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THE GLOBAL RESPONSE AND UNMET ACTIONS FOR HIV AND SEX WORKERS

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Abstract

Female, male, and transgender sex workers continue to have disproportionately high burdens of HIV infection in low-income, middle-income, and high-income countries in 2018. 4 years since our Lancet Series on HIV and sex work, our updated analysis of the global HIV burden among female sex workers shows that HIV prevalence is unacceptably high at 10·4% (95% CI 9·5–11·5) and is largely unchanged. Comprehensive epidemiological data on HIV and antiretroviral therapy (ART) coverage are scarce, particularly among transgender women. Sustained coverage of treatment is markedly uneven and challenged by lack of progress on stigma and criminalisation, and sustained human rights violations. Although important progress has been made in biomedical interventions with pre-exposure prophylaxis and early ART feasibility and demonstration projects, limited coverage and retention suggest that sustained investment in community and structural interventions is required for sex workers to benefit from the preventive interventions and treatments that other key populations have. Evidence-based progress on full decriminalisation grounded in health and human rights—a key recommendation in our Lancet Series—has stalled, with South Africa a notable exception. Additionally, several countries have rolled back rights to sex workers further. Removal of legal barriers through the decriminalisation of sex work, alongside political and funding investments to support community and structural interventions, is

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urgently needed to reverse the HIV trajectory and ensure health and human rights for all sex workers.

INTRODUCTION

In July 2014, *The Lancet* published a series on HIV and Sex Workers, released at the International AIDS Conference in Melbourne, Australia. The series of comprehensive reviews of global epidemiology and structural determinants, prevention science, community empowerment, human rights abuses, and HIV disparities amongst men and transgender women who sell sex highlighted the heavy HIV burden and suboptimal coverage of HIV prevention and treatment for sex workers across low, middle and high-income countries and both concentrated and generalized epidemics. Despite significant advancement and promise in HIV prevention and treatment tools globally, the ability to bring programs to scale and sustain coverage continue to be hampered by a lack of funding and political will, insufficient data on HIV burden and ART coverage, and ongoing human rights abuses, criminalisation, stigma and discrimination. The final paper was a *Call to Action*[1] which laid out an ambitious agenda for programmatic and policy change, research investment, and sustained community engagement and empowerment.

Since the 2014 *Lancet* series, the HIV burden among sex workers remains high and among the few countries with available data, limited coverage of ART. There have been some notable exceptions in prevention science literature including the SAPPH-IRE Trial in Zimbabwe specifically evaluating the feasibility and impact of combination prevention services including PrEP.[2] However retention to PrEP and limited ART coverage data suggest key gaps remain in bringing these to scale, especially in settings with repressive regimes where addressing community empowerment, human rights abuses, and structural inequities among sex workers persist. The pace of expansion of community empowerment efforts outside of South Asia[3] has been slow and remains underfunded.

In the months following our *2014 Lancet* series, UNAIDS/WHO launched ambitious 90-90-90 targets to mobilize political and financial response to HIV. Bilateral and Multilateral funding agencies including PEPFAR, Global Fund for AIDS Tuberculosis and Malaria commitment to the UNAIDS 90-90-90 targets and ‘fast tracking’ the end of AIDS by 2030 has led to ambitious target-setting that has potential to support rapid prevention and treatment scale-up, and through infectious disease modeling contribute to measurability of economic and social rights.[4] However, a lack of political and financial investment in addressing structural barriers (e.g. contextual factors external to the individual) remains a major obstacle to measuring and achieving these goals for sex workers. Without accurate denominators and continued barriers of stigma and criminalisation in including sex workers in HIV surveillance,[5,6] bringing scientific advancements to scale remains largely out of reach for sex workers.

Our *Lancet* series papers set out key markers of potential progress in human rights and HIV response,[1] suggesting that decriminalisation of sex work through its downstream impacts on violence, safer work environments and sexual risks, had the potential to avert 33–46% of HIV infections in sex work over the next decade.[7] Our Lancet series coincided with the

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release of the WHO consolidated guidelines on prevention, treatment and care for key populations, which set out key recommendations on creating enabling environments, community empowerment, and decriminalization, with broad momentum coming out of Melbourne to 'leave no one behind'. There has been some policy progress with Amnesty International, an international human rights body, taking a formal policy position in support of full decriminalisation of sex work after careful review of evidence and extensive consultation.[8] Yet in complete disregard of scientific and evaluation data on the harms of criminalisation models, the wave of end-demand criminalisation laws ('Nordic model') has rolled back progress on human rights of sex workers in far too many settings.

