Quarterly Research Digest on HIV and Key Populations

December 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.

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Key Populations General - 7

1. Do, H. T., et al. **"An Alarmingly High Proportion of HIV-1 Isolates Carrying Mutations Corresponding to Resistance to Antiretroviral Drugs among HIV-Positive High-Risk Groups in Central Vietnam: a Substudy of the National Sentinel Survey**." *Jpn J Infect Dis* 2017 70(6): 621-627. Online at: https://www.jstage.jst.go.jp/article/yoken/70/6/70_JJID.2016.512/_pdf

    We studied the prevalence of HIV drug resistance among high-risk groups such as injecting drug users (IDUs), female sex workers (FSWs), and men having sex with men (MSM) in central Vietnam. We used HIV-positive blood samples from 2012-2013 sentinel surveillance surveys. Study subjects were screened for HIV infection by standardized screening assays, and the HIV-positive samples were further tested for HIV viral load and drug-resistance mutations (DRMs) by in-house assays. DRMs were identified using the Stanford University online sequence analysis tool. Their risk behaviors were also investigated. During the study period, 6,016 (high-risk) subjects were screened, and 97 tested positive for HIV infection (IDUs: n = 63, 3.0%; FSWs: n = 24, 0.9%; and MSM: n = 10, 1.0%). Ninety-two of the 97 samples (45 from 2012 and 47 from 2013) were available for further testing. HIV RNA was detected in 56 (60.9%) of the 92 samples, and drug resistance genotyping was successfully performed on 40 (71.4%) samples. All these isolates were subtype CRF01_AE, except for 1 (2.5%) IDU whose HIV belongs to subtype B. Thirteen individuals (32.5%) were carrying HIV with

at least 1 DRM: 9 IDUs, 1 FSW, and 3 MSM. Thus, HIV seroprevalence among high-risk individuals in central Vietnam is low, but a high proportion of drug resistant HIV-1 isolates is observed in the high-risk group.

2. Deuba, K., et al. **"Condom use behaviour among people living with HIV: a seven-country community-based participatory research in the Asia-Pacific region**." *Sex Transm Infect* 2017.

    OBJECTIVES: We examined the prevalence of inconsistent condom use and its correlates among people living with HIV (PLHIV) in the Asia-Pacific region.

    METHODS: Between 1 October 2012 and 31 May 2013, a total of 7843 PLHIV aged 18-50 years were recruited using targeted and venue-based sampling in Bangladesh, Indonesia, Lao People's Democratic Republic (PDR), Nepal, Pakistan, Philippines and Vietnam. Logistic regression was used to explore the association between condom use behaviour and demographics, social support, stigma and discrimination and various health-related variables.

    RESULTS: Overall, 43% of 3827 PLHIV practised inconsistent condom use at sexual intercourse with their regular partner. An even higher proportion, 46% of 2044 PLHIV admitted that they practised unprotected sex with a casual partner. Participants from Lao PDR reported the lowest prevalence of inconsistent condom use for both regular and casual partners, while participants from the Philippines had the highest risk behaviour. Inconsistent condom use was significantly associated with belonging to a key population (drug user, sex worker or refugee subpopulation), not knowing that condoms are still needed if both partners are HIV positive, having a regular partner whose HIV status was either positive or unknown, having experienced physical assault and not receiving antiretroviral treatment.

    CONCLUSIONS: This large seven-country study highlights a high prevalence of inconsistent condom use among PLHIV in the Asia-Pacific region. In addition to knowledge-imparting interventions, the adoption and expansion of the 'Test and Treat' strategy could help to maximise the prevention benefits of antiretroviral treatment.

3. Williams, B. G., et al. **"Dynamics and control of infections on social networks of population types**." *Epidemics* 2017.

    Random mixing in host populations has been a convenient simplifying assumption in the study of epidemics, but neglects important differences in contact rates within and between population groups. For HIV/AIDS, the assumption of random mixing is inappropriate for epidemics that are concentrated in groups of people at high risk, including female sex workers (FSW) and their male clients (MCF), injecting drug users (IDU) and men who have sex with men (MSM). To find out who transmits infection to whom and how that affects the spread and containment of infection remains a major empirical challenge in the epidemiology of HIV/AIDS. Here we develop a technique, based on the routine sampling of infection in linked population groups (a social network of population types), which shows how an HIV/AIDS epidemic in Can Tho Province of Vietnam began in FSW, was propagated mainly by IDU, and ultimately generated most cases among the female partners of MCF (FPM). Calculation of the case reproduction numbers within and between groups, and for the whole network, provides insights into control that cannot be deduced simply from observations on the prevalence of infection. Specifically, the per capita rate of HIV transmission was highest from FSW to MCF, and most HIV infections occurred in FPM, but the number of infections in the whole network is best reduced by interrupting transmission to and from IDU. This analysis can be used to guide HIV/AIDS interventions using needle and syringe exchange, condom distribution and antiretroviral therapy. The method requires only routine data and could be applied to infections in other populations.

4. Schwartz, S. R., et al. **"HIV viral load monitoring among key populations in low- and middle-income countries: challenges and opportunities**." *J Int AIDS Soc* 2017 20 Suppl 7. Online at:
    http://onlinelibrary.wiley.com/doi/10.1002/jia2.25003/epdf

INTRODUCTION: Key populations bear a disproportionate HIV burden and have substantial unmet treatment needs. Routine viral load monitoring represents the gold standard for assessing treatment response at the individual and programme levels; at the population-level, community viral load is a metric of HIV programme effectiveness and can identify "hotspots" of HIV transmission. Nevertheless, there are specific implementation and ethical challenges to effectively operationalize and meaningfully interpret viral load data at the community level among these often marginalized populations.

DISCUSSION: Viral load monitoring enhances HIV treatment, and programme evaluation, and offers a better understanding of HIV surveillance and epidemic trends. Programmatically, viral load monitoring can provide data related to HIV service delivery coverage and quality, as well as inequities in treatment access and uptake. From a population perspective, community viral load data provides information on HIV transmission risk. Furthermore, viral load data can be used as an advocacy tool to demonstrate differences in service delivery and to promote allocation of resources to disproportionately affected key populations and communities with suboptimal health outcomes. However, in order to perform viral load monitoring for individual and programme benefit, health surveillance and advocacy purposes, careful consideration must be given to how such key population programmes are designed and implemented. For example, HIV risk factors, such as particular sex practices, sex work and drug use, are stigmatized or even criminalized in many contexts. Consequently, efforts must be taken so that routine viral load monitoring among marginalized populations does not cause inadvertent harm. Furthermore, given the challenges of reaching representative samples of key populations, significant attention to meaningful recruitment, decentralization of care and interpretation of results is needed. Finally, improving the interoperability of health systems through judicious use of biometrics or identifiers when confidentiality can be maintained is important to generate more valuable data to inform monitoring programmes.

CONCLUSIONS: Opportunities for expanded viral load monitoring could and should benefit all those affected by HIV, including key populations. The promise of the increasing routinization of viral load monitoring as a tool to advance HIV treatment equity is great and should be prioritized and appropriately implemented within key population programmatic and research agendas.

5. Rao, A., et al. **"Sampling Key Populations for HIV Surveillance: Results From Eight Cross-Sectional Studies Using Respondent-Driven Sampling and Venue-Based Snowball Sampling**." *JMIR Public Health Surveill* 2017 3(4): e72. Online at:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5670312/pdf/publichealth_v3i4e72.pdf

BACKGROUND: In using regularly collected or existing surveillance data to characterize engagement in human immunodeficiency virus (HIV) services among marginalized populations, differences in sampling methods may produce different pictures of the target population and may therefore result in different priorities for response.

OBJECTIVE: The objective of this study was to use existing data to evaluate the sample distribution of eight studies of female sex workers (FSW) and men who have sex with men (MSM), who were recruited using different sampling approaches in two locations within Sub-Saharan Africa: Manzini, Swaziland and Yaounde, Cameroon.

METHODS: MSM and FSW participants were recruited using either respondent-driven sampling (RDS) or venue-based snowball sampling. Recruitment took place between 2011 and 2016. Participants at each study site were administered a face-to-face survey to assess sociodemographics, along with the prevalence of self-reported HIV status, frequency of HIV testing, stigma, and other HIV-related characteristics. Crude and RDS-adjusted prevalence estimates were calculated. Crude prevalence estimates from the venue-based snowball samples were compared with the overlap of the RDS-adjusted prevalence estimates, between both FSW and MSM in Cameroon and Swaziland.

RESULTS: RDS samples tended to be younger (MSM aged 18-21 years in Swaziland: 47.6% [139/310] in RDS vs 24.3% [42/173] in Snowball, in Cameroon: 47.9% [99/306] in RDS vs 20.1% [52/259] in Snowball; FSW aged

18-21 years in Swaziland 42.5% [82/325] in RDS vs 8.0% [20/249] in Snowball; in Cameroon 15.6% [75/576] in RDS vs 8.1% [25/306] in Snowball). They were less educated (MSM: primary school completed or less in Swaziland 42.6% [109/310] in RDS vs 4.0% [7/173] in Snowball, in Cameroon 46.2% [138/306] in RDS vs 14.3% [37/259] in Snowball; FSW: primary school completed or less in Swaziland 86.6% [281/325] in RDS vs 23.9% [59/247] in Snowball, in Cameroon 87.4% [520/576] in RDS vs 77.5% [238/307] in Snowball) than the snowball samples. In addition, RDS samples indicated lower exposure to HIV prevention information, less knowledge about HIV prevention, limited access to HIV prevention tools such as condoms, and less-reported frequency of sexually transmitted infections (STI) and HIV testing as compared with the venue-based samples. Findings pertaining to the level of disclosure of sexual practices and sexual practice-related stigma were mixed.

CONCLUSIONS: Samples generated by RDS and venue-based snowball sampling produced significantly different prevalence estimates of several important characteristics. These findings are tempered by limitations to the application of both approaches in practice. Ultimately, these findings provide further context for understanding existing surveillance data and how differences in methods of sampling can influence both the type of individuals captured and whether or not these individuals are representative of the larger target population. These data highlight the need to consider how program coverage estimates of marginalized populations are determined when characterizing the level of unmet need.

6. Cao, B., et al. **"Social Media Interventions to Promote HIV Testing, Linkage, Adherence, and Retention: Systematic Review and Meta-Analysis**." *J Med Internet Res* 2017 19(11): e394. Online at: http://www.jmir.org/2017/11/e394/pdf

BACKGROUND: Social media is increasingly used to deliver HIV interventions for key populations worldwide. However, little is known about the specific uses and effects of social media on human immunodeficiency virus (HIV) interventions.

OBJECTIVE: This systematic review examines the effectiveness of social media interventions to promote HIV testing, linkage, adherence, and retention among key populations.

METHODS: We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist and Cochrane guidelines for this review and registered it on the International Prospective Register of Systematic Reviews, PROSPERO. We systematically searched six databases and three conference websites using search terms related to HIV, social media, and key populations. We included studies where (1) the intervention was created or implemented on social media platforms, (2) study population included men who have sex with men (MSM), transgender individuals, people who inject drugs (PWID), and/or sex workers, and (3) outcomes included promoting HIV testing, linkage, adherence, and/or retention. Meta-analyses were conducted by Review Manager, version 5.3. Pooled relative risk (RR) and 95% confidence intervals were calculated by random-effects models.

RESULTS: Among 981 manuscripts identified, 26 studies met the inclusion criteria. We found 18 studies from high-income countries, 8 in middle-income countries, and 0 in low-income countries. Eight were randomized controlled trials, and 18 were observational studies. All studies (n=26) included MSM; five studies also included transgender individuals. The focus of 21 studies was HIV testing, four on HIV testing and linkage to care, and one on antiretroviral therapy adherence. Social media interventions were used to do the following: build online interactive communities to encourage HIV testing/adherence (10 studies), provide HIV testing services (9 studies), disseminate HIV information (9 studies), and develop intervention materials (1 study). Of the studies providing HIV self-testing, 16% of participants requested HIV testing kits from social media platforms. Existing social media platforms such as Facebook (n=15) and the gay dating app Grindr (n=10) were used most frequently. Data from four studies show that HIV testing uptake increased after social media interventions (n=1283, RR 1.50, 95% CI 1.28-1.76). In the studies where social media interventions were participatory, HIV testing uptake was higher in the intervention arm than the comparison arm (n=1023, RR 1.64, 95% CI 1.19-2.26).

CONCLUSIONS: Social media interventions are effective in promoting HIV testing among MSM in many settings. Social media interventions to improve HIV services beyond HIV testing in low- and middle-income countries and among other key populations need to be considered. TRIAL REGISTRATION: International Prospective Register of Systematic Reviews (PROSPERO): CRD42016048073; http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42016048073 (Archived by WebCite at http://www. webcitation.org/6usLCJK3v).

7. Chhim, S., et al. **"Using risk-tracing snowball approach to increase HIV case detection among high-risk populations in Cambodia: an intervention study**." *BMC Infect Dis* 2017 17(1): 689. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5648448/pdf/12879_2017_Article_2790.pdf

BACKGROUND: Early HIV diagnosis and initiation onto antiretroviral therapy may prevent ongoing spread of HIV. Risk Tracing Snowball Approach (RTSA) has been shown to be effective in detecting new HIV cases in other settings. The main objective of this study is to evaluate the effectiveness of RTSA in increasing the rate of newly identified HIV cases among high-risk populations. Our second objective was to evaluate the effectiveness of RTSA, as compared to the walk-in group, in increasing the number of HIV tests and early case detection.

METHODS: This study was conducted from April 1 to September 30, 2016 at two NGO clinics in Phnom Penh, Cambodia. Respondent driven sampling method was adapted to develop RTSA to reach high-risk populations, including key populations and the general population who have social connections with key populations. Bivariate and multivariate logistic regression analyses were conducted.

RESULTS: During the implementation period, 721 clients walked in for HIV testing (walk-in group), and all were invited to be seeds. Of the invited clients, 36.6% agreed to serve as seeds. Throughout the implementation, 6195 coupons were distributed to seeds or recruiters, and resulted in 1572 clients visiting the two clinics with coupons (RTSA group), for a coupon return rate of 25.3%. The rate of newly identified HIV cases among the RTSA group was significantly lower compared to that in walk-in group. However, the highest number of newly identified HIV cases was found during the implementation period, compared to both pre- and post-implementation period. Although statistically not significant, the mean CD4 count of newly identified HIV cases detected through RTSA was almost 200 cells/mm3 higher than that in the walk-in group.

CONCLUSIONS: Although the rate of newly identified HIV cases among the RTSA group was lower than that in the walk-in group, the inclusion of RTSA in addition to the traditional walk-in method boosted new HIV case detection in the two participating clinics. A higher mean CD4 count for the RTSA group may reveal that RTSA may be able to detect HIV cases earlier than the traditional walk-in approach. Further research is needed to understand whether RTSA is a cost-effective intervention to prevent ongoing spread of the HIV among high-risk populations in Cambodia.

People Who Inject Drugs - 29

1. Do, H. T., et al. **"An Alarmingly High Proportion of HIV-1 Isolates Carrying Mutations Corresponding to Resistance to Antiretroviral Drugs among HIV-Positive High-Risk Groups in Central Vietnam: a Substudy of the National Sentinel Survey**." *Jpn J Infect Dis* 2017 70(6): 621-627. Online at: https://www.jstage.jst.go.jp/article/yoken/70/6/70_JJID.2016.512/_pdf

We studied the prevalence of HIV drug resistance among high-risk groups such as injecting drug users (IDUs), female sex workers (FSWs), and men having sex with men (MSM) in central Vietnam. We used HIV-positive blood samples from 2012-2013 sentinel surveillance surveys. Study subjects were screened for HIV infection by standardized screening assays, and the HIV-positive samples were further tested for HIV viral load and drug-resistance mutations (DRMs) by in-house assays. DRMs were identified using the Stanford University online sequence analysis tool. Their risk behaviors were also investigated. During the study period, 6,016 (high-risk) subjects were screened, and 97 tested positive for HIV infection (IDUs: n = 63, 3.0%; FSWs: n = 24, 0.9%; and MSM: n = 10, 1.0%). Ninety-two of the 97 samples (45 from 2012 and 47 from 2013) were available for further testing. HIV RNA was detected in 56 (60.9%) of the 92 samples, and drug resistance genotyping was successfully performed on 40 (71.4%) samples. All these isolates were subtype CRF01_AE, except for 1 (2.5%) IDU whose HIV belongs to subtype B. Thirteen individuals (32.5%) were carrying HIV with at least 1 DRM: 9 IDUs, 1 FSW, and 3 MSM. Thus, HIV seroprevalence among high-risk individuals in central Vietnam is low, but a high proportion of drug resistant HIV-1 isolates is observed in the high-risk group.

2.   Li, L., et al. **"Antiretroviral therapy adherence and self-efficacy among people living with HIV and a history of drug use in Vietnam**." *Int J STD AIDS* 2017 28(12): 1247-1254.

People living with HIV with a history of drug use face additional psychosocial challenges that could compromise their adherence to antiretroviral therapy (ART). This study examined ART treatment adherence and adherence self-efficacy among people living with HIV with a history of drug use in Vietnam. We used cross-sectional baseline data collected between October 2014 and February 2015 from a randomized controlled trial in Vietnam. Of the 900 persons with a history of drug use in the trial, a sample of 109 people living with HIV currently on ART were included in the study. The vast majority (92%) of the participants reported not missing any medications in the past 30 days. Multiple regression results indicated that social support was positively associated with adherence self-efficacy (beta = 0.420, P < 0.001) and general adherence to ART (beta = 0.201, P = 0.0368). General adherence to ART was negatively associated with depressive symptoms (beta = -0.188, P = 0.046) and current heroin use (beta = -0.196, P = 0.042). These findings underscore the importance of addressing mental health and social challenges facing people living with HIV with a history of drug use to promote ART treatment adherence. Clinical management of HIV should identify and address concurrent substance use behaviors to maximize adherence and treatment outcomes.

3.   Ayon, S., et al. **"Barriers and facilitators of access to HIV, harm reduction and sexual and reproductive health services by women who inject drugs: role of community-based outreach and drop-in centers**." *AIDS Care* 2017: 1-8.

There is limited data regarding women who inject drugs, and how harm-reduction services can be made more women-centered. This study explored experiences of Kenyan women who inject drugs, with regard to access to HIV, harm reduction and sexual and reproductive health (SRH) services. A total of 45 women who inject drugs and 5 key stakeholders participated in-depth interviews and focus group discussions. Thematic analysis of the data revealed that stigma, long distances, lack of confidentiality, user fees, multiple appointments, drug users' unfamiliarity with health facilities, disconnect in communication with healthcare providers, and healthcare providers' lack of understanding of women's needs were factors that impede women's access to health services. Community-based services, comprising of outreach and drop-in centers mitigate these barriers by building trust, educating women on their health and rights, linking women to health facilities, sensitizing health providers on the needs of women who inject drugs, and integrating women's SRH services into community-based harm-reduction outreach. Inclusion of SRH services into community-based harm-reduction activities increased women's interest and access to harm-reduction interventions. These findings underscore the need to strengthen community-based programming for women who inject drugs, and to integrate SRH services into needle and syringe exchange programs.

4.   Ruadze, E., et al. **"Cascade of care among HIV patients diagnosed in 2013 in Georgia: Risk factors for late diagnosis and attrition from HIV care**." *SAGE Open Med* 2017 5: 2050312117731977. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5613841/pdf/10.1177_2050312117731977.pdf

INTRODUCTION: The major challenge in the HIV epidemic in Georgia is a high proportion of undiagnosed people living with HIV (estimated 48%) as well as a very high proportion of late presentations for care, with 66% presenting for HIV care with CD4 count <350 and 40% with <200 cells/mm(3), in 2013. The objectives of this study was to evaluate patient engagement in the continuum of HIV care for HIV patients diagnosed in 2013 and, within this cohort, to evaluate factors associated with late diagnosis and attrition from care.

METHODS: Factors associated with late diagnosis were analyzed through binary logistic regression. Exposure variables were the mode of HIV transmission (injecting drug use, male-to-male contact, and heterosexual contact), gender (male vs female), and age (categorized by median value </=36 vs >36). In addition, CD4 count at diagnosis (cells/mm(3)) (</=350 or >350) together with all above factors were tested for the association with attrition through Poisson regression.

RESULTS: Overall, 317 patients retained in care, representing 65% of those diagnosed (n = 488). Out of eligible 295 patients, 89.5% were on treatment and 84% of those viral load count was measured after 6 months of antiretroviral treatment initiation had HIV-1 viral load <1000 copies/mL. Patients reporting injecting drug use as a route-of HIV transmission had two times the odds (95% confidence interval = 1.34-3.49) to be diagnosed late and patients reporting male-to-male contact as a way of HIV transmission had half the odds (odds ratio = 0.46 (95% confidence interval = 0.26-0.81)) of late diagnosis compared to patients acquiring HIV through heterosexual contact. Patients older than 36 years were more likely to being diagnosed late.

CONCLUSION: More attention should be given to injecting drug users as they represent the most at-risk population for late diagnosis together with older age and attrition.

5.   Toussova, O., et al. **"A Cohort Approach to Real Time Detection of Acute HIV infections among People who Inject Drugs in St. Petersburg, Russia**." *AIDS Res Hum Retroviruses* 2017.

OBJECTIVES: To detect acute HIV infections (AHI) in real time among people who inject drugs (PWID) in St. Petersburg, Russia and to test the feasibility of this approach.

DESIGN: Prospective cohort study.

METHODS: 100 seronegative or acutely HIV-infected at screening PWID were enrolled and followed until the end of the 12 month pilot period. Each participant was evaluated, tested and counseled for HIV monthly. Two HIV tests were used: HIV antibody and HIV RNA PCR. If diagnosed with AHI, participants were followed weekly for a month, then monthly for three months and then quarterly for the duration of the follow-up period. HIV risk behavior was assessed at each study visit.

RESULTS: Most enrolled PWID were 30-39 years old, male, completed high school or more, not employed full time, heroin users, and frequently shared injection paraphernalia. AHI prevalence at screening was 1.8% (95% CI: 0.4, 5.5). Three participants with AHI at enrollment represented 3% (95% CI: 0.6, 8.5) of the 100 participants who consented to enroll. Among the HIV-uninfected participants (n=97), the AHI incidence over time was 9.3 per 100 person-years. Persons with AHI were more likely to report alcohol intoxication within the prior 30 days.

CONCLUSIONS: This was the first study to detect AHI using a cohort approach. The approach proved to be feasible: recruitment, retention, AHI detection and virological endpoints were successfully reached. A cost analysis in a real world setting would be required to determine if this strategy could be brought to scale. The study revealed continued high HIV incidence rate among PWID in St. Petersburg, Russia and the importance of prevention and treatment programs for this group.

6.   Deuba, K., et al. **"Condom use behaviour among people living with HIV: a seven-country community-based participatory research in the Asia-Pacific region**." *Sex Transm Infect* 2017.

OBJECTIVES: We examined the prevalence of inconsistent condom use and its correlates among people living with HIV (PLHIV) in the Asia-Pacific region.

METHODS: Between 1 October 2012 and 31 May 2013, a total of 7843 PLHIV aged 18-50 years were recruited using targeted and venue-based sampling in Bangladesh, Indonesia, Lao People's Democratic Republic (PDR), Nepal, Pakistan, Philippines and Vietnam. Logistic regression was used to explore the association between condom use behaviour and demographics, social support, stigma and discrimination and various health-related variables.

RESULTS: Overall, 43% of 3827 PLHIV practised inconsistent condom use at sexual intercourse with their regular partner. An even higher proportion, 46% of 2044 PLHIV admitted that they practised unprotected sex with a casual partner. Participants from Lao PDR reported the lowest prevalence of inconsistent condom use for both regular and casual partners, while participants from the Philippines had the highest risk behaviour. Inconsistent condom use was significantly associated with belonging to a key population (drug user, sex worker or refugee subpopulation), not knowing that condoms are still needed if both partners are HIV positive, having a regular partner whose HIV status was either positive or unknown, having experienced physical assault and not receiving antiretroviral treatment.

CONCLUSIONS: This large seven-country study highlights a high prevalence of inconsistent condom use among PLHIV in the Asia-Pacific region. In addition to knowledge-imparting interventions, the adoption and expansion of the 'Test and Treat' strategy could help to maximise the prevention benefits of antiretroviral treatment.

7. West, B. S., et al. **"Contraceptive Use Among HIV-Infected Females with History of Injection Drug Use in St. Petersburg, Russia**." *AIDS Behav* 2017.

Limited research examines family planning for HIV-infected women with a history of injection drug use. We describe modern contraceptive use and its association with heavy drinking and recent injection for HIV-infected females in St. Petersburg, Russia (N = 49): 22.4% (n = 11) used traditional methods and 30.6% (n = 15) reported modern contraceptive use, which consisted primarily of condoms (26.5%, n = 13). Over 63% (n = 31) had an abortion. Observed associations for heavy alcohol use (AOR = 2.36, CI = 0.53, 12.41) and recent injection drug use (AOR = 2.88, CI = 0.60, 16.92) were clinically notable, but not statistically significant. Prioritizing family planning for HIV-infected women with a history of substance use is urgently needed.

8. Cooke, A., et al. **"Convenience without disclosure: a formative research study of a proposed integrated methadone and antiretroviral therapy service delivery model in Dar es Salaam, Tanzania**." *Addict Sci Clin Pract* 2017 12(1): 23. Online at:
    https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5646174/pdf/13722_2017_Article_89.pdf

BACKGROUND: Though timely initiation of antiretroviral therapy (ART) is a vital component of effective HIV prevention, care and treatment, people who inject drugs are less likely to receive ART than their non-drug using counterparts. In an effort to increase access to ART for people who inject drugs, we examined perceived benefits, challenges, and recommendations for implementing an integrated methadone and ART service delivery model at an opioid treatment program (OTP) clinic in Dar es Salaam, Tanzania.

METHODS: We conducted in-depth interviews with 12 providers and 20 HIV-positive patients at the Muhimbili National Hospital OTP clinic in early 2015. We used thematic content analysis to examine patient and provider perspectives of an integrated model.

RESULTS: Respondents perceived that offering on-site CD4 testing and HIV clinical management at the OTP clinic would improve the timeliness and efficiency of the ART eligibility process, make HIV clinical care more convenient, mitigate stigma and discrimination in HIV care and treatment settings, and improve patient monitoring and ART adherence. However, perceived challenges included overburdened OTP clinic staff and

limited space at the clinic to accommodate additional services. Limited privacy at the OTP clinic and its contribution to fear among HIV-positive patients of being stigmatized by their peers at the clinic was a common theme expressed particularly by patients, and often corroborated by providers. Co-dispensing ART and methadone at the clinic's pharmacy window was viewed as a potential deterrent for patients. Providers felt that an electronic health information system would help them better monitor patients' progress, but that this system would need to be integrated into existing health information systems. To address these potential barriers to implementing an integrated model, respondents recommended increasing OTP provider and clinic capacity, offering flexible ART dispensing options, ensuring privacy with ART dispensing, and harmonizing any new electronic health information systems with existing systems.

CONCLUSIONS: An integrated methadone and ART service delivery model at the MNH OTP clinic could improve access to HIV care and treatment for OTP patients. However, specific implementation strategies must ensure that OTP providers are not overburdened and confidentiality of patients is maintained.

9.   Noroozi, M., et al. **"Decomposing Economic Disparities in Risky Sexual Behaviors among People Who Inject Drugs in Tehran: Blinder-Oaxaca Decomposition Analysis**." *Epidemiol Health* 2017. Online at: https://www.e-epih.org/upload/pdf/epih-39-e2017049.pdf

Objectives: To our knowledge, no study yet has assessed systematically the role of economic status on risky sexual behavior among people who inject drugs(PWID) in Iran. In this study,we used a Blinder-Oaxaca (BO)decomposition to explore the relative contributions of inequality in unprotected sex and to decompose it to its determinants among PWID in Tehran.

Methods: Behavioral surveys among PWID were conducted in Tehran the capital city of Iran from November 2016 to April 2017. We employed a cross-sectional design and snowball sampling methodology. We constructed the asset index (weighted by the first PCA factor) using socioeconomic data and then divided the variable into three tertiles. we used Blinder- Oaxaca (BO) method to decompose the economic inequality in unprotected sex.

Results: Out of the 520 recruited individuals, 20 persons had missing data on variables used to define the economic status and so were excluded form analysis. in terms of increasing the likelihood of the unprotected sex, compared to high economic subgroup (OR = 2.7), which led to an increase of the low-high disparity by 5.5 pp (i.e., the largest "share" of 21.4%). The "share" of the constant term indicates that out of the unadjusted total low-high disparity in unprotected sex, 52% was still unexplained by observable characteristics included in the regression model. In terms of unprotected sex, the difference between high- and low-economic groups was 25%.

Conclusion: Increasing NSP coverage and HIV knowledge might be essential to efforts to eliminate inequalities in HIV risk behaviors among PWID.

10.   Noroozi, M., et al. **"Decomposition of Economic Inequality in Needle and Syringe Programs Utilization to its Determinants among Men Who Inject Drugs in Tehran using Blinder-Oaxaca Decomposition Method**." *Subst Use Misuse* 2017: 1-7.

