



Quarterly Research Digest on HIV and Key Populations

June 2018

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 - 4

1. Kelly, S. L., et al. "**The global Optima HIV allocative efficiency model: targeting resources in efforts to end AIDS.**" *Lancet HIV* 2018 5(4): e190-e198. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29540265>

BACKGROUND: To move towards ending AIDS by 2030, HIV resources should be allocated cost-effectively. We used the Optima HIV model to estimate how global HIV resources could be retargeted for greatest epidemiological effect and how many additional new infections could be averted by 2030.

METHODS: We collated standard data used in country modelling exercises (including demographic, epidemiological, behavioural, programmatic, and expenditure data) from Jan 1, 2000, to Dec 31, 2015 for 44 countries, capturing 80% of people living with HIV worldwide. These data were used to parameterise separate subnational and national models within the Optima HIV framework. To estimate optimal resource allocation at subnational, national, regional, and global levels, we used an adaptive stochastic descent optimisation algorithm in combination with the epidemic models and cost functions for each programme in each country. Optimal allocation analyses were done with international HIV funds remaining the same to each country and by redistributing these funds between countries.

FINDINGS: Without additional funding, if countries were to optimally allocate their HIV resources from 2016 to 2030, we estimate that an additional 7.4 million (uncertainty range 3.9 million-14.0 million) new infections could be averted, representing a 26% (uncertainty range 13-50%) incidence reduction. Redistribution of international funds between countries could avert a further 1.9 million infections, which represents a 33% (uncertainty range 20-58%) incidence reduction overall. To reduce HIV incidence by 90% relative to 2010, we estimate that more than a three-fold increase of current annual funds will be necessary until 2030. The most common priorities for optimal resource reallocation are to scale up treatment and prevention programmes targeting key populations at greatest risk in each setting. Prioritisation of other HIV programmes depends on the epidemiology and cost-effectiveness of service delivery in each setting as well as resource availability.

INTERPRETATION: Further reductions in global HIV incidence are possible through improved targeting of international and national HIV resources. **FUNDING:** World Bank and Australian NHMRC.

2. Wirtz, A. L., et al. "**HIV and Viral Hepatitis Among Imprisoned Key Populations.**" *Epidemiol Rev* 2018 40(1): 12-26. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29688317>

Prisons and other closed facilities create opportunities for transmission of human immunodeficiency virus (HIV) and viral hepatitis during detention and after release. We conducted a systematic review and meta-analysis of peer-reviewed publications (2005-2015) to describe the prevalence of HIV, hepatitis C virus, and hepatitis B virus among key populations in prisons worldwide and to compare estimates of infection with those of other prison populations. Most data were reported for people who inject drugs (PWID; n = 72) and for men who have sex with men (MSM; n = 21); few data were reported on sex workers (SW; n = 6), or transgender women (n = 2). Publications were identified from 29 countries, predominantly middle- and high-income countries. Globally, PWID had 6 times the prevalence of HIV (pooled prevalence ratio (PPR) = 6.0, 95% CI: 3.8, 9.4), 8 times the prevalence of hepatitis C virus (PPR = 8.1, 95% CI: 6.4, 10.4), and 2 times the prevalence of hepatitis B virus (PPR = 2.0, 95% CI: 1.5, 2.7) compared with noninjecting prisoner populations. Among these articles, only those from Iran, Scotland, Spain, and Italy included the availability of methadone therapy; 2 articles included information on access to needle exchange programs by PWID detainees. HIV prevalence was more than 2 times higher among SW (PPR = 2.6, 95% CI: 2.2, 3.1) and 5 times higher among MSM (PPR = 5.3, 95% CI: 3.5, 7.9) compared with other prisoners. None of these articles reported HIV prevention coverage among SW or transgender women; 1 described HIV and sexually transmitted infection screening for MSM in prison. Prevention programs specific to key populations are important, particularly for populations that are criminalized and/or may cycle in and out of prison.

3. Brown, A. E., et al. "**Monitoring the HIV continuum of care in key populations across Europe and Central Asia.**" *HIV Med* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29737610>

OBJECTIVES: The aim of the study was to measure and compare national continuum of HIV care estimates in Europe and Central Asia in three key subpopulations: men who have sex with men (MSM), people who inject drugs (PWID) and migrants.

METHODS: Responses to a 2016 European Centre for Disease Prevention and Control (ECDC) survey of 55 European and Central Asian countries were used to describe continuums of HIV care for the subpopulations. Data were analysed using three frameworks: Joint United Nations Programme on HIV/AIDS (UNAIDS) 90-90-90 targets; breakpoint analysis identifying reductions between adjacent continuum stages; quadrant analysis categorizing countries using 90% cut-offs for continuum stages.

RESULTS: Overall, 29 of 48 countries reported national data for all HIV continuum stages (numbers living with HIV, diagnosed, receiving treatment and virally suppressed). Six countries reported all stages for MSM, seven for PWID and two for migrants. Thirty-one countries did not report data for MSM (34 for PWID and 41 for migrants). In countries that provided key-population data, overall, 63%, 40% and 41% of MSM, PWID and migrants living with HIV were virally suppressed, respectively (compared with 68%, 65% and 68% nationally, for countries reporting key-population data). Variation was observed between countries, with higher outcomes in subpopulations in Western Europe compared with Eastern Europe and Central Asia.

CONCLUSIONS: Few reporting countries can produce the continuum of HIV care for the three key populations. Where data are available, differences exist in outcomes between the general and key populations. While MSM broadly mirror national outcomes (in the West), PWID and migrants experience poorer treatment and viral suppression. Countries must develop continuum measures for key populations to identify and address inequalities.

4. Weir, S. S., et al. "**Opportunities for Enhanced Strategic Use of Surveys, Medical Records, and Program Data for HIV Surveillance of Key Populations: Scoping Review.**" *JMIR Public Health Surveill* 2018 4(2): e28. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29789279>

BACKGROUND: Normative guidelines from the World Health Organization recommend tracking strategic information indicators among key populations. Monitoring progress in the global response to the HIV epidemic uses indicators put forward by the Joint United Nations Programme on HIV/AIDS. These include the 90-90-90 targets that require a realignment of surveillance data, routinely collected program data, and medical record data, which historically have developed separately.

OBJECTIVE: The aim of this study was to describe current challenges for monitoring HIV-related strategic information indicators among key populations ((men who have sex with men [MSM], people in prisons and other closed settings, people who inject drugs, sex workers, and transgender people) and identify future opportunities to enhance the use of surveillance data, programmatic data, and medical record data to describe the HIV epidemic among key populations and measure the coverage of HIV prevention, care, and treatment programs.

METHODS: To provide a historical perspective, we completed a scoping review of the expansion of HIV surveillance among key populations over the past three decades. To describe current efforts, we conducted a review of the literature to identify published examples of SI indicator estimates among key populations. To describe anticipated challenges and future opportunities to improve measurement of strategic information indicators, particularly from routine program and health data, we consulted participants of the Third Global HIV Surveillance Meeting in Bangkok, where the 2015 World Health Organization strategic information guidelines were launched.

RESULTS: There remains suboptimal alignment of surveillance and programmatic data, as well as routinely collected medical records to facilitate the reporting of the 90-90-90 indicators for HIV among key populations. Studies (n=3) with estimates of all three 90-90-90 indicators rely on cross-sectional survey data. Programmatic data and medical record data continue to be insufficiently robust to provide estimates of the 90-90-90 targets for key populations. **CONCLUSIONS:** Current reliance on more active data collection processes, including key population-specific surveys, remains warranted until the quality and validity of passively collected routine program and medical record data for key populations is optimized.

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People Who Inject Drugs - 25

1. Dawson, L., et al. "**Addressing ethical challenges in HIV prevention research with people who inject drugs.**" *J Med Ethics* 2018 44(3): 149-158. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/27114469>

Despite recent advances in HIV prevention and treatment, high HIV incidence persists among people who inject drugs (PWID). Difficult legal and political environments and lack of services for PWID likely contribute to high HIV incidence. Some advocates question whether any HIV prevention research is ethically justified in settings where healthcare system fails to provide basic services to PWID and where implementation of

research findings is fraught with political barriers. Ethical challenges in research with PWID include concern about whether research evidence will be translated into practice; concerns that research might exacerbate background risks; and ethical challenges regarding the standard of HIV prevention in research. While these questions arise in other research settings, for research with PWID, these questions are especially controversial. This paper analyses four ethical questions in determining whether research could be ethically acceptable: (1) Can researchers ensure that research does not add to the burden of social harms and poor health experienced by PWID? (2) Should research be conducted in settings where it is uncertain whether research findings will be translated into practice? (3) When best practices in prevention and care are not locally available, what standard of care and prevention is ethically appropriate? (4) Does the conduct of research in settings with oppressive policies constitute complicity? We outline specific criteria to address these four ethical challenges. We also urge researchers to join the call to action for policy change to provide proven safe and effective HIV prevention and harm reduction interventions for PWID around the world.

2. Hugo, J. M., et al. "**Anova Health Institute's harm reduction initiatives for people who use drugs.**" *Sex Health* 2018 15(2): 176-178. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29559070>

Chemsex is the colloquial term used for a specific pattern of drug use that is increasingly common among men who have sex with men (MSM) globally. The recreational substances employed are used specifically in a sexualized context. The reasons for chemsex among MSM are complex. The Anova Health Institute (Anova) provided harm-reduction services in Cape Town, South Africa in 2013 and 2014. This project, known as Ticking the Boxes had two objectives: first to provide direct harm-reduction services to drug-using MSM in Cape Town, South Africa, and second, to reduce HIV and hepatitis B and C transmission among this population. This was done by identifying drug-using behaviour among MSM and linking them to harm-reduction services. Employing people who were currently using drugs was a novel aspect of this program, and successfully facilitated access to MSM drug-using networks. At the launch of the project, the concept of harm reduction was easily misunderstood by MSM. Another challenge was that the harm-reduction service, encompassing needle exchange, excluded opioid substitution therapy. People who use drugs were employed as outreach workers, requiring the project to be very flexible and adaptable to sometimes complex lives and difficult-to-reach peers. JAB SMART is Anova's new harm-reduction initiative and started in May 2017, with support from the City of Johannesburg Health Department, and is the first project of its kind in the city to provide harm-reduction services to people who inject drugs (PWID) and their sexual partners.

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* 2018 30(4): 480-487. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29067855>

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. Dukhovlinova, E., et al. "**Characterization of the Transmitted Virus in an Ongoing HIV-1 Epidemic Driven by Injecting Drug Use.**" *AIDS Res Hum Retroviruses* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29756455>

Understanding features of the HIV-1 transmission process have the potential to inform biological interventions for prevention. We have examined the transmitted virus in a cohort of people who inject drugs and who are at risk of HIV-1 infection through blood contamination when injecting in a group. This study focused on seven newly infected participants in St. Petersburg, Russia, who were in acute or early infection. We used end-point dilution PCR to amplify single viral genomes to assess the complexity of the transmitted virus. We also used deep sequencing to further assess the complexity of the virus. We interpret the results as indicating that a single viral variant was transmitted in each case, consistent with a model where the exposure to virus during transmission was limiting. We also looked at phenotypic properties of the viral Env protein in isolates from acute and chronic infection. Although differences were noted, there was no consistent pattern that distinguished the transmitted variants. Similarly, in spite of the reduced genetic heterogeneity of the more recent subtype A HIV-1 epidemic in St. Petersburg, we did not see reduced variance in the neutralization properties compared to isolates from the more mature subtype C HIV-1 epidemic. Finally, in looking at members of injecting groups related to the AHI/early subjects we found examples of sequence linkage consistent with ongoing and rapid spread of HIV-1 in these groups. These studies emphasize the dynamic nature of this epidemic and reinforce the idea that improved prevention methods are needed.

5. Ospina-Escobar, A., et al. "**Comparing risk environments for HIV among people who inject drugs from three cities in Northern Mexico.**" *Harm Reduct J* 2018 15(1): 27. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29776368>

BACKGROUND: A large body of research has investigated the rise of injection drug use and HIV transmission in Tijuana and Ciudad Juarez (CJ). However, little is known about the dynamics of injecting in Hermosillo. This study compares drug-related behaviors and risk environment for HIV of people who inject drugs (PWID) across Tijuana, CJ, and Hermosillo to identify factors that could explain differences in HIV prevalence.

METHODS: Data from Tijuana belong to a prospective study (El Cuete IV). Data from Hermosillo and Ciudad Juarez belong to a cross-sectional study. Both studies collected data in places where PWID spend time. All participants completed quantitative behavioral and serological testing for HIV. Datasets were merged using only comparable variables. Descriptive statistics tests were used to compare sociodemographic and behavioral characteristics of people who inject drugs PWID sampled in each city. A logistic regression model was built to identify factors independently associated with the likelihood of reporting receptive syringe sharing in the past 6 months.

RESULTS: A total of 1494 PWID provided data between March 2011 and May 2012. HIV prevalence differed significantly between participants in Tijuana (4.2%), CJ (7.7%), and Hermosillo (5.2%; $p < 0.05$). PWID from Hermosillo reported better living conditions, less frequency of drug injection, and lower prevalence of syringe sharing ($p < 0.01$). PWID from CJ reported a higher prevalence of syringe sharing and confiscation by police ($p < 0.01$). In a multivariable logistic regression model, living in Hermosillo compared to Tijuana (adjusted odds ratio [AOR] = 0.42, 95% confidence interval [CI] 0.29-0.61) and being female (AOR = 0.61, 95% CI 0.45-0.83) were protective against syringe sharing. Having used crystal meth (AOR = 1.62, 95% CI 1.24-2.13, $p = 0.001$), having experienced syringe confiscation by police in the last 6 months (AOR = 1.78, 95% CI 1.34-2.40), and lower perception of syringe availability (AOR = 2.15, 95% CI 1.59-2.91) were significantly associated with syringe sharing ($p < 0.05$).

CONCLUSIONS: Differences in HIV prevalence across cities reflect mainly differences in risk environments experienced by PWID, shaped by police practices, access to injection equipment, and dynamics of drug markets. Findings highlight the importance of ensuring sterile syringe availability through harm reduction

services and a human rights approach to drug harms in northern Mexico and to generate better understanding of local dynamics and contexts of drug use for designing proper harm reduction programs.

6. Ismail, R., et al. **"A Content Analysis Study: Concerns of Indonesian Women Infected With HIV by Husbands Who Used Intravenous Drugs."** *J Assoc Nurses AIDS Care* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29803604>

Few international studies document the concerns of women living with HIV (WLWH) who were infected by their intravenous drug-using husbands. Our content analysis described the concerns of this population by analyzing 12 interviews with WLWH. Three main concerns were discussed by the women: dealing with anger and being a dedicated wife, going home to one's parents as the only place to go, and being strong and staying alive for the children. Dealing with their own emotional responses to the HIV diagnosis, lacking financial resources after the husband's death, and remaining focused on staying healthy were major issues in their stories. Indonesia needs large-scale public HIV education campaigns about the risks women encounter as wives to husbands who use intravenous drugs as well as campaigns to educate husbands about their risks. Nurses need to encourage women to get tested during prenatal care to prevent infecting their children.

7. Chen, Y., et al. **"Decreasing HIV, Syphilis, and Hepatitis C Infection After a Decade of Harm Reduction Implementation Among Drug Users in Southwestern Areas of China."** *J Stud Alcohol Drugs* 2018 79(2): 248-257. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29553354>

OBJECTIVE: Since 2003, the Chinese central government has implemented several harm reduction and preventive measures to control HIV. We aim to describe epidemiological trends of HIV, hepatitis C virus (HCV), and syphilis in Guangxi drug users after the policy implementation.

METHOD: A total of 12,161-15,870 drug users in Guangxi, China, were recruited annually from 2009 to 2015 through community outreach or snowball sampling. The participants' demographics, behavior, and infection status were used to characterize rates of protective behaviors and disease prevalence (HIV, syphilis, and HCV). Chi-squared trend testing was used.

RESULTS: Relative to baseline, the prevalence of HIV, HCV, and syphilis decreased from 13.6% to 6.2%, 68.0% to 50.5%, and 8.5% to 5.2%, respectively, by 2015. Concurrently, the rate of injecting drugs, needle sharing, unprotected last sexual encounter, and regular unprotected intercourse decreased from 82.6% to 64.5%, 24.1% to 5.5%, 66.6% to 39.7%, and 74.0% to 51.2%, respectively. The usage of prevention services, methadone maintenance therapy or needle exchange, peer education programs, HIV testing in the previous year, and knowledge of HIV status increased from 63.4% to 93.6%, 52.0% to 56.6%, 37.4% to 43.1%, 45.3% to 91.3%, and 76.7% to 99.4%, respectively, from 2009 to 2015.

CONCLUSIONS: After a decade of HIV control policies, this was the first Chinese study to show a decreasing prevalence of HIV, HCV, and syphilis in the context of increasing uptake of protective services and behaviors.

8. Lan, C. W., et al. **"Drug-related stigma and access to care among people who inject drugs in Vietnam."** *Drug Alcohol Rev* 2018 37(3): 333-339. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28762584>

INTRODUCTION AND AIMS: There are considerable challenges faced by people with a history of injecting drug use (PWID) in Vietnam, including drug-related stigma and lack of access to healthcare. Seeking and utilising healthcare, as well as harm reduction programs for PWID, are often hampered by drug-related stigma. This study aimed to examine the impacts of drug-related stigma on access to care and utilisation of harm reduction programs among PWID in Vietnam.

DESIGN AND METHODS: A cross-sectional study was conducted in two provinces in Vietnam, Phu Tho and Vinh Phuc. The study participants completed the survey by using Audio Computer-Assisted Self-Interview between late 2014 and early 2015. Linear multiple regression models and logistic regression models were

used to assess the relationship among drug-related stigma, access to care and utilisation of harm reduction programs, including methadone maintenance treatment (MMT) and needle exchange programs (NEP).

RESULTS: A total of 900 PWID participated in this study. Drug-related stigma was significantly associated with lower level of access to care, but not with utilisation of MMT or NEP. Older age was positively associated with higher levels of access to care. Levels of education were positively correlated with access to care, as well as utilisation of MMT and NEP.

DISCUSSION AND CONCLUSIONS: This study underscores the need for future interventions to reduce drug-related stigma in society and in health-care settings to improve PWID's utilisation of care services. Special attention should be paid to younger PWID and those with lower levels of education.

9. Li, L., et al. "**Efficacy of Communication Training of Community Health Workers on Service Delivery to People Who Inject Drugs in Vietnam: A Clustered Randomized Trial.**" *Am J Public Health* 2018 108(6): 791-798. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29672144>

OBJECTIVES: To evaluate the efficacy of an intervention targeted to commune health workers (CHWs) who deliver services to people who inject drugs (PWID) in Vietnam.

METHODS: From 2014 to 2016, we conducted a cluster randomized controlled trial of 300 CHWs and 900 PWID in 60 communes in 2 provinces of Vietnam. Intervention CHWs participated in training sessions to enhance their communication skills. Trained CHWs were asked to deliver individual sessions to PWID. We assessed the outcomes at baseline and at 3-, 6-, 9-, and 12-month follow-ups.

RESULTS: Intervention CHWs showed greater improvement in provider-client interactions than did control CHWs at all follow-ups (range of difference = 3.33-5.18; $P < .001$). Intervention CHWs showed greater reduction in negative attitudes toward PWID at the 12-month follow-up (mean \pm SD = 1.75 \pm 0.50; $P < .001$). PWID in the intervention group exhibited greater improvement in drug avoidance than did those in the control group from the 6-month follow-up on (range of difference = 1.21-1.65; $P < .001$). We observed no intervention effect on heroin use as measured by urinalysis.

CONCLUSIONS: This intervention targeting CHWs could lead to desired outcomes for both CHWs and PWID. ClinicalTrials.gov: NCT0213092.1.

10. Su, S., et al. "**Epidemics of HIV, HCV and syphilis infection among synthetic drugs only users, heroin-only users and poly-drug users in Southwest China.**" *Sci Rep* 2018 8(1): 6615. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29700352>

The number of poly-drug users who mix use heroin and synthetic drugs (SD) is increasing worldwide. The objective of this study is to measure the risk factors for being infected with hepatitis C (HCV), human immunodeficiency virus (HIV) and syphilis among SD-only users, heroin-only users and poly-drug users. A cross-sectional study was conducted in 2015 from a national HIV surveillance site in Southwest China, 447 poly-drug, 526 SD-only and 318 heroin-only users were recruited. Poly-drug users have higher drug-use frequency, higher rates of drug-sharing and unsafe sexual acts than other users ($p < 0.05$). About a third (36.7%) of poly-drug users experienced sexual arousal due to drug effects, which is higher than the rate among other drug users. Poly-drug users had the highest prevalence of HIV (10.5%) and syphilis (3.6%), but heroin-only users had the highest prevalence of HCV (66.0%) (all $p < 0.05$) among three groups. Logistic regression shows among poly-drug users, having sex following drug consumption and using drugs ≥ 1 /day were the major risk factors for both HIV (Adjusted odds ratio (AOR) = 2.4, 95% CI [1.8-3.4]; 2.3, [1.6-3.1]) and syphilis infection (AOR = 4.1, [2.1-6.9]; 3.9, [1.8-5.4]). Elevated risk of both HIV and syphilis infection have been established among poly-drug users.

11. Wirtz, A. L., et al. "**HIV and Viral Hepatitis Among Imprisoned Key Populations.**" *Epidemiol Rev* 2018 40(1): 12-26. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29688317>

Prisons and other closed facilities create opportunities for transmission of human immunodeficiency virus (HIV) and viral hepatitis during detention and after release. We conducted a systematic review and meta-analysis of peer-reviewed publications (2005-2015) to describe the prevalence of HIV, hepatitis C virus, and hepatitis B virus among key populations in prisons worldwide and to compare estimates of infection with those of other prison populations. Most data were reported for people who inject drugs (PWID; n = 72) and for men who have sex with men (MSM; n = 21); few data were reported on sex workers (SW; n = 6), or transgender women (n = 2). Publications were identified from 29 countries, predominantly middle- and high-income countries. Globally, PWID had 6 times the prevalence of HIV (pooled prevalence ratio (PPR) = 6.0, 95% CI: 3.8, 9.4), 8 times the prevalence of hepatitis C virus (PPR = 8.1, 95% CI: 6.4, 10.4), and 2 times the prevalence of hepatitis B virus (PPR = 2.0, 95% CI: 1.5, 2.7) compared with noninjecting prisoner populations. Among these articles, only those from Iran, Scotland, Spain, and Italy included the availability of methadone therapy; 2 articles included information on access to needle exchange programs by PWID detainees. HIV prevalence was more than 2 times higher among SW (PPR = 2.6, 95% CI: 2.2, 3.1) and 5 times higher among MSM (PPR = 5.3, 95% CI: 3.5, 7.9) compared with other prisoners. None of these articles reported HIV prevention coverage among SW or transgender women; 1 described HIV and sexually transmitted infection screening for MSM in prison. Prevention programs specific to key populations are important, particularly for populations that are criminalized and/or may cycle in and out of prison.

12. Mumtaz, G. R., et al. "**HIV incidence among people who inject drugs in the Middle East and North Africa: mathematical modelling analysis.**" *J Int AIDS Soc* 2018 21(3): e25102. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29577623>

INTRODUCTION: Emerging HIV epidemics have been documented among people who inject drugs (PWID) in the Middle East and North Africa (MENA). This study estimates the HIV incidence among PWID due to sharing needles/syringes in MENA. It also delineates injecting drug use role as a driver of the epidemic in the population, and estimates impact of interventions.

METHODS: A mathematical model of HIV transmission among PWID was applied in seven MENA countries with sufficient and recent epidemiological data and HIV prevalence $\geq 1\%$ among PWID. Estimations of incident and/or prevalent infections among PWID, ex-PWID and sexual partners of infected current and ex-PWID were conducted.

RESULTS: The estimated HIV incidence rate for 2017 among PWID ranged between 0.7% per person-year (ppy) in Tunisia and 7.8% ppy in Pakistan, with Libya being an outlier (24.8% ppy). The estimated number of annual new infections was lowest in Tunisia (n = 79) and Morocco (n = 99), and highest in Iran and Pakistan (approximately n = 6700 each). In addition, 20 to 2208 and 5 to 837 new annual infections were estimated across the different countries among sexual partners of PWID and ex-PWID respectively. Since epidemic emergence, the number of total ever acquired incident infections across countries was 706 to 90,015 among PWID, 99 to 18,244 among sexual partners of PWID, and 16 to 4360 among sexual partners of ex-PWID. The estimated number of prevalent infections across countries was 341 to 23,279 among PWID, 119 to 16,540 among ex-PWID, 67 to 10,752 among sexual partners of PWID, and 12 to 2863 among sexual partners of ex-PWID. Increasing antiretroviral therapy (ART) coverage to the global target of 81% - factoring in ART adherence and current coverage - would avert about half of new infections among PWID and their sexual partners. Combining ART with harm reduction could avert over 90% and 70% of new infections among PWID and their sexual partners respectively.

CONCLUSIONS: There is considerable HIV incidence among PWID in MENA. Of all new infections ultimately due to injecting drug use, about 75% are among PWID and the rest among sexual partners. Of all prevalent infections ultimately attributed to injecting drug use as epidemic driver, about half are among PWID, 30% among ex-PWID and 20% among sexual partners of PWID and ex-PWID. These findings call for scale-up of services for PWID, including harm reduction as well as testing and treatment services.

13. Oyaro, M., et al. "Human immunodeficiency virus infection predictors and genetic diversity of hepatitis B virus and hepatitis C virus co-infections among drug users in three major Kenyan cities." *South Afr J HIV Med* 2018 19(1): 737. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29707384>

BACKGROUND: Drug users act as reservoirs and transmission channels for hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) infections to the general population worldwide. Periodic epidemiological studies to monitor the prevalence and genetic diversity of these infections to inform on interventions are limited. Objective of the study: The objective of this study was to determine the predictors of HIV infection and genetic diversity of HBV and HCV among drug users in Kenya. Materials and methods: A cross-sectional study on previous drug use history among drug users was conducted in three Kenyan cities using a respondent-driven sampling method between January 2011 and September 2012. Blood samples were collected and analysed for the presence of HBV, HCV and HIV serological markers and to determine the genotypes of HBV and HCV.

RESULTS: The overall prevalence of HBV, HCV and HIV among drug users was 4.3%, 6.5% and 11.1%, respectively, with evidence of HBV/HIV, HCV/HIV and HBV/HCV/HIV co-infections. The HBV circulating genotypes were A1 (69%) and D6 (19%), whereas HCV genotypes were 1a (72%) and 4a (22%). Injection drug use was a significant predictor of HIV/HCV infections. Younger age (30 years; aOR (adjusted odds ratio) = 0.50, 95% CI (confidence interval): 0.33-0.76; $p < 0.001$) and early sexual debut (aOR = 0.54, 95% CI: 0.40-0.82; $p < 0.05$) were negatively associated with detection of any of the three infections. Injecting drug use was positively associated with HCV infection (aOR = 5.37, 95% CI: 2.61-11.06; $p < 0.001$).

CONCLUSION: This high level of genetic diversity exhibited by HBV and HCV isolates requires urgent implementation of harm reduction strategies and continuous monitoring for effective management of the patients.

14. Mabileau, G., et al. "Intervention Packages to Reduce the Impact of HIV and HCV Infections Among People Who Inject Drugs in Eastern Europe and Central Asia: A Modeling and Cost-effectiveness Study." *Open Forum Infect Dis* 2018 5(3): ofy040. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29594179>

BACKGROUND: We evaluated the effectiveness and cost-effectiveness of interventions targeting hepatitis C virus (HCV) and HIV infections among people who inject drugs (PWID) in Eastern Europe/Central Asia. We specifically considered the needle-syringe program (NSP), opioid substitution therapy (OST), HCV and HIV diagnosis, antiretroviral therapy (ART), and/or new HCV treatment (direct acting antiviral [DAA]) in Belarus, Georgia, Kazakhstan, Republic of Moldova, and Tajikistan.

