



Quarterly Research Digest on HIV and Key Populations

March 2017

The LINKAGES Project is pleased to provide this quarterly compilation of article abstracts from the peer-reviewed literature related to HIV and key populations in Africa, Asia and Pacific, Eastern Europe, Latin America, the Caribbean, and the Middle East. Abstracts are grouped by key population (people who inject drugs, men who have sex with men, sex workers, and transgender people). For open access articles, we include the link to the full text.

Browse by topic:

[Key Populations General - 6](#)

[People Who Inject Drugs - 26](#)

[Men who have Sex with Men - 66](#)

[Sex Workers - 30](#)

[Transgender People - 16](#)

[Young Key Populations - 5](#)

Key Populations General - 6

1. Stalter, R., et al. **"Association of sexual risk behaviour with previous HIV testing among voluntary HIV counselling and testing clients in Kigali, Rwanda."** *Int J STD AIDS* 2016 27(14): 1317-1325.

With increased coverage of voluntary HIV counselling and testing (VCT) in Rwanda and a greater focus on repeat testing of key populations, it is important to understand whether the right clients are returning for repeat testing and if repeat testing is effective at reducing risk. We assessed the association between repeat testing and recent sexual risk behaviours among 1852 first time or repeat HIV testing clients in Kigali who had had sex, using data from a cross-sectional survey. Repeat testing was associated with being female, older and type of occupation. Multivariable analyses indicate that individuals who tested for HIV 1-2 times (aOR = 1.52, 95% CI: 1.08, 2.15) and 3+ times (aOR = 1.51, 95% CI: 1.06, 2.17) previously were more likely to report recent unprotected sex. Those with 3+ previous tests were more likely to have recently had multiple sexual partners (aOR = 2.19, 95% CI: 1.22, 3.92). However, a significant decrease in HIV prevalence is shown as individuals receive more HIV tests in their lifetime ($p < 0.001$). These findings show that individuals who report high-risk behaviours are returning for repeat tests. However, VCT may not be successful at addressing certain sexual risk behaviours. Therefore more intensive counselling or additional HIV prevention services may be needed.

2. Hargreaves, J. R., et al. **"HIV-related stigma and universal testing and treatment for HIV prevention and care: design of an implementation science evaluation nested in the HPTN 071 (PopART) cluster-randomized trial in Zambia and South Africa."** *Health Policy Plan* 2016 31(10): 1342-1354.

BACKGROUND: Stigma and discrimination related to HIV and key populations at high risk of HIV have the potential to impede the implementation of effective HIV prevention and treatment programmes at scale. Studies measuring the impact of stigma on these programmes are rare. We are conducting an implementation science study of HIV-related stigma in communities and health settings within a large, pragmatic cluster-randomized trial of a universal testing and treatment intervention for HIV prevention in Zambia and South Africa and will assess how stigma affects, and is affected by, implementation of this intervention.

METHODS/DESIGN: A mixed-method evaluation will be nested within HIV prevention trials network (HPTN) 071/PopART (Clinical Trials registration number NCT01900977), a three-arm trial comparing universal door-to-door delivery of HIV testing and referral to prevention and treatment services, accompanied by either an immediate offer of anti-retroviral treatment to people living with HIV regardless of clinical status, or an offer of treatment in-line with national guidelines, with a standard-of-care control arm. The primary outcome of HPTN 071/PopART is HIV incidence measured among a cohort of 52 500 individuals in 21 study clusters. Our evaluation will include integrated quantitative and qualitative data collection and analysis in all trial sites. We will collect quantitative data on indicators of HIV-related stigma over 3 years from large probability samples of community members, health workers and people living with HIV. We will collect qualitative data, including in-depth interviews and observations from members of these same groups sampled purposively. In analysis, we will: (1) compare HIV-related stigma measures between study arms, (2) link data on stigma to measures of the success of implementation of the PopART intervention and (3) explore changes in the dominant drivers and manifestations of stigma in study communities and the health system.

DISCUSSION: HIV-related stigma may impede the successful implementation of HIV prevention and treatment programmes. Using a novel study-design nested within a large, community randomized trial we will evaluate the extent to which HIV-related stigma affects and is affected by the implementation of a comprehensive combination HIV prevention intervention including a universal test and treatment approach.

3. Gupta, S., et al. **"National HIV Care Continua for Key Populations."** *J Int Assoc Provid AIDS Care* 2017. We reviewed published national HIV care continua for men who have sex with men (MSM), people who inject drugs (PWID), and female sex workers (FSWs) to track progress toward the 90-90-90 target. We searched the Internet, PubMed, surveillance reports, United Nations Programme on HIV/AIDS country reports, US President's Emergency Plan for AIDS Relief country/regional operational plans, and conference abstracts for the continua and graded them on quality. We found 12 continua for MSM, 7 for PWID, and 5 for FSW from 12 countries. HIV diagnosis, antiretroviral therapy coverage, and viral suppression varied between (1) 5% and 85%, 2% and 73%, and 1% and 72%, respectively for MSM; (2) 54% and 96%, 14% and 80%, and 8% and 68%, respectively for PWID; and (3) 27% and 63%, 8% and 16%, and 2% and 14%, respectively for FSW. Two countries, using data from national cohorts, were high quality. There are limited key population continua in the public domain. Of the few available, none have achieved 90-90-90. Improved monitoring and evaluation of key population continua is necessary to achieve the 90-90-90 target.

4. Cremin, I., et al. **"PrEP for key populations in combination HIV prevention in Nairobi: a mathematical modelling study."** *Lancet HIV* 2017.

BACKGROUND: The HIV epidemic in the population of Nairobi as a whole is in decline, but a concentrated sub-epidemic persists in key populations. We aimed to identify an optimal portfolio of interventions to reduce HIV incidence for a given budget and to identify the circumstances in which pre-exposure prophylaxis (PrEP) could be used in Nairobi, Kenya. **METHODS:** A mathematical model was developed to represent HIV transmission in specific key populations (female sex workers, male sex workers, and men who have sex with men [MSM]) and among the wider population of Nairobi. The scale-up of existing interventions (condom promotion, antiretroviral therapy, and male circumcision) for key populations and the

wider population as have occurred in Nairobi is represented. The model includes a detailed representation of a PrEP intervention and is calibrated to prevalence and incidence estimates specific to key populations and the wider population.

FINDINGS: In the context of a declining epidemic overall but with a large sub-epidemic in MSM and male sex workers, an optimal prevention portfolio for Nairobi should focus on condom promotion for male sex workers and MSM in particular, followed by improved antiretroviral therapy retention, earlier antiretroviral therapy, and male circumcision as the budget allows. PrEP for male sex workers could enter an optimal portfolio at similar levels of spending to when earlier antiretroviral therapy is included; however, PrEP for MSM and female sex workers would be included only at much higher budgets. If PrEP for male sex workers cost as much as US\$500, average annual spending on the interventions modelled would need to be less than \$3.27 million for PrEP for male sex workers to be excluded from an optimal portfolio. Estimated costs per infection averted when providing PrEP to all female sex workers regardless of their risk of infection, and to high-risk female sex workers only, are \$65 160 (95% credible interval [CrI] \$43 520-\$90 250) and \$10 920 (95% CrI \$4700-\$51 560), respectively.

INTERPRETATION: PrEP could be a useful contribution to combination prevention, especially for under-served key populations in Nairobi. An ongoing demonstration project will provide important information regarding practical aspects of implementing PrEP for key populations in this setting. **FUNDING:** The Bill & Melinda Gates Foundation.

5. Conserve, D. F., et al. **"Systematic review of mobile health behavioural interventions to improve uptake of HIV testing for vulnerable and key populations."** *J Telemed Telecare* 2017 23(2): 347-359.

INTRODUCTION: This systematic narrative review examined the empirical evidence on the effectiveness of mobile health (mHealth) behavioural interventions designed to increase the uptake of HIV testing among vulnerable and key populations.

METHODS: MEDLINE/PubMed, Embase, Web of Science, and Global Health electronic databases were searched. Studies were eligible for inclusion if they were published between 2005 and 2015, evaluated an mHealth intervention, and reported an outcome relating to HIV testing. We also reviewed the bibliographies of retrieved studies for other relevant citations. The methodological rigor of selected articles was assessed, and narrative analyses were used to synthesize findings from mixed methodologies.

RESULTS: A total of seven articles met the inclusion criteria. Most mHealth interventions employed a text-messaging feature and were conducted in middle- and high-income countries. The methodological rigor was moderate among studies. The current literature suggests that mHealth interventions can have significant positive effects on HIV testing initiation among vulnerable and key populations, as well as the general public. In some cases, null results were observed. Qualitative themes relating to the use of mobile technologies to increase HIV testing included the benefits of having low-cost, confidential, and motivational communication. Reported barriers included cellular network restrictions, poor linkages with physical testing services, and limited knowledge of appropriate text-messaging dose.

DISCUSSION: MHealth interventions may prove beneficial in reducing the proportion of undiagnosed persons living with HIV, particularly among vulnerable and key populations. However, more rigorous and tailored interventions are needed to assess the effectiveness of widespread use.

6. Sales, J. M., et al. **"Trauma-Informed HIV Prevention and Treatment."** *Curr HIV/AIDS Rep* 2016 13(6): 374-382.

The high prevalence of trauma and its negative impact on health and health-promoting behaviors underscore the need for multi-level interventions to address trauma and its associated sequelae to improve physical and mental well-being in both HIV-infected and HIV-uninfected populations. Growing global awareness of the intersection of trauma and HIV has resulted in development and testing of interventions to

address trauma in the context of HIV treatment and HIV prevention in the USA and globally. Despite increasing recognition of the widespread nature of trauma and the importance of trauma to HIV transmission around the globe, several gaps remain. Through a survey of the literature, we identified eight studies (published in the past 5 years) describing interventions to address the effects of trauma on HIV-related outcomes. In particular, this study focused on the levels of intervention, populations the interventions were designed to benefit, and types of trauma addressed in the interventions in the context of both HIV prevention and treatment. Remarkably absent from the HIV prevention, interventions reviewed were interventions designed to address violence experienced by men or transgender individuals, in the USA or globally. Given the pervasive nature of trauma experienced generally, but especially among individuals at heightened risk for HIV, future HIV prevention interventions universally should consider becoming trauma-informed. Widespread acknowledgement of the pervasive impact of gender-based violence on HIV outcomes among women has led to multiple calls for trauma-informed care (TIC) approaches to improve the effectiveness of HIV services for HIV-infected women. TIC approaches may be relevant for and should also be tested among men and all groups with high co-occurring epidemics of HIV and trauma (e.g., men who have sex with men (MSM), transgendered populations, injection drug users, sex workers), regardless of type of trauma experience.

[Back to top](#)

People Who Inject Drugs - 26

1. Guise, A., et al. **"Access to HIV treatment and care for people who inject drugs in Kenya: a short report."** *AIDS Care* 2016 28(12): 1595-1599.

People who inject drugs (PWID) experience a range of barriers to HIV treatment and care access. The Kenyan government and community-based organisations have sought to develop HIV care for PWID. A principal approach to delivery in Kenya is to provide care from clinics serving the general population and for this to be linked to support from community-based organisations providing harm reduction outreach. This study explores accounts of PWID accessing care in Kenya to identify care barriers and facilitators. PWID accounts were collected within a qualitative longitudinal study. In-depth interviews with PWID living with HIV (n = 44) are combined with interviews with other PWID, care providers and community observation. Results show that some PWID are able to access care successfully, whilst other PWID report challenges. The results focus on three principal themes to give insights into these experiences: the hardship of addiction and the costs of care, the silencing of HIV in the community and then discrimination and support in the clinic. Some PWID are able to overcome, often with social and outreach support, barriers to clinic access; for others, the challenges of addiction, hardship, stigma and discrimination are too constraining. We discuss how clinics serving the general population could be further adapted to increase access. Clinic-based care, even with community links, may, however, be fundamentally challenging for some PWID to access. Additional strategies to develop stand-alone care for PWID and also decentralise HIV treatment and care to community settings and involve peers in delivery should be considered.

2. Polonsky, M., et al. **"Attitudes Toward Addiction, Methadone Treatment, and Recovery Among HIV-Infected Ukrainian Prisoners Who Inject Drugs: Incarceration Effects and Exploration of Mediators."** *AIDS Behav* 2016 20(12): 2950-2960.

In this study, we use data from a survey conducted in Ukraine among 196 HIV-infected people who inject drugs, to explore attitudes toward drug addiction and methadone maintenance therapy (MMT), and intentions to change drug use during incarceration and after release from prison. Two groups were recruited: Group 1 (n = 99) was currently incarcerated and Group 2 (n = 97) had been recently released from prison. This paper's key finding is that MMT treatment and addiction recovery were predominantly viewed as

mutually exclusive processes. Group comparisons showed that participants in Group 1 (pre-release) exhibited higher optimism about changing their drug use, were less likely to endorse methadone, and reported higher intention to recover from their addiction. Group 2 participants (post-release), however, reported higher rates of HIV stigma. Structural equation modeling revealed that in both groups, optimism about recovery and awareness of addiction mediated the effect of drug addiction severity on intentions to recover from their addiction.

3. Page, K., et al. **"Commitment issues: PrEP adherence in injecting drug users."** *Lancet HIV* 2017 4(2): e52-e53.
4. Gounder, K., et al. **"Complex subtype diversity of HIV-1 among drug users in major Kenyan cities."** *AIDS Res Hum Retroviruses* 2017.

Drug users are increasingly recognized as a key population driving HIV spread in sub-Saharan Africa. To determine HIV-1 subtypes circulating in this population group and explore possible geographic differences, we analyzed HIV-1 sequences among drug users from Nairobi, Mombasa and Kisumu in Kenya. We sequenced gag and env from 55 drug users. Subtype analysis from 220 gag clonal sequences from 54/55 participants (median=4/participant) showed that 44.4% were A, 16.7% were C, 3.7% were D and 35.2% were intersubtype recombinants. Of 156 env clonal sequences from 48/55 subjects (median=3/participant), 45.8% were subtype A, 14.6% were C, 6.3% were D and 33.3% were recombinants. Comparative analysis of both genes showed that 30 (63.8%) participants had concordant subtypes while 17 (36.2%) were discordant. We identified one genetically-linked transmission pair and 2 cases of dual infection. These data are indicative of extensive HIV-1 intersubtype recombination in Kenya and suggest decline in subtype D prevalence.

5. Girchenko, P., et al. **"Correlates of Double Risk of HIV Acquisition and Transmission Among Women who Inject Drugs in St. Petersburg, Russia."** *AIDS Behav* 2017.

Russia continues to experience a growing HIV epidemic, and women account for an increasing proportion of new HIV diagnoses in the country. This study aims to provide up-to-date information on factors associated with unsafe sex and drug use behaviors among women who inject drugs in St. Petersburg, Russia. In this community-based sample of 500 women who inject drugs, 64% tested positive for HIV. Women reported the following: 21% reported injection risk, 22% reported sexual risk, and 18% reported double risk. Multivariable analyses using logistic multinomial regression showed that older age is associated with increased risk behaviors. Involvement in transactional sex is associated with injection risk [aOR = 1.59 (1.02, 2.48)] but protective against sexual risk [aOR = 0.11 (0.06, 0.19)]. Exposure to sexual violence is associated with increased injection risk [aOR = 1.78 (1.01, 3.14)] and double risk [aOR = 3.38 (1.50, 7.63)]. These findings indicate the need to address both the unsafe injection and sexual risks among women who inject drugs in Russia.

6. Wu, Q., et al. **"Coverage of harm reduction services and HIV infection: a multilevel analysis of five Chinese cities."** *Harm Reduct J* 2017 14(1): 10. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5307648/pdf/12954_2017_Article_137.pdf

BACKGROUND: Since 2003, a harm reduction program for injecting drug users has been rolled out countrywide in China. It entails services for condom promotion, a needle and syringe program (NSP), and methadone maintenance treatment (MMT). However, it remains unknown if and to what extent the coverage of these services at city level is related to a reduced risk of HIV infection among drug users.

METHODS: We wished to quantify the extent to which city-level characteristics (such as NSP and MMT service coverage) and individual-level determinants (e.g., self-reported exposure to NSP and MMT services, knowledge, motivation, and skills) were associated with the risk of HIV infection among drug users. In 2006, we conducted an integrated serological and behavioral survey among drug users in five cities of Yunnan Province, China (N = 685), constructing a multilevel logistic regression model with drug users clustered within these cities.

RESULTS: Drug users who reported having received NSP or MMT services were about 50% less likely to be infected with HIV than those who reported not having received them (OR 0.45, 95% CI, 0.26-0.83 for NSP and 0.48, 95% CI, 0.31-0.73 for MMT). Despite a between-city variation of HIV infection risk (ICC 0.24, 95% CI 0.08-0.54), none of the city-level factors could explain this difference. Individual-level determinants such as perceived risk of infection and use of condoms were not associated with HIV infection.

CONCLUSIONS: Although people who had used NSP or MMT services were less likely to be HIV infected, this study found no relationship between city-level coverage of HIV prevention programs and variations in HIV infection between cities. This may have been due to the low number of cities in the analysis. Future research should include the analysis of data from a larger number of cities, which are collected widely in China through integrated behavioral and serological surveys.

7. Sawangjit, R., et al. **"Effectiveness of pharmacy-based needle/syringe exchange programme for people who inject drugs: a systematic review and meta-analysis."** *Addiction* 2017 112(2): 236-247.

AIMS: To appraise the evidence critically for effectiveness of pharmacy-based needle/syringe exchange programmes (pharmacy-based NSPs) on risk behaviours (RBs), HIV/HCV prevalence and economic outcomes among people who inject drugs (PWID).

DESIGN: Systematic review and meta-analysis.

SETTING: Primary care setting.

PARTICIPANTS: Of 1568 studies screened, 14 studies with 7035 PWID were included.

MEASURES: PubMed, Embase, Web of Sciences, CENTRAL and Cochrane review databases were searched without language restriction from their inception to 27 January 2016. All published study designs with control groups that reported the effectiveness of pharmacy-based NSP on outcomes of interest were included. Outcomes of interest are risk behaviour (RB), HIV/hepatitis C virus (HCV) prevalence and economic outcomes. The estimates of pooled effects of these outcomes were calculated as pooled odds ratio (OR) with 95% confidence interval (CI) using a random-effects model. Heterogeneity was assessed by I² and chi² tests.

FINDINGS: Most studies (nine of 14, 64.3%) were rated as having a serious risk of bias, while 28.6 and 7.1% were rated as having a moderate risk and low risk of bias, respectively. For sharing-syringe behaviour, pharmacy-based NSPs were significantly better than no NSPs for both main (OR = 0.50, 95% CI = 0.34-0.73; I² = 59.6%) and sensitivity analyses, excluding studies with a serious risk of bias (OR = 0.52, 95% CI = 0.32-0.84; I² = 41.4%). For safe syringe disposal and HIV/HCV prevalence, the evidence for pharmacy-based NSPs compared with other NSP or no NSP was unclear, as few of the studies reported this and most of them had a serious risk of bias. Compared with the total life-time cost of US\$55 640 for treating a person with HIV infection, the HIV prevalence among PWID has to be at least 0.8% (for pharmacy-based NSPs) or 2.1% (for other NSPs) to result in cost-savings.

CONCLUSIONS: Pharmacy-based needle/syringe exchange programmes appear to be effective for reducing risk behaviours among people who inject drugs, although their effect on HIV/HCV prevalence and economic outcomes is unclear.

8. Hung, V., et al. **"Evaluation of the integrated clinic model for HIV/AIDS services in Ho Chi Minh City, Viet Nam, 2013-2014."** *Public Health Action* 2016 6(4): 255-260. Online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5176051/pdf/i2220-8372-6-4-255.pdf>

Setting: Ho Chi Minh City (HCMC), Viet Nam.

Objective: To evaluate a new integrated service model for human immunodeficiency virus/acquired immune-deficiency syndrome (HIV/AIDS) care.

Design: In HCMC, co-located services, including voluntary HIV counseling and testing (VCT), HIV treatment at out-patient clinics (OPC), and methadone maintenance therapy (MMT) for persons who inject drugs, have operated under different administrative structures. In the context of decreasing international financial support, integration of these services into one administrative structure with reduced staff occurred in seven districts in HCMC between October 2013 and June 2014. We used a pre-post study design to compare service-related outcomes from routinely collected data at health facilities 6 months before and 6 months after integration.

Results: The proportion of HIV-infected persons linked from VCT to OPCs was unchanged or increased following integration. A higher percentage of patients eligible for antiretroviral therapy (ART) were started on ART. The proportion of ART patients lost to follow-up remained unchanged. The proportions of MMT patients who tested positive for heroin or other substances decreased or were unchanged.

Conclusions: VCT, OPC and MMT service delivery quality remained the same or improved during the 6 months following the integration. Expansion of the integrated model should be considered for HIV-related services.

9. Martin, M., et al. **"Factors associated with the uptake of and adherence to HIV pre-exposure prophylaxis in people who have injected drugs: an observational, open-label extension of the Bangkok Tenofovir Study."** *Lancet HIV* 2017 4(2): e59-e66.

BACKGROUND: Results of the randomised, double-blind, placebo-controlled Bangkok Tenofovir Study (BTS) showed that taking tenofovir daily as pre-exposure prophylaxis (PrEP) can reduce the risk of HIV infection by 49% in people who inject drugs. In an extension to the trial, participants were offered 1 year of open-label tenofovir. We aimed to examine the demographic characteristics, drug use, and risk behaviours associated with participants' uptake of and adherence to PrEP.

METHODS: In this observational, open-label extension of the BTS (NCT00119106), non-pregnant, non-breastfeeding, HIV-negative BTS participants, all of whom were current or previous injecting drug users at the time of enrolment in the BTS, were offered daily oral tenofovir (300 mg) for 1 year at 17 Bangkok Metropolitan Administration drug-treatment clinics. Participant demographics, drug use, and risk behaviours were assessed at baseline and every 3 months using an audio computer-assisted self-interview. HIV testing was done monthly and serum creatinine was assessed every 3 months. We used logistic regression to examine factors associated with the decision to take daily tenofovir as PrEP, the decision to return for at least one PrEP follow-up visit, and greater than 90% adherence to PrEP.

FINDINGS: Between Aug 1, 2013, and Aug 31, 2014, 1348 (58%) of the 2306 surviving BTS participants returned to the clinics, 33 of whom were excluded because they had HIV (n=27) or grade 2-4 creatinine results (n=6). 798 (61%) of the 1315 eligible participants chose to start open-label PrEP and were followed up for a median of 335 days (IQR 0-364). 339 (42%) participants completed 12 months of follow-up; 220 (28%) did not return for any follow-up visits. Participants who were 30 years or older (odds ratio [OR] 1.8, 95% CI 1.4-2.2; p<0.0001), injected heroin (OR 1.5, 1.1-2.1; p=0.007), or had been in prison (OR 1.7, 1.3-2.1; p<0.0001) during the randomised trial were more likely to choose PrEP than were those without these characteristics. Participants who reported injecting heroin or being in prison during the 3 months before open-label enrolment were more likely to return for at least one open-label follow-up visit than those who did not report injecting heroin (OR 3.0, 95 % CI 1.3-7.3; p=0.01) or being in prison (OR 2.3, 1.4-3.7; p=0.0007). Participants who injected midazolam or were in prison during open-label follow-up were more likely to be greater than 90% adherent than were those who did not inject midazolam (OR 2.2, 95% CI 1.2-4.3; p=0.02) or were not in prison (OR 4.7, 3.1-7.2; p<0.0001). One participant tested positive for HIV, yielding an HIV incidence of 2.1 (95% CI 0.05-11.7) per 1000 person-years. No serious adverse events related to tenofovir use were reported.

INTERPRETATION: More than 60% of returning, eligible BTS participants started PrEP, which indicates that a substantial proportion of PWID who are knowledgeable about PrEP might be interested in taking it.

Participants who had injected heroin or been in prison were more likely to choose to take PrEP, suggesting that participants based their decision to take PrEP, at least in part, on their perceived risk of incident HIV infection. FUNDING: US Centers for Disease Control and Prevention and the Bangkok Metropolitan Administration.

10. Walley, A. Y., et al. **"Fatal and non-fatal overdose after narcology hospital discharge among Russians living with HIV/AIDS who inject drugs."** *Int J Drug Policy* 2017 39: 114-120.

OBJECTIVES: Among Russians living with HIV/AIDS who inject drugs, we examined the incidence of fatal and non-fatal overdoses following discharge from a narcology hospital and the associations with more advanced HIV infection.

DESIGN: Prospective cohort study of data collected at baseline, 3 and 6 months from HIV-infected patients with a history of injection drug use who were not treated with anti-retroviral therapy. Participants were recruited between 2012-2014 from a narcology (addiction) hospital in St. Petersburg, Russia.

METHODS: Fatal overdose was determined based on contact reports to study staff in the year after discharge. Non-fatal overdose was self-reported at the 3- and 6-month assessments. The main independent variable for HIV severity was CD4 cell count at the baseline interview ($<200\text{cells/mm}^3$ vs $\geq 200\text{cells/mm}^3$). Secondary analyses assessed time since HIV diagnosis and treated with anti-retroviral treatment (ART) prior to enrolment as independent variables. We fit Cox proportional hazards models to assess whether HIV severity is associated with either fatal or non-fatal overdose. RESULTS: Among 349 narcology patients, 18 participants died from overdose within one year after discharge (8.7%, 95% CI 3.4-14.2 by Kaplan-Meier); an estimated 51% [95% CI 34-68%] reported at least one non-fatal overdose within 6 months of discharge. HIV severity, time since HIV diagnosis and ever ART were not significantly associated with either fatal or non-fatal overdose events.

CONCLUSION: Fatal and non-fatal overdose are common among Russians living with HIV/AIDS who inject drugs after narcology hospital discharge. Overdose prevention interventions are urgently warranted among Russian narcology patients with HIV infection.

11. Sabri, B., et al. **"Gender Differences in Factors Related to HIV Risk Behaviors among People Who Inject Drugs in North-East India."** *PLoS One* 2017 12(1): e0169482. Online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5242464/pdf/pone.0169482.pdf>

People who inject drugs (PWID) in India are at high risk for HIV, with women being at elevated risk. Using a socio-ecological framework, this study assessed whether factors associated with HIV transmission risk behaviors differed across men and women PWID. Data for this cross-sectional study were collected from 6449 PWID in 7 cities in Northeast India. Men ($n = 5653$) and women ($n = 796$) PWID were recruited using respondent-driven sampling (RDS). We assessed sex differences in two recent HIV transmission risk behaviors: multiple sex partners and needle/syringe sharing. We used multi-level logistic regression models, which incorporated sampling weights and random intercepts for city, to assess factors associated with these HIV risks, separately among men and women. The prevalence of HIV was significantly higher among women than men (53% vs 18.4%, $p < 0.01$). Nearly 13% of men and 8% of women ($p = .30$) had multiple partners. Employment in men and relationship status and stigma in women were significantly associated with multiple partners. Approximately 25% of men and 19% of women engaged in needle sharing ($p = .16$). Younger age in women and depression symptoms in men were significantly associated with increased risk for sharing needles. We found that sexual and drug related risk behaviors were common among PWID in Northeast India, and there were differences between men and women in the socio-ecologic correlates of these behaviors. Contextually-integrated and gender-specific HIV prevention and intervention efforts are needed that consider factors at individual, interpersonal- and community-levels that uniquely impact HIV risks among PWID.

12. Akbarzadeh, V., et al. **"HCV prevalence can predict HIV epidemic potential among people who inject drugs: mathematical modeling analysis."** *BMC Public Health* 2016 16(1): 1216. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5135754/pdf/12889_2016_Article_3887.pdf

BACKGROUND: Hepatitis C virus (HCV) and HIV are both transmitted through percutaneous exposures among people who inject drugs (PWID). Ecological analyses on global epidemiological data have identified a positive association between HCV and HIV prevalence among PWID. Our objective was to demonstrate how HCV prevalence can be used to predict HIV epidemic potential among PWID.

METHODS: Two population-level models were constructed to simulate the evolution of HCV and HIV epidemics among PWID. The models described HCV and HIV parenteral transmission, and were solved both deterministically and stochastically.

RESULTS: The modeling results provided a good fit to the epidemiological data describing the ecological HCV and HIV association among PWID. HCV was estimated to be eight times more transmissible per shared injection than HIV. A threshold HCV prevalence of 29.0% (95% uncertainty interval (UI): 20.7-39.8) and 46.5% (95% UI: 37.6-56.6) were identified for a sustainable HIV epidemic (HIV prevalence >1%) and concentrated HIV epidemic (HIV prevalence >5%), respectively. The association between HCV and HIV was further described with six dynamical regimes depicting the overlapping epidemiology of the two infections, and was quantified using defined and estimated measures of association. Modeling predictions across a wide range of HCV prevalence indicated overall acceptable precision in predicting HIV prevalence at endemic equilibrium. Modeling predictions were found to be robust with respect to stochasticity and behavioral and biological parameter uncertainty. In an illustrative application of the methodology, the modeling predictions of endemic HIV prevalence in Iran agreed with the scale and time course of the HIV epidemic in this country.