PROGRAMMATIC AND SCIENTIFIC ADVANCES

The 2014 call to action paper made several recommendations for programmatic and scientific advances, and despite some progress to report with increased reporting of HIV burden, social and structural research, and combination prevention advancements, many actions are left unmet (Table 1).

Global HIV Burden among Sex Workers

Encouragingly, the updated review found increases in data availability for HIV prevalence among female, transgender, and male sex workers, though there remains limited incidence data (Appendix, Table 1).

Among female sex workers specifically, the original review identified HIV burden data from 79 countries and 437,025 women, with the updated review identifying 451 data points covering 101 countries and a sample size of 2,103,380 women (Table 2). New data were identified in North America, Latin America and the Caribbean, Europe and eastern and southern African regions. There have been several trends including improved sampling strategies with respondent-driven sampling and time-location sampling now representing 19% and 33% of studies identified in this search, respectively. Our updated global meta-analysis estimated HIV prevalence among all female sex workers at 10.4% (95%CI: 9.5–11.5), and remains largely unchanged from the 2014 estimate of 11.8%.[1] However, there is great variability in HIV prevalence among female sex workers across regions (Figure 1) and increased burden compared to adult women in all regions (Figure 2) with HIV acquisition risks being a product of HIV prevalence among male clients and high incidence among female sex workers. Moreover, mathematical models of HIV transmission have suggested that even in more generalized HIV epidemics across Sub Saharan Africa, 5–20% of new HIV infections in several sub-Saharan countries are among female sex workers.[9] These data show that HIV prevalence will continue to rise among female sex workers in generalized epidemics as epidemics in general populations contract. In North American, European, and Asian countries, the burden of HIV infection among female sex workers continues to be affected by co-occurring risks related to injecting drug use. Multiple studies demonstrate that women engaged in substance use are not only at increased risk for HIV acquisition directly via use of contaminated equipment, but also indirectly via other environmental and occupational exposures. Engagement in substance use has also been associated with increased exposure to client, police, and stranger-perpetrated violence, increased client

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loads, polysubstance use, and work in unsafe locations, which may further facilitate HIV acquisition through reduced condom use in these situations.[10,11] In the Russian Federation, however, research has shown that women who ended drug use more than six months prior to the study reported low levels of exposure to such situations and similar to levels among sex workers who never injected drugs.[10]

The call to action recommended separating reporting of HIV burden among transgender women and male sex workers. There has been a significant increase in research on the health of transgender people in the past few years,[12–15] mostly focused on HIV though available data remains relatively scarce. There are now 18 countries reporting HIV data on transgender women sex workers, only slightly higher than the 15 countries in 2014. While the majority of HIV research with transgender women has been conducted in the United States, a review of HIV epidemiology in transgender populations,[16] identified 14 studies from Latin America with the majority from Peru and Brazil, 10 studies from Asia including India, Pakistan, and Thailand, and 9 from Europe including Spain and Portugal. Once again, no data on transgender women were available from the Eastern Europe/Central Asia region. Small sample sizes as well as conflation of transgender women and MSM continue to challenge access to transgender specific HIV data, particularly in Africa.[17]

Comparatively, there have been 22 articles published with HIV prevalence data among male sex workers since the publication of the Lancet Call to Action including 12 from Asia, three from Europe, two from the United States, two from Peru, and two from Kenya, and one from Australia (Appendix, Table 1). Studies with male sex workers continue to be challenged by limited uniformity of the underlying population being studied ranging from men who have sex with men who have ever sold sex to men who sell sex as a primary profession. HIV and STI prevalence outcomes vary accordingly with MSM who sell sex often having higher burden of HIV compared to other MSM and male sex workers who professionally sell sex often having lower or equivalent burdens of HIV. Moreover, the latter population tends to report higher engagement with HIV prevention services including condom use.

Our series called for increased attention to HIV burden and response among youth who sell sex. Emergent data now suggest transactional sex among adolescent girls and young women (AGYW) is a determinant of HIV acquisition and transmission.[18] PEPFAR-funded Determined Resilient Empowered AIDS-free Mentored and Safe (DREAMS) initiative launched in 2014 to respond to the increased needs of adolescent girls and young women (AGYW) in some of the most generalized HIV epidemics across Sub-Saharan Africa, including youth who sell sex.[19] There continues to be a need for investment in programs and services for youth of all genders who sell or trade sex, given the significant proportion of youth engaged in transactional sex. Similar to adult sex workers, there are biological, behavioural, and structural risks potentiating HIV risks. Critically, early entry into selling sex for AGYW aged 13–17 has been associated with increased exposure to violence, incarceration, and HIV and STI-related risks, reflecting a confluence of biologic factors that facilitate STI/HIV acquisition, and age-based and gender-based power disparities that compromise negotiation power for AGYW.[18,20,21] While sex work is officially designated for those in the age of majority, policy contradictions for those under the age drive them further underground, and render them further criminalized and effectively excluded from

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services. Responding to evidence of exacerbated risk in this population requires harm reduction and rights-based services for young people selling sex rather than punitive restrictions.