BACKGROUND: According to latest available data there are more of 300,000 people injects drug users (PWID) in Iran.

OBJECTIVES: In this study, we used a Blinder-Oaxaca (BO) decomposition to explore the relative contributions of inequality in utilization of NSPs and to decompose it to its determinants in Teheran.

METHODS: We used data from a cross-sectional survey using snowball sampling to recruit 500 PWID from June to July 2016 in Tehran. Participants were reported injecting drug use in the past month, were able to speak and comprehend Farsi enough to respond to survey questions, and were able to provide informed consent to complete the interview. We used a BO method to decompose the role of economic inequality on

utilization of needle and syringe programs.

RESULTS: A total 520 of clients participated in the study of which data was fully complete for 500. The selected predictor variables (age, education level, marital status, homelessness, HIV risk perception, and HIV knowledge) together explain 54% (8.5% out of 16%) of total inequality in utilization of needle and syringe programs and the remaining 46% constitute the unexplained residual. HIV risk perception status contributed about 38% (3.3% out of 8.5%) to the total health inequality, followed by HIV knowledge (26%) and education level were contributed 20% each, respectively.

CONCLUSION: The results showed that contribution of economic inequalities in utilization of NSPs was primarily explained by the differential effects of HIV risk perception and HIV knowledge among PWID. Reducing HIV risk perception and increasing HIV knowledge might be essential to efforts to eliminate inequalities in access to NSPs among PWID.

11. Williams, B. G., et al. **"Dynamics and control of infections on social networks of population types**." *Epidemics* 2017.

Random mixing in host populations has been a convenient simplifying assumption in the study of epidemics, but neglects important differences in contact rates within and between population groups. For HIV/AIDS, the assumption of random mixing is inappropriate for epidemics that are concentrated in groups of people at high risk, including female sex workers (FSW) and their male clients (MCF), injecting drug users (IDU) and men who have sex with men (MSM). To find out who transmits infection to whom and how that affects the spread and containment of infection remains a major empirical challenge in the epidemiology of HIV/AIDS. Here we develop a technique, based on the routine sampling of infection in linked population groups (a social network of population types), which shows how an HIV/AIDS epidemic in Can Tho Province of Vietnam began in FSW, was propagated mainly by IDU, and ultimately generated most cases among the female partners of MCF (FPM). Calculation of the case reproduction numbers within and between groups, and for the whole network, provides insights into control that cannot be deduced simply from observations on the prevalence of infection. Specifically, the per capita rate of HIV transmission was highest from FSW to MCF, and most HIV infections occurred in FPM, but the number of infections in the whole network is best reduced by interrupting transmission to and from IDU. This analysis can be used to guide HIV/AIDS interventions using needle and syringe exchange, condom distribution and antiretroviral therapy. The method requires only routine data and could be applied to infections in other populations.

12. Vasylyeva, T. I., et al. **"Engagement in sex work does not increase HIV risk for women who inject drugs in Ukraine**." *J Public Health (Oxf)* 2017 39(3): e103-e110.

Background: We studied the association between sex in exchange for money, drugs or goods and HIV for women who inject drugs (WWID) in Ukraine, as previous data on this association from the post-USSR region are contradictory.

Methods: Data come from the Integrated Bio-Behavioral Survey of Ukrainian people who inject drugs collected in 2011 using respondent-driven sampling. Participants were interviewed and tested with rapid HIV tests.

Results: The sample included 2465 WWID (24% HIV positive); 214 (8.7%) of which reported having had exchange sex during the last 90 days. Crude analysis showed no association between exchange sex and HIV (OR = 0.644; 95% CI 0.385-1.077). No confounders were found to alter this result in a multivariable analysis. Further modeling showed that exchange sex modifies association between HIV and alcohol use: no association between HIV and daily alcohol use was found for those women who exchanged sex (OR = 1.699, 95% CI 0.737-3.956); while not engaging in sex work and daily using alcohol reduced odds to be HIV infected (OR = 0.586, 95% CI 0.389-0.885).

Conclusions: Exchange sex may have less impact on the HIV status of WWID who are exposed to injecting

risks. The finding that daily alcohol use appears protective against HIV among WWID who do not exchange sex requires more research.

13. Paraschiv, S., et al. **"Epidemic dispersion of HIV and HCV in a population of co-infected Romanian injecting drug users**." *PLoS One* 2017 12(10): e0185866. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5633171/pdf/pone.0185866.pdf

Co-infections with HIV and HCV are very frequent among people who inject drugs (PWID). However, very few studies comparatively reconstructed the transmission patterns of both viruses in the same population. We have recruited 117 co-infected PWID during a recent HIV outbreak in Romania. Phylogenetic analyses were performed on HIV and HCV sequences in order to characterize and compare transmission dynamics of the two viruses. Three large HIV clusters (2 subtype F1 and one CRF14_BG) and thirteen smaller HCV transmission networks (genotypes 1a, 1b, 3a, 4a and 4d) were identified. Eighty (65%) patients were both in HIV and HCV transmission chains and 70 of those shared the same HIV and HCV cluster with at least one other patient. Molecular clock analysis indicated that all identified HIV clusters originated around 2006, while the origin of the different HCV clusters ranged between 1980 (genotype 1b) and 2011 (genotypes 3a and 4d). HCV infection preceded HIV infection in 80.3% of cases. Coincidental transmission of HIV and HCV was estimated to be rather low (19.65%) and associated with an outbreak among PWID during detention in the same penitentiary. This study has reconstructed and compared the dispersion of these two viruses in a PWID population.

14. Degenhardt, L., et al. **"Global prevalence of injecting drug use and sociodemographic characteristics and prevalence of HIV, HBV, and HCV in people who inject drugs: a multistage systematic review**." *Lancet Glob Health* 2017 5(12): e1192-e1207. Online at: http://www.sciencedirect.com/science/article/pii/S2214109X17303753/pdfft?md5=a2df323f08cdd6ba123f1544478785e7&pid=1-s2.0-S2214109X17303753-main.pdf

BACKGROUND: Sharing of equipment used for injecting drug use (IDU) is a substantial cause of disease burden and a contributor to blood-borne virus transmission. We did a global multistage systematic review to identify the prevalence of IDU among people aged 15-64 years; sociodemographic characteristics of and risk factors for people who inject drugs (PWID); and the prevalence of HIV, hepatitis C virus (HCV), and hepatitis B virus (HBV) among PWID.

METHODS: Consistent with the GATHER and PRISMA guidelines and without language restrictions, we systematically searched peer-reviewed databases (MEDLINE, Embase, and PsycINFO; articles published since 2008, latest searches in June, 2017), searched the grey literature (websites and databases, searches between April and August, 2016), and disseminated data requests to international experts and agencies (requests sent in October, 2016). We searched for data on IDU prevalence, characteristics of PWID, including gender, age, and sociodemographic and risk characteristics, and the prevalence of HIV, HCV, and HBV among PWID. Eligible data on prevalence of IDU, HIV antibody, HBsAg, and HCV antibody among PWID were selected and, where multiple estimates were available, pooled for each country via random effects meta-analysis. So too were eligible data on percentage of PWID who were female; younger than 25 years; recently homeless; ever arrested; ever incarcerated; who had recently engaged in sex work, sexual risk, or injecting risk; and whose main drugs injected were opioids or stimulants. We generated regional and global estimates in line with previous global reviews.

FINDINGS: We reviewed 55 671 papers and reports, and extracted data from 1147 eligible records. Evidence of IDU was recorded in 179 of 206 countries or territories, which cover 99% of the population aged 15-64 years, an increase of 31 countries (mostly in sub-Saharan Africa and the Pacific Islands) since a review in 2008. IDU prevalence estimates were identified in 83 countries. We estimate that there are 15.6 million (95% uncertainty interval [UI] 10.2-23.7 million) PWID aged 15-64 years globally, with 3.2 million (1.6-5.1 million) women and 12.5 million (7.5-18.4 million) men. Gender composition varied by location: women were estimated to comprise 30.0% (95% UI 28.5-31.5) of PWID in North America and 33.4% (31.0-35.6) in Australasia, compared with 3.1% (2.1-4.1) in south Asia. Globally, we estimate that 17.8% (10.8-24.8) of PWID

are living with HIV, 52.3% (42.4-62.1) are HCV-antibody positive, and 9.0% (5.1-13.2) are HBV surface antigen positive; there is substantial geographic variation in these levels. Globally, we estimate 82.9% (76.6-88.9) of PWID mainly inject opioids and 33.0% (24.3-42.0) mainly inject stimulants. We estimate that 27.9% (20.9-36.8) of PWID globally are younger than 25 years, 21.7% (15.8-27.9) had recently (within the past year) experienced homelessness or unstable housing, and 57.9% (50.5-65.2) had a history of incarceration.

INTERPRETATION: We identified evidence of IDU in more countries than in 2008, with the new countries largely consisting of low-income and middle-income countries in Africa. Across all countries, a substantial number of PWID are living with HIV and HCV and are exposed to multiple adverse risk environments that increase health harms. FUNDING: Australian National Drug and Alcohol Research Centre, Australian National Health and Medical Research Council, Open Society Foundation, World Health Organization, the Global Fund, and UNAIDS.

15. Larney, S., et al. **"Global, regional, and country-level coverage of interventions to prevent and manage HIV and hepatitis C among people who inject drugs: a systematic review**." *Lancet Glob Health* 2017 5(12): e1208-e1220. Online at: http://www.sciencedirect.com/science/article/pii/S2214109X1730373X/pdfft?md5=868ee5e420cdc4c2559c611d16c93ae9&pid=1-s2.0-S2214109X1730373X-main.pdf

BACKGROUND: People who inject drugs (PWID) are a key population affected by the global HIV and hepatitis C virus (HCV) epidemics. HIV and HCV prevention interventions for PWID include needle and syringe programmes (NSP), opioid substitution therapy (OST), HIV counselling and testing, HIV antiretroviral therapy (ART), and condom distribution programmes. We aimed to produce country-level, regional, and global estimates of coverage of NSP, OST, HIV testing, ART, and condom programmes for PWID.

METHODS: We completed searches of peer-reviewed (MEDLINE, Embase, and PsycINFO), internet, and grey literature databases, and disseminated data requests via social media and targeted emails to international experts. Programme and survey data on each of the named interventions were collected. Programme data were used to derive country-level estimates of the coverage of interventions in accordance with indicators defined by WHO, UNAIDS, and the UN Office on Drugs and Crime. Regional and global estimates of NSP, OST, and HIV testing coverage were also calculated. The protocol was registered on PROSPERO, number CRD42017056558.

FINDINGS: In 2017, of 179 countries with evidence of injecting drug use, some level of NSP services were available in 93 countries, and there were 86 countries with evidence of OST implementation. Data to estimate NSP coverage were available for 57 countries, and for 60 countries to estimate OST coverage. Coverage varied widely between countries, but was most often low according to WHO indicators (<100 needle-syringes distributed per PWID per year; <20 OST recipients per PWID per year). Data on HIV testing were sparser than for NSP and OST, and very few data were available to estimate ART access among PWID living with HIV. Globally, we estimate that there are 33 (uncertainty interval [UI] 21-50) needle-syringes distributed via NSP per PWID annually, and 16 (10-24) OST recipients per 100 PWID. Less than 1% of PWID live in countries with high coverage of both NSP and OST (>200 needle-syringes distributed per PWID and >40 OST recipients per 100 PWID).

INTERPRETATION: Coverage of HIV and HCV prevention interventions for PWID remains poor and is likely to be insufficient to effectively prevent HIV and HCV transmission. Scaling up of interventions for PWID remains a crucial priority for halting the HIV and HCV epidemics. FUNDING: Open Society Foundations, The Global Fund, WHO, UNAIDS, United Nations Office on Drugs and Crime, Australian National Drug and Alcohol Research Centre, University of New South Wales Sydney.

16. Khatib, A., et al. **"HIV and hepatitis B and C co-infection among people who inject drugs in Zanzibar**." *BMC Public Health* 2017 17(1): 917. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5706423/pdf/12889_2017_Article_4933.pdf

BACKGROUND: People who inject drugs are at high risk of acquiring hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV) due to risky injection and sexual practices. The objective of this study is to investigate the epidemiology of HIV, hepatitis B, and hepatitis C, and co-infection of these viruses among people who inject drugs in Zanzibar, Tanzania.

METHODS: We used respondent-driven sampling to identify 408 participants, from whom we collected demographic data, information on sexual behaviours and injection drug practices, and blood samples for biological testing.

RESULTS: Prevalence of hepatitis B surface antigenaemia, HCV, and HIV infection were 5.9, 25.4, and 11.3%, respectively. Of the participants who were hepatitis B surface antigen (HBsAg) positive, 33.5% were infected with HCV and 18.8% were infected with HIV. Of the HCV-infected participants, 29.3% were infected with HIV. Of the participants who were infected with HIV, 9.0% were HBsAg positive, 66.6% had HCV and 8.5% had both. None of the potential risk factors we measured were associated with HBsAg positivity. In contrast, older age and longer duration of injection drug use were independently associated with HCV infection. HCV infection among people who inject drugs is lower in Zanzibar than in other countries, but could rise without proper interventions.

CONCLUSIONS: These findings underscore the importance of screening people who inject drugs for HIV, HBsAg, and HCV; providing HBV vaccination to those who are eligible; initiating antiretroviral therapy for those who are co-infected with HIV/HBV and HIV/HCV; and introducing interventions that have high impact on reducing needle sharing.

17.   Li, L., et al. **"HIV Disclosure and Unprotected Sex Among Vietnamese Men with a History of Drug Use**." *AIDS Behav* 2017 21(9): 2634-2640.

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.

18.   Dinesha, T. R., et al. **"HIV, HBV and HCV prevalence among high risk populations in South India**." *AIDS Res Hum Retroviruses* 2017.

HBV and HCV coinfection with HIV has become a major concern for the survival of HIV patients. HBV, HCV coinfection with HIV is less reported in risk population especially in India. Persons presenting for HIV testing at a large testing center in Chennai, India were screened for HIV, HBV, and HCV infections with serologic testing. Prevalence of these infections was compared between heterosexual and injection drugs using (IDU) risk groups. Of 1612 persons presenting for testing, 502 (31%) were HIV infected, 131 (8%) were HBV infected and 618 (38%) were HCV infected. HIV/HBV, HIV/HCV and HBV/HCV co-infections were seen in 2%, 16% and 2% respectively. HIV/HBV/HCV triple infection was seen in 2% of participants. Except HIV infection, HBV, HCV and other coinfections were significantly associated with IDUs (p <0.05). The prevalence of HIV infection was higher among those reporting heterosexual risk than IDU risk and the prevalence of HBV infection was low among the HIV infected. As might be expected, the overall prevalence of HIV, HBV and HCV co-infections were high among IDU risk participants.

19.   Yu, J., et al. **"Implementation of a "County-Township-Village" Allied HIV Prevention and Control Intervention in Rural China**." *AIDS Patient Care STDS* 2017 31(9): 384-393.

In China, rural areas are a weak link of HIV/AIDS prevention and control. From September 2011, an innovative "county-township-village" allied intervention was implemented in Longzhou County, Guangxi, which assigned the tasks of HIV/AIDS prevention and control to the county Centers for Disease Control and Prevention (CDC), township hospitals, and village clinics, respectively, instead of traditional intervention in which the county CDC undertook the entire work. A 6-year consecutive cross-sectional survey, including 3-year traditional intervention (2009-2011) and 3-year innovative intervention (2012-2014), was conducted to evaluate the effects of the new intervention. Compared to traditional intervention, the innovative intervention achieved positive effects in decreasing risky behaviors. Among female sex workers, condom use rate in the last month increased from 72.06% to 96.82% (p < 0.01). Among drug users, having commercial sex rate in the last year reduced from 17.20% to 5.94% and condom use rate increased from 14.06% to 76.09% (p < 0.01). The risk ratio of HIV infection during innovative intervention was 0.631 (95% confidence interval 0.549-0.726) compared with traditional one. Cost-effectiveness analysis indicates that innovative intervention restores each disability-adjusted life year costing an average of $124.26. Taken together, Longzhou's innovative intervention has achieved good effects on HIV/AIDS prevention and control and provides a good reference for rural China.

20.	Guise, A., et al. **"Integrated opioid substitution therapy and HIV care: a qualitative systematic review and synthesis of client and provider experiences**." *AIDS Care* 2017 29(9): 1119-1128.

People who use drugs in many contexts have limited access to opioid substitution therapy and HIV care. Service integration is one strategy identified to support increased access. We reviewed and synthesized literature exploring client and provider experiences of integrated opioid substitution therapy and HIV care to identify acceptable approaches to care delivery. We systematically reviewed qualitative literature. We searched nine bibliographic databases, supplemented by manual searches of reference lists of articles from the database search, relevant journals, conferences, key organizations and consultation with experts. Thematic synthesis was used to develop descriptive themes in client and provider experiences. The search yielded 11 articles for inclusion, along with 8 expert and policy reports. We identify five descriptive themes: the convenience and comprehensive nature of co-located care, contrasting care philosophies and their role in shaping integration, the limits to disclosure and communication between clients and providers, opioid substitution therapy enabling HIV care access and engagement, and health system challenges to delivering integrated services. The discussion explores how integrated opioid substitution therapy and HIV care needs to adapt to specific social conditions, rather than following universal approaches. We identify priorities for future research. Acceptable integrated opioid substitution therapy and HIV care for people who use drugs and providers is most likely through co-located care and relies upon attention to stigma, supportive relationships and client centred cultures of delivery. Further research is needed to understand experiences of integrated care, particularly delivery in low and middle income settings and models of care focused on community and non-clinic based delivery.

21.	Utami, S., et al. **"Mortality among people living with HIV on antiretroviral treatment in Bali, Indonesia: incidence and predictors**." *Int J STD AIDS* 2017 28(12): 1199-1207.

Indonesia has the third highest number of people living with HIV/AIDS (PLWH) and the greatest increase in proportion of AIDS-related mortality in the Asia Pacific region between 2005 and 2013. Longitudinal mortality data among PLWH in Indonesia are limited. We conducted a retrospective cohort study from medical records of antiretroviral treatment (ART) recipients attending Badung General Hospital (BGH) and Bali Medica Clinic (BMC) between 2006 and 2014. We explored incidence of mortality by Kaplan-Meier analysis and identified predictors using a Cox proportional hazard model. In total, 575 patients were included in the analysis; the majority were male. The overall mortality rate was 10% per year. Multivariate analysis suggested that being male (adjusted hazard ratio [aHR]: 2.74; 95% confidence interval [CI]: 1.34-5.59), having a lower education (aHR: 2.17; 95%CI: 1.31-3.61), having heterosexual (aHR: 7.40; 95% CI: 2.61-21.00) or injecting drug use (aHR: 13.20; 95% CI: 3.17-55.00) as the likely transmission risk category, starting treatment with low CD4 cell counts (aHR: 3.18; 95% CI: 1.16-8.69), and not having a treatment supervisor (aHR: 4.02; 95% CI: 2.44-6.65) were independent predictors of mortality. The mortality was high, particularly in the first

three months after initiating ART. These findings highlight the need to encourage HIV testing and early diagnosis and prompt treatment. Applying aspects of BMCs targeted HIV services model in more generalised services such as BGH may be beneficial. Providing adherence support as part of ART services is key to promoting adherence to ART.

22.   Pokhrel, K. N., et al. **"Predicting health-related quality of life in people living with HIV in Nepal: mental health disorders and substance use determinants**." *AIDS Care* 2017 29(9): 1137-1143.

HIV-positive people often experience mental health disorders and engage in substance use. Such conditions tend to impair their health-related quality of life (QOL). Evidence, however, is limited about the influence of mental health disorders and substance use on QOL by gender. Also, little is known about the influences of anxiety and high levels of stress on QOL. We recruited 682 HIV-positive people in Nepal and measured their depression, anxiety, stress levels, substance use, and QOL. Multiple linear regressions assessed the association of mental health disorders and substance use with QOL. Presence of depressive symptoms was negatively associated with all domains of QOL including the physical (men: beta = -0.68, p = 0.037; women: beta = -1.37, p < 0.001) and the psychological (men: beta = -1.08, p < 0.001; women: beta = -1.13, p < 0.001). Those who experienced anxiety had lower scores in the physical (beta = -0.89, p = 0.027) and psychological (beta = -1.75, p = 0.018) QOL domains among men and in the spiritual QOL domain (beta = -0.061, p = 0.043) among women. High stress levels were associated with lower scores across all QOL domains including the physical (men: beta = -0.16, p < 0.001; women: beta = -0.14, p < 0.001) and the psychological (men: beta = -0.09, p < 0.001; women: beta = -0.10, p < 0.001). Substance-using men were more likely to have lower scores in physical (beta = -0.70, p = 0.039) and psychological (beta = -0.073, p = 0.002) domains. Among women, meanwhile, substance use was negatively associated with the psychological domain only (beta = -0.77, p = 0.005). In conclusion, mental health disorders and substance use had negative associations with QOL. Attention should be given to addressing the mental health care needs of HIV-positive people to improve their QOL.

23.   Solomon, S. S., et al. **"Respondent-driven sampling for identification of HIV- and HCV-infected people who inject drugs and men who have sex with men in India: A cross-sectional, community-based analysis**." *PLoS Med* 2017 14(11): e1002460. Online at:
http://journals.plos.org/plosmedicine/article/file?id=10.1371/journal.pmed.1002460&type=printable

BACKGROUND: A major barrier to achieving ambitious targets for global control of HIV and hepatitis C virus (HCV) is low levels of awareness of infection among key populations such as men who have sex with men (MSM) and people who inject drugs (PWID). We explored the potential of a strategy routinely used for surveillance in these groups, respondent-driven sampling (RDS), to be used as an intervention to identify HIV- and HCV-infected PWID and MSM who are unaware of their status and those who are viremic across 26 Indian cities at various epidemic stages.

METHODS AND FINDINGS: Data were collected as part of the baseline assessment of an ongoing cluster-randomized trial. RDS was used to accrue participants at 27 sites (15 PWID sites and 12 MSM sites) selected to reflect varying stages of the HIV epidemic among MSM and PWID in India. A total of 56 seeds recruited a sample of 26,447 persons (approximately 1,000 participants per site) between October 1, 2012, and December 19, 2013. Across MSM sites (n = 11,997), the median age was 25 years and the median number of lifetime male partners was 8. Across PWID sites (n = 14,450), 92.4% were male, the median age was 30 years, and 87.5% reported injection in the prior 6 months. RDS identified 4,051 HIV-infected persons, of whom 2,325 (57.4%) were unaware of their HIV infection and 2,816 (69.5%) were HIV viremic. It also identified 5,777 HCV-infected persons, of whom 5,337 (92.4%) were unaware that they were infected with HCV and 4,728 (81.8%) were viremic. In the overall sample (both MSM and PWID), the prevalence of HIV-infected persons who were unaware of their status increased with sampling depth, from 7.9% in participants recruited in waves 1 through 5 to 12.8% among those recruited in waves 26 and above (p-value for trend < 0.001). The overall detection rate of people unaware of their HIV infection was 0.5 persons per day, and the detection rate of HIV-infected persons with viremia (regardless of their awareness status) was 0.7 per day. The detection rate of HIV viremic individuals was positively associated with underlying HIV prevalence and the

prevalence of HIV viremia (linear regression coefficient per 1-percentage-point increase in prevalence: 0.05 and 0.07, respectively). The median detection rate of PWID who were unaware of their HCV infection was 2.5 per day. The cost of identifying 1 unaware HIV-infected individual ranged from US$51 to US$2,072 across PWID sites and from US$189 to US$5,367 across MSM sites. The mean additional cost of identifying 1 unaware HCV-infected PWID was US$13 (site range: US$7-US$140). Limitations of the study include the exclusivity of study sites to India, lack of prior HIV/HCV diagnosis confirmation with clinic records, and lack of cost data from other case-finding approaches commonly used in India.

CONCLUSIONS: In this study, RDS was able to rapidly identify at nominal cost a substantial number of unaware and viremic HIV-infected and HCV-infected individuals who were currently not being reached by existing programs and who were at high risk for transmission. Combining RDS (or other network-driven recruitment approaches) with strategies focused on linkage to care, particularly in high-burden settings, may be a viable option for achieving the 90-90-90 targets in key populations in resource-limited settings.

24. Machado, I. K., et al. **"Self-rated health and substance use among individuals in HIV care in Rio de Janeiro, Brazil: a cross-sectional study**." *Int J STD AIDS* 2017 28(12): 1175-1183.

Self-rated health (SRH) is associated with morbidity and mortality in HIV-uninfected populations but is understudied in HIV. Substance use may affect SRH in addition to its deleterious effect on HIV disease. This analysis aimed to estimate SRH and substance use prevalence and evaluate factors associated with poor SRH among individuals in HIV care in Rio de Janeiro, Brazil. A convenience sample of HIV-infected adults completed one item of SRH, the Alcohol, Smoking and Substance Involvement Screening Test, and the Patient Health Questionnaire-2 (PHQ-2). Logistic regression models identified factors associated with poor SRH. Participants' (n = 1029) median age was 42.9 years, 64.2% were male, and 54.5% were nonwhite. Poor SRH was reported by 19.5% and the use of alcohol, tobacco, marijuana, and crack/cocaine by 30.1, 19.5, 3.9, and 3.5%, respectively. Less than high school education (adjusted odds ratio [aOR] 1.54, 95% confidence interval [CI]: 1.08-2.20), lack of sexual activity in previous 12 months (aOR 1.53, 95% CI: 1.01-2.30), crack/cocaine use (aOR 3.82, 95% CI: 1.80-8.09), positive PHQ-2 screen (aOR 3.43, 95% CI: 2.09-5.62), and HIV-1 RNA >/=40 c/ml (aOR 2.51, 95% CI: 1.57-4.02) were significantly associated with poor SRH as identified by logistic regression analyses. Alcohol, marijuana, and sedative use were not significantly associated with poor SRH. These results emphasize the need for substance use and mental health screening and treatment in this population. Further research may elucidate the consequences of poor SRH on treatment adherence, morbidity, and mortality in HIV-infected individuals.

25. Kakchapati, S., et al. **"Social determinants and risk behaviors associated with prevalent Hepatitis C and HIV/HCV co-infection among male injection drug users in Nepal**." *Arch Public Health* 2017 75: 39. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5582397/pdf/13690_2017_Article_206.pdf

BACKGROUND: Nepal is facing double burden of injecting drug use and HIV, yet the problem of Hepatitis C Virus (HCV) has not been so well addressed, where there is large population known to be at risk for HCV. This study assessed the prevalence of HCV infection and HIV/HCV co-infection among male injection drug users (IDUs) in Nepal and identified factors associated with infection.

METHODS: Cross-sectional surveys in 2015 aimed to sample 1045 male IDUs in the Kathmandu valley, Pokhara Valley and Eastern Terai districts of Nepal. Information about socio demographic characteristics, injecting and sexual risk behaviours were obtained, and biological specimens tested for HCV and HIV. The logistic regression model was used to identify the determinants associated with HCV and HIV/HCV co-infection.

RESULTS: HCV prevalence was 28.8% and HIV/HCV co-infection was 4%. Among the 6% of HIV positive male IDUs, 65% were found to be co-infected. The multivariate logistic analysis revealed that HCV prevalence was higher in Eastern Terai districts, longer duration of drug use and injecting drugs and presence of HIV. Similarly, HIV/HCV co-infection was associated with Eastern highway districts, older age and longer duration of injecting drugs.

CONCLUSION: The factors strongly contributing to HCV and HIV/HCV co-infection was longer duration of injecting drugs. Highest HCV and HIV/HCV co-infection was found in Eastern Terai districts. Target health interventions need to be focused in Eastern Terai districts and IDUs with longer duration of injecting drugs for the prevention of HCV and HIV/HCV transmission.

26. Cao, B., et al. **"Social Media Interventions to Promote HIV Testing, Linkage, Adherence, and Retention: Systematic Review and Meta-Analysis**." *J Med Internet Res* 2017 19(11): e394. Online at: http://www.jmir.org/2017/11/e394/pdf

BACKGROUND: Social media is increasingly used to deliver HIV interventions for key populations worldwide. However, little is known about the specific uses and effects of social media on human immunodeficiency virus (HIV) interventions.

OBJECTIVE: This systematic review examines the effectiveness of social media interventions to promote HIV testing, linkage, adherence, and retention among key populations.

METHODS: We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist and Cochrane guidelines for this review and registered it on the International Prospective Register of Systematic Reviews, PROSPERO. We systematically searched six databases and three conference websites using search terms related to HIV, social media, and key populations. We included studies where (1) the intervention was created or implemented on social media platforms, (2) study population included men who have sex with men (MSM), transgender individuals, people who inject drugs (PWID), and/or sex workers, and (3) outcomes included promoting HIV testing, linkage, adherence, and/or retention. Meta-analyses were conducted by Review Manager, version 5.3. Pooled relative risk (RR) and 95% confidence intervals were calculated by random-effects models.