METHODS: We developed a deterministic dynamic compartmental model and evaluated the number of infections averted, costs, and incremental cost-effectiveness ratios (ICERs) of interventions. OST decreased frequencies of injecting by 85% and NSP needle sharing rates by 57%; ART was introduced at CD4 < 350 and DAA at fibrosis stage $\geq F2$ at a \$2370 to \$23 280 cost. Results: Increasing NSP+OST had a high impact on transmissions (infections averted in PWID: 42% in Tajikistan to 55% in Republic of Moldova for HCV; 30% in Belarus to 61% in Kazakhstan for HIV over 20 years). Increasing NSP+OST+ART was very cost-effective in Georgia (ICER = \$910/year of life saved [YLS]), and was cost-saving in Kazakhstan and Republic of Moldova. NSP+OST+ART and HIV diagnosis was very cost-effective in Tajikistan (ICER = \$210/YLS). Increasing the coverage of all interventions was always the most effective strategy and was cost-effective in Belarus and Kazakhstan (ICER = \$12 960 and \$21 850/YLS); it became cost-effective/cost-saving in all countries when we decreased DAA costs.

CONCLUSION: Increasing NSP+OST coverage, in addition to ART and HIV diagnosis, had a high impact on both epidemics and was very cost-effective and even cost-saving. When HCV diagnosis was improved, increased DAA averted a high number of new infections if associated with NSP+OST.

15. Kantakamalakul, W., et al. "**Lymphocyte subsets and natural killer cell cytotoxicity in intravenous drug users with HIV-1 infection among Thai population.**" *Asian Pac J Allergy Immunol* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29549702>

BACKGROUND: Intravenous drug users (IVDUs) are among the high-risk groups who are most vulnerable to HIV infection. Several illicit drugs alter host immune function with increased incidence of infections including that of HIV. Many studies of the immune response of NK cells in HIV-1 seronegative IVDUs and HIV-1 seropositive IVDUs have been published from the Western countries and yet no data is available from Thailand.

OBJECTIVE: To determine natural killer cell cytotoxicity and lymphocyte subsets in Thai HIV-1 infected intravenous drug users.

METHODS: The NK cell cytotoxic function was determined using our well-established EGFP-K562 flow cytometric assay in 30 IVDUs with HIV-1 infection (IVH) comparing with those from the same number of non-infected IVDUs (IVX), HIV-1 seropositive individuals (HIV-1+ve) and healthy controls. The percentage and the absolute number of NK cells, helper CD4+ T cells and cytotoxic CD8+ T cells were also investigated.

RESULTS: Among the study groups, IVH showed not only the lowest percentage of lytic activity by NK cells, but also a decline in the percentage and absolute count of NK cells. A decline in helper CD4+ T cells and an increase of cytotoxic CD8+ T cells of IVH group when compared to those of other 3 groups were also demonstrated.

CONCLUSIONS: The failure of innate immune NK cell function and their number in IVH may support the involvement of additional components of the immune system in the control of HIV-1 disease.

16. Brown, A. E., et al. "**Monitoring the HIV continuum of care in key populations across Europe and Central Asia.**" *HIV Med* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29737610>

OBJECTIVES: The aim of the study was to measure and compare national continuum of HIV care estimates in Europe and Central Asia in three key subpopulations: men who have sex with men (MSM), people who inject drugs (PWID) and migrants.

METHODS: Responses to a 2016 European Centre for Disease Prevention and Control (ECDC) survey of 55 European and Central Asian countries were used to describe continuums of HIV care for the subpopulations. Data were analysed using three frameworks: Joint United Nations Programme on HIV/AIDS (UNAIDS) 90-90-90 targets; breakpoint analysis identifying reductions between adjacent continuum stages; quadrant analysis categorizing countries using 90% cut-offs for continuum stages.

RESULTS: Overall, 29 of 48 countries reported national data for all HIV continuum stages (numbers living with HIV, diagnosed, receiving treatment and virally suppressed). Six countries reported all stages for MSM, seven for PWID and two for migrants. Thirty-one countries did not report data for MSM (34 for PWID and 41 for migrants). In countries that provided key-population data, overall, 63%, 40% and 41% of MSM, PWID and migrants living with HIV were virally suppressed, respectively (compared with 68%, 65% and 68% nationally, for countries reporting key-population data). Variation was observed between countries, with higher outcomes in subpopulations in Western Europe compared with Eastern Europe and Central Asia.

CONCLUSIONS: Few reporting countries can produce the continuum of HIV care for the three key populations. Where data are available, differences exist in outcomes between the general and key populations. While MSM broadly mirror national outcomes (in the West), PWID and migrants experience poorer treatment and viral suppression. Countries must develop continuum measures for key populations to identify and address inequalities.

17. Weir, S. S., et al. "Opportunities for Enhanced Strategic Use of Surveys, Medical Records, and Program Data for HIV Surveillance of Key Populations: Scoping Review." *JMIR Public Health Surveill* 2018 4(2): e28. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29789279>

BACKGROUND: Normative guidelines from the World Health Organization recommend tracking strategic information indicators among key populations. Monitoring progress in the global response to the HIV epidemic uses indicators put forward by the Joint United Nations Programme on HIV/AIDS. These include the 90-90-90 targets that require a realignment of surveillance data, routinely collected program data, and medical record data, which historically have developed separately.

OBJECTIVE: The aim of this study was to describe current challenges for monitoring HIV-related strategic information indicators among key populations ((men who have sex with men [MSM], people in prisons and other closed settings, people who inject drugs, sex workers, and transgender people) and identify future opportunities to enhance the use of surveillance data, programmatic data, and medical record data to describe the HIV epidemic among key populations and measure the coverage of HIV prevention, care, and treatment programs.

METHODS: To provide a historical perspective, we completed a scoping review of the expansion of HIV surveillance among key populations over the past three decades. To describe current efforts, we conducted a review of the literature to identify published examples of SI indicator estimates among key populations. To describe anticipated challenges and future opportunities to improve measurement of strategic information indicators, particularly from routine program and health data, we consulted participants of the Third Global HIV Surveillance Meeting in Bangkok, where the 2015 World Health Organization strategic information guidelines were launched.

RESULTS: There remains suboptimal alignment of surveillance and programmatic data, as well as routinely collected medical records to facilitate the reporting of the 90-90-90 indicators for HIV among key populations. Studies (n=3) with estimates of all three 90-90-90 indicators rely on cross-sectional survey data. Programmatic data and medical record data continue to be insufficiently robust to provide estimates of the 90-90-90 targets for key populations.

CONCLUSIONS: Current reliance on more active data collection processes, including key population-specific surveys, remains warranted until the quality and validity of passively collected routine program and medical record data for key populations is optimized.

18. Smith, M. K., et al. "Overlap between harm reduction and HIV service utilisation among PWID in India: Implications for HIV combination prevention." *Int J Drug Policy* 2018 57: 111-118. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29730586>

BACKGROUND: In some regions, HIV incidence is rising among people who inject drugs (PWID). Combination prevention approaches are well suited to PWID who face multiple sources of HIV risk. This analysis investigates patterns of utilisation to basic HIV services (HIV counselling and testing [HCT], antiretroviral therapy [ART]) as well as harm reduction programs (needle and syringe exchange programs [NSEP] and opioid agonist therapy [OAT]) among PWID and how utilisation of harm reduction services is associated with HIV-related care seeking behaviours.

METHODS: Respondent-driven sampling was used to recruit 14,481 PWID across 15 cities in India. Sampling-weighted multilevel logistic regression models assessed associations between utilisation of harm reduction service and HCT and ART use among those indicated (90.3% and 5.0% of full sample, respectively). We considered both recent (prior year) and ever use of services.

RESULTS: Overall, 42.3% reported prior HIV testing and 57.9% of eligible persons reported ART initiation, but overlap with NSEP and OAT use was limited. In adjusted models, recent and ever use of both NSEP and

OAT were significantly associated with recent and ever HCT utilisation, respectively; however, harm reduction utilisation was not associated with ART initiation among eligible participants.

CONCLUSIONS: Harm reduction services may play a key role in linking PWID with HIV testing; however, they were not associated with ART initiation among eligible individuals. Moreover, a large majority who utilised NSEP and OAT were not engaged in optimal HIV care or prevention, highlighting missed opportunities and a need for stronger linkages between NSEP/OAT and HIV care and treatment, particularly among those actively injecting. These findings provide key insights to better understand how services can be linked or combined to optimise service utilisation among PWID.

19. Bazzi, A. R., et al. "**Perspectives on biomedical HIV prevention options among women who inject drugs in Kenya.**" *AIDS Care* 2018 30(3): 343-346. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28780885>

Due to heightened vulnerability to HIV from frequent engagement in sex work and overlapping drug-using and sexual networks, women who inject drugs should be a high priority population for pre-exposure prophylaxis (PrEP) and other biomedical HIV prevention tools. Kenya is one of the first African countries to approve oral PrEP for HIV prevention among "key populations," including people who inject drugs and sex workers. The objective of this study was to explore preferences and perceived challenges to PrEP adoption among women who inject drugs in Kisumu, Kenya. We conducted qualitative interviews with nine HIV-uninfected women who inject drugs to assess their perceptions of biomedical HIV interventions, including oral PrEP, microbicide gels, and intravaginal rings. Despite their high risk and multiple biomedical studies in the region, only two women had ever heard of any of these methods. All women were interested in trying at least one biomedical prevention method, primarily to protect themselves from partners who were believed to have multiple other sexual partners. Although women shared concerns about side effects and product efficacy, they did not perceive drug use as a significant deterrent to adopting or adhering to biomedical prevention methods. Beginning immediately and continuing throughout Kenya's planned PrEP rollout, efforts are urgently needed to include the perspectives of high risk women who use drugs in biomedical HIV prevention research and programing.

20. Heimer, R. "**The Policy-Driven HIV Epidemic Among Opioid Users in the Russian Federation.**" *Curr HIV/AIDS Rep* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29671203>

PURPOSE OF REVIEW: To explore the consequences of policies implemented in the Russian Federation in response to syndemic of HIV-1 and opioid use disorder and compare the responses to the concomitant syndemic in rural America.

RECENT FINDINGS: The syndemic spread has not been reduced by policies implemented by the Russian government, which continues to underfund harm reduction efforts to reduce HIV transmission, refuses to approve evidence-based opioid agonist treatments for opioid use disorder, and relies on criminal justice and abstinence approaches to control illicit opioids. When effective measures have been undertaken locally, the lessons learned have not been transferred to other parts of the country and local programs have been allowed to wither. As in many parts of rural America, Russia has experienced intertwined epidemics of opioid misuse and HIV-1 that continue to expand. The expansion has been facilitated by adoption of policies that run contrary to medical and public health evidence.

21. Tavitian-Exley, I., et al. "**Polydrug Use and Heterogeneity in HIV Risk Among People Who Inject Drugs in Estonia and Russia: A Latent Class Analysis.**" *AIDS Behav* 2018 22(4): 1329-1340. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28699018>

Non-medical drug injection is a major risk factor for HIV infection in Russia and Estonia. Multiple drug use (polydrug) has further been associated with increased harms. We compared HIV, injecting and sexual risk associated with polydrug use among people who injected drugs (PWID) in 2012-2013 in Kohtla-Jarve (Estonia, n = 591) and St Petersburg (Russia, n = 811). Using latent class analysis, we identified five (poly)drug classes, the largest consisting of single-drug injectors among whom an opioid was the sole drug

injected (56% of PWID). The four remaining polydrug classes included polydrug-polyroute injectors who injected and used opiates and stimulants (9%), opiate-stimulant poly-injectors who injected amphetamine-type-stimulants with a primary opiate (7%) and opiate-opioid poly-injectors who injected opioids and opiates (16%). Non-injection stimulant co-users were injectors who also used non-injection stimulants (12%). In multivariable multinomial regressions, all four polydrug classes were associated with greater injection risks than single-drug injection, while opiate-stimulant and opiate-opioid poly-injection were also associated with having multiple sex partners. Riskier behaviours among polydrug-injectors suggest increased potential for transmission of blood-borne and sexually-transmitted infections. In addition to needles/syringes provision, services tailored to PWID drug and risk profiles, could consider drug-appropriate treatment and sexual risk reduction strategies to curb HIV transmission.

22. Amirkhani, Y. A., et al. **"Predictors of HIV Care Engagement, Antiretroviral Medication Adherence, and Viral Suppression Among People Living with HIV Infection in St. Petersburg, Russia."** *AIDS Behav* 2018 22(3): 791-799. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/27990579>

Over 1 million HIV infections have been diagnosed in Russia, and HIV care uptake and viral suppression are very low. 241 HIV-positive individuals in St. Petersburg were enrolled through social networks, provided blood for viral load testing, and completed measures of medication-taking adherence, readiness, and self-efficacy; psychosocial well-being; and substance use. Outcomes included attending an HIV care appointment in the past 6 months, >90% ART adherence, and undetectable viral load. 26% of participants had no recent care appointment, 18% had suboptimal adherence, and 56% had detectable viral load. Alcohol use consistently predicted all adverse health outcomes. Having no recent care visit was additionally associated with being single and greater past-month drug injection frequency. Poor adherence was additionally predicted by lower medication-taking self-efficacy and lower anxiety. Detectable viral load was additionally related to younger age. Comprehensive interventions to improve HIV care in Russia must address substance abuse, anxiety, and medication-taking self-efficacy.

23. Pathack, A., et al. **"Programmatic mapping to determine the size and dynamics of sex work and injecting drug use in Mauritius."** *Afr J AIDS Res* 2018: 1-7. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29745291>

HIV in Mauritius is in a concentrated phase. Most HIV infection is among key populations (KPs) including female sex workers (FSW), people who inject drugs (PWID), men who have sex with men (MSM), and transgender sex workers (TGSW). The objective of this research was to use geographical mapping to determine the precise locations, typologies and population estimates of each KP in Mauritius. From May to July 2014 a programmatic mapping approach determined national estimates and information on the specific locations, "hotspots", frequented by KPs in Mauritius. Data were collected through multiple levels of activity. Key informants provided information about hotspots where KPs congregated and were actively engaged in risky behaviours. Validation of hotspots was done by engaging KPs. A total of 17 248 KP members were estimated spread over 1 964 hotspots in Mauritius. The largest KP was PWID with an estimate of 7 598 (range: 4 091-6 223), followed by 6 223 (range: 5 090-7 456) FSWs, spread over 694 and 731 hotspots respectively. A total of 2 020 (range: 1 595-2 446) MSM and 294 geographic MSM hotspots, and 1 407 TGSWs (range: 1 165-1 649) distributed over 245 hotspots. This research provided Mauritius with validated KPs size estimations and provided the first national data on KP hotspots and operational dynamics. The use of these data will strengthen HIV prevention, intervention, and programme planning in the country through focusing efforts to systematically target high-risk areas.

24. Hammett, T. M., et al. **"The relationship between health policy and public health interventions: a case study of the DRIVE project to "end" the HIV epidemic among people who inject drugs in Haiphong, Vietnam."** *J Public Health Policy* 2018 39(2): 217-230. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29531303>

We present a case study of the effects of health policies on the implementation and potential outcomes of a public health intervention, using the DRIVE project, that aims to 'end' the HIV epidemic among people who

inject drugs in Haiphong, Vietnam. DRIVE's success depends on two policy transitions: (1) integration of donor-funded HIV outpatient clinics into public health clinics and expansion of social health insurance; (2) implementation of a "Renovation Plan" for substance use treatment. Interviews and focus group discussions with key informants and review of policy documents and clinic data reveal that both policy transitions are underway but face challenges. DRIVE promises to show how evolving policy affects health interventions and how advocacy based on project data can improve policy. Broad lessons include the importance of clear and consistent policies, vigorous enforcement, and adequate funding of promulgated policies.

25. Mburu, G., et al. **"Who has ever loved a drug addict? It's a lie. They think a 'teja' is as bad person": multiple stigmas faced by women who inject drugs in coastal Kenya.** *Harm Reduct J* 2018 15(1): 29. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29801494>

BACKGROUND: A tenth of all people who inject drugs in Kenya are women, yet their social contexts and experiences remain poorly understood. This paper reports how multiple forms of stigma are experienced by women who inject drugs in coastal Kenya and the impact that they have on their ability to access essential health services.

METHODS: In 2015, in-depth interviews and focus group discussions were held with 45 women who inject drugs in two coastal towns. These data were supplemented with in-depth interviews with five individual stakeholders involved in service provision to this population. Data were analyzed thematically using NVivo.

RESULTS: Women who inject drugs experience multiple stigmas, often simultaneously. These included the external stigma and self-stigma of injection drug use, external gender-related stigma of being a female injecting drug user, and the external stigma of being HIV positive (i.e., among those living with HIV). Stigma led to rejection, social exclusion, low self-esteem, and delay or denial of services at health facilities.

CONCLUSION: HIV and harm reduction programs should incorporate interventions that address different forms of stigma among women who inject drugs in coastal Kenya. Addressing stigma will require a combination of individual, social, and structural interventions, such as collective empowerment of injecting drug users, training of healthcare providers on issues and needs of women who inject drugs, peer accompaniment to health facilities, addressing wider social determinants of stigma and discrimination, and expansion of harm reduction interventions to change perceptions of communities towards women who inject drugs.

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Men who have Sex with Men - 75

1. Johnson, L. F., et al. **"Age bias in survey sampling and implications for estimating HIV prevalence in men who have sex with men: insights from mathematical modelling."** *Epidemiol Infect* 2018: 1-7. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29708084>

Respondent-driven sampling (RDS) is widely used to estimate HIV prevalence in men who have sex with men (MSM). Mathematical models that are calibrated to these data may be compromised if they fail to account for selection biases in RDS surveys. To quantify the potential extent of this bias, an agent-based model of HIV in South Africa was calibrated to HIV prevalence and sexual behaviour data from South African studies of MSM, first reweighting the modelled MSM population to match the younger age profile of the RDS surveys (age-adjusted analysis) and then without reweighting (unadjusted analysis). The model estimated a median

HIV prevalence in South African MSM in 2015 of 34.6% (inter-quartile range (IQR): 31.4-37.2%) in the age-adjusted analysis, compared with 26.1% (IQR: 24.1-28.4%) in the unadjusted analysis. The median lifetime risk of acquiring HIV in exclusively homosexual men was 88% (IQR: 82-92%) in the age-adjusted analysis, compared with 76% (IQR: 64-85%) in the unadjusted analysis. These results suggest that RDS studies may under-estimate the exceptionally high HIV prevalence rates in South African MSM because of over-sampling of younger MSM. Mathematical models that are calibrated to these data need to control for likely over-sampling of younger MSM.

2. Hugo, J. M., et al. "**Anova Health Institute's harm reduction initiatives for people who use drugs.**" *Sex Health* 2018 15(2): 176-178. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29559070>

Chemsex is the colloquial term used for a specific pattern of drug use that is increasingly common among men who have sex with men (MSM) globally. The recreational substances employed are used specifically in a sexualized context. The reasons for chemsex among MSM are complex. The Anova Health Institute (Anova) provided harm-reduction services in Cape Town, South Africa in 2013 and 2014. This project, known as Ticking the Boxes had two objectives: first to provide direct harm-reduction services to drug-using MSM in Cape Town, South Africa, and second, to reduce HIV and hepatitis B and C transmission among this population. This was done by identifying drug-using behaviour among MSM and linking them to harm-reduction services. Employing people who were currently using drugs was a novel aspect of this program, and successfully facilitated access to MSM drug-using networks. At the launch of the project, the concept of harm reduction was easily misunderstood by MSM. Another challenge was that the harm-reduction service, encompassing needle exchange, excluded opioid substitution therapy. People who use drugs were employed as outreach workers, requiring the project to be very flexible and adaptable to sometimes complex lives and difficult-to-reach peers. JAB SMART is Anova's new harm-reduction initiative and started in May 2017, with support from the City of Johannesburg Health Department, and is the first project of its kind in the city to provide harm-reduction services to people who inject drugs (PWID) and their sexual partners.

3. Giguere, R., et al. "**Are participants concerned about privacy and security when using short message service to report product adherence in a rectal microbicide trial?**" *J Am Med Inform Assoc* 2018 25(4): 393-400. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29025127>

Objective: During a Phase 2 rectal microbicide trial, men who have sex with men and transgender women (n = 187) in 4 countries (Peru, South Africa, Thailand, United States) reported product use daily via short message service (SMS). To prevent disclosure of study participation, the SMS system program included privacy and security features. We evaluated participants' perceptions of privacy while using the system and acceptability of privacy/security features. Materials and Methods: To protect privacy, the SMS system: (1) confirmed participant availability before sending the study questions, (2) required a password, and (3) did not reveal product name or study participation. To ensure security, the system reminded participants to lock phone/delete messages. A computer-assisted self-interview (CASI), administered at the final visit, measured burden of privacy and security features and SMS privacy concerns. A subsample of 33 participants underwent an in-depth interview (IDI). Results: Based on CASI, 85% had no privacy concerns; only 5% were very concerned. Most were not bothered by the need for a password (73%) or instructions to delete messages (82%). Based on IDI, reasons for low privacy concerns included sending SMS in private or feeling that texting would not draw attention. A few IDI participants found the password unnecessary and more than half did not delete messages. Discussion: Most participants were not concerned that the SMS system would compromise their confidentiality. SMS privacy and security features were effective and not burdensome. Conclusion: Short ID-related passwords, ambiguous language, and reminders to implement privacy and security-enhancing behaviors are recommended for SMS systems.

4. Chang, H. H., et al. "**Awareness and Acceptance of HIV Pre-exposure Prophylaxis among Medical Personnel and Men Who Have Sex with Men in Korea.**" *J Korean Med Sci* 2018 33(12): e91. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29542300>

BACKGROUND: We aimed to investigate the awareness of human immunodeficiency virus (HIV) infection among high-risk individuals, including men who have sex with men (MSM) and medical personnel (MP) in Korea through a cross-sectional survey, identify possible obstacles hindering their access to pre-exposure prophylaxis (PrEP).

METHODS: In 2016, the first questionnaire survey was sent to randomly selected MSM and MP. To compare the changes in attitudes and knowledge of MSM, a second questionnaire survey was conducted in August 2017.

RESULTS: More than half of MSM (61.3% in 2016, 88.6% in 2017) were aware of PrEP. However, MP who offered PrEP had less knowledge regarding PrEP (23.4%). The background knowledge and experience with PrEP among MSM and MP in this survey was low (3.4% in 2016 and 5.7% in 2017, 1.9% in MP). The major obstacles that MSM reported were lack of insurance coverage (29% in 2016 and 32% in 2017), concern regarding adverse effects of PrEP (19% and 21%), and risk of exposing HIV-positive status to other people (15% and 18%). Among MP, lack of knowledge regarding the efficacy of PrEP was the most common obstacle (30%), followed by lack of insurance coverage (22%), and concern regarding adverse effects (20%).

CONCLUSION: Our study showed that PrEP is required among MSM in Korea; however, most MP were not aware of PrEP. Lack of insurance coverage and knowledge regarding PrEP were major hindrances in the access to PrEP; therefore, further studies on how to make PrEP information more accessible are needed to help prevent HIV infection.

5. Patel, V. V., et al. "**Barriers to HIV testing among men who have sex with men in India reached online: implications for interventions.**" *J Acquir Immune Defic Syndr* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29649075>

6. Ogunbajo, A., et al. "**Barriers, Motivators, and Facilitators to Engagement in HIV Care Among HIV-Infected Ghanaian Men Who have Sex with Men (MSM).**" *AIDS Behav* 2018 22(3): 829-839. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28550380>

In Ghana, men who have sex with men (MSM) bear a high burden of HIV. Identifying factors that influence engagement in HIV care among HIV-infected Ghanaian MSM is critical to devising novel interventions and strengthening existing programs aimed at improving outcomes across the HIV care continuum. Consequently, we conducted an exploratory qualitative research study with 30 HIV-infected Ghanaian MSM between May 2015 and July 2015. Common barriers were fear of being seen in HIV-related health facility, financial difficulties, and health system challenges. Major motivators for engagement in care included social support, fear of mortality from HIV, and knowledge of effectiveness of HIV treatment. Key facilitators were enrollment in health insurance, prior relationship and familiarity with hospital personnel, and positive experience in healthcare setting. Our findings highlight the need for new and innovative care delivery mediums, affirming and competent healthcare providers, and increased access to health insurance.

7. Daniels, J., et al. "**""Booze is the main factor that got me where I am today"": alcohol use and HIV risk for MSM in rural South Africa.**" *AIDS Care* 2018: 1-7. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29807437>

Excessive alcohol consumption has been shown to increase HIV risk for men who have sex with men (MSM) and compromise HIV prevention behaviors. However, there is limited contextual understanding of alcohol use for MSM in rural sub-Saharan African settings, which can inform and direct HIV interventions. Applying an adaptation of PhotoVoice, we worked with 35 HIV-positive MSM who created photo-essays about alcohol and HIV in Mpumalanga. A semi-structured protocol was used in focus group discussions that were audio-recorded, translated and transcribed. Transcript data and visual data of 24 photo-essays were analyzed using a constant comparison approach. We found that participants used alcohol to build and sustain social networks, meet sexual partners, and enhance sexual experience. Excessive alcohol use was common, which

was associated with increased HIV risk behaviors within a community of MSM who maintained multiple partnerships. Our study suggests that HIV interventions need to address excessive alcohol use to mitigate the associated HIV risk at both the individual and community levels.

8. Song, T. Z., et al. "**Comparison of HIV Status Between Transgender Women and Men Who Have Sex with Men: A Meta-Analysis.**" *J Assoc Nurses AIDS Care* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29716789>

As key population groups in HIV infection, transgender women (TGW) share the same oral and anal sexual practices with men who have sex with men (MSM). However, the differences in HIV rates between the two groups are still unclear. In our study, relevant publications were electronically searched in three databases. After excluding irrelevant studies based on review of the title, abstract, and full text, a total of 24 studies, including 37,521 cases, were identified. There were no significant differences between TGW and MSM regarding HIV status and condom use. However, TGW had a higher proportion of high-risk behaviors, including exchanges of sex, forced sex, receptive intercourse, and sex work experience. Moreover, most curable sexually transmitted diseases were more prevalent in the TGW group compared to MSM. Although TGW showed a higher proportion of high-risk behavior and sexually transmitted disease incidence, their HIV incidence was the same as that for MSM.

9. Tao, L., et al. "**Condom use in combination with ART can reduce HIV incidence and mortality of PLWHA among MSM: a study from Beijing, China.**" *BMC Infect Dis* 2018 18(1): 124. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29534685>

BACKGROUND: Condom use and antiretroviral therapy (ART) are effective means to prevent and control HIV transmission. We aimed to assess the effect of condom use in combination with antiretroviral therapy (ART) on HIV incidence and mortality among men who had sex with men (MSM) in Beijing, China.

METHODS: We evaluated the effect of condom use, ART, and the combination of both among people living with HIV/AIDS (PLWHA) of MSM in the Chaoyang District of Beijing using the Asian Epidemic Model (AEM). Evaluation indicators included absolute risk reduction (ARR) and the percentage of relative risk reduction (RRR %).

RESULTS: HIV incidence and prevalence declined substantially when condoms were used by MSM in Chaoyang from 2003 to 2013. The ARR of HIV incidence was from 0 to 0.91% and the RRR% was from 0 to 43.93%. The ARR of HIV prevalence was from 0 to 3.79% and the RRR% was from 0 to 31.53%. The HIV mortality rate decreased substantially (ARR from 0 to 1.75%, and RRR% from 0 to 40.03%) when ART was implemented. When condom use combined with ART was implemented in MSM in 2003-2013, HIV incidence declined substantially (ARR from 0 to 0.99%, and RRR% from 0 to 46.11%). HIV prevalence was also reduced with an ARR from 0 to 3.5%, and an RRR% from 0 to 29.88%. The HIV mortality also declined substantially (ARR from - 0.01% to 1.02%, RRR% from - 1.44% to 39.98%).

CONCLUSIONS: Among MSM, a combination of condom use and ART reduces both HIV incidence and mortality caused by HIV. Combining these methods results in a more effective prevention and control of HIV.

10. Rich, K. M., et al. "**Correlates of viral suppression among HIV-infected men who have sex with men and transgender women in Lima, Peru.**" *AIDS Care* 2018: 1-10. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29843518>

In Peru, HIV is concentrated among men who have sex with men (MSM) and transgender women (TGW). Between June 2015 and August 2016, 591 HIV-positive MSM and TGW were recruited at five clinical care sites in Lima, Peru. We found that 82.4% of the participants had achieved viral suppression (VS; VL < 200) and 73.6% had achieved maximal viral suppression (MVS; VL < 50). Multivariable modeling indicated that patients reporting transportation as a barrier to HIV care were less likely to achieve VS (aOR = 0.47; 95% CI = 0.30-0.75) and MVS (aOR = 0.56; 95% CI = 0.37-0.84). Alcohol use disorders were negatively associated with

MVS (aOR = 0.62; 95% CI = 0.30-0.75) and age was positively associated with achieving MVS (aOR = 1.29; 95% CI = 1.04-1.59). These findings underscore the need for more accessible HIV care with integrated behavioral health services in Lima, Peru.