CONCLUSIONS: Our results show that HCV prevalence can be used as a proxy biomarker of HIV epidemic potential among PWID, and that the scale and evolution of HIV epidemic expansion can be predicted with sufficient precision to inform HIV policy, programming, and resource allocation.

13. Bick, J., et al. **"Healthcare resources are inadequate to address the burden of illness among HIV-infected male prisoners in Malaysia."** *Int J Prison Health* 2016 12(4): 253-269.

Purpose Criminalization of drug use in Malaysia has concentrated people who inject drugs (PWID) and people living with HIV into prisons where health services are minimal and HIV-related mortality is high. Few studies have comprehensively assessed the complex health needs of this population. The paper aims to discuss these issues. Design/methodology/approach From October 2012 through March 2013, 221 sequentially selected HIV-infected male prisoners underwent a comprehensive health assessment that included a structured history, physical examination, and clinically indicated diagnostic studies. Findings Participants were mostly PWID (83.7 percent) and diagnosed with HIV while incarcerated (66.9 percent). Prevalence of hepatitis C virus (90.4 percent), untreated syphilis (8.1 percent), active (13.1 percent), and latent (81.2 percent) tuberculosis infection was several fold higher than non-prisoner Malaysian adults, as was tobacco use (71.9 percent) and heavy drinking (30.8 percent). Most (89.5 percent) were aware of their HIV status before the current incarceration, yet few had been engaged previously in HIV care, including pre-incarceration CD4 monitoring (24.7 percent) or prescribed antiretroviral therapy (ART) (16.7 percent). Despite most (73.7 percent) meeting Malaysia's criteria for ART (CD4 <350 cells/ μ L), less than half (48.4 percent) ultimately received it. Nearly one-quarter (22.8 percent) of those with AIDS (<200 cells/ μ L) did not receive ART. Originality/value Drug addiction and communicable disease comorbidity, which interact negatively and synergistically with HIV and pose serious public health threats, are highly prevalent in HIV-infected prisoners. Interventions to address the critical shortage of healthcare providers and large gaps in treatment for HIV and other co-morbid conditions are urgently needed to meet the health needs of HIV-infected Malaysian prisoners, most of whom will soon transition to the community.

14. Li, L., et al. **"HIV Disclosure and Unprotected Sex Among Vietnamese Men with a History of Drug Use."** *AIDS Behav* 2016.

Additional barriers to self-disclosure of HIV status exist for people living with HIV (PLH) with a history of drug use. The objectives of this study were to explore the extent of HIV disclosure, sexual practice patterns and the relationships between HIV disclosure and unprotected sex among Vietnamese male PLH with a history of drug use. We used cross-sectional data of a sample of 133 PLH collected from a randomized controlled intervention trial in Vietnam. More than one-quarter of the participants reported not disclosing their HIV status to any sexual partners. Self-reported rates of condom use were 67.8, 51.1 and 32.6% with regular, casual, and commercial partners, respectively. Unprotected sex, testing positive for heroin, and fewer years since HIV diagnosis were significantly associated with lower level of HIV disclosure. Future intervention programs should focus on the complex interplay among HIV disclosure, drug use, and unprotected sexual practices in this vulnerable population.

15. Uuskula, A., et al. **"HIV prevalence and gender differences among new injection-drug-users in Tallinn, Estonia: A persisting problem in a stable high prevalence epidemic."** *PLoS One* 2017 12(2): e0170956. Online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5289488/pdf/pone.0170956.pdf>

INTRODUCTION: New injectors / younger drug users are an important population to target for intervention because they are often at especially high risk of HIV and HCV infection. We examined HIV prevalence and gender differences in HIV prevalence and risk behavior among new injection-drug-users in Tallinn, Estonia.

METHODS: Respondent driven sampling (RDS) interview surveys and HIV testing were conducted in Tallinn in 2009, 2011 and 2013. We classified "new injectors" as persons who reported their first injection as occurring within three years of the study interview. Recruiting trees of the three individual RDS studies were joined to form one RDS dataset and RDS estimates for prevalence and means were derived. Bootstrap tests were used to compare data from men and women, HIV infected and uninfected.

RESULTS: Among 110 new injectors (34 women and 76 men) the mean age was 24.5 (SD 7.5) years; 63% reported injecting mainly fentanyl, 34% injecting mainly amphetamine, 36% sharing syringes, 89% were sexually active, and, of these, 88% did not always use condoms in the last 6 months. HIV prevalence was 18% (95%CI 8-28%) (41% (95%CI 19-63%) among female and 7% (95%CI 2-12%) among male new injectors). Based on self-reports, 8.1% of all new injectors (and 22% of female new injectors) were HIV positive before starting to inject drugs. 40% of HIV infected reported receiving antiretroviral therapy. In multivariable analysis, gender (male: OR 0.12, 95% CI 0.03-0.45), main drug injected (fentanyl: OR 6.7, 95% CI 1.3-35.7) and syringe sharing (distributive: OR 0.11, 95% CI 0.02-0.55; and receptive: OR 3.7, 95% CI 1.0-13.5) were associated with the HIV seropositivity.

CONCLUSIONS: New injectors exhibit high-risk behavior and correspondingly high HIV prevalence. Sexual transmission of HIV infection, including before injection initiation, is likely to be a significant contributor to HIV risk among female new injectors. This highlights the need to identify and target new injectors and their partners with gender specific interventions in addition to interventions to reduce initiation into injecting and ensuring provision of ART to HIV positive new injectors.

16. Connors, E. E., et al. **"HIV Risk Behaviors and Correlates of Inconsistent Condom Use Among Substance Using Migrants at the Mexico/Guatemala Border."** *AIDS Behav* 2017.

This study assessed correlates of inconsistent condom use with casual partners and the prevalence of sexual risk behaviors and STIs in the Mexico/Guatemala border region using a sample of 392 migrants (303 men, 85 women) who reported current substance use or problem drinking. We ran separate univariate logistic regression models for men and women, and multivariate logistic regression models for men only. Prevalence of syphilis was 1.2% among women and 2.3% among men; HIV prevalence was 2.4% among women and 1.3% among men. Inconsistent condom use with casual partners was higher in women with greater education and lower among women who sold sex. In men, less access to free condoms, drug use with sexual partners, and drug use before sex were independently associated with inconsistent condom use with casual partners. Sexual and substance use risk behaviors were common, and HIV/STI prevention efforts should target both genders and expand beyond most-at risk populations.

17. Noroozi, M., et al. **"HIV Risk Perception and Risky Behavior Among People Who Inject Drugs in Kermanshah, Western Iran."** *Int J Behav Med* 2017.

PURPOSE: Understanding and increasing awareness on individual risk for HIV infection as well as HIV risk perception's effects on different behavioral outcomes for people who inject drugs (PWID) is important for policymaking and planning purposes. The objectives of the present study were to determine whether HIV risk perception was associated with greater injection and sexual risk-taking behaviors among PWIDs.

METHOD: We surveyed 460 PWID in Kermanshah regarding their demographic characteristics, sexual risk behaviors, HIV risk perception, and drug-related risk behaviors in the month prior to the study. Three classes of HIV risk perception were identified using ordinal regression to determine factors associated with HIV risk perception.

RESULTS: Study participants were categorized as follows: "low" (n = 100, 22%), "moderate" (n = 150, 32%), and "high" (n = 210, 46%) risk perception for becoming infected with HIV. The odds of categorizing as "high" risk for HIV was significantly greater in PWID that reported unprotected sex (adjusted odds ratio (AOR) 2.4, p value 0.02), receptive syringe sharing (AOR 1.8, p value 0.01), and multiple sex partners (AOR 1.4, p value 0.03). PWID who reported unprotected sex had 2.7 times the odds of "high" risk perception when compared to PWID with "low" risk perception.

CONCLUSION: Findings show that PWID could rate their HIV risk with acceptable accuracy. Additionally, perceived HIV risk was associated with many risk factors for transmission of HIV, emphasizing the importance of developing targeted prevention and harm reduction programs for all domains of risk behaviors, both sexual and drug-related use.

18. Go, V. F., et al. **"Increased Survival Among HIV-Infected PWID Receiving a Multi-Level HIV Risk and Stigma Reduction Intervention: Results From a Randomized Controlled Trial."** *J Acquir Immune Defic Syndr* 2017 74(2): 166-174.

OBJECTIVE: In Vietnam, where 58% of prevalent HIV cases are attributed to people who inject drugs, we evaluated whether a multi-level intervention could improve care outcomes and increase survival.

METHODS: We enrolled 455 HIV-infected males who inject drugs from 32 communes in Thai Nguyen Province. Communes were randomized to a community stigma reduction intervention or standard of care and then within each commune, to an individual enhanced counseling intervention or standard of care, resulting into 4 arms: Arm 1 (standard of care); Arm 2 (community intervention alone); Arm 3 (individual intervention alone); and Arm 4 (community + individual interventions). Follow-up was conducted at 6, 12, 18, and 24 months to assess survival.

RESULTS: Overall mortality was 23% (n = 103/455) more than 2 years. There were no losses to follow-up for the mortality endpoint. Survival at 24 months was different across arms: Arm 4 (87%) vs Arm 1 (82%) vs Arm 2 (68%) vs Arm 3 (73%); log-rank test for comparison among arms: P = 0.001. Among those with CD4 cell count <200 cells/mm and not on antiretroviral therapy at baseline (n = 162), survival at 24 months was higher in Arm 4 (84%) compared with other arms (Arm 1: 61%; Arm 2: 50%; Arm 3: 53%; P-value = 0.002). Overall, Arm 4 (community + individual interventions) had increased uptake of antiretroviral therapy compared with Arms 1, 2, and 3.

CONCLUSIONS: This multi-level behavioral intervention seemed to increase survival of HIV-infected participants more than a 2-year period. Relative to the standard of care, the greatest intervention effect was among those with lower CD4 cell counts.

19. Alexiev, I., et al. **"Origin and spread of HIV-1 in persons who inject drugs in Bulgaria."** *Infect Genet Evol* 2016 46: 269-278.

Increased HIV transmission in persons who inject drugs (PWIDs) has led to subepidemics and outbreaks in several countries in Europe, including Bulgaria. In this study in Bulgaria, we investigate the origin and spatiotemporal evolutionary history of HIV-1 infections in PWIDs and the distribution of antiretroviral resistance mutations and hepatitis co-infections in these populations. We analyzed HIV-1 polymerase sequences available from 117 of 359 PWIDs diagnosed with HIV/AIDS from 1999 to 2011. Of these, 50 (42.7%) were classified as CRF02_AG, 41 (35.0%) CRF01_AE, 12 (10.3%) URFs, ten (8.5%) subtype B, two (1.7%) subtype F1 and two (1.7%) CRF14_BG. Most recent common ancestor dating suggests that CRF01_AE was likely first introduced from Southeast Asia into persons reporting heterosexual infection in Bulgaria in 1992 and spread subsequently to PWIDs in the capital city of Sofia around 2003. Conversely, CRF02_AG in Bulgaria was likely first introduced into PWID from Germany in 2000 and later entered heterosexual populations around 2009. The overall prevalence of resistance mutations was 6.8% (8/117), of which 5.1% (5/117) was observed in patients on antiretroviral therapy and 1.7% (2/117) was from transmitted drug resistance mutations in drug-naïve individuals. 189/204 (92.6%) PWIDs were also co-infected with hepatitis C (HCV) and 31/183 (16.9%) were co-infected with hepatitis B (HBV). Our study provides valuable molecular epidemiological information on the introduction and distribution of the main HIV-1 subtypes, resistance mutations and hepatitis co-infections among PWIDs with HIV-1 in Bulgaria which can be used to target prevention efforts.

20. Nikolopoulos, G. K., et al. **"Overview of HIV molecular epidemiology among people who inject drugs in Europe and Asia."** *Infect Genet Evol* 2016 46: 256-268.

HIV strains continuously evolve, tend to recombine, and new circulating variants are being discovered. Novel strains complicate efforts to develop a vaccine against HIV and may exhibit higher transmission efficiency and virulence, and elevated resistance to antiretroviral agents. The United Nations Joint Programme on HIV/AIDS (UNAIDS) set an ambitious goal to end HIV as a public health threat by 2030 through comprehensive strategies that include epidemiological input as the first step of the process. In this context, molecular epidemiology becomes invaluable as it captures trends in HIV evolution rates that shape epidemiological pictures across several geographical areas. This review briefly summarizes the molecular epidemiology of HIV among people who inject drugs (PWID) in Europe and Asia. Following high transmission rates of subtype G and CRF14_BG among PWID in Portugal and Spain, two European countries, Greece and Romania, experienced recent HIV outbreaks in PWID that consisted of multiple transmission clusters including subtypes B, A, F1, and recombinants CRF14_BG and CRF35_AD. The latter was first identified in Afghanistan. Russia, Ukraine, and other Former Soviet Union (FSU) states are still facing the devastating effects of epidemics in PWID produced by AFSU (also known as IDU-A), BFSU (known as IDU-B), and CRF03_AB. In Asia, CRF01_AE and subtype B (Western B and Thai B) travelled from PWID in Thailand to neighboring countries. Recombination hotspots in South China, Northern Myanmar, and Malaysia have been generating several intersubtype and inter-CRF recombinants (e.g. CRF07_BC, CRF08_BC, CRF33_01B etc.), increasing the complexity of HIV molecular patterns.

21. Ompad, D. C., et al. **"Patterns of harm reduction service utilization and HIV incidence among people who inject drugs in Ukraine: A two-part latent profile analysis."** *Int J Drug Policy* 2017 43: 7-15.

BACKGROUND: Program utilization patterns are described within a large network of harm reduction service providers in Ukraine. The relationship between utilization patterns and HIV incidence is determined among people who inject drugs (PWID) controlling for oblast-level HIV incidence and treatment/syringe coverage.

METHODS: Data were extracted from the network's monitoring and evaluation database (January 2011-September 2014, n=327,758 clients). Latent profile analysis was used to determine harm reduction utilization patterns using the number of HIV tests received annually and the number of condoms, syringes, and services (i.e., information and counseling sessions) received monthly over a year. Cox proportional hazards regression determined the relations between HIV seroconversion and utilization class membership. **RESULTS:** In the final 4-class model, class 1 (34.0% of clients) received 0.1 HIV tests, 1.3 syringes, 0.6 condom and minimal counseling and information sessions per month; class 2 (33.6%) received 8.6 syringes, 3.2 condoms, and 0.5 HIV tests and counseling and information sessions; class 3 (19.1%) received 1 HIV test, 11.9 syringes, 4.3

condoms, and 0.7 information and counseling sessions; class 4 (13.3%) received 1 HIV test, 26.1 syringes, 10.3 condoms, and 1.8 information and 1.9 counseling sessions. Class 4 clients had significantly decreased risk for HIV seroconversion as compared to those in class 1 after controlling for oblast-level characteristics.

CONCLUSION: Injection drug use continues to be a major mode of HIV transmission in Ukraine, making evaluation of harm reduction efforts in reducing HIV incidence among PWID critical. These analyses suggest that receiving more syringes and condoms decreased risk of HIV. Scaling up HIV testing and harm reduction services is warranted.

22. Sharifi, H., et al. **"Patterns of HIV Risks and Related Factors among People Who Inject Drugs in Kermanshah, Iran: A Latent Class Analysis."** *J Psychoactive Drugs* 2017 49(1): 69-73.

The objective of this study was to explore patterns of drug use and sexual risk behaviors among people who inject drugs (PWID) in Iran. We surveyed 500 PWID in Kermanshah concerning demographic characteristics, sexual risk behaviors, and drug-related risk behaviors in the month prior to study. We used latent class analysis (LCA) to establish a baseline model of risk profiles and to identify the optimal number of latent classes, and we used ordinal regression to identify factors associated with class membership. Three classes of multiple HIV risk were identified. The probability of membership in the high-risk class was 0.33, compared to 0.26 and 0.40 for the low- and moderate-risk classes, respectively. Compared to members in the lowest-risk class (reference group), the highest-risk class members had higher odds of being homeless (OR = 4.5, CI: 1.44-8.22; $p = 0.001$) in the past 12 months. Members of the high-risk class had lower odds of regularly visiting a needle and syringe exchange program as compared to the lowest-risk class members (AOR = 0.42, CI: 0.2-0.81; $p = 0.01$). Findings show the sexual and drug-related HIV risk clusters among PWID in Iran, and emphasize the importance of developing targeted prevention and harm reduction programs for all domains of risk behaviors, both sexual and drug use related.

23. Mmbaga, E. J., et al. **"Prevalence and Predictors of Human Immunodeficiency Virus and Selected Sexually Transmitted Infections Among People Who Inject Drugs in Dar es Salaam, Tanzania: A New Focus to Get to Zero."** *Sex Transm Dis* 2017 44(2): 79-84.

BACKGROUND: Previous studies in Tanzania indicated that human immunodeficiency virus (HIV) prevalence among people who inject drugs (PWIDs) could be as high as 40%. We aim to provide data on the prevalence of HIV and sexually transmitted infection among PWIDs to inform national plans to get to zero.

MATERIALS AND METHODS: Respondent-driven sampling was used to collect drug use, and sexual practices data among PWIDs aged 15 years and older. Blood samples were examined for HIV, herpes simplex virus type 2, syphilis, and hepatitis B.

RESULTS: A total of 620 PWIDs with a median age of 32 (interquartile range, 17-52) participated in the study. Their use of drugs had typically started during adolescence. The prevalence of HIV was found to be 15.5%, whereas that of herpes simplex type 2 was 43.3%. Associated with an increased likelihood of HIV infection was being a female (adjusted odds ratio [aOR], 2.3; 95% confidence interval [CI], 1.0-3.6), sharing of syringes (aOR, 2.4; 95% CI, 1.1-6.1), used syringes hidden in public places (aOR, 5.1; 95% CI, 1.3-10.2), and having had a genital ulcer during the last 12 months before this survey. On the other hand, being educated, use of noninjectable drugs, access (aOR, 0.5; 95% CI, 0.2-0.8), and use of clean syringes (aOR, 0.3; 95% CI, 0.1-0.6) were associated with decreased likelihood of HIV infection.

CONCLUSIONS: The prevalence of HIV infection among PWIDs in Dar es Salaam is 3 times higher than that in the general population. Behavioral and biological risk factors contribute to HIV transmission and needs to be addressed to be able to get to zero.

24. Morozova, O., et al. **"Primary healthcare-based integrated care with opioid agonist treatment: First experience from Ukraine."** *Drug Alcohol Depend* 2017 173: 132-138.

BACKGROUND: Ukraine's HIV epidemic is concentrated among people who inject drugs (PWID), however, coverage with opioid agonist therapies (OATs) available mostly at specialty addiction clinics is extremely low. OAT integrated into primary healthcare clinics (PHCs) provides an opportunity for integrating comprehensive healthcare services and scaling up OAT.

METHODS: A pilot study of PHC-based integrated care for drug users conducted in two Ukrainian cities between 2014 and 2016 included three sub-studies: 1) cross-sectional treatment site preference assessment among current OAT patients (N=755); 2) observational cohort of 107 PWID who continued the standard of care versus transition of stabilized and newly enrolled PWID into PHC-based integrated care; and 3) pre/post analysis of attitudes toward PWID and HIV patients by PHC staff (N=26).

RESULTS: Among 755 OAT patients, 53.5% preferred receiving OAT at PHCs, which was independently correlated with convenience, trust in physician, and treatment with methadone (vs. buprenorphine). In 107 PWID observed over 6 months, retention in treatment was high: 89% in PWID continuing OAT in specialty addiction treatment settings (standard of care) vs 94% in PWID transitioning to PHCs; and 80% among PWID newly initiating OAT in PHCs. Overall, satisfaction with treatment, subjective self-perception of well-being, and trust in physician significantly increased in patients prescribed OAT in PHCs. Among PHC staff, attitudes towards PWID and HIV patients significantly improved over time.

CONCLUSIONS: OAT can be successfully integrated into primary care in low and middle-income countries and improves outcomes in both patients and clinicians while potentially scaling-up OAT for PWID.

25. Desrosiers, A., et al. "**Psychiatric symptoms, quality of life, and HIV status among people using opioids in Saint Petersburg, Russia.**" *Drug Alcohol Depend* 2017 172: 60-65.

BACKGROUND: The Russian Federation is experiencing a very high rate of HIV infection among people who inject drugs (PWID). However, few studies have explored characteristics of people with co-occurring opioid use disorders and HIV, including psychiatric symptom presentations and how these symptoms might relate to quality of life. The current study therefore explored a.) differences in baseline psychiatric symptoms among HIV+ and HIV- individuals with opioid use disorder seeking naltrexone treatment at two treatment centers in Saint Petersburg, Russia and b.) associations between psychiatric symptom constellations and quality of life.

METHODS: Participants were 328 adults enrolling in a randomized clinical trial evaluating outpatient treatments combining naltrexone with different drug counseling models. Psychiatric symptoms and quality of life were assessed using the Brief Symptom Inventory and The World Health Organization Quality of Life-BREF, respectively.

RESULTS: Approximately 60% of participants were HIV+. Those who were HIV+ scored significantly higher on BSI anxiety, depression, psychoticism, somatization, paranoid ideation, phobic anxiety, obsessive-compulsive, and GSI indexes (all $p < 0.05$) than those HIV-. A K-means cluster analysis identified three distinct psychiatric symptom profiles; the proportion of HIV+ was significantly greater and quality of life indicators were significantly lower in the cluster with the highest psychiatric symptom levels.

CONCLUSION: Higher levels of psychiatric symptoms and lower quality of life indicators among HIV+ (compared to HIV-) individuals injecting drugs support the potential importance of combining interventions that target improving psychiatric symptoms with drug treatment, particularly for HIV+ patients.

26. Pham, L. T., et al. "**Retrospective analysis of antiretroviral therapy uptake and retention of male clients receiving methadone maintenance therapy in two provinces in Vietnam: potential synergy of the two therapies.**" *Harm Reduct J* 2017 14(1): 12. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5316168/pdf/12954_2017_Article_133.pdf

BACKGROUND: Vietnam has a concentrated HIV epidemic with injection drug use being the dominant

mode of HIV transmission. Vietnam has rapidly expanded antiretroviral therapy (ART) and methadone maintenance therapy (MMT). This study aims to analyze ART uptake and retention among male clients receiving MMT in Vietnam in the early phase of the MMT program.

METHODS: The male clients (age ≥ 18) who were newly enrolled in care or started ART at two HIV clinics in Hanoi (2009 to 2011) and three HIV clinics in Can Tho (2010 to 2012) were included for the analysis. The CD4 lymphocyte count at HIV care enrollment and ART initiation and retention on ART were retrospectively analyzed. The values of those receiving MMT were compared with the values of two groups: those in whom injection drug use (IDU) status was documented, but were not receiving MMT, and all male clients not receiving MMT. To analyze retention, survival analysis with log rank test and Cox proportional hazard model was used.

RESULTS: During the study period, 663 adult men were newly enrolled in HIV care (237 had IDU status documented) and 456 initiated ART (167 had IDU status documented). Among those who initiated ART, 28 were receiving MMT. At care enrolment, those receiving MMT had a median CD4 count of 230 (IQR 57-308) cells/mm³, while men self-reporting IDU and not receiving MMT and all men not receiving MMT had a median CD4 count of 158 (IQR 50-370) cells/mm³ and 143 (IQR 35-366) cells/mm³, respectively. At ART initiation, men receiving MMT had significantly higher CD4 count with median at 203 (IQR 64-290) cells/mm³ than men self-reporting IDU and not receiving MMT (80, IQR 40-220, cells/mm³, $p = 0.038$) and all men not receiving MMT (76, IQR 20-199, cells/mm³, $p = 0.009$). Those receiving MMT had a significantly higher retention rate than those self-reporting IDU but not receiving MMT (hazard ratio = 0.18, $p = 0.019$) and men not receiving MMT (hazard ratio = 0.20, $p = 0.041$).

CONCLUSIONS: Our analysis suggests that men receiving MMT in Vietnam are achieving relatively early uptake and high retention rates on ART. The findings support potential benefits of integrating MMT and ART services in Vietnam.

[Back to top](#)

Men who have Sex with Men - 66

1. Fairley, C. K., et al. **"2020, sexually transmissible infections and HIV in gay, bisexual and other men who have sex with men."** *Sex Health* 2017.

This editorial accompanies a series of papers dealing with this watershed period for HIV and sexually transmissible infections (STI) infections in gay, bisexual and other men who have sex with men (GBM). We are delighted to share with you the views of some international opinion leaders on what the future may hold and what challenges lie ahead. In this issue of the Journal, authors describe current HIV and STI incidence among GBM and predict the future.

2. Hugo, J. M., et al. **"Anti-retroviral Therapy Based HIV Prevention Among a Sample of Men Who Have Sex with Men in Cape Town, South Africa: Use of Post-exposure Prophylaxis and Knowledge on Pre-exposure Prophylaxis."** *AIDS Behav* 2016 20(Suppl 3): 357-364.

Men who have Sex with Men (MSM) have been affected disproportionately by the global HIV pandemic. Rates of consistent condom-use are low and there is a need for further biomedical prevention interventions to prevent new HIV infections. Post exposure prophylaxis (PEP) can reduce the risk of HIV, but uptake among MSM is low. Pre-exposure prophylaxis (PrEP), an innovative anti-retroviral-based HIV prevention tool might

be an appropriate intervention for MSM who have recently accessed PEP that involves HIV negative individuals taking daily tenofovir+emtricitabine for HIV prevention. 44 MSM, attending a primary health-care level MSM-focused sexual health clinic in Cape Town, South Africa, who had initiated PEP were enrolled in this study. Participants were followed up after 2, 4 and 12 weeks. Self-administered electronic surveys were completed at the initial, 4 and 12 week visit. Barriers and facilitators to accessing PEP and remaining adherent were examined, as was knowledge about PrEP. Thirty-two participants (80 %) were <40 years of age (range 20-65 years). 35 % of the participants reported their reason for requiring PEP as condomless receptive anal intercourse. A further 20 % required PEP following condomless penetrative anal intercourse; 27.5 % required PEP due to a broken condom during receptive anal sex and 2 participants during insertive anal sex. Three participants did not complete 28 days of PEP or were lost to follow up. Over half (58.5 %) of the participants reported being completely adherent to their regime; under a third (31.7 %) reported missing one PEP dose; and 9.8 % reported missing more than one dose. 36/40 (90 %) had heard of PrEP and 30/40 (75 %) indicated that they would use PrEP if it were accessible to them. That we enrolled 44 MSM who accessed PEP from a Department of Health affiliated clinic over 12 months, speaks to the low uptake by MSM of PEP services in South Africa. Adherence was high and demonstrates that adherence support is feasible from a state health clinic. Reported risk behaviors in some high-risk participants did not change over time, demonstrating the need for additional longer-term HIV preventions such as PrEP. PEP users could conceivably be transitioned from PEP to PrEP.

3. Hidru, T. H., et al. "**Associated factors of self-reported psychopathology and health related quality of life among men who have sex with men (MSM) with HIV/AIDS in Dalian, China: a pilot study.**" *Infect Dis Poverty* 2016 5(1): 108. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5131411/pdf/40249_2016_Article_204.pdf

BACKGROUND: Despite the availability of Anti-Retroviral Therapy (ART), the health-related quality of life (HRQoL) among HIV-positive men who have sex with men (HIVMSM) in China remains poor. This study aimed to explore the relationship between self-reported psychopathology and HRQoL among HIVMSM in Dalian, China.

METHODS: A cross-sectional study was conducted in 112 HIVMSM. Symptom check list 90 (SCL 90): a measure of psychopathology and World Health Organization quality of life in HIV infection (WHOQOL-HIV-Bref): a measure of HRQoL were used. Correlation and multiple regression analysis were employed to explore the association between self-reported psychopathology and HRQoL in HIVMSM.

RESULTS: Out of the total 112 HIVMSM cases, 9 (8 %) cases were homosexuals and 103 (92 %) ones were bisexuals. The participants who had low family income ($P = 0.001$), perceived discrimination ($P = 0.001$) and lack of regular attendance in medical follow-ups ($P = 0.014$) reported poorer HRQoL than their counterparts. Somatization, obsession, depression, phobia and overall SCL 90 scores in self-reported psychopathology had a negative impact on the domains of HRQoL among HIVMSM.

CONCLUSIONS: Total quality of life was predicted by family income, perceived discrimination, and medical follow-up attendance. Self-reported psychopathology was negatively correlated with HRQoL in HIVMSM. The Strategies that target MSM focusing on linking and engaging HIV-positive patients in medical care is the key step to improve their HRQoL. More emphasis is needed on the newly diagnosed HIVMSM in Dalian in order to develop a more targeted intervention to prevent perceived discrimination and lack of proper medical follow-up services.

TRIAL REGISTRATION: The trial registration number does not require for this manuscript. The study is cross-sectional design that do not involve intervention at all, it is not a clinical trial.