Social and Structural Research

The call to action paper made several recommendations for increased integration of social and structural measures in HIV and sex work research. Although there have been some promising developments, including increased reporting of structural risks and violence measures in epidemiological research and some emergent innovation in modeling, the scope and pace of progress has been slow. Our 2014 *Lancet paper* found less than half of global epidemiological studies with HIV and HIV-related outcomes among sex workers considered one or more structural drivers upstream factors at macro-structural, community or work environment domains), despite increasing evidence to suggest the centrality of structural determinants of HIV.[7] Few studies considered one or more structural determinants from the heaviest or emerging HIV epidemic settings of SSA, Russia or Eastern Europe. Since 2014, a number of key studies have begun to document macro-structural factors including stigma,[22,23] migration,[24,25] and downstream products of laws and policies such as policing24, and violence[26–29] on HIV outcomes and access to care among sex workers in sub-Saharan Africa, with a small handful of studies from Russia and Eastern Europe.[10] Many of the published studies have been completed across Western, Central and South Africa[18–25] reinforcing the consistency of significance of these relationships using a combination of quantitative and qualitative methods. Taken together, this work highlights the need for effective responses to address HIV-related risks secondary to these higher order determinants of HIV acquisition and transmission. Research progress has also been slow on detailed measures of types and exposures of violence, contextual factors shaping violence and other structural exposures including work environments, policing and migration in relation to HIV.

Our Call to Action set out key targets for scaled up methods and modelling. We updated our search from 2014 onwards to identify new mathematical modelling studies of the influence of structural factors not limited to criminalisation and violence on any STI, including HIV - 1) among female sex workers only and 2) among sex workers. The search yielded 2691 studies among female sex workers, of which 34 were mathematical modelling studies and only 2 assessed the population-level impact of structural interventions. These studies suggested that community empowerment (CE) and cost-effectiveness of community mobilization (CM) interventions could reduce new infections by 17–40%[30] and be cost-effective.[31] Research has been slow to progress on the development of longitudinal and dynamics models critical to further disentangling pathways to HIV on which to intervene, both in high and emerging epidemics as well as low and medium prevalence settings.[32] There are no new mathematical modelling studies focused on violence, stigma, decriminalisation or any other structural factors and HIV in sex work.

Encouragingly, two large-scale ecological studies provide important data that support our *Lancet* 2014 modelling that the removal of criminal laws targeting sex work drastically reduces HIV risks, through reduced violence, police harassment and access to safer indoor work spaces. In *The Lancet HIV*, Reeves and colleagues'[33] ecological analysis of 27

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European countries found that countries where aspects of sex work are fully or partly legalised have a lower burden of HIV among female sex workers compared to countries that criminalise it, after adjusting for prevalence of sex workers who inject drugs, gross domestic product, HIV prevalence, and ART coverage among reproductive aged adults. In investigating the effect of enforcement using the World Bank Rule of Law (a measure of confidence in effective and fair judiciary and police) on HIV prevalence, they suggest that fair and effective judiciary might act as a mediating pathway. Indeed, we know that legalisation (which includes explicit regulation of where and how the industry can operate) unlike decriminalisation (where the industry follows regulations of other businesses) can remove some barriers, while also creating a two-tier system that pushes more vulnerable sex workers to the margins.[34] In Rhode Island, a legal loophole decriminalized indoor sex work for a period of six years and new analyses suggests that decriminalisation reduced the rates of sexual violence by 30% and STI incidence by 40%, not just among sex workers, but in the general female population.[35]

Antiretroviral Therapy and Combination Prevention

Despite launch of global markers by WHO/ UNAIDS in 2014 to ‘fast track’ the HIV response, new data on HIV care continuum have been slow to emerge and specific data on early ART initiation and ‘test and treat’ models among sex workers remain patchwork at best. Ongoing challenges in accurately estimating size of sex work populations in the absence of accurate denominators, and structural barriers to engagement in ART programs and research persist. New qualitative data in sub-Saharan Africa show profound structural barriers of stigma and discrimination still impede progress in the HIV care continuum.[36] Importantly, studies now confirm that successful HIV treatment trajectories are impeded by violence and displacement due to policing.[37,38]