11. Luz, P. M., et al. **"The cost-effectiveness of HIV pre-exposure prophylaxis in men who have sex with men and transgender women at high risk of HIV infection in Brazil."** *J Int AIDS Soc* 2018 21(3): e25096. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29603888>

INTRODUCTION: Men who have sex with men (MSM) and transgender women (TGW) in Brazil experience high rates of HIV infection. We examined the clinical and economic outcomes of implementing a pre-exposure prophylaxis (PrEP) programme in these populations.

METHODS: We used the Cost-Effectiveness of Preventing AIDS Complications (CEPAC)-International model of HIV prevention and treatment to evaluate two strategies: the current standard of care (SOC) in Brazil, including universal ART access (No PrEP strategy); and the current SOC plus daily tenofovir/emtricitabine PrEP (PrEP strategy) until age 50. Mean age (31 years, SD 8.4 years), age-stratified annual HIV incidence (age \leq 40 years: 4.3/100 PY; age $>$ 40 years: 1.0/100 PY), PrEP effectiveness (43% HIV incidence reduction) and PrEP drug costs (\$23/month) were from Brazil-based sources. The analysis focused on direct medical costs of HIV care. We measured the comparative value of PrEP in 2015 United States dollars (USD) per year of life saved (YLS). Willingness-to-pay threshold was based on Brazil's annual per capita gross domestic product (GDP; 2015: \$8540 USD).

RESULTS: Lifetime HIV infection risk among high-risk MSM and TGW was 50.5% with No PrEP and decreased to 40.1% with PrEP. PrEP increased per-person undiscounted (discounted) life expectancy from 36.8 (20.7) years to 41.0 (22.4) years and lifetime discounted HIV-related medical costs from \$4100 to \$8420, which led to an incremental cost-effectiveness ratio (ICER) of \$2530/YLS. PrEP remained cost-effective ($<$ 1x GDP) under plausible variation in key parameters, including PrEP effectiveness and cost, initial cohort age and HIV testing frequency on/off PrEP.

CONCLUSION: Daily tenofovir/emtricitabine PrEP among MSM and TGW at high risk of HIV infection in Brazil would increase life expectancy and be highly cost-effective.

12. Korhonen, C., et al. **"Depressive symptoms and problematic alcohol and other substance use in 1,476 gay, bisexual, and other men who have sex with men at three research sites in Kenya."** *AIDS* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29734218>

OBJECTIVE: Information on mental health and substance use challenges among gay, bisexual, and other men who have sex with men (GBMSM) is needed to focus resources on these issues and optimize services for HIV prevention and care. We determined factors associated with depressive symptoms and problematic alcohol and other substance use among GBMSM in Kenya.

METHODS: Self-identified GBMSM in three HIV research studies in Kenya provided information on depressive symptoms (PHQ-9), alcohol use (AUDIT), and other substance use (DAST-6). Associations were evaluated using mixed effects Poisson regression.

RESULTS: Of 1,476 participants, 452 (31%) reported moderate to severe depressive symptoms (PHQ-9 \geq 10), 637 (44%) hazardous alcohol use (AUDIT \geq 8), and 749 (51%) problematic substance use (DAST-6 \geq 1). Known HIV-positive status was not associated with these outcomes. Transactional sex was associated with AUDIT \geq 8 (adjusted prevalence ratio [aPR] 1.34, 95% confidence interval [CI] 1.12-1.60). Childhood abuse and recent trauma were associated with PHQ-9 \geq 10 (aPR 1.43, 95% CI 1.10-1.86 and aPR 2.43, 95% CI 1.91-3.09, respectively), AUDIT \geq 8 (aPR 1.36, 95% CI 1.10-1.68 and aPR 1.60, 95% CI 1.33-1.93, respectively), and DAST-6 \geq 1 (aPR 1.32, 95% CI 1.09-1.60 and aPR 1.35, 95% CI 1.14-1.59, respectively).

CONCLUSIONS: GBMSM in rights-constrained settings need culturally appropriate services for treatment and prevention of mental health and substance use disorders, in addition to human rights advocacy to prevent abuse. Mental health and substance use screening and treatment or referral should be an integral part of programs, including HIV prevention and treatment programs, providing services to GBMSM.

13. Lama, J. R., et al. "**Design Strategy of the Sabes Study: Diagnosis and Treatment of Early HIV Infection Among Men Who Have Sex With Men and Transgender Women in Lima, Peru, 2013-2017.**" *Am J Epidemiol* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29522079>

The Sabes study evaluates a treatment-as-prevention intervention in cis-gender men who have sex with men and transgender women in Lima, Peru, populations disproportionately affected by the HIV epidemic. The intervention is designed to prevent onward transmission of HIV by identifying HIV-negative, high-risk individuals, testing them monthly for the presence of HIV, and then rapidly treating those who become HIV positive. The main outcome of interest is the development of a model predicting the population-level impact of early detection of HIV infection and immediate initiation of antiretroviral therapy (ART) in this population. From July 2013 to September 2015, 3,336 subjects were screened for HIV; 2,682 (80.4%) were negative and 2,084 began monthly testing. We identified 248 individuals shortly after HIV acquisition, 215 of whom were enrolled in the treatment phase of our study. All participants were followed for 48 weeks and then were referred to the Peruvian Ministry of Health to continue free HIV care and treatment. This intervention demonstrates that it is possible to recruit high-risk individuals, screen them for HIV, continue to test those who are initially HIV negative in order to identify incident cases shortly after acquisition, and then rapidly link them to care.

14. Coll, J., et al. "**Early diagnosis of HIV infection among men who have sex with men in Lima (Peru). A prospective cohort study.**" *Clin Microbiol Infect* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29505882>

15. Traeger, M. W., et al. "**Effects of Pre-exposure Prophylaxis for the Prevention of HIV Infection on Sexual Risk Behavior in Men Who Have Sex with Men: A Systematic Review and Meta-analysis.**" *Clin Infect Dis* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29509889>

BACKGROUND: HIV pre-exposure prophylaxis (PrEP) is effective in reducing HIV risk in men who have sex with men (MSM). However concerns remain that risk compensation in PrEP users may lead to decreased condom use and increased incidence of sexually transmitted infections (STIs). We assessed the impact of PrEP on sexual risk outcomes in MSM.

METHODS: We conducted a systematic review of open-label trials and observational studies published to August 2017 reporting sexual risk outcomes (STI diagnoses, condom use, number of sexual partners) in the context of daily oral PrEP use in HIV-negative MSM and transgender women. Pooled effect estimates were calculated using random-effects meta-analysis and a qualitative review and risk of bias assessment were performed.

RESULTS: Sixteen observational studies and one open-label trial met selection criteria. Eight studies with 4388 participants reported STI prevalence and 13 studies with 5008 participants reported change in condom use. PrEP use was associated with a significant increase in rectal chlamydia (odds ratio [OR]=1.59; 95%CI 1.19-2.13; p=0.002; heterogeneity I²=23%) and an increase in any STI diagnosis (OR=1.24; 95%CI 0.99-1.54; p=0.059; I²=50%). The association of PrEP use with STI diagnoses was stronger in later studies. Most studies showed evidence of an increase in condomless sex among PrEP users.

CONCLUSION: Findings highlight the importance of efforts to minimize STIs among PrEP users and their sexual partners. Monitoring of risk compensation among MSM in the context of PrEP scale-up is needed to assess the impact of PrEP on the sexual health of MSM and to inform preventive strategies.

16. Wahome, E., et al. **"An Empiric Risk Score to Guide PrEP Targeting Among MSM in Coastal Kenya."** *AIDS Behav* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29767324>

Men who have sex with men (MSM), who have heterogeneous HIV-acquisition risks are not specifically targeted in Kenyan pre-exposure prophylaxis (PrEP) guidelines. We used data from an open cohort, which followed 753 initially HIV-negative MSM participants for more than 1378.5 person-years, to develop an empiric risk score for targeting PrEP delivery. Independent predictors of incident HIV-1 infection in this cohort were an age of 18-24 years, having only male sex partners, having receptive anal intercourse, having any unprotected sex, and having group sex. Poisson model coefficients were used to assign a numeric score to each statistically significant predictor. A risk score of ≥ 1 corresponded to an HIV-1 incidence of ≥ 2.2 [95% confidence interval (CI) 1.2-4.1] and identified 81.3% of the cohort participants as being at high risk for HIV-1 acquisition. The area under the receiver operating characteristic curve was 0.76 (95% CI 0.71-0.80). This empiric risk score may help Kenyan health care providers to assess HIV-1 acquisition risk and encourage PrEP uptake by high-risk MSM.

17. Gichuru, E., et al. **"Engaging religious leaders to support HIV prevention and care for gays, bisexual men, and other men who have sex with men in coastal Kenya."** *Crit Public Health* 2018 28(3): 294-305. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29770367>

In Kenyan communities, religious leaders are important gatekeepers in matters of health and public morality. In a context that is generally homophobic, religious leaders may aggravate or reduce stigmatization of sexual minorities such as gay and bisexual men, and other men who have sex with men (GBMSM). Literature indicates mixed results in efforts to encourage religious leaders to work effectively and sensitively with issues regarding HIV and sexuality. This paper describes the implementation of an engagement intervention with religious leaders from different denominations, which took place following a homophobic hate attack that was led by local religious leaders, at an HIV research clinic for GBMSM on the Kenyan coast. After the homophobic attack, tailored engagement activities, including a comprehensive four-day online sensitivity training course took place between June 2015 and October 2016 in the Kenyan coast. HIV researchers, together with trained GBMSM activists, organized the series of engagement activities for religious leaders which unfolded iteratively, with each subsequent activity informed by the results of the previous one. Facilitated conversations were used to explore differences and disagreements in relation to questions of scripture, mission, HIV, and human sexuality. As a result, researchers noted that many religious leaders, who initially expressed exceedingly negative attitudes towards GBMSM, started to express far more accepting and supportive views of sexuality, sexual identities, and same-sex relations. This paper describes the changes in religious leaders' discourses relating to GBMSM, and highlights the possibility of using engagement interventions to build trust between research institutes, religious leaders, and GBMSM.

18. Logie, C. H., et al. **"Exploring the Potential of Participatory Theatre to Reduce Stigma and Promote Health Equity for Lesbian, Gay, Bisexual, and Transgender (LGBT) People in Swaziland and Lesotho."** *Health Educ Behav* 2018: 1090198118760682. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29589481>

Stigma and discrimination affecting lesbian, gay, bisexual, and transgender (LGBT) people compromise health and human rights and exacerbate the HIV epidemic. Scant research has explored effective LGBT stigma reduction strategies in low- and middle-income countries. We developed and pilot-tested a participatory theatre intervention (PTI) to reduce LGBT stigma in Swaziland and Lesotho, countries with the world's highest HIV prevalence. We collected preliminary data from in-depth interviews with LGBT people in Lesotho and Swaziland to enhance understanding of LGBT stigma. Local LGBT and theatre groups worked with these data to create a 2-hour PTI composed of three skits on LGBT stigma in health care, family, and community settings in Swaziland (Manzini) and Lesotho (Maseru, Mapoteng). Participants (n = 106; nursing students, health care providers, educators, community members) completed 12 focus groups following the PTI. We conducted thematic analysis to understand reactions to the PTI. Focus groups revealed the PTI increased understanding of LGBT persons and issues, increased empathy, and fostered self-reflection of personal biases. Increased understanding included enhanced awareness of the negative impacts of LGBT stigma, and of LGBT people's lived experiences and issues. Participants discussed changes in attitude and

perspective through self-reflection and learning. The format of the theatre performance was described as conducive to learning and preferred over more conventional educational methods. Findings indicate changed attitudes and awareness toward LGBT persons and issues following a PTI in Swaziland and Lesotho. Stigma reduction interventions may help mitigate barriers to HIV prevention, treatment, and care in these settings with a high burden of HIV.

19. Chen, L., et al. "**Factors associated with disclosing men who have sex with men (MSM) sexual behaviors and HIV-positive status: A study based on a social network analysis in Nanjing, China.**" *PLoS One* 2018 13(4): e0196116. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29672596>

OBJECTIVE: We explored the factors associated with disclosure of men who have with sex with men (MSM) behaviors and HIV-positive status among HIV-positive MSM in Nanjing, China.

METHODS: Social network analysis and epidemiological methods were combined in this pilot study. Information about participants' (egos') characteristics and behaviors and their social network members (alters) were collected through interview-administered questionnaires. General estimating equation logistic regression analysis was applied in both univariate and multivariate analysis.

RESULTS: Eighty-seven HIV-positive MSM participated. Their mean age was 35.9 +/-13.81years. They were more likely to disclose their MSM behavior to their friends [adjust Odds Ratio (AOR) = 6.43, 95% confidence interval (CI):3.08-13.42] or to the social network members who were not heterosexual [AOR = 4.40, 95%CI: 2.17-8.91]. Being participants' friends [AOR = 5.16, 95%CI: 2.03-13.10] or family members [AOR = 6.22, 95%CI: 2.52-15.33] was significantly associated with HIV-positive status disclosure.

CONCLUSION: HIV-positive MSM tended to disclose their MSM behaviors and HIV positive status to close friends, family members or other individuals who were HIV-positive, engaging in MSM behavior, or both. Consequently, it will be an effective way to implement HIV prevention and intervention strategies in both MSM population and their trusted social networks.

20. Yang, H. J., et al. "**Factors associated with intention to be tested for HIV among men who have sex with men in a country with a very low HIV prevalence.**" *AIDS Care* 2018 30(3): 289-295. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28859484>

This study examined factors associated with the intention to take an HIV test among men who have sex with men (MSM) in South Korea. An internet website-based survey was conducted among users of the only and largest online MSM website between 20 July 2016, and 20 August 2016. A total of 2915 participants completed the survey and answered questions related to sociodemographic information, health behaviors, sexual behaviors, and HIV testing history. Of these, 2587 (88.7%) participants responded as having an intention to take an HIV test. A multivariable logistic regression analysis revealed the following as having reduced the intention to undergo HIV testing: very good subjective health status and no sexual interactions during the last 6 months (Adjusted odds ratios [AOR] 0.45 and 0.54, respectively). In contrast, increased intention to take an HIV test was associated with being 20-29 years old, 30-39 years old, not paying or receiving money for sex, having a history of HIV testing, and taking an HIV test once per 12 months (AOR 2.64, 2.13, 1.54, 1.81, and 2.17, respectively). In conclusion, HIV testing among MSM in this study was associated with age, subjective health status, sex(es) of one's sexual partner(s) during the last 6 months, sexual risk behaviors, HIV testing history, and undergoing regular HIV testing.

21. Jobson, G., et al. "**Gender identity and HIV risk among men who have sex with men in Cape Town, South Africa.**" *AIDS Care* 2018: 1-5. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29667424>

Gender identity plays a potentially important role contributing to HIV risk among MSM in South Africa. Where studies have included a focus on gender identity, MSM reporting gender non-conformity have been found to have a higher risk of being HIV positive than other MSM. This article examines HIV risk among gender non-conforming MSM in a sample of 316 MSM in Cape Town, South Africa. Reporting gender non-

conformity was associated with higher HIV prevalence and increased HIV risk behaviour. Gender non-conformity was also associated with a higher likelihood of being unemployed and reporting low household incomes. These findings highlight the importance of gender-identity as a factor affecting access to HIV treatment, care, and prevention in South Africa and this is an issue that needs to be addressed in interventions targeting MSM populations.

22. Peng, P., et al. "**A Global Estimate of the Acceptability of Pre-exposure Prophylaxis for HIV Among Men Who have Sex with Men: A Systematic Review and Meta-analysis.**" *AIDS Behav* 2018 22(4): 1063-1074. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28176168>

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

23. Lippman, S. A., et al. "**High Acceptability and Increased HIV-Testing Frequency After Introduction of HIV Self-Testing and Network Distribution Among South African MSM.**" *J Acquir Immune Defic Syndr* 2018 77(3): 279-287. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29210826>

BACKGROUND: South African men who have sex with men (MSM) have a high burden of undiagnosed HIV infection and HIV-testing rates incommensurate with their risk. HIV self-testing (HIVST) may increase testing uptake, frequency, and earlier HIV detection and treatment.

SETTING: Gert Sibande and Ehlanzeni districts, Mpumalanga Province, South Africa.

METHODS: We conducted a longitudinal HIVST study among MSM between June 2015 and May 2017. Overall 127 HIV-negative MSM were provided with up to 9 test kits of their choice-oral fluid or blood fingerstick-to use themselves and distribute to their networks. Surveys conducted 3- and 6-month post-enrollment elicited information on HIVST experiences, preferences, acceptability, utilization, and distribution. We used generalized estimating equations to assess changes in testing frequency.

RESULTS: Ninety-one percent of participants self-tested. All participants who self-tested reported being likely to self-test again, with over 80% preferring HIVST to clinic-based testing. Fingerstick was preferred to oral fluid tests by approximately 2:1. Returning participants distributed 728 tests to sexual partners (18.5% of kits), friends (51.6%), and family (29.8%). Six participants seroconverted during the study, and 40 new diagnoses were reported among test recipients. Frequent (semi-annual) testing increased from 37.8% before the study to 84.5% at follow-up ($P < 0.001$), and participants reported anticipated frequent testing of 100% if HIVST were available compared with 84% if only clinic-testing were available in the coming year ($P < 0.01$).

CONCLUSIONS: HIVST use and network distribution is acceptable and feasible for MSM in South Africa and can increase testing uptake and frequency, potentially improving early detection among MSM and their networks.

24. Allan-Blitz, L. T., et al. "**High incidence of extra-genital gonorrhoeal and chlamydial infections among high-risk men who have sex with men and transgender women in Peru.**" *Int J STD AIDS* 2018 29(6): 568-576. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29183269>

Extra-genital *Neisseria gonorrhoeae* and *Chlamydia trachomatis* infections are associated with antimicrobial resistance and HIV acquisition. We analyzed data from a cohort of men who have sex with men (MSM) and transgender women followed quarterly for two years in Peru. Incident cases were defined as positive *N. gonorrhoeae* or *C. trachomatis* nucleic acid tests during follow-up. Repeat positive tests were defined as reinfection among those with documented treatment. We used generalized estimating equations to calculate adjusted incidence rate ratios (aIRRs). Of 404 participants, 22% were transgender. Incidence rates of rectal *N. gonorrhoeae* and *C. trachomatis* infection were 28.1 and 37.3 cases per 100 person-years, respectively. Incidence rates of pharyngeal *N. gonorrhoeae* and *C. trachomatis* infection were 21.3 and 9.6 cases per 100 person-years, respectively. Incident HIV infection was associated with incident rectal (aIRR = 2.43; 95% CI 1.66-3.55) *N. gonorrhoeae* infection. Identifying as transgender versus cisgender MSM was associated with incident pharyngeal *N. gonorrhoeae* (aIRR = 1.85; 95% CI 1.12-3.07) infection. The incidence of extra-genital *N. gonorrhoeae* and *C. trachomatis* infections was high in our population. The association with incident HIV infection warrants evaluating the impact of rectal *N. gonorrhoeae* screening and treatment on HIV transmission.

25. Balan, I. C., et al. "**High Substance Use and HIV Risk Behavior Among Young Argentine Men Who Have Sex with Men.**" *AIDS Behav* 2018 22(4): 1373-1382. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29151198>

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.

26. Chen, M., et al. "**HIV-1 genetic transmission networks among men who have sex with men in Kunming, China.**" *PLoS One* 2018 13(4): e0196548. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29698467>

BACKGROUND: Yunnan has the greatest share of reported human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) cases in China. In recent years, HIV prevalence and incidence remained stubbornly high in men who have sex with men (MSM). To follow the dynamics of the HIV-1 epidemic among MSM, HIV-1 genetic characteristics and genetic transmission networks were investigated.

METHODS: Blood samples from 190 newly diagnosed HIV-1 cases among MSM were continuously collected at fixed sites from January 2013 to December 2015 in Kunming City, Yunnan Province. Partial gag, pol and env genes were sequenced and used for phylogenetic and genotypic drug resistance analyses. The genetic characteristics of the predominant HIV-1 strains were analyzed by the Bayesian Markov Chain Monte Carlo (MCMC) method. The genetic transmission networks were identified with a genetic distance of 0.03 substitutions/site and 90% bootstrap support.

RESULTS: Among the 190 HIV-1 positive MSM reported during 2013-2015, various genotypes were identified, including CRF01_AE (45.3%), CRF07_BC (35.8%), unique recombinant forms (URFs) (11.6%), CRF08_BC (3.2%), CRF55_01B (2.1%), subtype B (1.6%) and CRF59_01B (0.5%). The effective population sizes (EPS) for CRF01_AE and CRF07_BC increased exponentially from approximately 2001-2010 and 2005-2009, respectively. Genetic transmission networks were constructed with 308 pol sequences from MSM diagnosed during 2010-2015. Of the 308 MSM, 109 (35.4%) were identified in 38 distinct clusters. Having multiple male partners was associated with a high probability of identification in the genetic transmission networks. Of the 38 clusters, 27 (71.1%) contained individuals diagnosed in different years. Of the 109 individuals in the networks, 26 (23.9%) had ≥ 2 potential transmission partners (≥ 2 links). The proportion of MSM with

>/=2 links was higher among those diagnosed from 2010-2012. The constituent ratios of their potential transmission partners by areas showed no significant difference among MSM from Kunming, other cities in Yunnan and other provinces. Additionally, surveillance drug resistance mutations (SDRMs) were identified in 5% of individuals.

CONCLUSION: This study revealed the various HIV-a genotypes circulating among MSM in Kunming. MSM with more partners were more easily detected in transmission networks, and early-diagnosed MSM remained active in transmission networks. These findings suggested that the routine interventions should be combined with HIV testing and linkage to care and early antiretroviral therapy among HIV-positive MSM.

27. Dijkstra, M., et al. "**HIV-1 status is independently associated with decreased erectile function among middle-aged men who have sex with men in the era of cART.**" *AIDS* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29547444>

INTRODUCTION: HIV-1-infected men who have sex with men (MSM) more often experience sexual dysfunctions than the general population. We assessed associations between HIV-1 status and decreased sexual functioning among MSM.

METHODS: We used cross-sectional data from 399 HIV-1-infected MSM mostly on combination antiretroviral therapy (cART) and 366 HIV-1-uninfected MSM aged >/=45 years participating in the AGEHIV Cohort Study. The study questionnaire included questions on erectile function, sexual satisfaction, and sexual desire. Multivariable logistic regression models were constructed to assess the association between HIV-1 status and these three sexual domains. We also explored HIV-1- and ART-related parameters in multivariable models among HIV-1-infected participants.

RESULTS: Decreased erectile function (13.0% vs. 3.4%, $p < 0.001$), decreased satisfaction (17.8% vs. 11.8%, $p = 0.02$), and decreased desire (7.0% vs. 3.6% $p = 0.03$) were each more prevalent in HIV-1-infected than in HIV-1-uninfected participants. In multivariable models adjusted for age, ethnicity, waist-to-hip ratio, age-associated comorbidities, depression, frailty, use of antihypertensive and antidepressant medication, we found HIV-1 status significantly associated with decreased erectile function (adjusted odds ratio (aOR) 2.53, 95%CI 1.23-5.20), but not with decreased satisfaction (aOR 1.34, 95%CI 0.83-2.16), or decreased desire (aOR 1.77, 95%CI 0.80-3.91). Among HIV-1-infected participants, current exposure (aOR 5.39, 95%CI 2.09-13.92) and cumulative duration of exposure (aOR per year 1.20, 95%CI 1.07-1.35) to lopinavir/ritonavir were significantly associated with decreased erectile function in multivariable analysis.

CONCLUSIONS: Among MSM aged >/=45 years, HIV-1 status was independently associated with decreased erectile function. Exposure to lopinavir/ritonavir appeared to be an independent risk factor for decreased erectile function. among MSM with HIV-1.

28. Wirtz, A. L., et al. "**HIV and Viral Hepatitis Among Imprisoned Key Populations.**" *Epidemiol Rev* 2018 40(1): 12-26. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29688317>

Prisons and other closed facilities create opportunities for transmission of human immunodeficiency virus (HIV) and viral hepatitis during detention and after release. We conducted a systematic review and meta-analysis of peer-reviewed publications (2005-2015) to describe the prevalence of HIV, hepatitis C virus, and hepatitis B virus among key populations in prisons worldwide and to compare estimates of infection with those of other prison populations. Most data were reported for people who inject drugs (PWID; $n = 72$) and for men who have sex with men (MSM; $n = 21$); few data were reported on sex workers (SW; $n = 6$), or transgender women ($n = 2$). Publications were identified from 29 countries, predominantly middle- and high-income countries. Globally, PWID had 6 times the prevalence of HIV (pooled prevalence ratio (PPR) = 6.0, 95% CI: 3.8, 9.4), 8 times the prevalence of hepatitis C virus (PPR = 8.1, 95% CI: 6.4, 10.4), and 2 times the prevalence of hepatitis B virus (PPR = 2.0, 95% CI: 1.5, 2.7) compared with noninjecting prisoner populations. Among these articles, only those from Iran, Scotland, Spain, and Italy included the availability of methadone therapy; 2 articles included information on access to needle exchange programs by PWID detainees. HIV

prevalence was more than 2 times higher among SW (PPR = 2.6, 95% CI: 2.2, 3.1) and 5 times higher among MSM (PPR = 5.3, 95% CI: 3.5, 7.9) compared with other prisoners. None of these articles reported HIV prevention coverage among SW or transgender women; 1 described HIV and sexually transmitted infection screening for MSM in prison. Prevention programs specific to key populations are important, particularly for populations that are criminalized and/or may cycle in and out of prison.

29. Zhang, J., et al. **"HIV Incidence and Care Linkage among MSM First-Time-Testers in Shenyang, China 2012-2014."** *AIDS Behav* 2018 22(3): 711-721. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28660379>

HIV testing is the first step to the fulfillment of Treat as Prevention (TasP) and reaching the 90-90-90 goal in HIV control. However, there are still a large number of Men who have Sex with Men (MSM) have never been tested for HIV before, and little is known about the HIV incidence and care linkage among this population. A Mixed method was used to recruit MSM who had never tested for HIV before from January 2012 to December 2014 in Shenyang, China. Potential MSM participants were invited to attend the enrollment for HIV and syphilis testing at a general hospital-based voluntary counseling and test (VCT). HIV confirmed positive subjects were further tested by BED HIV-1 capture enzyme immunoassay (BED-CEIA) to determine the HIV incidence. Syphilis was screened by the rapid plasma reagent test (RPR) and confirmed by *Treponema pallidum* particle assay (TPPA). All the HIV positive subjects were referred to the local Center for Disease Control and Prevention (CDC) and clinics for HIV primary care and follow-ups. In total 646 HIV first-time-testers of MSM (FMSM) attended this study, 73.4% (474/646) were aged under 31-year-old and 57.3% (370/646) and used the Internet as their major cruising avenue for seeking male sexual partners. The average prevalence of HIV and current syphilis infection was 10.8% (70/646) and 11.0% (71/646), respectively. The HIV incidence was 10.3 (95% confidence interval [CI] 6.1-14.5)/100PY. Multivariate logistic analysis showed that factors such as use of the Internet as the major cruising avenue (adjusted OR [AOR] 2.7, 95% CI 0.9-7.6) and having a current syphilis infection (AOR 4.2, 95% CI 1.8-12.2) were independent correlates of a recent HIV infection. Of the 95 HIV screening test positive FMSM, 73.7% (70/95) returned and be confirmed positive, 92.9% (65/70) of confirmed patients were linked to care. Among those retained and underwent CD4+ T cell test, 76.3% (42/55) started HIV antiretroviral therapy. Among the unconfirmed, 84.0% (21/25) were non-local migrants. The HIV incidence of FMSM in Shenyang was high. Future HIV testing program needs to keep on expanding among the MSM who have never been tested for HIV yet. The Internet-based campaigns and syphilis testing and treatment could represent an opportunity to get access to this hard-to-reach population and link them to HIV care. Future linkage to HIV care of this population should underscore the usage of HIV rapid diagnostic tests to prevent lost at early steps of linkage.