RESULTS: Among 981 manuscripts identified, 26 studies met the inclusion criteria. We found 18 studies from high-income countries, 8 in middle-income countries, and 0 in low-income countries. Eight were randomized controlled trials, and 18 were observational studies. All studies (n=26) included MSM; five studies also included transgender individuals. The focus of 21 studies was HIV testing, four on HIV testing and linkage to care, and one on antiretroviral therapy adherence. Social media interventions were used to do the following: build online interactive communities to encourage HIV testing/adherence (10 studies), provide HIV testing services (9 studies), disseminate HIV information (9 studies), and develop intervention materials (1 study). Of the studies providing HIV self-testing, 16% of participants requested HIV testing kits from social media platforms. Existing social media platforms such as Facebook (n=15) and the gay dating app Grindr (n=10) were used most frequently. Data from four studies show that HIV testing uptake increased after social media interventions (n=1283, RR 1.50, 95% CI 1.28-1.76). In the studies where social media interventions were participatory, HIV testing uptake was higher in the intervention arm than the comparison arm (n=1023, RR 1.64, 95% CI 1.19-2.26).

CONCLUSIONS: Social media interventions are effective in promoting HIV testing among MSM in many settings. Social media interventions to improve HIV services beyond HIV testing in low- and middle-income countries and among other key populations need to be considered. TRIAL REGISTRATION: International Prospective Register of Systematic Reviews (PROSPERO): CRD42016048073; http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42016048073 (Archived by WebCite at http://www. webcitation.org/6usLCJK3v).

27. Verdery, A. M., et al. **"Social Network Clustering and the Spread of HIV/AIDS Among Persons Who Inject Drugs in 2 Cities in the Philippines**." *J Acquir Immune Defic Syndr* 2017 76(1): 26-32.

INTRODUCTION: The Philippines has seen rapid increases in HIV prevalence among people who inject drugs. We study 2 neighboring cities where a linked HIV epidemic differed in timing of onset and levels of prevalence. In Cebu, prevalence rose rapidly from below 1% to 54% between 2009 and 2011 and remained high through 2013. In nearby Mandaue, HIV remained below 4% through 2011 then rose rapidly to 38% by

2013.

OBJECTIVES: We hypothesize that infection prevalence differences in these cities may owe to aspects of social network structure, specifically levels of network clustering. Building on previous research, we hypothesize that higher levels of network clustering are associated with greater epidemic potential.

METHODS: Data were collected with respondent-driven sampling among men who inject drugs in Cebu and Mandaue in 2013. We first examine sample composition using estimators for population means. We then apply new estimators of network clustering in respondent-driven sampling data to examine associations with HIV prevalence.

RESULTS: Samples in both cities were comparable in composition by age, education, and injection locations. Dyadic needle-sharing levels were also similar between the 2 cities, but network clustering in the needle-sharing network differed dramatically. We found higher clustering in Cebu than Mandaue, consistent with expectations that higher clustering is associated with faster epidemic spread.

CONCLUSIONS: This article is the first to apply estimators of network clustering to empirical respondent-driven samples, and it offers suggestive evidence that researchers should pay greater attention to network structure's role in HIV transmission dynamics.

28.   Li, M., et al. **"Spatial distribution of HIV, HCV, and co-infections among drug users in the southwestern border areas of China (2004-2014): a cohort study of a national methadone maintenance treatment program**." *BMC Public Health* 2017 17(1): 759. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5622551/pdf/12889_2017_Article_4769.pdf

BACKGROUND: A methadone maintenance treatment (MMT) program to curb the dual epidemics of HIV/AIDS and drug use has been administered by China since 2004. Little is known regarding the geographic heterogeneity of HIV and hepatitis C virus (HCV) infections among MMT clients in the resource-constrained context of Chinese provinces, such as Guangxi. This study aimed to characterize the geographic distribution patterns and co-clustered epidemic factors of HIV, HCV and co-infections at the county level among drug users receiving MMT in Guangxi Zhuang Autonomous Region, located in the southwestern border area of China.

METHODS: Baseline data on drug users' demographic, behavioral and biological characteristics in the MMT clinics of Guangxi Zhuang Autonomous Region during the period of March 2004 to December 2014 were obtained from national HIV databases. Residential addresses were entered into a geographical information system (GIS) program and analyzed for spatial clustering of HIV, HCV and co-infections among MMT clients at the county level using geographic autocorrelation analysis and geographic scan statistics.

RESULTS: A total of 31,015 MMT clients were analyzed, and the prevalence of HIV, HCV and co-infections were 13.05%, 72.51% and 11.96% respectively. Both the geographic autocorrelation analysis and geographic scan statistics showed that HIV, HCV and co-infections in Guangxi Zhuang Autonomous Region exhibited significant geographic clustering at the county level, and the Moran's I values were 0.33, 0.41 and 0.30, respectively (P < 0.05). The most significant high-risk overlapping clusters for these infections were restricted to within a 10.95 km(2) radius of each of the 13 locations where P county was the cluster center. These infections also co-clustered with certain characteristics, such as being unmarried, having a primary level of education or below, having used drugs for more than 10 years, and receptive sharing of syringes with others. The high-risk clusters for these characteristics were more likely to reside in the areas surrounding P county.

CONCLUSIONS: HIV, HCV and co-infections among MMT clients in Guangxi Zhuang Autonomous Region all presented substantial geographic heterogeneity at the county level with a number of overlapping significant clusters. The areas surrounding P county were effective in enrolling high-risk clients in their MMT programs which, in turn, might enable people who inject drugs to inject less, share fewer syringes, and receive referrals for HIV or HCV treatment in a timely manner.

29.   Zhang, A., et al. **"What Would an HIV Cure Mean to You: Qualitative Analysis from a Crowdsourcing Contest in Guangzhou, China**." *AIDS Res Hum Retroviruses* 2017.

Much HIV cure social science research has focused on high-income countries. Local key population perspectives, especially from people living with HIV (PLHIV), are needed in low- and middle-income countries. We organized an open contest soliciting responses from key populations, including PLHIV, about what a cure would mean in their lives. Tailored in-person events and social media were used to engage PLHIV, men who have sex with men (MSM), people who inject drugs, and local residents. We received 471 contributions over 4 months. Our thematic analysis showed that many people perceived that a cure would sterilize HIV and bring about new life for PLHIV. Many individuals believed a cure would decrease PLHIV discrimination and many MSM perceived a cure would decrease MSM discrimination. Some participants noted that a cure could help improve interpersonal relations, particularly with families and partners. Many individuals envisioned HIV cure as a panacea to bring about social stability. Some participants also anticipated changes in attitudes toward sex that may result in increased condomless sex. Our findings suggest a continued need for careful management of patient expectations and community engagement.

Men who have Sex with Men - 54

1.   Khumsaen, N., et al. **"Adaptation of the HIV/AIDS Self-Management Education Program for Men Who Have Sex With Men in Thailand: An Application of the ADAPT-ITT Framework**." *AIDS Educ Prev* 2017 29(5): 401-417.

This formative research aimed to describe the use of the ADAPT-ITT framework to modify the HASMEP for use with HIV-positive Thai men who have sex with men (MSM). We selected, adapted, and tested the acceptability and feasibility of the HASMEP intervention for delivery in an HIV clinic in Thailand. We chose to base our adaptation on the HASMEP that was initially developed in South Africa. The ADAPT-ITT framework was used to guide the study. Our adaptation was informed by qualitative data collected during focus groups from 48 participants (40 HIV-positive Thai MSM and 8 health care providers) and online surveys of Thai MSM. Findings of focus groups indicate that the HASMEP is feasible and acceptable when administered to the participants. The result of this work is an adapted HASMEP intervention and training materials. This study provides a strong foundation for further research on HIV/AIDS self-management in HIV-positive MSM.

2.   Do, H. T., et al. **"An Alarmingly High Proportion of HIV-1 Isolates Carrying Mutations Corresponding to Resistance to Antiretroviral Drugs among HIV-Positive High-Risk Groups in Central Vietnam: a Substudy of the National Sentinel Survey**." *Jpn J Infect Dis* 2017 70(6): 621-627. Online at: https://www.jstage.jst.go.jp/article/yoken/70/6/70_JJID.2016.512/_pdf

We studied the prevalence of HIV drug resistance among high-risk groups such as injecting drug users (IDUs), female sex workers (FSWs), and men having sex with men (MSM) in central Vietnam. We used HIV-positive blood samples from 2012-2013 sentinel surveillance surveys. Study subjects were screened for HIV infection by standardized screening assays, and the HIV-positive samples were further tested for HIV viral load and drug-resistance mutations (DRMs) by in-house assays. DRMs were identified using the Stanford University online sequence analysis tool. Their risk behaviors were also investigated. During the study period, 6,016 (high-risk) subjects were screened, and 97 tested positive for HIV infection (IDUs: n = 63, 3.0%; FSWs: n = 24, 0.9%; and MSM: n = 10, 1.0%). Ninety-two of the 97 samples (45 from 2012 and 47 from 2013) were

available for further testing. HIV RNA was detected in 56 (60.9%) of the 92 samples, and drug resistance genotyping was successfully performed on 40 (71.4%) samples. All these isolates were subtype CRF01_AE, except for 1 (2.5%) IDU whose HIV belongs to subtype B. Thirteen individuals (32.5%) were carrying HIV with at least 1 DRM: 9 IDUs, 1 FSW, and 3 MSM. Thus, HIV seroprevalence among high-risk individuals in central Vietnam is low, but a high proportion of drug resistant HIV-1 isolates is observed in the high-risk group.

3.   Pina, C., et al. **"Antiretroviral Treatment Uptake and Adherence Among Men Who Have Sex With Men and Transgender Women With HIV in Mumbai, India: A Cross-Sectional Study**." *J Assoc Nurses AIDS Care* 2017.

4.   Daniels, J., et al. **"Assessing the Feasibility of Smartphone Apps for HIV-Care Research with MSM and Transgender Individuals in Mpumalanga, South Africa**." *J Int Assoc Provid AIDS Care* 2017 16(5): 433-439.

There is an urgent need to develop the HIV treatment cascade for men who have sex with men (MSM) and transgender individuals in rural Mpumalanga, South Africa. Mhealth tools such as smartphone applications have the potential to support HIV self-care behaviors. We conducted an exploratory study with HIV-positive community leaders to understand their current uses of cell phones and smartphones and to assess their interest in an HIV research study that utilized a smartphone application for HIV care support. A total of 18 community leaders were recruited to complete a questionnaire and focus group. We found that a large proportion of participants had smartphone access and were interested in a research study that utilized a smartphone application with secure access measures. We conclude that smartphone applications for HIV care research are feasible based on access and interest by MSM and transgender individuals in this rural setting.

5.   Cummings, B., et al. **"Bisexual and Bidirectional: Assessing the Potential for HIV Bridging in Mozambique**." *AIDS Behav* 2017.

African men who have sex with men (MSM) frequently, and often concurrently, have female partners, raising concerns about HIV sexual bridging. We explored potential HIV transmission in Mozambique from and to female partners of MSM focusing on preferred anal sex role and circumcision status. Data collected in a respondent-driven sampling study of MSM in 2011 in Maputo and Beira. Men who had oral or anal sex with other men 12 months prior completed a questionnaire and consented for HIV testing. Statistical analysis explored demographic/risk characteristics and associations among circumcision status, anal sex with men, sexual positions during anal sex with men and vaginal or anal sex with women. We identified 326 MSM in Maputo and 237 in Beira with both male and female partners 3 months before the study. Of these, 20.8% in Maputo and 36.0% in Beira had any receptive anal sex with men 12 months prior, including 895 unprotected sexual acts with males in Maputo and 692 in Beira. Uncircumcised and exclusively insertive males, 27.7% of the sample in Maputo and 33.6% in Beira, had the most unprotected sex with females: 1159 total acts in Maputo and 600 in Beira. Sexual bridging between MSM and women likely varies geographically and is probably bi-directional, occurring within a generalized epidemic where HIV prevalence is higher among reproductive-age women than MSM. Prevention strategies emphasizing correct and consistent condom use for all partners and circumcision for bisexual men should be considered.

6.   Kushwaha, S., et al. **""But the moment they find out that you are MSM...": a qualitative investigation of HIV prevention experiences among men who have sex with men (MSM) in Ghana's health care system**." *BMC Public Health* 2017 17(1): 770. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5627492/pdf/12889_2017_Article_4799.pdf

BACKGROUND: The prevalence of HIV in Ghana is 1.3%, compared to 17% among men who have sex with men (MSM). There is limited empirical data on the current health care climate and its impact on HIV prevention services for Ghanaian MSM. The purposes of this study were to investigate (1) MSM's experiences using HIV prevention resources, (2) what factors, including health care climate factors, influenced MSM's use of prevention resources and (3) MSM self-identified strategies for improving HIV/sexually transmitted infection (STI) prevention among MSM in Ghanaian communities.

METHODS: We conducted 22 focus groups (n = 137) with peer social networks of MSM drawn from three geographic communities in Ghana (Accra, Kumasi, Manya Krobo). The data were examined using qualitative content analysis. Interviews with individual health care providers were also conducted to supplement the analysis of focus group findings to provide more nuanced illuminations of the experiences reported by MSM.

RESULTS: There were four major findings related to MSM experiences using HIV prevention resources: (1) condom quality is low, condom access is poor, and condom use is disruptive, (2) inaccurate information undermines HIV testing (3), stigma undermines HIV testing, and (4) positive attitudes towards HIV prevention exist among MSM. The main healthcare climate factors that affected prevention were that MSM were not free to be themselves, MSM were not understood by healthcare providers, and that MSM did not feel that healthcare providers cared about them. To improve HIV prevention MSM suggested increased education tailored to MSM should be provided to enable self-advocacy and that education and awareness are needed to protect human rights of MSM in Ghana.

CONCLUSION: MSM in Ghana are exposed to negative health care climates. Health care spaces that are unsupportive of MSM's autonomy undermine the uptake of prevention measures such as condoms, HIV testing, and accurate sexual health education. These findings contribute to knowledge to inform development of HIV prevention interventions for MSM in Ghana, such as culturally appropriate sexual health education, and digital technology to connect individuals with resources supportive of MSM.

7.   Ong, J. J., et al. **"Coercion And Hiv Self-Testing In Men Who Have Sex With Men: Implementation Data From A Cross-Sectional Survey In China**." *J Acquir Immune Defic Syndr* 2017.

8.   Semple, S. J., et al. **"Correlates of condomless anal sex among men who have sex with men (MSM) in Tijuana, Mexico: The role of public sex venues**." *PLoS One* 2017 12(10): e0186814. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5655432/pdf/pone.0186814.pdf

Condomless anal sex between male partners is the primary risk factor for HIV transmission among men who have sex with men (MSM). Correlates of condomless anal sex have been well-studied in developed countries, but they have received less attention in lower-to-middle income countries (LMIC), where MSM are often subject to stigma, discrimination, intolerance, and even the criminalization of same sex behavior. In Mexico, a LMIC where traditional views on homosexuality are common, HIV prevalence among MSM is high (16.9%), yet little research has been conducted on the correlates of condomless anal sex in this high-risk population. The present study examined correlates of condomless anal sex among 201 MSM recruited in Tijuana, Mexico, with a focus on the role of public sex venues in relation to sexual risk behavior. Eligibility requirements were: biologically male, 18 years of age or older, resident of Tijuana, and self-reported anal or oral sex with a male partner in the past year. Participants completed an interviewer-administered, demographic and psychosocial survey, and were tested for HIV and syphilis. A hierarchical multiple linear regression model was tested to identify correlates of condomless anal sex. Thirty-eight percent of participants (N = 76) reported condomless anal sex with a male partner in the past 2 months. Higher levels of condomless anal sex were associated with higher levels of depressive symptoms, greater sexual compulsivity, and more frequent seeking out of sex partners in a public venue in the past 2 months. In view of these findings, we recommend the development of multi-level, "combination" interventions, which in the Mexican context should include enhanced condom promotion and distribution, improved availability and access to mental health treatment and counseling services, and expanded HIV/STI testing in public venues.

9.   Williams, B. G., et al. **"Dynamics and control of infections on social networks of population types**." *Epidemics* 2017.

Random mixing in host populations has been a convenient simplifying assumption in the study of epidemics, but neglects important differences in contact rates within and between population groups. For HIV/AIDS, the assumption of random mixing is inappropriate for epidemics that are concentrated in groups of people at high risk, including female sex workers (FSW) and their male clients (MCF), injecting drug users (IDU) and men who have sex with men (MSM). To find out who transmits infection to whom and how that affects the

spread and containment of infection remains a major empirical challenge in the epidemiology of HIV/AIDS. Here we develop a technique, based on the routine sampling of infection in linked population groups (a social network of population types), which shows how an HIV/AIDS epidemic in Can Tho Province of Vietnam began in FSW, was propagated mainly by IDU, and ultimately generated most cases among the female partners of MCF (FPM). Calculation of the case reproduction numbers within and between groups, and for the whole network, provides insights into control that cannot be deduced simply from observations on the prevalence of infection. Specifically, the per capita rate of HIV transmission was highest from FSW to MCF, and most HIV infections occurred in FPM, but the number of infections in the whole network is best reduced by interrupting transmission to and from IDU. This analysis can be used to guide HIV/AIDS interventions using needle and syringe exchange, condom distribution and antiretroviral therapy. The method requires only routine data and could be applied to infections in other populations.

10. Weikum, D., et al. **"An explanatory factor analysis of a brief self-report scale to detect neurocognitive impairment among HIV-positive men who have sex with men and transgender women in Peru**." *AIDS Care* 2017 29(10): 1297-1301.

Neurocognitive impairment (NCI) has been associated with poor clinical outcomes in various patient populations. This study used exploratory factor analysis (EFA) to examine the factor structure of the existing 95-item Neuropsychological Impairment Scale (NIS) to create a suitable NCI screening instrument for people living with HIV (PLH). In Lima, Peru, 313 HIV-positive men who have sex with men (MSM) and transgender women (TGW) prescribed antiretroviral therapy (ART) completed the NIS using computer-assisted self-interviews (CASI). The EFA used principal axis factoring and orthogonal varimax rotation, which resulted in 42 items with an 8-factor solution that explained 51.8% of the overall variance. The revised, 8-factor, Brief Inventory of Neurocognitive Impairment for Peru (BINI-P) showed a diverse set of factors with excellent to good reliability (i.e., F1 alpha = 0.92 to F8 alpha = 0.78). This EFA supports the use of the BINI-P to screen for NCI among Spanish-speaking, HIV-positive MSM and TGW. Future research should examine the effectiveness of the BINI-P in detecting NCI in clinical care settings and the impact of NCI on HIV health-related outcomes, including linkage and retention in care, ART adherence and HIV risk behaviors.

11. Gomes, R., et al. **"[Factors associated with low knowledge on HIV/AIDS among men who have sex with men in Brazil]**." *Cad Saude Publica* 2017 33(10): e00125515. Online at:
http://www.scielo.br/pdf/csp/v33n10/1678-4464-csp-33-10-e00125515.pdf

This cross-sectional study analyzed social vulnerability, individual, and programmatic factors associated with low knowledge on HIV/AIDS among men who have sex with men (MSM). Respondent Driven Sampling (RDS) was used in 10 Brazilian cities. Knowledge scores on HIV/AIDS were estimated by Item Response Theory and categorized in three levels: high, medium, and low knowledge. Ordinal logistic regression was used for the analysis. Of the 3,746 MSM, 36.6%, 37.4%, and 26% showed high, medium, and low knowledge, respectively. The following were associated with low knowledge in the final model: schooling </= 8 years, non-white skin color, economic classes C and D-E, age < 25 years, having only one sex partner, and no previous HIV test. It is essential to improve knowledge on HIV/AIDS among young MSM with low socioeconomic status. Interventions focused on programmatic vulnerability factors can help reduce individual and social risk.

12. Magno, L., et al. **"Factors associated with self-reported discrimination against men who have sex with men in Brazil**." *Rev Saude Publica* 2017 51: 102. Online at:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5697921/pdf/0034-8910-rsp-S1518-51-87872017051000016.pdf

OBJECTIVE: To estimate self-reported discrimination due to sexual orientation among men who have sex with men (MSM) in Brazil and to analyze associated factors.

METHODS: A cross-sectional study of 3,859 MSM recruited in 2008-2009 with respondent driven sampling. Data collection conducted in health centers in 10 Brazilian cities. A face-to-face questionnaire was used and rapid HIV and syphilis tests conducted. Aggregated data were weighted and adjusted odds ratio estimated

to measure the association between selected factors and self-reported discrimination due to sexual orientation.

RESULTS: The sample was predominantly young, eight plus years of schooling, pardo (brown), single, low-income, and identified themselves as gay or homosexual. The prevalence of self-reported discrimination due to sexual orientation was 27.7% (95%CI 26.2-29.1). Discrimination was independently associated with: age < 30 years, more years of schooling, community involvement and support, history of sexual and physical violence, suicidal thoughts, and unprotected receptive anal intercourse.

CONCLUSIONS: The prevalence of self-reported discrimination among MSM in Brazil is high. These results challenge the assumptions that MSM-specific prevention and support programs are not required or that health professionals do not need special training to address MSM needs.

13.   Wang, C., et al. **"Generalisability of an online randomised controlled trial: an empirical analysis**." *J Epidemiol Community Health* 2017.

BACKGROUND: Investigators increasingly use online methods to recruit participants for randomised controlled trials (RCTs). However, the extent to which participants recruited online represent populations of interest is unknown. We evaluated how generalisable an online RCT sample is to men who have sex with men in China.

METHODS: Inverse probability of sampling weights (IPSW) and the G-formula were used to examine the generalisability of an online RCT using model-based approaches. Online RCT data and national cross-sectional study data from China were analysed to illustrate the process of quantitatively assessing generalisability. The RCT (identifier NCT02248558) randomly assigned participants to a crowdsourced or health marketing video for promotion of HIV testing. The primary outcome was self-reported HIV testing within 4 weeks, with a non-inferiority margin of -3%.

RESULTS: In the original online RCT analysis, the estimated difference in proportions of HIV tested between the two arms (crowdsourcing and health marketing) was 2.1% (95% CI, -5.4% to 9.7%). The hypothesis that the crowdsourced video was not inferior to the health marketing video to promote HIV testing was not demonstrated. The IPSW and G-formula estimated differences were -2.6% (95% CI, -14.2 to 8.9) and 2.7% (95% CI, -10.7 to 16.2), with both approaches also not establishing non-inferiority.

CONCLUSIONS: Conducting generalisability analysis of an online RCT is feasible. Examining the generalisability of online RCTs is an important step before an intervention is scaled up. TRIAL REGISTRATION NUMBER: NCT02248558.

14.   Hakim, A., et al. **"High Prevalence of Concurrent Male-Male Partnerships in the Context of Low Human Immunodeficiency Virus Testing Among Men Who Have Sex With Men in Bamako, Mali**." *Sex Transm Dis* 2017 44(9): 565-570.

BACKGROUND: Concurrent male-male sexual partnerships have been understudied in sub-Saharan Africa and are especially important because human immunodeficiency virus (HIV) prevalence and acquisition probability are higher among men who have sex with men (MSM) than among heterosexual men and women.

METHODS: We conducted a respondent-driven sampling survey of 552 men who have sex with men in Bamako, Mali from October 2014 to February 2015. Eligibility criteria included 18 years or older, history of oral or anal sex with another man in the last 6 months, residence in or around Bamako in the last 6 months, ability to communicate in French.

RESULTS: HIV prevalence was 13.7%, with 86.7% of MSM with HIV unaware of their infection. Concurrent male-male sexual partnerships were common, with 60.6% of MSM having a concurrent male sexual

partnerships or believing their sex partner did in the last 6 months, and 27.3% having a concurrent male sexual partnerships and believing their sex partner did in the last 6 months. Over half (52.5%) of MSM had sex with women, and 30.8% had concurrent male partnerships and sex with a woman in the last 6 months. Concurrency was more likely among MSM with limited education, telling only MSM of same-sex behaviors, high social cohesion, and not knowing anyone with HIV.

CONCLUSIONS: The high proportion of HIV-infected MSM in Bamako who are unaware of their HIV infection and the high prevalence of concurrent partnerships could further the spread of HIV in Bamako. Increasing testing through peer educators conducting mobile testing could improve awareness of HIV status and limit the spread of HIV in concurrent partnerships.

15. Mmbaga, E. J., et al. **"Hiv Prevalence and Associated Risk Factors Among Men Who Have Sex With Men in Dar Es Salaam, Tanzania**." *J Acquir Immune Defic Syndr* 2017.

    INTRODUCTION: Limited studies and differential risk behaviours among men who have sex with men(MSM) in Africa calls for population specific studies. We present results from the largest integrated bio-behavioural survey among MSM in Africa to inform programming.

    METHODS: This was a cross-sectional study utilizing respondent driven sampling to recruit MSM aged 18 and above. Data on socio-demographic characteristics and HIV-related risks were collected and all participants were tested for HIV, Herpes Simplex Virus Type-2 (HSV-2), Hepatitis-B Virus (HBV) and Syphilis.

    RESULTS: A total of 753 MSM with a mean age of 26.5 years participated in the study and 646 (85.7%) gave blood for biological testing. The prevalence of HIV was 22.3%, HSV-2 40.9%, syphilis 1.1 %, and HBV 3.25%. Significant risk factors for HIV were age above 25, having no children (aOR), 2.4, 95% CI: 1.4-4.2), low HIV-risk perception (aOR, 2.6, 95% CI: 1.2-5.3), receptive position (aOR, 8.7; 95% CI 1.2-5.3), and not using water-based lubricants (aOR, 2.6, 95% CI: 1.0-4.5) during last anal sex. Also associated with HIV infection was, having sexual relationships with women (aOR, 8.0, 95% CI: 4.1-15.6), engaging in group sex (aOR, 3.8, 95% CI: 1.6-8.4), HSV-2 seropositivity (aOR, 4.1, 95% CI: 2.6- 6.5) and history of genital ulcers (aOR, 4.1, 95% CI: 1.1-7.2).

    CONCLUSIONS: HIV infection and HSV-2 were highly prevalent among MSM. Low perceived HIV risk, practice of risk behaviours and infection with HSV-2 were significant predictors of HIV infection. Behavioural interventions, HSV-2 suppressive therapies and Pre-exposure Prophylaxis are highly needed.

16. Poteat, T., et al. **"HIV prevalence and behavioral and psychosocial factors among transgender women and cisgender men who have sex with men in 8 African countries: A cross-sectional analysis**." *PLoS Med* 2017 14(11): e1002422. Online at:
    https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5675306/pdf/pmed.1002422.pdf

    INTRODUCTION: Sub-Saharan Africa bears more than two-thirds of the worldwide burden of HIV; however, data among transgender women from the region are sparse. Transgender women across the world face significant vulnerability to HIV. This analysis aimed to assess HIV prevalence as well as psychosocial and behavioral drivers of HIV infection among transgender women compared with cisgender (non-transgender) men who have sex with men (cis-MSM) in 8 sub-Saharan African countries.

    METHODS AND FINDINGS: Respondent-driven sampling targeted cis-MSM for enrollment. Data collection took place at 14 sites across 8 countries: Burkina Faso (January-August 2013), Cote d'Ivoire (March 2015-February 2016), The Gambia (July-December 2011), Lesotho (February-September 2014), Malawi (July 2011-March 2012), Senegal (February-November 2015), Swaziland (August-December 2011), and Togo (January-June 2013). Surveys gathered information on sexual orientation, gender identity, stigma, mental health, sexual behavior, and HIV testing. Rapid tests for HIV were conducted. Data were merged, and mixed effects logistic regression models were used to estimate relationships between gender identity and HIV infection. Among 4,586 participants assigned male sex at birth, 937 (20%) identified as transgender or female, and

3,649 were cis-MSM. The mean age of study participants was approximately 24 years, with no difference between transgender participants and cis-MSM. Compared to cis-MSM participants, transgender women were more likely to experience family exclusion (odds ratio [OR] 1.75, 95% CI 1.42-2.16, p < 0.001), rape (OR 1.95, 95% CI 1.63-2.36, p < 0.001), and depressive symptoms (OR 1.30, 95% CI 1.12-1.52, p < 0.001). Transgender women were more likely to report condomless receptive anal sex in the prior 12 months (OR 2.44, 95% CI 2.05-2.90, p < 0.001) and to be currently living with HIV (OR 1.81, 95% CI 1.49-2.19, p < 0.001). Overall HIV prevalence was 25% (235/926) in transgender women and 14% (505/3,594) in cis-MSM. When adjusted for age, condomless receptive anal sex, depression, interpersonal stigma, law enforcement stigma, and violence, and the interaction of gender with condomless receptive anal sex, the odds of HIV infection for transgender women were 2.2 times greater than the odds for cis-MSM (95% CI 1.65-2.87, p < 0.001). Limitations of the study included sampling strategies tailored for cis-MSM and merging of datasets with non-identical survey instruments.

CONCLUSIONS: In this study in sub-Saharan Africa, we found that HIV burden and stigma differed between transgender women and cis-MSM, indicating a need to address gender diversity within HIV research and programs.