The SAPPHIRE trial in Zimbabwe found high prevalence (77.8%) of VL suppression among sex workers taking ART (67.7%), but only 49.5% with suppressed VL among all female sex workers living with HIV.[39] There was no significant difference between the SAPPHIRE and standard sister clinic arms, but with adequate supports in the SAPPIRE arm, female sex workers achieved 90-90-90 targets. Similarly in Cambodia, rates of initiation of ART were high (83%), however only 39% of sex workers were retained on ART at 12 months with 23% viral suppression.[40] In Uganda, sex workers were most likely to experience delayed initiation relative to the general population during the roll-out of early ART initiation.[41] Higher ART retention was observed in South Africa, with only 30% loss to follow-up at 12 months, similar to current standard of care.[42]

Since 2014, combination HIV prevention among sex workers has been catalysed by global plans to roll-out PrEP and HIV self-testing (HIVST), whilst exploring the acceptability of vaginal and rectal microbicides. Our series called for tailored combination HIV prevention, especially the integration of PrEP in different global settings.[43] The call to action noted the paucity of evidence of these interventions in sex workers due to the exclusion of involvement of sex workers in clinical trials. Since then, feasibility and acceptability studies amongst sex workers have indicated acceptability within groups, while simultaneously identifying implementation challenges.[42,44–46]

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Interest in oral PrEP and microbicide rings amongst female sex workers and transgender women sex workers was high across diverse global settings, as well as high acceptability of HIVST in two large scale RCTs in Uganda[47] and Zambia[48]. and a small survey (n = 12) amongst young men and transgender female sex workers in Puerto Rico found rectal microbicide gels to be acceptable.[45,49,50] However, challenges around fears of breach of confidentially or confronting violence situations, and side effects were associated with reduced HIVST and PrEP acceptability.[49]

In 2016 and 2017, the South African and Kenyan governments put forward new National Sex Worker HIV Plans that included access to PrEP and early ART for female sex workers. In South Africa, free PrEP uptake amongst sex workers was initially slow. Uptake was higher amongst younger females (aged 21–30 years).[39] The Kenyan PrEP roll-out includes sex workers, discordant couples and young women and girls and is just beginning to gather momentum in a few high burden districts. The TAPS demonstration project (South Africa) found that PrEP can be implemented within female sex workers' routine services in high-prevalence urban settings.[42] However, although initiation on PrEP was high, and despite high adherence (70–85%), only 22% were retained over 12 months.[42] Kenya's Bridge to Scale project[51] enrolled 1,143 female sex workers on PrEP by February 2017, but similarly reported retention as their biggest challenge. Zimbabwe's SAPPH-Ire trial similarly found low retention rates, with the average sex worker retained on PrEP for only 4 months. Investment in community mobilisation and follow-up promotion of regular HIV testing at clinics led to a doubling of HIV testing and diagnosis suggesting the need for additional adherence support.[2] The South African TAPS study found that retention for HIV-positive sex workers starting on ART was higher[42] suggesting that either adherence models and lessons from ART need to be applied concurrently to PrEP users, or that new adherence mechanisms need to be developed for HIV-negative sex workers.

While PrEP has emerged as a potentially powerful tool for reducing HIV incidence among key populations, data on uptake and efficacy among transgender women, including those who sell sex, remains limited. The only published study of PrEP efficacy among transgender women (N=339) found lack of efficacy for TDF-based oral PrEP among transgender women (HR 1.1 [95%CI: 0.5–2.7]). However, adherence was only 18% and TDF was detected in none of the transgender women at the seroconversion visit, suggesting barriers to adherence as the main driver of low efficacy.[52] Small studies[49] suggest that barriers to uptake include concerns about side effects, lack of transgender-inclusive PrEP promotion, medical mistrust, and prioritization of hormone use. Transgender women have noted that PrEP could be empowering in sex work situations where they experience reduced power to negotiate safer sex. Two recent studies have documented high willingness to take PrEP among transgender women sex workers: 84% in Argentina[53] and 61% in Shenyang China.[50]

Community Empowerment

Our 2014 call to action offered a number of recommendations for scale-up and increased funding investment in community empowerment and sex worker-led programming in the HIV response. Despite recognition in the UNAIDS 2015 Report on the Global AIDS Epidemic of the global evidence for rights-based health programming with sex workers

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based on principles of community empowerment, the adoption of the 'Sex Worker Implementation Tool' (SWIT; for the WHO/UNAIDS/UNDP/UNFPA/NSWP 2012 guidelines)[54] by governments and NGOs has been slow.