30. Wong, N. S., et al. **"HIV Linkage to Care and Retention in Care Rate Among MSM in Guangzhou, China."** *AIDS Behav* 2018 22(3): 701-710. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28849284>

Quantifying HIV service provision along the HIV care continuum is increasingly important for monitoring and evaluating HIV interventions. We examined factors associated with linkage and retention in care longitudinally among MSM (n = 1974, 4933 person-years) diagnosed and living in Guangzhou, China, in 2008-2014. We measured longitudinal change of retention in care (>=2 CD4 tests per year) from linkage and antiretroviral therapy initiation (ART). We examined factors associated with linkage using logistic regression and with retention using generalized estimating equations. The rate of linkage to care was 89% in 2014. ART retention rate dropped from 71% (year 1) to 46% (year 2), suggesting that first-year retention measures likely overestimate retention over longer periods. Lower CD4 levels and older age predicted retention in ART care. These data can inform interventions to improve retention about some subgroups.

31. Kerr, L., et al. **"HIV prevalence among men who have sex with men in Brazil: results of the 2nd national survey using respondent-driven sampling."** *Medicine (Baltimore)* 2018 97(1S Suppl 1): S9-S15. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29794604>

This paper reports human immuno-deficiency virus (HIV) prevalence in the 2nd National Biological and Behavioral Surveillance Survey (BBSS) among men who have sex with men (MSM) in 12 cities in Brazil using respondent-driven sampling (RDS). Following formative research, RDS was applied in 12 cities in the 5

macroregions of Brazil between June and December 2016 to recruit MSM for BBSS. The target sample size was 350 per city. Five to 6 seeds were initially selected to initiate recruitment and coupons and interviews were managed online. On-site rapid testing was used for HIV screening, and confirmed by a 2nd test. Participants were weighted using Gile estimator. Data from all 12 cities were merged and analyzed with Stata 14.0 complex survey data analysis tools in which each city was treated as its own strata. Missing data for those who did not test were imputed HIV+ if they reported testing positive before and were taking antiretroviral therapy. A total of 4176 men were recruited in the 12 cities. The average time to completion was 10.2 weeks. The longest chain length varied from 8 to 21 waves. The sample size was achieved in all but 2 cities. A total of 3958 of the 4176 respondents agreed to test for HIV (90.2%). For results without imputation, 17.5% (95%CI: 14.7-20.7) of our sample was HIV positive. With imputation, 18.4% (95%CI: 15.4-21.7) were seropositive. HIV prevalence increased beyond expectations from the results of the 2009 survey (12.1%; 95%CI: 10.0-14.5) to 18.4%; CI95%: 15.4 to 21.7 in 2016. This increase accompanies Brazil's focus on the treatment to prevention strategy, and a decrease in support for community-based organizations and community prevention programs.

32. 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* 2018 77(3): 243-249. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29140871>

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

METHODS: This was a cross-sectional study using respondent-driven sampling to recruit MSM aged 18 and above. Data on sociodemographic 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%) provided 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 [adjusted odds ratio (aOR), 2.4, 95% confidence interval (CI): 1.4 to 4.2], low HIV-risk perception (aOR, 2.6, 95% CI: 1.2 to 5.3), receptive position (aOR, 8.7, 95% CI: 1.2 to 5.3), and not using water-based lubricants (aOR, 2.6, 95% CI: 1.0 to 4.5) during the last anal sex. Also associated with HIV infection was, having sexual relationships with women (aOR, 8.0, 95% CI: 4.1 to 15.6), engaging in group sex (aOR, 3.8, 95% CI: 1.6 to 8.4), HSV-2 seropositivity (aOR, 4.1, 95% CI: 2.6 to 6.5), and history of genital ulcers (aOR, 4.1, 95% CI: 1.1 to 7.2).

CONCLUSIONS: HIV infection and HSV-2 were highly prevalent among MSM. Low perceived HIV risk, practice of risk behaviors, and infection with HSV-2 were significant predictors of HIV infection. Behavioral interventions, HSV-2 suppressive therapies, and pre-exposure prophylaxis are highly needed.

33. Shuper, P. A., et al. "HIV Risk and Protective Factors in the Context of Alcohol and Substance Use During Pride." *AIDS Behav* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29680936>

This investigation sought to identify HIV-risk and -protective factors among men-who-have-sex-with-men (MSM) who engaged in anal sex following alcohol or substance use during an international Pride Festival. MSM attending World Pride were surveyed regarding (1) alcohol, substance use, and sex during the past 24 h; and (2) HIV-risk and -protective factors. Valid data were provided by 1123 MSM. Anal sex was reported by 195 MSM, among whom the majority (n = 105) consumed alcohol or substances prior to sex. Among MSM aware of their HIV status who consumed alcohol or substances prior to sex (n = 99), those who engaged in serodiscordant condomless anal sex (n = 22) were more likely to be HIV+ (AOR = 10.14, 95% CI 1.48-69.35); report multiple sex partners (AOR = 9.05, 95% CI 1.70-48.12); and possess lower condom efficacy (AOR = 0.47, 95% CI 0.23-0.93) and social support (AOR = 0.08, 95% CI 0.01-0.46). Bolstering condom negotiation skills and social support could potentially reduce HIV acquisition/transmission-risk behavior, even when under the influence of alcohol or substances.

34. Katz, D. A., et al. "HIV Self-Testing Increases HIV Testing Frequency in High Risk Men Who Have Sex with Men: A Randomized Controlled Trial." *J Acquir Immune Defic Syndr* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29697595>

BACKGROUND: Self-testing may increase HIV testing and decrease the time people with HIV are unaware of their status, but there is concern that absence of counseling may result in increased HIV risk. SETTING: Seattle, Washington.

METHODS: We randomly assigned 230 high-risk HIV-negative men who have sex with men (MSM) to have access to oral fluid HIV self-tests at no cost versus testing as usual for 15 months. The primary outcome was self-reported number of HIV tests during follow-up. To evaluate self-testing's impact on sexual behavior, we compared the following between arms: non-HIV-concordant condomless anal intercourse (CAI) and number of male CAI partners in the last 3 months (measured at 9 and 15 months) and diagnosis with a bacterial sexually transmitted infection (STI: early syphilis, gonorrhea, chlamydial infection) at the final study visit (15 months). A post hoc analysis compared the number of STI tests reported during follow-up.

RESULTS: Men randomized to self-testing reported significantly more HIV tests during follow-up (mean=5.3, 95%CI=4.7-6.0) than those randomized to testing as usual (3.6, 3.2-4.0; $p<.0001$), representing an average increase of 1.7 tests per participant over 15 months. Men randomized to self-testing reported using an average of 3.9 self-tests. Self-testing was non-inferior with respect to all markers of HIV risk. Men in the self-testing arm reported significantly fewer STI tests during follow-up (mean=2.3, 95%CI=1.9-2.7) than men in the control arm (3.2, 2.8-3.6; $p=0.0038$).

CONCLUSIONS: Access to free HIV self-testing increased testing frequency among high-risk MSM and did not impact sexual behavior or STI acquisition.

35. 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* 2018 30(4): 466-472. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29082776>

HIV pre-exposure prophylaxis (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.

36. Ntale, R. S., et al. "HIV seroprevalence, self-reported STIs and associated risk factors among men who have sex with men: a cross-sectional study in Rwanda, 2015." *Sex Transm Infect* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29680827>

OBJECTIVES: In many populations, men who have sex with men (MSM) are at a high risk of HIV infection. This study aimed to estimate the burden of HIV, other STIs and risk behaviours among Rwandan MSM.

METHODS: In this cross-sectional study, we recruited through peer referral men aged between 18 and 60 years, who reported sex with men at least once in the 12 months prior to the survey. Representativeness was increased using 'seeds' from a variety of sources. Signed informed consent was obtained from all participants. Data on demographics, risk behaviours and self-reported STIs were collected through an interviewer-administered questionnaire. We screened all eligible participants for HIV using the Rwanda-approved protocol for rapid HIV detection.

RESULTS: 504 MSM were recruited from five major cities in Rwanda. Participants were mostly young (median age 23 years, range 18-55 years) and unmarried (484/504, 96.0%). Thirteen per cent (65/504) of the participants reported past gonorrhoea and/or syphilis infection. Of 504 MSM, 53 (10.5%) reported they were diagnosed and treated for gonorrhoea in the past 12 months and 24 (4.8%) tested positive for HIV. A high proportion (232/504, 46%) reported receiving payment for sex by a man, with almost half of these reporting on more than three occasions (107/232, 46%). Many reported having had an HIV test within the past 12 months (385/504, 76.4%). In multivariate logistic regression models controlling for age, being paid for sex was associated with higher odds of past STI (OR 3.36 (1.82-6.43); $P < 0.001$) and testing HIV positive (OR 3.13, $P < 0.05$).

CONCLUSION: Further research is needed to understand the high rate of payment for sex in this population, which appears to be a major risk factor for STI including HIV.

37. Guanghua, L., et al. "**HIV, syphilis and behavioral risk factors among men who have sex with men in a drug-using area of southwestern China: Results of 3 cross-sectional surveys from 2013 to 2015.**" *Medicine (Baltimore)* 2018 97(16): e0404. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29668597>

To assess human immunodeficiency virus (HIV), syphilis, and behavioral risk factors among men who have sex with men (MSM) in southwestern China, where HIV started as a drug-driven epidemic, and shifted to mainly heterosexual transmission. These cross-sectional studies were conducted yearly in 2013, 2014, and 2015 in Guangxi, China. A total of 1,996, 1,965, and 1,697 participants were recruited in 2013, 2014, and 2015, respectively. The data included demographic and sexual behavioral variables. Other variables included individuals who used illegal drugs, and who received HIV counseling, testing, and free condoms, and peer education. Participants were tested for HIV, syphilis, and hepatitis C virus (HCV) with whole blood specimens. Questionnaires and laboratory testing data were double entered, and validated with EpiData software. The data were then transferred into SPSS software (SPSS Inc, Chicago, IL) and Chi-square test performed. The prevalence of HIV was 6.6% in 2013, 8.4% in 2014, and 11.2% in 2015. The prevalence of syphilis was 9.3% in 2013, 9.8% in 2014, and 6.1% in 2015. And HCV prevalence was 0.5% in 2013 and remained stable at 0.4% in 2014, and 2015. HIV infection, and associated factors among MSM in these 3 annual cross-sectional survey showed that HIV-infected MSM were significantly, more likely, to perform unprotected anal intercourse with any commercial male partners in the past 6 months (adjusted odds ratio [AOR] = 1.81, 95% CI: 1.50-2.20), had sex with any female partners in the past 6 months (AOR = 1.31, 95% CI: 1.01-1.71), used drugs in the past (AOR = 2.73, 95% CI: 1.30-5.71), and are syphilis infected (AOR = 3.53, 95% CI: 2.77-4.49). There is an urgent need for intervention strategies like condom distribution, HIV counseling, free testing, and education regarding safe sex, HIV, and other sex-related diseases in Guangxi to curb, and prevent HIV among MSM.

38. Oldenburg, C. E., et al. "**Human rights protections and HIV prevalence among MSM who sell sex: Cross-country comparisons from a systematic review and meta-analysis.**" *Glob Public Health* 2018 13(4): 414-425. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/26979302>

Laws and policies can affect the HIV risk of key populations through a number of direct and indirect pathways. We investigated the association between HIV prevalence among men who engage in transactional sex and language in the penal code protecting sexual minorities, including men who have sex with men (MSM), and sex workers. HIV prevalence among men who engage in transactional sex was assessed through meta-analysis of published literature and country surveillance reports. Meta-regression was used to determine the association between HIV prevalence and protective laws for sexual minorities and sex workers. Sixty-six reports representing 28 countries and 31,924 individuals were included in the meta-analysis.

Controlling for multiple study- and country-level variables, legal protection for sexual minorities was associated with a 10.9% (95% CI: 3.8-18.0%) and sex workers associated with a 7.0% (95% CI: 1.3-12.8%) decrease in country-level HIV prevalence among men who engage in transactional sex. Laws that seek to actively protect sex workers and MSM may be necessary to decrease HIV risk for this key population.

39. Anderson, K., et al. "**The impact of social support and partner relationship dynamics on engagement in HIV care and antiretroviral treatment adherence among MSM in Latin America.**" *AIDS Care* 2018: 1-7. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29587490>

In Latin America (LA), HIV prevalence among MSM is estimated at thirty times greater than in the general male population. Little is known about the role of social support or disclosure status in relation to the HIV care continuum among LA MSM. Using multivariable logistic generalized estimation equations, we assessed the impact of social support satisfaction and disclosure status on engagement in HIV care, ART initiation, and ART adherence with data from an online, multinational sample of HIV infected MSM in Latin America (N = 2,350). 80.0% were engaged in HIV care, 71% initiated ART, and among those, 37% reported missing at least one dose in the past month. In multivariable models, compared to being very satisfied with social support, being somewhat satisfied (aOR = 0.73, 95% CI 0.56, 0.95) or somewhat dissatisfied (aOR = 0.83, 95% CI 0.70, 0.98) were associated with reduced odds of reporting 100% ART adherence. Disclosure of status was associated with a greater odds of HIV care engagement (OR = 1.63, 95% CI 1.28, 2.07) and ART initiation (OR = 1.55, 95% CI 1.30, 1.84). Greater satisfaction with social support and comfort disclosing HIV status to these sources were associated with improved engagement in HIV care and greater initiation of ART among MSM in LA.

40. Ramadhani, H. O., et al. "**Individual and Network Factors Associated with HIV Care Continuum Outcomes Among Nigerian MSM Accessing HealthCare Services.**" *J Acquir Immune Defic Syndr* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29781881>

BACKGROUND: and setting: As data on the determinants of the HIV care continuum from key populations such as men who have sex with men (MSM) in resource-limited, settings (RLS) are limited, the study aimed to characterize HIV care continuum outcomes and assess individual and network barriers to progression through the HIV care continuum among MSM in Abuja and Lagos, Nigeria.

METHODS: TRUST/RV368 study used respondent-driven-sampling to accrue MSM into community-based clinics in Nigeria. Participants received HIV testing at enrollment. HIV-infected participants were offered antiretroviral therapy (ART) with HIV RNA testing every three months (Abuja) or six months (Lagos). Multiple logistic regression models were used to calculate adjusted odds ratios for factors associated with each point in the HIV care continuum, including HIV testing, ART initiation, and six-month viral suppression.

RESULTS: A total of 1506 MSM were recruited, 1178 (78.2%) tested for HIV and 369 (31.3%) were HIV positive newly diagnosed. Of these, 188 (50.1%) initiated ART, 136 (72.3%) completed six months and 96 (70.6%) were virally suppressed. Larger network size and stronger social network support were positively associated with HIV testing uptake. Factors associated with ART initiation were higher education and stronger social network support. Having stronger social network support was associated with increased odds of viral suppression at six months.

CONCLUSIONS: Social determinants of health potentiated increased HIV Care Continuum outcomes. Integration of HIV prevention, HIV Counselling and Testing services and universal coverage of ART into a community-based clinic is critical in achieving better high HIV Care Continuum outcomes.

41. Flores, J. A., et al. "**Individual-level characteristics associated with oral HIV test acceptability among Peruvian men who have sex with men and transgender women: a cross-sectional study.**" *Sex Transm Infect* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29574465>

OBJECTIVES: Peruvian men who have sex with men (MSM) and transgender women (TGW) are highly vulnerable to HIV infection (HIV), but stigma, access issues and fear of venipuncture hamper testing. The oral HIV test-which uses oral fluids and provides results in 20 minutes-could reduce these barriers. The objective of this study was to determine the acceptability of the oral HIV test and the individual-level factors associated with its acceptability among MSM and TGW.

METHODS: We conducted a cross-sectional secondary analysis among Peruvian MSM and TGW attending a community-based health centre between February 2012 and February 2013 to determine the individual-level factors associated with oral HIV test acceptability.

RESULTS: Of 334 participants, 88% were MSM and 12% TGW. Overall, 85% of participants indicated their acceptability of the oral HIV test. Acceptability was higher in MSM than TGW (85.7% vs 80.0%) but this difference was not significant. Factors associated with acceptability in MSM were: tertiary or higher education (prevalence ratio (PR)=1.18, 95% CI 1.06 to 1.32 and PR=1.16, 95% CI 1.03 to 1.30, respectively); sex with drug use (PR=1.19, 95% CI 1.05 to 1.36); believing that HIV is transmitted by saliva (PR=1.20, 95% CI 1.08 to 1.33); and potential use of the oral test at home (PR=1.56, 95% CI 1.32 to 1.85). The only factor associated with lower acceptability was having had first anal intercourse between 14 and 19 years of age (PR=0.89, 95% CI 0.80 to 0.98).

CONCLUSIONS: We identified the individual factors associated with oral HIV test acceptability among Peruvian MSM and TGW. Expanded use of the oral HIV test to increase testing rates among Peruvian MSM and TGW is recommended. TRIAL REGISTRATION NUMBER: NCT01387412, post-results.

42. Fauk, N. K., et al. "The Intention of Men Who Have Sex With Men to Participate in Voluntary Counseling and HIV Testing and Access Free Condoms in Indonesia." *Am J Mens Health* 2018: 1557988318779737. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29855216>

This study aimed to identify factors that influenced the intention of men who have sex with men (MSM) to participate in voluntary counseling and HIV testing (VCT) and in accessing free condoms. A qualitative inquiry using one-on-one in-depth interviews was conducted with MSM participants who were recruited using a purposive sampling technique. Data analysis was guided by a framework analysis for qualitative data by Ritchie and Spencer, and the Theory of Planned Behavior (TPB) framework was used to analyze the data. The findings were grouped into three themes-namely, (a) attitude encompassing knowledge about HIV/AIDS and HIV/AIDS services and the belief about the positive outcomes of the services; (b) subjective norms including support from MSM peers and family members and motivation to comply with the support; and (c) perceived behavioral control, which is associated with resource availability and having confidence and positive intention to participate in VCT and willingness to access free condoms. Findings indicated that personal, community, and structural factors were predictors to intention to accessing services. Interventions targeting large numbers of MSM population and further studies to understand what needs to be done by nongovernmental organizations and governmental institutions to halt the spread of HIV infections among MSM populations and increase their intention to use HIV/AIDS services are also recommended.

43. Meyers, K., et al. "Interest in Long-Acting Injectable PrEP in a Cohort of Men Who have Sex with Men in China." *AIDS Behav* 2018 22(4): 1217-1227. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28707025>

Long-acting injectable (LAI) formulations of antiretrovirals (ARVs) as pre-exposure prophylaxis (PrEP) could be an attractive alternative for men who have sex with men (MSM) who are interested in ARV-based biomedical prevention but will not use a daily pill. This study investigated interest in LAI-PrEP in a cohort of MSM in China and characterized how MSM willing to use only injectable PrEP differed from MSM who would use PrEP regardless of modality or not at all. Demographic, behavioral, and risk perception measures were collected and associations investigated. A licensed LAI-PrEP agent would increase the proportion interested in PrEP by 24.5% over oral PrEP alone. Combining interest in oral and injectable PrEP, 78.5% of the sample could be covered if reported interest in PrEP translated into actual uptake. Partnership factors differentiated those who would be willing to use only LAI-PrEP versus any PrEP modality, while higher self-perception of

risk was associated with interest in LAI-PrEP versus no PrEP. The addition of a second PrEP modality could yield increased population coverage of PrEP. Social and behavioral research should be undertaken in parallel with clinical development of injectable PrEP agents to identify characteristics of those who are not interested in oral PrEP but would take advantage of ARV-based prevention with the introduction of an injectable product.

44. He, J., et al. "**Intimate relationship characteristics as determinants of HIV risk among men who have sex with regular male sex partners: a cross-sectional study in Guangzhou, China.**" *BMC Infect Dis* 2018 18(1): 150. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29606100>

BACKGROUND: China faces a serious HIV epidemic among men who have sex with men (MSM), and a large proportion of new infections are attributed to their regular male sex partners (RP). The objective of this study was to investigate the association between intimate relationship characteristics and HIV-related behaviors among MSM with RP in Guangzhou, China.

METHODS: A convenience-sampling method was used in data collection. A total of 608 MSM were screened, of whom 406 HIV negative MSM with at least one RP in the past six months were used for data analysis. Three-step logistic regressions were used to analyze the data.

RESULTS: The prevalence of unprotected anal intercourse (UAI) with regular male sex partners, non-regular male sex partners, and concurrent UAI in the past six months was 53.9%, 23.6%, 20.7%, respectively. Variables associated with UAI with regular male sex partners included expectations for this relationship (adjusted odds ratio in multiple forward stepwise logistic regression, OR_M = 1.66) and open communication about the sexual relationship (OR_M = 1.79), while expectations for the relationship (OR_M = 0.46 to 0.54) and conflicts of interest (OR_M = 5.46 to 5.97) were associated with concurrent UAI and UAI with non-regular male sex partners.

CONCLUSION: Intimate relationship characteristics were related to HIV-related risk behaviors. Future HIV prevention interventions should take MSM couples into consideration, include a focus on the quality of their intimate relationships, and encourage open communication about their sexual relationships.

45. C, H. L., et al. "**Marginalization and social change processes among lesbian, gay, bisexual and transgender persons in Swaziland: implications for HIV prevention.**" *AIDS Care* 2018: 1-8. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29848007>

Swaziland has among the highest national adult HIV prevalence globally. There is limited knowledge of HIV vulnerabilities and prevention engagement among lesbian, gay, bisexual and transgender (LGBT) persons in the context of Swaziland's criminalization of consensual same-sex practices. This study explored social processes of marginalization to assess how they could potentiate HIV vulnerabilities and limit engagement in HIV prevention services. Additionally, we assessed positive change to better understand existing strategies employed by LGBT persons to challenge these HIV prevention barriers. Guided by community-based research methodology and conducted in Mbabane and Manzini, Swaziland, data were collected by LGBT peer-research assistants (PRA) in collaboration with an LGBT community organization in Manzini. Semi-structured interviews were conducted by trained PRAs and explored HIV prevention, including experiences of stigma and coping. Audio files were transcribed verbatim, translated to English, and analyzed using thematic techniques. Among participants (n = 51; mean age: 26.47, SD: 4.68), 40 self-identified as gay or lesbian (78.4%), 11 bisexual (22.6%), and 12 (23.5%) identified as transgender. Findings highlighted three primary processes of marginalization and positive change in structural, community, and internal domains. First, structural marginalization, which included criminalization, healthcare discrimination, and a scarcity of LGBT tailored HIV prevention resources was challenged by grassroots networks created to access and share specific HIV resources with LGBT persons and the Ministry of Health. Second, community marginalization included stigma and multi-dimensional forms of violence, however, this was met with LGBT persons providing mutual peer support, including for accessing HIV testing services. Thirdly, internal marginalization comprised of self-stigma and associated sexual risk practices was contrasted with coping strategies focused

on self-acceptance, stemming from social support and leading to healthcare utilization. Jointly, these findings can inform the implementation of community-based and rights affirming HIV prevention and care cascade strategies that improve coverage of services with LGBT persons in Swaziland.

46. 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* 2018 22(5): 1614-1638. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29128941>

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.

47. Scheibe, A., et al. "**Modelling the UNAIDS 90-90-90 treatment cascade for gay, bisexual and other men who have sex with men in South Africa: using the findings of a data triangulation process to map a way forward.**" *AIDS Behav* 2018 22(3): 853-859. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28444469>

A data triangulation exercise was carried out between 2013 and 2015 to assess the HIV epidemic and response among gay, bisexual and other men who have sex with men (GBMSM) in South Africa. We used the findings to assess progress in achieving the UNAIDS 90-90-90 goals for GBMSM in the country. Three scenarios were developed using different GBMSM population factors (2.0, 3.5 and 5.0% of males aged ≥ 15) to estimate the population size, HIV prevalence of 13.2-49.5%, and 68% of GBMSM knowing their status. Due to data gaps, general population data were used as estimates of GBMSM on antiretroviral therapy (ART) and virologically suppressed (25.7 and 84.0%, respectively). The biggest gap is access to ART. To address the data gap we recommend developing data collection tools, indicators, and further quantification of HIV cascades. Targeted testing, linkage to services and scaled-up prevention interventions (including pre-exposure prophylaxis) are also required.

48. Brown, A. E., et al. "**Monitoring the HIV continuum of care in key populations across Europe and Central Asia.**" *HIV Med* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29737610>

OBJECTIVES: The aim of the study was to measure and compare national continuum of HIV care estimates in Europe and Central Asia in three key subpopulations: men who have sex with men (MSM), people who inject drugs (PWID) and migrants.

METHODS: Responses to a 2016 European Centre for Disease Prevention and Control (ECDC) survey of 55 European and Central Asian countries were used to describe continuums of HIV care for the subpopulations. Data were analysed using three frameworks: Joint United Nations Programme on HIV/AIDS (UNAIDS) 90-90-90 targets; breakpoint analysis identifying reductions between adjacent continuum stages; quadrant analysis categorizing countries using 90% cut-offs for continuum stages.

RESULTS: Overall, 29 of 48 countries reported national data for all HIV continuum stages (numbers living with HIV, diagnosed, receiving treatment and virally suppressed). Six countries reported all stages for MSM, seven for PWID and two for migrants. Thirty-one countries did not report data for MSM (34 for PWID and 41 for migrants). In countries that provided key-population data, overall, 63%, 40% and 41% of MSM, PWID and migrants living with HIV were virally suppressed, respectively (compared with 68%, 65% and 68% nationally, for countries reporting key-population data). Variation was observed between countries, with higher outcomes in subpopulations in Western Europe compared with Eastern Europe and Central Asia.

CONCLUSIONS: Few reporting countries can produce the continuum of HIV care for the three key populations. Where data are available, differences exist in outcomes between the general and key populations. While MSM broadly mirror national outcomes (in the West), PWID and migrants experience poorer treatment and viral suppression. Countries must develop continuum measures for key populations to identify and address inequalities.

49. He, L., et al. "New types of drug use and risks of drug use among men who have sex with men: a cross-sectional study in Hangzhou, China." *BMC Infect Dis* 2018 18(1): 182. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29665785>

BACKGROUND: The use of new types of drugs has become more common among men who have sex with men (MSM). The aim of this study was to describe the patterns of the use of new types of drugs, such as methamphetamine, ketamine, ecstasy, and rush poppers, and to examine the factors associated with drug use and HIV infection among MSM in Hangzhou, China.

METHODS: This cross-sectional study was conducted between August 2015 and April 2016. We used snowball sampling to recruit MSM; participants were recruited from voluntary counseling and testing centers, baths, bars, Blued (an app for the gay community), QQ groups, clubs, and other types of venues. MSM were included if their previous HIV test results were negative or unknown, or they had not been tested for HIV. MSM were excluded if they were known to be HIV positive before the survey. Face-to-face questionnaires were conducted and a venous blood specimen was drawn from each participant following the interview.

RESULTS: In total, 555 MSM were included; 18.2% (101/555) of the participants had used new types of drugs in the past 3 months. Among the users, 65.3% used single-use rush poppers, while the remainder used ketamine, methamphetamine, ecstasy, or other mixed combinations of drugs. The HIV positivity rate was 14.8% (82/555). Factors associated with increased odds of using new types of drugs in the past 3 months were higher education levels (adjusted odds ratio [AOR] 4.45, 95% confidence interval [CI] 2.12-9.37), having multiple sexual partners (AOR 1.76, 95 CI 1.02-3.05), alcohol use before sexual intercourse (AOR 33.44, 95% CI 10.80-103.50), and seeing friends using new types of drugs.

CONCLUSION: We revealed the widespread use of new types of drugs, as well as a high diagnosis rate of new HIV infection, among MSM in Hangzhou. The use of new types of drugs was associated with an increased number of sexual partners among MSM; the high-risk sexual behaviors increased the risk of HIV infection. Attention should be given to the use of new types of drugs in MSM, and supervision programs should be strengthened to combat drug use.