17.   Heimer, R., et al. **"HIV Risk, Prevalence, and Access to Care Among Men Who Have Sex with Men in Lebanon**." *AIDS Res Hum Retroviruses* 2017 33(11): 1149-1154.

Little is known about HIV prevalence and risk among men who have sex with men (MSM) in much of the Middle East, including Lebanon. Recent national-level surveillance has suggested an increase in HIV prevalence concentrated among men in Lebanon. We undertook a biobehavioral study to provide direct evidence for the spread of HIV. MSM were recruited by respondent-driven sampling, interviewed, and offered HIV testing anonymously at sites located in Beirut, Lebanon, from October 2014 through February 2015. The interview questionnaire was designed to obtain information on participants' sociodemographic situation, sexual behaviors, alcohol and drug use, health, HIV testing and care, and experiences of stigma and discrimination. Individuals not reporting an HIV diagnosis were offered optional, anonymous HIV testing. Among the 292 MSM recruited, we identified 36 cases of HIV (12.3%). A quarter of the MSM were born in Syria and recently arrived in Lebanon. Condom use was uncommon; 65% reported condomless sex with other men. Group sex encounters were reported by 22% of participants. Among the 32 individuals already aware of their infection, 30 were in treatment and receiving antiretroviral therapy. HIV prevalence was substantially increased over past estimates. Efforts to control future increases will have to focus on reducing specific risk behaviors and experience of stigma and abuse, especially among Syrian refugees.

18.   Hojilla, J. C., et al. **"HIV sero disclosure among men who have sex with men and transgender women on HIV pre-exposure prophylaxis**." *AIDS Care* 2017: 1-7.

HIV pre-exposure prophyalxis (PrEP) might lead individuals to view serodisclosure as unnecessary. We examined the prevalence of non-disclosure and lack of knowledge of partner status in a global cohort of men who have sex with men (MSM) and transgender women (TW) enrolled in the iPrEx Open Label Extension (OLE). We calculated prevalence ratios by fitting a logistic model and estimating predicted probabilities using marginal standardization. Prevalence of non-disclosure and lack of knowledge of partner status were highest in Thailand (73% and 74%, respectively) and lowest in the USA (23% and 37%, respectively). In adjusted analyses, PrEP use was not significantly associated with non-disclosure or lack of knowledge of partner status (p-values>0.05). We found that relationship characteristics were significantly associated with both outcomes. Non-disclosure was higher among casual (adjusted prevalence ratio [aPR] 1.54, [95% confidence interval 1.24-1.84]) and transactional sex partners (aPR 2.03, [1.44-2.62]), and among partners whom participants have known only minutes or hours before their first sexual encounter (aPR 1.62, [1.33-1.92]). Similarly, participants were less likely to know the HIV status of casual partners (aPR 1.50, [1.30-1.71]), transactional sex partners (aPR 1.62, [1.30-1.95]), and those they have known for only days or weeks (aPR 1.13, [0.99-1.27]) or minutes or hours (aPR 1.27, [1.11-1.42]). Our findings underscore the role of dyadic factors in influencing serodisclosure. Comprehensive risk reduction counseling provided in conjunction with PrEP that address relationship characteristics are needed to help patients navigate discussions around HIV status.

19. Szwarcwald, C. L., et al. **"HIV Testing among men in Curitiba, Brazil**." *AIDS Care* 2018 30(1): 56-58.

In 2015, a community-wide intervention was launched in the city of Curitiba to evaluate the uptake of multiple HIV testing. A three-stage cluster sampling of 4800 men aged 15-64 years was selected in Curitiba. Logistic regression models were used to establish driving factors of HIV testing over the past 12 months. In the total sample, 49.5% have tested for HIV once in lifetime and 18.7% in the last 12 months. Among MSM, the proportions were much higher: 75.9% and 47.8% respectively. In the multivariate analysis, a significantly higher likelihood of HIV testing was found for young men (15-24 years), men with better educational level, those with more than 6 casual partners, and MSM compared to heterosexual men. The results indicate that the intervention to increase HIV diagnosis has substantially expanded MSM access to HIV testing.

20. Liu, Y., et al. **"HIV testing and sexual risks among migrant men who have sex with men: findings from a large cross-sectional study in Beijing, China**." *AIDS Care* 2018 30(1): 86-94.

Despite the exacerbating HIV transmission among migrant men who have sex with men (MSM) in China, few epidemiological studies explore their HIV testing/risk profiles. We sought to explore sociodemographic/behavioral correlates of HIV/syphilis and HIV testing among migrant MSM. A study was conducted among 3,588 HIV-uninfected MSM. Participants were recruited via short message services, peer referral, web-advertisement and community outreach. HIV/syphilis infections were lab-confirmed. Migrant MSM were more likely to be HIV-infected compared to local MSM. Among 2,699 migrant MSM, HIV testing was associated with older age, living longer in Beijing, having >/=10 lifetime male sexual partners (LMSPs), having insertive anal sex; while being unemployed/retired and having condomless receptive anal sex (CRAS) were associated with a lower odds of HIV testing. Being married, living longer in Beijing, ever testing for HIV and having sex with women were associated with lower HIV odds; while being unemployed/retired, having higher HIV perception, having >/= 10 LMSPs and having CRAS were associated a higher HIV odds. Increased likelihood of syphilis was associated with older age, being employed, higher HIV perception, having >/=10 LMSPs and having CRAS. Our study provides implications for targeted interventions to tackle HIV/STI risks and improve HIV testing among migrant Chinese MSM.

21. Maleke, K., et al. **"How social stigma sustains the HIV treatment gap for MSM in Mpumalanga, South Africa**." *Glob Health Promot* 2017.

There are gaps in HIV care for men who have sex with men (MSM) in African settings, and HIV social stigma plays a significant role in sustaining these gaps. We conducted a three-year research project with 49 HIV-positive MSM in two districts in Mpumalanga Province, South Africa, to understand the factors that inform HIV care seeking behaviors. Semi-structured focus group discussions and interviews were conducted in IsiZulu, SiSwati, and some code-switching into English, and these were audio-recorded, transcribed, and translated into English. We used a constant comparison approach to analyze these data. HIV social stigma centered around gossip that sustained self-diagnosis and delayed clinical care with decisions to use traditional healers to mitigate the impact of gossip on their lives. More collaboration models are needed between traditional healers and health professionals to support the global goals for HIV testing and treatment.

22. Galea, J. T., et al. **"HPV knowledge, burden and genital wart location among heterosexually identified versus homosexually identified men who have sex with men in Lima, Peru: cross-sectional results from a cohort study**." *BMJ Open* 2017 7(10): e017338. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5665270/pdf/bmjopen-2017-017338.pdf

OBJECTIVES: The relationship between sexual practices, identity and role among Latino men who have sex with men (MSM) and HIV risk is the subject of ongoing investigation but less is known about how these aspects of sexuality relate to human papilloma-virus (HPV), an independent risk factor for HIV. This observational study investigated the relationship between HPV and sexual practices, identity and role as well as other sexually transmitted infection (STI)/HIV risk factors among HIV-negative heterosexually and

homosexually identified Peruvian MSM.

SETTING: Community-based clinic for MSM in Lima, Peru.

PARTICIPANTS: 756 subjects were screened based on inclusion criteria of: born anatomically male; age >/=18 years; had any anal intercourse with a man during the previous 12 months; residing in metropolitan Lima; HIV negative; willing to commit to twice-yearly clinic visits for 24 months; had not participated in an HIV or HPV vaccine study. 600/756 participants met the inclusion criteria and were enrolled, of whom 48% (284) identified as homosexual and 10% (57) as heterosexual, the basis of the analyses performed.

RESULTS: Compared with homosexually identified MSM, heterosexually identified MSM had completed fewer years of formal education and were less likely to have: anogenital HPV or visible anal warts; given oral sex to a man; or used a condom with their most recent female sexual partner (all p<0.05). Conversely, heterosexually identified MSM were more likely to have: visible penile warts; used a condom during last anal intercourse; smoked cigarettes; had transactional sex; and used drugs during sex in the previous month (all p<0.01). There was no difference found between heterosexually and homosexually identified MSM by syphilis or high-risk HPV prevalence.

CONCLUSIONS: HPV burden, wart type (penile vs anal) and select HIV/STI risk behaviours differed between heterosexually and homosexually identified Peruvian MSM. Understanding the implications of these differences can lead to tailored HIV/STI prevention interventions for heterosexually identified MSM.

TRIAL REGISTRATION NUMBER: NCT01387412.

23. Qian, H. Z., et al. **"Human Immunodeficiency Virus Status Differentially Associated With Genital and Anal Human Papillomavirus Infection Among Chinese Men Who Have Sex With Men: A Cross-Sectional Survey**." *Sex Transm Dis* 2017 44(11): 656-662.

BACKGROUND: Little is known about human papillomavirus (HPV) infection and genotypes when considering both anatomic site and human immunodeficiency virus (HIV) status among men who have sex with men (MSM) in low- and middle-income countries.

METHODS: A cross-sectional study was conducted among MSM in Beijing, China. HIV serostatus was determined, and genital and anal HPV genotyping were performed from respective swabs.

RESULTS: Of 1155 MSM, 817 (70.7%) had testing for genital (611; 52.9%) and/or anal (671; 58.1%) HPV. Preference for insertive anal sex (adjusted odds ratio [aOR], 2.60; 95% confidence interval [CI], 1.42-4.75) and syphilis (aOR, 1.50; 95% CI, 1.01-2.23) were associated with genital HPV. Inconsistent condom use during receptive anal sex (aOR, 1.82; 95% CI, 1.17-2.84), and HIV seropositivity (aOR, 2.90; 95% CI, 1.91-4.42) were associated with anal HPV. Among 465 (40.3%) MSM with specimens from both anatomic sites, anal HPV (68%) was more common than genital HPV (37.8%). Prevalence of anal HPV was higher among HIV-infected than uninfected MSM (P < 0.01). Some oncogenic HPV types were more commonly found at the anal site of HIV-infected MSM (P < 0.01).

CONCLUSIONS: Human papillomavirus is highly prevalent among Chinese MSM. Anal HPV was more common than genital HPV, and HIV seropositivity was associated with oncogenic HPV types at the anal site.

24. 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 28(10): 1010-1017.

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.

25. Zhang, Z., et al. **"Knowledge, attitude, and status of nitrite inhalant use among men who have sex with men in Tianjin, China**." *BMC Public Health* 2017 17(1): 690. Online at:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5584038/pdf/12889_2017_Article_4696.pdf

BACKGROUND: Nitrite inhalants have become popular as recreational drugs among the homosexual population in some developed countries since the 1980s. These drugs, also called RUSH in China, have become attractive among Chinese men who have sex with men (MSM) in the past few years. The aim of this cross-sectional study was to understand the knowledge, attitude, and status of nitrite inhalant use among Chinese MSM.

METHODS: The study participants were recruited from Tianjin, China between April and August 2012. Information, including demographics, sexual behavior, and RUSH use, was obtained through structured interviewer questionnaires. Blood samples were also collected to identify the status of HIV, HSV, and syphilis infections.

RESULTS: A total of 500 participants were interviewed. Of the participants, 64.0% knew that RUSH could increase sexual pleasure and 38.6% of the participants had used RUSH at least once. The mean duration of RUSH use was 1.5 years. Among the participants who were familiar with RUSH, 60.0% had heard of RUSH for the first time after 2011, 55% received information about RUSH via the internet, and only 42.2% knew the side effects of RUSH. RUSH users were more likely to work in companies (Odds ratio [OR]: 2.61; 95% CI: 1.65-4.12), live with homosexual partners (OR: 1.88; 95% CI: 1.19-2.92), not live alone (OR: 2.26; 95% CI: 1.29-3.96), smoke cigarettes (OR: 1.49; 95% CI: 1.02-2.17), use alcohol (OR: 1.63; 95% CI: 1.12-2.39), and seek sexual partners on the internet (OR: 2.59; 95% CI: 1.50-4.50).

CONCLUSIONS: The impact of RUSH abuse on the expanding HIV epidemic among MSM has been demonstrated in China. Our findings suggest that the communication and awareness of health hazard of recreational drugs should be reinforced in HIV prevention education, especially through new media. Future research is needed to further explore how integrative strategies should be used to reduce the substance abuse and risky sexual behaviors.

26. Freeland, R., et al. **"Measurements of Sexuality-Based Stigma among Gay, Bisexual, and Other Men Who Have Sex with Men (GBMSM) in Resource-Poor Settings: A Review**." *AIDS Behav* 2017.

Gay, bisexual, and other men who have sex with men (GBMSM) in resource-poor settings are disproportionately affected by the HIV/AIDS epidemic. GBMSM living in these settings may face unique barriers to HIV prevention, including legal barriers and increased sexuality-based stigma. It is therefore imperative to tailor HIV prevention and care resources to recognize the lived realities of GBMSM in these settings. Central to this is the accurate measurement of sexuality-based stigma. However, there is wide inconsistency in how sexuality-based stigma is measured among GBMSM in resource-poor settings. This paper reviews recent studies of sexuality-based stigma among GBMSM in resource-poor settings, finding great variability in measurements. The results of the review call for greater attention to the development of contextually and culturally specific measures of sexuality-based stigma for GBMSM living in resource-poor settings.

27.   Fitzgerald-Husek, A., et al. **"Measuring stigma affecting sex workers (SW) and men who have sex with men (MSM): A systematic review**." *PLoS One* 2017 12(11): e0188393. Online at: http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0188393&type=printable

BACKGROUND: Stigma involves discrediting a person or group based on a perceived attribute, behaviour or reputation associated with them. Sex workers (SW) and men who have sex with men (MSM) are key populations who are often at increased risk for the acquisition and transmission of HIV and who are affected by stigma that can negatively impact their health and well-being. Although stigma was included as an indicator in the US National HIV/AIDS Strategic Plan and there have been consultations focused on adding a stigma indicator within PEPFAR and the Global Fund in relation to potentiating HIV risks among key populations, there remains limited consensus on the appropriate measurement of SW- or MSM-associated stigma. Consequently, this systematic review summarizes studies using quantitative, qualitative, or mixed methods approaches to measure stigma affecting sex workers and men who have sex with men.

METHODS AND FINDINGS: This systematic review included English, French, and Spanish peer-reviewed research of any study design measuring SW- or MSM-associated stigma. Articles were published from January 1, 2004 to March 26, 2014 in PsycINFO, PubMed, EMBASE, CINAHL Plus, Global Health, and World Health Organization Global Health Library Regional Indexes. Of the 541 articles reviewed, the majority measured stigma toward MSM (over 97%), were conducted in North America, used quantitative methods, and focused on internalized stigma.

CONCLUSIONS: With the inclusion of addressing stigma in several domestic and international HIV strategies, there is a need to ensure the use of validated metrics for stigma. The field to date has completed limited measurement of stigma affecting sex workers, and limited measurement of stigma affecting MSM outside of higher income settings. Moving forward requires a concerted effort integrating validated metrics of stigma into health-related surveys and programs for key populations.

28.   Stahlman, S., et al. **"Online Sex-Seeking Among Men who have Sex with Men in Nigeria: Implications for Online Intervention**." *AIDS Behav* 2017 21(11): 3068-3077.

The TRUST/RV368 project was undertaken to apply innovative strategies to engage Nigerian MSM into HIV care. In this analysis we evaluate characteristics of online sex-seekers from the TRUST/RV368 cohort of 1370 MSM in Abuja and Lagos. Logistic regression and generalized estimating equation models were used to assess associations with online sex-seeking. Online sex-seeking (n = 843, 61.5 %) was associated with participation in MSM community activities, larger social and sexual networks, and higher levels of sexual behavior stigma. In addition, online sex-seeking was associated with testing positive for HIV at a follow-up visit [adjusted odds ratio (aOR) = 2.02, 95 % confidence interval (CI) = 1.37, 2.98)] among those who were unaware of or not living with HIV at baseline. Across visits, online sex-seekers were marginally more likely to test positive for chlamydia/gonorrhea (aOR 1.28, 95 % CI 0.99, 1.64). Online sex-seekers in Nigeria are at increased risk for HIV/STIs but may not be benefiting from Internet-based risk reduction opportunities.

29.   Wu, F., et al. **"Overcoming HIV Stigma? A Qualitative Analysis of HIV Cure Research and Stigma Among Men Who Have Sex with Men Living with HIV**." *Arch Sex Behav* 2017.

Despite global progress in HIV stigma reduction, persistent HIV stigma thwarts effective HIV service delivery. Advances in HIV biomedical research toward a cure may shift perceptions of people living with HIV and HIV stigma. The purpose of this study was to examine how men who have sex with men (MSM) living with HIV in Guangzhou, China perceive HIV cure research and its potential impact on MSM and HIV stigma. We conducted in-depth interviews with 26 MSM living with HIV about their perceptions of HIV cure research and the potential impact of an HIV cure on their lives. Thematic coding was used to identify themes and structure the analysis. Two overarching themes emerged. First, participants stated that an HIV cure may have a limited impact on MSM-related stigma. Men noted that most stigma toward MSM was linked to stereotypes of promiscuity and high rates of sexual transmitted diseases in the MSM community and might persist even after a cure. Second, participants believed that an HIV cure could substantially reduce enacted, anticipated,

and internalized stigma associated with HIV. These findings suggest that a biomedical cure alone would not remove the layered stigma facing MSM living with HIV. Comprehensive measures to reduce stigma are needed.

30. Rodriguez-Hart, C., et al. **"Pathways from sexual stigma to incident HIV and sexually transmitted infections among Nigerian MSM**." *Aids* 2017 31(17): 2415-2420.

OBJECTIVES: Sexual stigma affecting MSM in Nigeria may be an important driver of HIV and other sexually transmitted infections (STIs), but potential mechanisms through which this occurs are not well understood. This study assessed the contributions of suicidal ideation and sexual risk behaviors to causal pathways between stigma and HIV/STIs.

DESIGN: Data were collected from the TRUST/RV368 Study, a prospective cohort of 1480 MSM from Abuja and Lagos, Nigeria.

METHODS: Participants enrolled from March 2013 to February 2016 were classified into three stigma subgroups based on a latent class analysis of nine stigma indicators. Path analysis was used to test a model where disclosure led to stigma, then suicidal ideation, then condomless sex with casual sex partners, and finally incident HIV infection and/or newly diagnosed STIs, adjusting the model for age, education, having had female sex partners in the past 12 months, and sex position. Both direct and indirect (mediational) paths were tested for significance and analyses were clustered by city.

RESULTS: As stigma increased in severity, the proportion of incident HIV/STI infections increased in a dose-response relationship (low: 10.6%, medium: 14.2%, high 19.0%, P = 0.008). All direct relationships in the model were significant and suicidal ideation and condomless sex partially mediated the association between stigma and incident HIV/STI infection.

CONCLUSION: These findings highlight the importance of the meaningful integration of stigma-mitigation strategies in conjunction with mental health services as part of a broader strategy to reduce STI and HIV acquisitions among Nigerian MSM.

31. Berg, R. C., et al. **"Predictors of HIV Risk Behaviors Among a National Sample of Russian Men Who Have Sex with Men**." *AIDS Behav* 2017 21(10): 2904-2912.

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.

32. Uthappa, C. K., et al. **"Pre-exposure prophylaxis: awareness, acceptability and risk compensation behaviour among men who have sex with men and the transgender population**." *HIV Med* 2017.

OBJECTIVES: This exploratory study examined the facilitators of and barriers to acceptance of pre-exposure prophylaxis (PrEP) and potential risk compensation behaviour emerging from its use among men who have sex with men (MSM) and transgender individuals (TGs) in India.

METHODS: A questionnaire was administered to 400 individuals registered with a targeted intervention programme. Logistic regression models were used to identify facilitators of and barriers to PrEP acceptance.

RESULTS: The respondents consisted of 68% MSM and 32% TGs. Risk behaviour categorization identified 40% as low risk, 41% as medium risk and, 19% as high risk for HIV infection. About 93% of the respondents were unaware of PrEP, but once informed about it, 99% were willing to use PrEP. The facilitators of PrEP acceptance were some schooling [odds ratio (OR) 2.16; P = 0.51], being married or in a live-in relationship (OR 2.08; P = 0.46), having a high calculated risk (OR 3.12; P = 0.33), and having a high self-perceived risk (OR 1.8; P = 0.35). Increasing age (OR 2.12; P = 0.04) was a significant barrier. TGs had higher odds of acceptance of PrEP under conditions of additional cost (OR 2.12; P = 0.02) and once-daily pill (OR 2.85; P = 0.04). Individuals identified as low risk for HIV infection showed lower odds of potential risk compensation, defined as more sexual partners (OR 0.8; P = 0.35), unsafe sex with new partners (OR 0.71; P = 0.16), and decreased condom use with regular partners (OR 0.95; P = 0.84), as compared with medium-risk individuals. The associations, although not statistically significant, are nevertheless important for public health action given the limited scientific evidence on PrEP use among MSM and TGs in India.

CONCLUSIONS: With high acceptability and a low likelihood of risk compensation behaviour, PrEP can be considered as an effective prevention strategy for HIV infection among MSM and TGs in India.

33.   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 28(11): 1115-1123.

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.

34.   Elmahy, A. G. **"Reaching Egyptian Gays Using Social Media: A Comprehensive Health Study and a Framework for Future Research**." *J Homosex* 2017: 1-10.

The Internet has revolutionized research on sexual minorities by providing direct and safe access to hidden, stigmatized, and high-risk populations. This study investigated the possibility of using Facebook to reach Egyptian gays. The questionnaire was manually distributed to an extensive list of Facebook pages and groups related to the topic that has been collected using a snowball-like technique. The recruitment lasted from August 2015 to May 2016. Among the 461 eligible participants, the mean age was 26.6 (SD = 7.6), and the majority (74%) were highly educated. Only 17% use condoms consistently, and 34% have ever tested for HIV. Guilt feelings and trying to change sexual orientation were very high and were associated with higher religiosity and low condom use and HIV testing (p < .05). Also, 10% have ever tried to end their life. Most of the participants did not disclose their sexual orientation to anybody other than their partners, and 60% will not disclose it to health care providers even if needed. The low health awareness among Egyptian gays requires Internet-based health campaigns.

35.   Muessig, K. E., et al. **"Recent mobile health interventions to support medication adherence among HIV-positive MSM**." *Curr Opin HIV AIDS* 2017 12(5): 432-441.

PURPOSE OF REVIEW: We describe recent mobile health (mHealth) interventions supporting antiretroviral therapy (ART) medication adherence among HIV-positive MSM.

RECENT FINDINGS: Keyword searches (1 January 2016-13 May 2017) identified 721 citations. Seven publications reporting on six studies met inclusion criteria. Five studies focused on MSM. Interventions primarily employed text messaging (n = 4), whereas two focused on smartphone apps and one on social media. Three studies measured intervention impact on adherence and found increased ART use intentions (n = 1), self-reported adherence (n = 1), and viral suppression (n = 1, no control group). Other mHealth interventions for HIV-positive MSM focused on status disclosure and reducing sexual risk.

SUMMARY: mHealth interventions to support ART adherence among MSM show acceptability, feasibility, and preliminary efficacy. No recent mHealth interventions for MSM measured impact on viral suppression compared with a control condition despite earlier (pre-2015) evidence for efficacy. Studies are underway that include multiple features designed to improve adherence within complex smartphone or internet-based platforms. Areas for future growth include overcoming measurement and engagement challenges, developing tools for coordinating patient and provider adherence data, testing combination interventions, and adapting efficacious interventions for new languages and geographic settings.

36. Duan, C., et al. **"Recreational drug use and risk of HIV infection among men who have sex with men: A cross-sectional study in Shenzhen, China**." *Drug Alcohol Depend* 2017 181: 30-36.

BACKGROUND: Recreational drug use has increased in recent years, especially among MSM, and has been found to be associated with higher risk of HIV infection. However, there is limited information about current recreational drug use among MSM in Shenzhen which is an international gateway city to China with a rapidly expanding MSM population.

METHODS: A cross-sectional survey among MSM in Shenzhen was conducted and was used to collected information on demographics, sexual behavior and drug use via questionnaires. Serologic results on HIV and syphilis were obtained from laboratory assays. We performed logistic regression analysis to evaluate correlates with drug use.

RESULTS: Among the 1935 MSM surveyed, 12.7% reported use of recreational drugs in the past six months. Rush poppers had become the most frequently used drug (10.6%). Risk factors associated with the use of recreational drugs included being unmarried, non-Han ethnicity, having high education level, seeking male sex partners via the internet, having multiple male sex partners, performing receptive role during anal sex, and having unprotected anal intercourse. Recreational drug use was significantly associated with higher risk of both HIV and syphilis infections (aOR:1.89, 95% CI:1.28-2.79; aOR:1.79, 95% CI:1.25-2.60, respectively).

CONCLUSIONS: Recreational drug use is associated with increased risk of HIV and syphilis infections among MSM in Shenzhen. Rush poppers were the most popular recreational drug. This finding suggests the need for targeted prevention and behavioral intervention programs to control the recreational drug use, and to reduce HIV and other sexually transmitted diseases among MSM in Shenzhen and internationally.

37. Aristegui, I., et al. **"Resources to cope with stigma related to HIV status, gender identity, and sexual orientation in gay men and transgender women**." *J Health Psychol* 2017.

The stigma related to HIV status, gender identity, and sexual orientation has negative implications for the quality of life of individuals. A qualitative study was conducted to explore the resources that these stigmatized groups recognize as tools to cope with stigma and maintain their psychological well-being. Four focus groups were conducted with gay men and transgender women divided by HIV status. A thematic analysis revealed that individual, interpersonal, and institutional resources are commonly recognized as coping resources. This article discusses the importance of enhancing self-acceptance, social support, and a legal framework that legitimizes these groups as right holders.

38. Solomon, S. S., et al. **"Respondent-driven sampling for identification of HIV- and HCV-infected people who inject drugs and men who have sex with men in India: A cross-sectional, community-based**

analysis." *PLoS Med* 2017 14(11): e1002460. Online at:
http://journals.plos.org/plosmedicine/article/file?id=10.1371/journal.pmed.1002460&type=printable

BACKGROUND: A major barrier to achieving ambitious targets for global control of HIV and hepatitis C virus (HCV) is low levels of awareness of infection among key populations such as men who have sex with men (MSM) and people who inject drugs (PWID). We explored the potential of a strategy routinely used for surveillance in these groups, respondent-driven sampling (RDS), to be used as an intervention to identify HIV- and HCV-infected PWID and MSM who are unaware of their status and those who are viremic across 26 Indian cities at various epidemic stages.

METHODS AND FINDINGS: Data were collected as part of the baseline assessment of an ongoing cluster-randomized trial. RDS was used to accrue participants at 27 sites (15 PWID sites and 12 MSM sites) selected to reflect varying stages of the HIV epidemic among MSM and PWID in India. A total of 56 seeds recruited a sample of 26,447 persons (approximately 1,000 participants per site) between October 1, 2012, and December 19, 2013. Across MSM sites (n = 11,997), the median age was 25 years and the median number of lifetime male partners was 8. Across PWID sites (n = 14,450), 92.4% were male, the median age was 30 years, and 87.5% reported injection in the prior 6 months. RDS identified 4,051 HIV-infected persons, of whom 2,325 (57.4%) were unaware of their HIV infection and 2,816 (69.5%) were HIV viremic. It also identified 5,777 HCV-infected persons, of whom 5,337 (92.4%) were unaware that they were infected with HCV and 4,728 (81.8%) were viremic. In the overall sample (both MSM and PWID), the prevalence of HIV-infected persons who were unaware of their status increased with sampling depth, from 7.9% in participants recruited in waves 1 through 5 to 12.8% among those recruited in waves 26 and above (p-value for trend < 0.001). The overall detection rate of people unaware of their HIV infection was 0.5 persons per day, and the detection rate of HIV-infected persons with viremia (regardless of their awareness status) was 0.7 per day. The detection rate of HIV viremic individuals was positively associated with underlying HIV prevalence and the prevalence of HIV viremia (linear regression coefficient per 1-percentage-point increase in prevalence: 0.05 and 0.07, respectively). The median detection rate of PWID who were unaware of their HCV infection was 2.5 per day. The cost of identifying 1 unaware HIV-infected individual ranged from US$51 to US$2,072 across PWID sites and from US$189 to US$5,367 across MSM sites. The mean additional cost of identifying 1 unaware HCV-infected PWID was US$13 (site range: US$7-US$140). Limitations of the study include the exclusivity of study sites to India, lack of prior HIV/HCV diagnosis confirmation with clinic records, and lack of cost data from other case-finding approaches commonly used in India.

CONCLUSIONS: In this study, RDS was able to rapidly identify at nominal cost a substantial number of unaware and viremic HIV-infected and HCV-infected individuals who were currently not being reached by existing programs and who were at high risk for transmission. Combining RDS (or other network-driven recruitment approaches) with strategies focused on linkage to care, particularly in high-burden settings, may be a viable option for achieving the 90-90-90 targets in key populations in resource-limited settings.

39. Hernandez, I., et al. **"Risk Factors Associated With HIV Among Men Who Have Sex With Men (MSM) in Ecuador**." *Am J Mens Health* 2017 11(5): 1331-1341.