In 2014, a systematic review and meta-analysis documented the effectiveness of community empowerment responses to HIV among female sex workers in lower- and middle-income countries, including a more than 3-fold increase in the odds of consistent condom use with clients and a 32% reduction in the odds of HIV infection among female sex workers engaged in these efforts.[55] Our 2014 Call to Action documented several key gaps in the literature, including: lack of evidence on the impact of community empowerment approaches on HIV care and treatment outcomes, data on the role of community empowerment along the causal pathway between program exposure and behavioral and biological HIV outcomes, and lack of rigorous evaluations of community empowerment approaches among female sex workers in sub-Saharan Africa. Over the last few years, important advances have occurred in each of these three areas. Yet, the level and pace of progress has been limited in scope and scale.

We updated our 2014 search on community empowerment and HIV-related outcomes among female sex workers for the period 2013–2017 and found an additional 10 articles that met our original search criteria.[55] Similar to our 2014 review, the majority of these new studies (7/10) were conducted in South Asia, and mostly the Avahan project, and most were focused on behavioral outcomes such as condom use and STI,[56,57] with one on HIV prevalence itself.[58] In terms of examining the effectiveness of community empowerment on HIV care outcomes, a longitudinal evaluation of the *Abriendo Puertas* (Opening Doors) model in the Dominican Republic found that a community-driven, multi-level intervention among female sex workers living with HIV was associated with improved engagement and adherence to ART.[59]

From Swaziland, Fonner et al.[60] documented the role of social cohesion and participation on HIV outcomes among female sex workers in terms of their positive influence on condom use with clients and HIV testing, demonstrating that intervening on these factors may play a key role in the HIV response among sex workers in Africa. However, the need for rigorous evaluations of community empowerment-based responses to HIV among female sex workers in sub-Saharan Africa continues to be great given the regional burden of HIV.

Our previous review also highlighted challenges to the implementation and sustainability of community empowerment-based HIV prevention initiatives, including dynamics both internal (e.g. lack of trust, competition) and external (e.g. stigma, legal constraints) to the sex worker community. Addressing these challenges will take sustained funding for not only for the HIV-related aspects of community empowerment, but also the organizational capacity of sex worker rights groups to mobilize their collective resources to generate solidarity within the community, as well as, stimulate and sustain strategic partnerships with allies that can assist in enacting structural change.

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POLICY ADVANCMENTS AND CHALLENGES

Perhaps the most significant policy advancement since our *Lancet* 2014 series is Amnesty International's high-profile decision[8] to call for full decriminalisation of sex work based on human rights and health evidence (Panel 1). While Amnesty International does not set policy, it wields tremendous influence in shaping policy frameworks globally, thus the impact of this recommendation cannot be overstated. In 2016, an expert group convened by UN Women "Women's economic empowerment in the changing world of work" published a number of recommendations regarding sex work, including recommending the decriminalisation of sex work on human rights grounds. UN Women is currently developing a policy on sex work and sex worker groups are challenging them to meaningfully involve sex workers in the process.[61]

Our call to action made several recommendations on the policy front, including increased number of countries or regions decriminalizing sex work and ending impunity for crimes and abuses against sex workers. Since our *Lancet* 2014 paper demonstrating potential to avert HIV infections through decriminalisation and its downstream impact on violence, sexual risk behavior and safer work environments,[7] meaningful policy change has yet to be achieved in most settings and the harms of criminalisation continue to be articulated in shadow reports to CEDAW. In criminalized environments, sex workers continue to report a profound lack of police protection, exacerbated by experiences of violence.[27] One notable exception is South Africa, where on December 20, 2017, the African National Congress (ANC) following huge efforts by the sex worker rights movement resolved to decriminalize sex work and reject proposals put forward by its delegates to move to an end-demand criminalisation model of criminalizing clients but not sex workers.

Since 2014, Canada, Ireland and France have all implemented versions of criminalisation under an "end-demand model". Large-scale anti-client raids have been reported alongside raids of sex workers in Tanzania. In 2016, a new bill was introduced in Uganda to criminalize clients of sex workers.[62] While data on end-demand criminalisation approaches is only just beginning to emerge, new data suggests similar outcomes to full criminalisation models. In Vancouver, Canada, local enforcement guidelines in 2013 to cease targeting sex workers while continuing to target clients and third parties showed similar rates of violence, police harassment and rushed negotiations, including reduced ability to negotiate safer sex as compared to 2012 when sex workers remained targets for arrest.[63] Unfortunately, despite these data being shared with Canada's federal government of the day, and a landmark human rights ruling by the highest court that struck down previous criminal laws, new end-demand laws were rolled out in late 2014. Analysis of arrests on brothel-keeping offenses in the Republic of Ireland found that out of 141 people charged, "91% of the people convicted were sex workers, not owners or managers of brothels who have others working for them".[64]