50. Weir, S. S., et al. "Opportunities for Enhanced Strategic Use of Surveys, Medical Records, and Program Data for HIV Surveillance of Key Populations: Scoping Review." *JMIR Public Health Surveill* 2018 4(2): e28. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29789279>

BACKGROUND: Normative guidelines from the World Health Organization recommend tracking strategic information indicators among key populations. Monitoring progress in the global response to the HIV epidemic uses indicators put forward by the Joint United Nations Programme on HIV/AIDS. These include the 90-90-90 targets that require a realignment of surveillance data, routinely collected program data, and medical record data, which historically have developed separately.

OBJECTIVE: The aim of this study was to describe current challenges for monitoring HIV-related strategic information indicators among key populations ((men who have sex with men [MSM], people in prisons and other closed settings, people who inject drugs, sex workers, and transgender people) and identify future opportunities to enhance the use of surveillance data, programmatic data, and medical record data to describe the HIV epidemic among key populations and measure the coverage of HIV prevention, care, and treatment programs.

METHODS: To provide a historical perspective, we completed a scoping review of the expansion of HIV surveillance among key populations over the past three decades. To describe current efforts, we conducted a review of the literature to identify published examples of SI indicator estimates among key populations. To describe anticipated challenges and future opportunities to improve measurement of strategic information indicators, particularly from routine program and health data, we consulted participants of the Third Global HIV Surveillance Meeting in Bangkok, where the 2015 World Health Organization strategic information guidelines were launched.

RESULTS: There remains suboptimal alignment of surveillance and programmatic data, as well as routinely collected medical records to facilitate the reporting of the 90-90-90 indicators for HIV among key populations. Studies (n=3) with estimates of all three 90-90-90 indicators rely on cross-sectional survey data. Programmatic data and medical record data continue to be insufficiently robust to provide estimates of the 90-90-90 targets for key populations.

CONCLUSIONS: Current reliance on more active data collection processes, including key population-specific surveys, remains warranted until the quality and validity of passively collected routine program and medical record data for key populations is optimized.

51. Nyato, D., et al. "**Participants' accrual and delivery of HIV prevention interventions among men who have sex with men in sub-Saharan Africa: a systematic review.**" *BMC Public Health* 2018 18(1): 370. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29554867>

BACKGROUND: Across sub-Saharan Africa (SSA), HIV disproportionately affects men-who-have-sex-with-men (MSM) compared with other men of the same age group in the general population. Access to HIV services remains low among this group although several effective interventions have been documented. It is therefore important to identify what has worked well to increase the reach of HIV services among MSM.

METHODS: We searched MEDLINE, POPLINE and the Web of Science databases to collect published articles reporting HIV interventions among MSM across sub-Saharan Africa. Covidence was used to review the articles. The review protocol was registered in International Prospective Register of Systematic Reviews (PROSPERO) - CRD42017060808.

RESULTS: The search identified 2627 citations, and following removal of duplicates and inclusion and exclusion criteria, only 15 papers were eligible for inclusion in the review. The articles reported various accrual strategies, namely: respondent driven sampling, known peers identified through hotspot or baseline surveys, engagement with existing community-based organizations, and through peer educators contacting MSM in virtual sites. Some programs, however, combined some of these accrual strategies. Peer-led outreach services were indicated to reach and deliver services to more MSM. A combination of peer outreach and mobile clinics increased uptake of health information and services. Health facilities, especially MSM-friendly facilities attract access and use of services by MSM and retention into care.

CONCLUSIONS: There are various strategies for accrual and delivering services to MSM across SSA. However, each of these strategies have specific strengths and weaknesses necessitating combinations of interventions and integration of the specific context to inform implementation. If the best of intervention content and implementation are used to inform these services, sufficient coverage and impact of HIV prevention and treatment programs for MSM across SSA can be optimized.

52. Logie, C. H., et al. "**Pathways from sexual stigma to inconsistent condom use and condom breakage and slippage among men who have sex with men in Jamaica.**" *J Acquir Immune Defic Syndr* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29697593>

BACKGROUND: HIV prevalence among men who have sex with men (MSM) in Jamaica, where same sex practices are criminalized, is among the Caribbean's highest. Sexual stigma, the devaluation, mistreatment and reduced power afforded to sexual minorities, is a distal driver of HIV vulnerabilities. The mechanisms

accounting for associations between sexual stigma and condom use outcomes are underexplored. We examined pathways from sexual stigma to condom use and condom breakage and/or slippage among MSM in Jamaica.

METHODS: We conducted a cross-sectional survey with a chain referral sample of MSM (n=556) in Kingston, Montego Bay, and Ocho Rios. Structural equation modeling using weighted least squares estimation methods was conducted to test the direct effects of sexual stigma on inconsistent condom use and condom breakage/slippage, and the indirect effects via depression, sexual abuse history, and condom use self-efficacy, adjusting for socio-demographic factors.

RESULTS: One-fifth of participants (21%; 90/422) who had engaged in anal sex reported inconsistent condom use and 38% (155/410) reported condom breakage/slippage during the prior four weeks. The relationship between sexual stigma and inconsistent condom use was mediated by the combination effect of sexual abuse history, condom use self-efficacy, and depression. The relationship between sexual stigma and condom breakage and slippage was mediated by the combination effect of condom use self-efficacy and sexual abuse history.

CONCLUSIONS: Sexual stigma is associated with negative condom use outcomes in Jamaican MSM, mediated by psychosocial factors. Multilevel social ecological approaches to the HIV prevention cascade can inform interventions at individual, interpersonal, community, and systemic levels.

53. Johnson, W. D., et al. "**Per-partner condom effectiveness for men who have receptive sex with HIV-positive men.**" *AIDS* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29794493>

OBJECTIVE: Few studies have examined condom effectiveness for HIV prevention among men who have sex with men (MSM). We estimated condom effectiveness per partner in four cohorts of MSM during 1993-2003 (JumpStart, Vaccine Preparedness Study, VAX004 and Project Explore).

METHODS: We used logistic regression to estimate the increase in odds of new HIV infection per HIV-positive partner for condom-protected receptive anal intercourse (PRAI; partners with whom condoms were always used) and condomless (unprotected) receptive anal intercourse (URAI; partners with whom condoms were sometimes or never used). To estimate condom effectiveness for preventing HIV transmission we applied the concept of excess odds, the odds ratio minus 1. The condom failure rate was estimated as the excess odds per PRAI partner divided by the excess odds per URAI partner. Condom effectiveness was then 1 minus the failure rate.

RESULTS: The excess odds of HIV infection per HIV-positive partner were 83% for URAI and 7% for PRAI. The resulting failure rate (9%) indicated per-partner condom effectiveness of 91% (95% confidence interval 69-101).

CONCLUSION: The increase in odds of new HIV infection per HIV-positive partner for RAI was reduced by 91% for each partner with whom condoms were always used.

54. 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* 2018 19(4): 243-251. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29178158>

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.

55. Luz, P. M., et al. "PrEP adopted by the brazilian national health system: What is the size of the demand?" *Medicine (Baltimore)* 2018 97(1S Suppl 1): S75-S77. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29794605>

BACKGROUND: Brazil's response to the HIV epidemic now includes free access to preexposure prophylaxis (PrEP) to populations at substantial risk for HIV infection including men who have sex with men (MSM). We used nationally representative demographic, epidemiologic, and surveillance data to offer estimates for the number of MSM at substantial risk for HIV infection who might be eligible and willing to use PrEP in Brazil.

METHODS: Starting from the age/sex-stratified population, we calculated the number of men aged 15 to 64 years, in 5-year age groups, and the proportion of those who report sex with other men during their lifetime. We focused on 11 cities (representing all regions) that are responsible for a significant fraction of the HIV burden of the country and used city-specific HIV prevalence estimates to infer the fraction of MSM who are HIV-negative. We then derived the proportion of HIV-negative MSM under substantial risk for HIV infection defined as having unprotected receptive anal intercourse in the 6 months before study participation. Finally, PrEP uptake among the eligible was inferred from the PrEP Brazil study.

RESULTS: Our results show that PrEP demand in these 11 cities is of 66,120 men aged 15 to 64 years. When we consider the lower and upper bounds for the available parameters, we find that PrEP demand in these 11 cities might vary from 33,378 to 97,962 men. If PrEP is restricted to those aged 15 to 49 years, demand drops by 20%. PrEP demand varies considerably by city, mostly because of the differences in population size and city-specific HIV prevalence.

DISCUSSION: We have shed light on the probable size of PrEP demand in Brazil certain that the incorporation of PrEP as part of Brazil's combination prevention for populations at substantial risk for HIV infection is a necessary challenge. PrEP will not only prevent HIV infections, it will also expand testing among the most vulnerable with the added benefit of offering combination prevention for the uninfected and immediate treatment for those already infected. As such, expected added benefits of PrEP will be earlier linkage to care, prompt treatment initiation leading to health benefits and decreased transmission.

56. Ong, J. J., et al. "Pressured HIV testing "in the name of love": a mixed methods analysis of pressured HIV testing among men who have sex with men in China." *J Int AIDS Soc* 2018 21(3): e25098. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29577598>

INTRODUCTION: HIV testing has rapidly expanded into diverse, decentralized settings. While increasing accessibility to HIV testing is beneficial, it may lead to unintended consequences such as being pressured to test. We examined the frequency, correlates and contexts of pressured HIV testing among Chinese men who have sex with men (MSM) using mixed methods.

METHODS: We conducted an online survey of MSM (N = 1044) in May 2017. Pressured HIV testing was defined as being forced to test for HIV. We conducted logistic regression analysis to determine the associations between pressured HIV testing and socio-demographic and sexual behavioural factors. Follow-up interviews (n = 17) were conducted with men who reported pressured testing and we analysed qualitative data using a thematic analysis approach.

RESULTS: Ninety-six men (9.2%) reported experiencing pressure to test for HIV. Regular male sex partners were the most common source of pressure (61%, 59/96), and the most common form of pressure was a threat to end a relationship with the one who was being pressured (39%, 37/96). We found a higher risk of pressured testing in men who had only used HIV self-testing compared to men who had never self-tested (AOR 2.39 (95%CI: 1.38 to 4.14)). However, this relationship was only significant among men with low education (AOR 5.88 (95% CI: 1.92 to 17.99)) and not among men with high education (AOR 1.62 (95% CI: 0.85 to 3.10)). After pressured testing, about half of men subsequently tested for HIV (55%, 53/96) without pressure - none reported being diagnosed with HIV. Consistent with this finding, qualitative data suggest that perceptions of pressure existed on a continuum and depended on the relationship status of the one who pressured them. Although being pressured to test was accompanied by negative feelings, men who were pressured into testing often changed their attitude towards HIV testing, testing behaviours, sexual behaviours and relationship with the one who pressured them to test.

CONCLUSION: Pressured HIV testing was reported among Chinese MSM, especially from men with low education levels and men who received HIV self-testing. However, in some circumstances, pressure to test helped MSM in several ways, challenging our understanding of the role of agency in the setting of HIV testing.

57. Moyer, E., et al. "**Queering the evidence: remaking homosexuality and HIV risk to 'end AIDS' in Kenya.**" *Glob Public Health* 2018: 1-13. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29671365>

Until recently, HIV in Africa was presumed to be driven by poverty, gender inequality and poor governance. The last decade has seen a shift in global and national public health discourses, especially in eastern Africa where new statistical evidence is used to justify prevention efforts to target Key Populations, i.e. men who have sex with men (MSM), injecting drug users, and sex workers. In this article, we focus on Kenya to examine state, NGO and community HIV treatment and prevention efforts targeting MSM, specifically male sex workers. We combine ethnographic fieldwork with a critical analysis of policy(making) and implementation practices to sketch the contours of the global, national and local forces that have combined to (re)make male homosexual sex to be understood as a practice that contributes to HIV incidence in Kenya. We also show that HIV-related MSM programmes in Kenya primarily enrol male sex workers in HIV treatment programmes, which focus on mainly on treatment adherence and pay insufficient attention to the economic and psycho-social problems experienced by male sex workers. Although upper and middle class MSM are involved in running LGTBI rights-based interventions and in mobilising male sex workers for HIV interventions, they are rarely targeted by those interventions.

58. Rawat, S., et al. "**Recommendations for the Development of a Mobile HIV Prevention Intervention for Men Who Have Sex With Men and Hijras in Mumbai: Qualitative Study.**" *JMIR Public Health Surveill* 2018 4(2): e46. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29724705>

BACKGROUND: As Internet and mobile phone use expands in India, there is an opportunity to develop mobile health (mHealth) interventions for marginalized populations, including men who have sex with men (MSM) and hijras (transgender women), hesitant to access traditional health care systems.

OBJECTIVE: The purpose of this study was to determine if an mHealth intervention was acceptable to MSM and hijras living in Mumbai, and if so, what features would be useful in targeting the prevention of HIV acquisition and to increase the quality of life among persons living with HIV/AIDS.

METHODS: Data from 4 focus groups with MSM and interviews with 4 hijras, 10 health service providers, and 8 mHealth developers were thematically analyzed.

RESULTS: Once the need for an mHealth intervention was confirmed, comments about features were organized into 3 themes: content, interface, and retention. Content subthemes included providing sex education for younger community members, providing information about STIs, and providing information and social support for persons living with HIV. Interface subthemes included presenting content using pictures; using videos to present stories of role models; using push notifications for testing, appointment, and medication reminders; using geolocation to link to just-in-time services; and using telemedicine to increase access to health service providers and community services. The 5 retention subthemes included keeping it fun, using gaming mechanics, developing content in regional languages, protecting confidentiality, and linking to social networking apps.

CONCLUSIONS: These findings may help inform mHealth development in India.

59. Mo, P. K., et al. "**Relationship between illness representations and mental health among HIV-positive men who have sex with men.**" *AIDS Care* 2018; 1-6. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29504429>

Illness representations play a significant role on mental health across various health conditions. The present study explores the associations between illness representations of HIV and mental health (suicidal ideation and depression), and the mediation effects of emotional representations on the associations between cognitive representations and mental health among men who have sex with men who were newly diagnosed with HIV (ND-MSM) in China. A total of 225 ND-MSM were recruited from a non-governmental organisation and were invited to complete a cross-sectional survey. Results showed that 48.0% had suicidal ideation since HIV diagnosis and 48.4% scored higher than the cut-off for mild depression or above. Stepwise regression analyses showed that higher levels of emotional representations of HIV and lower levels of treatment control were associated with both suicidal ideation and depression. Emotional representations were shown to mediate the associations between some cognitive representations variables and mental health. Findings suggest that both cognitive and emotional representations of HIV were important factors of mental health among ND-MSM. Interventions to promote the mental health of ND-MSM are warranted and should seek to improve their cognitive and emotional representations of HIV.

60. Hong, H., et al. "**Relationship between the use of gay mobile phone applications and HIV infection among men who have sex with men in Ningbo, China: a cross-sectional study.**" *Int J STD AIDS* 2018 29(5): 491-497. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29099328>

In recent years, there has been a significant increase in the use of gay mobile phone applications (gay apps) and HIV prevalence among men who have sex with men (MSM) in China. The aim of this study was to investigate whether there was a relationship between the use of gay apps and HIV infection and provide a targeted intervention to MSM. A cross-sectional study was conducted. Chinese MSM who were over 18 years old and had self-reported homosexual intercourse in the past six months were interviewed in 2016. Proportions were used for categorical variables and determinants of HIV infection were assessed using univariate and multivariate regression. Of the 403 participants, nearly 66.0% reported having used gay apps to seek sexual partners in the past six months. A higher proportion of the gay app users were younger than 19 years old, single, had high school education, were earning less than 115 GBP income per month, and identified themselves as homosexual. Compared to app non-users, a greater proportion of app users reported a higher frequency of male-male sexual contact (≥ 1 time/week: 57.5% versus 39.4%, $p < 0.01$), multiple male sex partners (34.2% versus 11.7%, $p < 0.001$), and unprotected sex with men (51.5% versus 36.5%, $p < 0.01$) in the past six months. The prevalence of HIV among app users was 7.9%. HIV infection was significantly associated with being an app user (adjusted odds ratio = 5.2, 95% CI = 1.1-24.3). It is suggested that the use of gay apps, especially Blued, is popular among Chinese MSM and is associated with high-risk sexual behaviors and HIV infection. Therefore, there is an urgent need to promote HIV testing and HIV prevention through gay apps to decrease the risk of HIV infection among Chinese MSM.

61. Rocha, G. M., et al. **"Risk behavior score: a practical approach for assessing risk among men who have sex with men in Brazil."** *Braz J Infect Dis* 2018 22(2): 113-122. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29551334>

HIV/AIDS epidemic is not well controlled, and multiple sexual behavior factors help explain high rates of HIV infection among men who have sex with men (MSM). This article proposes to exam the use of a potential risk behavior score for HIV infection, based on the type and number of sexual partners, and condom use, and their associated factors in a sample of MSM in Brazil. A cross sectional RDS (Respondent Driven Sampling) study was performed among 3738 MSM aged 18+ years old from ten Brazilian cities. The risk behavior score was composed by the number of male partners and anal condom use in the last year with steady, casual, and commercial partners. Most participants were 25+ years old (58.1%), non-white (83.1%), and single (84.9%). Final weighted ordinal logistic model showed that age \leq 25 years old ($p=0.037$), homosexual or bisexual identity ($p<0.001$), sexual initiation before 15-year-old ($p<0.001$), having sex with men only in the last 12 months ($p<0.001$), frequent alcohol and illicit drug use ($p<0.001$), and use of local sites to meet sexual partners in the last month were independently associated with higher scores of risky behavior. Specific strategies should be developed aimed at the MSM population. Additionally, pre-exposed prophylaxis (Prep) should be considered for those at higher score as a strategy for reducing risk for HIV infection in this population.

62. Yin, L., et al. **"Risk Prediction Score for HIV Infection: Development and Internal Validation with Cross-Sectional Data from Men Who Have Sex with Men in China."** *AIDS Behav* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29786768>

Receptive anal intercourse, multiple partners, condomless sex, sexually transmitted infections (STIs), and drug/alcohol addiction are familiar factors that correlate with increased human immunodeficiency virus (HIV) risk among men who have sex with men (MSM). To improve estimation to HIV acquisition, we created a composite score using questions from routine survey of 3588 MSM in Beijing, China. The HIV prevalence was 13.4%. A risk scoring tool using penalized maximum likelihood multivariable logistic regression modeling was developed, deploying backward step-down variable selection to obtain a reduced-form model. The full penalized model included 19 sexual predictors, while the reduced-form model had 12 predictors. Both models calibrated well; bootstrap-corrected c-indices were 0.70 (full model) and 0.71 (reduced-form model). Non-Beijing residence, short-term living in Beijing, illegal drug use, multiple male sexual partners, receptive anal sex, inconsistent condom use, alcohol consumption before sex, and syphilis infection were the strongest predictors of HIV infection. Discriminating higher-risk MSM for targeted HIV prevention programming using a validated risk score could improve the efficiency of resource deployment for educational and risk reduction programs. A valid risk score can also identify higher risk persons into prevention and vaccine clinical trials, which would improve trial cost-efficiency.

63. Mehrotra, M. L., et al. **"The Role of Social Relationships in PrEP Uptake and Use Among Transgender Women and Men Who Have Sex with Men."** *AIDS Behav* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29754268>

Qualitative studies suggest that social relationships play an important role in HIV pre-exposure prophylaxis (PrEP) use, but there have been few quantitative assessments of the role of social relationships in PrEP uptake or adherence. We examined the association between disclosure of study participation or LGBT identity and PrEP use in the 1603 HIV-negative participants enrolled in the iPrEx OLE study. We also evaluated the association between LGBT social group involvement and PrEP use. Study participation disclosure to parents and LGBT identity disclosure to anyone in a participant's social network were associated with greater PrEP uptake. Study participation disclosure to partners was associated with higher probability of having protective PrEP drug concentrations compared [risk difference 0.15 95% CI (0.01, 0.30)]. For each additional type of LGBT organization a participant was involved in, the probability of PrEP uptake and having protective drug concentrations increased by 0.04 [95% CI (0.03, 0.06)] and 0.04 (95% CI (0.02,

0.07]) respectively. Overall, social context was associated with PrEP use in iPrEx OLE, and should be taken into consideration when designing future PrEP implementation programs.

64. Zhuang, X., et al. "**Scaling Up Human Immunodeficiency Virus Screening and Antiretroviral Therapy Among Men Who Have Sex With Men to Achieve the 90-90-90 Targets in China.**" *Sex Transm Dis* 2018 45(5): 343-349. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29465693>

INTRODUCTION: The Joint United Nations Programme on human immunodeficiency virus (HIV)/acquired immune deficiency syndrome has proposed the 90-90-90 targets by 2020. Human immunodeficiency virus epidemic is spreading rapidly among men who have sex with men (MSM) in China. This study investigates how the scale-up of HIV testing and treatment in achieving the targets and its cost-effectiveness.

METHODS: We constructed a compartmental model to forecast the HIV epidemic in Chinese MSM based on various "test-and-treat" scale-up scenarios. We assessed their cost effectiveness based on the cost for each HIV infection, death, and disability-adjusted life years (DALYs) prevented by the scale-up.

RESULTS: If the current epidemic continued, HIV prevalence among Chinese MSM would increase from 9.2% in 2016 to 12.6% (9.2-15.6%) in 2020 and 16.2% (11.3-20.0%) in 2025. By 2020, 49.2% of infected MSM would be diagnosed and 40.1% of whom on treatment, falling short of the 90-90-90 targets, so would be even by 2025. To achieve these targets by 2020, additional 850,000 HIV screening tests and 112,500 person-years of antiretroviral treatment (ART) annually are necessary. This spending is US \$478 million during 2016 to 2020, which almost tripled the status quo. However, by delaying to 2025, an investment of US \$1210 million over 2016 to 2025 corresponding to 52% increase to the status quo, will enable extra 340,000 HIV screening tests and 60,000 person-year on ART annually. In both scenarios, the incremental cost-effectiveness ratio was US \$733 to 960 for each DALY prevented, indicating highly cost-effective scenarios.

CONCLUSIONS: Achieving the 90-90-90 targets by 2020 requires steep increase in investment, but delaying the targets to 2025 is practical and cost-effective.

65. Mao, J., et al. "**Sex tourism among Chinese men who have sex with men: a cross-sectional observational study.**" *BMC Public Health* 2018 18(1): 306. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29499752>

BACKGROUND: Sex tourism among men who have sex with men (MSM) may exacerbate transmission of HIV and other sexually transmitted infections (STIs). Sex tourism is defined as purchasing sex with gifts or money outside of one's hometown. Our objective was to characterize the frequency, socio-demographic characteristics, and sexual risk behaviors among Chinese MSM sex tourists.

METHODS: An online, cross-sectional survey for high-risk MSM throughout China was conducted in November 2015 covering sociodemographic characteristics, sexual risk behaviors, and sex tourism. Univariate and multivariable logistic regressions were performed to identify correlates of sex tourism. The mean MSM HIV prevalence of sex tourism journey origins and destinations were compared.

RESULTS: Of 1189 MSM who completed the survey, 62 (5%) men identified as sex tourists; among these sex tourists, twenty (32%) traveled primarily to purchase sex and the remainder purchased sex while traveling for another purpose. There was minimal socio-demographic and behavioral difference between the two groups. In multivariable analyses, adjusting for age and income, sex tourism was correlated with high-risk sexual behaviors, higher income (aOR 4.44, 95%CI 1.77-11.18) and living with HIV (aOR 2.79, 95%CI 1.03-7.55). Sex tourism was more often from locations with lower to higher MSM HIV prevalence (mean = 4.47, SD = 2.01 versus mean = 6.86, SD = 5.24).

CONCLUSION: MSM sex tourists were more likely to have risky sexual behaviors and travel to locations with a higher HIV prevalence. MSM sex tourists may be part of core groups that are disproportionately

responsible for MSM HIV transmission. Enhanced surveillance and interventions tailored to MSM sex tourists should be considered.

66. Ding, Y., et al. "**Sex with older partners, condomless anal sex and unrecognized HIV infection among Chinese men who have sex with men.**" *AIDS Care* 2018 30(3): 305-311. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28678526>

We examined the prevalence of sex with older male partner (SWOMP) and its association with condomless anal intercourse (CAI) with male partners and unrecognized HIV infection among young men who have sex with men (MSM) in Shanghai, China. The analytic sample included 243 MSM who were 18-45 years and HIV negative or of unknown HIV serostatus. Older male partner refers to male sex partner who was at least 10 years older than themselves. Overall, 99 (43.0%) and 50 (20.7%) reported having SWOMP in lifetime and in the last 3 months, respectively. Having any CAI with male partners in the last 3 months was independently associated with SWOMP and sex with stable male partners in the last 3 months. Unrecognized HIV infection was independently associated with being HSV-2 positive and having any CAI with male partners as well as SWOMP in last 3 months. Sex with stable male partner in the last 3 months was also marginally significantly associated with unrecognized infection ($p = 0.084$). Older partner selection is common among young MSM in China. Prevention programs should incorporate education messages about the HIV risk associated with SWOMP. MSM should be informed that having condomless sex with stable partners may place them at HIV risk.

67. 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* 2018 22(5): 1662-1670. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29168069>

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 $\chi^2(2) p < 0.001$) and STI prevalence (15, 21, 24%, overall $\chi^2(2) p = 0.011$). 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.

68. Lamontagne, E., et al. "**A socioecological measurement of homophobia for all countries and its public health impact.**" *Eur J Public Health* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29514190>

BACKGROUND: Measuring homophobia at country level is important to guide public health policy as reductions in stigma are associated with improved health outcomes among gay men and other men who have sex with men. Methods: We developed a Homophobic Climate Index incorporating institutional and social components of homophobia. Institutional homophobia was based on the level of enforcement of laws that criminalise, protect or recognise same-sex relations. Social homophobia was based on the level of acceptance and justifiability of homosexuality. We estimated the Index for 158 countries and assessed its robustness and validity.

RESULTS: Western Europe is the most inclusive region, followed by Latin America. Africa and the Middle East are home to the most homophobic countries with two exceptions: South Africa and Cabo Verde. We found that a 1% decrease in the level of homophobia is associated with a 10% increase in the gross domestic product per capita. Countries whose citizens face gender inequality, human rights abuses, low health expenditures and low life satisfaction are the ones with a higher homophobic climate. Moreover, a 10% increase in the level of homophobia at country level is associated with a 1.7-year loss in life expectancy for

males. A higher level of homophobia is associated with increased AIDS-related death among HIV-positive men.

CONCLUSION: The socioecological approach of this index demonstrates the negative social, economic and health consequences of homophobia in low- and middle-income countries. It provides sound evidence for public health policy in favour of the inclusion of sexual minorities.

69. Philbin, M. M., et al. **"Structural barriers to HIV prevention among men who have sex with men (MSM) in Vietnam: Diversity, stigma, and healthcare access."** *PLoS One* 2018 13(4): e0195000. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29614104>

Men who have sex with men (MSM) in Vietnam experience disproportionate rates of HIV infection. To advance understanding of how structural barriers may shape their engagement with HIV prevention services, we draw on 32 in-depth interviews and four focus groups (n = 31) conducted with MSM in Hanoi between October 2015- March 2016. Three primary factors emerged: (1) Diversity, both in relation to identity and income; Vietnamese MSM described themselves as segregated into Bong kin (hidden, often heterosexually-identified MSM) and Bong lo ('out,' transgender, or effeminate MSM). Lower-income, 'hidden' MSM from rural areas were reluctant to access MSM-targeted services; (2) Stigma: MSM reported being stigmatized by the healthcare system, family, and other MSM; and (3) Healthcare access: this was limited due to economic barriers and lack of MSM-friendly services. Our research suggests the need for multiple strategies to reach diverse types of MSM as well as to address barriers in access to health services such as stigma and costs. While a great deal has been written about the diversity of MSM in relation to gender performance and sexual identities, our research points to the substantial structural-level barriers that must be addressed in order to achieve meaningful and effective HIV prevention for MSM worldwide.

70. Wilkerson, J. M., et al. **"Substance Use, Mental Health, HIV Testing, and Sexual Risk Behavior Among Men Who Have Sex With Men in the State of Maharashtra, India."** *AIDS Educ Prev* 2018 30(2): 96-107. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29688773>

Among 433 men who have sex with men in Maharashtra, India who completed an online survey, 23% reported hazardous drinking, 12% illicit substance, and 9% polysubstance use. The overall prevalence of depression and intimate partner violence (IPV) were 58% and 56%, respectively. Participants engaging in hazardous drinking had more sexual partners and were less likely to be married to women. Participants reporting illicit substance use or polysubstance use were more likely to have been out, had more sexual partners, or experienced IPV. Those reporting illicit substance use were more likely to engage in condomless anal sex. Based on our findings, we suggest that public health interventions integrate HIV, substance use, and mental health services.