4. Bui, H. T., et al. "**Barriers to access and uptake of antiretroviral therapy among HIV-positive men who have sex with men in Hanoi, Vietnam: from HIV testing to treatment.**" *Cult Health Sex* 2017: 1-14.

Little is known about the experiences of Vietnamese men who have sex with men in accessing HIV testing

and treatment. We aimed to explore barriers to access and uptake of antiretroviral therapy (ART) among HIV-positive men who have sex with men in Hanoi. During 2015, we conducted qualitative interviews with 35 participants recruited using snowball sampling based on previous research and social networks. Key individual impediments to ART uptake included inadequate preparation for a positive diagnosis and the dual stigmatisation of homosexuality and HIV and its consequences, leading to fear of disclosure of HIV status. Health system barriers included lack of clarity and consistency about how to register for and access ART, failure to protect patient confidentiality and a reticence by providers to discuss sexual identity and same-sex issues. Results suggest fundamental problems in the way HIV testing is currently delivered in Hanoi, including a lack of client-centred counselling, peer support and clear referral pathways. Overcoming these barriers will require educating men who have sex with men about the benefits of routine testing, improving access to quality diagnostic services and building a safe, confidential treatment environment for HIV-positive men to access, receive and remain in care.

5. Nugroho, A., et al. **"Behavioral interventions to reduce HIV risk behavior for MSM and transwomen in Southeast Asia: a systematic review."** *AIDS Care* 2017 29(1): 98-104.

This systematic review aims to gain insights from existing literature from Southeast Asian countries to improve future HIV prevention programs for men who have sex with men (MSM) and transgender women (transwomen). We conducted a systematic search in six international databases for literature published prior to 1 January 2015. We included studies describing behavioral interventions targeting MSM and/or transwomen, and conducted in at least one Southeast Asian country. Five out of 575 screened studies met the inclusion criteria and reported a significant intervention effect on at least one outcome measure, that is, condom use (with casual or commercial partner), water-based lubricant use, number of sex partners, HIV prevention knowledge, or willingness to use pre-exposure prophylaxis. Peer education/outreach was the most commonly employed type of intervention in the five included studies and was usually delivered as an element of a larger intervention package, together with condom distribution and the provision of drop-in centers. Motivational interviewing was effective, while internet-based interventions appeared to be a viable platform for intervention delivery. Nevertheless, research on behavioral interventions among MSM and transwomen in Southeast Asia is limited. Future interventions should be culturally appropriate, theoretically grounded, and rigorously evaluated. Only then can we best address the HIV epidemic among MSM and transwomen in this region.

6. Rowe, C., et al. **"Binge drinking concurrent with anal intercourse and condom use among men who have sex with men."** *AIDS Care* 2016 28(12): 1566-1570.

Men who have sex with men (MSM) are the demographic group most severely affected by HIV in the USA. Global association studies have shown that MSM who binge drink are more likely to engage in risky sexual behaviors and day- and event-level analyses have linked binge drinking to sexual risk behavior on specific days and during specific sexual encounters. Despite this strong foundation of research, no studies have examined the association between the frequency of situational binge drinking (i.e., binge drinking concurrent with sexual activity) and aggregated sexual risk over periods of longer duration. We used multivariable logistic regression to assess the relationship between situational binge drinking (i.e., binge drinking concurrent with anal intercourse) and condomless anal intercourse (CAI) and among a cross-sectional sample of 124 MSM in San Francisco, CA. There was a positive relationship between frequency of situational binge drinking and CAI (1-5 times vs. never: adjusted odds ratio = 2.78, 95% CI = 1.01-7.63; 6-10 times vs. never: 6.19, 1.27-30.22; more than 10 times vs. never: 11.88, 1.31-107.60). By filling a methodological gap and complementing existing global and event-level analyses, this positive situational relationship strengthens the evidence linking binge drinking and sexual risk, enhances the comparability of the existing literature, and further suggests that the integration of dual strategies that aim to prevent HIV and reduce binge drinking may be warranted.

7. Lane, T., et al. **"Brief Report: High HIV Incidence in a South African Community of Men Who Have Sex With Men: Results From the Mpumalanga Men's Study, 2012-2015."** *J Acquir Immune Defic Syndr* 2016 73(5): 609-611.

Cross-sectional studies among African men who have sex with men (MSM) populations demonstrate high HIV prevalence, but few incidence estimates exist. The Mpumalanga Men's Study in Gert Sibande, Mpumalanga province, South Africa, involved 3 serial cross-sectional surveys of MSM recruited through respondent-driven sampling between 2012 and 2015. Successive surveys recaptured a nested cohort of 179, contributing 144.3 person-years (PY) of observation. We observed 18 seroconversions, or incidence of 12.5/100 (PY) (95% confidence interval CI: 8.1 to 19.2/100 PY). Presumptions of high incidence among MSM were confirmed and demonstrate an urgent need for biomedical prevention and treatment programming for MSM in South Africa.

8. Zheng, C., et al. **"Commercial sex and risk of HIV, syphilis, and herpes simplex virus-2 among men who have sex with men in six Chinese cities."** *BMC Infect Dis* 2016 16(1): 765. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5178086/pdf/12879_2016_Article_2130.pdf

BACKGROUND: Men who have sex with men (MSM) are at high risk of HIV and sexually transmitted infections (STIs) in China and globally. Engaging in commercial sex put them at even greater risk. This study estimated the prevalence of HIV/STIs among three subgroups of MSM: MSM who sold sex (MSM-selling), MSM who bought sex (MSM-buying), and non-commercial MSM (NC-MSM) and evaluated the relationship between commercial sex and HIV/STIs.

METHODS: We conducted a cross-sectional survey among MSM in six Chinese cities (Shenyang, Ji'nan, Changsha, Zhengzhou, Nanjing, and Kunming) from 2012 to 2013. Data on socio-demographics and sexual behaviors were collected. Serological tests were conducted to detect HIV, syphilis, and human simplex virus type 2 (HSV-2).

RESULTS: Of 3717 MSM, 6.8% were engaged in commercial sex. The overall prevalence of HIV, syphilis and HSV-2 infections was 11.1, 8.8 and 12.1%, respectively. MSM-selling had higher prevalence of HIV (13.4%), syphilis (12.1%) and HSV-2 (17.9%) than NC-MSM (10.9, 8.7 and 11.9% for HIV, syphilis and HSV-2, respectively), though the differences are not statistically significant. Among MSM-selling, HIV prevalence was significantly higher for those who found sex partners via Internet than those did not (19.4% vs. 8.1%, $P = 0.04$). Compared to NC-MSM, MSM-selling were more likely to use recreation drugs (59.3% vs. 26.3%), have unprotected anal intercourse (77.9% vs. 61.7%), and have ≥ 10 male sex partners (46.2% vs. 6.2%) in the past 6 months (each $P < 0.05$).

CONCLUSIONS: All three subgroups of MSM in six large Chinese cities have high prevalence of HIV/STIs. Those who sell sex only have a particularly high risk of acquiring and transmitting disease, and therefore, they should be considered as a priority group in HIV/STIs surveillance and intervention programs.

9. Sapsirisavat, V., et al. **"Differences Between Men Who Have Sex with Men (MSM) with Low CD4 Cell Counts at Their First HIV Test and MSM with Higher CD4 Counts in Bangkok, Thailand."** *AIDS Behav* 2016 20(Suppl 3): 398-407.

Although HIV prevalence remains high among Bangkok's MSM early HIV testing as an entry point to ART has not been successfully implemented among in this population. Men who present late for initial HIV testing are a particular concern in the context of the Bangkok HIV epidemic, in that if long-term positives have had condomless sex during the time that they remained untreated they are likely to have been efficient transmitters of infection, to say nothing of the implications for their own health. A sequential sample of MSM who tested HIV positive, and CD4 counts, was taken at the Thai Red Cross Anonymous Clinic and two drop-in centers in Bangkok. Inclusion criteria were MSM aged > 18 years, having not tested HIV positive earlier, who reported ≥ 1 of the following in the previous 6 months: condomless sex with a male, being a sex worker, or having a sexual transmitted infection (STI) diagnosis. Analysis was conducted by distinguishing between three groups of CD4 counts: < 200 , 200-500, > 500 cells/ μ m to identify the social and behavioral characteristics of the men who presented late for HIV testing. Median CD4 was 325 cells/ μ m ($n = 95$). MSM with initial CD4 < 200 cells/ μ m were significantly more likely to report problematic alcohol use. They were also more likely to report receptive anal sex and more likely to be engaged in sex work. MSM with CD4 < 200

cells/mu were less likely to report recent HIV testing. Main barriers to HIV testing included being afraid of finding out that they were HIV positive and concerns about efficacy and side effects of HIV treatment. HIV stigma and concerns about treatment are still widespread and are potential barriers to HIV care among MSM in Bangkok. These barriers may work to keep men from finding out their positive HIV status in a timely manner. Thai MSM need to be made aware of the current availability of friendly HIV testing and ART services, and public health programs need to work to change their perceptions regarding ART itself. These same types of strategies might also work to destigmatize HIV and MSM within Thai society as a whole.

10. Rekart, M. L., et al. **"A double-edged sword: does highly active antiretroviral therapy contribute to syphilis incidence by impairing immunity to *Treponema pallidum*?"** *Sex Transm Infect* 2017.

BACKGROUND AND HYPOTHESIS: Recently, the world has experienced a rapidly escalating outbreak of infectious syphilis primarily affecting men who have sex with men (MSM); many are taking highly active antiretroviral therapy (HAART) for HIV-1 infection. The prevailing hypothesis is that HAART availability and effectiveness have led to the perception among both individuals who are HIV-1 infected and those who are uninfected that HIV-1 transmission has become much less likely, and the effects of HIV-1 infection less deadly. This is expected to result in increased sexual risk-taking, especially unprotected anal intercourse, leading to more non-HIV-1 STDs, including gonorrhoea, chlamydia and syphilis. However, syphilis incidence has increased more rapidly than other STDs. We hypothesise that HAART downregulates the innate and acquired immune responses to *Treponema pallidum* and that this biological explanation plays an important role in the syphilis epidemic.

METHODS: We performed a literature search and developed a mathematical model of HIV-1 and *T. pallidum* confection in a population with two risk groups with assortative mixing to explore the consequence on syphilis prevalence of HAART-induced changes in behaviour versus HAART-induced biological effects.

CONCLUSIONS AND IMPLICATIONS: Since rising syphilis incidence appears to have outpaced gonorrhoea and chlamydia, predominantly affecting HIV-1 positive MSM, behavioural factors alone may be insufficient to explain the unique, sharp increase in syphilis incidence. HAART agents have the potential to alter the innate and acquired immune responses in ways that may enhance susceptibility to *T. pallidum*. This raises the possibility that therapeutic and preventative HAART may inadvertently increase the incidence of syphilis, a situation that would have significant and global public health implications. We propose that additional studies investigating the interplay between HAART and enhanced *T. pallidum* susceptibility are needed. If our hypothesis is correct, HAART should be combined with enhanced patient management including frequent monitoring for pathogens such as *T. pallidum*.

11. Shangani, S., et al. **"Effectiveness of peer-led interventions to increase HIV testing among men who have sex with men: a systematic review and meta-analysis."** *AIDS Care* 2017: 1-11.

HIV testing constitutes a key step along the continuum of HIV care. Men who have sex with men (MSM) have low HIV testing rates and delayed diagnosis, especially in low-resource settings. Peer-led interventions offer a strategy to increase testing rates in this population. This systematic review and meta-analysis summarizes evidence on the effectiveness of peer-led interventions to increase the uptake of HIV testing among MSM. Using a systematic review protocol that was developed a priori, we searched PubMed, PsycINFO and CINAHL for articles reporting original results of randomized or non-randomized controlled trials (RCTs), quasi-experimental interventions, and pre- and post-intervention studies. Studies were eligible if they targeted MSM and utilized peers to increase HIV testing. We included studies published in or after 1996 to focus on HIV testing during the era of combination antiretroviral therapy. Seven studies encompassing a total of 6205 participants met eligibility criteria, including two quasi-experimental studies, four non-randomized pre- and post intervention studies, and one cluster randomized trial. Four studies were from high-income countries, two were from Asia and only one from sub-Saharan Africa. We assigned four studies a "moderate" methodological rigor rating and three a "strong" rating. Meta-analysis of the seven studies found HIV testing rates were statistically significantly higher in the peer-led intervention groups versus control groups (pooled OR 2.00, 95% CI 1.74-2.31). Among randomized trials, HIV testing rates were significantly higher in the peer-

led intervention versus control groups (pooled OR: 2.48, 95% CI 1.99-3.08). Among the non-randomized pre- and post-intervention studies, the overall pooled OR for intervention versus control groups was 1.71 (95% CI 1.42-2.06), with substantial heterogeneity among studies ($I^2 = 70\%$, $p < 0.02$). Overall, peer-led interventions increased HIV testing among MSM but more data from high-quality studies are needed to evaluate effects of peer-led interventions on HIV testing among MSM in low- and middle-income countries.

12. Tao, J., et al. **"Effects of depression and anxiety on antiretroviral therapy adherence among newly diagnosed HIV-infected Chinese MSM."** *Aids* 2017 31(3): 401-406.

OBJECTIVE: Our objective was to explore the effect of depression and anxiety on adherence to antiretroviral therapy (ART) among MSM with newly diagnosed HIV infections.

DESIGN: We conducted a prospective study of Chinese MSM with newly diagnosed HIV infections.

METHODS: The Hospital Anxiety and Depression Scale was used to measure depression and anxiety at baseline, 6 and 12 months, separately. ART adherence was self-reported once every 3 months ('perfect' or no missing dose in the past 3 months vs. 'imperfect' adherence or at least one missing dose in the past 3 months). We utilized a priori substantial knowledge guided by causal models to identify confounding covariates, and performed mixed-effect logistic regression to assess the effects of depression and anxiety on ART adherence.

RESULTS: We included 228 participants who initiated ART after HIV diagnosis and before the end of study. A one-unit increase in the depression and anxiety score was associated with a 16% increase [adjusted odds ratio (aOR), 1.16; 95% confidence interval (CI), 1.02-1.32] and a 17% increase (aOR, 1.17; 95% CI, 1.03-1.33) in the odds of reporting imperfect ART adherence, respectively. When depression and anxiety were categorized (normal, borderline, and likely), only likely anxiety had a significant association with imperfect ART adherence (aOR, 4.79; 95% CI, 1.12-20.50).

CONCLUSION: Depression and anxiety are risk factors for imperfect ART adherence among Chinese MSM with newly diagnosed HIV infections. Intensive intervention on depression and/or anxiety beyond regular post-HIV-testing counseling may increase adherence to ART, and improve HIV treatment outcomes.

13. Ibragimov, U., et al. **"Estimating self-reported sex practices, drug use, depression, and intimate partner violence among MSM in China: a comparison of three recruitment methods."** *AIDS Care* 2017 29(1): 125-131.

Men who have sex with men (MSM) are the group at highest risk for HIV in China. Researchers have used various recruitment methods to reach this population hidden from the hetero-normative culture. To inform future recruitment strategies, we compared estimates of socio-demographic characteristics, HIV risk behaviors, depression, and intimate partner violence (IPV) across three samples of MSM and money boys in Shanghai, China. Data were collected from three community-based samples of MSM and money boys ($n = 1352$) recruited via respondent-driven sampling (RDS) ($n = 404$), community popular opinion leaders (CPOL) ($n = 385$), and Internet and venue-based sampling (VBS) ($n = 546$). Different recruitment methods generated samples with statistically significant differences among a number of socio-demographic characteristics, sexual behaviors, drug use, depression scores, and exposure to IPV. Specifically, RDS participants had lower education ($p = .002$), income levels ($p < .001$), and were more likely to report condomless sex with a woman ($p < .001$). CPOL participants were younger ($p < .001$), more likely to report lifetime condomless anal sex ($p = .009$), more than 10 male partners in the past 30 days ($p < .001$), and were less likely to experience violence by a male intimate partner ($p = .001$). VBS participants had lowest depression score ($p = .005$) and were more likely to report lifetime drug use ($p = .003$). Our findings reinforce that each recruitment method may reach a sub-group of MSM with a specific risk profile, so multiple methods may be needed to obtain a representative sample of MSM. Interventions may use specific recruitment methods to target certain segments of the MSM population.

14. Garrett, R., et al. **"Ethical Issues in Using Social Media to Deliver an HIV Prevention Intervention: Results from the HOPE Peru Study."** *Prev Sci* 2017 18(2): 225-232.

Social media technologies have become increasingly useful tools for research-based interventions. However, participants and social media users have expressed ethical concerns with these studies, such as risks and benefits of participation, as well as privacy, confidentiality, and informed consent issues. This study was designed to follow up with and assess experiences and perceptions of ethics-related issues among a sample of 211 men who have sex with men who participated in the Harnessing Online Peer Education (HOPE) Peru study, a randomized controlled HIV prevention intervention conducted in Peru. We found that after adjusting for age, highest educational attainment, race, sexual orientation, and prior HIV research experience, participants in the intervention group were more likely than those in the control group to have safe sex ($p = 0.0051$) and get tested for HIV regularly ($p = 0.0051$). As a result of their participation, those in the intervention group benefited more positively than participants in the control group in improving HIV care ($p = 0.0077$) and learning where to receive sexual health services ($p = 0.0021$). Participants in the intervention group expressed higher levels of comfort than those in the control group in joining and seeing other people in the Facebook group ($p = 0.039$), seeing other people's posts ($p = 0.038$) and having other group members talk to them online ($p = 0.040$). We discuss the implications of these results as they relate to social media-based HIV research.

15. Shangani, S., et al. **"Factors associated with HIV testing among men who have sex with men in Western Kenya: a cross-sectional study."** *Int J STD AIDS* 2017 28(2): 179-187.

HIV diagnosis is an important step in the HIV cascade of prevention and treatment. However, men who have sex with men in low- and middle-income countries have limited access to HIV care services. We examined factors associated with prior HIV testing among men who have sex with men in western Kenya. We recruited 95 men who have sex with men aged 18 years and older, and who reported at least one sexual contact with a man in the past 6 months; however, this analysis is restricted to 89 participants who completed questions on HIV testing. Logistic regression model was used to determine factors associated with HIV testing in the past one year. Results indicate that 23 (26%) had not been tested in the past 12 months. Bivariate analyses demonstrated that condomless anal sex (odds ratio = 3.29, 95% confidence interval = 1.18-9.17) and comfort with healthcare providers (odds ratio = 1.15, 95 % CI = 1.05-1.26) were associated with higher odds of HIV testing in the past 12 months. Experiencing social stigma was associated with lower odds of HIV testing in the last 12 months (odds ratio = 0.91, 95% confidence interval = 0.84-0.94). In multivariable models, social stigma remained significantly associated with lower odds of HIV testing in the last 12 months odds ratio = 0.90, 95% confidence interval = 0.82-0.99) after inclusion of sexual risk and individual level variables. Development of men who have sex with men-sensitive HIV-testing services, addressing stigma, and training healthcare workers to provide culturally sensitive services may assist in effectively engaging men who have sex with men in the HIV treatment cascade.

16. Peng, P., et al. **"A Global Estimate of the Acceptability of Pre-exposure Prophylaxis for HIV Among Men Who have Sex with Men: A Systematic Review and Meta-analysis."** *AIDS Behav* 2017.

Pre-exposure prophylaxis (PrEP) is a new biomedical intervention for HIV prevention. This study systematically reviews the acceptability of PrEP among men who have sex with men (MSM) worldwide. We searched major English databases to identify English-language articles published between July 2007 and July 2016, which reported the acceptability of PrEP and associated population characteristics. Meta-analysis was conducted to estimate a pooled acceptability, and meta-regression and subgroup analysis were used to analyse heterogeneities. The estimated acceptance from included sixty-eight articles was 57.8% (95% confidence interval 52.4-63.1%). MSM who were younger (4/5 studies, range of adjusted odds ratio (aOR) = 1.39-3.47), better educated (aOR = 1.49-7.70), wealthier (aOR = 1.31-13.03) and previously aware of PrEP (aOR = 1.33-3.30) showed significantly higher acceptance. Male sex workers (84.0% [26.3-98.7%]) were more likely to accept PrEP than general MSM. Self-perceived low efficacy, concern about side effects, adherence, affordability, and stigma were main barriers. This review identifies a moderate acceptability of PrEP in MSM. Efficacy, perception of HIV risk and experienced stigma determine its acceptance.

17. Lee, V. C., et al. **"Global travel and HIV/STI epidemics among MSM: what does the future hold?"** *Sex Health* 2017.

Infectious disease epidemics occur within dynamic systems and environments that shape risk and, ultimately, the spread of infectious diseases. Gay men and other men who have sex with men (MSM) are disproportionately impacted by HIV everywhere in the world. Several emerging trends present risks for sustained or increased HIV acquisition and transmission, and the growth of global travel in the context of emerging online platforms for social/sexual networking is discussed here. Four factors associated with travel that could potentiate HIV transmission are highlighted: different patterns of sexual risk behaviours during travel; the growth of online tools to meet sex partners more efficiently; the global heterogeneity of HIV strains; and the potential for diassortative mixing of men from high- and low-HIV prevalence areas. Prevention tools and services must rise to these challenges, and innovative mobile applications and programs have played, and will continue to play, an important role in supporting MSM at risk for or living with HIV during their periods of travel.

18. Keshinro, B., et al. **"High prevalence of HIV, chlamydia and gonorrhoea among men who have sex with men and transgender women attending trusted community centres in Abuja and Lagos, Nigeria."** *J Int AIDS Soc* 2016 19(1): 21270. Online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5146323/pdf/JIAS-19-21270.pdf>

INTRODUCTION: Sexually transmitted infection (STI) and HIV prevalence have been reported to be higher amongst men who have sex with men (MSM) in Nigeria than in the general population. The objective of this study was to characterize the prevalence of HIV, chlamydia and gonorrhoea in this population using laboratory-based universal testing.

METHODS: TRUST/RV368 represents a cohort of MSM and transgender women (TGW) recruited at trusted community centres in Abuja and Lagos, Nigeria, using respondent-driven sampling (RDS). Participants undergo a structured comprehensive assessment of HIV-related risks and screening for anorectal and urogenital Chlamydia trachomatis and Neisseria gonorrhoeae, and HIV. Crude and RDS-weighted prevalence estimates with 95% confidence intervals (CIs) were calculated. Log-binomial regression was used to explore factors associated with prevalent HIV infection and STIs.

RESULTS: From March 2013 to January 2016, 862 MSM and TGW (316 in Lagos and 546 in Abuja) underwent screening for HIV, chlamydia and gonorrhoea at study enrolment. Participants' median age was 24 years [interquartile range (IQR) 21-27]. One-third (34.2%) were identified as gay/homosexual and 65.2% as bisexual. The overall prevalence of HIV was 54.9%. After adjusting for the RDS recruitment method, HIV prevalence in Abuja was 43.5% (95% CI 37.3-49.6%) and in Lagos was 65.6% (95% CI 54.7-76.5%). The RDS-weighted prevalence of chlamydia was 17.0% (95% CI 11.8-22.3%) in Abuja and 18.3% (95% CI 11.1-25.4%) in Lagos. Chlamydia infection was detected only at the anorectal site in 70.2% of cases. The RDS-weighted prevalence of gonorrhoea was 19.1% (95% CI 14.6-23.5%) in Abuja and 25.8% (95% CI 17.1-34.6%) in Lagos. Overall, 84.2% of gonorrhoea cases presented with anorectal infection only. Over 95% of STI cases were asymptomatic. In a multivariable model, increased risk for chlamydia/gonorrhoea was associated with younger age, gay/homosexual sexual orientation and higher number of partners for receptive anal sex. HIV infection was associated with older age, female gender identity and number of partners for receptive anal sex.

CONCLUSIONS: There is a high burden of infection with HIV and asymptomatic chlamydia and gonorrhoea among MSM and TGW in Nigeria. Most cases would have been missed without anorectal screening. Interventions are needed to target this population for appropriate STI screening and management beginning at a young age.

19. Mmbaga, E. J., et al. **"HIV and STI s among men who have sex with men in Dodoma municipality, Tanzania: a cross-sectional study."** *Sex Transm Infect* 2017.

OBJECTIVES: To determine the seroprevalence of HIV, STI and related risks among men who have sex with men (MSM) in Dodoma municipality, Tanzania.

METHODS: A cross-sectional study using respondent-driven sampling was employed to recruit study participants aged 18 years and above. Data on sociodemographics, HIV/STI knowledge and sexual practices were collected. Blood samples were tested for HIV and selected STIs.

RESULTS: A total of 409 participants aged from 18 to 60 years took part in this study. The median age at first anal intercourse was 15 years. At last anal intercourse, 37.5% practiced receptive, 47.5% insertive and 15.0% both insertive and receptive anal intercourse. The seroprevalence of HIV, herpes simplex virus 2 (HSV-2), syphilis, hepatitis B virus and hepatitis C virus were 17.4%, 38.5%, 0.2%, 5.4% and 3.4%, respectively. A third of MSM perceived their risk for HIV to be low and this was associated with unprotected sex (adjusted OR (AOR), 4.8, 95% CI 1.8 to 10.2). HIV seropositivity was also associated with HSV-2 (AOR, 5.0, 95% CI 3.01 to 11.21); having lived outside Dodoma (AOR 1.7, 95% CI 1.1 to 6.7); age above 25 years; (AOR 2.1, 95% CI 1.7 to 3.7); sexual relationship with a woman (AOR 5.6, 95% CI 3.9 to 12.8); assuming a receptive (AOR 7.1, 95% CI 4.8 to 17.4) or receptive and insertive (AOR 4.5, 95% CI 1.9 to 11.4) position during last anal intercourse; engaging in group sex (AOR 3.1, 95% CI 1.2 to 6.1) and the use of alcohol (AOR 3.9, 95% CI 1.1 to 9.2).

CONCLUSIONS: HIV prevalence among MSM is five times higher compared with men in the general population in Dodoma. Perceived risk for HIV infection was generally low and low risk perception was associated with unprotected sex. STI, bisexuality and other behavioural risk factors played an important part in HIV transmission. The findings underscore the need for intensified HIV prevention programming addressing and involving key populations in Tanzania.

20. Gulov, K., et al. **"HIV and STIs Among MSM in Tajikistan: Laboratory-Confirmed Diagnoses and Self-Reported Testing Behaviors."** *AIDS Behav* 2016 20(Suppl 3): 341-349.

Little is known about the prevalence and associations of HIV/STI diagnoses and testing behaviors among men who have sex with men (MSM) in Tajikistan. A non-governmental organization conducted a cross-sectional study of MSM (n = 502) assessing laboratory-confirmed HIV/STI diagnoses, HIV/STI testing behavior in the past 6 months, sociodemographics, HIV/STI risk factors, and victimization/discrimination. Overall, 2.6 % were diagnosed with HIV, 2.2 % with syphilis, 17.6 % with chlamydia, and 56.0 % with herpes. Recent testing rates were low for HIV (35.9 %) and STIs (14.1 %). Compared to MSM who completed university, MSM with a high school education or less had lower odds of recent HIV and STI testing; however, victimization and healthcare discrimination were associated with greater odds of recent STI testing. Given the low HIV prevalence, there is a window of opportunity to extinguish the epidemic before it worsens. Non-governmental organizations are indispensable for expanding testing strategies because they can efficiently reach MSM in Tajikistan.

21. Tohme, J., et al. **"HIV Prevalence and Demographic Determinants of Unprotected Anal Sex and HIV Testing among Male Refugees Who have Sex with Men in Beirut, Lebanon."** *AIDS Behav* 2016 20(Suppl 3): 408-416.

Men who have sex with men (MSM), the same as refugees are at higher risk for health issues including HIV infection. With the large influx of refugees to Lebanon, and to better understand HIV transmission in this setting, we explored the socio-demographic correlates of condom use and HIV testing among MSM refugees in Beirut, by surveying and testing 150 participants. 67 % self-identified as gay, 84.6 % of respondents reported unprotected anal intercourse (UAI) in the prior 3 months, and 56.7 % with men of positive or unknown HIV status (UAIPU). 2.7 % tested positive for HIV, and 36 % reported having engaged in sex work. Men in a relationship and men who self-identified as gay had higher odds of UAI, of ever been tested, but lower odds of UAIPU. HIV prevention and testing promotion efforts targeting MSM refugees need to account for how men self-identify in relation to their sexual behavior and relationship status. Such efforts also should place emphasis on MSM of lower socio-economic status.

22. Bustamante, M. J., et al. **"HIV self-testing in Peru: questionable availability, high acceptability but potential low linkage to care among men who have sex with men and transgender women."** *Int J STD AIDS* 2017 28(2): 133-137.