The conflation of trafficking with sex work persistently shapes sex work policy, often with significant human rights implications for sex workers. Research continues to document the impact of criminalisation on severe violence and other human rights abuses against sex workers globally. The scholarly literature increasingly offers direction on how to craft policy, including decriminalisation, that upholds the necessary distinction and human rights

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of sex workers and those trafficked.[65] Yet Germany's 2017 law introduced new regulations inclusive of mandatory medical exams and compulsory registration at the local level, adding additional levels of regulation over the legalization policy enacted in 2002.

RESEARCH GAPS AND AGENDA

Substantial gaps in knowledge need to be addressed if we are to truly realize health and human rights for sex workers and optimize the benefits of new and emerging HIV prevention and treatment tools (panel 3). We now have structural determinants and socio-ecological models[66,67] to help guide more complex epidemiology analyses of HIV epidemic structures and intervention science in sex work but research has been slow to catch up and structural and contextual factors that confound accurate HIV reporting remain under documented for many of the same reasons: lack of funding and political will, criminalisation and stigma, and the 'invisibility' of sex work and HIV. Reliable, ethical, and community-engaged data to measure epidemic structures remains a major challenge for HIV programming and policy for sex work, perhaps more so than any other key population outside of general population of transgender women, with criminalisation, stigma, violence and migration acting as major structural barriers to counting sex workers in surveillance, engagement in HIV services, and accurate reporting. Accurate surveillance estimates of female, male and transgender sex workers are critical to assess impacts of programmes and structural interventions. In our updated meta-analysis, only 11% of HIV prevalence data were from IBBSS or country-level surveillance system data. As UNAIDS global AIDS monitoring tracks 90-90-90 targets and service coverage,[68] lack of denominators and limited inclusion of sex workers in country-level surveillance remains a major barrier to 'fast-tracking' the end of AIDS.

Critical implementation science questions regarding the process and impact of community-led initiatives as they incorporate novel biomedical approaches, including ART-based prevention strategies such as PrEP and TasP, need immediate attention given their ongoing expansion. There have been significant scientific advancements in biomedical interventions with a cascade of feasibility and acceptability studies for PrEP and TasP among sex workers, and yet new data suggest very low retention rates among sex workers. From a broader health and human rights perspective, key operations research questions also include how to better integrate HIV with other relevant health services (e.g. reproductive health, substance use) and access to social and economic services to improve the overall health and well-being. Implementation science is also urgently needed to inform how to reduce and monitor changes in societal stigma regarding sex work at the community level and how to ensure that sex workers are appropriately screened and referred to tailored violence prevention and care services. Immediate and sustained political and funding investment in community empowerment and rights-based intervention approaches to HIV in sex work are necessary.

In these implementation science efforts, sex worker organizations can play a key role by documenting their experiences and efforts to respond to HIV and protect their human rights, and ensure that the community is playing a leadership role (Panel 2). Community-driven monitoring tools such as the Community Ownership and Preparedness Index (COPI)[69] are important examples of how sex worker organizations can engage in implementation science to document changes in community-led and sustained efforts. Several South-to-South

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initiatives are also ongoing to document and share community-led, programmatic lessons learned between lower- or middle-income countries.[70]

CONCLUSIONS

The HIV pandemic among sex workers remains under-addressed and under-resourced, with glaring gaps in comprehensive measures of HIV prevalence, incidence, ART coverage, slow and stalled retention of PrEP, and repressive policy climates and ubiquitous human rights violations against sex workers in far too many settings. Achieving 90–90 targets and shifting the HIV landscape cannot be achieved without addressing the human rights of sex workers. We have seen some progress on measuring structural measures of violence, stigma and discrimination, particularly in heavy HIV burden settings of SSA where these were notably absent 4 years ago, and yet the pace of progress remains far too slow and more complex measures and methods to model structural factors that increase multi-level methods and modelling are critical if we want to stem the tide of HIV for sex workers.

In most countries and regions, community movement and policy advocacy have not translated into real and sustained uptake of community empowerment and structural interventions within or alongside biomedical interventions. With growing advances in biomedical tools, we must ensure sex workers are not left behind. It is unacceptable that we still do have adequate global ART coverage data for sex workers in most settings. Despite relatively strong feasibility and acceptability for PrEP, demonstration projects thus far report limited retention reinforcing the importance of community engagement and tailored sex worker approaches and concurrent structural interventions to optimize the impact of biomedical interventions.