71. Chen, Z. W., et al. **"Surging HIV-1 CRF07_BC epidemic among recently infected men who have sex with men in Fujian, China."** *J Med Virol* 2018 90(7): 1210-1221. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29574774>

A rapidly increasing number of HIV-1 infections have been identified among men who have sex with men (MSM) in Fujian province of China since 2010. We aimed to investigate the causative factors underlying this surging epidemic. Using immunoassays for HIV-1 diagnosis and phylogenetic analysis for viral genotyping, we found that the number of MSM infections doubled from 171 in 2011 to 340 in 2013 with a significantly increased prevalent rate from 4.1% to 5.2%. Majority of these increased infections took place in Fuzhou, Xiamen, and Quanzhou, three large cities in Fujian, mainly among youth, unemployed, business, and well-educated MSMs. Phylogenetic analysis revealed three major HIV-1 genotypes including CRF01_AE, CRF07_BC, and B/B' yet the surging MSM infections were primarily associated with the rapid sexual spread of CRF07_BC in addition to CRF01_AE. In particular, there was a significant proportional expansion of CRF07_BC infections among recently infected MSMs from 19% in 2012 to 41.9% in 2013. This increase was accompanied by emergence of complex patterns of viral recombination including multiple hybrid variants derived from CRF01_AE and CRF07_BC. Full-genome analysis indicated that CRF07_BC in Fujian was likely

originated from similar strains previously found among IDUs in Yunnan province but with unique recombination break points. Our findings indicated that HIV-1 CRF07_BC has adapted for rapid sexual transmission, resulting in the surging HIV-1 epidemic and the emergence of new recombinant strains among MSMs in Fujian. Our findings have implications to vaccine and passive immunization trials in Fujian with emphasis on the induction of cross-subtype protective immunity.

72. Pollard, A., et al. "**Syndemics of stigma, minority-stress, maladaptive coping, risk environments and littoral spaces among men who have sex with men using chemsex.**" *Cult Health Sex* 2018 20(4): 411-427. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28741417>

There has been a steep rise in the use of drugs during sex (chemsex) by some men who have sex with men in economically developed countries, with associated increases in sexual risk for HIV and other STIs. This paper presents data from telephone interviews with 15 men attending sexual health clinics for post-exposure prophylaxis following a chemsex-related risk for HIV and discusses some of the theoretical approaches that have been employed to understand chemsex and inform interventions. Interviews were conducted as part of a larger intervention study, which used an adapted version of motivational interviewing to explore risk behaviour and support change. Participants conceptualised their chemsex and HIV-related risks in a psycho-social context, highlighting the influences of psycho-socio-cultural challenges of homophobic marginalisation and the 'gay scene' on behaviour. Multiple influences of stigma, marginalisation, minority stress and maladaptive coping (including drug-use) contribute to syndemic 'risk-environments' and 'littoral spaces' in which chemsex and risk behaviours are played out.

73. Mgbako, O., et al. "**Transactional Sex and Preferences for Pre-Exposure Prophylaxis (PrEP) Administration Modalities Among Men Who Have Sex With Men (MSM).**" *J Sex Res* 2018: 1-9. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29634362>

Pre-exposure prophylaxis (PrEP) is an important biomedical human immunodeficiency virus (HIV) prevention tool gaining more popularity among Parisian men who have sex with men (MSM) who engage in transactional sex. This study examines the knowledge of, and willingness to use, different modalities of PrEP among this subgroup. Broadcast advertisements were placed on a geosocial-networking smartphone application with a link to a Web-based survey during three 24-hour periods in October 2016. Modified Poisson regression models were used to assess the association between engagement in transactional sex and preferences for each of these PrEP modalities. A total of 444 respondents were included. About 14% reported engagement in transactional sex. In all, 90% of MSM who engaged in transactional sex were knowledgeable of daily oral PrEP, while 13.3% were knowledgeable about long-acting injectable PrEP or penile or rectal microbicides. They were more likely to be aware of long-acting injectable PrEP (aRR = 2.52, 95% CI = 1.16 to 5.47) and willing to use daily oral PrEP (aRR = 1.48; 95% CI = 1.11 to 1.98) or long-acting injectable PrEP (aRR = 1.40; 95% CI = 1.09 to 1.81) than MSM who had not engaged in transactional sex. Long-acting injectable PrEP may be an important HIV-prevention option for MSM who engage in transactional sex if this modality is proven effective.

74. Nguyen, M. X., et al. "**The use of technology to find sexual health information online among men who have sex with men in Hanoi, Vietnam, 2016.**" *Int J STD AIDS* 2018 29(5): 505-510. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29059034>

In an era where mobile phones and computers are ubiquitous, technology-based interventions to reduce HIV and other sexually transmitted infections (STIs) have great potential to reach high-risk groups, including men who have sex with men (MSM). This study aimed to examine technology usage to find sexual health information online among MSM in Hanoi, Vietnam. A cross-sectional study of 205 MSM in Hanoi was conducted from February to May 2016. Overall, 50.7% of participants reported having used a smartphone, computer, or tablet to find HIV/STI testing locations in the past year, and 75.1% reported having used such devices to find other HIV/STI information online. Unemployment (adjusted prevalence ratio [aPR]: 1.13, 95%CI: 1.00-1.28) and having been tested for HIV (aPR: 1.27, 95%CI: 1.07-1.51) were significantly associated with using technology to find online sexual health information. MSM who had ever exchanged sex for money

or drugs (aPR: 0.80; 95%CI: 0.68-0.94) were less likely to use technology to find sexual health information online. Technology is a promising platform for HIV/STI prevention programs among MSM, with the potential to reach different subgroups. Further efforts to develop technology-based interventions tailored to the needs of the MSM communities in Hanoi and to encourage MSM who were not currently seeking sexual health information and testing services online to do so are necessary.

75. Pankam, T., et al. "**The validation and evaluation of anti-HIV testing algorithm used in mobile clinic setting for men who have sex with men in metropolitan Bangkok, Thailand.**" *Asian Pac J Allergy Immunol* 2018 36(1): 42-50. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28364412>

BACKGROUND: Same-day anti-HIV testing algorithm is recommended by Thai National Guidelines. We compared performance characteristics of algorithms used in a mobile clinic and a facility-based clinic for men who have sex with men (MSM) in Bangkok.

METHODS: Mobile clinic samples collected from 4 saunas and 2 spa venues were tested by Alere Determine™ HIV 1/2, followed by DoubleCheck Gold™ Ultra HIV 1/2 and SD Bioline HIV 1/2 3.0. All samples were re-tested at the Thai Red Cross Anonymous Clinic (TRCAC) by Architect HIV Ag/Ab or Elecsys HIV combi PT, followed by Alere Determine™ HIV 1/2 and Serodia HIV 1/2. Non-reactive samples were tested by Aptima nucleic acid amplification test (NAAT) and reactive/inconclusive samples were tested by less-sensitive immunoassays (IA) and HIV-1 RNA to detect acute HIV infection (positive NAAT or non-reactive IA/positive HIV-1 RNA).

RESULTS: Of 233 MSM, 36 (15.5%) had HIV infection diagnosed using mobile clinic algorithm. Two additional acute HIV cases (1 positive NAAT and 1 reactive Architect with detectable HIV-1 RNA) were diagnosed using TRCAC algorithm. The mobile clinic algorithm had a sensitivity of 94.9% (95% CI: 82.7, 99.4) and a specificity of 100% (95% CI: 98.1, 100).

CONCLUSION: Use of whole blood on rapid test kits demonstrated satisfactory performance and allowed same-day HIV test result through a mobile clinic model. For populations with high HIV incidence, careful history taking to define the window period is crucial and repeat testing must be encouraged if the testing algorithm does not include 4th generation anti-HIV assay or NAAT.

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Sex Workers - 33

1. Leddy, A. M., et al. "**Adapting the Risk Environment Framework to Understand Substance Use, Gender-Based Violence, and HIV Risk Behaviors Among Female Sex Workers in Tanzania.**" *AIDS Behav* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29767818>

Female sex workers (FSWs) in sub-Saharan Africa are disproportionately affected by HIV and gender-based violence (GBV). Substance use overlaps with these co-occurring epidemics to further increase FSWs' risk for negative health outcomes. We explored the relationship between substance use, GBV, and consistent condom use utilizing baseline data from a cohort of 496 FSWs in Tanzania. Results demonstrate high levels of alcohol use and GBV, and low levels of consistent condom use. Frequent intoxication during sex work was associated with increased odds of recent GBV (aOR 1.64, 95% CI 1.07, 2.49; p value 0.02) and reduced odds of consistent condom use with clients (aOR 0.58, 95% CI 0.37, 0.92; p-value 0.02). We adapt the risk environment framework to contextualize our findings in the social and structural context and to gain insight into intervention approaches to address the intersecting challenges of substance use, GBV, and HIV among FSWs in Tanzania and similar settings.

2. Bailey, A. E., et al. "**Agency, lapse in condom use and relationship intimacy among female sex workers in Jamaica.**" *Cult Health Sex* 2018 20(5): 531-544. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28862527>

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.

3. Asadi-Aliabadi, M., et al. "**Barriers to Health Service Utilization Among Iranian Female Sex Workers: A Qualitative Study.**" *J Prev Med Public Health* 2018 51(2): 64-70. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29631351>

OBJECTIVES: In most countries around the world, sex work is an illegal activity. Female sex workers (FSWs) in Iran hide their identities, and they are known to be a hard-to-reach population. Despite free access to HIV testing, fewer than half of FSWs receive HIV testing. The purpose of this study was to characterize the reasons for which FSWs do not seek testing at drop-in centers (DICs) and voluntary counseling and testing (VCT) centers in Iran.

METHODS: A qualitative study was conducted in 2016. The participants were 24 FSWs who received services at VCT centers and DICs for vulnerable females in the north of Iran and 9 males who were the clients of FSWs. In this study, we made use of purposive sampling and carried out a thematic analysis. Results: We found 4 major and 6 minor themes. The major themes were: fear of being infected (with HIV), stigma, indifference, and knowledge.

CONCLUSIONS: Despite the significant efforts made by the government of Iran to establish and expand DICs for vulnerable females, the number of FSWs receiving services at these centers has not been very considerable. Consequently, by introducing and implementing training programs for peer groups, it may be possible to take steps toward establishing strategic programs for the control and prevention of HIV/AIDS.

4. Jing, L., et al. "**Combining the randomized response technique and the network scale-up method to estimate the female sex worker population size: an exploratory study.**" *Public Health* 2018 160: 81-86. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29783041>

OBJECTIVES: Recall bias, barrier effects, transmission error, and response bias affecting the network scale-up method (NSUM) led the Joint United Nations Programme on HIV/AIDS and the World Health Organization to designate NSUM as a developing method for estimating the size of high-risk populations in 2010. The method has subsequently been adjusted for three of these biases. The present study, therefore, aimed to explore the combination of the randomized response technique (RRT) and NSUM to adjust the last remaining bias.

STUDY DESIGN: RRT was used in an NSUM survey to estimate the population proportion of female sex workers (FSWs) in Taiyuan, China, in 2012. **METHODS:** Multiplier method estimates and national-level estimates of the population proportion of FSWs were used as criteria to assess the aforementioned results.

RESULTS: Successful interviews were completed with 96.4% of the respondents selected for the NSUM survey. The NSUM estimate fell within the range of the national-level estimates of the population proportion of FSWs in Asia and was close to the estimate yielded by the multiplier method.

CONCLUSIONS: In the present study, the combination of RRT and NSUM obtained a high response rate and produced a reliable estimate of the size of a high-risk population.

5. Blanchard, A. K., et al. "**A community-based qualitative study on the experience and understandings of intimate partner violence and HIV vulnerability from the perspectives of female sex workers and male intimate partners in North Karnataka state, India.**" *BMC Womens Health* 2018 18(1): 66. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29751752>

BACKGROUND: Research has increasingly documented the important role that violence by clients and the police play in exacerbating HIV vulnerability for women in sex work. However few studies have examined violence in the intimate relationships of women in sex work, or drawn on community partnerships to explore the social dynamics involved. A community-based participatory research study was undertaken by community and academic partners leading intimate partner violence (IPV) and HIV prevention programs in Bagalkot district, Karnataka state, India. The purpose was to explore the experience and understandings of intimate partner violence and HIV/AIDS among women in sex work and their intimate partners in Bagalkot that would inform both theory and practice.

METHODS: A community-based, interpretive qualitative methodology was used. Data was collected between July and October 2014 through in-depth interviews with 38 participants, including 10 couples, 13 individual female sex workers, and 5 individual male intimate partners. Purposive sampling was done to maximize variation on socio-demographic characteristics. Thematic content analysis was conducted through coding and categorization for each interview question in NVivo 10.0, followed by collaborative analysis to answer the research questions.

RESULTS: The results showed that an array of interrelated, multi-level factors underlay the widespread acceptance and perpetuation of violence and lack of condom use in participants' intimate relationships. These included individual expectations that justified violence and reflected societal gender norms, compounded by stigma, legal and economic constraints relating to sex work. The results demonstrate that structural vulnerability to IPV and HIV must be addressed not only on the individual and relationship levels to resolve relevant triggers of violence and lack of condom use, but also the societal-level to address gender norms and socio-economic constraints among women in sex work and their partners.

CONCLUSION: The study contributes to a better understanding on the interplay of individual agency and structural forces at a time when researchers and program planners are increasingly pondering how best to address complex and intersecting social and health issues. Ongoing research should assess the generalizability of the results and the effectiveness of structural interventions aiming to reduce IPV and HIV vulnerability in other contexts.

6. Quaife, M., et al. "**The cost-effectiveness of multi-purpose HIV and pregnancy prevention technologies in South Africa.**" *J Int AIDS Soc* 2018 21(3). Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29537654>

INTRODUCTION: A number of antiretroviral HIV prevention products are efficacious in preventing HIV infection. However, the sexual and reproductive health needs of many women extend beyond HIV prevention, and research is ongoing to develop multi-purpose prevention technologies (MPTs) that offer dual HIV and pregnancy protection. We do not yet know if these products will be an efficient use of constrained health resources. In this paper, we estimate the cost-effectiveness of combinations of candidate multi-purpose prevention technologies (MPTs), in South Africa among general population women and female sex workers (FSWs).

METHODS: We combined a cost model with a static model of product impact based on incidence data in South Africa to estimate the cost-effectiveness of five candidate co-formulated or co-provided MPTs: oral PrEP, intravaginal ring, injectable ARV, microbicide gel and SILCS diaphragm used in concert with gel. We accounted for the preferences of end-users by predicting uptake using a discrete choice experiment (DCE). Product availability and protection were systematically varied in five potential rollout scenarios. The impact model estimated the number of infections averted through decreased incidence due to product use over one year. The comparator for each scenario was current levels of male condom use, while a health system perspective was used to estimate discounted lifetime treatment costs averted per HIV infection. Product benefit was estimated in disability-adjusted life years (DALYs) averted. Benefits from contraception were incorporated through adjusting the uptake of these products based on the DCE and through estimating the costs averted from avoiding unwanted pregnancies. We explore the additional impact of STI protection through increased uptake in a sensitivity analysis.

RESULTS: At central incidence rates, all single- and multi-purpose scenarios modelled were cost-effective among FSWs and women aged 16-24, at a governmental willingness-to-pay threshold of \$1175/DALY averted (range: \$214-\$810/DALY averted among non-dominant scenarios), however, none were cost-effective among women aged 25-49 (minimum \$1706/DALY averted). The cost-effectiveness of products improved with additional protection from pregnancy. Estimates were sensitive to variation in incidence assumptions, but robust to other parameters.

CONCLUSIONS: To the best of our knowledge, this is the first study to estimate the cost-effectiveness of a range of potential MPTs; suggesting that MPTs will be cost-effective among higher incidence FSWs or young women, but not among lower incidence older women. More work is needed to make attractive MPTs available to potential users who could use them effectively.

7. Lorway, R., et al. "**Ecologies of security: On the everyday security tactics of female sex workers in Nairobi, Kenya.**" *Glob Public Health* 2018: 1-14. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29506439>

This paper highlights important environmental dimensions of HIV vulnerability by describing how the sex trade operates in Nairobi, Kenya. Although sex workers there encounter various forms of violence and harassment, as do sex workers globally, we highlight how they do not merely fall victim to a set of environmental risks but also act upon their social environment, thereby remaking it, as they strive to protect their health and financial interests. In so doing, we illustrate the mutual constitution of 'agency' and 'structure' in social network formations that take shape in everyday lived spaces. Our findings point to the need to expand the focus of interventions to consider local ecologies of security in order to place the local knowledges, tactics, and capacities that communities might already possess on centre stage in interventions. Planning, implementing, and monitoring interventions with a consideration of these ecologies would tie interventions not only to the risk reduction goals of global public health policy, but also to the very real and grounded financial priorities of what it means to try to safely earn a living through sex work.

8. Lafort, Y., et al. "**Effect of a 'diagonal' intervention on uptake of HIV and reproductive health services by female sex workers in three sub-Saharan African cities.**" *Trop Med Int Health* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29752836>

OBJECTIVES: To enhance uptake of sexual and reproductive health (SRH) services by female sex workers (FSWs), we conducted an implementation study in which we piloted and tested context-specific 'diagonal' interventions, combining vertical, targeted interventions with horizontally improved access to the general health services, in three cities in sub-Saharan Africa.

METHODS: We collected indicators of SRH service uptake through face-to-face interviews with approximately 400 FSWs, pre- and post-intervention, in Durban, South Africa; Tete, Mozambique; and Mombasa, Kenya, recruited by respondent-driven sampling. Changes in uptake were tested for their statistical significance using multivariate logistic regression models.

RESULTS: In all cities, overall uptake of services increased. Having used all services for contraception, STI care, HIV testing, HIV care, cervical cancer screening and sexual violence, if needed, increased from 12.5% to 41.5% in Durban, 25.0% to 40.1% in Tete and 44.9% to 69.1% in Mombasa. Across cities, the effect was greatest in having been tested for HIV in the past six months which increased from 40.9% to 83.2% in Durban, 56.0% to 76.6% in Tete and 70.9% to 87.6% in Mombasa. In Tete and Mombasa, rise in SRH service use was almost entirely due to a greater uptake of targeted services. Only in Durban was there additionally an increase in the utilisation of general health services.

CONCLUSION: SRH service utilisation improved in the short-term in three different sub-Saharan African contexts, primarily through vertical, targeted components. The long-term effectiveness of diagonal approaches, in particular on the use of general, horizontal health services, needs further investigation.

9. Oldenburg, C. E., et al. "Effect of HIV self-testing on the number of sexual partners among female sex workers in Zambia." *AIDS* 2018 32(5): 645-652. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29494424>

OBJECTIVES: To assess the effect of two health system approaches to distribute HIV self-tests on the number of female sex workers' client and nonclient sexual partners.

DESIGN: Cluster randomized controlled trial.

METHODS: Peer educators recruited 965 participants. Peer educator-participant groups were randomized 1 : 1 : 1 to one of three arms: delivery of HIV self-tests directly from a peer educator, free facility-based delivery of HIV self-tests in exchange for coupons, or referral to standard-of-care HIV testing. Participants in all three arms completed four peer educator intervention sessions, which included counseling and condom distribution. Participants were asked the average number of client partners they had per night at baseline, 1 and 4 months, and the number of nonclient partners they had in the past 12 months (at baseline) and in the past month (at 1 month and 4 months).

RESULTS: At 4 months, participants reported significantly fewer clients per night in the direct delivery arm (mean difference -0.78 clients, 95% CI -1.28 to -0.28, $P = 0.002$) and the coupon arm (-0.71, 95% CI -1.21 to -0.21, $P = 0.005$) compared with standard of care. Similarly, they reported fewer nonclient partners in the direct delivery arm (-3.19, 95% CI -5.18 to -1.21, $P = 0.002$) and in the coupon arm (-1.84, 95% CI -3.81 to 0.14, $P = 0.07$) arm compared with standard of care.

CONCLUSION: Expansion of HIV self-testing may have positive behavioral effects enhancing other HIV prevention efforts among female sex workers in Zambia. TRIAL REGISTRATION: ClinicalTrials.gov NCT02827240.

10. Prakash, R., et al. "Effects of exposure to an intensive HIV-prevention programme on behavioural changes among female sex workers in Nairobi, Kenya." *Afr J AIDS Res* 2018: 1-9. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29514590>

While Kenya has had a long-standing national HIV-prevention programme, evidence on the level of exposure to its interventions and related effects on behavioural changes among female sex workers (FSWs) is limited. Using cross-sectional behavioural data collected in 2013 from 1 357 FSWs aged 18 years and above in Nairobi, Kenya, this study explores the relationship between FSW programme exposure levels and behavioural outcomes including condom use, sexually transmitted infection (STI)-treatment, and empowerment measures like disclosure of self-identity and violence reporting. We categorised programme exposure levels as none, moderate and intensive. Multivariate logistic regression was used for analysis. Overall, 35% of the FSWs were not exposed to any HIV prevention programme, whereas about 24% had moderate and 41% had intensive exposure. FSWs having intensive programme exposure had a higher likelihood of using condoms consistently with occasional clients (AOR: 1.57; 95% CI: 1.08-2.31) and seeking treatment for STIs (AOR: 3.37; 95% CI: 1.63-7.02) compared to FSWs with no or moderate exposure. Intensive programme exposure was also associated with higher self-disclosure of sex-work identity (AOR: 1.63; 95% CI:

1.19-2.24), reporting of violence to police (AOR: 2.45; 95% CI: 1.03-5.84), and negotiation of condom use at last sex when the client was under the influence of alcohol (AOR: 1.63; 95% CI: 0.94-2.82). Although HIV prevention programmes in Kenya have been underway for over a decade, programme efforts were largely focused on saturating the coverage (intervention breadth). Strategies should now focus on ensuring improved quality of contacts through intensified programme exposure (intervention depth) to enhance gains in behavioural change among FSWs and preventing the burden of HIV infection among them.

11. Ortblad, K. F., et al. "**Female sex workers often incorrectly interpret HIV self-test results in Uganda.**" *J Acquir Immune Defic Syndr* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29847478>

12. Heller, M., et al. "**Gender-Based Violence, Physiological Stress, and Inflammation: A Cross-Sectional Study.**" *J Womens Health (Larchmt)* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29630431>

BACKGROUND: Female sex workers (FSWs) are at high risk for gender-based violence (GBV) and HIV infection. This study aimed to identify associations between GBV exposure in the past 12 months and biomarkers of physiologic stress and inflammation that may play a role in increased HIV risk among Kenyan FSWs.

MATERIALS AND METHODS: Participating women responded to a detailed questionnaire on GBV and mental health. Plasma was collected for assessment of systemic C-reactive protein (CRP) and interleukin-6 (IL-6) levels. Hair proximal to the scalp was collected to measure cortisol concentration. CRP and IL-6 were measured by enzyme-linked immunosorbent assay, and hair cortisol concentration was determined by enzyme immunoassay. Log-transformed biomarker values were compared across GBV exposure categories using Kruskal-Wallis or Wilcoxon rank sum tests. Multivariable linear regression was used to explore associations between recent GBV and hair cortisol concentration.

RESULTS: Two hundred eighty-three women enrolled, of whom 112 (39.6%) reported physical, sexual, or emotional violence in the past 12 months, 134 (47.3%) reported more remote exposure, and 37 (13.1%) reported no exposure. CRP and IL-6 levels did not differ across groups ($p = 0.57$ and $p = 0.62$, respectively). Among 141 women who provided hair, cortisol concentrations were higher among recently exposed women compared to the other two groups combined ($p = 0.02$). In multivariable regression, recently exposed women had higher hair cortisol levels than remotely exposed or unexposed women (adjusted beta = 0.52, 95% confidence interval 0.02-1.02, $p = 0.04$).

CONCLUSIONS: While CRP and IL-6 levels did not differ by GBV category, recent GBV was associated with increased hair cortisol concentration. GBV-related increases in cortisol could affect health outcomes and merit study in relation to HIV acquisition risk.

13. Diabate, S., et al. "**Gonorrhea, Chlamydia and HIV incidence among female sex workers in Cotonou, Benin: A longitudinal study.**" *PLoS One* 2018 13(5): e0197251. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29746535>

Female sex workers (FSWs) continue to carry a heavy burden of sexually transmitted infections (STI). For prevention purposes, there is a need to identify most-at-risk subgroups among them. The objective of this longitudinal cohort study conducted at Dispensaire IST, Cotonou, Benin, was to assess *Neisseria gonorrhoeae* (NG) / *Chlamydia trachomatis* (CT) incidence and determinants; and HIV incidence among FSWs in presence of STI/HIV risk reduction activities. Overall, 319 adult FSWs were followed quarterly from September 2008 to March 2012. NG/CT were detected from endocervical swabs by Amplified DNA Assays employing Strand displacement amplification technology. HIV testing was done on capillary blood using two consecutive rapid diagnostic tests. Anderson-Gill proportional hazard models (HR) were used to determine factors independently associated with NG/CT incidence. The majority of FSWs were HIV-negative (188, 58.9%). There were 6 HIV seroconversions among these 188 HIV-negative women. HIV incidence (95% Confidence interval, CI) was 1.41 (0.28-2.54) seroconversions per 100 person-years at risk (PYAR): 6 events /

425.1 PYAR. Sixty-two out of 319 women experienced 83 new episodes of NG/CT for an overall incidence rate (95% CI) of 10.8 (8.17-13.88) events / 100 PYAR. From month-24 onwards, HIV-positive women (treated: HR (95%CI): 4.2 (1.60-10.77); untreated: HR (95%CI): 4.2 (1.59-11.49) were more likely to acquire NG/CT compared to HIV-negative FSWs. Longer duration in sex work (>2 years: HR; 95%CI: 0.4 (0.22-0.72)) was protective against NG/CT. Refusal by clients (55.8%) was the main reason for non-condom use. Enrolling women from one clinic (Dispensaire IST) may have impaired generalizability of the findings. New NG/CT/HIV infections were observed among FSWs notwithstanding ongoing prevention interventions. To eliminate HIV transmission among FSWs, STI/HIV control programs need to promote women's empowerment and address vulnerability to infection of HIV-positive FSWs.

14. 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* 2018 22(4): 1113-1121. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29159593>

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.

15. Goldsamt, L. A., et al. **"HIV and other STIs in male sex workers: Findings from a sexual health promotion intervention in Vietnam."** *Int J STD AIDS* 2018 29(6): 540-546. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29130407>

Male sex workers (MSWs) in Vietnam are at high risk for acquisition and transmission of human immunodeficiency virus (HIV) and other sexually transmitted infections (STIs), yet are extremely disengaged from the healthcare system. This contributes to large numbers of untreated or late-treated infections and increased secondary transmission. We enrolled 995 MSWs in Hanoi and Ho Chi Minh City (HCMC) in a Sexual Health Promotion intervention that included face-to-face delivery of seven content modules, a clinical examination and testing for HIV, syphilis, gonorrhea and Chlamydia. Onsite treatment was provided for STIs, and those who tested positive for HIV were referred to local treatment centers. While 64.6% of participants had never been to a health service and fewer than half (41.2%) had ever been tested for HIV, 67.1% returned for test results. This testing identified 109 (11.0%) participants who were HIV-positive and 312 (31.4%) who tested positive for at least one other STI. Substantive differences were seen in MSWs from different cities, with those from Hanoi more likely to have ever visited a health service (57.8% vs. 24.9%) and to have taken a prior HIV test (54.1% vs. 37.9%) than those in HCMC. Sexual health promotion is a promising approach to engaging MSWs in health services.