HIV status awareness is key to prevention, linkage-to-care and treatment. Our study evaluated the accessibility and potential willingness of HIV self-testing among men who have sex with men (MSM) and transgender women in Peru. We surveyed four pharmacy chains in Peru to ascertain the commercial availability of the oral HIV self-test. The pharmacies surveyed confirmed that HIV self-test kits were available; however, those available were not intended for individual use, but for clinician use. We interviewed 147 MSM and 45 transgender women; nearly all (82%) reported willingness to perform the oral HIV self-test. However, only 55% of participants would definitely seek a confirmatory test in a clinic after an HIV-positive test result. Further, price may be a barrier, as HIV self-test kits were available for 18 USD, and MSM and transgender women were only willing to pay an average of 5 USD. HIV self-testing may facilitate increased access to HIV testing among some MSM/transgender women in Peru. However, price may prevent use, and poor uptake of confirmatory testing may limit linkage to HIV treatment and care.

23. Konda, K. A., et al. **"HIV Status Communication with Sex Partners and Associated Factors Among High-Risk MSM and Transgender Women in Lima, Peru."** *AIDS Behav* 2017 21(1): 152-162.

Men who have sex with men (MSM) and transgender women (TW) are key populations in the HIV epidemic. HIV status communication between sex partners can inform decisions regarding sexual behavior. MSM and TW were asked about HIV status communication with sex partners at baseline, 9- and 18-months. GEE models assessed associations with HIV status communication at baseline using prevalence ratios (PRs) and longitudinally using odds ratios (ORs). At baseline, those who had previously had an HIV test, disclosed their HIV status to 42 % of their sex partners. HIV status communication was associated with knowing their sex partner's HIV status at baseline (aPR 5.20) and longitudinally (aOR 1.86). HIV positivity at baseline was negatively associated with HIV status communication during follow-up (aOR 0.55). All reported aPRs and aORs have $p < 0.05$. Interventions promoting HIV status communication and more frequent HIV testing should be explored as current efforts are insufficient.

24. Han, L., et al. **"HIV test uptake among MSM in China: Implications for enhanced HIV test promotion campaigns among key populations."** *Glob Public Health* 2017 12(1): 31-44.

Despite global efforts to increase HIV test uptake among men who have sex with men (MSM), social stigma and negative attitudes toward homosexuality hinder the effectiveness of traditional test promotion campaigns. Increasing HIV test uptake requires greater understanding of the conditions that facilitate decisions to get tested. We conducted an online survey hosted by two of the most highly frequented MSM web portals in China. A generalised ordered logistic regression analysis was conducted to determine factors associated with HIV testing behaviour. Compared to men who had never tested for HIV, men who had tested in the past year were more likely to have never engaged in sex with women, have multiple male sex partners in the past 3 months and have disclosed their sexual orientation to others. MSM found testing at local Chinese Centers for Disease Control and Prevention (80.7%), gay men's community-based organisations (80.2%) and public hospitals (70.9%) to be acceptable, while saunas (50.5%) and gay bars (41.8%) were found to be unacceptable testing venues. Our study shows that MSM in China prefer to test at venues that guarantee confidentiality, quality and quick results. Our study also suggests that self-testing may be a feasible approach to increase test uptake.

25. Chaillon, A., et al. **"HIV Trafficking Between Blood and Semen During Early Untreated HIV Infection."** *J Acquir Immune Defic Syndr* 2017 74(1): 95-102.

BACKGROUND: Understanding the dynamics of HIV across anatomic compartments is important to design effective eradication strategies. In this study, we evaluated viral trafficking between blood and semen during primary HIV infection in 6 antiretroviral-naïve men who have sex with men.

METHODS: Deep sequencing data of HIV env were generated from longitudinal blood plasma, peripheral blood mononuclear cells, and seminal plasma samples. The presence or absence of viral compartmentalization was assessed using tree-based Slatkin-Maddison and distance-based Fst methods. Phylogeographic analyses were performed using a discrete Bayesian asymmetric approach of diffusion with Markov jump count estimation to evaluate the gene flow between blood and semen during primary HIV infection. Levels of DNA from human herpesviruses and selected inflammatory cytokines were also measured on genital secretions collected at baseline to evaluate potential correlates of increased viral migration between anatomic compartments.

RESULTS: We detected varying degrees of compartmentalization in all 6 individuals evaluated. None of them maintained viral compartmentalization between blood and seminal plasma throughout the analyzed time points. Phylogeographic analyses revealed that the HIV population circulating in blood plasma populated the seminal compartment during the earliest stages of infection. In our limited data set, we found no association between local inflammation or herpesvirus shedding at baseline and viral trafficking between semen and blood.

CONCLUSIONS: The early spread of virus from blood plasma to genital tract and the complex viral interplay between these compartments suggest that viral eradication efforts will require monitoring viral subpopulations in anatomic sites and viral trafficking during the course of infection.

26. Tao, J., et al. **"Impact of Depression and Anxiety on Initiation of Antiretroviral Therapy Among Men Who Have Sex with Men with Newly Diagnosed HIV Infections in China."** *AIDS Patient Care STDS* 2017 31(2): 96-104.

Depression and anxiety are common among persons recently diagnosed with HIV infection. We examined whether depression or anxiety was associated with delayed initiation of antiretroviral therapy (ART) among a prospective cohort of Chinese men who have sex with men (MSM) who were newly diagnosed with HIV. The Hospital Anxiety and Depression Scale (HADS) was used for measuring depression and anxiety, with scores of 0-7, 8-10, and 11-21 representing normal, borderline, and likely, respectively. ART initiation information was extracted from the National ART Database. Cox regression was performed to assess associations between HADS scores and the time to ART initiation. Of 364 eligible participants enrolling in the cohort within a median of 11 days after HIV diagnosis, 62% initiated ART during the 12-month follow-up period. The baseline prevalence for likely/borderline depression was 36%, and likely/borderline anxiety was 42%. In adjusted analyses, compared with a depression score of 0, the likelihood of starting ART was 1.82 [95% confidence interval (CI): 1.38-2.41], 3.11 (95% CI: 1.82-5.30), and 2.53 (95% CI: 1.48-4.32) times higher for depression scores of 3, 9, and 13, respectively. A similar pattern was observed for the anxiety score. In contrast to our hypothesis, both depression and anxiety were associated with earlier ART initiation among Chinese MSM with newly diagnosed HIV. We speculate that individuals who are more concerned about their new HIV diagnosis may be more likely to seek HIV care and follow a doctor's advice. The effects of depression or anxiety on ART initiation likely differ in varying subgroups and by symptom severity.

27. Pan, S., et al. **"Internet-Based Sex-Seeking Behavior Promotes HIV Infection Risk: A 6-Year Serial Cross-Sectional Survey to MSM in Shenyang, China."** *Biomed Res Int* 2016 2016: 2860346. Online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5220408/pdf/BMRI2016-2860346.pdf>

HIV prevalence is still rapidly increasing among Chinese men who have sex with men (MSM). The Internet also makes it easier for MSM to have casual partners. This study aims to evaluate the trend of Internet-based sex-seeking behavior of MSM and its impact on HIV prevalence, the distribution of HIV subtype strains, and transmitted drug resistance rates. A serial cross-sectional study was conducted from 2009 to 2014. Of the 1,981 MSM, 50.5% (1,000/1,981) mainly sought homosexual partners through the Internet (Internet-based MSM, IBM). The proportion of IBM among total MSM subjects increased from 43.3% to 61.5% ($p < 0.001$). HIV prevalence of IBM increased from 5.7% to 20.7%, while that of non-Internet-based MSM (NIBM) increased from 7.0% to 14.7%. A relative higher proportion of NIBM were infected with HIV CRF01_AE subtype than IBM (79.5% versus 72.2%, $p = 0.52$). Multivariable analysis found IBM had a significantly higher

HIV prevalence than NIBM (13.2% versus 10.5%, aOR = 1.4, 95% CI [1.0-1.9]). Being a migrant non-Shenyang resident MSM (aOR = 1.9, 95% CI [1.3-2.9]) and occasionally/never using condoms with casual homosexual partners (aOR = 1.7, 95% CI [1.1-2.6]) were two distinct risk factors for HIV infection in IBM. More efforts should be targeted towards developing interventions aimed at IBM, particularly migrant MSM and who engage in UAI with casual homosexual partners.

28. Couderc, C., et al. **"Is PrEP needed for MSM in West Africa? HIV incidence in a prospective multi-country cohort."** *J Acquir Immune Defic Syndr* 2017.
29. Wandell, G. M., et al. **"Knowledge and preferences concerning acute HIV testing programs among both Peruvian men who have sex with men and transgender women."** *Int J STD AIDS* 2017.

Immediate antiretroviral therapy (ART) for acute HIV infection (AHI) may decrease HIV transmission in high-risk populations. This study evaluated knowledge of AHI and AHI testing program preferences in Lima, Peru through four semi-structured focus groups with high-risk men who have sex with men (MSM) (n = 20) and transgender women (TW) (n = 16). Using content analysis, emergent themes included knowledge of AHI symptoms, AHI transmission potential, and the HIV testing window period, and preferences concerning point of care results. Participants demonstrated low familiarity with the term AHI, but many correctly identified AHI symptoms. However, these symptoms may not motivate testing because they overlap with common viral illnesses and AIDS. Some were aware that infectiousness is highest during AHI, and believe this knowledge would facilitate HIV testing. The shortened window period with AHI testing would encourage testing following high-risk sex. Delayed result notification would not decrease AHI testing demand among MSM, although it might for some TW.

30. Hugo, J. M., et al. **"Knowledge, Attitudes and Beliefs regarding Post Exposure Prophylaxis among South African Men who have Sex with Men."** *AIDS Behav* 2016 20(Suppl 3): 350-356.

The Soweto Men's Study (2008), demonstrated an overall HIV prevalence rate of 13.2 %, with 10.1 % among straight-identified Men-who-have-sex-with-men (MSM), 6.4 % among bisexual-identified MSM and 33.9 % among gay-identified MSM. Behavioral interventions are imperative, but insufficient to prevent new HIV infections. Biomedical prevention of HIV offers a variety of combination prevention tools, including Post-exposure prophylaxis (PEP). PEP studies amongst MSM have been conducted in Amsterdam, Brazil and San Francisco, but never before in Africa. A cross-sectional, Internet-based survey was initiated to measure knowledge, attitudes and beliefs regarding PEP among South African MSM. Recruitment commenced in June 2014 and ran until October 2015. Participants were recruited through banner advertisements on Facebook.com and mambaonline.com, advertisements in the local gay media and at Health4Men (H4M) MSM-targeted clinics. Outreach workers distributed flyers advertising the study in their local communities. The survey was also made available on a computer at the H4M clinics in Cape Town and Johannesburg to reach MSM who may not have Internet access. A total of 408 men completed the survey. The majority of these men were under the age of 40, identified as gay/homosexual and were employed; 51 % (208/408) self-identified as black or of mixed race. In multivariate analysis participants who identified as gay had greater odds of having previously heard of PEP (AOR 1.91, 95 % CI 1.04, 3.51; p = 0.036), as did those who reported their HIV status as positive (AOR 2.59, 95 % CI 1.47, 4.45; p = 0.001). Participants with medical insurance had greater odds of having used PEP previously (AOR 2.67, 95 % CI 1.11, 6.43; p = 0.029). Bivariate analysis showed that condomless sex in the past 6 months was not significantly associated with PEP knowledge (p = 0.75) or uptake (p = 0.56) of PEP. Our findings suggest a lack of PEP knowledge and uptake among non-gay identified, HIV negative and un-insured MSM. Focusing PEP programs on these men may potentially increase uptake. Increased knowledge needs to be provided to MSM who engage in risky sexual behaviors.

31. Romijnders, K. A., et al. **"Lubricant use and condom use during anal sex in men who have sex with men in Tanzania."** *Int J STD AIDS* 2016 27(14): 1289-1302.

The lack of data on condom and lubricant use among African men who have sex with men (MSM) hinders prevention efforts. We describe use, knowledge, and access to lubricants in Dar es Salaam and Tanga,

Tanzania. Data were collected in 2012 and 2013 from a cross-sectional survey of 200 MSM in Dar es Salaam and 100 MSM in Tanga, Tanzania. The most common reason for not using condoms was dislike of condoms. Two-thirds of the men reported always using a lubricant for anal sex. Results showed that: fewer men who have sex with both men and women (MSMW) know about lubricants; more MSM look for, have difficulty finding, and find lubricants to be expensive; and MSM use lubricants to facilitate penetration. MSMW commonly receive their lubricants from their sexual partner, while MSM got them from friends and pharmacies. HIV-negative MSM used lubricants to facilitate penetration and reduce pain. HIV-positive MSM are likely to get their lubricants from pharmacies or friends. MSMW use Vaseline(R) significantly more than MSM as a lubricant. Results suggest that HIV prevention knowledge among MSM is greater, so HIV prevention efforts should emphasise carrying water-based lubricant among MSMW. Consequently, there is an opportunity to co-market condoms and water-based lubricants.

32. Cranston, R. D., et al. **"MTN-017: A Rectal Phase 2 Extended Safety and Acceptability Study of Tenofovir Reduced-Glycerin 1% Gel."** *Clin Infect Dis* 2016.

BACKGROUND: HIV disproportionately affects men who have sex with men (MSM) and transgender women (TGW). Safe and acceptable topical HIV prevention methods that target the rectum are needed.

METHODS: MTN-017 was a Phase 2, three-period, randomized sequence, open-label, expanded safety and acceptability crossover study comparing rectally applied reduced-glycerin (RG) 1% tenofovir (TFV) and oral emtricitabine/TFV disoproxil fumarate (FTC/TDF). In each 8-week study period participants were randomized to RG-TFV rectal gel daily; or RG-TFV rectal gel before and after receptive anal intercourse (RAI) (or at least twice weekly in the event of no RAI); or daily oral FTC/TDF.

RESULTS: MSM and TGW (n=195) were enrolled from 8 sites in the United States, Thailand, Peru, and South Africa with mean age of 31.1 years (range 18-64). There were no differences in Grade 2 or higher adverse event rates in participants using daily gel (Incidence Rate Ratio (IRR): 1.09, p=0.59) or RAI gel (IRR: 0.90, p=0.51) compared to FTC/TDF. High adherence ($\geq 80\%$ of prescribed doses as assessed by unused product return and SMS reports) was less likely in the daily gel regimen (Odds Ratio (OR): 0.35, p<0.001) and participants reported less likelihood of future daily gel use for HIV protection compared to FTC/TDF (OR: 0.38, p<0.001).

CONCLUSIONS: Rectal application of RG TFV gel was safe in MSM and TGW. Adherence and product use likelihood were similar for the intermittent gel and daily oral FTC/TDF regimens, but lower for the daily gel regimen.

33. Stall, R., et al. **"Overview of the University of Pittsburgh/amfAR Training Program in HIV Prevention Research for MSM and Male-to-Female Transgender Populations in Low- and Middle-Income Countries."** *AIDS Behav* 2016 20(Suppl 3): 426-436.

Gay men, other men who have sex with men and transgender (GMT) populations suffer a disproportionate burden of HIV disease around the globe, which is directly attributable to the virulently homophobic environments in which many GMT people live. In addition to the direct effects of homophobia on GMT individuals, the ongoing marginalization of GMT people has meant that there is limited social capital on which effective HIV prevention and care programs can be built in many low- and middle-income countries (LMIC). Thus, meaningful responses meant to address the dire situation of GMT populations in LMIC settings must include a combination of bold and innovative approaches if efforts to end the epidemic are to have any chance of making a real difference. The HIV Scholars Program at the University of Pittsburgh's Center for LGBT Health Research is a prime example of a creative and dynamic approach to raising the expertise needed within GMT populations to respond to the global HIV/AIDS pandemic.

34. Safarnejad, A., et al. **"Population Size Estimation of Men Who Have Sex with Men in Ho Chi Minh City and Nghe An Using Social App Multiplier Method."** *J Urban Health* 2017.

This study aims to estimate the number of men who have sex with men (MSM) in Ho Chi Minh City (HCMC) and Nghe An province, Viet Nam, using a novel method of population size estimation, and to assess the feasibility of the method in implementation. An innovative approach to population size estimation grounded on the principles of the multiplier method, and using social app technology and internet-based surveys was undertaken among MSM in two regions of Viet Nam in 2015. Enumeration of active users of popular social apps for MSM in Viet Nam was conducted over 4 weeks. Subsequently, an independent online survey was done using respondent driven sampling. We also conducted interviews with key informants in Nghe An and HCMC on their experience and perceptions of this method and other methods of size estimation. The population of MSM in Nghe An province was estimated to be 1765 [90% CI 1251-3150]. The population of MSM in HCMC was estimated to be 37,238 [90% CI 24,146-81,422]. These estimates correspond to 0.17% of the adult male population in Nghe An province [90% CI 0.12-0.30], and 1.35% of the adult male population in HCMC [90% CI 0.87-2.95]. Our size estimates of the MSM population (1.35% [90% CI 0.87%-2.95%] of the adult male population in HCMC) fall within current standard practice of estimating 1-3% of adult male population in big cities. Our size estimates of the MSM population (0.17% [90% CI 0.12-0.30] of the adult male population in Nghe An province) are lower than the current standard practice of estimating 0.5-1.5% of adult male population in rural provinces. These estimates can provide valuable information for sub-national level HIV prevention program planning and evaluation. Furthermore, we believe that our results help to improve application of this population size estimation method in other regions of Viet Nam.

35. Lyons, C. E., et al. "**Potential Impact of Integrated Stigma Mitigation Interventions in Improving HIV/AIDS Service Delivery and Uptake for Key Populations in Senegal.**" *J Acquir Immune Defic Syndr* 2017 74 Suppl 1: S52-s59.

BACKGROUND: Men who have sex with men (MSM) and female sex workers (FSW) are consistently shown to have a higher burden of HIV compared with other adults in Senegal. This study, HIV Prevention 2.0, evaluates the impact of the 3-tiered integrated stigma mitigation interventions (ISMIs) approach to optimizing HIV service delivery for key populations in Senegal.

METHODS: Baseline assessment includes a questionnaire and biological testing for HIV. A proportion of participants enrolled into a 24-month longitudinal cohort with questionnaires and biological testing every 3 months. In these preliminary analyses, ISMIs are evaluated from participants in the cohort through uptake of HIV services and implementation outcomes.

RESULTS: Overall, 724 MSM and 758 FSW participated in the baseline assessment. HIV prevalence is 30.2% (n = 219/724) among MSM and 5.3% (n = 40/758) among FSW. Fear of seeking health services among MSM is 17.7% (n = 128/724) at baseline, 10.5% (n = 18/172) at month 3, and 9.8% (n = 10/102) at month 6 (P < 0.004); and among FSW is 21.9% (n = 166/758) at baseline, 8.1% (n = 15/185) at month 3, and 10.7% (n = 18/168) at month 6 (P < 0.001). Overall, 63.9% (n = 62/97) of MSM and 82.5% (n = 118/143) of FSW agreed that the intervention is effective in addressing stigma; however, loss to follow-up was 41.1% among MSM and 10% among FSW.

CONCLUSION: Baseline data reinforce the need for stigma mitigation interventions, combined with enhanced linkage and retention to optimize HIV treatment. Preliminary results show high levels of HIV-related risk determinants and suggest the potential utility of the ISMI to decrease perceived stigma relating to engagement in HIV prevention, treatment, and care services among key populations in Senegal.

36. Berg, R. C., et al. "**Predictors of HIV Risk Behaviors Among a National Sample of Russian Men Who Have Sex with Men.**" *AIDS Behav* 2016.

Russia has one of the fastest growing HIV epidemics in the world and is at the point of transitioning from injection drug use to sexual transmissions. We sought to identify factors associated with unprotected sex among men who have sex with men (MSM) in Russia, separately for Moscow, St. Petersburg and the rest of the country. Multivariable data from a national cross-sectional study (n = 5035) demonstrate that significant correlates of unprotected anal intercourse (UAI) with a non-steady partner across all areas were visiting sex-

related venues (AOR range 1.35-1.96) and access to condoms (AOR range 0.37-0.52). In Moscow and St. Petersburg, being HIV-positive was correlated with UAI (AOR 2.13 and 2.69). The dynamics of the HIV epidemic among MSM in Russia appear to be both similar, and different, across various areas and factors associated with unprotected sex should be seen as part of an environment of exogenous factors impacting MSM's sexual behaviors.

37. Wu, E., et al. **"Preliminary Population Size Estimation of Men Who Have Sex With Men in Kazakhstan: Implications for HIV Testing and Surveillance."** *LGBT Health* 2016.

PURPOSE: The purpose of this study is to estimate the population size of men who have sex with men (MSM) in Kazakhstan and their HIV testing history.

METHODS: We conducted structured interviews with MSM in four geographically disparate cities-N = 400 (n = 100/city)-to implement four population estimation methods and ascertain HIV testing history.

RESULTS: Approximately 3.2% of men-corresponding to approximately 154,000 individuals-in Kazakhstan aged 18-59 are MSM. The 49.9% of the sample who reported taking an HIV test far exceeds the <1% reported as MSM in surveillance data.

CONCLUSION: HIV testing surveillance in Kazakhstan has underestimated the number of MSM. This underscores the need to redress social and structural barriers to HIV testing and disclosure of sexual behavior experienced by MSM in Kazakhstan. Recommendations include promoting cultural sensitivity among testing staff through quality assurance and regular training, and increasing protection and public awareness through antidiscrimination policy development.

38. Vu, N. T., et al. **"The Prevalence and Correlates of HIV and Undiagnosed Infection among Men Who Have Sex with Men in Hanoi, Vietnam: Findings from a Cross-sectional, Biobehavioral Study."** *Front Public Health* 2016 4: 275. Online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5165257/pdf/fpubh-04-00275.pdf>

INTRODUCTION: Men who have sex with men (MSM) are a key population for HIV infection in Vietnam, and the use of amphetamine type substances (ATS) is prevalent and possibly increasing in this population. The reported analysis examines the association between ATS use before or during sex and HIV infection among MSM in Hanoi, Vietnam.

METHODS: This cross-sectional study of 210 MSM was conducted in Hanoi, Vietnam, in late 2014. Men tested for HIV and answered questions about demographic characteristics, sexual sensation seeking, depression, belief in HIV prevention strategies, homosexuality-related stigma and discrimination, recent accessing of HIV prevention services, sexual behaviors and ATS, and other drug use behaviors. We performed logistic regression to assess correlates of HIV infection.

RESULTS: HIV prevalence was 6.7% (14/210), and 85.7% (12/14) of HIV-positive men were not aware of their HIV status. Of the 210 participants, 10.5, 2.9, and 3.8% of men had used methamphetamine, amphetamine, and ecstasy before or during sex in the last 3 months. In multivariable analysis, HIV infection was associated with recent sex-related methamphetamine use [adjusted odds ratio (AOR): 5.03, 95% confidence interval (CI): 1.35-18.68], engaging in recent sex work (AOR: 3.55, 95% CI: 1.07-11.75), and homosexuality-related perceived stigma (AOR: 2.32, 95% CI: 0.98-5.47).

CONCLUSION: Findings underscore the importance of integrating methamphetamine use interventions into HIV prevention services and scaling-up of gay-friendly, non-stigmatizing HIV testing services for MSM in Hanoi. We recommend the routine assessment of ATS use and undiagnosed infection in this population.

39. Zhang, X., et al. **"Prevalence and the associated risk factors of HIV, STIs and HBV among men who have sex with men in Kunming, China."** *Int J STD AIDS* 2017.

To investigate the prevalence and the associated risk factors of human immunodeficiency virus (HIV), hepatitis B virus (HBV) and sexually transmitted infections (STIs) among men who have sex with men (MSM) in Kunming, 300 MSM were recruited through community-based organizations between September 2014 and January 2015. The prevalence of HIV, HBsAg, syphilis, Chlamydia trachomatis (CT) and Neisseria gonorrhoeae (NG) were 17.0%, 7.7%, 11.3%, 18.2% and 13.2%, respectively. In the three different anatomic sites (urethra, rectum and pharynx), the prevalence of rectal CT was the highest (15.5%), whereas NG was most commonly found in the pharynx (8.1%). Low education level, homosexuality, inconsistent condom use and drug use in the previous six months were significantly associated with HIV infection, whereas the former three factors were also associated with HBV infection. Older people (aged ≥ 40 years) and those who lacked knowledge of STIs, and younger people (aged <30 years) as well as inconsistent condom users were more at risk of syphilis and CT infections, respectively. NG infection was only associated with reported dating venues. Our study revealed a heavy disease burden and multiple risk factors of HIV/STIs among MSM in Kunming. It is necessary to promote regular screening and proactive treatment of HIV/STIs among MSM.

40. Hu, J., et al. **"Prevalence and Trends of HIV, Syphilis, and HCV in Migrant and Resident Men Who Have Sex with Men in Shandong, China: Results from a Serial Cross-Sectional Study."** *PLoS One* 2017 12(1): e0170443. Online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5245858/pdf/pone.0170443.pdf>

BACKGROUND: Migrant men who have sex with men (MSM) have a higher predisposition for HIV transmission. We aimed to determine and compare the prevalence and trends of HIV, Syphilis, and HCV between migrant and resident MSM in Shandong, China.

METHODS: A serial cross-sectional study was conducted in eight cities in Shandong, China from 2010 to 2014. The surveys collected information on demographics, HIV-related knowledge, and HIV-related behaviors including the serologic status of HIV, syphilis, and HCV. Bivariate and multivariable logistic regressions were used to determine differences between migrant and resident MSM.

RESULTS: The overall prevalence of HIV among the 15,705 MSM (14120 were resident, 1580 were migrant and 5 were missing) was 2.6%, with an increase of 1.0% in 2010 to 4.4% in 2014. Prevalence of HIV was higher among migrant MSMs (5.5%) compared to resident MSMs (2.3%). Compared to residents, migrants also had higher prevalence of syphilis (7.5% vs 4.9%) and HCV (1.1% vs 0.6%). We found that there was an increase in the proportion of migrant MSM engaging in anal sex [adjusted OR (AOR) = 1.41 in migrants vs 1.12 in residents], condom use during last anal sex (AOR = 1.14 in residents, P for trend = 0.32), consistent condom use (AOR = 1.04 residents, P for trend = 0.11) and drug use (AOR = 1.51 in migrants and 1.29 among residents). Except in the year 2011, receiving some health services in last year was significant for people who were HIV-positive compared to negative. (P for trend <0.05).

CONCLUSIONS: Prevalence of HIV increased in resident as well as migrant MSMs. The migrant MSMs had higher STIs compared to resident MSMs and therefore, should be targeted for effective interventions aimed at reducing their risk behaviors. Deeper understanding of the role of migration in health issues is required for combating the persistently high and gradually increasing HIV burden in MSM in China.

41. Jordan, A. E., et al. **"Prevalence of hepatitis C virus infection among HIV+ men who have sex with men: a systematic review and meta-analysis."** *Int J STD AIDS* 2017 28(2): 145-159.

Since 2000, an increase in hepatitis C virus infection among HIV-infected (HIV+) men who have sex with men has been observed. Evidence points to blood exposure during sex as the medium of hepatitis C virus transmission. Hepatitis C virus prevalence among HIV + MSM overall and in relation to injection drug use is poorly characterized. In this study, a systematic review and meta-analysis examining global hepatitis C virus antibody prevalence and estimating active hepatitis C virus prevalence among HIV + MSM were conducted; 42 reports provided anti-hepatitis C virus prevalence data among HIV + MSM. Pooled prevalence produced an overall anti-hepatitis C virus prevalence among HIV + MSM of 8.1%; active HCV prevalence estimate was 5.3%-7.3%. Anti-hepatitis C virus prevalence among injection drug use and non-injection drug use HIV + MSM was 40.0% and 6.7%, respectively. Among HIV + MSM, hepatitis C virus prevalence increased

significantly over time among the overall and non-injection drug use groups, and decreased significantly among injection drug use HIV + MSM. We identified a moderate prevalence of hepatitis C virus among all HIV + MSM and among non-injection drug use HIV + MSM; for both, prevalence was observed to be increasing slightly. Pooled prevalence of hepatitis C virus among HIV + MSM was higher than that observed in the 1945-1965 US birth cohort. The modest but rising hepatitis C virus prevalence among HIV + MSM suggests an opportunity to control HCV among HIV + MSM; this combined with data demonstrating a rising hepatitis C virus incidence highlights the temporal urgency to do so.

42. Ross, M. W., et al. **"Prevalence of STI symptoms and high levels of stigma in STI healthcare among men who have sex with men in Dar es Salaam, Tanzania: a respondent-driven sampling study."** *Int J STD AIDS* 2016.

Symptoms of sexually transmitted infections (STIs), whether they are presented for treatment or diagnosis, and how they are received by the clinician where they are presented, may be concomitants of stigma associated with homosexuality in homophobic climates. We analyzed respondent-driven sampling data from a study on 200 young men who have sex with men (MSM) in Dar es Salaam, Tanzania to examine sample prevalence, treatment and clinician response to 10 symptoms potentially associated with STIs. Survey measures included 10 self-reported STI symptoms, further specified according to location (genital, anal, oral), further specified according to place of diagnosis, place of, treatment whether there was pharmacy treatment or self-medication, healthcare worker (HCW) inquiries about source of infection and whether the HCW was polite. Most common symptoms reported were genital pain, burning urination, genital itching/burning, penile discharge, and groin swelling. Anal symptoms had the lowest proportion of treatment at public clinics and among the highest proportion of pharmacy treatment; anal sores had the highest proportion of self-medication. HCWs were reported as not being polite in response to 71-90% of the symptoms, (median = 82%). The findings suggest that stigma and negative HCW response are barriers to public clinic treatment for MSM in Tanzania and that these may have implications for both STI treatment and the HIV cascade.