The Joint United Nations Program on HIV/AIDS estimates that between 0.3% and 0.7% of adults aged 15 to 49 years were living with HIV in Ecuador in 2013. However, very little is known about the HIV prevalence rate among men who have sex with men (MSM) in that country. A cross-sectional survey was conducted to investigate the knowledge, attitudes, and practices regarding HIV/AIDS as well as to estimate the prevalence of HIV among MSM in one of the cities with high HIV prevalence rates in Ecuador. In this study, questionnaires were administered to 307 adult MSM. An HIV prevalence of 10% was observed. Knowledge about HIV was high; 91% of participants could identify how HIV is transmitted. Although consistent condom use for anal sex was relatively high (89%) among participants who reported having pay-for-service clients, only 64% reported using a condom during oral sex with a client. Participants who had multiple male sexual partners (i.e., their stable male partners plus other partner[s]) had 3.7 times higher odds of testing positive for HIV compared with those who did not. They also had reduced odds of condom use. Participants who were forced to have anal receptive sex had 3 times higher odds of testing positive for HIV. Despite the

finding that participants exhibited high knowledge about HIV/AIDS, a high prevalence rate of HIV was observed, which warrants targeted behavioral interventions. These data are consistent with MSM being one of the highest at-risk population groups for HIV in this region of Ecuador.

40. Rao, A., et al. **"Sampling Key Populations for HIV Surveillance: Results From Eight Cross-Sectional Studies Using Respondent-Driven Sampling and Venue-Based Snowball Sampling**." *JMIR Public Health Surveill* 2017 3(4): e72. Online at:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5670312/pdf/publichealth_v3i4e72.pdf

BACKGROUND: In using regularly collected or existing surveillance data to characterize engagement in human immunodeficiency virus (HIV) services among marginalized populations, differences in sampling methods may produce different pictures of the target population and may therefore result in different priorities for response.

OBJECTIVE: The objective of this study was to use existing data to evaluate the sample distribution of eight studies of female sex workers (FSW) and men who have sex with men (MSM), who were recruited using different sampling approaches in two locations within Sub-Saharan Africa: Manzini, Swaziland and Yaounde, Cameroon.

METHODS: MSM and FSW participants were recruited using either respondent-driven sampling (RDS) or venue-based snowball sampling. Recruitment took place between 2011 and 2016. Participants at each study site were administered a face-to-face survey to assess sociodemographics, along with the prevalence of self-reported HIV status, frequency of HIV testing, stigma, and other HIV-related characteristics. Crude and RDS-adjusted prevalence estimates were calculated. Crude prevalence estimates from the venue-based snowball samples were compared with the overlap of the RDS-adjusted prevalence estimates, between both FSW and MSM in Cameroon and Swaziland.

RESULTS: RDS samples tended to be younger (MSM aged 18-21 years in Swaziland: 47.6% [139/310] in RDS vs 24.3% [42/173] in Snowball, in Cameroon: 47.9% [99/306] in RDS vs 20.1% [52/259] in Snowball; FSW aged 18-21 years in Swaziland 42.5% [82/325] in RDS vs 8.0% [20/249] in Snowball; in Cameroon 15.6% [75/576] in RDS vs 8.1% [25/306] in Snowball). They were less educated (MSM: primary school completed or less in Swaziland 42.6% [109/310] in RDS vs 4.0% [7/173] in Snowball, in Cameroon 46.2% [138/306] in RDS vs 14.3% [37/259] in Snowball; FSW: primary school completed or less in Swaziland 86.6% [281/325] in RDS vs 23.9% [59/247] in Snowball, in Cameroon 87.4% [520/576] in RDS vs 77.5% [238/307] in Snowball) than the snowball samples. In addition, RDS samples indicated lower exposure to HIV prevention information, less knowledge about HIV prevention, limited access to HIV prevention tools such as condoms, and less-reported frequency of sexually transmitted infections (STI) and HIV testing as compared with the venue-based samples. Findings pertaining to the level of disclosure of sexual practices and sexual practice-related stigma were mixed.

CONCLUSIONS: Samples generated by RDS and venue-based snowball sampling produced significantly different prevalence estimates of several important characteristics. These findings are tempered by limitations to the application of both approaches in practice. Ultimately, these findings provide further context for understanding existing surveillance data and how differences in methods of sampling can influence both the type of individuals captured and whether or not these individuals are representative of the larger target population. These data highlight the need to consider how program coverage estimates of marginalized populations are determined when characterizing the level of unmet need.

41. Rodriguez-Hart, C., et al. **"Sexual Stigma Patterns Among Nigerian Men Who Have Sex with Men and Their Link to HIV and Sexually Transmitted Infection Prevalence**." *AIDS Behav* 2017.

Sexual stigma facilitates the spread of HIV and sexually transmitted infections (STIs) but little is known about stigma affecting Nigerian men who have sex with men (MSM). We assessed patterns of sexual stigma across Nigerian MSM and their relationship to HIV and STIs. Data were collected from the TRUST/RV368 Study, a

prospective cohort of 1480 Nigerian MSM enrolled from March 2013 to February 2016 using respondent driven sampling. Structural equation modeling was utilized to assess the association between stigma classes and HIV and STI prevalence, adjusting for participants' characteristics. A dose-response association was found between stigma class and HIV prevalence (27, 40, 55%, overall chi(2) p < 0.001) and STI prevalence (15, 21, 24%, overall chi(2) p = 0.011). These data suggest that stigma mitigation strategies, combined with increased engagement of MSM and retention in the HIV care continuum, need to be a component of interventions focused on reducing HIV transmission risks among MSM in Nigeria.

42.   Cao, B., et al. **"Social Media Interventions to Promote HIV Testing, Linkage, Adherence, and Retention: Systematic Review and Meta-Analysis**." *J Med Internet Res* 2017 19(11): e394. Online at: http://www.jmir.org/2017/11/e394/pdf

BACKGROUND: Social media is increasingly used to deliver HIV interventions for key populations worldwide. However, little is known about the specific uses and effects of social media on human immunodeficiency virus (HIV) interventions.

OBJECTIVE: This systematic review examines the effectiveness of social media interventions to promote HIV testing, linkage, adherence, and retention among key populations.

METHODS: We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist and Cochrane guidelines for this review and registered it on the International Prospective Register of Systematic Reviews, PROSPERO. We systematically searched six databases and three conference websites using search terms related to HIV, social media, and key populations. We included studies where (1) the intervention was created or implemented on social media platforms, (2) study population included men who have sex with men (MSM), transgender individuals, people who inject drugs (PWID), and/or sex workers, and (3) outcomes included promoting HIV testing, linkage, adherence, and/or retention. Meta-analyses were conducted by Review Manager, version 5.3. Pooled relative risk (RR) and 95% confidence intervals were calculated by random-effects models.

RESULTS: Among 981 manuscripts identified, 26 studies met the inclusion criteria. We found 18 studies from high-income countries, 8 in middle-income countries, and 0 in low-income countries. Eight were randomized controlled trials, and 18 were observational studies. All studies (n=26) included MSM; five studies also included transgender individuals. The focus of 21 studies was HIV testing, four on HIV testing and linkage to care, and one on antiretroviral therapy adherence. Social media interventions were used to do the following: build online interactive communities to encourage HIV testing/adherence (10 studies), provide HIV testing services (9 studies), disseminate HIV information (9 studies), and develop intervention materials (1 study). Of the studies providing HIV self-testing, 16% of participants requested HIV testing kits from social media platforms. Existing social media platforms such as Facebook (n=15) and the gay dating app Grindr (n=10) were used most frequently. Data from four studies show that HIV testing uptake increased after social media interventions (n=1283, RR 1.50, 95% CI 1.28-1.76). In the studies where social media interventions were participatory, HIV testing uptake was higher in the intervention arm than the comparison arm (n=1023, RR 1.64, 95% CI 1.19-2.26).

CONCLUSIONS: Social media interventions are effective in promoting HIV testing among MSM in many settings. Social media interventions to improve HIV services beyond HIV testing in low- and middle-income countries and among other key populations need to be considered.

TRIAL REGISTRATION: International Prospective Register of Systematic Reviews (PROSPERO): CRD42016048073; http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42016048073 (Archived by WebCite at http://www. webcitation.org/6usLCJK3v).

43.   Canoy, N. A., et al. **"Struggling to care: A discursive-material analysis of negotiating agency among HIV-positive MSM**." *Health (London)* 2017 21(6): 575-594.

A discursive-materialist framework of agency asserts the mutual constitution of agency within cultural discursive, economic, and embodied material structures. Understanding how HIV-positive men who have sex with men in the Philippines negotiate agency vis-a-vis wider social structures, we utilized Foucault's care of the self to locate agency in relationships with the self, others, and the broader world. Using data from narratives of 20 Filipino HIV-positive men who have sex with men, we analyzed the negotiation of agency as HIV-positive as embedded in the unique discursive terrain of Roman Catholicism and the economic materiality of a developing country. Three main processes of negotiating agency are elaborated: (1) questioning the spiritual self and the sexual body in the relationship with the self, (2) navigating interpersonal limits to care giving in the relationship with others, and (3) reclaiming human dignity in health care in the relationship with the broader world. Theoretical insights on the discursive and material constitution of healing in light of discursive and material challenges are discussed.

44. 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 21(10): 2913-2923.

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.

45. Kupprat, S. A., et al. **"Substance Use and Cognitive Function as Drivers of Condomless Anal Sex Among HIV-Positive Gay, Bisexual, and Other Men Who Have Sex with Men Aged 50 and Older: The Gold Studies**." *LGBT Health* 2017.

PURPOSE: Substance use has been linked to the sexual transmission of HIV among gay, bisexual, and other men who have sex with men (MSM) across the lifespan. Among older, HIV-positive, MSM populations, cognitive dysfunction associated with age and HIV disease progression also may play a role in sexual risk-taking. People aged 50 years and older represent a growing proportion of the overall HIV-positive population. This study aimed to explore relationships between substance use and cognitive function, and their impact on condomless anal sex (CAS) among HIV-positive gay, bisexual, and other MSM aged 50 years and older.

METHODS: Data from a cross-sectional study of HIV-positive MSM, aged 50 and older (N = 169) were gathered using a computer-assisted survey, researcher-administered behavioral and neurocognitive measures.

RESULTS: More than 50% of the men used substances and had one or more cognitive impairments. However, only 25% were at higher risk for dementia (i.e., two or more cognitive impairments). Multivariable modeling indicated that use of alcohol to intoxication and date of HIV diagnosis were the strongest predictors of CAS in both a model that included dementia risk and a model that included impaired executive function risk. Current illicit substance use was a significant predictor of CAS only in the model that included dementia risk. Those with better cognitive and executive function had higher odds of CAS. However, only executive function was a significant cognitive predictor of CAS.

CONCLUSION: Further research is needed to clarify the impact of cognitive function and substance use on sexual risk behaviors as these HIV-positive men achieve normal life expectancies, while continuing to use

substances and engage in CAS. Furthermore, addiction treatment remains a critical need for this group even as they transition into later adulthood.

46. Sandfort, T. G. M., et al. **"Substance Use and HIV Risk Among Men Who Have Sex With Men in Africa: A Systematic Review**." *J Acquir Immune Defic Syndr* 2017 76(2): e34-e46.

BACKGROUND: Substance use and its relation to HIV risk among men who have sex in Africa, a population at high risk for HIV, has received little attention.

METHODS: This systematic review summarizes and discusses findings from 68 empirical studies, published between 1980 and 2016 that included data about substance use in men who have sex with men (MSM) in Africa.

RESULTS: Substance use has rarely been the primary focus of studies in African MSM. In general, measurement of substance use was suboptimal. Whereas prevalence of alcohol use varied across studies, partly resulting from variety in assessment strategies, it seemed higher than in the general male population across countries. Alcohol use was associated with sexual risk practices, but not with HIV infection. The most frequently reported drug used by African MSM was cannabis. The use of other drugs, such as cocaine and heroin seemed relatively rare, although injection drug use was exceptionally high in a few studies. As alcohol, drugs were regularly used in conjunction with sex. Both alcohol and drug use were often associated with other risk factors for HIV infection, including violence and transactional sex. No interventions were found addressing substance use among African MSM.

CONCLUSIONS: Given high HIV risk and prevalence in this population, substance use should be studied more in-depth, taking into account the specific social and cultural context. Assessment of substance use practices in this population has to be improved. The available information suggests, though, that there is an urgent need for interventions addressing substance use tailored to the needs of this critical population.

47. 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 33(10): 1004-1012.

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.

48.   Badal, H. J., et al. **"Swipe Right: Dating Website and App Use Among Men Who Have Sex With Men**."
AIDS Behav 2017.

This study explored the frequency of dating website and app usage among MSM to understand sub-group differences in use. Web-based survey data (N = 3105) were analyzed to assess the use of dating websites and apps. More than half (55.7%) of MSM in this sample were frequent users of dating websites and apps. Two-thirds (66.7%) of frequent users had casual partners only in the past 12 months and reported a high average number of casual sexual partners in the past 12 months (Mdn = 5.0) compared to never users (Mdn = 0.0; chi (2)(2) = 734.94, adj. p < .001). The most frequently used dating website or app was Grindr, with 60.2% of the sample reporting some or frequent use. Adam4Adam (23.5%), Jack'd (18.9%) and Scruff (18.7%) were also frequently used. Dating websites and apps may be effective channels to reach a diverse group of MSM with HIV prevention messages.

49.   Niven, H., et al. **"'They love us just the way they love a woman': gender identity, power and transactional sex between men who have sex with men and transgender women in Timor-Leste**." *Cult Health Sex* 2017: 1-15.

There has been limited research on the experiences of men who have sex with men and transgender women in Timor-Leste. Previous research has suggested a phenomenon by which same-sex-attracted men and transgender women have sexual and intimate relationships with straight-identifying men or mane-forte. Transactional sex has also been reported to be common. This paper, which complements a larger national size estimation among key populations at risk of HIV, further investigates sexual and social identities and roles, including sexual practices, among men who have sex with men and transgender women in Timor-Leste. Fifteen interviews were conducted with a profile of participants from urban and rural settings. Using inductive thematic analysis, we found that gender identity played a significant role in sexual relationships, with mane-forte having power over their sexual partner(s). Transactional sex was also found to be customary. Some participants experienced stigma, discrimination, sexual coercion and violence, while others, such as mane-forte, did not. Our research suggests that gender identity and power are significant in sexual relationships between men who have sex with men and transgender women in Timor-Leste, have implications for HIV prevention efforts and may reflect gender norms within the broader community.

50.   Semple, S. J., et al. **"Uptake of a Partner Notification Model for HIV Among Men Who Have Sex With Men and Transgender Women in Tijuana, Mexico**." *AIDS Behav* 2017.

Undiagnosed HIV infection is common among men who have sex with men (MSM) and transgender women (TW) in Latin America. We examined uptake of a partner notification (PN) model among MSM and TW in Tijuana, Mexico. Forty-six HIV-positive MSM/TW enrolled as index patients, and reported 132 MSM/TW sexual partners for PN. Of notified partners (90/132), 39% declined eligibility screening or participation, 39% tested for HIV, and of those 28% were newly-diagnosed HIV-positive. Partners who were seen by the index patient more than once in the past 4 months and those who primarily had sex with the index patient in one of their homes were more likely to be notified via PN (76% vs. 50%; p = 0.01 and 86% vs. 64%, p = 0.02, respectively). Lower than expected PN uptake was associated with problems identifying index patients, obtaining reliable partner contact information, and engaging notified partners.

51.   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 29(9): 1169-1177.

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.

52.   LeGrand, S., et al. **"Using technology to support HIV self-testing among MSM**." *Curr Opin HIV AIDS* 2017 12(5): 425-431.

   PURPOSE OF REVIEW: Technology-based HIV self-testing (HST) interventions have the potential to improve access to HIV testing among gay, bisexual, and other MSM, as well as address concerns about HST use, including challenges with linkage to appropriate follow-up services. This review examines studies that use technology-based platforms to increase or improve the experience of HST among MSM.

   RECENT FINDINGS: Seven published studies and eight funded studies were included in this review. Comprehensive prevention interventions with free HST kit distribution and interventions that provide free HST kits and support the HST process address a greater number of barriers (e.g., access, correct use of testing kits, and correct interpretation of results) than studies that only distribute free HST kits through technology-based platforms.

   SUMMARY: By addressing HIV-testing barriers and specific HST concerns, these interventions address a critical need to improve first time and repeat testing rates among MSM. Additional research is needed to determine the efficacy of recent formative HST interventions. If proven efficacious, scale-up of these strategies have the potential to increase HIV testing among MSM via expanded HST uptake.

53.   Zhang, A., et al. **"What Would an HIV Cure Mean to You: Qualitative Analysis from a Crowdsourcing Contest in Guangzhou, China**." *AIDS Res Hum Retroviruses* 2017.

   Much HIV cure social science research has focused on high-income countries. Local key population perspectives, especially from people living with HIV (PLHIV), are needed in low- and middle-income countries. We organized an open contest soliciting responses from key populations, including PLHIV, about what a cure would mean in their lives. Tailored in-person events and social media were used to engage PLHIV, men who have sex with men (MSM), people who inject drugs, and local residents. We received 471 contributions over 4 months. Our thematic analysis showed that many people perceived that a cure would sterilize HIV and bring about new life for PLHIV. Many individuals believed a cure would decrease PLHIV discrimination and many MSM perceived a cure would decrease MSM discrimination. Some participants noted that a cure could help improve interpersonal relations, particularly with families and partners. Many individuals envisioned HIV cure as a panacea to bring about social stability. Some participants also anticipated changes in attitudes toward sex that may result in increased condomless sex. Our findings suggest a continued need for careful management of patient expectations and community engagement.

54.   Lim, S. H., et al. **"Willingness to use pre-exposure prophylaxis for HIV prevention among men who have sex with men in Malaysia: Findings from an online survey**." *PLoS One* 2017 12(9): e0182838. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5597127/pdf/pone.0182838.pdf

OBJECTIVE: We examined willingness to use pre-exposure prophylaxis (PrEP) for HIV prevention among men who have sex with men (MSM) in Malaysia.

METHODS: An online survey of 990 MSM was conducted between March and April 2016. Eligibility criteria included being biological male, Malaysian citizen, 18 years of age or above, identifying as MSM, and being HIV negative or unknown status. Participants' demographics, sexual and drug use behaviors, attitudes towards PrEP, and preferences regarding future access to PrEP were collected. Bivariate analysis and logistic regression were performed to determine factors associated with willingness to use PrEP.

RESULTS: Fewer than half of participants (44%) knew about PrEP before completing the survey. Overall, 39% of the sample were willing to take PrEP. Multivariate logistic regression indicated that Malay men (AOR: 1.73, 95% CI:1.12, 2.70), having 2 or more male anal sex partners in the past 6 months (AOR: 1.98, 95% CI: 1.29, 3.05), previous knowledge of PrEP (AOR: 1.40, 95%CI: 1.06, 1.86), lack of confidence in practising safer sex (AOR: 1.36, 95% CI: 1.02, 1.81), and having ever paid for sex with a male partner (AOR: 1.39, 95% CI: 1.01, 1.91) were independently associated with greater willingness to use PrEP, while men who identified as heterosexual were less willing to use PrEP (AOR, 0.36, 95% CI: 0.13, 0.97). Majority of participants preferred to access PrEP at affordable cost below 100 Malaysian Ringgit (USD25) per month from community based organisations followed by private or government hospitals.

CONCLUSIONS: Overall, MSM in Malaysia reported a relatively low level of willingness to use PrEP, although willingness was higher among those previously aware of PrEP. There is a need to provide PrEP at affordable cost, increase demand and awareness of PrEP, and to provide access to this preventative medication via diverse, integrated and tailored sexual health services.

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Sex Workers - 36

1.   Bailey, A. E., et al. **"Agency, lapse in condom use and relationship intimacy among female sex workers in Jamaica**." *Cult Health Sex* 2017: 1-14.

        This paper explores barriers to consistent condom use among female sex workers in Jamaica in a qualitative study using grounded theory. Multiple perspectives were sought through 44 in-depth interviews conducted with female sex workers, clients, the partners of sex workers and facilitators of sex work. Poverty and lack of education or skills, severely limited support systems as well as childhood abuse served to push the majority of participants into sex work and created vulnerability to HIV and other STIs. Despite these constraints, women found ways to exercise agency, ensure condom use, adopt protective measures and gain economic advantage in various aspects of the Jamaican sex trade. Perceived relationship intimacy between sex workers and their clients and/or their main partners emerged as the main factor contributing to reduced risk perception and inconsistent condom use. Relationship intimacy, with associated trust and affirmation of self, is the most important factor influencing sexual decision-making with respect to lapse in condom use among female sex workers in Jamaica. Study findings provide important insights that can enhance individual psychosocial, interpersonal and community-based interventions as well as inform environmental, structural and policy interventions to reduce risk and vulnerability among female sex workers.

2.   Mazeingia, Y. T., et al. **"Anal sexual experience and HIV risk awareness among female sex workers in Dire Dawa, eastern Ethiopia**." *Glob Health Res Policy* 2017 2: 27. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5683548/pdf/41256_2017_Article_47.pdf

Background: Female sex workers have been disproportionately affected with HIV and anal sexual experience elevate their vulnerability. Anal intercourse has more risk of HIV transmission than vaginal intercourse for receptors that coupled with low condom and proper lubricant use behavior during anal sex. Besides majority of them did not understand HIV transmission risk of anal intercourse. In Ethiopia, studies on anal sexual experience is almost none existent, so the purpose of this study is to explored anal sexual experience and HIV transmission risk awareness among female sex worker in Dire Dawa, Eastern Ethiopia.

Method: Qualitative study with thematic analysis approach was conducted among 18 female sex workers and recruitment of study participants performed until saturation of information. The principal investigator conducted in-depth interviews using local language (Amharic) and it was recorded on audio recorder. Tape recorded data was transcribed and translated to English and entered into open code version 3.4 for coding and theme identification. Data collection conducted simultaneously with data analysis.

Result: Female sex workers practiced anal sex for different themes like financial influence, coercion, intentionally, peer pressure and as a sign of intimacy and love. Coercion, negative attitudes, poor awareness about HIV transmission risks of anal sex and protection capacity of condom and proper lubricants are the identified themes for not using condom and proper lubricants during anal sex by female sex workers. Inaccessibility and unavailability of health services for issues related to anal sex was the core reason for female sex workers' misperception and risk anal sexual experience.

Conclusion: Female sex workers practiced anal sex without risk reduction approaches and they did not understand exacerbated risk of anal sex to HIV transmission. Stakeholders including ministry of health need to incorporate potential awareness raising tasks and programs about risk of anal sex and methods of risk reduction for female sex workers.

3. Surie, D., et al. **"Association between non-barrier modern contraceptive use and condomless sex among HIV-positive female sex workers in Mombasa, Kenya: A prospective cohort analysis**." *PLoS One* 2017 12(11): e0187444. Online at:
http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0187444&type=printable

BACKGROUND: As access to antiretroviral therapy in sub-Saharan Africa continues to expand, more women with HIV can expect to survive through their reproductive years. Modern contraceptives can help women choose the timing and spacing of childbearing. However, concerns remain that women with HIV who use non-barrier forms of modern contraception may engage in more condomless sex because of their decreased risk of unintended pregnancy. We examined whether non-barrier modern contraceptive use by HIV-positive female sex workers was associated with increased frequency of recent condomless sex, measured by detection of prostate-specific antigen (PSA) in vaginal secretions.

METHODS: Women who were HIV-positive and reported transactional sex were included in this analysis. Pregnant and post-menopausal follow-up time was excluded, as were visits at which women reported trying to get pregnant. At enrollment and quarterly follow-up visits, a pelvic speculum examination with collection of vaginal secretions was conducted for detection of PSA. In addition, women completed a structured face-to-face interview about their current contraceptive methods and sexual risk behavior at enrollment and monthly follow-up visits. Log-binomial generalized estimating equations regression was used to test for associations between non-barrier modern contraceptive use and detection of PSA in vaginal secretions and self-reported condomless sex. Data from October 2012 through September 2014 were included in this analysis.

RESULTS: Overall, 314 women contributed 1,583 quarterly examination visits. There was minimal difference in PSA detection at contraceptive-exposed versus contraceptive-unexposed visits (adjusted relative risk [aRR] 1.28, 95% confidence interval [95% CI] 0.93-1.76). There was a higher rate of self-reported condomless sex at visits where women reported using modern contraceptives, but this difference was not statistically significant after adjustment for potential confounding factors (aRR 1.59, 95% CI 0.98-2.58).

CONCLUSION: Non-barrier methods of modern contraception were not associated with increased risk of objective evidence of condomless sex.

4. Wessels, J. M., et al. **"Association of high-risk sexual behaviour with diversity of the vaginal microbiota and abundance of Lactobacillus**." *PLoS One* 2017 12(11): e0187612. Online at:
    https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5667760/pdf/pone.0187612.pdf

    OBJECTIVE: To compare the vaginal microbiota of women engaged in high-risk sexual behaviour (sex work) with women who are not engaged in high-risk sexual behaviour. Diverse vaginal microbiota, low in Lactobacillus species, like those in bacterial vaginosis (BV), are associated with increased prevalence of sexually transmitted infections (STIs) and human immunodeficiency virus (HIV) acquisition. Although high-risk sexual behaviour increases risk for STIs, the vaginal microbiota of sex workers is understudied.

    METHODS: A retrospective cross-sectional study was conducted comparing vaginal microbiota of women who are not engaged in sex work (non-sex worker controls, NSW, N = 19) and women engaged in sex work (female sex workers, FSW, N = 48), using Illumina sequencing (16S rRNA, V3 region).

    RESULTS: Bacterial richness and diversity were significantly less in controls, than FSW. Controls were more likely to have Lactobacillus as the most abundant genus (58% vs. 17%; P = 0.002) and composition of their vaginal microbiota differed from FSW (PERMANOVA, P = 0.001). Six microbiota clusters were detected, including a high diversity cluster with three sub-clusters, and 55% of women with low Nugent Scores fell within this cluster. High diversity was observed by 16S sequencing in FSW, regardless of Nugent Scores, suggesting that Nugent Score may not be capable of capturing the diversity present in the FSW vaginal microbiota.

    CONCLUSIONS: High-risk sexual behaviour is associated with diversity of the vaginal microbiota and lack of Lactobacillus. These factors could contribute to increased risk of STIs and HIV in women engaged in high-risk sexual behaviour.

5. Okafor, U. O., et al. **"Behavioural interventions promoting condom use among female sex workers in sub-Saharan Africa: a systematic review**." *Afr J AIDS Res* 2017 16(3): 257-268.

    The objective of this review was to provide an overview of behavioural interventions promoting condom use amongst female sex workers (FSW) in sub-Saharan Africa. A search of four electronic bibliographic databases from 1990 to September 2016 was carried out. The search was limited to articles published in English. Studies which evaluated behavioural interventions to increase condom use among FSWs were selected and reviewed. Data were extracted on effectiveness, condom use, intervention content, and process outcomes. A total of 20 eligible articles describing 18 interventions in sub-Saharan Africa on HIV prevention with condom use as an outcome measure were identified. Most of the behavioural interventions incorporated a combination of approaches: health education by peers, health workers and project staff, and activities by brothel owners and brothel managers. Most studies showed effectiveness of these interventions on condom use with paying clients. Five studies measuring condom use with regular non-paying partners recorded less consistent condom use with these partners. This review illustrates the existence of sufficient evidence showing the effectiveness of behavioural interventions targeting correct and consistent condom use by FSWs.

6. Deuba, K., et al. **"Condom use behaviour among people living with HIV: a seven-country community-based participatory research in the Asia-Pacific region**." *Sex Transm Infect* 2017.

    OBJECTIVES: We examined the prevalence of inconsistent condom use and its correlates among people living with HIV (PLHIV) in the Asia-Pacific region.

    METHODS: Between 1 October 2012 and 31 May 2013, a total of 7843 PLHIV aged 18-50 years were recruited using targeted and venue-based sampling in Bangladesh, Indonesia, Lao People's Democratic

Republic (PDR), Nepal, Pakistan, Philippines and Vietnam. Logistic regression was used to explore the association between condom use behaviour and demographics, social support, stigma and discrimination and various health-related variables.

RESULTS: Overall, 43% of 3827 PLHIV practised inconsistent condom use at sexual intercourse with their regular partner. An even higher proportion, 46% of 2044 PLHIV admitted that they practised unprotected sex with a casual partner. Participants from Lao PDR reported the lowest prevalence of inconsistent condom use for both regular and casual partners, while participants from the Philippines had the highest risk behaviour. Inconsistent condom use was significantly associated with belonging to a key population (drug user, sex worker or refugee subpopulation), not knowing that condoms are still needed if both partners are HIV positive, having a regular partner whose HIV status was either positive or unknown, having experienced physical assault and not receiving antiretroviral treatment.

CONCLUSIONS: This large seven-country study highlights a high prevalence of inconsistent condom use among PLHIV in the Asia-Pacific region. In addition to knowledge-imparting interventions, the adoption and expansion of the 'Test and Treat' strategy could help to maximise the prevention benefits of antiretroviral treatment.