16. Wirtz, A. L., et al. **"HIV and Viral Hepatitis Among Imprisoned Key Populations."** *Epidemiol Rev* 2018 40(1): 12-26. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29688317>

Prisons and other closed facilities create opportunities for transmission of human immunodeficiency virus (HIV) and viral hepatitis during detention and after release. We conducted a systematic review and meta-analysis of peer-reviewed publications (2005-2015) to describe the prevalence of HIV, hepatitis C virus, and hepatitis B virus among key populations in prisons worldwide and to compare estimates of infection with those of other prison populations. Most data were reported for people who inject drugs (PWID; n = 72) and for men who have sex with men (MSM; n = 21); few data were reported on sex workers (SW; n = 6), or transgender women (n = 2). Publications were identified from 29 countries, predominantly middle- and

high-income countries. Globally, PWID had 6 times the prevalence of HIV (pooled prevalence ratio (PPR) = 6.0, 95% CI: 3.8, 9.4), 8 times the prevalence of hepatitis C virus (PPR = 8.1, 95% CI: 6.4, 10.4), and 2 times the prevalence of hepatitis B virus (PPR = 2.0, 95% CI: 1.5, 2.7) compared with noninjecting prisoner populations. Among these articles, only those from Iran, Scotland, Spain, and Italy included the availability of methadone therapy; 2 articles included information on access to needle exchange programs by PWID detainees. HIV prevalence was more than 2 times higher among SW (PPR = 2.6, 95% CI: 2.2, 3.1) and 5 times higher among MSM (PPR = 5.3, 95% CI: 3.5, 7.9) compared with other prisoners. None of these articles reported HIV prevention coverage among SW or transgender women; 1 described HIV and sexually transmitted infection screening for MSM in prison. Prevention programs specific to key populations are important, particularly for populations that are criminalized and/or may cycle in and out of prison.

17. Lai, J., et al. "**HIV prevalence among female sex workers in Guigang City, Guangxi, China: an 8-year consecutive cross-sectional study.**" *BMC Public Health* 2018 18(1): 450. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29618343>

BACKGROUND: Female sex workers (FSW) are a population that are at high risk for HIV infection, and their HIV/AIDS knowledge levels and sexual behaviors are of concern. This study describes changes in HIV prevalence and factors associated among female sex workers in Guigang City, Guangxi, one of the highest HIV prevalence areas in China.

METHODS: Data were derived from an annual cross-sectional venue-based survey, 2008 to 2015, in the form of sentinel surveillance. The participants were recruited using cluster sampling. FSW aged 16 years and above who completed a questionnaire and HIV testing. Both descriptive and multi-level analyses were used to explore factors associated with changes in HIV prevalence.

RESULTS: Seven thousand four hundred ninety-six FSW were recruited in this study. HIV prevalence among FSW in Guigang City fell into two periods, one with an increasing trend (2008-2011) and one with a decline (2012-2015). Differences between these time periods included age, relationship status, HIV knowledge, consistent condom use, lifetime illicit drug use, history of sexually transmitted infection in the past year, HIV testing, receipt of a condom distribution and education program or HIV counseling and testing, and peer education services.

CONCLUSIONS: Since 2012, a reduction in HIV prevalence among FSW in Guigang City has been observed. The decline of HIV prevalence was associated with coinciding changes in demographic characteristics of FSW, improvement of HIV knowledge and safer sexual behaviors, and a program that promotes condom use, HIV counseling & testing, and peer education.

18. Zhu, J., et al. "**HIV prevalence and correlated factors of female sex workers and male clients in a border region of Yunnan Province, China.**" *Int J STD AIDS* 2018 29(5): 424-434. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/28901213>

Female sex workers (FSWs) and their male clients are vulnerable to HIV infection and serve as a bridge in HIV transmission from the high-risk population to the general, low-risk population. To examine the factors of FSWs and male clients that correlate with the prevalence of HIV infection in the Chinese-Vietnamese border region, a cross-sectional survey was conducted in 2014 in the Hekou county of the Yunnan province of China. We performed a questionnaire survey to collect data on demographics, sexual behavior, and drug use. Blood and urine samples were collected for testing of HIV/sexually transmitted infections and drug use. We found that the prevalence of HIV infection among FSWs was 2.74%, and 15 male clients (2.62%) were HIV-positive. Multivariate logistic regression analysis revealed that herpes simplex virus type 2 infection was a risk factor for HIV infection in FSWs and male clients, suggesting the increased role of sexual transmission in the HIV epidemic in the Chinese-Vietnamese border region. Positive urinalysis result for amphetamine-type stimulants was observed in FSWs with HIV infection. History of drug use was correlated with HIV infection, which increased the HIV infection risk of male clients, confirming that drug use is an important target in future interventions for HIV prevention.

19. Carrasco, M. A., et al. "**HIV Stigma Mediates the Association Between Social Cohesion and Consistent Condom Use Among Female Sex Workers Living with HIV in the Dominican Republic.**" *Arch Sex Behav* 2018 47(5): 1529-1539. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29687290>

Evidence indicates that social cohesion is a successful strategy to improve consistent condom use (CCU) among female sex workers. However, the individual and layered or combined effect that various types of overlapping stigmas may have on CCU between female sex workers living with HIV and their clients and steady partners has not been analyzed. Drawing on the Abriendo Puertas cohort of female sex workers living with HIV in the Dominican Republic, we used structural equation modeling to test the hypothesis that both HIV stigma and sex work stigma mediate the association between social cohesion and CCU and that they have a layered effect. The results indicated that HIV stigma mediated the association between social cohesion and CCU with clients and partners, while sex work-related stigma did not. There was no evidence of a layered HIV stigma and sex work stigma effect, which may be due to methodological limitations to handle highly correlated latent variables. Findings highlight the need to address internalized HIV stigma within the context of community-based approaches to enhance their HIV prevention impact. This will help to reduce the risk of HIV re-infection with a new distinct HIV viral strain, STI infection, and onward HIV transmission among female sex workers living with HIV.

20. Oldenburg, C. E., et al. "**Human rights protections and HIV prevalence among MSM who sell sex: Cross-country comparisons from a systematic review and meta-analysis.**" *Glob Public Health* 2018 13(4): 414-425. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/26979302>

Laws and policies can affect the HIV risk of key populations through a number of direct and indirect pathways. We investigated the association between HIV prevalence among men who engage in transactional sex and language in the penal code protecting sexual minorities, including men who have sex with men (MSM), and sex workers. HIV prevalence among men who engage in transactional sex was assessed through meta-analysis of published literature and country surveillance reports. Meta-regression was used to determine the association between HIV prevalence and protective laws for sexual minorities and sex workers. Sixty-six reports representing 28 countries and 31,924 individuals were included in the meta-analysis. Controlling for multiple study- and country-level variables, legal protection for sexual minorities was associated with a 10.9% (95% CI: 3.8-18.0%) and sex workers associated with a 7.0% (95% CI: 1.3-12.8%) decrease in country-level HIV prevalence among men who engage in transactional sex. Laws that seek to actively protect sex workers and MSM may be necessary to decrease HIV risk for this key population.

21. Lafort, Y., et al. "**Impact of a "Diagonal" Intervention on Uptake of Sexual and Reproductive Health Services by Female Sex Workers in Mozambique: A Mixed-Methods Implementation Study.**" *Front Public Health* 2018 6: 109. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29721490>

BACKGROUND: Female sex workers (FSWs) have high risks for adverse sexual and reproductive health (SRH) outcomes, yet low access to services. Within an implementation research project enhancing uptake of SRH services by FSWs, we piloted a "diagonal" intervention, which combined strengthening of FSW-targeted services (vertical) with making public health facilities more FSW-friendly (horizontal), and tested its effect.

METHODS: The study applied a convergent parallel mixed-methods design to assess changes in access to SRH services. Results of structured interviews with FSWs pre-intervention (N = 311) and thereafter (N = 404) were compared with the findings of eight post-intervention focus group discussions (FGDs) with FSWs and two with FSW-peer educators (PEs).

RESULTS: Marked and statistically significant rises occurred in consistent condom use with all partners (55.3-67.7%), ever use of female condoms (37.9-54.5%), being tested for HIV in the past 6 months (56.0-76.6%), using contraception (84.5-95.4%), ever screened for cervical cancer (0.0-16.9%) and having ≥ 10 contacts with a PE in the past year (0.5-24.45%). Increases mostly resulted from FSW-targeted outreach, with no rise detected in utilization of public health facilities. FGD participants reported that some facilities had become

more FSW-friendly, but barriers such as stock-outs, being asked for bribes and disrespectful treatment persisted.

CONCLUSION: The combination of expanding FSW-targeted SRH services with improving access to the public health services resulted in an overall increased uptake of services, but almost exclusively because of the strengthened targeted (vertical) outreach services. Utilization of public SRH services had not yet increased and many barriers to access remained. Our diagonal approach was thus only successful in its vertical component. Improving access to the general health services remains nevertheless important and further research is needed how to reduce barriers. Ideally, the combination approach should be maintained and more successful approaches to increase utilization of public services should be explored.

22. 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* 2018 30(4): 444-452. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29063817>

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.

23. Chang, R. C., et al. "**Mitigating circumstances: A model-based analysis of associations between risk environment and infrequent condom use among Chinese street-based sex workers.**" *PLoS One* 2018 13(5): e0195982. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29763416>

BACKGROUND: Little is known about how freelance street-based sex workers navigate condom use while soliciting. Traditional behavioural model may fail to account for the complex risk environment that most street-based sex workers work within. We examine first the association of self-efficacy and the infrequent condom use, then we investigated the roles of clients and venues frequented on this association.

METHOD: Using a purposive chain-referral sampling method, we surveyed 248 street-based sex workers in Shanghai. The survey focused on sex workers HIV risk factors, sex work patterns, HIV knowledge, and related HIV self-efficacy. Clients types and behaviours, and characteristics of the venues frequented by these commercial sex workers were also collected. We conducted a series of multiple logistic regression models to explore how the association between a sex worker's self-efficacy with infrequent condom use change as client and venue characteristics were added to the models.

RESULTS: We find that within the basic model, low self-efficacy was marginally associated with infrequent condom use (54.9% vs. 45.1%, AOR = 1.70, 95% CI = 0.95-3.03). As client- and venue- characteristics were added, the associations between self-efficacy and condom use were strengthened (AOR = 2.10 95% CI = 1.12-3.91 and 2.54 95% CI = 1.24-5.19 respectively). Those who reported middle-tiered income were more likely to report infrequent condom use compared to their peers of high income (AOR = 3.92 95% CI = 1.32-11.70) whereas such difference was not found between low income and high income sex workers. Visiting multiple venues and having migrant workers as clients were also associated with infrequent condom use.

CONCLUSION: Our findings suggest sex worker's self-efficacy matters in their HIV risk behaviours only when environment characteristics were adjusted. Risk environment for street-based sex workers are complex.

Programming addressing behavioural changes among female sex workers should adopt holistic, multilevel models with the consideration of risk environments.

24. Brody, C., et al. "**Mobile Link - a theory-based messaging intervention for improving sexual and reproductive health of female entertainment workers in Cambodia: study protocol of a randomized controlled trial.**" *Trials* 2018 19(1): 235. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29673381>

BACKGROUND: In Cambodia, HIV prevalence is concentrated in key populations including among female entertainment workers (FEWs) who may engage in direct or indirect sex work. Reaching FEWs with sexual and reproductive health (SRH) services has been difficult because of their hidden and stigmatized nature. Mobile-phone-based interventions may be an effective way to reach this population and connect them with the existing services. This article describes study design and implementation of a randomized controlled trial (RCT) of a mobile health intervention (the Mobile Link) aiming to improve SRH and related outcomes among FEWs in Cambodia.

METHODS: A two-arm RCT will be used to determine the effectiveness of a mobile-phone-based text/voice messaging intervention. The intervention will be developed through a participatory process. Focus group discussions and in-depth interviews have been conducted to inform and tailor behavior change theory-based text and voice messages. During the implementation phase, 600 FEWs will be recruited and randomly assigned into one of the two arms: (1) a control group and (2) a mobile phone message group (either text messages [SMS] or voice messages [VM], a delivery method chosen by participants). Participants in the control group will also receive a weekly monitoring survey, which will provide real-time information to implementing partners to streamline outreach efforts and be able to quickly identify geographic trends. The primary outcome measures will include self-reported HIV and sexually transmitted infections (STI) testing and treatment, condom use, contraceptive use, and gender-based violence (GBV).

DISCUSSION: If the Mobile Link trial is successful, participants will report an increase in condom use, linkages to screening and treatment for HIV and STI, and contraception use as well as a reduction in GBV. This trial is unique in a number of ways. First, the option of participation mode (SMS or VM) allows participants to choose the message medium that best links them to services. Second, this is the first RCT of a mobile-phone-based behavior change intervention using SMS/VMs to support linkage to SRH services in Cambodia. Lastly, we are working with a hidden, hard-to-reach, and dynamic population with which existing methods of outreach have not been fully successful. TRIAL REGISTRATION: Clinical trials.gov, NCT03117842 . Registered on 31 March 2017.

25. Weir, S. S., et al. "**Opportunities for Enhanced Strategic Use of Surveys, Medical Records, and Program Data for HIV Surveillance of Key Populations: Scoping Review.**" *JMIR Public Health Surveill* 2018 4(2): e28. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29789279>

BACKGROUND: Normative guidelines from the World Health Organization recommend tracking strategic information indicators among key populations. Monitoring progress in the global response to the HIV epidemic uses indicators put forward by the Joint United Nations Programme on HIV/AIDS. These include the 90-90-90 targets that require a realignment of surveillance data, routinely collected program data, and medical record data, which historically have developed separately.

OBJECTIVE: The aim of this study was to describe current challenges for monitoring HIV-related strategic information indicators among key populations ((men who have sex with men [MSM], people in prisons and other closed settings, people who inject drugs, sex workers, and transgender people) and identify future opportunities to enhance the use of surveillance data, programmatic data, and medical record data to describe the HIV epidemic among key populations and measure the coverage of HIV prevention, care, and treatment programs.

METHODS: To provide a historical perspective, we completed a scoping review of the expansion of HIV surveillance among key populations over the past three decades. To describe current efforts, we conducted a

review of the literature to identify published examples of SI indicator estimates among key populations. To describe anticipated challenges and future opportunities to improve measurement of strategic information indicators, particularly from routine program and health data, we consulted participants of the Third Global HIV Surveillance Meeting in Bangkok, where the 2015 World Health Organization strategic information guidelines were launched.

RESULTS: There remains suboptimal alignment of surveillance and programmatic data, as well as routinely collected medical records to facilitate the reporting of the 90-90-90 indicators for HIV among key populations. Studies (n=3) with estimates of all three 90-90-90 indicators rely on cross-sectional survey data. Programmatic data and medical record data continue to be insufficiently robust to provide estimates of the 90-90-90 targets for key populations.

CONCLUSIONS: Current reliance on more active data collection processes, including key population-specific surveys, remains warranted until the quality and validity of passively collected routine program and medical record data for key populations is optimized.

26. Roberts, S. T., et al. "**Patterns of Gender-Based Violence and Associations with Mental Health and HIV Risk Behavior Among Female Sex Workers in Mombasa, Kenya: A Latent Class Analysis.**" *AIDS Behav* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29603110>

Gender-based violence (GBV) is common among female sex workers (FSWs) and is associated with multiple HIV risk factors, including poor mental health, high-risk sexual behavior, and sexually transmitted infections (STIs). Prior studies have focused on GBV of one type (e.g. physical or sexual) or from one kind of perpetrator (e.g., clients or regular partners), but many FSWs experience overlapping types of violence from multiple perpetrators, with varying frequency and severity. We examined the association between lifetime patterns of GBV and HIV risk factors in 283 FSWs in Mombasa, Kenya. Patterns of GBV were identified with latent class analysis based on physical, sexual, or emotional violence from multiple perpetrators. Cross-sectional outcomes included depressive symptoms, post-traumatic stress disorder (PTSD) symptoms, disordered alcohol and other drug use, number of sex partners, self-reported unprotected sex, prostate-specific antigen (PSA) in vaginal secretions, and a combined unprotected sex indicator based on self-report or PSA detection. We also measured HIV/STI incidence over 12 months following GBV assessment. Associations between GBV patterns and each outcome were modeled separately using linear regression for mental health outcomes and Poisson regression for sexual risk outcomes. Lifetime prevalence of GBV was 87%. We identified 4 GBV patterns, labeled Low (21% prevalence), Sexual (23%), Physical/Moderate Emotional (18%), and Severe (39%). Compared to women with Low GBV, those with Severe GBV had higher scores for depressive symptoms, PTSD symptoms, and disordered alcohol use, and had more sex partners. Women with Sexual GBV had higher scores for disordered alcohol use than women with Low GBV, but similar sexual risk behavior. Women with Physical/Moderate Emotional GBV had more sex partners and a higher prevalence of unprotected sex than women with Low GBV, but no differences in mental health. HIV/STI incidence did not differ significantly by GBV pattern. The prevalence of GBV was extremely high in this sample of Kenyan FSWs, and different GBV patterns were associated with distinct mental health and sexual risk outcomes. Increased understanding of how health consequences vary by GBV type and severity could lead to more effective programs to reduce HIV risk in this vulnerable population.

27. Pathack, A., et al. "**Programmatic mapping to determine the size and dynamics of sex work and injecting drug use in Mauritius.**" *Afr J AIDS Res* 2018: 1-7. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29745291>

HIV in Mauritius is in a concentrated phase. Most HIV infection is among key populations (KPs) including female sex workers (FSW), people who inject drugs (PWID), men who have sex with men (MSM), and transgender sex workers (TGSW). The objective of this research was to use geographical mapping to determine the precise locations, typologies and population estimates of each KP in Mauritius. From May to July 2014 a programmatic mapping approach determined national estimates and information on the specific locations, "hotspots", frequented by KPs in Mauritius. Data were collected through multiple levels of activity.

Key informants provided information about hotspots where KPs congregated and were actively engaged in risky behaviours. Validation of hotspots was done by engaging KPs. A total of 17 248 KP members were estimated spread over 1 964 hotspots in Mauritius. The largest KP was PWID with an estimate of 7 598 (range: 4 091-6 223), followed by 6 223 (range: 5 090-7 456) FSWs, spread over 694 and 731 hotspots respectively. A total of 2 020 (range: 1 595-2 446) MSM and 294 geographic MSM hotspots, and 1 407 TGSWs (range: 1 165-1 649) distributed over 245 hotspots. This research provided Mauritius with validated KPs size estimations and provided the first national data on KP hotspots and operational dynamics. The use of these data will strengthen HIV prevention, intervention, and programme planning in the country through focusing efforts to systematically target high-risk areas.

28. Wilson, K. S., et al. **"A prospective cohort study of fertility desire, unprotected sex, and detectable viral load in HIV-positive female sex workers in Mombasa, Kenya."** *J Acquir Immune Defic Syndr* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29543635>

BACKGROUND: Little is known about fertility desire in HIV-positive female sex workers (FSW). Fertility desire could increase HIV transmission risk if it were associated with condomless sex or lower adherence to antiretroviral therapy (ART).

METHODS: A prospective cohort study was conducted among 255 HIV-positive FSWs in Mombasa, Kenya. Using generalized estimating equations, fertility desire was evaluated as a risk factor for semen detection in vaginal secretions by prostate specific antigen (PSA) test, a biomarker of condomless sex, detectable plasma viral load (VL), and HIV transmission potential, defined as visits with positive PSA and detectable VL.

RESULTS: The effect of fertility desire on PSA detection varied significantly by non-barrier contraception use (p -interaction <0.01). At visits when women reported not using non-barrier contraception, fertility desire was associated with higher risk of semen detection (82/385, 21.3% versus 158/1007, 15.7%; aRR 1.58, 95%CI 1.12-2.23). However, when women used non-barrier contraception, fertility desire was associated with lower risk of PSA detection (10/77, 13.0% vs. 121/536, 22.6%; aRR 0.58, 95%CI 0.35-0.94). Fertility desire was not associated with detectable VL (31/219, 14.2% vs. 128/776, 16.5%; aRR 0.82, 95%CI 0.46-1.45) or higher absolute risk of transmission potential (10/218, 4.6% vs. 21/769, 2.7%; adjusted risk difference=0.011, 95%CI -0.031-0.050).

CONCLUSION: Fertility desire was associated with higher risk of biological evidence of semen exposure when women were not using non-barrier contraceptives. Low HIV transmission potential regardless of fertility desire suggests that the combination of condoms and ART adherence was effective.

29. Moyer, E., et al. **"Queering the evidence: remaking homosexuality and HIV risk to 'end AIDS' in Kenya."** *Glob Public Health* 2018: 1-13. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29671365>

Until recently, HIV in Africa was presumed to be driven by poverty, gender inequality and poor governance. The last decade has seen a shift in global and national public health discourses, especially in eastern Africa where new statistical evidence is used to justify prevention efforts to target Key Populations, i.e. men who have sex with men (MSM), injecting drug users, and sex workers. In this article, we focus on Kenya to examine state, NGO and community HIV treatment and prevention efforts targeting MSM, specifically male sex workers. We combine ethnographic fieldwork with a critical analysis of policy(making) and implementation practices to sketch the contours of the global, national and local forces that have combined to (re)make male homosexual sex to be understood as a practice that contributes to HIV incidence in Kenya. We also show that HIV-related MSM programmes in Kenya primarily enrol male sex workers in HIV treatment programmes, which focus on mainly on treatment adherence and pay insufficient attention to the economic and psycho-social problems experienced by male sex workers. Although upper and middle class MSM are involved in running LGTBI rights-based interventions and in mobilising male sex workers for HIV interventions, they are rarely targeted by those interventions.

30. 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* 2018 22(3): 1053-1061. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29127534>

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.

31. Mgbako, O., et al. **"Transactional Sex and Preferences for Pre-Exposure Prophylaxis (PrEP) Administration Modalities Among Men Who Have Sex With Men (MSM)."** *J Sex Res* 2018: 1-9. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29634362>

Pre-exposure prophylaxis (PrEP) is an important biomedical human immunodeficiency virus (HIV) prevention tool gaining more popularity among Parisian men who have sex with men (MSM) who engage in transactional sex. This study examines the knowledge of, and willingness to use, different modalities of PrEP among this subgroup. Broadcast advertisements were placed on a geosocial-networking smartphone application with a link to a Web-based survey during three 24-hour periods in October 2016. Modified Poisson regression models were used to assess the association between engagement in transactional sex and preferences for each of these PrEP modalities. A total of 444 respondents were included. About 14% reported engagement in transactional sex. In all, 90% of MSM who engaged in transactional sex were knowledgeable of daily oral PrEP, while 13.3% were knowledgeable about long-acting injectable PrEP or penile or rectal microbicides. They were more likely to be aware of long-acting injectable PrEP (aRR = 2.52, 95% CI = 1.16 to 5.47) and willing to use daily oral PrEP (aRR = 1.48; 95% CI = 1.11 to 1.98) or long-acting injectable PrEP (aRR = 1.40; 95% CI = 1.09 to 1.81) than MSM who had not engaged in transactional sex. Long-acting injectable PrEP may be an important HIV-prevention option for MSM who engage in transactional sex if this modality is proven effective.

32. Bhattacharjee, P., et al. **"Understanding the Relationship Between Female Sex Workers and Their Intimate Partners: Lessons and Initial Findings From Participatory Research in North Karnataka, South India."** *Health Educ Behav* 2018: 1090198118763934. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29618240>

While traditional HIV prevention programs with female sex workers (FSWs) in Karnataka, India, have focused on reducing HIV transmission between FSWs and clients through increased condom use, these programs have not fully addressed the transmission risk between FSWs and their nonpaying intimate partners (IPs). Condom use is infrequent and violence is recurrent in these relationships: Furthermore, there is little evidence on the precise nature of FSW-IP relationships. Our study addresses this knowledge gap to inform HIV programs targeted at FSWs. A series of workshops, using participatory tools, was held to explore FSW-IP relationships; 31 FSWs and 37 IPs participated. Three aspects of FSW-IP relationships were examined: how FSWs and IPs understand and interpret their relationships, factors influencing condom use, and the role of violence and its consequences. FSWs wish to be perceived as their IPs' wives, while IPs expect their FSW partners to accept their dominance in the relationship. Nonuse of condoms signals fidelity and elevates the status of the relationship almost to that of marriage, which helps FSWs enter the category of "good" (married) women. Tolerating and accepting violence in these relationships is normative, as in other marital relationships; IPs justify violence as necessary to establish and maintain their power within the relationship. Both FSWs and IPs value their relationships despite the high degree of risk posed by low condom use and

high levels of violence. Implications for program design include addressing current norms around masculinity and gender roles, and improving communication within relationships.

33. Leddy, A. M., et al. **"You already drank my beer, I can decide anything': using structuration theory to explore the dynamics of alcohol use, gender-based violence and HIV risk among female sex workers in Tanzania."** *Cult Health Sex* 2018: 1-15. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29547070>

Female sex workers experience high rates of gender-based violence and HIV. Alcohol has been shown to facilitate women's risk of both gender-based violence and HIV; however, little research has explored how aspects of the sex work environment shape this risk. Drawing on structuration theory, this study explored how social conduct is patterned across time and space within the sex work environment to influence alcohol consumption, gender-based violence and HIV risk among female sex workers. Qualitative in-depth interviews were conducted with 24 female sex workers enrolled in an ongoing community randomised controlled trial of a combination HIV prevention intervention in Iringa, Tanzania. Data were analysed using both inductive and deductive approaches. Findings reveal how routine interactions between female sex workers and their clients occur at three moments of time and space during the sex exchange process to facilitate alcohol consumption and increase women's risk of gender-based violence and HIV. Findings also highlight how sex workers utilise collective agency to address aspects of the sex work environment that place them at risk of alcohol abuse, gender-based violence and HIV. Implications for future interventions to prevent gender-based violence and HIV among female sex workers in Tanzania and similar contexts are discussed.

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Transgender People - 17

1. Giguere, R., et al. **"Are participants concerned about privacy and security when using short message service to report product adherence in a rectal microbicide trial?"** *J Am Med Inform Assoc* 2018 25(4): 393-400. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29025127>

OBJECTIVE: During a Phase 2 rectal microbicide trial, men who have sex with men and transgender women (n = 187) in 4 countries (Peru, South Africa, Thailand, United States) reported product use daily via short message service (SMS). To prevent disclosure of study participation, the SMS system program included privacy and security features. We evaluated participants' perceptions of privacy while using the system and acceptability of privacy/security features.

MATERIALS AND METHODS: To protect privacy, the SMS system: (1) confirmed participant availability before sending the study questions, (2) required a password, and (3) did not reveal product name or study participation. To ensure security, the system reminded participants to lock phone/delete messages. A computer-assisted self-interview (CASI), administered at the final visit, measured burden of privacy and security features and SMS privacy concerns. A subsample of 33 participants underwent an in-depth interview (IDI).

RESULTS: Based on CASI, 85% had no privacy concerns; only 5% were very concerned. Most were not bothered by the need for a password (73%) or instructions to delete messages (82%). Based on IDI, reasons for low privacy concerns included sending SMS in private or feeling that texting would not draw attention. A few IDI participants found the password unnecessary and more than half did not delete messages.

DISCUSSION: Most participants were not concerned that the SMS system would compromise their confidentiality. SMS privacy and security features were effective and not burdensome. Conclusion: Short ID-

related passwords, ambiguous language, and reminders to implement privacy and security-enhancing behaviors are recommended for SMS systems.

2. Calabrese, S. K., et al. **"A Closer Look at Racism and Heterosexism in Medical Students' Clinical Decision-Making Related to HIV Pre-Exposure Prophylaxis (PrEP): Implications for PrEP Education."** *AIDS Behav* 2018 22(4): 1122-1138. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29151200>

Social biases among healthcare providers could limit PrEP access. In this survey study of 115 US medical students, we examined associations between biases (racism and heterosexism) and PrEP clinical decision-making and explored prior PrEP education as a potential buffer. After viewing a vignette about a PrEP-seeking MSM patient, participants reported anticipated patient behavior (condomless sex, extra-relational sex, and adherence), intention to prescribe PrEP to the patient, biases, and background characteristics. Minimal evidence for racism affecting clinical decision-making emerged. In unadjusted analyses, heterosexism indirectly affected prescribing intention via all anticipated behaviors, tested as parallel mediators. Participants expressing greater heterosexism more strongly anticipated increased risk behavior and adherence problems, which were associated with lower prescribing intention. The indirect effect via condomless sex remained significant adjusting for background characteristics. Prior PrEP education did not buffer any indirect effects. Heterosexism may compromise PrEP provision to MSM and should be addressed in PrEP-related medical education.