43. Sapsirisavat, V., et al. **"Psychosocial and Behavioral Characteristics of High-Risk Men Who Have Sex with Men (MSM) of Unknown HIV Positive Serostatus in Bangkok, Thailand."** *AIDS Behav* 2016 20(Suppl 3): 386-397.

HIV prevalence remains high in men who have sex with men (MSM) in Bangkok. Even though resources for HIV testing and treatment are available for all, a large proportion of MSM still do not get HIV tested. We studied high risk MSM who are unaware of their HIV status to help maximize effectiveness of our resources. Convenience sampling was conducted among MSM who came for HIV testing at the Thai Red Cross Anonymous Clinic and two popular drop-in centers in Bangkok. Inclusion criteria were MSM aged >18 years, have not been tested positive for HIV, who reported >=1 of the following in the previous 6 months: condomless sex with a male, being a sex worker, or having a sexual transmitted infection diagnosis. Audio-Computer-Assisted Self-Interview was used to assess psychosocial profile, sexual risks, and HIV testing patterns prior to being informed of their HIV positive status. Among 499 high-risk MSM enrolled, the median age was 24.8 years and 112 (22 %) tested HIV-positive. Among the HIV-positive participants, 92 % self-identified as gay (versus bisexual), 39 % attained a bachelors degree or higher, 65 % had monthly income 10,000-29,999 baht (\$280-830 USD), 10 % had vaginal or anal sex with a woman in the past 12 months, 39 % had condomless receptive sex with men and 21 % went to Lat Phrao to find a sexual partner. Compared to HIV negative MSM, HIV-positive MSM had less HIV testing: 31 % had ever been tested for HIV, 12 % had been tested in the past 6 months; but were more likely to guess correctly their positive status (31 %). Regarding psychosocial variables among HIV-positive MSM, 7 % had regular methamphetamine use in the past 3 months, 10 % had >2 sources of discrimination, and 8 % had >2 sources of discrimination due to being MSM. In multivariable model, age<30 year old, self-identified as gay, had monthly income <50,000 baht (\$1400 USD), had anal sex with men in past 12 months, had >2 sources of discrimination because of being MSM, did not get HIV test in past 6 months, and guess of positive HIV were significantly associated with HIV positive status. Young MSM with lower socioeconomic status (SES) should be prioritized for innovative approaches to promoting awareness and uptake of HIV testing. Societal stigmatization of MSM should be addressed as a potential barrier to uptake of voluntary HIV testing. Resilience factors among these

marginalized MSM who still test frequently and remain HIV-negative despite residing in a context with community viral loads and discrimination should also be studied in order to curb the HIV epidemic in Bangkok.

44. Tohme, J., et al. **"Psycho-social Correlates of Condom Use and HIV Testing among MSM Refugees in Beirut, Lebanon."** *AIDS Behav* 2016 20(Suppl 3): 417-425.

MSM refugees have to deal with personal challenges and social/structural adversaries based on their refugee status on top of their sexual identity. To better customize interventions beside this population, we explored psycho-social and structural correlates of condom use and HIV testing in Lebanon by surveying and testing 150 participants. 67 % self-identified as gay. 84.6 % reported any unprotected anal intercourse (UAI) with men in the prior 3 months. Those who engaged in UAI, were less comfortable with a doctor, didn't know where to get free HIV testing, experienced discrimination based on their refugee status and spent more time with their refugee peers, were less inclined to have seen a doctor in the past 12 month or knew where to get free HIV testing. Ever having been HIV tested was associated with being comfortable with medical doctors, knowing where to get HIV testing and spending time with other peer refugees. HIV prevention and testing promotion efforts targeting MSM refugees need to account for structural barriers, while fighting discrimination is crucial for a healthy sexual identity development.

45. Elmes, J., et al. **"A reconfiguration of the sex trade: How social and structural changes in eastern Zimbabwe left women involved in sex work and transactional sex more vulnerable."** *PLoS One* 2017 12(2): e0171916. Online at: <http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0171916&type=printable>

Understanding the dynamic nature of sex work is important for explaining the course of HIV epidemics. While health and development interventions targeting sex workers may alter the dynamics of the sex trade in particular localities, little has been done to explore how large-scale social and structural changes, such as economic recessions-outside of the bounds of organizational intervention-may reconfigure social norms and attitudes with regards to sex work. Zimbabwe's economic collapse in 2009, following a period (2000-2009) of economic decline, within a declining HIV epidemic, provides a unique opportunity to study community perceptions of the impact of socio-economic upheaval on the sex trade. We conducted focus group discussions with 122 community members in rural eastern Zimbabwe in January-February 2009. Groups were homogeneous by gender and occupation and included female sex workers, married women, and men who frequented bars. The focus groups elicited discussion around changes (comparing contemporaneous circumstances in 2009 to their memories of circumstances in 2000) in the demand for, and supply of, paid sex, and how sex workers and clients adapted to these changes, and with what implications for their health and well-being. Transcripts were thematically analyzed. The analysis revealed how changing economic conditions, combined with an increased awareness and fear of HIV-changing norms and local attitudes toward sex work-had altered the demand for commercial sex. In response, sex work dispersed from the bars into the wider community, requiring female sex workers to employ different tactics to attract clients. Hyperinflation meant that sex workers had to accept new forms of payment, including sex-on-credit and commodities. Further impacting the demand for commercial sex work was a poverty-driven increase in transactional sex. The economic upheaval in Zimbabwe effectively reorganized the market for sex by reducing previously dominant forms of commercial sex, while simultaneously providing new opportunities for women to exchange sex in less formal and more risky transactions. Efforts to measure and respond to the contribution of sex work to HIV transmission need to guard against unduly static definitions and consider the changing socioeconomic context and how this can cause shifts in behavior.

46. Nowak, R. G., et al. **"Rectal microbiota among HIV-uninfected, untreated HIV, and treated HIV-infected men who have sex with men (MSM) in Nigeria."** *Aids* 2017.

OBJECTIVE: Untreated advanced HIV infection alters the gut microbiota, but it is unclear whether antiretroviral therapy (ART) reverses these changes. We compared the composition of the rectal microbiota among three groups of men who have sex with men (MSM): HIV-uninfected, untreated HIV, and ART-treated

HIV-infected.

DESIGN: A cross-sectional study was conducted among 130 MSM (55 HIV-uninfected, 41 untreated HIV, 34 ART-treated HIV) in Abuja, Nigeria.

METHODS: Bacterial 16S rRNA genes were amplified from rectal swabs, sequenced and clustered into Genera-level operational taxonomic units. Alpha diversity was quantified using the Shannon Index and compared among groups using the Kruskal-Wallis test; Associations with other scale variables were quantified using Spearman's Rank Correlation (Rs). The relative abundance of the top 15 taxa was compared according to HIV infection/treatment status using the Wilcoxon-Rank sum test.

RESULTS: HIV treated MSM had a decrease in a commensal phylum, Bacteroidetes ($p < 0.01$). Alpha diversity was positively correlated with viral loads ($R_s = 0.32$, $p < 0.01$). Statistically significant shifts in relative abundance of rectal microbiota for the HIV treated group included a decrease in the most abundant bacteria, Prevotella ($p = 0.02$) and an increase in pathogenic bacteria, Peptoniphilus ($p = 0.04$), Finegoldia ($p = 0.01$), Anaerococcus ($p = 0.03$), and Campylobacter ($p = 0.03$) as compared to the other groups.

CONCLUSIONS: Untreated HIV infection does not significantly alter the rectal microbiota, whereas prior treatment is associated with a shift towards a more pathogenic pattern of microbiota. Treatment with an antibiotic, co-trimoxazole, in conjunction with ART may have contributed to this shift.

47. Santos, G. M., et al. "**Reductions in access to HIV prevention and care services are associated with arrest and convictions in a global survey of men who have sex with men.**" *Sex Transm Infect* 2017 93(1): 62-64.

OBJECTIVES: Men who have sex with men (MSM) are disproportionately impacted by HIV. Criminalisation of homosexuality may impede access to HIV services. We evaluated the effect of the enforcement of laws criminalising homosexuality on access to services.

METHODS: Using data from a 2012 global online survey that was published in a prior paper, we conducted a secondary analysis evaluating differences in perceived accessibility to health services (ie, 'how accessible are ____' services) between MSM who responded 'yes'/'no' to: 'have you ever been arrested or convicted for being gay/MSM?'

RESULTS: Of the 4020 participants who completed the study and were included in the analysis, 8% reported ever being arrested or convicted under laws relevant to being MSM. Arrests and convictions were most common in sub-Saharan Africa (23.6% (58/246)), Eastern Europe/Central Asia (18.1% (123/680)), the Caribbean (15% (15/100)), Middle East/North Africa (13.2% (10/76)) and Latin America (9.7% (58/599)). Those arrested or convicted had significantly lower access to sexually transmitted infection treatment (adjusted OR (aOR)=0.81; 95% CI 0.67 to 0.97), condoms (aOR=0.77; 95% CI 0.61 to 0.99) and medical care (aOR=0.70; 95% CI 0.54 to 0.90), compared with other MSM, while accounting for clustering by country and adjusting for age, HIV status, education and country-level income.

CONCLUSIONS: Arrests and convictions under laws relevant to being MSM have a strong negative association with access to HIV prevention and care services. Creating an enabling legal and policy environment, and increasing efforts to mitigate antihomosexuality stigma to ensure equitable access to HIV services are needed, along with decriminalisation of homosexuality, to effectively address the public health needs of this population.

48. Tao, J., et al. "**Relationship of Stigma and Depression Among Newly HIV-Diagnosed Chinese Men Who Have Sex with Men.**" *AIDS Behav* 2017 21(1): 292-299.

Little is known about the relationship between HIV stigma and depression among newly diagnosed HIV-infected men who have sex with men (MSM). We measured HIV-related stigma and current depression using standard scales among 367 Chinese MSM who had been diagnosed very recently with HIV infection,

analyzing key associations with multivariable ordinal logistic regression. Current depression prevalence was 36 %. Median scores for felt, vicarious, and internalized stigma were 17, 2, and 5, respectively, each on a 0-30 scale. A one-point increase in the total stigma score was associated with a 4 % increase in the odds of current depression [adjusted odds ratio (aOR) = 1.04, 95 % confidence interval (CI) 1.03-1.05]. Internalized stigma had the strongest association with depression (aOR = 1.09, 95 % CI 1.07-1.12). Effective interventions to address coping with HIV-related stigma immediately following HIV-diagnosis might help reduce depression, improve long-term mental health, and improve engagement in their care.

49. Pan, S. W., et al. "**Religion and HIV Sexual Risk Among Men Who Have Sex With Men in China.**" *J Acquir Immune Defic Syndr* 2016 73(4): 463-474.

BACKGROUND: Religion can profoundly impact the sociocultural contexts that shape sexual HIV vulnerability among men who have sex with men (MSM). However, the relationship between religion and HIV vulnerability remains poorly understood for MSM in China, where religious affiliations and practices are rapidly increasing.

METHODS: Using cross-sectional survey data collected in Beijing and Tianjin, China, from 2013 to 2014 (n = 400), this study tests 3 hypotheses regarding religion and HIV sexual risk: (1) HIV vulnerabilities and testing patterns among religiously affiliated MSM are lower than for areligious MSM, (2) religiosity is inversely associated with HIV vulnerabilities and testing, and (3) the magnitude of inverse association between religiosity and HIV vulnerabilities/testing will be stronger among Christian and Muslim MSM than Buddhist and areligious MSM.

RESULTS: Compared with areligious participants, Buddhists had higher odds of reporting unprotected anal intercourse [adjusted odds ratio (AOR): 2.06, 95% confidence interval (CI): 1.13 to 3.75] and more male sex partners (AOR: 1.95, 1.16-3.27), whereas Muslims had lower odds of reporting unprotected anal intercourse (AOR: 0.33, 95% CI: 0.15 to 0.73) and higher odds of reporting male circumcision (AOR: 3.04, 95% CI: 1.45 to 6.40). Reporting of forced sex was associated with more frequent participation in social religious activities (AOR: 1.25, 95% CI: 1.02 to 1.52) and private religious activities (AOR: 1.30, 95% CI: 1.04 to 1.61). Among Christians, participation in private religious activities was associated with lower odds of reporting anal intercourse (AOR: 0.49, 95% CI: 0.27 to 0.88).

CONCLUSIONS: The sustained growth of multiple religious traditions in China appears to have important implications for HIV vulnerability among religious minority MSM.

50. Khatib, A., et al. "**Reproducibility of Respondent-Driven Sampling (RDS) in Repeat Surveys of Men Who have Sex with Men, Unguja, Zanzibar.**" *AIDS Behav* 2016.

To assess the reproducibility of respondent-driven sampling (RDS) in obtaining comparable samples across two survey rounds, we conducted integrated bio-behavioral surveillance surveys (IBBSS) using RDS in 2007 and 2011 among men who have sex with men (MSM) on Unguja island in Zanzibar. Differences in the two rounds were assessed by comparing RDS-adjusted population estimates, stratified estimates, and bottleneck plots. Participants in the 2011 survey round were younger (31.4 vs. 9.9% under 19 years old, $p < 0.001$), more likely to have tested for HIV in the last year (53.7 vs. 10.6%, $p < 0.001$), and less likely to have injected drugs in the last 3 months (1.0 vs. 23.2%, $p < 0.001$) compared to participants in the 2007 round. HIV prevalence was 12.3% in 2007 compared to 2.6% in 2011 ($p < 0.001$). The difference in HIV prevalence persisted after stratifying and adjusting for known differences in the two surveys rounds. Bottleneck plots suggest that recruitment chains were "trapped" in the social networks of MSM who injected drugs to a greater extent in 2007 than in 2011. We conclude that the two rounds of RDS sampled different subsets of the MSM population on Unguja, particularly with respect to inclusion of MSM within the social networks of people who inject drugs. Findings underscore the need to evaluate the reproducibility of RDS in repeated rounds of IBBSS and to develop new sampling methods for key populations at high risk for HIV in order to track the epidemic, develop evidence-based prevention and care programs, and assess their impact.

51. Biello, K. B., et al. **"The 'Safe Sex' Conundrum: Anticipated Stigma From Sexual Partners as a Barrier to PrEP Use Among Substance Using MSM Engaging in Transactional Sex."** *AIDS Behav* 2017 21(1): 300-306.

Pre-exposure prophylaxis (PrEP) is efficacious for HIV prevention when taken consistently; however, barriers to PrEP use are poorly understood among individuals who could benefit from PrEP, including men who have sex with men (MSM) who engage in transactional sex (i.e., sex exchanged for money or drugs). Two hundred and thirty-seven HIV-uninfected, PrEP-naïve MSM reporting concurrent substance dependence and sexual risk completed a questionnaire on PrEP use barriers. Barriers to PrEP use for MSM who engaged in recent transactional sex (22 %) versus those who had not were compared using an ecological framework. Individual (e.g., HIV stigma, substance use) and structural (e.g., economic, healthcare) barriers did not differ ($p > 0.05$). MSM who recently engaged in transactional sex were more likely to report that anticipated stigma from primary and casual partners would be barriers to PrEP use. Assessing recent transactional sex may help identify men who may need additional counseling to avoid anticipated stigma so they can integrate PrEP into their lives.

52. Aung, T., et al. **"Seroadaptive Behaviors of Men Who Have Sex with Men in Myanmar."** *AIDS Behav* 2016 20(12): 2827-2833.

Serosorting (i.e., choosing partners of the same HIV serostatus to reduce the risk of transmission with unprotected sex) and other forms of seroadaptation (i.e., engaging in diverse behaviors according to a hierarchy of risk by type of sex and partner serostatus) are phenomena widely described for men who have sex with men (MSM) in the developed world. We assessed seroadaptive behaviors among MSM surveyed in Yangon, Myanmar in 2013-2014. Among HIV-negative MSM, 43.1 % engaged in some form seroadaptation including serosorting (21.8 %), using condoms with potentially serodiscordant anal sex (19.3 %), and seropositioning (1.7 %). Among HIV-positive MSM, 3.5 % engaged in serosorting, 36.0 % in using condoms with potentially serodiscordant anal sex, 7.0 % in seropositioning, and 46.5 % in any form of seroadaptation. For HIV-negative and HIV-positive MSM, seroadaptation was more common than consistent condom use (38.0 and 26.7 %, respectively). MSM in Myanmar are engaging in seroadaptive behaviors in magnitude and ways similar to MSM in industrialized countries.

53. Zhang, C., et al. **"Sexual Behaviors Linked to Drug and Alcohol Use Among Men Who Have Sex With Men in China."** *Subst Use Misuse* 2016 51(14): 1821-30.

BACKGROUND: High-risk sexual behaviors drive the HIV epidemic among men who have sex with men (MSM). Alcohol consumption and use of club drugs may increase sexual risk behaviors. We evaluated effects of drug and alcohol use on sexual behaviors with both their male and female partners as well as on HIV and syphilis infections among MSM in China.

METHODS: As the part of a community randomized clinical trial that conducted among MSM in Beijing from 2013 to 2015, we recruited a total of 3,680 participants cross-sectionally. A self-administered questionnaire was employed to collect information regarding demographics, sexual behaviors, and a history of alcohol and drug use. Blood sample was collected for HIV and syphilis testing.

RESULTS: A total of 3,588 MSM completed the survey and were included in the data analysis. The mean age was 29.9 with 97.3% of Han-ethnicity and 85.0% unmarried. The HIV and syphilis prevalence was 12.7% and 7.4%, respectively. Drug use was significantly associated with higher odds of HIV infection (aOR = 1.3, 95% Confidence Interval [CI] = 1.0,1.6), but not associated with syphilis. A higher level of alcohol consumption was similarly associated with higher odds of HIV risks with both male (e.g., condomless sex acts) and female partners (e.g., numbers of sexual partners).

CONCLUSION: The association between drug and alcohol use and high-risk behaviors is notable among MSM in China. Integrated HIV interventions that target substance use among MSM may be more effective than programs that only target HIV alone.

54. Ekstrand, M. L., et al. **"Sexual identity and behavior in an online sample of Indian men who have sex with men."** *AIDS Care* 2016: 1-9.

Indian men who have sex with men are disproportionately impacted by HIV. While prevention efforts to date have focused on men who visit drop-in centers or physical cruising sites, little is known about men who are meeting sexual partners on virtual platforms. This paper explores issues related to sexual identity and sexual behaviors in an online sample of men who identified as gay (n = 279) or bisexual (n = 123). There were significant differences in outedness between the two groups, with 48% of bisexually identified men reporting that they were out to "no one" and 82% stating that they present themselves as heterosexual to family and friends. Corresponding rates for gay-identified men were 15% and 41%, respectively (both $p < .001$). Twenty-nine percent of bisexually identified men reported being married, compared to only 3% of the gay-identified men ($p < .001$). Bisexually identified men were also more likely to report having exclusively insertive anal sex (49% vs 30% $p < .001$), while gay-identified men were more likely to report exclusively receptive anal sex (41% vs 13% $p < .0001$). Rates of unprotected anal sex (UAS) in the two groups were similar; however, married men were significantly more likely to report unprotected vaginal sex (76% vs 35%, $p < .012$). Positive attitudes toward UAS and lower self-efficacy were associated with sexual risk in both groups; however, substance use was associated with sexual risk only among bisexually identified men. These findings show that a large proportion of Indian bisexually identified men lead closeted lives, especially in their interactions with friends and family, with the vast majority presenting as heterosexual. The lower condom use with wives may be due to societal pressures to have children. The results suggest that bisexually identified men may benefit from targeted programs and non-directive, non-judgmental individual or couples counseling which emphasizes condom use with both male and female partners.

55. El Sayed, A., et al. **"Sofosbuvir in the treatment of early HCV infection in HIV-infected men."** *HIV Clin Trials* 2017: 1-7.

BACKGROUND: There is an international epidemic of hepatitis C virus (HCV) infection among HIV-infected men who have sex with men. We previously showed that adding telaprevir to pegylated interferon (IFN) and ribavirin (RBV) both shortened treatment and increased the cure rate of early HCV in these men. Whether shortening treatment of early HCV using IFN-free regimens would be similarly successful has not yet been demonstrated.

METHODS: We performed a pilot study of treatment with sofosbuvir (SOF) + RBV for 12 weeks in early genotype 1 HCV infection in HIV-infected men. The primary endpoint was SVR 12.

RESULTS: Twelve men were treated with 12 weeks SOF + RBV and 11 (92%) achieved SVR 12. Most (63%) were actively using recreational drugs, mostly methamphetamine. The one man who failed had laboratory results more characteristic of chronic than of early HCV infection. The overall safety profile was similar to that known for SOF + RBV.

CONCLUSIONS: The success of this short-duration IFN-free treatment in early HCV infection is proof in principle that enhanced treatment responsiveness is an inherent characteristic of early HCV infection and not a function of IFN treatment itself. Future studies should now be done with more potent regimens to try to further shorten therapy. In the mean time, in clinical practice early HCV infection should be treated immediately after detection to take advantage of short-duration treatments, as well as to decrease further HCV transmission among HIV-infected MSM.

56. Jin, H., et al. **"Suboptimal HIV Testing Uptake Among Men Who Engage in Commercial Sex Work with Men in Asia."** *LGBT Health* 2016 3(6): 465-471.

PURPOSE: Men who have sex with men and are sex workers (MSMSW) are disproportionately affected by the growing and emerging HIV epidemic. As sex work and same-sex behavior are heavily stigmatized and often illegal in most Asian countries, HIV research focusing on MSMSW has been limited. The goal of this

analysis is to examine HIV testing practices and identify correlates of HIV testing among MSMSW in Asia.

METHODS: The Asia Internet MSM Sex Survey, an online cross-sectional survey of 10,861 men who have sex with men (MSM), was conducted in 2010. Data on sociodemographic characteristics, HIV testing behaviors, and sexual behaviors were collected. Five hundred and seventy-four HIV-negative/unknown respondents reported receiving payment for sex with men at least once in the past 6 months and were included in this analysis. Multivariable logistic regression was conducted to identify independent correlates of HIV testing in the past year.

RESULTS: About half (48.6%) of the participants had been tested for HIV at least once within the past year, and 30.5% had never been tested. We also found that MSMSW participants who engaged in risky behaviors were less likely to be tested.

CONCLUSION: While one might expect a high HIV testing rate among MSMSW due to the risks associated with engaging in sex work, we found that HIV testing uptake is suboptimal among MSMSW in Asia. These results suggest that targeted HIV prevention and testing promotion among MSMSW are needed.

57. Liu, Y., et al. **"Subsequent Sexual Risks Among Men Who Have Sex with Men May Differ by Sex of First Partner and Age at Sexual Debut: A Cross-Sectional Study in Beijing, China."** *AIDS Behav* 2017.

Sexual debut experience may influence HIV/sexual risks among men who have sex with men (MSM). We assessed associations between age of sexual debut and sex of debut partner with recent (past-3-month) sexual/HIV/syphilis risks among 3588 community-based Chinese MSM. Sexual debut with women was associated with more recent (condomless) insertive anal sex with men, more recent (condomless) vaginal sex, and more lifetime female partners. Sexual debut with men was associated with more recent (condomless) receptive anal sex with men and more lifetime male partners. All associations were strongest among those having first sex ≤ 18 years in both groups. Earlier sexual debut was associated with higher HIV/syphilis risk; HIV risk was higher with first sex with a man, but syphilis was higher with first sex with a woman. Earlier age of sexual debut is associated with greater HIV/syphilis and sexual risks, but MSM risk differs with first sex with women versus men.

58. Knox, J., et al. **"Substance Use and Sexual Risk Behavior Among Black South African Men Who Have Sex With Men: The Moderating Effects of Reasons for Drinking and Safer Sex Intentions."** *AIDS Behav* 2016.

Research studies suggest an association between substance use and sexual risk behavior, but are not completely consistent. The moderating effects of other psychosocial factors might help explain these inconsistencies. The current study therefore assessed whether substance use is associated with sexual risk behavior, and whether this relationship is modified by expectancies about the effects of alcohol, reasons for consuming alcohol, or intentions to engage in safe sex. A cross-sectional survey was conducted among 480 black South African men who have sex with men recruited using respondent-driven sampling. In multivariable analyses, the effect of alcohol use on unprotected receptive anal intercourse (URAI) was modified by drinking to enhance social interaction (R^2 change = 0.03, $p < 0.01$). The effect of drug use on URAI was modified by safe sex intentions (R^2 change = 0.03, $p < 0.001$). Alcohol use was positively associated with URAI only among those who drink to enhance social interaction ($\beta = 0.08$, $p < 0.05$). Drug use was positively associated with URAI only among those with high safe sex intentions ($\beta = 0.30$, $p < 0.001$). Our findings suggest that efforts to minimize the impact of substance use on HIV risk behavior should target men who drink to enhance social interaction and men who intend to engage in safer sex. Efforts made to increase safer sex intentions as a way to reduce HIV risk behavior should additionally consider the effects of substance use.

59. Lam, C. R., et al. **"Subtypes and Risk Behaviors Among Incident HIV Cases in the Bangkok Men Who Have Sex with Men Cohort Study, Thailand, 2006-2014."** *AIDS Res Hum Retroviruses* 2017.

HIV-1 incidence and prevalence remain high among men who have sex with men (MSM), and transgender women (TGW), in Thailand. To examine the link between epidemiologic factors and HIV-1 subtype transmission among Thai MSM, we compared covariates of infection with HIV CRF01_AE and other HIV strains among participants in the Bangkok MSM Cohort Study (BMCS). The BMCS was an observational cohort study of Thai MSM and TGW with up to 60 months of follow-up at 4 monthly intervals. Participants underwent HIV/sexually transmitted infections testing and provided behavioral data at each visit. Infecting viral strain was characterized by gene sequencing and/or multiregion hybridization assay. We correlated behavioral/clinical variables with infecting strain using Cox proportional hazards. Among a total of 1372 HIV seronegative enrolled participants with 4,192 person-years of follow-up, we identified 215 seroconverters between April 2006 and December 2014, with 177 infected with CRF01_AE and 38 with non-CRF01_AE subtype. Age 18-21 years (adjusted hazard ratio [AHR] 2.2, 95% confidence interval [CI]: 1.4-3.5), age 22-29 (AHR 1.6, 95% CI: 1.1-2.3), living alone (AHR 1.5, 95% CI: 1.1-2.1), drug use (AHR 2.2, 95% CI: 1.4-3.5), intermittent condom use (AHR 1.7, 95% CI: 1.3-2.3), any receptive anal intercourse (AHR 1.7, 95% CI: 1.2-2.4), group sex (AHR 1.5, 95% CI: 1.1-2.2), anti-herpes simplex virus type 1 (AHR 1.5, 95% CI: 1.1-2.1), and *Treponema pallidum* antibody positivity (AHR 2.5, 95% CI: 1.4-4.4) were associated with CRF01_AE infection. Age 18-21 years (AHR 5.1, 95% CI: 1.6-16.5), age 22-29 (AHR 3.6, 95% CI: 1.3-10.4), drug use (AHR 3.1, 95% CI: 1.3-7.5), group sex (AHR 2.4, 95% CI: 1.1-5.0), and hepatitis B virus surface antigen (AHR 3.6, 95% CI: 1.3-10.2) were associated with non-CRF01_AE infection. We observed several significant biological and behavioral correlates of infection with CRF01_AE and other HIV strains among Thai MSM. Divergence in correlates by strain may indicate differences in HIV transmission epidemiology between CRF01_AE and other strains. These differences could reflect founder effects, transmission within networks distinguished by specific risk factors, and possibly biological differences between HIV strains.

60. Li, H., et al. **"Suicidal Ideation, Resilience, and Healthcare Implications for Newly Diagnosed HIV-Positive Men Who Have Sex with Men in China: A Qualitative Study."** *Arch Sex Behav* 2016.

Globally, suicidal ideation and behavior have been widely reported among people living with human immunodeficiency virus (HIV). Knowledge gaps exist regarding the longer life and resilience-related experiences of people living with HIV (PLWH). Specifically, there is a dearth of data about the interaction of perceived risk and resilient factors resulting in a wide spectrum of intentional suicidal ideation outcomes in a Chinese cultural context. This qualitative research drew from a larger ethnographic study of newly diagnosed HIV-positive men who have sex with men (MSM) in Mainland China. Interviews were conducted with 31 MSM within 6 months of diagnosis of HIV infection. Initial suicidal ideation was commonly reported with participants subsequently feeling more resilient to these thoughts through gaining a greater understanding of their prognosis and treatment. Post-HIV diagnosis, some participants reported forming new relationships and receiving increased support from their partners, friends, peers, families, and community-based organizations. At follow-up, these participants generally reported suicidal ideation had declined. However, participants who continued to express suicidal ideation perceived extended pressure from their families' expectations for them to engage in heterosexual marriages and parenthood. Furthermore, these men reported ongoing hardships in their daily life, unemployment, lack of social support, and isolation. Among this Mainland Chinese cohort of HIV-positive MSM, suicidal ideation may be a transient phenomenon experienced initially following HIV diagnosis that resolves with increased and specific familial, social, and service-based support. It is crucial to identify the causes of stress and social suffering associated with HIV diagnosis in order to reduce suicidal ideation. In China, action is needed to develop routine mental health screening and to increase services that support PLWH. Important services mechanism to accomplish this are promoting resilience through intentional activities as well as continued public health campaigns to reduce stigma toward HIV-positive MSM.