7. Coetzee, J., et al. **"Cross-sectional study of female sex workers in Soweto, South Africa: Factors associated with HIV infection**." *PLoS One* 2017 12(10): e0184775. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5628807/pdf/pone.0184775.pdf

INTRODUCTION: In South Africa, the rate of HIV in the sex worker (SW) population is exceedingly high, but critical gaps exist in our understanding of SWs and the factors that make them vulnerable to HIV. This study aimed to estimate HIV prevalence among female sex workers (FSWs) in Soweto, South Africa, and to describe their sexual behavior and other factors associated with HIV infection.

METHODS: A cross-sectional, respondent-driven sampling (RDS) recruitment methodology was used to enroll 508 FSWs based in Soweto. Data were collected using a survey instrument, followed by two HIV rapid tests. Raw and RDS adjusted data were analyzed using a chi-squared test of association and multivariate logistic regression to show factors associated with HIV infection.

FINDINGS: HIV prevalence among FSWs was 53.6% (95% CI 47.5-59.9). FSWs were almost exclusively based in taverns (85.6%) and hostels (52.0%). Less than a quarter (24.4%) were under 25 years of age. Non-partner violence was reported by 55.5%, 59.6% of whom were HIV-infected. Advancing age, incomplete secondary schooling, migrancy and multiple clients increased the likelihood of HIV acquisition: >30 years of age was associated with a 4.9 times (95% CI 2.6-9.3) increased likelihood of HIV; incomplete secondary schooling almost tripled the likelihood (AOR 2.8, 95% CI 1.6-5.0); being born outside of the Gauteng province increased the likelihood of HIV 2.3 times (95% CI 1.3-4.0); and having more than five clients per day almost doubled the likelihood (AOR 1.9, 95% CI 1.1-3.2).

CONCLUSION: Our findings highlight the extreme vulnerability of FSWs to HIV. Advancing age, limited education and multiple clients were risk factors associated with HIV, strongly driven by a combination of structural, biological and behavioral determinants. Evidence suggests that interventions need to be carefully tailored to the varying profiles of SW populations across South Africa. Soweto could be considered a microcosm of South Africa in terms of the epidemic of violence and HIV experienced by the SW population, which is influenced by factors often beyond an individual level of control. While describing a hitherto largely undocumented population of FSWs, our findings confirm the urgent need to scale up innovative HIV prevention and treatment programs for this population.

8. Ortblad, K., et al. **"Direct provision versus facility collection of HIV self-tests among female sex workers in Uganda: A cluster-randomized controlled health systems trial**." *PLoS Med* 2017 14(11): e1002458. Online at: http://journals.plos.org/plosmedicine/article/file?id=10.1371/journal.pmed.1002458&type=printable

BACKGROUND: HIV self-testing allows HIV testing at any place and time and without health workers. HIV self-testing may thus be particularly useful for female sex workers (FSWs), who should test frequently but face stigma and financial and time barriers when accessing healthcare facilities.

METHODS AND FINDINGS: We conducted a cluster-randomized controlled health systems trial among FSWs in Kampala, Uganda, to measure the effect of 2 HIV self-testing delivery models on HIV testing and linkage to care outcomes. FSW peer educator groups (1 peer educator and 8 participants) were randomized to either (1) direct provision of HIV self-tests, (2) provision of coupons for free collection of HIV self-tests in a healthcare facility, or (3) standard of care HIV testing. We randomized 960 participants in 120 peer educator groups from October 18, 2016, to November 16, 2016. Participants' median age was 28 years (IQR 24-32). Our prespecified primary outcomes were self-report of any HIV testing at 1 month and at 4 months; our prespecified secondary outcomes were self-report of HIV self-test use, seeking HIV-related medical care and ART initiation. In addition, we analyzed 2 secondary outcomes that were not prespecified: self-report of repeat HIV testing-to understand the intervention effects on frequent testing-and self-reported facility-based testing-to quantify substitution effects. Participants in the direct provision arm were significantly more likely to have tested for HIV than those in the standard of care arm, both at 1 month (risk ratio [RR] 1.33, 95% CI 1.17-1.51, p < 0.001) and at 4 months (RR 1.14, 95% CI 1.07-1.22, p < 0.001). Participants in the direct provision arm were also significantly more likely to have tested for HIV than those in the facility collection arm, both at 1 month (RR 1.18, 95% CI 1.07-1.31, p = 0.001) and at 4 months (RR 1.03, 95% CI 1.01-1.05, p = 0.02). At 1 month, fewer participants in the intervention arms had sought medical care for HIV than in the standard of care arm, but these differences were not significant and were reduced in magnitude at 4 months. There were no statistically significant differences in ART initiation across study arms. At 4 months, participants in the direct provision arm were significantly more likely to have tested twice for HIV than those in the standard of care arm (RR 1.51, 95% CI 1.29-1.77, p < 0.001) and those in the facility collection arm (RR 1.22, 95% CI 1.08-1.37, p = 0.001). Participants in the HIV self-testing arms almost completely replaced facility-based testing with self-testing. Two adverse events related to HIV self-testing were reported: interpersonal violence and mental distress. Study limitations included self-reported outcomes and limited generalizability beyond FSWs in similar settings.

CONCLUSIONS: In this study, HIV self-testing appeared to be safe and increased recent and repeat HIV testing among FSWs. We found that direct provision of HIV self-tests was significantly more effective in increasing HIV testing among FSWs than passively offering HIV self-tests for collection in healthcare facilities. HIV self-testing could play an important role in supporting HIV interventions that require frequent HIV testing, such as HIV treatment as prevention, behavior change for transmission reduction, and pre-exposure prophylaxis. TRIAL REGISTRATION: ClinicalTrials.gov NCT02846402.

9. Quaife, M., et al. **"Divergent Preferences for HIV Prevention: A Discrete Choice Experiment for Multipurpose HIV Prevention Products in South Africa**." *Med Decis Making* 2017.

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

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

RESULTS: HIV protection was the most important attribute to respondents; however, results indicate significant demand among all groups for multipurpose prevention products that offer protection from HIV infection, other STIs, and unwanted pregnancy. All groups demonstrated a strong preference for long-lasting

injectable products. There was substantial heterogeneity in preferences within and across population groups.

LIMITATIONS: Hypothetical DCE data may not mirror real-world choices, and products will have more attributes in reality than represented in choice tasks. Background data on participants, including sensitive areas of HIV status and condom use, was self-reported.

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

10.   Williams, B. G., et al. **"Dynamics and control of infections on social networks of population types**." *Epidemics* 2017.

Random mixing in host populations has been a convenient simplifying assumption in the study of epidemics, but neglects important differences in contact rates within and between population groups. For HIV/AIDS, the assumption of random mixing is inappropriate for epidemics that are concentrated in groups of people at high risk, including female sex workers (FSW) and their male clients (MCF), injecting drug users (IDU) and men who have sex with men (MSM). To find out who transmits infection to whom and how that affects the spread and containment of infection remains a major empirical challenge in the epidemiology of HIV/AIDS. Here we develop a technique, based on the routine sampling of infection in linked population groups (a social network of population types), which shows how an HIV/AIDS epidemic in Can Tho Province of Vietnam began in FSW, was propagated mainly by IDU, and ultimately generated most cases among the female partners of MCF (FPM). Calculation of the case reproduction numbers within and between groups, and for the whole network, provides insights into control that cannot be deduced simply from observations on the prevalence of infection. Specifically, the per capita rate of HIV transmission was highest from FSW to MCF, and most HIV infections occurred in FPM, but the number of infections in the whole network is best reduced by interrupting transmission to and from IDU. This analysis can be used to guide HIV/AIDS interventions using needle and syringe exchange, condom distribution and antiretroviral therapy. The method requires only routine data and could be applied to infections in other populations.

11.   Vasylyeva, T. I., et al. **"Engagement in sex work does not increase HIV risk for women who inject drugs in Ukraine**." *J Public Health (Oxf)* 2017 39(3): e103-e110.

Background: We studied the association between sex in exchange for money, drugs or goods and HIV for women who inject drugs (WWID) in Ukraine, as previous data on this association from the post-USSR region are contradictory.

Methods: Data come from the Integrated Bio-Behavioral Survey of Ukrainian people who inject drugs collected in 2011 using respondent-driven sampling. Participants were interviewed and tested with rapid HIV tests.

Results: The sample included 2465 WWID (24% HIV positive); 214 (8.7%) of which reported having had exchange sex during the last 90 days. Crude analysis showed no association between exchange sex and HIV (OR = 0.644; 95% CI 0.385-1.077). No confounders were found to alter this result in a multivariable analysis. Further modeling showed that exchange sex modifies association between HIV and alcohol use: no association between HIV and daily alcohol use was found for those women who exchanged sex (OR = 1.699, 95% CI 0.737-3.956); while not engaging in sex work and daily using alcohol reduced odds to be HIV infected (OR = 0.586, 95% CI 0.389-0.885).

Conclusions: Exchange sex may have less impact on the HIV status of WWID who are exposed to injecting risks. The finding that daily alcohol use appears protective against HIV among WWID who do not exchange sex requires more research.

12.   LaCourse, S. M., et al. **"Evaluation of the Isoniazid Preventive Therapy Care Cascade Among HIV-Positive Female Sex Workers in Mombasa, Kenya**." *J Acquir Immune Defic Syndr* 2017 76(1): 74-81.

       BACKGROUND: Kenyan female sex workers (FSWs) have a high HIV prevalence, increasing their tuberculosis (TB) risk. Despite recommendations that HIV-positive individuals be offered isoniazid preventive therapy (IPT), uptake has been limited.

       METHODS: In this longitudinal cohort of HIV-positive FSWs, we retrospectively characterized the IPT care cascade between March 2000 and January 2010, including reasons for cascade loss or appropriate exit. Cascade success required completion of 6 months of IPT. Baseline characteristics were assessed as potential correlates of cascade loss using multivariable logistic regression.

       RESULTS: Among 642 HIV-positive FSWs eligible for IPT evaluation, median age was 31 years (IQR 26-35) with median CD4 lymphocyte count of 409 (IQR 292-604) cells per cubic millimeter. There were 249 (39%) women who successfully completed 6 months of IPT, 157 (24%) appropriately exited the cascade, and 236 (37%) were cascade losses. Most cascade losses occurred at symptom screen (38%, 90/236), chest radiograph evaluation (28%, 66/236), or during IPT treatment (30%, 71/236). Twenty-nine women were diagnosed with tuberculosis, including one after IPT initiation. Most women initiating IPT completed the course (71%, 249/351); <5% had medication intolerance. Younger women [<25 and 25-35 vs. >35 years; adjusted odds ratio (AOR) 2.65, 95% confidence interval (CI): 1.46 to 4.80 and AOR 1.78, 95% CI: 1.13 to 2.80, respectively], and those evaluated for IPT after antiretroviral availability in 2004 (AOR 1.92, 95% CI: 1.31 to 2.81), were more likely to be cascade losses.

       CONCLUSIONS: Implementation of IPT among HIV-positive FSWs in Kenya is feasible. However, significant losses along the IPT care cascade underscore the need for strategies improving retention in care.

13.   Rocha-Jimenez, T., et al. **"Exploring the Context and Implementation of Public Health Regulations Governing Sex Work: A Qualitative Study with Migrant Sex Workers in Guatemala**." *J Immigr Minor Health* 2017 19(5): 1235-1244.

       Public health regulations practices surrounding sex work and their enforcement can have unintended consequences for HIV and sexually transmitted infection (STI) prevention and care among sex workers. This analysis was based on qualitative in-depth (n = 33) and focus groups interviews (n = 20) conducted with migrant female sex workers in Tecun Uman and Quetzaltenango, Guatemala, and explored the implementation of sex work regulations and related consequences for HIV prevention and care among migrant sex workers. Sex work regulations were found to have health-related benefits (e.g., access to HIV/STI testing) as well as negative impacts, such as abuse by police and harassment, detention/deportation of migrant sex workers. Whereas public health regulations may improve access to HIV/STI testing, their implementation may inadvertently jeopardize sex workers' health through unintended negative consequences. Non-coercive, evidence-based public health and sex work policies and programs are needed to expand access to HIV/STI prevention and care among migrant sex workers, while protecting their dignity and human rights.

14.   Cange, C. W., et al. **"Female sex workers' empowerment strategies amid HIV-related socioeconomic vulnerabilities in Cameroon**." *Cult Health Sex* 2017 19(10): 1053-1065.

       Research has consistently demonstrated that female sex workers use a variety of empowerment strategies to protect one another and their families. This study examines the strategies Cameroonian sex workers employ to do so. In-depth interviews and focus-group discussions were conducted with 100 sex workers. Coded texts were analysed for recurring themes. Sex workers reported being concerned with physical violence and sexual assault and demands from authorities for bribes to avoid fines and/or imprisonment. Women described strategies such as 'looking out for' each other when faced with security threats. Many reported staying in sex work to provide for their children through education and other circumstances to allow them to

lead a better life. Sex worker mothers reported not using condoms when clients offered higher pay, or with intimate partners, even when they understood the risk of HIV transmission to themselves. Concern for their children's quality of life took precedence over HIV-related risks, even when sex workers were the children's primary carers. A sex worker empowerment programme with a focus on family-oriented services could offer an effective and novel approach to increasing coverage of HIV prevention, treatment and care in Cameroon.

15.   Reeves, A., et al. **"Gender violence, poverty and HIV infection risk among persons engaged in the sex industry: cross-national analysis of the political economy of sex markets in 30 European and Central Asian countries**." *HIV Med* 2017 18(10): 748-755.

OBJECTIVES: Persons engaged in the sex industry are at greater risk of HIV and other sexually transmitted infections than the general population. One major factor is exposure to higher levels of risky sexual activity. Expanding condom use is a critical prevention strategy, but this requires negotiation with those buying sex, which takes place in the context of cultural and economic constraints. Impoverished individuals who fear violence are more likely to forego condoms.

METHODS: Here we tested the hypotheses that poverty and fear of violence are two structural drivers of HIV infection risk in the sex industry. Using data from the European Centre for Disease Prevention and Control and the World Bank for 30 countries, we evaluated poverty, measured using the average income per day per person in the bottom 40% of the income distribution, and gender violence, measured using homicide rates in women and the proportion of women exposed to violence in the last 12 months and/or since age 16 years.

RESULTS: We found that HIV prevalence among those in the sex industry was higher in countries where there were greater female homicide rates (beta = 0.86; P = 0.018) and there was some evidence that self-reported exposure to violence was also associated with higher HIV prevalence (beta = 1.37; P = 0.043). Conversely, HIV prevalence was lower in countries where average incomes among the poorest were greater (beta = -1.05; P = 0.046).

CONCLUSIONS: Our results are consistent with the theory that reducing poverty and exposure to violence may help reduce HIV infection risk among persons engaged in the sex industry.

16.   Vu, L., et al. **"High Burden of HIV, Syphilis and HSV-2 and Factors Associated with HIV Infection Among Female Sex Workers in Tanzania: Implications for Early Treatment of HIV and Pre-exposure Prophylaxis (PrEP)**." *AIDS Behav* 2017.

This paper estimates population-based prevalence of HIV, syphilis, HSV-2 and factors influencing HIV infection using a national sample of 1914 female sex workers (FSWs) in 7 regions in Tanzania. Additionally, HIV incidence was estimated by comparing biological HIV results with self-reported HIV status. The average HIV prevalence among FSWs in all 7 regions was 28%, ranging from 14% in Tabora to 38% in Shinyanga. HIV incidence was found to be 13 per 100 person-years. Syphilis prevalence was 8% with significantly higher burden found in Iringa (11%), Mbeya (13%), and Shinyanga (12%). Nearly 60% of the study population was infected with HSV-2. The high HIV prevalence and incidence coupled with suboptimal condom use indicate an urgent need to roll out the "Treat-All" approach and provide antiretroviral therapy to FSWs living with HIV regardless of their CD4 count. In addition, antiretroviral-based prevention technologies such as oral pre-exposure prophylaxis and microbicides should be piloted and evaluated.

17.   Mutagoma, M., et al. **"High HIV prevalence and associated risk factors among female sex workers in Rwanda**." *Int J STD AIDS* 2017 28(11): 1082-1089.

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.

18. Eakle, R., et al. **"HIV pre-exposure prophylaxis and early antiretroviral treatment among female sex workers in South Africa: Results from a prospective observational demonstration project**." *PLoS Med* 2017 14(11): e1002444. Online at:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5697804/pdf/pmed.1002444.pdf

BACKGROUND: Operational research is required to design delivery of pre-exposure prophylaxis (PrEP) and early antiretroviral treatment (ART). This paper presents the primary analysis of programmatic data, as well as demographic, behavioural, and clinical data, from the TAPS Demonstration Project, which offered both interventions to female sex workers (FSWs) at 2 urban clinic sites in South Africa.

METHODS AND FINDINGS: The TAPS study was conducted between 30 March 2015 and 30 June 2017, with the enrolment period ending on 31 July 2016. TAPS was a prospective observational cohort study with 2 groups receiving interventions delivered in existing service settings: (1) PrEP as part of combination prevention for HIV-negative FSWs and (2) early ART for HIV-positive FSWs. The main outcome was programme retention at 12 months of follow-up. Of the 947 FSWs initially seen in clinic, 692 were HIV tested. HIV prevalence was 49%. Among those returning to clinic after HIV testing and clinical screening, 93% of the women who were HIV-negative were confirmed as clinically eligible for PrEP (n = 224/241), and 41% (n = 110/270) of the women who were HIV-positive had CD4 counts within National Department of Health ART initiation guidelines at assessment. Of the remaining women who were HIV-positive, 93% were eligible for early ART (n = 148/160). From those eligible, 98% (n = 219/224) and 94% (n = 139/148) took up PrEP and early ART, respectively. At baseline, a substantial fraction of women had a steady partner, worked in brothels, and were born in Zimbabwe. Of those enrolled, 22% on PrEP (n = 49/219) and 60% on early ART (n = 83/139) were seen at 12 months; we observed high rates of loss to follow-up: 71% (n = 156/219) and 30% (n = 42/139) in the PrEP and early ART groups, respectively. Little change over time was reported in consistent condom use or the number of sexual partners in the last 7 days, with high levels of consistent condom use with clients and low use with steady partners in both study groups. There were no seroconversions on PrEP and 7 virological failures on early ART among women remaining in the study. Reported adherence to PrEP varied over time between 70% and 85%, whereas over 90% of participants reported taking pills daily while on early ART. Data on provider-side costs were also collected and analysed. The total cost of service delivery was approximately US$126 for PrEP and US$406 for early ART per person-year. The main limitations of this study include the lack of a control group, which was not included due to ethical considerations; clinical study requirements imposed when PrEP was not approved through the regulatory system, which could have affected uptake; and the timing of the implementation of a national sex worker HIV programme, which could have also affected uptake and retention.

CONCLUSIONS: PrEP and early ART services can be implemented within FSW routine services in high prevalence, urban settings. We observed good uptake for both PrEP and early ART; however, retention rates for PrEP were low. Retention rates for early ART were similar to retention rates for the current standard of care. While the cost of the interventions was higher than previously published, there is potential for cost

reduction at scale. The TAPS Demonstration Project results provided the basis for the first government PrEP and early ART guidelines and the rollout of the national sex worker HIV programme in South Africa.

19.   Wechsberg, W. M., et al. **"HIV Prevention Among Women Who Use Substances And Report Sex Work: Risk Groups Identified Among South African Women**." *AIDS Behav* 2017 21(Suppl 2): 155-166.

This cross-sectional study presents baseline data from women (n = 641) in a community-based randomized trial in Pretoria, South Africa. Women were eligible if they reported recent alcohol or other drug (AOD) use and condomless sex. Latent class analyses were conducted separately for those who reported sex work and those who did not. Among those who reported sex work, a Risky Sex class (n = 72, 28%) and Low Sexual Risk class (n = 190, 73%) emerged. Those in the Risky Sex class were more likely to report that their last episode of sexual intercourse was with their boyfriend (vs. a client/other partner) compared with the Low Sexual Risk class (p < 0.001). Among participants who did not report sex work, a Drug-Using, Violence-Exposed, and Impaired Sex class (n = 53; 14%) and Risky Sex and Moderate Drinking class (n = 326; 86%) emerged. The findings suggest that interventions for women who engage in sex work should promote safer sexual behavior and empowerment with main partners. Women who use AODs, experience physical or sexual violence, and have impaired sex may be a key population at risk for HIV and should be considered for tailored behavioral interventions in conjunction with South Africa's plan to disseminate HIV prevention methods to vulnerable women. TRIAL REGISTRATION: ClinicalTrials.gov registration NCT01497405.

20.   Chanda, M. M., et al. **"HIV self-testing among female sex workers in Zambia: A cluster randomized controlled trial**." *PLoS Med* 2017 14(11): e1002442. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5697803/pdf/pmed.1002442.pdf

BACKGROUND: HIV self-testing (HIVST) may play a role in addressing gaps in HIV testing coverage and as an entry point for HIV prevention services. We conducted a cluster randomized trial of 2 HIVST distribution mechanisms compared to the standard of care among female sex workers (FSWs) in Zambia.

METHODS AND FINDINGS: Trained peer educators in Kapiri Mposhi, Chirundu, and Livingstone, Zambia, each recruited 6 FSW participants. Peer educator-FSW groups were randomized to 1 of 3 arms: (1) delivery (direct distribution of an oral HIVST from the peer educator), (2) coupon (a coupon for collection of an oral HIVST from a health clinic/pharmacy), or (3) standard-of-care HIV testing. Participants in the 2 HIVST arms received 2 kits: 1 at baseline and 1 at 10 weeks. The primary outcome was any self-reported HIV testing in the past month at the 1- and 4-month visits, as HIVST can replace other types of HIV testing. Secondary outcomes included linkage to care, HIVST use in the HIVST arms, and adverse events. Participants completed questionnaires at 1 and 4 months following peer educator interventions. In all, 965 participants were enrolled between September 16 and October 12, 2016 (delivery, N = 316; coupon, N = 329; standard of care, N = 320); 20% had never tested for HIV. Overall HIV testing at 1 month was 94.9% in the delivery arm, 84.4% in the coupon arm, and 88.5% in the standard-of-care arm (delivery versus standard of care risk ratio [RR] = 1.07, 95% CI 0.99-1.15, P = 0.10; coupon versus standard of care RR = 0.95, 95% CI 0.86-1.05, P = 0.29; delivery versus coupon RR = 1.13, 95% CI 1.04-1.22, P = 0.005). Four-month rates were 84.1% for the delivery arm, 79.8% for the coupon arm, and 75.1% for the standard-of-care arm (delivery versus standard of care RR = 1.11, 95% CI 0.98-1.27, P = 0.11; coupon versus standard of care RR = 1.06, 95% CI 0.92-1.22, P = 0.42; delivery versus coupon RR = 1.05, 95% CI 0.94-1.18, P = 0.40). At 1 month, the majority of HIV tests were self-tests (88.4%). HIV self-test use was higher in the delivery arm compared to the coupon arm (RR = 1.14, 95% CI 1.05-1.23, P = 0.001) at 1 month, but there was no difference at 4 months. Among participants reporting a positive HIV test at 1 (N = 144) and 4 months (N = 235), linkage to care was non-significantly lower in the 2 HIVST arms compared to the standard-of-care arm. There were 4 instances of intimate partner violence related to study participation, 3 of which were related to HIV self-test use. Limitations include the self-reported nature of study outcomes and overall high uptake of HIV testing.

CONCLUSIONS: In this study among FSWs in Zambia, we found that HIVST was acceptable and accessible. However, HIVST may not substantially increase HIV cascade progression in contexts where overall testing and linkage are already high. TRIAL REGISTRATION: ClinicalTrials.gov NCT02827240.

21. Muth, S., et al. **"HIV treatment cascade among female entertainment and sex workers in Cambodia: impact of amphetamine use and an HIV prevention program**." *Addict Sci Clin Pract* 2017 12(1): 20. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5584046/pdf/13722_2017_Article_85.pdf

BACKGROUND: HIV prevalence remains high in Cambodia among female entertainment and sex workers (FESW), and amphetamine-type stimulant (ATS) use significantly increases risk of infection. A successful continuum of care (CoC) is key to effective clinical care and prevention. This study aimed to describe the HIV CoC in HIV-positive FESW. We examined CoC outcomes among HIV-positive FESW participating in the Cambodia Integrated HIV and Drug Prevention Implementation (CIPI) study, being implemented in ten provinces. CIPI is a trial aimed at reducing ATS use concomitant with the SMARTgirl HIV prevention program.

METHODS: From 2013 to 2016, 1198 FESW >/= 18 years old who reported multiple sex partners and/or transactional sex were recruited. We identified 88 HIV-positive women at baseline. We described linkage to care as 12-month retention and viral suppression (<1000 copies/mL). Logistic regression analyses were conducted to examine correlates of retention in care at 12 months, and viral suppression.

RESULTS: Median age of the 88 HIV-positive women was 32 years [interquartile range (IQR) 28, 35]; 50% were working in entertainment venues and 50% as freelance sex workers; 70% reported SMARTgirl membership. In the past 3 months, women reported a median of 15 sex partners, 38% reported unprotected sex, and 55% reported using ATS. Overall, 88% were receiving HIV care, 83% were on antiretroviral therapy, 39% were retained in care at 12 months, and 23% were virally suppressed. SMARTgirl membership was independently associated with fourfold greater odds of 12-month retention in care (AOR = 4.16, 95% CI 1.38, 12.56). Those at high risk for an ATS use disorder had 91% lower odds of 12-month retention in care (AOR = 0.09, 95% CI 0.01, 0.72). Viral suppression was independently associated with SMARTgirl membership, older age, reporting of STI symptoms, worse symptoms of psychological distress, and greater numbers of sex partners.

CONCLUSIONS: This is the first study to characterize the HIV CoC in Cambodian FESW. While most women were successfully linked to HIV care, retention and viral suppression were low. Tailored programs like SMARTgirl, targeting the broader population of HIV-positive FESW as well as interventions to reduce ATS use could optimize the clinical and population health benefits of HIV treatment. Trial registration This work reports data collected as part of a trial: NCT01835574. This work does not present trial results.

22. Yu, J., et al. **"Implementation of a "County-Township-Village" Allied HIV Prevention and Control Intervention in Rural China**." *AIDS Patient Care STDS* 2017 31(9): 384-393.

In China, rural areas are a weak link of HIV/AIDS prevention and control. From September 2011, an innovative "county-township-village" allied intervention was implemented in Longzhou County, Guangxi, which assigned the tasks of HIV/AIDS prevention and control to the county Centers for Disease Control and Prevention (CDC), township hospitals, and village clinics, respectively, instead of traditional intervention in which the county CDC undertook the entire work. A 6-year consecutive cross-sectional survey, including 3-year traditional intervention (2009-2011) and 3-year innovative intervention (2012-2014), was conducted to evaluate the effects of the new intervention. Compared to traditional intervention, the innovative intervention achieved positive effects in decreasing risky behaviors. Among female sex workers, condom use rate in the last month increased from 72.06% to 96.82% (p < 0.01). Among drug users, having commercial sex rate in the last year reduced from 17.20% to 5.94% and condom use rate increased from 14.06% to 76.09% (p < 0.01). The risk ratio of HIV infection during innovative intervention was 0.631 (95% confidence interval 0.549-0.726) compared with traditional one. Cost-effectiveness analysis indicates that innovative intervention restores each disability-adjusted life year costing an average of $124.26. Taken together, Longzhou's innovative intervention has achieved good effects on HIV/AIDS prevention and control and provides a good reference for rural China.

23.   Ndakala, F. N., et al. **"The incidence of first-line antiretroviral treatment changes and related factors among HIV-infected sex workers in Nairobi, Kenya**." *Pan Afr Med J* 2017 28: 7. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5681014/pdf/PAMJ-28-7.pdf

Introduction: In many settings, several factors including adverse drug reactions and clinical failure can limit treatment choices for combined antiretroviral therapy (cART). The aim of the study was to describe the incidence of first-line cART changes and associated factors in a cohort of Kenyan sex workers.

Methods: This was a retrospective review of medical records collected from 2009 to 2013. The review included records of HIV-infected patients aged >/= 18 years, who received either stavudine or zidovudine or tenofovir disoproxil fumarate-based regimens. Using systematic random sampling, the study selected 1 500 records and censoring targeted the first incident of a drug change from the first-line cART.

Results: The overall incidence rate of cART changes was 11.1 per 100 person-years within a total follow-up period of 3 427.9 person-years. Out of 380 patients who changed cART, 370 (97%) had a drug substitution and 10 (3%) switched regimens. The most commonly cited reasons for changing cART were adverse drug reactions (76%). Tenofovir disoproxil fumarate had a lower drug change rate (1.9 per 100 person years) compared to stavudine (27 per 100 person years). Using zidovudine as the reference group, stavudine-based regimens were significantly associated with an increased hazard of drug changes (adjusted hazards ratio 10.2; 95% CI: 6.02-17.2).

Conclusion: These findings suggest a moderate incidence of cART changes among sex workers in Nairobi, Kenya. Individuals using stavudine were at a higher risk of experiencing a change in their cART, mostly presenting within 20 months, and primarily due to adverse drug reactions.