3. Song, T. Z., et al. **"Comparison of HIV Status Between Transgender Women and Men Who Have Sex with Men: A Meta-Analysis."** *J Assoc Nurses AIDS Care* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29716789>

As key population groups in HIV infection, transgender women (TGW) share the same oral and anal sexual practices with men who have sex with men (MSM). However, the differences in HIV rates between the two groups are still unclear. In our study, relevant publications were electronically searched in three databases. After excluding irrelevant studies based on review of the title, abstract, and full text, a total of 24 studies, including 37,521 cases, were identified. There were no significant differences between TGW and MSM regarding HIV status and condom use. However, TGW had a higher proportion of high-risk behaviors, including exchanges of sex, forced sex, receptive intercourse, and sex work experience. Moreover, most curable sexually transmitted diseases were more prevalent in the TGW group compared to MSM. Although TGW showed a higher proportion of high-risk behavior and sexually transmitted disease incidence, their HIV incidence was the same as that for MSM.

4. Rich, K. M., et al. **"Correlates of viral suppression among HIV-infected men who have sex with men and transgender women in Lima, Peru."** *AIDS Care* 2018: 1-10. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29843518>

In Peru, HIV is concentrated among men who have sex with men (MSM) and transgender women (TGW). Between June 2015 and August 2016, 591 HIV-positive MSM and TGW were recruited at five clinical care sites in Lima, Peru. We found that 82.4% of the participants had achieved viral suppression (VS; VL < 200) and 73.6% had achieved maximal viral suppression (MVS; VL < 50). Multivariable modeling indicated that patients reporting transportation as a barrier to HIV care were less likely to achieve VS (aOR = 0.47; 95% CI = 0.30-0.75) and MVS (aOR = 0.56; 95% CI = 0.37-0.84). Alcohol use disorders were negatively associated with MVS (aOR = 0.62; 95% CI = 0.30-0.75) and age was positively associated with achieving MVS (aOR = 1.29; 95% CI = 1.04-1.59). These findings underscore the need for more accessible HIV care with integrated behavioral health services in Lima, Peru.

5. Luz, P. M., et al. **"The cost-effectiveness of HIV pre-exposure prophylaxis in men who have sex with men and transgender women at high risk of HIV infection in Brazil."** *J Int AIDS Soc* 2018 21(3): e25096. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29603888>

INTRODUCTION: Men who have sex with men (MSM) and transgender women (TGW) in Brazil experience high rates of HIV infection. We examined the clinical and economic outcomes of implementing a pre-exposure prophylaxis (PrEP) programme in these populations.

METHODS: We used the Cost-Effectiveness of Preventing AIDS Complications (CEPAC)-International model of HIV prevention and treatment to evaluate two strategies: the current standard of care (SOC) in Brazil, including universal ART access (No PrEP strategy); and the current SOC plus daily tenofovir/emtracitabine PrEP (PrEP strategy) until age 50. Mean age (31 years, SD 8.4 years), age-stratified annual HIV incidence (age \leq 40 years: 4.3/100 PY; age $>$ 40 years: 1.0/100 PY), PrEP effectiveness (43% HIV incidence reduction) and PrEP drug costs (\$23/month) were from Brazil-based sources. The analysis focused on direct medical costs of HIV care. We measured the comparative value of PrEP in 2015 United States dollars (USD) per year of life saved (YLS). Willingness-to-pay threshold was based on Brazil's annual per capita gross domestic product (GDP; 2015: \$8540 USD).

RESULTS: Lifetime HIV infection risk among high-risk MSM and TGW was 50.5% with No PrEP and decreased to 40.1% with PrEP. PrEP increased per-person undiscounted (discounted) life expectancy from 36.8 (20.7) years to 41.0 (22.4) years and lifetime discounted HIV-related medical costs from \$4100 to \$8420, which led to an incremental cost-effectiveness ratio (ICER) of \$2530/YLS. PrEP remained cost-effective ($<$ 1x GDP) under plausible variation in key parameters, including PrEP effectiveness and cost, initial cohort age and HIV testing frequency on/off PrEP.

CONCLUSION: Daily tenofovir/emtracitabine PrEP among MSM and TGW at high risk of HIV infection in Brazil would increase life expectancy and be highly cost-effective.

6. Lama, J. R., et al. "**Design Strategy of the Sabes Study: Diagnosis and Treatment of Early HIV Infection Among Men Who Have Sex With Men and Transgender Women in Lima, Peru, 2013-2017.**" *Am J Epidemiol* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29522079>

The Sabes study evaluates a treatment-as-prevention intervention in cis-gender men who have sex with men and transgender women in Lima, Peru, populations disproportionately affected by the HIV epidemic. The intervention is designed to prevent onward transmission of HIV by identifying HIV-negative, high-risk individuals, testing them monthly for the presence of HIV, and then rapidly treating those who become HIV positive. The main outcome of interest is the development of a model predicting the population-level impact of early detection of HIV infection and immediate initiation of antiretroviral therapy (ART) in this population. From July 2013 to September 2015, 3,336 subjects were screened for HIV; 2,682 (80.4%) were negative and 2,084 began monthly testing. We identified 248 individuals shortly after HIV acquisition, 215 of whom were enrolled in the treatment phase of our study. All participants were followed for 48 weeks and then were referred to the Peruvian Ministry of Health to continue free HIV care and treatment. This intervention demonstrates that it is possible to recruit high-risk individuals, screen them for HIV, continue to test those who are initially HIV negative in order to identify incident cases shortly after acquisition, and then rapidly link them to care.

7. Logie, C. H., et al. "**Exploring the Potential of Participatory Theatre to Reduce Stigma and Promote Health Equity for Lesbian, Gay, Bisexual, and Transgender (LGBT) People in Swaziland and Lesotho.**" *Health Educ Behav* 2018: 1090198118760682. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29589481>

Stigma and discrimination affecting lesbian, gay, bisexual, and transgender (LGBT) people compromise health and human rights and exacerbate the HIV epidemic. Scant research has explored effective LGBT stigma reduction strategies in low- and middle-income countries. We developed and pilot-tested a participatory theatre intervention (PTI) to reduce LGBT stigma in Swaziland and Lesotho, countries with the world's highest HIV prevalence. We collected preliminary data from in-depth interviews with LGBT people in Lesotho and Swaziland to enhance understanding of LGBT stigma. Local LGBT and theatre groups worked with these data to create a 2-hour PTI composed of three skits on LGBT stigma in health care, family, and community settings in Swaziland (Manzini) and Lesotho (Maseru, Mapoteng). Participants (n = 106; nursing

students, health care providers, educators, community members) completed 12 focus groups following the PTI. We conducted thematic analysis to understand reactions to the PTI. Focus groups revealed the PTI increased understanding of LGBT persons and issues, increased empathy, and fostered self-reflection of personal biases. Increased understanding included enhanced awareness of the negative impacts of LGBT stigma, and of LGBT people's lived experiences and issues. Participants discussed changes in attitude and perspective through self-reflection and learning. The format of the theatre performance was described as conducive to learning and preferred over more conventional educational methods. Findings indicate changed attitudes and awareness toward LGBT persons and issues following a PTI in Swaziland and Lesotho. Stigma reduction interventions may help mitigate barriers to HIV prevention, treatment, and care in these settings with a high burden of HIV.

8. Magno, L., et al. "**Gender-based discrimination and unprotected receptive anal intercourse among transgender women in Brazil: A mixed methods study.**" *PLoS One* 2018 13(4): e0194306. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29641528>

INTRODUCTION: Discrimination related to gender identity may directly influence vulnerability to HIV through increased exposure to unprotected receptive anal intercourse (URAI). Little is known about the relationship between gender-based discrimination (GBD) and URAI with stable partners among transgender women.

METHODS: This mixed-methods research began with a cross-sectional survey conducted between 2014 and 2016 with transgender women in Salvador, the capital city in one of the poorest regions in Brazil. Respondent-driven sampling was used to recruit the study population. GBD was defined through Latent Class Analysis. Additionally, 19 semi-structured interviews with participants were transcribed and analyzed through thematic content analysis.

RESULTS: URAI with stable partners was commonly reported (37.3%). GBD was positively associated with URAI among stable partners (OR = 6.47; IC 95%: 1.67-25.02). The analysis of the interviews illustrated how GBD impacted transgender women in diverse ways. Experiences with GBD perpetrated by the family often initiated a trajectory of economic vulnerability that led many to engage in survival sex work. The constant experience with GBD contributed to participants feeling an immense sense of trust with their stable partners, ultimately diminished their desire to use condoms. Further, the high frequency of GBD contributed to poor mental health overall, though some participants said engagement in transgender advocacy efforts provided a vital source of resilience and support.

CONCLUSION: Our mixed-method study capitalizes upon the strengths of diverse data sets to produce a holistic understanding of GBD and URAI with stable partners. Furthermore, by confirming the association between greater GBD and URAI, we have demonstrated how GBD can impact condom negotiation in diverse relationships.

9. Wirtz, A. L., et al. "**HIV and Viral Hepatitis Among Imprisoned Key Populations.**" *Epidemiol Rev* 2018 40(1): 12-26. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29688317>

Prisons and other closed facilities create opportunities for transmission of human immunodeficiency virus (HIV) and viral hepatitis during detention and after release. We conducted a systematic review and meta-analysis of peer-reviewed publications (2005-2015) to describe the prevalence of HIV, hepatitis C virus, and hepatitis B virus among key populations in prisons worldwide and to compare estimates of infection with those of other prison populations. Most data were reported for people who inject drugs (PWID; n = 72) and for men who have sex with men (MSM; n = 21); few data were reported on sex workers (SW; n = 6), or transgender women (n = 2). Publications were identified from 29 countries, predominantly middle- and high-income countries. Globally, PWID had 6 times the prevalence of HIV (pooled prevalence ratio (PPR) = 6.0, 95% CI: 3.8, 9.4), 8 times the prevalence of hepatitis C virus (PPR = 8.1, 95% CI: 6.4, 10.4), and 2 times the prevalence of hepatitis B virus (PPR = 2.0, 95% CI: 1.5, 2.7) compared with noninjecting prisoner populations. Among these articles, only those from Iran, Scotland, Spain, and Italy included the availability of methadone

therapy; 2 articles included information on access to needle exchange programs by PWID detainees. HIV prevalence was more than 2 times higher among SW (PPR = 2.6, 95% CI: 2.2, 3.1) and 5 times higher among MSM (PPR = 5.3, 95% CI: 3.5, 7.9) compared with other prisoners. None of these articles reported HIV prevention coverage among SW or transgender women; 1 described HIV and sexually transmitted infection screening for MSM in prison. Prevention programs specific to key populations are important, particularly for populations that are criminalized and/or may cycle in and out of prison.

10. 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* 2018 30(4): 466-472. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29082776>

HIV pre-exposure prophylaxis (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.

11. Bastos, F. I., et al. "**HIV, HCV, HBV, and syphilis among transgender women from Brazil: Assessing different methods to adjust infection rates of a hard-to-reach, sparse population.**" *Medicine (Baltimore)* 2018 97(1S Suppl 1): S16-S24. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29794601>

Different sampling strategies, analytic alternatives, and estimators have been proposed to better assess the characteristics of different hard-to-reach populations and their respective infection rates (as well as their sociodemographic characteristics, associated harms, and needs) in the context of studies based on respondent-driven sampling (RDS). Despite several methodological advances and hundreds of empirical studies implemented worldwide, some inchoate findings and methodological challenges remain. The in-depth assessment of the local structure of networks and the performance of the available estimators are particularly relevant when the target populations are sparse and highly stigmatized. In such populations, bottlenecks as well as other sources of biases (for instance, due to homophily and/or too sparse or fragmented groups of individuals) may be frequent, affecting the estimates. In the present study, data were derived from a cross-sectional, multicity RDS study, carried out in 12 Brazilian cities with transgender women (TGW). Overall, infection rates for HIV and syphilis were very high, with some variation between different cities. Notwithstanding, findings are of great concern, considering the fact that female TGW are not only very hard-to-reach but also face deeply-entrenched prejudice and have been out of the reach of most therapeutic and preventive programs and projects. We cross-compared findings adjusted using 2 estimators (the classic estimator usually known as estimator II, originally proposed by Volz and Heckathorn) and a brand new strategy to adjust data generated by RDS, partially based on Bayesian statistics, called for the sake of this paper, the RDS-B estimator. Adjusted prevalence was cross-compared with estimates generated by non-weighted analyses, using what has been called by us a naive estimator or rough estimates.

12. Gianella, S., et al. "**The Importance of Human Immunodeficiency Virus Research for Transgender and Gender-Nonbinary Individuals.**" *Clin Infect Dis* 2018 66(9): 1460-1466. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29126186>

Transgender and gender-nonbinary (trans/GNB) individuals are disproportionately affected by human immunodeficiency virus (HIV), yet they are not adequately represented in HIV research and often underserved in clinical care. By building on community strengths and addressing structural, psychological and biological challenges, we can improve the engagement of trans/GNB people in research and ultimately improve prevention, testing, and care for this population. Here, we review the current state of the science related to HIV for trans/GNB people and discuss next steps to expand research that aims to improve the lives and well-being of trans/GNB persons.

13. Flores, J. A., et al. "**Individual-level characteristics associated with oral HIV test acceptability among Peruvian men who have sex with men and transgender women: a cross-sectional study.**" *Sex Transm Infect* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29574465>

OBJECTIVES: Peruvian men who have sex with men (MSM) and transgender women (TGW) are highly vulnerable to HIV infection (HIV), but stigma, access issues and fear of venipuncture hamper testing. The oral HIV test-which uses oral fluids and provides results in 20 minutes-could reduce these barriers. The objective of this study was to determine the acceptability of the oral HIV test and the individual-level factors associated with its acceptability among MSM and TGW.

METHODS: We conducted a cross-sectional secondary analysis among Peruvian MSM and TGW attending a community-based health centre between February 2012 and February 2013 to determine the individual-level factors associated with oral HIV test acceptability.

RESULTS: Of 334 participants, 88% were MSM and 12% TGW. Overall, 85% of participants indicated their acceptability of the oral HIV test. Acceptability was higher in MSM than TGW (85.7% vs 80.0%) but this difference was not significant. Factors associated with acceptability in MSM were: tertiary or higher education (prevalence ratio (PR)=1.18, 95% CI 1.06 to 1.32 and PR=1.16, 95% CI 1.03 to 1.30, respectively); sex with drug use (PR=1.19, 95% CI 1.05 to 1.36); believing that HIV is transmitted by saliva (PR=1.20, 95% CI 1.08 to 1.33); and potential use of the oral test at home (PR=1.56, 95% CI 1.32 to 1.85). The only factor associated with lower acceptability was having had first anal intercourse between 14 and 19 years of age (PR=0.89, 95% CI 0.80 to 0.98).

CONCLUSIONS: We identified the individual factors associated with oral HIV test acceptability among Peruvian MSM and TGW. Expanded use of the oral HIV test to increase testing rates among Peruvian MSM and TGW is recommended. TRIAL REGISTRATION NUMBER: NCT01387412, post-results.

14. Almeida-Brasil, C. C., et al. "**Medication non-adherence, multi-tablet regimens, and food insecurity are key experiences in the pathway to incomplete HIV suppression.**" *AIDS* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29683846>

OBJECTIVE: To identify potential pathways by which a variety of factors act to lead to unsuppressed viral load. DESIGN: A prospective cohort of HIV-HCV co-infected adults receiving care from 18 HIV clinics across Canada was followed every 6 months between November 2012 and October 2015. Participants with at least two visits while receiving combined antiretroviral treatment (cART) were included.

METHODS: A path analysis was conducted on the basis of ordered sequences of multivariate logistic regressions using generalized estimating equations. The first regression model used incomplete viral suppression (viral load >50 copies/ml) as the outcome of interest and all other variables (i.e. nonadherence, food insecurity, treatment attributes, and other sociodemographic, behavioural, and clinical factors) as potential predictors. Any variable determined to be a statistically significant predictor of incomplete viral suppression was then used as the next outcome of interest in the subsequent regression, until all predictors of each selected outcome were purely explanatory variables.

RESULTS: A total of 566 participants had at least two visits. Drivers of incomplete viral suppression included injection drug use, age 45 years or less, living alone, poor health status, longer duration of HIV infection and baseline CD4 200 cells/mul or less. Nonadherence, food insecurity, and the use of multitablet regimens mediated the effects of these factors on incomplete viral suppression.

CONCLUSION: Our results suggest that nonadherence, multitablet regimens, and food insecurity are key points in the pathway to incomplete HIV suppression. These are potentially amenable intervention targets that would not be revealed using traditional regression analyses.

15. Weir, S. S., et al. "**Opportunities for Enhanced Strategic Use of Surveys, Medical Records, and Program Data for HIV Surveillance of Key Populations: Scoping Review.**" *JMIR Public Health Surveill* 2018 4(2): e28. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29789279>

BACKGROUND: Normative guidelines from the World Health Organization recommend tracking strategic information indicators among key populations. Monitoring progress in the global response to the HIV epidemic uses indicators put forward by the Joint United Nations Programme on HIV/AIDS. These include the 90-90-90 targets that require a realignment of surveillance data, routinely collected program data, and medical record data, which historically have developed separately.

OBJECTIVE: The aim of this study was to describe current challenges for monitoring HIV-related strategic information indicators among key populations ((men who have sex with men [MSM], people in prisons and other closed settings, people who inject drugs, sex workers, and transgender people) and identify future opportunities to enhance the use of surveillance data, programmatic data, and medical record data to describe the HIV epidemic among key populations and measure the coverage of HIV prevention, care, and treatment programs.

METHODS: To provide a historical perspective, we completed a scoping review of the expansion of HIV surveillance among key populations over the past three decades. To describe current efforts, we conducted a review of the literature to identify published examples of SI indicator estimates among key populations. To describe anticipated challenges and future opportunities to improve measurement of strategic information indicators, particularly from routine program and health data, we consulted participants of the Third Global HIV Surveillance Meeting in Bangkok, where the 2015 World Health Organization strategic information guidelines were launched.

RESULTS: There remains suboptimal alignment of surveillance and programmatic data, as well as routinely collected medical records to facilitate the reporting of the 90-90-90 indicators for HIV among key populations. Studies (n=3) with estimates of all three 90-90-90 indicators rely on cross-sectional survey data. Programmatic data and medical record data continue to be insufficiently robust to provide estimates of the 90-90-90 targets for key populations.

CONCLUSIONS: Current reliance on more active data collection processes, including key population-specific surveys, remains warranted until the quality and validity of passively collected routine program and medical record data for key populations is optimized.

16. 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* 2018 19(4): 243-251. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29178158>

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.

17. Mehrotra, M. L., et al. "The Role of Social Relationships in PrEP Uptake and Use Among Transgender Women and Men Who Have Sex with Men." *AIDS Behav* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29754268>

Qualitative studies suggest that social relationships play an important role in HIV pre-exposure prophylaxis (PrEP) use, but there have been few quantitative assessments of the role of social relationships in PrEP uptake or adherence. We examined the association between disclosure of study participation or LGBT identity and PrEP use in the 1603 HIV-negative participants enrolled in the iPrEx OLE study. We also evaluated the association between LGBT social group involvement and PrEP use. Study participation disclosure to parents and LGBT identity disclosure to anyone in a participant's social network were associated with greater PrEP uptake. Study participation disclosure to partners was associated with higher probability of having protective PrEP drug concentrations compared [risk difference 0.15 95% CI (0.01, 0.30)]. For each additional type of LGBT organization a participant was involved in, the probability of PrEP uptake and having protective drug concentrations increased by 0.04 [95% CI (0.03, 0.06)] and 0.04 (95% CI (0.02, 0.07)) respectively. Overall, social context was associated with PrEP use in iPrEx OLE, and should be taken into consideration when designing future PrEP implementation programs.

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Young Key Populations - 6

1. Pettifor, A., et al. "Adolescent lives matter: preventing HIV in adolescents." *Curr Opin HIV AIDS* 2018 13(3): 265-273. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29528850>

PURPOSE OF REVIEW: Many of the almost 2 million HIV infections that occurred globally in the last year occurred among adolescents and young people, particularly those from East and Southern Africa and within key populations. Global HIV epidemic control will require that new infections among these youth populations be curtailed. This review examines the most effective prevention approaches to reach these adolescent populations in the next 5 years.

RECENT FINDINGS: Adolescents are in transition and are developmentally unique. They have specific needs and challenges, which if not addressed will result in less than successful interventions. Tailored, layered, combination prevention packages that take into account specific adolescent needs and involve biomedical,

behavioural and structural components are recommended. These packages should be designed for and with the meaningful input of adolescents, and involve their peers in their implementation and execution. Where possible, age-appropriate health and social interventions that go beyond HIV should be bundled and offered in a variety of community-based venues that are already acceptable to and frequented by adolescents.

SUMMARY: It is urgent that we reach adolescents globally with the most effective HIV prevention approaches. HIV prevention investment in this population has immediate and longer-term benefits.

2. Kakchapati, S., et al. "**Drug use, injecting behaviors, and survival sex among street children and youths in Kathmandu valley, Nepal.**" *Int J STD AIDS* 2018 29(6): 588-597. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29264955>

A disproportionate number of street children use and inject drugs and engage in survival sex as coping mechanisms. This study aimed to determine the prevalence of drug use, injecting drugs, survival sex, and condom use and determinants associated with these behaviors among street children. Cross-sectional surveys were conducted in 2016 with an aim to sample 350 street children and youths in Kathmandu Valley, Nepal. Information about sociodemographic characteristics, injecting drugs, sexual risk behaviors, and biological specimens for HIV testing were obtained. The logistic regression model was used to identify the determinants associated with drug use, injecting drugs, survival sex, and condom use during last sex. Variables that were significantly associated with being a current drug user (versus never) in the presence of other variables included being a rag picker (adjusted odds ratio [AOR] = 3.2; 95% confidence interval [95% CI] = 1.73-5.9), history of imprisonment (AOR = 2.21; 95% CI = 1.21-4.04), alcohol consumption (AOR = 2.66; 95% CI = 1.46-4.84), and solvent sniffing (AOR = 5.12; 95% CI = 2.74-9.59). Variables that were significantly predictive of injecting drugs (versus never) in the presence of other variables include being 17 years old (AOR = 3.42; 95% CI = 1.11-10.55) and being a rag picker (AOR = 3.5; 95% CI = 1.25-9.75). Variables that were significantly associated with having survival sex (versus never) in the presence of other variables include being 17 years old (AOR = 3.58; 95% CI = 1.31-9.81) and having forced sex (AOR = 9.62; 95% CI = 3.21-28.8). Drug use and survival sex are major coping mechanisms among street children in Kathmandu Valley and are associated with many risk behaviors. Targeted programs should be implemented to meet their special needs.

3. Cao, B., et al. "**Linking young men who have sex with men (YMSM) to STI physicians: a nationwide cross-sectional survey in China.**" *BMC Infect Dis* 2018 18(1): 228. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29776395>

BACKGROUND: Many young men who have sex with men (YMSM) are reluctant to seek health services and trust local physicians. Online information seeking may encourage YMSM to identify and see trustworthy physicians, obtain sexual health services, and obtain testing for sexually transmitted infections (STIs). This study examined online STI information seeking behaviors among Chinese YMSM and its association with offline physician visits.

METHODS: We conducted a nationwide online survey among YMSM through WeChat, the largest social media platform in China. We collected information on individual demographics, sexual behaviors, online STI information seeking, offline STI testing, and STI physician visits. We examined the most commonly used platforms (search engines, governmental websites, counseling websites, generic social media, gay mobile apps, and mobile medical apps) and their trustworthiness. We assessed interest and willingness to use an MSM-friendly physician finder function embedded within a gay mobile app. Logistic regression models were used to examine the correlation between online STI information searching and offline physician visits.

RESULTS: A total of 503 men completed the survey. Most men (425/503, 84.5%) searched for STI information online. The most commonly used platform to obtain STI information were search engines (402/425, 94.5%), followed by gay mobile apps (201/425, 47.3%). Men reported high trustworthiness of information received from gay mobile apps. Men also reported high interest (465/503, 92.4%) and willingness (463/503, 92.0%) to use a MSM-friendly physician finder function within such apps. Both using general social media (aOR = 1.14,

95%CI: 1.04-1.26) and mobile medical apps (aOR =1.16, 95%CI: 1.01-1.34) for online information seeking were associated with visiting a physician.

CONCLUSION: Online STI information seeking is common and correlated with visiting a physician among YMSM. Cultivating partnerships with the emerging mobile medical apps may be useful for disseminating STI information and providing better physician services to YMSM.

4. Burch, W. J., et al. "**A Qualitative Study of Young Men Who Have Sex With Men and Multilevel Factors Related to HIV Risks in Malaysia.**" *AIDS Educ Prev* 2018 30(2): 85-95. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29688771>

Young men who have sex with men (YMSM) are a group at high risk for HIV infection, yet no research has been conducted to understand this population in Malaysia. Semistructured interviews from a combination of YMSM aged 18-25 (n = 20) and local service providers of sexual health services (n = 4) were conducted from May to June 2015. Thematic analysis was used to identify common themes in participant responses from transcripts. Participants reported societal and internalized homophobia, an absence of sex education and difficulty accessing confidential HIV testing. This study provides insights into how homophobia in Malaysian society influences individual risk behavior for HIV in Malaysian YMSM, and makes practical suggestions for more effective HIV prevention in this population.

5. Chiyaka, T., et al. "**Reaching young women who sell sex: Methods and results of social mapping to describe and identify young women for DREAMS impact evaluation in Zimbabwe.**" *PLoS One* 2018 13(3): e0194301. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29543858>

Young women (aged 15-24) who exchange sex for money or other support are among the highest risk groups for HIV acquisition, particularly in high prevalence settings. To prepare for introduction and evaluation of the DREAMS programme in Zimbabwe, which provides biomedical and social interventions to reduce adolescent girls' and young women's HIV vulnerability, we conducted a rapid needs assessment in 6 towns using a "social mapping" approach. In each site, we talked to adult sex workers and other key informants to identify locations where young women sell sex, followed by direct observation, group discussions and interviews. We collected data on socio-demographic characteristics of young women who sell sex, the structure and organisation of their sexual exchanges, interactions with each other and adult sex workers, and engagement with health services. Over a two-week period, we developed a "social map" for each study site, identifying similarities and differences across contexts and their implications for programming and research. Similarities include the concentration of younger women in street-based venues in town centres, their conflict with older sex workers due to competition for clients and acceptance of lower payments, and reluctance to attend existing services. Key differences were found in the 4 university towns included in our sample, where female students participate in diverse forms of sexual exchange but do not identify themselves as selling sex. In smaller towns where illegal gold panning or trucking routes were found, young women migrated in from surrounding rural areas specifically to sell sex. Young women who sell sex are different from each other, and do not work with or attend the same services as adult sex workers. Our findings are being used to inform appropriate intervention activities targeting these vulnerable young women, and to identify effective strategies for recruiting them into the DREAMS process and impact evaluations.

6. Kilburn, K., et al. "**Transactional sex and incident HIV infection in a cohort of young women from rural South Africa enrolled in HPTN 068.**" *AIDS* 2018. Online at: <https://www.ncbi.nlm.nih.gov/pubmed/29762176>

OBJECTIVE: In sub-Saharan Africa, young women who engage in transactional sex (the exchange of sex for money or gifts) with a male partner show an elevated risk of prevalent HIV infection. We analyse longitudinal data to estimate the association between transactional sex and HIV incidence.

DESIGN: We used longitudinal data from a cohort of 2,362 HIV negative young women (aged 13-20) enrolled in a randomized controlled trial in rural, South Africa who were followed for up to 4 visits over 6 years. **METHODS:** The effect of transactional sex on incident HIV was analysed using stratified Cox proportional hazards models and cumulative incidence curves. Risk ratios were estimated using log-binomial models to compare the effects across visits.

RESULTS: HIV incidence was higher for young women that reported transactional sex (HR 1.59, 95% CI 1.02 - 2.19), particularly when money and/or gifts were received frequently (at least weekly) (HR 2.71, 95% CI 1.44 - 5.12). We also find that effects were much stronger during the main trial and dissipate at the post-intervention visit, despite an increase in both transactional sex and HIV.

CONCLUSIONS: Transactional sex elevates the risk of HIV acquisition among young women, especially when it involves frequent exchanges of money and/or gifts. However, the effect was attenuated after the main trial, possibly due to the changing nature of transactional sex and sexual partners as women age. These findings suggest that reducing transactional sex among young women, especially during adolescence, is important for HIV prevention.

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