61. Chakrapani, V., et al. **"Syndemics of depression, alcohol use, and victimisation, and their association with HIV-related sexual risk among men who have sex with men and transgender women in India."** *Glob Public Health* 2017 12(2): 250-265.

We examined the presence and co-occurrence of psychosocial health conditions (depression, frequent alcohol use, and victimisation) among men who have sex with men (MSM) and transgender (TG) women in

India, and their cumulative association with sexual risk. A survey questionnaire was administered among a convenience sample of 600 participants (MSM = 300; TG women = 300) recruited through six non-governmental organisations in four states. Prevalences of the number of psychosocial health conditions among MSM were: none = 31.3%, one = 43%, two = 20%, and three = 5.7%; and among TG women: none = 9%; one = 35.33%, two = 38.33%, and three = 17.33%. In bivariate and multivariate models, these conditions were positively and additively related to sexual risk, providing evidence for a syndemic of psychosocial health conditions among MSM and TG women and their synergistic effect on sexual risk. In addition to the number of syndemic conditions, resilient coping and social support were significant predictors of sexual risk among MSM and TG women, respectively. HIV preventive interventions in India should screen for and address co-occurring psychosocial health conditions - experiences of violence, mental health issues, and alcohol use - among MSM and TG women.

62. Hernandez, I., et al. **"Syphilis and HIV/Syphilis Co-infection Among Men Who Have Sex With Men (MSM) in Ecuador."** *Am J Mens Health* 2016.

There is a reemergence of syphilis in the Latin American and Caribbean region. There is also very little information about HIV/Syphilis co-infection and its determinants. The aim of this study is to investigate knowledge, attitudes, and practices regarding sexually transmitted infections (STIs), in particular syphilis infection and HIV/Syphilis co-infection, as well as to estimate the prevalence of syphilis among men who have sex with men (MSM) in a city with one of the highest HIV prevalence rates in Ecuador. In this study, questionnaires were administered to 291 adult MSM. Questions included knowledge about STIs and their sexual practices. Blood samples were taken from participants to estimate the prevalence of syphilis and HIV/syphilis co-infection. In this population, the prevalence of HIV/syphilis co-infection was 4.8%, while the prevalence of syphilis as mono-infection was 6.5%. Participants who had syphilis mono-infection and HIV/syphilis co-infection were older. Men who had multiple partners and those who were forced to have sex had increased odds of syphilis and HIV/syphilis co-infection. A high prevalence of syphilis and self-reported STI was observed, which warrants targeted behavioral interventions. Co-infections are a cause for concern when treating a secondary infection in a person who is immunocompromised. These data suggest that specific knowledge, attitudes, and behaviors among MSM are associated with increased odds of STIs (including HIV/syphilis co-infections) in this region of Ecuador.

63. Chen, G., et al. **"Syphilis incidence among men who have sex with men in China: results from a meta-analysis."** *Int J STD AIDS* 2017 28(2): 170-178.

The recent upsurge of syphilis infections among men who have sex with men (MSM) is one of the major challenges facing China. However, the overall burden is still not clear. This study aims to summarize the incidence of syphilis among MSM in China by using meta-analysis. We comprehensively searched PubMed-MEDLINE, China National Knowledge Infrastructure and Chinese Wanfang databases. Articles published between December 2009 and March 2015 that met the inclusion criteria were considerably involved in this meta-analysis. Two reviewers performed a quality assessment of the studies and extracted data for estimating the overall syphilis incidence. STATA 12.0 was used to summarize the overall incidence of syphilis. In all, 14 studies from 13 papers were included in this study. Follow-up duration of these studies ranged from six to 36 months, while drop-out rates ranged from 11.9% to 83.6%. The individual incidence rates of the included studies varied from 3.1/100 person-years (95% CI, 0.8-5.3/100 person-years) to 38.5/100 person-years (95% CI, 28.9-48.1/100 person-years), with a pooled incidence of 9.6/100 person-years (95% CI, 7.0-12.2/100 person-years). The subgroup meta-analysis revealed that incidence estimates were 38.5/100 person-years (95% CI, 28.9-48.1/100 person-years), 12.1/100 person-years (95% CI, 7.0-17.2/100 person-years), 11.2/100 person-years (95% CI, 0.7-23.1/100 person-years), 8.9/100 person-years (95% CI, 6.5-11.2/100 person-years), 5.7/100 person-years (95% CI, 3.4-8.0/100 person-years) and 3.1/100 person-years (95% CI, 0.8-5.3/100 person-years) in Northeast, North, Southwest, East, South and Northwest China, respectively. Syphilis incidence among Chinese MSM is high, and this may increase the spread of other sexually transmitted infections, including human immunodeficiency virus. It is essential to integrate syphilis control programs with HIV control programs. This can be achieved by establishing public health response systems to monitor and control the epidemic of syphilis and HIV together in China.

64. Xu, J. J., et al. "Treatment-seeking behaviour and barriers to service access for sexually transmitted diseases among men who have sex with men in China: a multicentre cross-sectional survey." *Infect Dis Poverty* 2017 6(1): 15. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5242014/pdf/40249_2016_Article_219.pdf

BACKGROUND: Delayed or inappropriate treatment for sexually transmitted diseases (STDs) increases the risk of HIV acquisition and may cause other harmful outcomes. However, studies on STD treatment-seeking behaviour and correlated factors in men who have sex with men (MSM) are scarce. This information is crucial for the promotion of STD treatment-seeking behaviour and reduction of HIV transmission among Chinese MSM.

METHODS: During 2012-2013, a multicentre cross-sectional study was conducted in 7 Chinese cities. Participants completed an interview-questionnaire and gave venous blood samples, which were then tested for antibodies to HIV, syphilis, and herpes simplex virus-2 (HSV-2). MSM who tested positive for syphilis/HSV-2 or had obvious STD-related symptoms within the last 12 months were defined as suspected STD-infected MSM.

RESULTS: Of the 4 496 eligible MSM who completed this survey, 24.4% (1 096/4 496) were categorized as suspected STD-infected MSM. 35.7% (391/1 096) of these MSM with suspected STD infections sought STD treatment in clinics within the last 12 months. Among MSM who did not attend STD clinics for treatment, the prevalence of syphilis and HSV-2 was significantly higher; the HIV prevalence and incidence within this subpopulation reached as high as 14.5% and 12.2/100 person-years, respectively. Multivariate logistic regression analysis indicated that having 7-12 years of education (vs. ≤ 6 years; aOR, 2.5; 95%CI, 1.0-6.1), ≥ 13 years of education (vs. ≤ 6 years: aOR, 2.8; 95%CI, 1.2-7.0), monthly income > 500 USD (vs. ≤ 500 USD: aOR, 1.5; 95%CI, 1.1-2.1), obvious STD-related symptoms within last 12 months (aOR, 5.3; 95%CI, 3.7-7.5), being HIV infected (aOR, 1.7; 95%CI, 1.1-2.6), currently syphilis infected (aOR, 0.6; 95%CI, 0.4-0.9) and HSV-2 infected (aOR, 0.6; 95%CI, 0.5-0.9) were independent correlates with seeking STD treatment in clinics among Chinese MSM.

CONCLUSIONS: The high prevalence of STD infection coupled with a low proportion of individuals who exhibit appropriate treatment-seeking behaviour create a high risk of a growing HIV epidemic among Chinese MSM. Models that prioritize better screening for and education about STDs should be urgently implemented, especially among low-income MSM.

65. Ruisenor-Escudero, H., et al. "Using a social ecological framework to characterize the correlates of HIV among men who have sex with men in Lome, Togo." *AIDS Care* 2017: 1-9.

In the mixed and concentrated HIV epidemics of West Africa, the relative disproportionate burden of HIV among men who have sex with men (MSM) compared to other reproductive-age men is higher than that observed in Southern and Eastern Africa. Our aim is to describe the correlates of HIV infection among MSM living in Lome, Togo, using the Modified Social Ecological Model (MSEM). A total of 354 MSM ≥ 18 years of age were recruited using respondent driven sampling (RDS) for a cross-sectional survey in Lome, Togo. Participants completed a structured questionnaire and were tested for HIV and syphilis. Statistical analyses included RDS-weighted proportions, bootstrapped confidence intervals (CI), and logistic regression models. Mean age of participants was 22 years; 71.5% were between 18 and 24 years. RDS-weighted HIV prevalence was 9.2% (95% CI=5.4-13.2). In RDS-adjusted (RDSa) bivariate analysis, HIV infection was associated with disclosure of sexual orientation to a family member, discriminatory remarks made by family members, forced sex, ever being blackmailed because of being MSM, community and social stigma and discrimination, and health service stigma and discrimination. In the multivariable model, HIV infection was associated with being 25 years or older (RDSa adjusted OR (aOR)=4.3, 95% CI=1.5-12.2), and having sex with a man before age 18 (RDSa aOR=0.3, 95% CI=0.1-0.9). HIV prevalence was more than seven times higher than that estimated among adults aged 15-49 living in Togo. Using the MSEM, network, community, and policy-level factors were associated with HIV infection among MSM in Lome, Togo. Through the use of this flexible risk

framework, a structured assessment of the multiple levels of HIV risk was characterized, highlighting the need for evidence-based and human-rights affirming combination HIV prevention and treatment programs that address these various risk levels for MSM in Lome.

66. Nugent, D., et al. "**Where next with preexposure prophylaxis?**" *Curr Opin Infect Dis* 2017 30(1): 44-49.

PURPOSE OF REVIEW: Controlling the HIV epidemic remains a major public health challenge, and there is an urgent need for novel prevention strategies. Preexposure prophylaxis (PrEP) refers to the use of antiretrovirals in HIV-negative people at high risk to prevent infection and has the potential to be an important component in the global effort to end the HIV epidemic by 2030. We review the current evidence for the safety and efficacy of PrEP in its different forms and address emergent issues and concerns regarding its implementation.

RECENT FINDINGS: Two further randomized control trials report high efficacy of both daily and intermittent PrEP in MSM leading to renewed calls for wider availability of PrEP for this group. Oral tenofovir disoproxil/emtricitabine has been licensed for PrEP in many countries and is well tolerated, safe and effective.

SUMMARY: Oral PrEP is well tolerated and effective in reducing the incidence of HIV infection in individuals at high risk. Implementation in high-income countries is progressing slowly; demonstration projects and trials continue in low and middle-income countries.

[Back to top](#)

Sex Workers - 30

1. Goyette, M. S., et al. "**Association between menopause and unprotected sex in high-risk HIV-positive women in Mombasa, Kenya.**" *J Acquir Immune Defic Syndr* 2016.

OBJECTIVE: Many HIV-positive women now live well beyond menopause. Postmenopausal women are no longer at risk for pregnancy, and some studies suggest they may use condoms less often than premenopausal women. This study tests the hypothesis that, in HIV-positive women who report trading sex for cash or in-kind payment, unprotected sex is more common at postmenopausal visits compared to premenopausal visits.

DESIGN: Prospective cohort study of HIV-positive women ≥ 16 years old in Mombasa, Kenya.

METHODS: At enrollment and monthly follow-up visits, participants completed a standardized interview. Study clinicians collected genital samples at enrollment and quarterly visits. Menopausal status was assessed annually. The primary outcome of unprotected sex was determined by detection of prostate specific antigen (PSA) in vaginal secretions.

RESULTS: This study followed 404 HIV-positive women who contributed 2753 quarterly examination visits. Detection of PSA was less frequent at postmenopausal visits compared to premenopausal visits (55/554, 10.5% versus 394/2199, 17.9%; relative risk [RR] 0.58, 95% confidence interval [CI] 0.39-0.87). Adjusting for age diminished the association between menopause and PSA detection (adjusted RR 0.73, 95%CI 0.47-1.14). At visits where women reported sexual activity in the past week, they reported similar rates of 100% condom use at postmenopausal and premenopausal visits (RR 0.99, 95%CI 0.87-1.13).

CONCLUSION: In this population of high-risk HIV-positive Kenyan women, postmenopausal status was not

associated with a greater risk of unprotected sex. The relationship between menopause and unprotected sex is likely context-specific and may differ with varying risk groups, regions, and levels of exposure to sexual health education.

2. Lancaster, K. E., et al. **"The association between substance use and sub-optimal HIV treatment engagement among HIV-infected female sex workers in Lilongwe, Malawi."** *AIDS Care* 2017 29(2): 197-203.

Female sex workers (FSW) have a high prevalence of substance use and HIV, but the impact of substance use on HIV treatment engagement is not well established. We evaluated the association between alcohol and marijuana use and sub-optimal HIV treatment engagement outcomes among HIV-infected FSW in Lilongwe, Malawi. We enrolled FSW using venue-based recruitment into a cross-sectional evaluation assessing substance use and HIV treatment engagement. Seropositive FSW, identified through HIV rapid testing, received rapid CD4 count and viral load testing. We used Poisson regression with robust variance estimates to ascertain associations of alcohol and marijuana use with sub-optimal HIV treatment outcomes: (1) lack of ART use among previously diagnosed, ART-eligible FSW and (2) viral nonsuppression among FSW on ART. Of previously diagnosed, ART-eligible FSW (n = 96), 29% were not using ART. Patterns of hazardous drinking were identified in 30%, harmful drinking in 10%, and alcohol dependence in 12%. ART-eligible FSW with harmful drinking or alcohol dependency were 1.9 (95% CI: 1.0, 3.8) times as likely to not use ART compared to FSW without harmful or dependent drinking. Among those on ART, 14% were virally nonsuppressed. The prevalence ratio for viral nonsuppression was 2.0 (95% CI: 0.6, 6.5) for harmful drinkers and alcohol-dependent FSW. Over 30% of ART-eligible FSW reported using marijuana. Marijuana-using FSW were 1.9 (95% CI: 0.8, 4.6) times as likely to not use ART compared to FSW who were not using marijuana. Given the high prevalence of alcohol use and its association with lack of ART use, ART uptake and alcohol reduction strategies should be tailored for alcohol-using FSW in Malawi.

3. Zheng, C., et al. **"Commercial sex and risk of HIV, syphilis, and herpes simplex virus-2 among men who have sex with men in six Chinese cities."** *BMC Infect Dis* 2016 16(1): 765. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5178086/pdf/12879_2016_Article_2130.pdf

BACKGROUND: Men who have sex with men (MSM) are at high risk of HIV and sexually transmitted infections (STIs) in China and globally. Engaging in commercial sex put them at even greater risk. This study estimated the prevalence of HIV/STIs among three subgroups of MSM: MSM who sold sex (MSM-selling), MSM who bought sex (MSM-buying), and non-commercial MSM (NC-MSM) and evaluated the relationship between commercial sex and HIV/STIs.

METHODS: We conducted a cross-sectional survey among MSM in six Chinese cities (Shenyang, Ji'nan, Changsha, Zhengzhou, Nanjing, and Kunming) from 2012 to 2013. Data on socio-demographics and sexual behaviors were collected. Serological tests were conducted to detect HIV, syphilis, and human simplex virus type 2 (HSV-2).

RESULTS: Of 3717 MSM, 6.8% were engaged in commercial sex. The overall prevalence of HIV, syphilis and HSV-2 infections was 11.1, 8.8 and 12.1%, respectively. MSM-selling had higher prevalence of HIV (13.4%), syphilis (12.1%) and HSV-2 (17.9%) than NC-MSM (10.9, 8.7 and 11.9% for HIV, syphilis and HSV-2, respectively), though the differences are not statistically significant. Among MSM-selling, HIV prevalence was significantly higher for those who found sex partners via Internet than those did not (19.4% vs. 8.1%, $P = 0.04$). Compared to NC-MSM, MSM-selling were more likely to use recreation drugs (59.3% vs. 26.3%), have unprotected anal intercourse (77.9% vs. 61.7%), and have ≥ 10 male sex partners (46.2% vs. 6.2%) in the past 6 months (each $P < 0.05$).

CONCLUSIONS: All three subgroups of MSM in six large Chinese cities have high prevalence of HIV/STIs. Those who sell sex only have a particularly high risk of acquiring and transmitting disease, and therefore, they should be considered as a priority group in HIV/STIs surveillance and intervention programs.

4. Shen, H., et al. **"Depression and HIV Risk Behaviors among Female Sex Workers in Guangdong, China: A Multicenter Cross-Sectional Study."** *Biomed Res Int* 2016 2016: 6986173. Online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5206416/pdf/BMRI2016-6986173.pdf>

Background. Our study aimed to assess the burden of depression and evaluate factors associated with depression and status of HIV risk behaviors among female sex workers (FSWs) in Guangdong, China.

Method. We recruited FSWs from massage parlors, saunas, restaurants, hotels, hair salons, and streets in Guangdong, China, in 2014. Information on demographic characteristics, HIV testing history, and sexual behaviors was collected using a questionnaire. A blood sample was collected to test for HIV, syphilis, and HCV. A participant was defined as being depressed if she obtained 6 points or above using the 12-item General Health Questionnaire.

Results. Among the 653 participants, 41.7% were 21-30 years old and 43.6% married. Overall, 52.4% were found to be depressed. FSWs who had correct syphilis related knowledge [aOR = 1.45; 95% CI: 1.04-2.03] and had primary sex partner (1.63, 1.14-2.33) were more likely to be depressed. FSWs who did not use a condom during their last sex with the primary sex partner were less likely to be depressed (0.47, 0.31-0.71).

Conclusion. Our study observed high level of depression and HIV risk behaviors among Chinese FSWs. Future interventions should integrate mental health services in comprehensive interventions to prevent depression among Chinese FSWs.

5. Khan, S., et al. **"Dutiful daughters: HIV/AIDS, moral pragmatics, female citizenship and structural violence among Devadasis in northern Karnataka, India."** *Glob Public Health* 2017: 1-16.

Decades of research have documented how sex workers worldwide, particularly female sex workers (FSWs), shoulder a disproportionate burden of the HIV epidemic. In India, although a substantial progress has been made in controlling the epidemic, its prevalence among FSWs and the Devadasis (also called traditional sex workers) in northern Karnataka is still significantly high. On the other hand, much of the HIV prevention research has focused on their mapping and size estimation, typologies, bio-behavioural surveillance, condom use and other prevention technologies. In this article, drawing on critical theoretical perspectives, secondary historical sources and in-depth interviews, we unravel wider social, cultural and political economic complexities surrounding the lives of Devadasis, and specifically illuminate the moral pragmatics that shed light on their entry into sex trade and vulnerability to HIV. Findings from this research are extremely important since while much is known about Devadasis in social sciences and humanities, relatively little is known about the complexities of their lives within public health discourses related to HIV. Our work has direct implications for ongoing HIV prevention and health promotion efforts in the region and beyond.

6. Parcesepe, A. M., et al. **"Early sex work initiation and condom use among alcohol-using female sex workers in Mombasa, Kenya: a cross-sectional analysis."** *Sex Transm Infect* 2016 92(8): 593-598.

OBJECTIVES: Early initiation of sex work is prevalent among female sex workers (FSWs) worldwide. The objectives of this study were to investigate if early initiation of sex work was associated with: (1) consistent condom use, (2) condom negotiation self-efficacy or (3) condom use norms among alcohol-using FSWs in Mombasa, Kenya.

METHODS: In-person interviews were conducted with 816 FSWs in Mombasa, Kenya. Sample participants were: recruited from HIV prevention drop-in centres, 18 years or older and moderate risk drinkers. Early initiation was defined as first engaging in sex work at 17 years or younger. Logistic regression modelled outcomes as a function of early initiation, adjusting for drop-in centre, years in sex work, supporting others and HIV status.

RESULTS: FSWs who initiated sex work early were significantly less likely to report consistent condom use with paying sex partners compared with those who initiated sex work in adulthood. There was no significant

difference between groups in consistent condom use with non-paying sex partners. FSWs who initiated sex work early endorsed less condom negotiation self-efficacy with paying sex partners compared with FSWs who did not initiate sex work early.

CONCLUSIONS: Findings highlight a need for early intervention for at-risk youth and adolescent FSWs, particularly in relation to HIV sexual risk behaviours. Evidence-based interventions for adolescent FSWs or adult FSWs who began sex work in adolescence should be developed, implemented and evaluated.

7. Decker, M. R., et al. **"Gender-based violence against female sex workers in Cameroon: prevalence and associations with sexual HIV risk and access to health services and justice."** *Sex Transm Infect* 2016 92(8): 599-604.

BACKGROUND/OBJECTIVES: Female sex workers (FSWs) are at risk for HIV and physical and sexual gender-based violence (GBV). We describe the prevalence of lifetime GBV and its associations with HIV risk behaviour, access to health services and barriers in accessing justice among FSWs in Cameroon.

METHODS: FSWs (n=1817) were recruited for a cross-sectional study through snowball sampling in seven cities in Cameroon. We examined associations of lifetime GBV with key outcomes via adjusted logistic regression models.

RESULTS: Overall, 60% (1098/1817) had experienced physical or sexual violence in their lifetime. GBV was associated with inconsistent condom use with clients (adjusted OR (AOR) 1.49, 95% CI 1.18 to 1.87), being offered more money for condomless sex (AOR 2.09, 95% CI 1.56 to 2.79), having had a condom slip or break (AOR 1.53, 95% CI 1.25 to 1.87) and difficulty suggesting condoms with non-paying partners (AOR 1.47, 95% CI 1.16 to 1.87). Violence was also associated with fear of health services (AOR 2.25, 95% CI 1.61 to 3.16) and mistreatment in a health centre (AOR 1.66, 95% CI 1.01 to 2.73). Access to justice was constrained for FSWs with a GBV history, specifically feeling that police did not protect them (AOR 1.41, 95% CI 1.12 to 1.78).

DISCUSSION: Among FSWs in Cameroon, violence is prevalent and undermines HIV prevention and access to healthcare and justice. Violence is highly relevant to FSWs' ability to successfully negotiate condom use and engage in healthcare. In this setting of criminalised sex work, an integrated, multisectoral GBV-HIV strategy that attends to structural risk is needed to enhance safety, HIV prevention and access to care and justice.

8. Mutagoma, M., et al. **"High HIV prevalence and associated risk factors among female sex workers in Rwanda."** *Int J STD AIDS* 2017.

Human immunodeficiency virus (HIV) prevalence is often high among female sex workers (FSWs) in sub-Saharan Africa. Understanding the dynamics of HIV infection in this key population is critical to developing appropriate prevention strategies. We aimed to describe the prevalence and associated risk factors among a sample of FSWs in Rwanda from a survey conducted in 2010. A cross-sectional biological and behavioral survey was conducted among FSWs in Rwanda. Time-location sampling was used for participant recruitment from 4 to 18 February 2010. HIV testing was done using HIV rapid diagnostic tests (RDT) as per Rwandan national guidelines at the time of the survey. Elisa tests were simultaneously done on all samples tested HIV-positive on RDT. Proportions were used for sample description; multivariable logistic regression model was performed to analyze factors associated with HIV infection. Of 1338 women included in the study, 1112 consented to HIV testing, and the overall HIV prevalence was 51.0%. Sixty percent had been engaged in sex work for less than five years and 80% were street based. In multivariable logistic regression, HIV prevalence was higher in FSWs 25 years or older (adjusted odds ratio [aOR] = 1.83, 95% [confidence interval (CI): 1.42-2.37]), FSWs with consistent condom use in the last 30 days (aOR = 1.39, [95% CI: 1.05-1.82]), and FSWs experiencing at least one STI symptom in the last 12 months (aOR = 1.74 [95% CI: 1.34-2.26]). There was an inverse relationship between HIV prevalence and comprehensive HIV knowledge (aOR = 0.65, [95% CI: 0.48-0.88]). HIV prevalence was high among a sample of FSWs in Rwanda, and successful prevention strategies

should focus on HIV education, treatment of sexually transmitted infections, and proper and consistent condom use using an outreach approach.

9. Lancaster, K. E., et al. **"HIV care and treatment experiences among female sex workers living with HIV in sub-Saharan Africa: A systematic review."** *Afr J AIDS Res* 2016 15(4): 377-386.

Female sex workers (FSW) living with HIV in sub-Saharan Africa have poor engagement to HIV care and treatment. Understanding the HIV care and treatment engagement experiences of FSW has important implications for interventions to enhance care and treatment outcomes. We conducted a systematic review to examine the HIV care experiences and determinants of linkage and retention in care, antiretroviral therapy (ART) initiation, and ART adherence and viral suppression among FSW living with HIV in sub-Saharan Africa. The databases PubMed, Embase, Web of Science, SCOPUS, CINAHL, Global Health, Psycinfo, Sociological Abstracts, and Popline were searched for variations of search terms related to sex work and HIV care and treatment among sub-Saharan African populations. Ten peer-reviewed articles published between January 2000 and August 2015 met inclusion criteria and were included in this review. Despite expanded ART access, FSW in sub-Saharan Africa have sub-optimal HIV care and treatment engagement outcomes. Stigma, discrimination, poor nutrition, food insecurity, and substance use were commonly reported and associated with poor linkage to care, retention in care, and ART initiation. Included studies suggest that interventions with FSW should focus on multilevel barriers to engagement in HIV care and treatment and explore the involvement of social support from intimate male partners. Our results emphasise several critical points of intervention for FSW living with HIV, which are urgently needed to enhance linkage to HIV care, retention in care, and treatment initiation, particularly where the HIV prevalence among FSW is greatest.

10. Akudibillah, G., et al. **"Maximizing the benefits of ART and PrEP in resource-limited settings."** *Epidemiol Infect* 2016: 1-15.

Antiretroviral therapy (ART) is increasingly being used as an HIV-prevention tool, administered to uninfected people with ongoing HIV exposure as pre-exposure prophylaxis (PrEP) and to infected people to reduce their infectiousness. We used a modelling approach to determine the optimal population-level combination of ART and PrEP allocations required in South Africa to maximize programme effectiveness for four outcome measures: new infections, infection-years, death and cost. We considered two different strategies for allocating treatment, one that selectively allocates drugs to sex workers and one that does not. We found that for low treatment availability, prevention through PrEP to the general population or PrEP and ART to sex workers is key to maximizing effectiveness, while for higher drug availability, ART to the general population is optimal. At South Africa's current level of treatment availability, using prevention is most effective at reducing new infections, infection-years, and cost, while using the treatment as ART to the general population best reduces deaths. At treatment levels that meet the UNAIDS's ambitious new 90-90-90 target, using all or almost all treatment as ART to the general population best reduces all four outcome measures considered.

11. Hargreaves, J. R., et al. **"Overlapping HIV and sex-work stigma among female sex workers recruited to 14 respondent-driven sampling surveys across Zimbabwe, 2013."** *AIDS Care* 2016: 1-11.

HIV stigma can inhibit uptake of HIV testing and antiretroviral therapy as well as negatively affect mental health. Efforts to reduce discrimination against people living with HIV (LWH) have contributed to greater acceptance of the infection. Female sex workers (FSW) LWH may experience overlapping stigma due to both their work and HIV status, although this is poorly understood. We examined HIV and sex-work stigma experienced by FSW LWH in Zimbabwe. Using the SAPPH-IRe cluster-randomised trial baseline survey, we analysed the data from 1039 FSW self-reporting HIV. The women were recruited in 14 sites using respondent-driven sampling. We asked five questions to assess internalised and experienced stigma related to working as a sex worker, and the same questions were asked in reference to HIV. Among all FSW, 91% reported some form of sex-work stigma. This was not associated with sociodemographic or sex-work characteristics. Rates of sex-work stigma were higher than those of HIV-related stigma. For example, 38% reported being "talked badly about" for LWH compared with 77% for their involvement in sex work. Those

who reported any sex-work stigma also reported experiencing more HIV stigma compared to those who did not report sex-work stigma, suggesting a layering effect. FSW in Zimbabwe experience stigma for their role as "immoral" women and this appears more prevalent than HIV stigma. As HIV stigma attenuates, other forms of social stigma associated with the disease may persist and continue to pose barriers to effective care.

12. Lyons, C., et al. **"Physical and sexual violence affecting female sex workers in Abidjan, Cote d'Ivoire: Prevalence, and the relationship between violence, the work environment, HIV and access to health services."** *J Acquir Immune Defic Syndr* 2017.

BACKGROUND: Violence is a human rights violation, and an important measure in understanding HIV among female sex workers (FSW). However, limited data exist regarding correlates of violence among FSW in Cote d'Ivoire. Characterizing prevalence and determinants of violence and the relationship with structural risks for HIV can inform development and implementation of comprehensive HIV prevention and treatment programs.