24.   Masvawure, T. B., et al. **"Intentional and Unintentional Condom Breakage and Slippage in the Sexual Interactions of Female and Male Sex Workers and Clients in Mombasa, Kenya**." *AIDS Behav* 2017.

We examined why male condoms broke or slipped off during commercial sex and the actions taken in response among 75 female and male sex workers and male clients recruited from 18 bars/nightclubs in Mombasa, Kenya. Most participants (61/75, 81%) had experienced at least one breakage or slippage during commercial sex. Many breakages were attributed to the direct actions of clients. Breakages and slippages fell into two main groups: those that were intentionally caused by clients and unintentional ones caused by inebriation, forceful thrusting during sex and incorrect or non-lubricant use. Participant responses included: stopping sex and replacing the damaged condoms, doing nothing, getting tested for HIV, using post-exposure prophylaxis and washing. Some sex workers also employed strategies to prevent the occurrence of condom breakages. Innovative client-oriented HIV prevention and risk-reduction interventions are therefore urgently needed. Additionally, sex workers should be equipped with skills to recognize and manage breakages.

25.   Sileo, K. M., et al. **"The intersection of intimate partner violence and HIV risk among women engaging in transactional sex in Ugandan fishing villages**." *AIDS Care* 2017: 1-9.

Intimate partner violence (IPV) may increase risk for HIV/AIDS among women engaging in transactional sex in Ugandan fishing communities. In this cross-sectional study, 115 women reporting engaging in transactional sex in Lake Victoria fishing communities completed a computerized interview. We tested associations between IPV and other HIV risk factors, with unprotected sex and HIV status, and tested moderators of the IPV-HIV risk relationship. Women reporting recent sexual IPV reported 3.36 times more unprotected sex acts (AdjExp[B] = 3.36, 95% CI = 1.29-8.69, p = 0.07). The effect of sexual IPV on sexual risk was significantly greater among alcohol and fish sellers compared to sex workers (interaction: Exp[B] = 12.29, 95% CI = 5.06-29.85, p < 0.001). Women reporting any sexual IPV were nearly four times more likely to report being HIV positive than women reporting no sexual IPV (AOR = 3.94, 95% CI = 1.22-12.66, p = 0.02). Integrated IPV and HIV interventions are needed in this context, especially among alcohol and fish sellers engaging in transactional sex.

26. Fitzgerald-Husek, A., et al. **"Measuring stigma affecting sex workers (SW) and men who have sex with men (MSM): A systematic review**." *PLoS One* 2017 12(11): e0188393. Online at: http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0188393&type=printable

BACKGROUND: Stigma involves discrediting a person or group based on a perceived attribute, behaviour or reputation associated with them. Sex workers (SW) and men who have sex with men (MSM) are key populations who are often at increased risk for the acquisition and transmission of HIV and who are affected by stigma that can negatively impact their health and well-being. Although stigma was included as an indicator in the US National HIV/AIDS Strategic Plan and there have been consultations focused on adding a stigma indicator within PEPFAR and the Global Fund in relation to potentiating HIV risks among key populations, there remains limited consensus on the appropriate measurement of SW- or MSM-associated stigma. Consequently, this systematic review summarizes studies using quantitative, qualitative, or mixed methods approaches to measure stigma affecting sex workers and men who have sex with men.

METHODS AND FINDINGS: This systematic review included English, French, and Spanish peer-reviewed research of any study design measuring SW- or MSM-associated stigma. Articles were published from January 1, 2004 to March 26, 2014 in PsycINFO, PubMed, EMBASE, CINAHL Plus, Global Health, and World Health Organization Global Health Library Regional Indexes. Of the 541 articles reviewed, the majority measured stigma toward MSM (over 97%), were conducted in North America, used quantitative methods, and focused on internalized stigma.

CONCLUSIONS: With the inclusion of addressing stigma in several domestic and international HIV strategies, there is a need to ensure the use of validated metrics for stigma. The field to date has completed limited measurement of stigma affecting sex workers, and limited measurement of stigma affecting MSM outside of higher income settings. Moving forward requires a concerted effort integrating validated metrics of stigma into health-related surveys and programs for key populations.

27. Srivastava, A., et al. **"Pathways to Male Transactional Sex in Mumbai, India**." *J Homosex* 2017.

The paper explores pathways to male transactional sex, focusing on entering, soliciting practices, role of pimps, client characteristics, and negotiations. Little scientific literature exists regarding male transactional sex in India, who represent a high-risk group for HIV infection. Case studies with 10 men who engage in transactional sex were conducted, who were recruited using purposive snowball sampling and interviewed at a social service organization. Participants differed in their sexual identity, sex roles, soliciting practices, and clients. Most of them listed economic crisis as their reason for entering transactional sex. Strategies to find clients included self-solicitation and referrals; while, pimps played a major role in solicitation, negotiations, and events of crisis. Relationship among men who engage in transactional sex, pimps, and clients involves points of negotiation, opportunities, and limitations. HIV prevention should focus on identifying and addressing the groups' unique needs and working with pimps on risk reduction strategies and crisis interventions.

28. Wood, D., et al. **"Recruitment of Female Sex Workers in HIV Prevention Trials: Can Efficacy Endpoints Be Reached More Efficiently?**" *J Acquir Immune Defic Syndr* 2017.

Background/Setting: Randomized controlled trials (RCTs) of HIV biomedical prevention interventions often enroll participants with varying levels of HIV exposure, including people never exposed to HIV. We assessed whether enrolling larger proportion of participants with consistently high exposure to HIV, such as female sex workers (FSW), might reduce trial duration and improve the accuracy of product efficacy estimates in future HIV prevention trials.

METHODS: We used an individual-based stochastic model to simulate event-driven RCTs of an HIV prevention intervention providing 80% reduction in susceptibility per act under different proportions of FSW enrolled. A 5% annual drop-out rate was assumed for both FSW and non-FSW in our main scenario, but

rates of up to 50% for FSW were also explored.

RESULTS: Enrolling 20% and 50% FSW reduced the median simulated trial duration from 30 months with 0% FSW enrolled to 22 months and 17 months, respectively. Estimated efficacy increased from 71% for RCTs without FSW to 74% and 76% for RCTs with 20% and 50% FSW enrolled, respectively. Increasing the FSW drop-out rate to 50% increased the duration of RCTs by 1-2 months on average and preserved the gain in estimated efficacy.

CONCLUSION: Despite the potential logistical challenges of recruiting and retaining FSW, trialists should revisit the idea of enrolling FSW in settings where HIV incidence among FSW is higher than among non-FSW. Our analysis suggests that enrolling FSW would increase HIV incidence, reduce trial duration and improve efficacy estimates, even if the annual drop-out rate among FSW participants is high.This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial License 4.0 (CCBY-NC), where it is permissible to download, share, remix, transform, and buildup the work provided it is properly cited. The work cannot be used commercially without permission from the journal.

29.   Nyblade, L., et al. **"The relationship between health worker stigma and uptake of HIV counseling and testing and utilization of non-HIV health services: the experience of male and female sex workers in Kenya**." *AIDS Care* 2017 29(11): 1364-1372.

The barrier HIV-stigma presents to the HIV treatment cascade is increasingly documented; however less is known about female and male sex worker engagement in and the influence of sex-work stigma on the HIV care continuum. While stigma occurs in all spheres of life, stigma within health services may be particularly detrimental to health seeking behaviors. Therefore, we present levels of sex-work stigma from healthcare workers (HCW) among male and female sex workers in Kenya, and explore the relationship between sex-work stigma and HIV counseling and testing. We also examine the relationship between sex-work stigma and utilization of non-HIV health services. A snowball sample of 497 female sex workers (FSW) and 232 male sex workers (MSW) across four sites was recruited through a modified respondent-driven sampling process. About 50% of both male and female sex workers reported anticipating verbal stigma from HCW while 72% of FSW and 54% of MSW reported experiencing at least one of seven measured forms of stigma from HCW. In general, stigma led to higher odds of reporting delay or avoidance of counseling and testing, as well as non-HIV specific services. Statistical significance of relationships varied across type of health service, type of stigma and gender. For example, anticipated stigma was not a significant predictor of delay or avoidance of health services for MSW; however, FSW who anticipated HCW stigma had significantly higher odds of avoiding (OR = 2.11) non-HIV services, compared to FSW who did not. This paper adds to the growing evidence of stigma as a roadblock in the HIV treatment cascade, as well as its undermining of the human right to health. While more attention is being paid to addressing HIV-stigma, it is equally important to address the key population stigma that often intersects with HIV-stigma.

30.   Longo, J. D., et al. **"Risk factors for HIV infection among female sex workers in Bangui, Central African Republic**." *PLoS One* 2017 12(11): e0187654. Online at:

OBJECTIVE: The aims of the study were i) to categorize female sex workers (FSW) according to socio-anthropologic criteria in Bangui; ii) to examine the association between a selection of demographic and risk variables with the different categories of female sex work as outcome, and iii) to investigate factors associated with HIV status.

METHODS: A cross-sectional questionnaire survey was conducted to describe the spectrum of commercial sex work in Bangui among 345 sexually active women. After collection of social and behavioral characteristics, each woman received a physical examination and a blood sample was taken for biological analyses, including HIV testing. The relationships between sociodemographic characteristics, behavioral variables involved in high risk for HIV as well as biological results were investigated by bivariate analysis in relationship with FSW categories as main outcomes, and by bivariate analysis followed by multivariate

logistic regression analysis in relationship with HIV as the main outcome. The strength of statistical associations was measured by crude and adjusted Odds ratios (OR) and their 95% confidence intervals.

RESULTS: The typology of FSW comprised six different categories. Two groups were the "official" professional FSW primarily classified according to their locations of work [i) "kata"(18.55%) representing women working in poor neighborhoods of Bangui; ii) "pupulenge" (13.91%) working in hotels and night clubs to seek white men]. Four groups were "clandestine" nonprofessional FSW classified according to their reported main activity [i) "market and street vendors" (20.86%); ii) "schoolgirls or students" (19.13%) involved in occasional transactional sex (during holidays); iii) "housewives or unemployed women" (15.65%); iv) "civil servants" (11.88%) working as soldiers or in the public sector]. The overall prevalence of HIV-1 was 19.12% (66/345). HIV varied according to FSW categories. Thus, among professional FSW, the HIV prevalence was 6-fold higher in "kata" than "pupulenge" (39.13% versus 6.30%; P = 0.001). Among nonprofessional FSW, the "vendors" showed the highest HIV prevalence (31.91%), which was higher than in "students" (6.10%; P = 0.001), "civil servants" (9.83%; P = 0.005), and "housewives" (13.00%; P = 0.01). In bivariate analysis, the following variables showed statistically significant association with risk for HIV infection: nationality; age of first sexual intercourse; self-assessment of HIV risk; knowledge of HIV status; anal sex practice with last clients; irregular condom use in last week; consumption of alcohol; other psycho-active substances; past history of STIs; HBs Ag; HSV-2 and bacterial vaginosis. However, the variable "sex workers categories" dichotomized into professional versus nonprofessional FSW was no longer associated with HIV. In multivariate logistical regression analysis, HIV infection was strongly associated with nationality (15.65% versus 3.77%) [adjusted OR (aOR) 3.39: 95% CI:1.25-9.16, P<0.05]; age of first sexual intercourse (21.10% versus 14.00%) (aOR 2.13: 95% CI: 1.03-4.39, P<0.05); anal sex practice with last clients (43.40% versus 11.50%) (aOR 4.31: 95% CI:2.28-8.33, P<0.001); irregular condom use in past week (33.50% versus 3.00%) (aOR 5.49: 95% CI:1.89-15.98, P<0.001); alcohol consumption before sex (34.70% versus 7.80%) (aOR 2.69: 95% CI:1.22-4.96, P<0.05); past history of STIs (41.00% versus 10.80%) (aOR 2.46: 95% CI:1.22-4.97, P<0.05) and bacterial vaginosis (29.80% versus 4.29%) (aOR 6.36: 95% CI: 2.30-17.72, P<0.001).

CONCLUSION: Our observations highlight the high level of vulnerability for HIV acquisition of both poor professional "kata" and nonprofessional "street vendor" FSW categories. These categories should be particularly taken into account when designing specific prevention programs for STIs/HIV control purposes.

31. Rao, A., et al. **"Sampling Key Populations for HIV Surveillance: Results From Eight Cross-Sectional Studies Using Respondent-Driven Sampling and Venue-Based Snowball Sampling**." *JMIR Public Health Surveill* 2017 3(4): e72. Online at:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5670312/pdf/publichealth_v3i4e72.pdf

BACKGROUND: In using regularly collected or existing surveillance data to characterize engagement in human immunodeficiency virus (HIV) services among marginalized populations, differences in sampling methods may produce different pictures of the target population and may therefore result in different priorities for response.

OBJECTIVE: The objective of this study was to use existing data to evaluate the sample distribution of eight studies of female sex workers (FSW) and men who have sex with men (MSM), who were recruited using different sampling approaches in two locations within Sub-Saharan Africa: Manzini, Swaziland and Yaounde, Cameroon.

METHODS: MSM and FSW participants were recruited using either respondent-driven sampling (RDS) or venue-based snowball sampling. Recruitment took place between 2011 and 2016. Participants at each study site were administered a face-to-face survey to assess sociodemographics, along with the prevalence of self-reported HIV status, frequency of HIV testing, stigma, and other HIV-related characteristics. Crude and RDS-adjusted prevalence estimates were calculated. Crude prevalence estimates from the venue-based snowball samples were compared with the overlap of the RDS-adjusted prevalence estimates, between both FSW and MSM in Cameroon and Swaziland.

RESULTS: RDS samples tended to be younger (MSM aged 18-21 years in Swaziland: 47.6% [139/310] in RDS vs 24.3% [42/173] in Snowball, in Cameroon: 47.9% [99/306] in RDS vs 20.1% [52/259] in Snowball; FSW aged 18-21 years in Swaziland 42.5% [82/325] in RDS vs 8.0% [20/249] in Snowball; in Cameroon 15.6% [75/576] in RDS vs 8.1% [25/306] in Snowball). They were less educated (MSM: primary school completed or less in Swaziland 42.6% [109/310] in RDS vs 4.0% [7/173] in Snowball, in Cameroon 46.2% [138/306] in RDS vs 14.3% [37/259] in Snowball; FSW: primary school completed or less in Swaziland 86.6% [281/325] in RDS vs 23.9% [59/247] in Snowball, in Cameroon 87.4% [520/576] in RDS vs 77.5% [238/307] in Snowball) than the snowball samples. In addition, RDS samples indicated lower exposure to HIV prevention information, less knowledge about HIV prevention, limited access to HIV prevention tools such as condoms, and less-reported frequency of sexually transmitted infections (STI) and HIV testing as compared with the venue-based samples. Findings pertaining to the level of disclosure of sexual practices and sexual practice-related stigma were mixed.

CONCLUSIONS: Samples generated by RDS and venue-based snowball sampling produced significantly different prevalence estimates of several important characteristics. These findings are tempered by limitations to the application of both approaches in practice. Ultimately, these findings provide further context for understanding existing surveillance data and how differences in methods of sampling can influence both the type of individuals captured and whether or not these individuals are representative of the larger target population. These data highlight the need to consider how program coverage estimates of marginalized populations are determined when characterizing the level of unmet need.

32. Duff, P., et al. **"Social and structural factors increase inconsistent condom use by sex workers' one-time and regular clients in Northern Uganda**." *AIDS Care* 2017: 1-9.

While sex workers (SWs) bear the brunt of the epidemic in Uganda, there remains a dearth of empirical research on the structural drivers of HIV prevention among SWs. This study examined the drivers of inconsistent condom use by one-time and regular clients of young women SWs in Gulu, Northern Uganda. Data were drawn from the Gulu Sexual Health Study, a cross-sectional study of young SWs, aged 14 years and older (2011-2012). SWs were recruited using peer/SW-led outreach, in partnership with The AIDS Support Organization and other CBOs. Multivariable logistic regression was used to examine the correlates of inconsistent condom use by one-time and regular clients. In total, 84.5% of the 381 SWs servicing regular clients and 76.8% of the 393 SWs servicing one-time clients reported inconsistent client condom use. In multivariable analysis, physical/sexual violence by clients (AOR = 5.39; 95%CI 3.05-9.49), low sexual control by workers (measured by the validated Pulweritz scale) (AOR = 2.86; 95%CI 1.47-5.58), alcohol/drug use while working (AOR = 1.98; 95%CI 1.17-3.35) and migration to Gulu for sex work (AOR = 1.73; 95%CI 0.95-3.14) were positively correlated with inconsistent condom use by one-time clients. Correlates of inconsistent condom use by regular clients included: low sexual control by workers (AOR = 4.63; 95%CI 2.32-9.23); physical/sexual violence by clients (AOR = 3.48; 95%CI 1.85-6.53); police harassment (AOR = 2.57; 95%CI 1.17-5.65); and being a single mother (AOR = 2.07; 95%CI 1.09-3.93). Structural and interpersonal factors strongly influence inconsistent condom use by clients, with violence by clients and police, low sexual control by workers, migration and single-parenthood all linked to non-condom use. There is a need for peer-led structural interventions that improve access to occupational health and safety standards (e.g., violence prevention and alcohol/drug harm reduction policies/programming). Shifts away from the current punitive approaches towards SWs are integral to the success of such interventions, as they continue to undermine HIV prevention efforts.

33. Cao, B., et al. **"Social Media Interventions to Promote HIV Testing, Linkage, Adherence, and Retention: Systematic Review and Meta-Analysis**." *J Med Internet Res* 2017 19(11): e394. Online at: http://www.jmir.org/2017/11/e394/pdf

BACKGROUND: Social media is increasingly used to deliver HIV interventions for key populations worldwide. However, little is known about the specific uses and effects of social media on human immunodeficiency virus (HIV) interventions.

OBJECTIVE: This systematic review examines the effectiveness of social media interventions to promote HIV testing, linkage, adherence, and retention among key populations.

METHODS: We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist and Cochrane guidelines for this review and registered it on the International Prospective Register of Systematic Reviews, PROSPERO. We systematically searched six databases and three conference websites using search terms related to HIV, social media, and key populations. We included studies where (1) the intervention was created or implemented on social media platforms, (2) study population included men who have sex with men (MSM), transgender individuals, people who inject drugs (PWID), and/or sex workers, and (3) outcomes included promoting HIV testing, linkage, adherence, and/or retention. Meta-analyses were conducted by Review Manager, version 5.3. Pooled relative risk (RR) and 95% confidence intervals were calculated by random-effects models.

RESULTS: Among 981 manuscripts identified, 26 studies met the inclusion criteria. We found 18 studies from high-income countries, 8 in middle-income countries, and 0 in low-income countries. Eight were randomized controlled trials, and 18 were observational studies. All studies (n=26) included MSM; five studies also included transgender individuals. The focus of 21 studies was HIV testing, four on HIV testing and linkage to care, and one on antiretroviral therapy adherence. Social media interventions were used to do the following: build online interactive communities to encourage HIV testing/adherence (10 studies), provide HIV testing services (9 studies), disseminate HIV information (9 studies), and develop intervention materials (1 study). Of the studies providing HIV self-testing, 16% of participants requested HIV testing kits from social media platforms. Existing social media platforms such as Facebook (n=15) and the gay dating app Grindr (n=10) were used most frequently. Data from four studies show that HIV testing uptake increased after social media interventions (n=1283, RR 1.50, 95% CI 1.28-1.76). In the studies where social media interventions were participatory, HIV testing uptake was higher in the intervention arm than the comparison arm (n=1023, RR 1.64, 95% CI 1.19-2.26).

CONCLUSIONS: Social media interventions are effective in promoting HIV testing among MSM in many settings. Social media interventions to improve HIV services beyond HIV testing in low- and middle-income countries and among other key populations need to be considered.

TRIAL REGISTRATION: International Prospective Register of Systematic Reviews (PROSPERO): CRD42016048073; http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42016048073 (Archived by WebCite at http://www. webcitation.org/6usLCJK3v).

34. Mayanja, Y., et al. **"'Test and Treat' Among Women at High Risk for HIV-infection in Kampala, Uganda: Antiretroviral Therapy Initiation and Associated Factors**." *AIDS Behav* 2017.

   Data on implementation of 'Test and Treat' among key populations in sub-Saharan Africa are still limited. We examined factors associated with prompt antiretroviral therapy/ART (within 1 month of HIV-positive diagnosis or 1 week if pregnant) among 343 women at high risk for HIV infection in Kampala-Uganda, of whom 28% initiated prompt ART. Most (95%) reported paid sex within 3 months prior to enrolment. Multivariable logistic regression was used to determine baseline characteristics associated with prompt ART. Sex work as main job, younger age and being widowed/separated were associated with lower odds of prompt ART; being enrolled after 12 months of implementing the intervention was associated with higher odds of prompt ART. Younger women, widowed/separated and those reporting sex work as their main job need targeted interventions to start ART promptly after testing. Staff supervision and mentoring may need strengthening during the first year of implementing 'test and treat' interventions.

35. Budhwani, H., et al. **"Transgender female sex workers' HIV knowledge, experienced stigma, and condom use in the Dominican Republic**." *PLoS One* 2017 12(11): e0186457. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5667872/pdf/pone.0186457.pdf

INTRODUCTION: Not only do transgender female sex workers have some of the highest rates of sexually transmitted infections (STI), human immunodeficiency virus (HIV), and experienced stigma, they also have higher likelihood of early sexual debut and some of the lowest levels of educational attainment compared to other stigmatized populations. Some of the most common interventions designed to reduce transmission of HIV and STIs seek to educate high-risk groups on sexual health and encourage condom use across all partner types; however, reaching stigmatized populations, particularly those in resource-limited settings, is particularly challenging. Considering the importance of condom use in stopping the spread of HIV, the aim of this study was two-fold; first to characterize this hard-to-reach population of transgender female sex workers in the Dominican Republic, and second, to assess associations between their HIV knowledge, experienced stigma, and condom use across three partner types.

METHODS: We analyzed self-reported data from the Questionnaire for Transgender Sex Workers (N = 78). Respondents were interviewed at their workplaces. Univariate and bivariate analyses were employed. Fisher Chi-square tests assessed differences in HIV knowledge and experienced stigma by condom use across partner types.

RESULTS: HIV knowledge was alarmingly low, condom use varied across partner type, and the respondents in our sample had high levels of experienced stigma. Average age of first sexual experience was 13.12 years with a youngest age reported of 7. Dominican Republic statutory rape laws indicate 18 years is the age of consent; thus, many of these transgender women's first sexual encounters would be considered forcible (rape) and constitute a prosecutable crime. On average, respondents reported 8.45 sexual partners in the prior month, with a maximum of 49 partners. Approximately two thirds of respondents used a condom the last time they had sex with a regular partner. This was considerably lower than condom use reported with coercive partners (92.96%) and clients (91.78%). Bivariate analyses revealed two trends: experienced stigma was associated with lower rates of condom use, and lower HIV knowledge was associated with lower rates of condom use. The former provides additional evidence that experienced stigma may become internalized, affecting individual-level behaviors-lowering self-confidence and resilience-making it more difficult to negotiate condom use due to lack of self-efficacy and desire to show trust in one's partner. The latter supports public health research that suggests gaps in HIV knowledge persist and are pronounced in highly stigmatized populations.

DISCUSSION: The vulnerabilities experienced by transgender persons, particularly in environments that vehemently adhere to conservative ideologies related to sex and gender, are significant and harm this population. These vulnerabilities could potentially be addressed through critically examining of impact of policies that indirectly promote or allow victimization of transgender citizens and subsequently diminish the effectiveness of public health and educational interventions. By taking action through the revocation of such laws, the Dominican Republic has the opportunity to improve overall population health, to protect some of its most stigmatized citizens, and to become the flag bearer of enhanced human rights in the Caribbean and Latin America.

36.   Grant, H., et al. **"When are declines in condom use while using PrEP a concern? Modelling insights from a Hillbrow, South Africa case study**." *J Int AIDS Soc* 2017 20(1): 21744. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5640310/pdf/jias-20-1371934.pdf

INTRODUCTION: Oral pre-exposure prophylaxis (PrEP) is a promising new prevention approach for those most at risk of HIV infection. However, there are concerns that behavioural disinhibition, specifically reductions in condom use, might limit PrEP's protective effect. This study uses the case of female sex workers (FSWs) in Johannesburg, South Africa, to assess whether decreased levels of condom use following the introduction of PrEP may limit HIV risk reduction.

METHOD: We developed a static model of HIV risk and compared HIV-risk estimates before and after the introduction of PrEP to determine the maximum tolerated reductions in condom use with regular partners and clients for HIV risk not to change. The model incorporated the effects of increased STI exposure owing to decreased condom use. Noting that condom use with regular partners is generally low, we also estimated

the change in condom use tolerated with clients only, to still achieve 50 and 90% risk reduction on PrEP. The model was parameterized using data from Hillbrow, Johannesburg. Sensitivity analyses were performed to ascertain the robustness of our results.

RESULTS: Reductions in condom use could be tolerated by FSWs with lower baseline condom use (65%). For scenarios where 75% PrEP effectiveness is attained, 50% HIV-risk reduction on PrEP would be possible even with 100% reduction in condom use from consistent condom use as high as 70% with clients. Increased exposure to STIs through reductions in condom use had limited effect on the reductions in condom use tolerated for HIV risk not to increase on PrEP.

CONCLUSIONS: PrEP is likely to be of benefit in reducing HIV risk, even if reductions in condom use do occur. Efforts to promote consistent condom use will be critical for FSWs with high initial levels of condom use, but with challenges in adhering to PrEP.

Transgender People - 14

1. Pina, C., et al. **"Antiretroviral Treatment Uptake and Adherence Among Men Who Have Sex With Men and Transgender Women With HIV in Mumbai, India: A Cross-Sectional Study**." *J Assoc Nurses AIDS Care* 2017.

2. Daniels, J., et al. **"Assessing the Feasibility of Smartphone Apps for HIV-Care Research with MSM and Transgender Individuals in Mpumalanga, South Africa**." *J Int Assoc Provid AIDS Care* 2017 16(5): 433-439.

   There is an urgent need to develop the HIV treatment cascade for men who have sex with men (MSM) and transgender individuals in rural Mpumalanga, South Africa. Mhealth tools such as smartphone applications have the potential to support HIV self-care behaviors. We conducted an exploratory study with HIV-positive community leaders to understand their current uses of cell phones and smartphones and to assess their interest in an HIV research study that utilized a smartphone application for HIV care support. A total of 18 community leaders were recruited to complete a questionnaire and focus group. We found that a large proportion of participants had smartphone access and were interested in a research study that utilized a smartphone application with secure access measures. We conclude that smartphone applications for HIV care research are feasible based on access and interest by MSM and transgender individuals in this rural setting.

3. Weikum, D., et al. **"An explanatory factor analysis of a brief self-report scale to detect neurocognitive impairment among HIV-positive men who have sex with men and transgender women in Peru**." *AIDS Care* 2017 29(10): 1297-1301.

   Neurocognitive impairment (NCI) has been associated with poor clinical outcomes in various patient populations. This study used exploratory factor analysis (EFA) to examine the factor structure of the existing 95-item Neuropsychological Impairment Scale (NIS) to create a suitable NCI screening instrument for people living with HIV (PLH). In Lima, Peru, 313 HIV-positive men who have sex with men (MSM) and transgender women (TGW) prescribed antiretroviral therapy (ART) completed the NIS using computer-assisted self-interviews (CASI). The EFA used principal axis factoring and orthogonal varimax rotation, which resulted in 42 items with an 8-factor solution that explained 51.8% of the overall variance. The revised, 8-factor, Brief Inventory of Neurocognitive Impairment for Peru (BINI-P) showed a diverse set of factors with excellent to good reliability (i.e., F1 alpha = 0.92 to F8 alpha = 0.78). This EFA supports the use of the BINI-P to screen for NCI among Spanish-speaking, HIV-positive MSM and TGW. Future research should examine the

effectiveness of the BINI-P in detecting NCI in clinical care settings and the impact of NCI on HIV health-related outcomes, including linkage and retention in care, ART adherence and HIV risk behaviors.

4. Poteat, T., et al. **"HIV prevalence and behavioral and psychosocial factors among transgender women and cisgender men who have sex with men in 8 African countries: A cross-sectional analysis**." *PLoS Med* 2017 14(11): e1002422. Online at:
    https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5675306/pdf/pmed.1002422.pdf

    INTRODUCTION: Sub-Saharan Africa bears more than two-thirds of the worldwide burden of HIV; however, data among transgender women from the region are sparse. Transgender women across the world face significant vulnerability to HIV. This analysis aimed to assess HIV prevalence as well as psychosocial and behavioral drivers of HIV infection among transgender women compared with cisgender (non-transgender) men who have sex with men (cis-MSM) in 8 sub-Saharan African countries.