Civil society has continued to highlight the exclusion of sex workers and other key populations in implementation by major donors, including PEPFAR and the Global Fund, from barriers to recipient eligibility, implementation process and monitoring. PEPFAR has seen a slow increase in country operational plans (COPs) investing in female sex workers from 32,000,000 in 2013 to 38,000,000 in 2017.[71] The actual country expenditures appear relatively stable from 2014–2017. In 2016, the Global Fund undertook a review of policies and action plans in relation to key populations and gender. While significant progress was noted in investing in engagement of civil society in roll-out of Global Fund,[72] major concerns were expressed in securing meaningful engagement of sex workers throughout granting processes, alongside investment and sustainability of engagement.[73] As of May 2018, the Global Fund board approved revised eligibility to including more flexibility in priority to heavy burden settings and key populations, as well as revised eligibility for high-income countries with no HIV prevalence data on key populations.

Political and funding investment must be put behind the WHO/UNAIDS Sex Worker Implementation Tool (SWIT)[54] to ensure commitment to rights-based programming and greater investment in civil society groups to lead. Integration of evidence and measures of human rights of health within global funding indicators (e.g. UNAIDS, Global Fund) will be key on that front. Global funding commitments to the UNAIDS/ WHO 90-90-90 targets and ‘fast tracking’ the HIV response by 2030 set ambitious targets and opportunities for

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measurable progress in expanding access and bringing HIV prevention and treatment to scale and yet key populations of sex workers remain 'invisible'. HIV prevention and treatment tools exist and yet without comprehensive HIV epidemiology, a lack of denominators and failure to address structural determinants including decriminalisation of sex work means we will continue to fall short in achieving health and rights for all sex workers.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Panel 1.

Amnesty International Policy on Decriminalisation of Sex Work

Resolution on State Obligations to Respect, Protect and Fulfil the Human Rights of Sex Workers

In August 2015, the Amnesty International Board voted to formally adopt a policy[8] for full decriminalisation of adult sex work, including those laws that prohibit associated activities— such as bans on buying, solicitation and general organization of sex work. The policy is consistent with international health policy bodies including World Health Organization, UNAIDS, UNPA, Human Rights Watch and the Global Commission on HIV and the Law.

1. The starting point of preventing and redressing human rights violations against sex workers, and in particular the need for states to not only review and repeal laws that make sex workers vulnerable to human rights violations, but also refrain from enacting such laws.
2. Amnesty International's overarching commitment to advancing gender equality and women's rights.
3. The obligation of states to protect every individual in their jurisdiction from discriminatory policies, laws and practices, given that the status and experience of being discriminated against are often key factors in what leads people to engage in sex work, as well as in increasing vulnerability to human rights violations while engaged in sex work and in limiting options for voluntarily ceasing involvement in sex work.
4. The harm reduction principle.
5. States have the obligation to prevent and combat trafficking for the purposes of sexual exploitation and to protect the human rights of victims of trafficking.
6. States have an obligation to ensure that sex workers are protected from exploitation and can use criminal law to address acts of exploitation.
7. Any act related to the sexual exploitation of a child must be criminalized. Recognizing that a child involved in a commercial sex act is a victim of sexual exploitation, entitled to support, reparations, and remedies, in line with international human rights law, and that states must take all appropriate measures to prevent sexual exploitation and abuse of children.
8. Evidence that sex workers often engage in sex work due to marginalisation and limited choices, and that therefore Amnesty International will urge states to take appropriate measures to realize the economic, social and cultural rights of all people so that no person enters sex work against their will or is compelled to rely on it as their only means of survival, and to ensure that people are able to stop sex work if and when they choose.

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9. Ensuring that the policy seeks to maximize protection of the full range of human rights - in addition to gender equality, women's rights, and non-discrimination -related to sex work, in particular security of the person, the rights of children, access to justice, the right to health, the rights of Indigenous peoples and the right to a livelihood.
10. Recognizing and respecting the agency of sex workers to articulate their own experiences and define the most appropriate solutions to ensure their own welfare and safety, while also complying with broader, relevant international human rights principles regarding participation in decision-making, such as the principle of Free, Prior, and Informed Consent with respect to Indigenous peoples.
11. The evidence from Amnesty International's and external research on the lived experiences of sex workers, and on the human rights impact of various criminal law and regulatory approaches to sex work.
12. The policy will be fully consistent with Amnesty International's positions with respect to consent to sexual activity, including in contexts that involve abuse of power or positions of authority.
13. Amnesty international does not take a position on whether sex work should be formally recognized as work for the purposes of regulation. States can impose legitimate restrictions on the sale of sexual services, provided that such restrictions comply with international human rights law, in particular in that they must be for a legitimate purpose, provided by law, necessary for and proportionate to the legitimate aim sought to be achieved, and not discriminatory.