METHODS: FSW > 18 years were recruited through respondent driven sampling (RDS) in Abidjan, Cote d'Ivoire. In total, 466 participants completed a socio-behavioral questionnaire and HIV testing. Prevalence estimates of violence were calculated using crude and RDS adjusted estimates. Relationships between structural risk factors and violence were analyzed using chi squared tests, and multivariable logistic regression.

RESULTS: RDS Police refusal of protection was associated with physical (adjusted Odds Ratio [aOR]:2.6; 95%CI: 1.7,4.4) and sexual violence (aOR: 3.0; 95%CI: 1.9,4.8). Blackmail was associated with physical (aOR: 2.5; 95%CI: 1.5,4.2) and sexual violence (aOR: 2.4; 95%CI: 1.5,4.0). Physical violence was associated with fear (aOR: 2.2; 95%CI: 1.3,3.1) and avoidance of seeking health services (aOR:1.7; 95%CI:1.1-2.6).

CONCLUSIONS: Violence is prevalent among FSW in Abidjan and associated with features of the work environment. These relationships highlight layers of rights violations affecting FSW, underscoring the need for structural interventions and policy reforms to improve work environments; and to address police harassment, stigma, and rights violations to reduce violence and improve access to HIV interventions.

13. Muldoon, K. A., et al. **"Policing the epidemic: High burden of workplace violence among female sex workers in conflict-affected northern Uganda."** *Glob Public Health* 2017 12(1): 84-97.

Sex workers in sub-Saharan Africa experience a high burden of HIV with a paucity of data on violence and links to HIV risk among sex workers, and even less within conflict-affected environments. Data are from a cross-sectional survey of female sex workers in Gulu, northern Uganda (n = 400). Logistic regression was used to determine the specific association between policing and recent physical/sexual violence from clients. A total of 196 (49.0%) sex workers experienced physical/sexual violence by a client. From those who experienced client violence the most common forms included physical assault (58.7%), rape (38.3%), and gang rape (15.8%) Police harassment was very common, a total of 149 (37.3%) reported rushing negotiations with clients because of police presence, a practice that was significantly associated with increased odds of client violence (adjusted odds ratio: 1.61, 95% confidence intervals: 1.03-2.52). Inconsistent condom use with clients, servicing clients in a bar, and working for a manager/pimp were also independently associated with recent client violence. Structural and community-led responses, including decriminalisation, and engagement with police and policy stakeholders, remain critical to addressing violence, both a human rights and public health imperative.

14. Lyons, C. E., et al. **"Potential Impact of Integrated Stigma Mitigation Interventions in Improving HIV/AIDS Service Delivery and Uptake for Key Populations in Senegal."** *J Acquir Immune Defic Syndr* 2017 74 Suppl 1: S52-s59.

BACKGROUND: Men who have sex with men (MSM) and female sex workers (FSW) are consistently shown to have a higher burden of HIV compared with other adults in Senegal. This study, HIV Prevention 2.0,

evaluates the impact of the 3-tiered integrated stigma mitigation interventions (ISMIs) approach to optimizing HIV service delivery for key populations in Senegal.

METHODS: Baseline assessment includes a questionnaire and biological testing for HIV. A proportion of participants enrolled into a 24-month longitudinal cohort with questionnaires and biological testing every 3 months. In these preliminary analyses, ISMIs are evaluated from participants in the cohort through uptake of HIV services and implementation outcomes.

RESULTS: Overall, 724 MSM and 758 FSW participated in the baseline assessment. HIV prevalence is 30.2% (n = 219/724) among MSM and 5.3% (n = 40/758) among FSW. Fear of seeking health services among MSM is 17.7% (n = 128/724) at baseline, 10.5% (n = 18/172) at month 3, and 9.8% (n = 10/102) at month 6 (P < 0.004); and among FSW is 21.9% (n = 166/758) at baseline, 8.1% (n = 15/185) at month 3, and 10.7% (n = 18/168) at month 6 (P < 0.001). Overall, 63.9% (n = 62/97) of MSM and 82.5% (n = 118/143) of FSW agreed that the intervention is effective in addressing stigma; however, loss to follow-up was 41.1% among MSM and 10% among FSW.

CONCLUSION: Baseline data reinforce the need for stigma mitigation interventions, combined with enhanced linkage and retention to optimize HIV treatment. Preliminary results show high levels of HIV-related risk determinants and suggest the potential utility of the ISMI to decrease perceived stigma relating to engagement in HIV prevention, treatment, and care services among key populations in Senegal.

15. De Beaudrap, P., et al. "**Prevalence of HIV infection among people with disabilities: a population-based observational study in Yaounde, Cameroon (HandiVIH).**" *Lancet HIV* 2017.

BACKGROUND: In resource-limited settings, people with disabilities have been left behind in the response to HIV. In the HandiVIH study, we estimate and compare HIV prevalence and associated risk factors between people with and without disabilities.

METHODS: In this cross-sectional, population-based, observational study, we used two-phase random sampling to recruit adults with disabilities and a control group matched for age, sex, and residential location from households of the general population. We used the Washington Group Short Set of Questions on Disability to identify people with disabilities. We administered an HIV test and a life-course history interview to participants. The primary outcome was the prevalence of HIV among participants with and without disabilities.

FINDINGS: Between Oct 2, 2014, and Nov 30, 2015, we recruited 807 people with disabilities and 807 participants without disabilities from Yaounde, Cameroon. 28 of 716 people in the control population had a positive HIV test result (crude prevalence 3.9%, 95% CI 2.9-5.3) compared with 50 of 739 people with disabilities (6.8%, 5.0-8.6; conditional odds ratio [OR] 1.7; p=0.04). Women with disabilities were more often involved in paid sexual relationships than were women without disabilities (2.5% vs 0.5%, p=0.05). People with disabilities were also at increased risk of sexual violence than were women without disabilities (11.0% vs 7.5%, OR 1.5; p=0.01). Sexual violence and sex work were strongly associated with increased risk of HIV infection among participants with disabilities but not among controls (OR 3.0, 95% CI 1.6-5.6 for sexual violence and 12.3, 4.4-34.6 for sex work). Analyses were done in men and women.

INTERPRETATION: The higher prevalence of HIV infection in people with disabilities than people without disabilities reflects a higher exposure to HIV infection as well as the presence of disability-associated HIV infection. The susceptibility of people with disabilities to HIV infection seems to be shaped by social and environmental factors. Research is needed to inform firm recommendations on how to protect this vulnerable population.

FUNDING: Agence nationale de recherches sur le sida et les hépatites virales (ANRS-Inserm) and the 5% Initiative.

16. McMillan, K. E., et al. **"Problematics of empowerment: sex worker HIV prevention in the Pacific."** *Health Promot Int* 2016 31(4): 946-953.

A recent overview of HIV/STI prevention programmes for sex workers in the Pacific region indicates that, despite a regional policy shift from universal to targeted interventions, Pacific Island countries currently lack core HIV/STI prevention services for sex workers. Across the region, condom distribution, peer outreach and support services for sex workers have ceased even in countries where such programmes had previously existed. This article cautions that the endorsement of empowerment projects does not negate the important role of condom access in HIV and STI prevention efforts for Pacific sex workers. While community empowerment underpins, and is essential to the sustainability of, effective interventions, it does not constitute an adequate form of HIV and STI prevention in and of itself. We contend that in the context of the Pacific Islands, timely and effective HIV prevention measures must specifically attend to the implementation of, and sustained support for, behavioural interventions such as sex-worker-specific peer education, condom and lubricant distribution, and access to appropriate sexual health services. Further, the responsibility for delivery of these should not be borne solely by fledgling sex worker organizations and communities. The evolution of targeted interventions in the Pacific and the current lack of funded condom distribution programmes highlight a more generalizable imperative within HIV prevention to ensure that behaviour change efforts are not considered to be extraneous to, or rendered redundant by, empowerment-based interventions.

17. Kerrigan, D., et al. **"Project Shikamana: Baseline Findings From a Community Empowerment-Based Combination HIV Prevention Trial Among Female Sex Workers in Iringa, Tanzania."** *J Acquir Immune Defic Syndr* 2017 74 Suppl 1: S60-s68.

BACKGROUND: Community empowerment approaches have been found to be effective in responding to HIV among female sex workers (FSWs) in South Asia and Latin America. To date, limited rigorous evaluations of these approaches have been conducted in sub-Saharan Africa.

METHODS: A phase II community randomized controlled trial is being conducted in Iringa, Tanzania, to evaluate the effectiveness of a community empowerment-based combination HIV prevention model (Project Shikamana) among a stratified sample of HIV-infected and HIV-uninfected FSWs. Cohort members were recruited from entertainment venues across 2 communities in the region using time-location sampling. All study participants gave consent, and were surveyed and screened for HIV at baseline. Primary biological study outcomes are viral suppression among the HIV-infected and remaining free of HIV among HIV-uninfected women.

RESULTS: A cohort of 496 FSWs was established and is currently under follow-up. Baseline HIV prevalence was 40.9% (203/496). Among HIV-infected FSWs, 30.5% (62/203) were previously aware of their HIV status; among those who were aware, 69.4% were on antiretroviral therapy (43/62); and for those on antiretroviral therapy, 69.8% (30/43) were virally suppressed. Factors associated with both HIV infection and viral suppression at baseline included community, age, number of clients, and substance use. Amount of money charged per client and having tested for sexually transmitted infection in the past 6 months were protective for HIV infection. Social cohesion among FSWs was protective for viral suppression.

CONCLUSIONS: Significant gaps exist in HIV service coverage and progress toward reaching the 90-90-90 goals among FSWs in Iringa, Tanzania. Community empowerment approaches hold promise given the high HIV prevalence, limited services and stigma, discrimination, and violence.

18. Blanchard, A. K., et al. **"Pursuing Authenticity From Process to Outcome in a Community-Based Participatory Research Study of Intimate Partner Violence and HIV Vulnerability in North Karnataka, India."** *Qual Health Res* 2017 27(2): 204-214. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5167108/pdf/10.1177_1049732316654871.pdf

Community-based participatory research has been seen to hold great promise by researchers aiming to

bridge research and action in global health programs and practice. However, there is still much debate around whether achieving authenticity in terms of in-depth collaboration between community and academic partners is possible while pursuing academic expectations for quality. This article describes the community-based methodology for a qualitative study to explore intimate partner violence and HIV/AIDS among women in sex work, or female sex workers, and their male partners in Karnataka, South India. Developed through collaborative processes, the study methodology followed an interpretive approach to qualitative inquiry, with three key components including long-term partnerships, knowledge exchange, and orientation toward action. We then discuss lessons learned on how to pursue authenticity in terms of truly collaborative processes with inherent value that also contribute to, rather than hinder, the instrumental goal of enhancing the quality and relevance of the research outcomes.

19. Schwartz, S. R., et al. **"Reproductive health needs of female sex workers and opportunities for enhanced prevention of mother-to-child transmission efforts in sub-Saharan Africa."** *J Fam Plann Reprod Health Care* 2017 43(1): 50-59.

INTRODUCTION: HIV infection and pregnancy are both common among female sex workers (FSW), indicating the need for prevention of mother-to-child transmission (PMTCT) among FSW.

METHODS: FSW were enrolled into studies in Swaziland, Burkina Faso and Togo using respondent-driven sampling. Women completed interview-administered socio-behavioural surveys and HIV counselling and testing. This secondary analysis describes contraceptive use and attempted pregnancy among reproductive-aged FSW (16-49 years). Robust Poisson regression with generalised estimating equations to account for clustering within recruitment networks was used to separately estimate associations between current unmet contraceptive need and attempted pregnancy among FSW.

RESULTS: Overall 1666 FSW were enrolled, 1372 (82.4%) of whom had ever been pregnant. In Togo and Burkina Faso, 83 FSW reported a prior HIV diagnosis and having a child, of which 12.1% (10/83) reported a child known to be HIV-positive. Twenty-five per cent of FSW had an unmet need for contraception; 9% of FSW employed dual contraception, including highly effective non-barrier methods and consistent condom use. Consistent condom use varied substantially by partner type and was higher with clients than non-paying partners. Nineteen per cent (n=313/1666) of FSW were trying to conceive. HIV-positive, undiagnosed FSW were more likely to be trying to conceive as compared to HIV-negative FSW; among 98 HIV-positive women trying to conceive, 25.5% were on antiretroviral therapy.

CONCLUSIONS: FSW have varying reproductive goals and contraceptive usage. Efforts to improve coverage of comprehensive family planning - including efforts to increase HIV testing and engagement in treatment among FSW trying to conceive - are necessary for PMTCT.

20. Biello, K. B., et al. **"The "Safe Sex" Conundrum: Anticipated Stigma From Sexual Partners as a Barrier to PrEP Use Among Substance Using MSM Engaging in Transactional Sex."** *AIDS Behav* 2017 21(1): 300-306.

Pre-exposure prophylaxis (PrEP) is efficacious for HIV prevention when taken consistently; however, barriers to PrEP use are poorly understood among individuals who could benefit from PrEP, including men who have sex with men (MSM) who engage in transactional sex (i.e., sex exchanged for money or drugs). Two hundred and thirty-seven HIV-uninfected, PrEP-naïve MSM reporting concurrent substance dependence and sexual risk completed a questionnaire on PrEP use barriers. Barriers to PrEP use for MSM who engaged in recent transactional sex (22 %) versus those who had not were compared using an ecological framework. Individual (e.g., HIV stigma, substance use) and structural (e.g., economic, healthcare) barriers did not differ ($p > 0.05$). MSM who recently engaged in transactional sex were more likely to report that anticipated stigma from primary and casual partners would be barriers to PrEP use. Assessing recent transactional sex may help identify men who may need additional counseling to avoid anticipated stigma so they can integrate PrEP into their lives.

21. Yi, S., et al. "Sex with sweethearts: Exploring factors associated with inconsistent condom use among unmarried female entertainment workers in Cambodia." *BMC Infect Dis* 2017 17(1): 20. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5217300/pdf/12879_2016_Article_2101.pdf

BACKGROUND: Despite the success in promoting condom use in commercial relationships, condom use with regular, noncommercial partners remains low among key populations in Cambodia. This study explores factors associated inconsistent condom use with sweethearts among unmarried sexually active female entertainment workers (FEWs).

METHODS: In 2014, the probability proportional to size sampling method was used to randomly select 204 FEWs from entertainment venues in Phnom Penh and Siem Reap for face-to-face interviews. Multivariate logistic regression analysis was conducted to examine independent determinants of inconsistent condom use.

RESULTS: Of total, 31.4% of the respondents reported consistent condom use with sweethearts in the past three months. After adjustment, respondents who reported inconsistent condom use with sweethearts remained significantly less likely to report having received any form of sexual and reproductive health education (AOR = 0.49, 95% CI = 0.22-0.99), but more likely to report having been tested for HIV in the past six months (AOR = 2.19, 95% CI = 1.03-4.65). They were significantly more likely to report having used higher amount of alcohol in the past three months (AOR = 1.29, 95% CI = 1.01-1.99) and currently using a contraceptive method other than condoms such as pills (AOR = 4.46, 95% CI = 1.34-10.52) or other methods (AOR = 9.75, 95% CI = 2.07-9.86).

CONCLUSIONS: The rate of consistent condom use in romantic relationships among unmarried FEWs in this study is considerably low. The importance of consistent condom use with regular, non-commercial partners should be emphasized in the education sessions and materials, particularly for FEWs who use non-barrier contraceptive methods.

22. Lafort, Y., et al. "Sexual and reproductive health services utilization by female sex workers is context-specific: results from a cross-sectional survey in India, Kenya, Mozambique and South Africa." *Reprod Health* 2017 14(1): 13. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5247811/pdf/12978_2017_Article_277.pdf

BACKGROUND: Female sex workers (FSWs) are extremely vulnerable to adverse sexual and reproductive health (SRH) outcomes. To mitigate these risks, they require access to services covering not only HIV prevention but also contraception, cervical cancer screening and sexual violence. To develop context-specific intervention packages to improve uptake, we identified gaps in service utilization in four different cities.

METHODS: A cross-sectional survey was conducted, as part of the baseline assessment of an implementation research project. FWSs were recruited in Durban, South Africa (n = 400), Mombasa, Kenya (n = 400), Mysore, India (n = 458) and Tete, Mozambique (n = 308), using respondent-driven sampling (RDS) and starting with 8-16 'seeds' identified by the peer educators. FSWs responded to a standardised interviewer-administered questionnaire about the use of contraceptive methods and services for cervical cancer screening, sexual violence and unwanted pregnancies. RDS-adjusted proportions and surrounding 95% confidence intervals were estimated by non-parametric bootstrapping, and compared across cities using post-hoc pairwise comparison tests with Dunn-Sidak correction.

RESULTS: Current use of any modern contraception ranged from 86.2% in Tete to 98.4% in Mombasa (p = 0.001), while non-barrier contraception (hormonal, IUD or sterilisation) varied from 33.4% in Durban to 85.1% in Mysore (p < 0.001). Ever having used emergency contraception ranged from 2.4% in Mysore to 38.1% in Mombasa (p < 0.001), ever having been screened for cervical cancer from 0.0% in Tete to 29.0% in Durban (p < 0.001), and having gone to a health facility for a termination of an unwanted pregnancy from 15.0% in Durban to 93.7% in Mysore (p < 0.001). Having sought medical care after forced sex varied from 34.4% in Mombasa to 51.9% in Mysore (p = 0.860). Many of the differences between cities remained statistically

significant after adjusting for variations in FSWs' sociodemographic characteristics.

CONCLUSION: The use of SRH commodities and services by FSWs is often low and is highly context-specific. Reasons for variation across cities need to be further explored. The differences are unlikely caused by differences in socio-demographic characteristics and more probably stem from differences in the availability and accessibility of SRH services. Intervention packages to improve use of contraceptives and SRH services should be tailored to the particular gaps in each city.

23. Kakchapati, S., et al. "**Sexual risk behaviors, HIV, and syphilis among female sex workers in Nepal.**" *HIV AIDS (Auckl)* 2017 9: 9-18. Online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5291463/pdf/hiv-9-009.pdf>

PURPOSE: Female sex workers (FSWs) are a key-affected population susceptible to acquiring HIV and sexually transmitted infections (STIs), as well as transmitting the virus to others. The aim of the study was to assess HIV and syphilis prevalence among FSWs in Nepal and to examine factors associated with it.

MATERIALS AND METHODS: The study was based on Integrated Biological and Behavioral Surveillance (IBBS) surveys among FSWs in Nepal from 2004 to 2015. Statistical analysis used chi-squared test to assess statistically significant risk factors for HIV and syphilis. Logistic regression models were used to identify the most important determinants for each outcome.

RESULTS: A total of 5,958 FSWs were tested, and among them, 100 (1.7%) were HIV positive and 230 (3.9%) were syphilis positive. The multivariate analysis revealed that syphilis was higher among those street-based, aged ≥ 35 years, illiterate, and with a duration of sex work of > 3 years. HIV was higher among those aged ≥ 35 years, illiterate, street-based, and with a duration of sex work > 3 years. Syphilis was strongly correlated with HIV.

CONCLUSION: HIV epidemic among FSWs in Nepal appears in the stagnant trend, whereas STI epidemic has increased in recent years. The high influencing factors for HIV and syphilis prevalence were advanced age, street-based, lower education, and longer duration of sex work. Urgent efforts, as part of routine HIV/STI prevention and intervention, are required to reduce the high burden of syphilis among FSWs.

24. Khanam, R., et al. "**Sexually Transmitted Infections and Associated Risk Factors Among Street-Based and Residence-Based Female Sex Workers in Dhaka, Bangladesh.**" *Sex Transm Dis* 2017 44(1): 21-28.

BACKGROUND: Female sex workers (FSWs) in Bangladesh remain at elevated risk of sexually transmitted infections (STIs) although the human immunodeficiency virus (HIV) prevalence among them is low. Recent information on the burden and etiological diagnosis of STIs among them has been lacking. This study examines prevalence and risk behaviors of selected STIs among FSWs in Dhaka in 2014.

METHODS: Between August and October 2014, a cross-sectional study was conducted among street-based and residence-based FSWs receiving HIV prevention services at 24 drop in centers in Dhaka. Participants underwent behavioral interview, clinical examination, and laboratory testing for selected STIs using cervical swabs and blood.

RESULTS: The sample consisted of 371 streets and 329 residence FSWs. Prevalence of gonorrhea, chlamydia, and active syphilis were 5.1%, 4.6%, 1.3% in street FSWs and were 5.8%, 8.2%, and 0.6% for residence FSWs which are lower compared with the previously reported rates. The following factors were associated with having any STI: being ≤ 5 years in sex trade (odds ratio, 2.2; 95% confidence interval, 1.2-3.9; $P < 0.01$), and having a cervical discharge (odds ratio, 2.6, 95% confidence interval, 1.5-4.6; $P < 0.01$). Resistance to cefixime and azithromycin was observed for 1 and 3 *Neisseria gonorrhoeae* strains, respectively.

CONCLUSIONS: Despite receiving HIV/STI prevention services, bacterial STIs remain prevalent among FSWs

suggesting the need for more effective management of STIs. The guidelines for management of STIs need revision in view of the emerging resistance.

25. Ganju, D., et al. **"Stigma, violence and HIV vulnerability among transgender persons in sex work in Maharashtra, India."** *Cult Health Sex* 2017: 1-15.

Among marginalised groups in India, HIV prevalence is highest among transgender persons; however, little is known about their HIV vulnerability. This study describes transgender sex workers' experiences of stigma and violence, a key driver of the HIV epidemic, and explores their coping responses. In-depth interviews were conducted with 68 respondents in Maharashtra state, India. Findings show that respondents face pervasive stigma and violence due to multiple marginalised social identities (transgender status, sex work, gender non-conformity), which reinforce and intersect with social inequities (economic and housing insecurity, employment discrimination, poverty), fuelling HIV vulnerability at the micro, meso and macro levels. Several factors, such as felt and internalised stigma associated with psycho-social distress and low self-efficacy to challenge abuse and negotiate condom use; clients' power in sexual transactions; establishing trust in regular partnerships through condomless sex; norms condoning violence against gender non-conforming persons; lack of community support; police harassment; health provider discrimination and the sex work environment create a context for HIV vulnerability. In the face of such adversity, respondents adopt coping strategies to shift power relations and mobilise against abuse. Community mobilisation interventions, as discussed in the paper, offer a promising vulnerability reduction strategy to safeguard transgender sex workers' rights and reduce HIV vulnerability.

26. Jin, H., et al. **"Suboptimal HIV Testing Uptake Among Men Who Engage in Commercial Sex Work with Men in Asia."** *LGBT Health* 2016 3(6): 465-471.

PURPOSE: Men who have sex with men and are sex workers (MSMSW) are disproportionately affected by the growing and emerging HIV epidemic. As sex work and same-sex behavior are heavily stigmatized and often illegal in most Asian countries, HIV research focusing on MSMSW has been limited. The goal of this analysis is to examine HIV testing practices and identify correlates of HIV testing among MSMSW in Asia.

METHODS: The Asia Internet MSM Sex Survey, an online cross-sectional survey of 10,861 men who have sex with men (MSM), was conducted in 2010. Data on sociodemographic characteristics, HIV testing behaviors, and sexual behaviors were collected. Five hundred and seventy-four HIV-negative/unknown respondents reported receiving payment for sex with men at least once in the past 6 months and were included in this analysis. Multivariable logistic regression was conducted to identify independent correlates of HIV testing in the past year.

RESULTS: About half (48.6%) of the participants had been tested for HIV at least once within the past year, and 30.5% had never been tested. We also found that MSMSW participants who engaged in risky behaviors were less likely to be tested.

CONCLUSION: While one might expect a high HIV testing rate among MSMSW due to the risks associated with engaging in sex work, we found that HIV testing uptake is suboptimal among MSMSW in Asia. These results suggest that targeted HIV prevention and testing promotion among MSMSW are needed.

27. Biello, K. B., et al. **"Transactional sex and the challenges to safer sexual behaviors: a study among male sex workers in Chennai, India."** *AIDS Care* 2017 29(2): 231-238.

Male sex workers (MSW) are a significant but invisible population in India who are at risk for HIV/sexually transmitted infections (STIs). Few studies from India have documented HIV risk factors and motivations for sex work in this population. Between 2013 and 2014, a community-based convenience sample of 100 MSW in Chennai (south India) completed a baseline risk assessment as part of a behavioral intervention. Participants were ≥ 18 years, and reported current sex work. We report medians and proportions, and Wilcoxon-Mann-Whitney and chi-square tests are used to examine differences between sex work and sexual

behavior measures by income source. Participants were engaged in sex work for 5.0 years (IQR = 2.3-10.0), and earned 3000 (IQR = 2000-8000) Rupees (<50 USD) per month from sex work. Sixty-four percent reported ever testing for HIV and 20.2% for any STI. The most common reasons for starting sex work were money (83.0%) and pleasure (56.0%). Compared to participants with an additional source of income, those whose only source of income was sex work reported more male clients in the past month (10.0 vs. 6.0, $p = .017$), as well as more condomless anal sex acts with male clients (8.0 vs. 5.0, $p = .008$). Nearly 70.0% were offered more money not to use a condom during sex with a client, and 74.2% reported accepting more money not to use a condom. Three-quarters reported having experienced difficulty using condoms with clients. MSW in India engage in high levels of sexual risk for HIV/STIs. Money appears to be a driving factor for engaging in sex work and condomless sex with clients. HIV prevention interventions with MSW should focus on facilitating skills that will support their ability to negotiate sexual safety in the context of monetary disincentives.

28. Parriault, M. C., et al. **"The use of structural equation modelling and behavioural theory to target priority interventions to increase condom use among the intimate partners of sex workers in French Guiana."** *AIDS Care* 2016 28(12): 1600-1606.

French Guiana is the French overseas territory that is most affected by HIV. Sex work seems to be an important driver of the epidemic. Although female sex workers are informed by local NGOs, they still have risky behaviours, including not using condoms with their intimate partner despite knowing HIV is highly prevalent. The objective of this study was to find intervention targets on this specific behaviour. For this, a structural equation model (SEM) was built using assumptions from behavioural theories. Behaviour theories attempt to connect research and practice. Within the health belief model framework, perceived threats, perceived benefits, and self-perceived efficacy were tested. Vulnerability was added because of the particular context of French Guiana. The results highlight that female sex workers' perceived self-efficacy was central in condom use with the intimate partner (with a significant correlation coefficient of 0.52 in the SEM). The perceived self-efficacy was strongly influenced by sociodemographic factors, particularly by nationality. Female sex workers from Brazil seemed to be more comfortable about asking their intimate partner to use condoms (OR: 7.81; CI: 1.87-32.63) than sex workers of other nationalities. These results emphasize that prevention interventions for female sex workers should emphasize their empowerment.

29. Okafor, U., et al. **"Using brothel leadership to promote condom use among brothel-based female sex workers in Abuja, Nigeria: study protocol for a cluster randomized pilot trial."** *Pilot Feasibility Stud* 2017 3: 10. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5317047/pdf/40814_2017_Article_124.pdf

BACKGROUND: The HIV prevalence among female populations involved in sex work in Nigeria has heightened interest in HIV prevention programming for this sub-population with brothel-based female sex workers (BB FSWs) having a prevalence of 27.4%, six times higher than the prevalence in the general population.

METHODS/DESIGN: The clusters in the randomized pilot trial will be brothels and female sex workers (FSWs) residing in the brothels will be the participants of the study. The participants will receive free condom distribution as well as HIV prevention messages on condom use and negotiation skills to increase self-efficacy in handling social and gender power plays within their environment. Twelve brothels will be randomized into experimental and control conditions with a minimum total sample size of 200 participants. Recruitment of participants will be carried out from within the brothels. The control condition will receive a standard intervention consisting of a minimum of six interactive sessions with peer educators (PE) engaging their peers through group discussions and one on one interaction using pre-designed HIV prevention messages. The experimental condition will receive the standard intervention as well as interactive sessions with the brothel leadership (chairladies and brothel managers) to facilitate consistent condom use and appropriate condom use policies, conditions, and messaging. Both interventions will be delivered over a maximum period of 16 weeks, and male and female condoms will be distributed during the intervention. Quantitative assessments will be carried out at baseline and at 16 weeks follow-up, and the pilot findings will inform feasibility of and sample size estimation for a phase III trial. The primary outcomes measured are

recruitment rate attrition rate and adherence to the intervention. Consistent condom use outcomes by FSWs within the brothel with all partner types and enhanced self-efficacy for condom negotiation with all partner types will be the primary outcomes for the main study, and the feasibility of their measurement will be determined in this pilot trial.

DISCUSSION: The manuscript describes the protocol for a pilot study to determine the feasibility of a behavioral intervention to improve consistent condom use among BB FSWs. The results of this pilot will inform a larger intervention for HIV prevention for this target group in Nigeria.

TRIAL REGISTRATION: The Institutional Review Board (IRB) of the Institute of Human Virology, Nigeria; Protocol Number NHREC/10/15/2014a-026.

