-7.04), had been to a drug rehabilitation center in the past year (AOR= 2.67, 95% CI= 1.21-5.90), had received methadone maintenance therapy in the past year (AOR= 3.02, 95% CI= 1.32-6.92), and were infected with HIV (AOR= 3.80, 95% CI= 1.58-9.12) compared to their respective reference group.

**Conclusions:** The prevalence of HCV antibody among people who inject drugs in Cambodia is high, particularly in older and more vulnerable subgroups. Tailor-made interventions are required to increase access to culturally sensitive harm reduction interventions to prevent primary HCV infection and reinfection. In addition, there is an opportunity to expand screening, diagnosis, and treatment with new directly-acting antiviral agents currently available in the country.

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**Changes in Liver Fibrosis in Patients with HCV / HIV Coinfection After Treatment with Sofosbuvir / Daclatasvir**

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Hepatitis Cs (HCV) / Human Immunodeficiency Virus (HIV) co-infection increases the progression of liver fibrosis to advanced liver disease and death. The mortality rate due to HCV / HIV coinfection is quite high, with the factor that most influences the survival of 5 years of co-infected patients is liver fibrosis Sustained Virologic Response (SVR) is a condition where HCV is not detected after therapy. In HCV monoinfection, SVR has been shown to reduce liver fibrosis. The aim of this study is to determine whether the changes of liver fibrosis occurs HCV/ HIV coinfection patients after therapy with Sofosbuvir / daclatasvir

This study used a quasi-experimental study design without a control group. The study subjects were HC HIV coinfection patients who received Sofosbuvir daclatasvir therapy in the Gastroentero-Hepatology Clinic of Dr. Hasan Sadikin Hospital. In this study measurement of liver fibrosis was carried out by using AST to Platelet Ratio Index (APRI) and Fibrosis-4 Index (FIB-4) before therapy and when SVR-24 was achieved.

The study involved 29 subjects. Most of the research subjects were men, with an average age of 40.38 years (SD 3.48). The success rate of Sofosbuvir Daclatasvir achieving SVR - 24 in this study reached 97 %. From the results of this study, we found a decrease in APRI scores and FIB-4 index when HCV/HIV coinfection patients, that were treated with Sofosbuvir Daclatasvir, achieved SVR 24. The median of APRI scores before therapy and after SVR - 24 was decreased from 0.41 to 0.28 ( 95 % CI : 0.01 0.23, p-value 0.01) and the median of FIB-4 Index before therapy and after the SVR 24 was decreased from 0.94 to 0.81 ( 95 % CI : -0.04 -0.35, p-value 0.28). Before being treated with sofosbuvir /daclatasvir there were 4 HCV-HIV coinfected patients had cirrhosis, marked by an APRI score of 1. After being treated with sofosbuvir daclatasvir, all of these patients experienced improvement in
liver fibrosis which was marked by a decrease in APRI score <.1

This study concluded that therapy using Sofosbvir Daclatasvir n HCV / HIV coinfected patients has very good effectiveness and can reduce liver fibrosis.

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Virtual elimination of Hepatitis C virus (HCV) from an inner city general practice

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Background: Holdsworth House Medical Brisbane (HHMB) is a general practice in the inner city suburb of Fortitude Valley in Brisbane. To understand the treatment experience of patients and general practitioners (GP) in the modern management of HCV, an audit of all patients with a diagnosis of HCV was performed.

Approach: A search was performed of all current or past HCV diagnosis on Medtech, the practice software. Demographic and clinical data were extracted from active patient records identified, and included in the audit.

Outcome: 86 active patient records were identified in the search. 32 had cleared HCV spontaneously or were cured with interferon based treatments. 49 were treated with DAA medication (Harvoni, Daklinza/Sovaldi, Zepatier and Epclusa), either in shared care with specialists (20) or initiated by GPs (29). Amongst the 29 patients that had GP initiated DAA treatment, 27 (93.1%) had achieved SVR, with 1 failure to treatment and 1 SVR 12 pending. Overall, 47 (95.9%) attained sustained virological response (SVR 12). Of the 4 patients previously treated with interferon/ribavirine and failed treatment, all achieved SVR with 12 weeks’ treatment with Harvoni. A mix of APRI score and Fibroscan was used for initiations by GPs.

Application: HCV can be virtually eliminated from general practice. Careful interrogation of the practice database should be performed to identify patients with HCV for treatment. GP initiated treatment has a high rate of success. Focused (cohort based) screening is recommended to find occult HCV in the general practice population.
4th Asia Pacific AIDS & Co-infections Conference

Translating Science into Clinical Practice

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