    METHODS AND FINDINGS: Respondent-driven sampling targeted cis-MSM for enrollment. Data collection took place at 14 sites across 8 countries: Burkina Faso (January-August 2013), Cote d'Ivoire (March 2015-February 2016), The Gambia (July-December 2011), Lesotho (February-September 2014), Malawi (July 2011-March 2012), Senegal (February-November 2015), Swaziland (August-December 2011), and Togo (January-June 2013). Surveys gathered information on sexual orientation, gender identity, stigma, mental health, sexual behavior, and HIV testing. Rapid tests for HIV were conducted. Data were merged, and mixed effects logistic regression models were used to estimate relationships between gender identity and HIV infection. Among 4,586 participants assigned male sex at birth, 937 (20%) identified as transgender or female, and 3,649 were cis-MSM. The mean age of study participants was approximately 24 years, with no difference between transgender participants and cis-MSM. Compared to cis-MSM participants, transgender women were more likely to experience family exclusion (odds ratio [OR] 1.75, 95% CI 1.42-2.16, $p < 0.001$), rape (OR 1.95, 95% CI 1.63-2.36, $p < 0.001$), and depressive symptoms (OR 1.30, 95% CI 1.12-1.52, $p < 0.001$). Transgender women were more likely to report condomless receptive anal sex in the prior 12 months (OR 2.44, 95% CI 2.05-2.90, $p < 0.001$) and to be currently living with HIV (OR 1.81, 95% CI 1.49-2.19, $p < 0.001$). Overall HIV prevalence was 25% (235/926) in transgender women and 14% (505/3,594) in cis-MSM. When adjusted for age, condomless receptive anal sex, depression, interpersonal stigma, law enforcement stigma, and violence, and the interaction of gender with condomless receptive anal sex, the odds of HIV infection for transgender women were 2.2 times greater than the odds for cis-MSM (95% CI 1.65-2.87, $p < 0.001$). Limitations of the study included sampling strategies tailored for cis-MSM and merging of datasets with non-identical survey instruments.

    CONCLUSIONS: In this study in sub-Saharan Africa, we found that HIV burden and stigma differed between transgender women and cis-MSM, indicating a need to address gender diversity within HIV research and programs.

5. Hojilla, J. C., et al. **"HIV sero disclosure among men who have sex with men and transgender women on HIV pre-exposure prophylaxis**." *AIDS Care* 2017: 1-7.

    HIV pre-exposure prophyalxis (PrEP) might lead individuals to view serodisclosure as unnecessary. We examined the prevalence of non-disclosure and lack of knowledge of partner status in a global cohort of men who have sex with men (MSM) and transgender women (TW) enrolled in the iPrEx Open Label Extension (OLE). We calculated prevalence ratios by fitting a logistic model and estimating predicted probabilities using marginal standardization. Prevalence of non-disclosure and lack of knowledge of partner status were highest in Thailand (73% and 74%, respectively) and lowest in the USA (23% and 37%, respectively). In adjusted analyses, PrEP use was not significantly associated with non-disclosure or lack of knowledge of partner status (p-values>0.05). We found that relationship characteristics were significantly associated with both outcomes. Non-disclosure was higher among casual (adjusted prevalence ratio [aPR] 1.54, [95% confidence interval 1.24-1.84]) and transactional sex partners (aPR 2.03, [1.44-2.62]), and among partners whom participants have known only minutes or hours before their first sexual encounter (aPR 1.62, [1.33-1.92]). Similarly, participants were less likely to know the HIV status of casual partners (aPR 1.50, [1.30-1.71]), transactional sex

partners (aPR 1.62, [1.30-1.95]), and those they have known for only days or weeks (aPR 1.13, [0.99-1.27]) or minutes or hours (aPR 1.27, [1.11-1.42]). Our findings underscore the role of dyadic factors in influencing serodisclosure. Comprehensive risk reduction counseling provided in conjunction with PrEP that address relationship characteristics are needed to help patients navigate discussions around HIV status.

6. Jalil, E. M., et al. **"HIV testing and the care continuum among transgender women: population estimates from Rio de Janeiro, Brazil**." *J Int AIDS Soc* 2017 20(1): 21873. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5640309/pdf/jias-20-1375202.pdf

INTRODUCTION: Evidence suggests that, of all affected populations, transgender women (transwomen) may have the heaviest HIV burden worldwide. Little is known about HIV linkage and care outcomes for transwomen. We aimed to estimate population-level indicators of the HIV cascade of care continuum, and to evaluate factors associated with viral suppression among transwomen in Rio de Janeiro, Brazil.

METHODS: We conducted a respondent-driven sampling (RDS) study of transwomen from August 2015 to January 2016 in Rio de Janeiro, Brazil and collected data on linkage and access to care, antiretroviral treatment and performed HIV viral load testing. We derived population-based estimates of cascade indicators using sampling weights and conducted RDS-weighted logistic regression analyses to evaluate correlates of viral suppression (viral load </=50 copies/mL).

RESULTS: Of the 345 transwomen included in the study, 89.2% (95% CI 55-100%) had been previously tested for HIV, 77.5% (95% CI 48.7-100%) had been previously diagnosed with HIV, 67.2% (95% CI 39.2-95.2) reported linkage to care, 62.2% (95% CI 35.4-88.9) were currently on ART and 35.4% (95% CI 9.5-61.4%) had an undetectable viral load. The final adjusted RDS-weighted logistic regression model for viral suppression indicated that those who self-identified as black (adjusted odds ratio [aOR] 0.06, 95% CI 0.01-0.53, p < 0.01), reported earning </=U$160/month (aOR 0.11, 95% CI 0.16-0.87, p = 0.04) or reported unstable housing (aOR 0.08, 95% CI 0.01-0.43, p < 0.01) had significantly lower odds of viral suppression.

CONCLUSIONS: Our cascade indicators for transwomen showed modest ART use and low viral suppression rates. Multi-level efforts including gender affirming care provision are urgently needed to decrease disparities in HIV clinical outcomes among transwomen and reduce secondary HIV transmission to their partners.

7. 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 28(10): 1010-1017.

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.

8. Uthappa, C. K., et al. **"Pre-exposure prophylaxis: awareness, acceptability and risk compensation behaviour among men who have sex with men and the transgender population**." *HIV Med* 2017.

OBJECTIVES: This exploratory study examined the facilitators of and barriers to acceptance of pre-exposure prophylaxis (PrEP) and potential risk compensation behaviour emerging from its use among men who have sex with men (MSM) and transgender individuals (TGs) in India.

METHODS: A questionnaire was administered to 400 individuals registered with a targeted intervention programme. Logistic regression models were used to identify facilitators of and barriers to PrEP acceptance.

RESULTS: The respondents consisted of 68% MSM and 32% TGs. Risk behaviour categorization identified 40% as low risk, 41% as medium risk and, 19% as high risk for HIV infection. About 93% of the respondents were unaware of PrEP, but once informed about it, 99% were willing to use PrEP. The facilitators of PrEP acceptance were some schooling [odds ratio (OR) 2.16; P = 0.51], being married or in a live-in relationship (OR 2.08; P = 0.46), having a high calculated risk (OR 3.12; P = 0.33), and having a high self-perceived risk (OR 1.8; P = 0.35). Increasing age (OR 2.12; P = 0.04) was a significant barrier. TGs had higher odds of acceptance of PrEP under conditions of additional cost (OR 2.12; P = 0.02) and once-daily pill (OR 2.85; P = 0.04). Individuals identified as low risk for HIV infection showed lower odds of potential risk compensation, defined as more sexual partners (OR 0.8; P = 0.35), unsafe sex with new partners (OR 0.71; P = 0.16), and decreased condom use with regular partners (OR 0.95; P = 0.84), as compared with medium-risk individuals. The associations, although not statistically significant, are nevertheless important for public health action given the limited scientific evidence on PrEP use among MSM and TGs in India.

CONCLUSIONS: With high acceptability and a low likelihood of risk compensation behaviour, PrEP can be considered as an effective prevention strategy for HIV infection among MSM and TGs in India.

9.   Aristegui, I., et al. **"Resources to cope with stigma related to HIV status, gender identity, and sexual orientation in gay men and transgender women**." *J Health Psychol* 2017.

The stigma related to HIV status, gender identity, and sexual orientation has negative implications for the quality of life of individuals. A qualitative study was conducted to explore the resources that these stigmatized groups recognize as tools to cope with stigma and maintain their psychological well-being. Four focus groups were conducted with gay men and transgender women divided by HIV status. A thematic analysis revealed that individual, interpersonal, and institutional resources are commonly recognized as coping resources. This article discusses the importance of enhancing self-acceptance, social support, and a legal framework that legitimizes these groups as right holders.

10.   Cao, B., et al. **"Social Media Interventions to Promote HIV Testing, Linkage, Adherence, and Retention: Systematic Review and Meta-Analysis**." *J Med Internet Res* 2017 19(11): e394. Online at: http://www.jmir.org/2017/11/e394/pdf

BACKGROUND: Social media is increasingly used to deliver HIV interventions for key populations worldwide. However, little is known about the specific uses and effects of social media on human immunodeficiency virus (HIV) interventions.

OBJECTIVE: This systematic review examines the effectiveness of social media interventions to promote HIV testing, linkage, adherence, and retention among key populations.

METHODS: We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist and Cochrane guidelines for this review and registered it on the International Prospective Register of Systematic Reviews, PROSPERO. We systematically searched six databases and three conference websites using search terms related to HIV, social media, and key populations. We included studies where (1) the intervention was created or implemented on social media platforms, (2) study population included men who have sex with men (MSM), transgender individuals, people who inject drugs (PWID), and/or sex workers, and (3) outcomes included promoting HIV testing, linkage, adherence, and/or retention. Meta-analyses were conducted by Review Manager, version 5.3. Pooled relative risk (RR) and 95% confidence intervals were calculated by random-effects models.

RESULTS: Among 981 manuscripts identified, 26 studies met the inclusion criteria. We found 18 studies from high-income countries, 8 in middle-income countries, and 0 in low-income countries. Eight were randomized controlled trials, and 18 were observational studies. All studies (n=26) included MSM; five studies also

included transgender individuals. The focus of 21 studies was HIV testing, four on HIV testing and linkage to care, and one on antiretroviral therapy adherence. Social media interventions were used to do the following: build online interactive communities to encourage HIV testing/adherence (10 studies), provide HIV testing services (9 studies), disseminate HIV information (9 studies), and develop intervention materials (1 study). Of the studies providing HIV self-testing, 16% of participants requested HIV testing kits from social media platforms. Existing social media platforms such as Facebook (n=15) and the gay dating app Grindr (n=10) were used most frequently. Data from four studies show that HIV testing uptake increased after social media interventions (n=1283, RR 1.50, 95% CI 1.28-1.76). In the studies where social media interventions were participatory, HIV testing uptake was higher in the intervention arm than the comparison arm (n=1023, RR 1.64, 95% CI 1.19-2.26).

CONCLUSIONS: Social media interventions are effective in promoting HIV testing among MSM in many settings. Social media interventions to improve HIV services beyond HIV testing in low- and middle-income countries and among other key populations need to be considered.

TRIAL REGISTRATION: International Prospective Register of Systematic Reviews (PROSPERO): CRD42016048073; http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42016048073 (Archived by WebCite at http://www. webcitation.org/6usLCJK3v).

11.   Niven, H., et al. **"'They love us just the way they love a woman': gender identity, power and transactional sex between men who have sex with men and transgender women in Timor-Leste**." *Cult Health Sex* 2017: 1-15.

There has been limited research on the experiences of men who have sex with men and transgender women in Timor-Leste. Previous research has suggested a phenomenon by which same-sex-attracted men and transgender women have sexual and intimate relationships with straight-identifying men or mane-forte. Transactional sex has also been reported to be common. This paper, which complements a larger national size estimation among key populations at risk of HIV, further investigates sexual and social identities and roles, including sexual practices, among men who have sex with men and transgender women in Timor-Leste. Fifteen interviews were conducted with a profile of participants from urban and rural settings. Using inductive thematic analysis, we found that gender identity played a significant role in sexual relationships, with mane-forte having power over their sexual partner(s). Transactional sex was also found to be customary. Some participants experienced stigma, discrimination, sexual coercion and violence, while others, such as mane-forte, did not. Our research suggests that gender identity and power are significant in sexual relationships between men who have sex with men and transgender women in Timor-Leste, have implications for HIV prevention efforts and may reflect gender norms within the broader community.

12.   Budhwani, H., et al. **"Transgender female sex workers' HIV knowledge, experienced stigma, and condom use in the Dominican Republic**." *PLoS One* 2017 12(11): e0186457. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5667872/pdf/pone.0186457.pdf

INTRODUCTION: Not only do transgender female sex workers have some of the highest rates of sexually transmitted infections (STI), human immunodeficiency virus (HIV), and experienced stigma, they also have higher likelihood of early sexual debut and some of the lowest levels of educational attainment compared to other stigmatized populations. Some of the most common interventions designed to reduce transmission of HIV and STIs seek to educate high-risk groups on sexual health and encourage condom use across all partner types; however, reaching stigmatized populations, particularly those in resource-limited settings, is particularly challenging. Considering the importance of condom use in stopping the spread of HIV, the aim of this study was two-fold; first to characterize this hard-to-reach population of transgender female sex workers in the Dominican Republic, and second, to assess associations between their HIV knowledge, experienced stigma, and condom use across three partner types.

METHODS: We analyzed self-reported data from the Questionnaire for Transgender Sex Workers (N = 78). Respondents were interviewed at their workplaces. Univariate and bivariate analyses were employed. Fisher

Chi-square tests assessed differences in HIV knowledge and experienced stigma by condom use across partner types.

RESULTS: HIV knowledge was alarmingly low, condom use varied across partner type, and the respondents in our sample had high levels of experienced stigma. Average age of first sexual experience was 13.12 years with a youngest age reported of 7. Dominican Republic statutory rape laws indicate 18 years is the age of consent; thus, many of these transgender women's first sexual encounters would be considered forcible (rape) and constitute a prosecutable crime. On average, respondents reported 8.45 sexual partners in the prior month, with a maximum of 49 partners. Approximately two thirds of respondents used a condom the last time they had sex with a regular partner. This was considerably lower than condom use reported with coercive partners (92.96%) and clients (91.78%). Bivariate analyses revealed two trends: experienced stigma was associated with lower rates of condom use, and lower HIV knowledge was associated with lower rates of condom use. The former provides additional evidence that experienced stigma may become internalized, affecting individual-level behaviors-lowering self-confidence and resilience-making it more difficult to negotiate condom use due to lack of self-efficacy and desire to show trust in one's partner. The latter supports public health research that suggests gaps in HIV knowledge persist and are pronounced in highly stigmatized populations.

DISCUSSION: The vulnerabilities experienced by transgender persons, particularly in environments that vehemently adhere to conservative ideologies related to sex and gender, are significant and harm this population. These vulnerabilities could potentially be addressed through critically examining of impact of policies that indirectly promote or allow victimization of transgender citizens and subsequently diminish the effectiveness of public health and educational interventions. By taking action through the revocation of such laws, the Dominican Republic has the opportunity to improve overall population health, to protect some of its most stigmatized citizens, and to become the flag bearer of enhanced human rights in the Caribbean and Latin America.

13. Barmania, S., et al. **"Transgender women in Malaysia, in the context of HIV and Islam: a qualitative study of stakeholders' perceptions**." *BMC Int Health Hum Rights* 2017 17(1): 30. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5648476/pdf/12914_2017_Article_138.pdf

BACKGROUND: Globally, one of the key groups considered to be at high risk of acquiring HIV are transgender women, often a marginalised group. In the Malaysian context there has been a scarcity of published research relating to transgender women, a sensitive issue in a Muslim majority country, where Islam plays an influential role in society. Furthermore, there has been a paucity of research relating to how such issues relate to HIV prevention in transgender women in Malaysia. Thus, the aim of this study is to explore the attitudes of stakeholders involved in HIV prevention policy in Malaysia towards transgender women, given the Islamic context.

METHODS: In-depth interviews were undertaken with stakeholders involved in HIV prevention, Ministry of Health, Religious Leaders and People Living with HIV, including transgender women. Thirty five participants were recruited using purposive sampling from June to December 2013 within Kuala Lumpur and surrounding vicinities. Interviews were in person, audiotaped, transcribed verbatim and used a framework analysis.

RESULTS: Five central themes emerged from the qualitative data; Perceptions of Transgender women and their place in Society; Reaching out to Transgender Women; Islamic doctrine; 'Cure', 'Correction' and finally, Stigma and Discrimination.

DISCUSSION: Islamic rulings about transgenderism were often the justification given by participants chastising transgender women, whilst there were also more progressive attitudes and room for debate. Pervasive negative attitudes and stigma and discrimination created a climate where transgender women often felt more comfortable with non-governmental organisations.

CONCLUSION: The situation of transgender women in Malaysia and HIV prevention is a highly sensitive and

challenging environment for all stakeholders, given the Muslim context and current legal system. Despite this apparent impasse, there are practically achievable areas that can be improved upon to optimise HIV prevention services and the environment for transgender women in Malaysia.

14.   Semple, S. J., et al. **"Uptake of a Partner Notification Model for HIV Among Men Who Have Sex With Men and Transgender Women in Tijuana, Mexico**." *AIDS Behav* 2017.

Undiagnosed HIV infection is common among men who have sex with men (MSM) and transgender women (TW) in Latin America. We examined uptake of a partner notification (PN) model among MSM and TW in Tijuana, Mexico. Forty-six HIV-positive MSM/TW enrolled as index patients, and reported 132 MSM/TW sexual partners for PN. Of notified partners (90/132), 39% declined eligibility screening or participation, 39% tested for HIV, and of those 28% were newly-diagnosed HIV-positive. Partners who were seen by the index patient more than once in the past 4 months and those who primarily had sex with the index patient in one of their homes were more likely to be notified via PN (76% vs. 50%; p = 0.01 and 86% vs. 64%, p = 0.02, respectively). Lower than expected PN uptake was associated with problems identifying index patients, obtaining reliable partner contact information, and engaging notified partners.

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Young Key Populations - 7

1.   Pham, M. D., et al. **"Factors associated with HIV testing among young men who have sex with men in Myanmar: a cross-sectional study**." *J Int AIDS Soc* 2017 20(3). Online at: http://onlinelibrary.wiley.com/doi/10.1002/jia2.25026/epdf

INTRODUCTION: In Myanmar, men who have sex with men (MSM) experience high risk of HIV infection. However, access to HIV testing and prevention services remains a challenge among this marginalized population. The objective of this study was to estimate population prevalence and correlates of prior HIV testing among young MSM (YMSM) and informs the development of HIV testing and intervention programmes that respond to the specific needs of this population.

METHODS: Five hundred and eighty-five YMSM aged 18 to 24 years were recruited using respondent-driven sampling (RDS) in a cross-sectional survey conducted in six townships of Myanmar. RDS-adjusted population estimates were calculated to estimate prevalence of HIV testing; RDS-weighted logistic regression was used to examine correlates of HIV testing in the past 6 months and in a lifetime.

RESULTS: There were 12 participants who reported receiving a HIV-positive test; of those, five were tested in the past 6 months. The RDS-weighted prevalence estimates of lifetime (any prior) HIV testing was 60.6% (95% CI: 53.3% to 66.4%) and of recent (</= 6 months) HIV testing was 50.1% (95% CI: 44.1% to 55.5%). In multivariable analysis, sexual identity was associated with lifetime but not recent HIV testing. Lifetime and recent HIV testing were associated with having three or more male sexual partners in the past 12 months (adjusted ORs (aORs) = 2.28, 95% CIs: 1.21 to 4.32 and 2.69, 95% CI: 1.59 to 4.56), having good HIV-related knowledge (aORs = 1.96, 95% CIs: 1.11 to 3.44 and 1.77, 95% CI: 1.08 to 2.89), reporting high HIV testing self-efficacy (aORs = 13.5, 95% CIs: 6.0 to 30.1 and 9.81, 95% CI: 4.27 to 22.6) and having access to and use of non-HIV health-related services in the past 12 months (aORs = 13.2, 95% CIs: 6.85 to 25.6 and 7.15, 95% CI: 4.08 to 12.5) respectively.

CONCLUSIONS: HIV testing coverage among YMSM aged 18 to 24 years old in Myanmar is still suboptimal. Integrated HIV testing and prevention services in existing health service provision systems with tailored HIV information and education programmes targeting YMSM to improve HIV-related knowledge and self-

efficacy may help to promote regular HIV testing behaviour and contribute to sustainable control of the HIV epidemic among this marginalized population in Myanmar.

2. Balan, I. C., et al. **"High Substance Use and HIV Risk Behavior Among Young Argentine Men Who Have Sex with Men**." *AIDS Behav* 2017.

   In the United States young men who have sex with men have higher rates of substance use, higher HIV incidence, and less frequent HIV testing than their heterosexual counterparts and older MSM. Less is known about comparable populations in Latin America. As part of an epidemiological study, MSM were recruited through Respondent Driven Sampling in the metropolitan area of Buenos Aires, Argentina and answered a computerized behavioral survey. From the total of 500 MSM enrolled, a sub-sample of 233 aged 18-25 was analyzed. The sample was concentrated among lower socioeconomic strata, and only 16% identified as gay. Nearly half reported male, female, and transvestite sexual partners. Reported substance use was widespread ranging from 61% for marijuana to 20% for pasta base (cocaine sulfate). Seventy percent of the sample had never been tested for HIV infection; 3% tested positive for HIV and 8% for syphilis during the study.

3. Knight, R., et al. **"Online interventions to address HIV and other sexually transmitted and blood-borne infections among young gay, bisexual and other men who have sex with men: a systematic review**." *J Int AIDS Soc* 2017 20(3). Online at: http://onlinelibrary.wiley.com/doi/10.1002/jia2.25017/epdf

   INTRODUCTION: Globally, young gay, bisexual and other men who have sex with men (gbMSM) continue to experience disproportionately high rates of HIV and other sexually transmitted and blood-borne infections (STBBIs). As such, there are strong public health imperatives to evaluate innovative prevention, treatment and care interventions, including online interventions. This study reviewed and assessed the status of published research (e.g. effectiveness; acceptability; differential effects across subgroups) involving online interventions that address HIV/STBBIs among young gbMSM.

   METHODS: We searched Medline, Embase, PsycINFO, CINAHL, and Google Scholar to identify relevant English-language publications from inception to November 2016. Studies that assessed an online intervention regarding the prevention, care, or treatment of HIV/STBBIs were included. Studies with <50% gbMSM or with a mean age >/=30 years were excluded.

   RESULTS: Of the 3465 articles screened, 17 studies met inclusion criteria. Sixteen studies assessed interventions at the "proof-of-concept" phase, while one study assessed an intervention in the dissemination phase. All of the studies focused on behavioural or knowledge outcomes at the individual level (e.g. condom use, testing behaviour), and all but one reported a statistically significant effect on >/=1 primary outcomes. Twelve studies described theory-based interventions. Twelve were conducted in the United States, with study samples focusing mainly on White, African-American and/or Latino populations; the remaining were conducted in Hong Kong, Peru, China, and Thailand. Thirteen studies included gay and bisexual men; four studies did not assess sexual identity. Two studies reported including both HIV+ and HIV- participants, and all but one study included one or more measure of socio-economic status. Few studies reported on the differential intervention effects by socio-economic status, sexual identity, race or serostatus.

   CONCLUSION: While online interventions show promise at addressing HIV/STBBI among young gbMSM, to date, little emphasis has been placed on assessing: (i) potential differential effects of interventions across subgroups of young gbMSM; (ii) effectiveness studies of interventions in the dissemination phase; and (iii) on some "key" populations of young gbMSM (e.g. those who are: transgender, from low-income settings and/or HIV positive). Future research that unpacks the potentially distinctive experiences of particular subgroups with "real world" interventions is needed.

4. Saffier, I. P., et al. **"A scoping review of prevalence, incidence and risk factors for HIV infection amongst young people in Brazil**." *BMC Infect Dis* 2017 17(1): 675. Online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5637257/pdf/12879_2017_Article_2795.pdf

BACKGROUND: Despite young people being a key population for HIV prevention, the HIV epidemic amongst young Brazilians is perceived to be growing. We therefore reviewed all published literature on HIV prevalence and risk factors for HIV infection amongst 10-25 year olds in Brazil.

METHODS: We searched Embase, LILACS, Proquest, PsycINFO, PubMed, Scopus and Web of Science for studies published up to March 2017 and analyzed reference lists of relevant studies. We included published studies from any time in the HIV epidemic which provided estimates specific to ages 10-25 (or some subset of this age range) for Brazilians on either: (a) HIV prevalence or incidence; or (b) the association between HIV and socio-demographic or behavioral risk factors.

RESULTS: Forty eight publications met the inclusion criteria: 44 cross-sectional, two case-control, two cohort. Four studies analysed national data. Forty seven studies provided HIV prevalence estimates, largely for six population subgroups: Counselling and Testing Center attendees; blood donors; pregnant women; institutional individuals; men-who-have-sex-with-men (MSM) and female sex workers (FSW); four provided HIV incidence estimates. Twelve studies showed HIV status to be associated with a wide range of risk factors, including age, sexual and reproductive history, infection history, substance use, geography, marital status, mental health and socioeconomic status.

CONCLUSIONS: Few published studies have examined HIV amongst young people in Brazil, and those published have been largely cross-sectional and focused on traditional risk groups and the south of the country. Despite these limitations, the literature shows raised HIV prevalence amongst MSM and FSW, as well as amongst those using drugs. Time trends are harder to identify, although rates appear to be falling for pregnant women, possibly reversing an earlier de-masculinization of the epidemic. Improved surveillance of HIV incidence, prevalence and risk factors is a key component of efforts to eliminate HIV in Brazil.

5. Conn, C., et al. **"Strengthening participation by young women sex workers in HIV programs: reflections on a study from Bangkok, Thailand**." *Int J Womens Health* 2017 9: 619-623. Online at: https://www.dovepress.com/getfile.php?fileID=38278

BACKGROUND: Participation is an accepted means of increasing the effectiveness of public health programs, and as such, it is considered an important component of HIV interventions targeting at-risk youth. The situation of young women sex workers in Thailand is alarming on many fronts, including that of HIV risk. As a result, HIV programs in Thailand are the key interventions undertaken in relation to young women sex workers' health. A small-scale study used semistructured interviews to explore the participation reports of five young women sex workers, as well as the related views of two community support workers, who lived and worked in Bangkok, Thailand.

DISCUSSION: This study is considered in the light of current research on - as well as new opportunities and challenges offered for - participation by vulnerable groups in the context of digital society. Thematic analysis of the interview data identified barriers to participation, including the illegality of sex work, fear, and lack of trust of the authorities, as well as widespread social stigma. Such barriers resulted in young women seeking anonymity. Yet, promisingly, young women positioned themselves as experts; they are involved in peer education and are supportive of greater involvement in HIV programs, such as further educational initiatives and collective actions.

CONCLUSION: There is a need for a more empowerment-oriented participation practice positioning young women sex workers as expert educators and codecision makers within a model of participation that is also accountable, such as including young women as members of program boards. Beyond current norms, there are new opportunities emerging because of the increasing availability of smartphone/Internet technology. These can support activist and codesign participation by young women sex workers in HIV programs. However, any developments in participation must maximize opportunities carefully, taking into consideration the difficult social environment faced by young women sex workers as well as the need for strategies to address illegality and stigma.

6.   Mutchler, M. G., et al. **"This is who we are: building community for HIV prevention with young gay and bisexual men in Beirut, Lebanon**." *Cult Health Sex* 2017: 1-14.

Young gay men in Beirut are at significantly elevated risk of HIV infection compared with the general Lebanese population. Despite nascent HIV prevention efforts in the region, there is a need for effective community-level HIV prevention interventions tailored for young gay men. This qualitative study examined internal dynamics within Beirut's gay community as a basis for developing community-level interventions. Peer ethnographers were trained to collect field notes on conversations between young gay men in public spaces in Beirut, and conducted follow-up focus groups with young gay men. Analyses revealed three major themes: (1) the need for safe spaces in which to socialise, (2) the importance of being able to locate and connect with other young gay men, and (3) ambivalence regarding a gay community that was supportive in some ways but also fragmented and often judgemental. Study findings also confirm the existence of external threats to community such as stigma, cultural and familial norms regarding heterosexuality and criminalisation of refugee status. Understanding such community dynamics and the environmental context is central to designing effective community-based HIV prevention programmes.

7.   Thienkrua, W., et al. **"Young Men Who Have Sex with Men at High Risk for HIV, Bangkok MSM Cohort Study, Thailand 2006-2014**." *AIDS Behav* 2017.

High HIV incidence has been reported in young men who have sex with men (YMSM) in North America and Western Europe, but there are limited data from Southeast Asia suggesting MSM may be the driver of the HIV epidemic in this region. We described HIV incidence and risk factors among 494 YMSM enrolled in a cohort study in Bangkok, Thailand. The HIV incidence was 7.4 per 100 person-years. In multivariable analysis, reporting use of an erectile dysfunction drug in combination with club drugs, having receptive or both insertive and receptive anal intercourse with men, having hepatitis A infection, having rectal Chlamydia trachomatis, having hepatitis B infection prior to HIV seroconversion, and reporting not always using condoms with male steady partners were significantly associated with HIV incidence in YMSM. Reduction in new HIV infections in YMSM are critical to reach targets set by Thailand and the region.