30. Reed, E., et al. **"Why female sex workers participate in HIV research: the illusion of voluntariness."** *AIDS Care* 2016: 1-5.

The purpose of this study was to examine factors influencing the motivation for and perceived voluntariness of participation in non-intervention HIV research among female sex workers (FSW) in India. FSW (n = 30) who participated in non-intervention HIV studies in the previous three years were recruited from a local community-based organization. Semi-structured qualitative interviews focused on women's personal and economic motivations for participation and their perceptions of the informed consent process. Interviews were audio-recorded, translated, transcribed, and reviewed for common themes. Content analysis indicated that while many women reported willing participation, reports of obligatory participation were also a common theme. Obligations included money-related pressures and coercion by other FSW, social pressures, not wanting to disappoint the researchers, and perceiving that they had a contractual agreement to complete participation as a result of signing the consent form. Findings suggest a need for additional efforts during and following informed consent to prevent obligatory participation in HIV research studies among FSW. Findings emphasize the importance of integrating ongoing participant feedback into research ethics practices to identify issues not well addressed via standard ethics protocols when conducting HIV research among vulnerable populations.

[Back to top](#)

Transgender People - 16

1. Nugroho, A., et al. **"Behavioral interventions to reduce HIV risk behavior for MSM and transwomen in Southeast Asia: a systematic review."** *AIDS Care* 2017 29(1): 98-104.

This systematic review aims to gain insights from existing literature from Southeast Asian countries to improve future HIV prevention programs for men who have sex with men (MSM) and transgender women (transwomen). We conducted a systematic search in six international databases for literature published prior to 1 January 2015. We included studies describing behavioral interventions targeting MSM and/or transwomen, and conducted in at least one Southeast Asian country. Five out of 575 screened studies met the inclusion criteria and reported a significant intervention effect on at least one outcome measure, that is, condom use (with casual or commercial partner), water-based lubricant use, number of sex partners, HIV prevention knowledge, or willingness to use pre-exposure prophylaxis. Peer education/outreach was the most commonly employed type of intervention in the five included studies and was usually delivered as an element of a larger intervention package, together with condom distribution and the provision of drop-in centers. Motivational interviewing was effective, while internet-based interventions appeared to be a viable platform for intervention delivery. Nevertheless, research on behavioral interventions among MSM and transwomen in Southeast Asia is limited. Future interventions should be culturally appropriate, theoretically

grounded, and rigorously evaluated. Only then can we best address the HIV epidemic among MSM and transwomen in this region.

2. Neumann, M. S., et al. **"Comprehensive HIV Prevention for Transgender Persons."** *Am J Public Health* 2017 107(2): 207-212.

Transgender persons are at high risk for HIV infection, but prevention efforts specifically targeting these people have been minimal. Part of the challenge of HIV prevention for transgender populations is that numerous individual, interpersonal, social, and structural factors contribute to their risk. By combining HIV prevention services with complementary medical, legal, and psychosocial services, transgender persons' HIV risk behaviors, risk determinants, and overall health can be affected simultaneously. For maximum health impact, comprehensive HIV prevention for transgender persons warrants efforts targeted to various impact levels-socioeconomic factors, decision-making contexts, long-lasting protections, clinical interventions, and counseling and education. We present current HIV prevention efforts that reach transgender persons and present others for future consideration.

3. Bao, A., et al. **"Correlates of HIV Testing Among Transgender Women in Ho Chi Minh, Vietnam."** *AIDS Behav* 2016 20(Suppl 3): 371-378.

HIV prevalence among transgender women (TW) in Ho Chi Minh City is estimated at 18 %. However, no evidence-based programs or surveillance data exist in Vietnam specific to HIV testing uptake. We examined prevalence and correlates of past-year HIV testing among TW (n = 204) recruited in 2015 via snowball sampling. 59.3 % reported HIV testing in the previous year. In adjusted models, factors positively associated with HIV testing included consistent condom use during sex work with male clients; STI testing in past year; sex with casual partners in the past month; and experiences of police harassment. Factors negatively associated with recent HIV testing included daily/weekly alcohol use and post-traumatic stress symptoms. This study found significant associations between greater safety in sexual behaviors and higher rates of HIV testing. Targeted and specific services are needed for TW in Vietnam in order to address sexual risk behaviors and provide appropriate access to regular HIV testing.

4. Keshinro, B., et al. **"High prevalence of HIV, chlamydia and gonorrhoea among men who have sex with men and transgender women attending trusted community centres in Abuja and Lagos, Nigeria."** *J Int AIDS Soc* 2016 19(1): 21270. Online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5146323/pdf/JIAS-19-21270.pdf>

INTRODUCTION: Sexually transmitted infection (STI) and HIV prevalence have been reported to be higher amongst men who have sex with men (MSM) in Nigeria than in the general population. The objective of this study was to characterize the prevalence of HIV, chlamydia and gonorrhoea in this population using laboratory-based universal testing.

METHODS: TRUST/RV368 represents a cohort of MSM and transgender women (TGW) recruited at trusted community centres in Abuja and Lagos, Nigeria, using respondent-driven sampling (RDS). Participants undergo a structured comprehensive assessment of HIV-related risks and screening for anorectal and urogenital Chlamydia trachomatis and Neisseria gonorrhoeae, and HIV. Crude and RDS-weighted prevalence estimates with 95% confidence intervals (CIs) were calculated. Log-binomial regression was used to explore factors associated with prevalent HIV infection and STIs.

RESULTS: From March 2013 to January 2016, 862 MSM and TGW (316 in Lagos and 546 in Abuja) underwent screening for HIV, chlamydia and gonorrhoea at study enrolment. Participants' median age was 24 years [interquartile range (IQR) 21-27]. One-third (34.2%) were identified as gay/homosexual and 65.2% as bisexual. The overall prevalence of HIV was 54.9%. After adjusting for the RDS recruitment method, HIV prevalence in Abuja was 43.5% (95% CI 37.3-49.6%) and in Lagos was 65.6% (95% CI 54.7-76.5%). The RDS-weighted prevalence of chlamydia was 17.0% (95% CI 11.8-22.3%) in Abuja and 18.3% (95% CI 11.1-25.4%) in Lagos. Chlamydia infection was detected only at the anorectal site in 70.2% of cases. The RDS-weighted

prevalence of gonorrhoea was 19.1% (95% CI 14.6-23.5%) in Abuja and 25.8% (95% CI 17.1-34.6%) in Lagos. Overall, 84.2% of gonorrhoea cases presented with anorectal infection only. Over 95% of STI cases were asymptomatic. In a multivariable model, increased risk for chlamydia/gonorrhoea was associated with younger age, gay/homosexual sexual orientation and higher number of partners for receptive anal sex. HIV infection was associated with older age, female gender identity and number of partners for receptive anal sex.

CONCLUSIONS: There is a high burden of infection with HIV and asymptomatic chlamydia and gonorrhoea among MSM and TGW in Nigeria. Most cases would have been missed without anorectal screening. Interventions are needed to target this population for appropriate STI screening and management beginning at a young age.

5. Colby, D., et al. **"HIV and Syphilis Prevalence Among Transgender Women in Ho Chi Minh City, Vietnam."** *AIDS Behav* 2016 20(Suppl 3): 379-385.

Globally, transgender women have higher risk for HIV than the general population and men who have sex with men, but there is little data on this population in Vietnam. In 2015 we conducted a biological and behavioral survey of 205 transgender women in Ho Chi Minh City, Vietnam. Factors associated with HIV and syphilis infection were assessed through multivariable logistic regression models. Median age was 25 years (range 18-64). Overall prevalence was 18.0 % for HIV and 17.6 % for syphilis. Factors independently associated with HIV infection included risky alcohol use [adjusted Odds Ratio (aOR) 3.55, 95 % confidence interval (CI) 1.53-8.21], amphetamine stimulant use (aOR 2.90, 95 % CI 1.27-6.61), sex with male sex workers (aOR 4.73, 95 % CI 1.72-13.0), and history of sex with an adult before the age of 18 years (aOR 2.97, 95 % CI 1.06-8.34). Two factors associated with syphilis infection were HIV infection (aOR 2.37, 95 % CI 1.03-5.45) and condomless anal sex with casual partners (aOR 2.27, 95 % CI 1.03-5.00). In order to address the HIV and syphilis epidemics in Vietnamese transgender women, interventions are needed to make HIV and sexually transmitted infection screening and treatment more accessible.

6. Poteat, T., et al. **"HIV in transgender women in Brazil."** *Lancet HIV* 2017.
7. Oldenburg, C. E., et al. **"HIV Pre-exposure Prophylaxis Indication and Readiness Among HIV-Uninfected Transgender Women in Ho Chi Minh City, Vietnam."** *AIDS Behav* 2016 20(Suppl 3): 365-370.

Few studies have considered acceptability of HIV pre-exposure prophylaxis (PrEP) among transgender women in Southeast Asia. We assessed PrEP indications and readiness among a sample of HIV-uninfected transgender women in Ho Chi Minh City, Vietnam. Of 168 HIV-uninfected transgender women, 72.6 % met criteria for PrEP based on United States CDC guidelines. PrEP indication was inversely associated with PrEP interest (76.0 % interested among those for whom PrEP was indicated; 89.1 % among those for whom it was not; aOR 0.16, 95 % CI 0.04-0.67, P = 0.01). PrEP readiness, defined as having heard of, being interested in taking, and believing that PrEP is efficacious, was low (7.7 %). The results of this study indicate potential need for PrEP among transgender women in Ho Chi Minh City, but very low awareness of PrEP in the community. Future PrEP implementation programs should include counseling on HIV risk and eligibility for PrEP to ensure that PrEP is available to those who may benefit the most from it.

8. Bustamante, M. J., et al. **"HIV self-testing in Peru: questionable availability, high acceptability but potential low linkage to care among men who have sex with men and transgender women."** *Int J STD AIDS* 2017 28(2): 133-137.

HIV status awareness is key to prevention, linkage-to-care and treatment. Our study evaluated the accessibility and potential willingness of HIV self-testing among men who have sex with men (MSM) and transgender women in Peru. We surveyed four pharmacy chains in Peru to ascertain the commercial availability of the oral HIV self-test. The pharmacies surveyed confirmed that HIV self-test kits were available; however, those available were not intended for individual use, but for clinician use. We interviewed 147 MSM and 45 transgender women; nearly all (82%) reported willingness to perform the oral HIV self-test. However,

only 55% of participants would definitely seek a confirmatory test in a clinic after an HIV-positive test result. Further, price may be a barrier, as HIV self-test kits were available for 18 USD, and MSM and transgender women were only willing to pay an average of 5 USD. HIV self-testing may facilitate increased access to HIV testing among some MSM/transgender women in Peru. However, price may prevent use, and poor uptake of confirmatory testing may limit linkage to HIV treatment and care.

9. Konda, K. A., et al. **"HIV Status Communication with Sex Partners and Associated Factors Among High-Risk MSM and Transgender Women in Lima, Peru."** *AIDS Behav* 2017 21(1): 152-162.

Men who have sex with men (MSM) and transgender women (TW) are key populations in the HIV epidemic. HIV status communication between sex partners can inform decisions regarding sexual behavior. MSM and TW were asked about HIV status communication with sex partners at baseline, 9- and 18-months. GEE models assessed associations with HIV status communication at baseline using prevalence ratios (PRs) and longitudinally using odds ratios (ORs). At baseline, those who had previously had an HIV test, disclosed their HIV status to 42 % of their sex partners. HIV status communication was associated with knowing their sex partner's HIV status at baseline (aPR 5.20) and longitudinally (aOR 1.86). HIV positivity at baseline was negatively associated with HIV status communication during follow-up (aOR 0.55). All reported aPRs and aORs have $p < 0.05$. Interventions promoting HIV status communication and more frequent HIV testing should be explored as current efforts are insufficient.

10. Wandell, G. M., et al. **"Knowledge and preferences concerning acute HIV testing programs among both Peruvian men who have sex with men and transgender women."** *Int J STD AIDS* 2017.

Immediate antiretroviral therapy (ART) for acute HIV infection (AHI) may decrease HIV transmission in high-risk populations. This study evaluated knowledge of AHI and AHI testing program preferences in Lima, Peru through four semi-structured focus groups with high-risk men who have sex with men (MSM) ($n = 20$) and transgender women (TW) ($n = 16$). Using content analysis, emergent themes included knowledge of AHI symptoms, AHI transmission potential, and the HIV testing window period, and preferences concerning point of care results. Participants demonstrated low familiarity with the term AHI, but many correctly identified AHI symptoms. However, these symptoms may not motivate testing because they overlap with common viral illnesses and AIDS. Some were aware that infectiousness is highest during AHI, and believe this knowledge would facilitate HIV testing. The shortened window period with AHI testing would encourage testing following high-risk sex. Delayed result notification would not decrease AHI testing demand among MSM, although it might for some TW.

11. Cranston, R. D., et al. **"MTN-017: A Rectal Phase 2 Extended Safety and Acceptability Study of Tenofovir Reduced-Glycerin 1% Gel."** *Clin Infect Dis* 2016.

BACKGROUND: HIV disproportionately affects men who have sex with men (MSM) and transgender women (TGW). Safe and acceptable topical HIV prevention methods that target the rectum are needed.

METHODS: MTN-017 was a Phase 2, three-period, randomized sequence, open-label, expanded safety and acceptability crossover study comparing rectally applied reduced-glycerin (RG) 1% tenofovir (TFV) and oral emtricitabine/TFV disoproxil fumarate (FTC/TDF). In each 8-week study period participants were randomized to RG-TFV rectal gel daily; or RG-TFV rectal gel before and after receptive anal intercourse (RAI) (or at least twice weekly in the event of no RAI); or daily oral FTC/TDF.

RESULTS: MSM and TGW ($n=195$) were enrolled from 8 sites in the United States, Thailand, Peru, and South Africa with mean age of 31.1 years (range 18-64). There were no differences in Grade 2 or higher adverse event rates in participants using daily gel (Incidence Rate Ratio (IRR): 1.09, $p=0.59$) or RAI gel (IRR: 0.90, $p=0.51$) compared to FTC/TDF. High adherence ($\geq 80\%$ of prescribed doses as assessed by unused product return and SMS reports) was less likely in the daily gel regimen (Odds Ratio (OR): 0.35, $p<0.001$) and participants reported less likelihood of future daily gel use for HIV protection compared to FTC/TDF (OR: 0.38, $p<0.001$).

CONCLUSIONS: Rectal application of RG TFV gel was safe in MSM and TGW. Adherence and product use likelihood were similar for the intermittent gel and daily oral FTC/TDF regimens, but lower for the daily gel regimen.

12. Stall, R., et al. **"Overview of the University of Pittsburgh/amfAR Training Program in HIV Prevention Research for MSM and Male-to-Female Transgender Populations in Low- and Middle-Income Countries."** *AIDS Behav* 2016 20(Suppl 3): 426-436.

Gay men, other men who have sex with men and transgender (GMT) populations suffer a disproportionate burden of HIV disease around the globe, which is directly attributable to the virulently homophobic environments in which many GMT people live. In addition to the direct effects of homophobia on GMT individuals, the ongoing marginalization of GMT people has meant that there is limited social capital on which effective HIV prevention and care programs can be built in many low- and middle-income countries (LMIC). Thus, meaningful responses meant to address the dire situation of GMT populations in LMIC settings must include a combination of bold and innovative approaches if efforts to end the epidemic are to have any chance of making a real difference. The HIV Scholars Program at the University of Pittsburgh's Center for LGBT Health Research is a prime example of a creative and dynamic approach to raising the expertise needed within GMT populations to respond to the global HIV/AIDS pandemic.

13. Ganju, D., et al. **"Stigma, violence and HIV vulnerability among transgender persons in sex work in Maharashtra, India."** *Cult Health Sex* 2017: 1-15.

Among marginalised groups in India, HIV prevalence is highest among transgender persons; however, little is known about their HIV vulnerability. This study describes transgender sex workers' experiences of stigma and violence, a key driver of the HIV epidemic, and explores their coping responses. In-depth interviews were conducted with 68 respondents in Maharashtra state, India. Findings show that respondents face pervasive stigma and violence due to multiple marginalised social identities (transgender status, sex work, gender non-conformity), which reinforce and intersect with social inequities (economic and housing insecurity, employment discrimination, poverty), fuelling HIV vulnerability at the micro, meso and macro levels. Several factors, such as felt and internalised stigma associated with psycho-social distress and low self-efficacy to challenge abuse and negotiate condom use; clients' power in sexual transactions; establishing trust in regular partnerships through condomless sex; norms condoning violence against gender non-conforming persons; lack of community support; police harassment; health provider discrimination and the sex work environment create a context for HIV vulnerability. In the face of such adversity, respondents adopt coping strategies to shift power relations and mobilise against abuse. Community mobilisation interventions, as discussed in the paper, offer a promising vulnerability reduction strategy to safeguard transgender sex workers' rights and reduce HIV vulnerability.

14. Chakrapani, V., et al. **"Syndemics of depression, alcohol use, and victimisation, and their association with HIV-related sexual risk among men who have sex with men and transgender women in India."** *Glob Public Health* 2017 12(2): 250-265.

We examined the presence and co-occurrence of psychosocial health conditions (depression, frequent alcohol use, and victimisation) among men who have sex with men (MSM) and transgender (TG) women in India, and their cumulative association with sexual risk. A survey questionnaire was administered among a convenience sample of 600 participants (MSM = 300; TG women = 300) recruited through six non-governmental organisations in four states. Prevalences of the number of psychosocial health conditions among MSM were: none = 31.3%, one = 43%, two = 20%, and three = 5.7%; and among TG women: none = 9%; one = 35.33%, two = 38.33%, and three = 17.33%. In bivariate and multivariate models, these conditions were positively and additively related to sexual risk, providing evidence for a syndemic of psychosocial health conditions among MSM and TG women and their synergistic effect on sexual risk. In addition to the number of syndemic conditions, resilient coping and social support were significant predictors of sexual risk among MSM and TG women, respectively. HIV preventive interventions in India should screen for and address co-

occurring psychosocial health conditions - experiences of violence, mental health issues, and alcohol use - among MSM and TG women.

15. Grinsztejn, B., et al. **"Unveiling of HIV dynamics among transgender women: a respondent-driven sampling study in Rio de Janeiro, Brazil."** *Lancet HIV* 2017.

BACKGROUND: The burden of HIV in transgender women (transwomen) in Brazil remains unknown. We aimed to estimate HIV prevalence among transwomen in Rio de Janeiro and to identify predictors of newly diagnosed HIV infections.

METHODS: We recruited transwomen from Rio de Janeiro, Brazil, by respondent-driven sampling. Eligibility criteria were self-identification as transwomen, being 18 years of age or older, living in Rio de Janeiro or its metropolitan area, and having a valid peer recruitment coupon. We recruited 12 seed participants from social movements and formative focus groups who then used peer recruitment coupons to refer subsequent peers to the study. We categorised participants as HIV negative, known HIV infected, or newly diagnosed as HIV infected. We assessed predictors of newly diagnosed HIV infections by comparing newly diagnosed with HIV-negative participants. We derived population estimates with the Respondent-Driven Sampling II estimator.

FINDINGS: Between Aug 1, 2015, and Jan 29, 2016, we enrolled 345 eligible transwomen. 29.1% (95% CI 23.2-35.4) of participants had no previous HIV testing (adjusted from 60 participants), 31.2% (18.8-43.6) had HIV infections (adjusted from 141 participants), and 7.0% (0.0-15.9) were newly diagnosed as HIV infected (adjusted from 40 participants). We diagnosed syphilis in 28.9% (18.0-39.8) of participants, rectal chlamydia in 14.6% (5.4-23.8), and gonorrhoea in 13.5% (3.2-23.8). Newly diagnosed HIV infections were associated with black race (odds ratio 22.8 [95% CI 2.9-178.9]; $p=0.003$), travesti (34.1 [5.8-200.2]; $p=0.0001$) or transsexual woman (41.3 [6.3-271.2]; $p=0.0001$) gender identity, history of sex work (30.7 [3.5-267.3]; $p=0.002$), and history of sniffing cocaine (4.4 [1.4-14.1]; $p=0.01$).

INTERPRETATION: Our results suggest that transwomen bear the largest burden of HIV among any population at risk in Brazil. The high proportion of HIV diagnosis among young participants points to the need for tailored long-term health-care and prevention services to curb the HIV epidemic and improve the quality of life of transwomen in Brazil.

FUNDING: Brazilian Research Council, National Institute of Allergy and Infectious Diseases, Brazilian Sexually Transmitted Disease/AIDS, and Viral Hepatitis Department of the Brazilian Ministry of Health.

16. Miller, W. M., et al. **"The Where and How for Reaching Transgender Women and Men Who Have Sex with Men with HIV Prevention Services in Guatemala."** *AIDS Behav* 2016.

This study aims to describe the transgender women and men who have sex with men (MSM) missed through venue-based sampling and illustrate how data on venues can be used to prioritize service delivery. Respondent-driven sampling (RDS) and time-location sampling (TLS) were used concurrently in 2010 for behavioral surveillance among MSM and transgender women in Guatemala City. RDS recruits who did not frequent venues ($n = 106$) were compared to TLS recruits ($n = 609$). TLS participants recruited at different types of venues were compared. RDS recruits who did not frequent venues were less educated, less likely to identify as gay, more likely to have concurrent partners and female sexual partners. Participants recruited at NGOs, saunas, hotels, streets and parks had more partners, were more likely to receive money for sex or have concurrent partners. Prevention programs for MSM and transgender women should characterize social venues and people that frequent them and improve service coverage through venues and social networks.

[Back to top](#)

Young Key Populations - 5

1. Aung, P. P., et al. **"Effectiveness of an Integrated Community- and Clinic-Based Intervention on HIV Testing, HIV Knowledge, and Sexual Risk Behavior of Young Men Who Have Sex With Men in Myanmar."** *J Adolesc Health* 2017 60(2s2): S45-s53.

PURPOSE: Young men who have sex with men (YMSM) in Myanmar are disproportionately affected by HIV, with prevalence five times that of the general population. The Link Up project implemented an intervention using peer education and outreach providing education and counseling on health seeking around sexually transmitted infections and reproductive health, combined with focused clinic capacity building to improve the sexual and reproductive health of YMSM. This study aimed to evaluate the effectiveness and acceptability of the intervention.

METHODS: Using a mixed-methods approach, and employing a quasi-experimental design, we conducted two quantitative repeat cross-sectional surveys in purposively selected control (no intervention) and intervention townships, before and after implementation of the Link Up intervention. Respondent-driven sampling was used to recruit YMSM aged 15-24 years, and study participants were administered a structured questionnaire assessing intervention exposure, health service access, knowledge of HIV, and sexual risk behavior. Focus group discussions were held to elicit perspectives on the use and acceptability of the health services and peer outreach.

RESULTS: At baseline, 314 YMSM were recruited in the intervention townships and 309 YMSM in the control townships. At end line, 267 (intervention) and 318 (control) YMSM were recruited. Coverage of the program was relatively low, with one-third of participants in the intervention townships having heard of the Link Up program by the end line. Comparing changes between baseline and end line, a greater proportion of HIV-negative or unknown status YMSM accessed HIV testing in the past 3 months in intervention townships (from 45.0% to 57.1%) compared with those in control townships (remained at 29.0%); however, this difference in the effect over time was not statistically significant in multivariate modeling (adjusted odds ratio: 1.45; 95% confidence interval: .66-3.17). Qualitative findings showed that the intervention was acceptable to YMSM.

CONCLUSIONS: Overall, the intervention was perceived as acceptable. Although not statistically significant, results showed some trends toward improvements among YMSM in accessing HIV testing services and HIV-related knowledge. The modest coverage and short time frame of the evaluation likely limits the ability for any significant behavioral improvements.

2. Stackpool-Moore, L., et al. **"Linking Sexual and Reproductive Health and Rights and HIV Services for Young People: The Link Up Project."** *J Adolesc Health* 2017 60(2s2): S3-s6.

Sexual health and access to services are a pressing need for young people. This article introduces Link Up, a 3-year project in three African and two Asian countries, to enable and scale up access to integrated HIV services and sexual and reproductive health and rights for marginalized young people. The young people we worked with in this project included young men who have sex with men, young sex workers, young people who use drugs, young transgender people, young homeless people, and other vulnerable young people. The research and programmatic activities of Link Up, as illustrated in this Supplement, have highlighted the importance of recognizing and engaging with diversity among young people to improve access to services and outcomes protecting their health and human rights.

3. McClair, T. L., et al. **"Paying for Sex by Young Men Who Live on the Streets in Dhaka City: Compounded Sexual Risk in a Vulnerable Migrant Community."** *J Adolesc Health* 2017 60(2s2): S29-s34.

PURPOSE: Dhaka City is home to thousands of migrants from Bangladesh's rural areas who often live in the streets. Prior studies examine street youth's practice of selling sex as a survival mechanism. We assess their less-studied practice of paying for sex and its association with sexual risk behaviors and outcomes.

METHODS: As part of the global Link Up project, trained interviewers recruited 447 young men who live on the streets, ages 15-24, from seven Dhaka City "hotspots" to participate in a survey about sexual health. Among those who ever had sex, we examined frequencies and conducted bivariate analyses of sociodemographic characteristics by paying for sex status. We then conducted bivariate and multivariate logistic regression analyses of paying for sex in the last 12 months and sexual health behaviors and outcomes.

RESULTS: Median participant age was 18 years. Among those who ever had sex (N = 321), 80% reported paying for sex in the last 12 months and 15% reported selling sex in the last 12 months. In multivariate analyses, those who paid for sex had significantly increased odds of reporting sexually transmitted infection-related symptoms in the last six months (adjusted odds ratio = 1.76, 95% confidence interval [CI] = 1.17-2.64) and engaging in unprotected last sex with a nonprimary partner (adjusted odds ratio = 2.19, CI = 1.58-3.03).

CONCLUSIONS: The adverse factors associated with paying for sex among young men who live on the streets in Dhaka City highlight the need for programs to educate on HIV/sexually transmitted infection prevention and promote condom use, STI screening/treatment, and HIV testing in this population.

4. Anand, T., et al. **"A qualitative study of Thai HIV-positive young men who have sex with men and transgender women demonstrates the need for eHealth interventions to optimize the HIV care continuum."** *AIDS Care* 2017: 1-6.

In Thailand, young men who have sex with men (YMSM) and transgender women (TG) are disproportionately affected by HIV and have suboptimal care continuum outcomes. Although Thai YMSM and young TG are early adopters of emerging technologies and have high Internet and technology access and utilization, the potential of technology has not been harnessed to optimize the HIV treatment cascade. We interviewed 18 behaviorally HIV-infected YMSM and young TG regarding care challenges, identified how eHealth could address care needs, and elicited preferences for eHealth interventions. Participants reported struggling with individual and societal-level stigma which negatively impacted linkage to and retention in care, and antiretroviral therapy adherence. YMSM and young TG described inadequate in-person support services and heavily relied on random online resources to fill information and support gaps, but sometimes viewed them as untrustworthy or inconsistent. Participants universally endorsed the development of eHealth resources and proposed how they could ameliorate individual-level fears over stigma and improve public perceptions about HIV. Personalized and integrated eHealth interventions with interactive, user-driven structures, credible content, rewards for engagement, real-time counseling and reminder support could help overcome barriers YMSM and young TG face in traditional HIV healthcare systems and have the potential to improve care outcomes.

5. Geibel, S., et al. **"Stigma Reduction Training Improves Healthcare Provider Attitudes Toward, and Experiences of, Young Marginalized People in Bangladesh."** *J Adolesc Health* 2017 60(2s2): S35-s44.

PURPOSE: Working with health providers to reduce HIV stigma in the healthcare setting is an important strategy to improve service utilization and quality of care, especially for young people who are sexually active before marriage, are sexual minorities, or who sell sex. A stigma reduction training program for health providers in Bangladesh was evaluated.

METHODS: A cohort of 300 healthcare providers were given a self-administered questionnaire, then attended a 2-day HIV and sexual and reproductive health and rights training (including a 90-minute session on stigma issues). Six months later, the cohort repeated the survey and participated in a 1-day supplemental training on stigma, which included reflection on personal values and negative impacts of stigma. A third

survey was administered 6 months later. A cross-sectional survey of clients age 15-24 years was implemented before and after the second stigma training to assess client satisfaction with services.

RESULTS: Provider agreement that people living with HIV should be ashamed of themselves decreased substantially (35.3%-19.7%-16.3%; $p < .001$), as did agreement that sexually active young people (50.3%-36.0%-21.7%; $p < .001$) and men who have sex with men (49.3%-38.0%-24.0%; $p < .001$) engage in "immoral behavior." Young clients reported improvement in overall satisfaction with services after the stigma trainings (63.5%-97.6%; $p < .001$).

CONCLUSIONS: This study indicates that a targeted stigma reduction intervention can rapidly improve provider attitudes and increase service satisfaction among young people. More funding to scale up these interventions is needed.

[Back to top](#)