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Panel 2:

Human Rights Monitoring by Sex Workers

Criminalisation and Violence Against Sex Worker Human Rights Defenders

The criminalisation of sex work continues to provide cover and sanction to state-sponsored human rights abuses against sex workers and sex worker human rights defenders.[75]

- In Zimbabwe, courts have denied sex workers the right to peaceful assembly to protest violence against them by citing sex workers' "illegality".
- Forty-four sex workers were arrested and jailed for two weeks in Uganda for participating in an emergency meeting to respond to 20 recent murders of women, most of whom were sex workers.
- Sex workers attending a vigil for two recently murdered transgender sex workers in Guyana faced harassment and threats from police. The head of the Guyana Sex Worker Coalition reported a police officer cranked his gun at her.
- Angelica Miriam Quintanilla, Director of LIQUIDAMBAR, a sex worker-led organisation in El Salvador was shot to death in the sex worker area of San Salvador where women face systematic harassment from police and gangs. According to fellow sex worker activist, Karina Bravo of Ecuador "This tireless warrior was foully murdered for denouncing the violence that female sex workers face.
- Trans sex workers face very high rates of violence in Turkey. Between 2008 and 2016, 43 trans people were murdered. According to a mapping of violence against trans sex workers 75% of trans sex workers had experienced violence and half of perpetrators were identified as police. Between 2008 and 2016, 43 trans people were murdered in Turkey.

Sex Workers Set Precedents in Courts: Ending Impunity, Challenging Criminalisation

- Nineteen sex workers from the Dedza District of Malawi successfully challenged their arrest for "living on the avails of prostitution". The Zomba High Court overturned the arrests and deemed them unconstitutional.
- According, to Aniz Mitha of the Malawian Sex Workers' Alliance "The wrongful arrest of sex workers is one of the main issues in the country," continued Aniz Mitha. "We hope that this case sends a clear message that sex workers are deserving of rights, and the police should not be arresting us when we are not doing anything illegal.
- Three men were found guilty and sentenced for a violent attack on Kemalita Ördek, a trans sex worker and the executive director of the Red Umbrella Sexual Health and Human Rights Association. Speaking to NSWP, Kemalita said: "I believe the perpetrators got a just judgment. The court team increased

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the level of sentences for the perpetrators compared to the demand of the prosecutor. The prosecutor demanded very low sentences. This was a surprise for me." Legal expert Denis Aksoy stated that "because the victim's identity as a sex worker was taken as a basis, this penalty imposed on the ground of sexual assault will be seen as a precedent."

- In 2014, Zimbabwe Lawyers for Human Rights (ZLHR) successfully argued that the solicitation-related arrest and conviction of 9 women violated rights to personal liberty and equal opportunity stipulated within the newly ratified constitution. The resulting court order in favor of their cases was widely interpreted as effective decriminalisation. Epidemiologic data demonstrated significant drops in the portion of sex workers stopped by police following this high-profile case,[76] illustrating the impact of policy interpretation even within criminalized environments.
- Nicaragua} is now the third country, following Colombia and Guatemala to have a sex workers' union recognized by the Ministry of Labour

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Panel 3.

Research Gaps and Priorities

Epidemiology of HIV

- Methodological innovations to better estimate size of sex work populations, contextual and structural features of HIV and ART coverage are critical to estimating priorities, reach and targets for programs and policies
- Address structural barriers to including female, male, transgender sex workers in HIV surveillance, including criminalisation, stigma, and lack of political will and donor investment
- Increased countries measuring and reporting of TG HIV data, including stigma and discrimination

Social and structural

- Expand research of social and structural measures, including more complex, multilevel data including longitudinal data, in dialogue with qualitative research, particularly in heavy HIV burden of SSA and emerging HIV endemic settings of Russia and Eastern Europe where repressive regimes and discrimination continue to hamper roll-out of biomedical interventions
- Careful monitoring of regional and local-level enforcement and arrest data alongside violence and sex worker-level evidence to disentangle fully how various policies and enforcement strategies shape violence, stigma, and access to health services and HIV care continuum
- Anchor mathematical models in more solid empirical evidence and in studies purposely designed to address this questions, in collaboration with social scientists, and in partnership with the sex work community, in order to attempt to disentangle the influence of structural interventions and policing approaches in different legal context on violence, and HIV and STI burden, and access and retention in biomedical interventions

Biomedical and implementation science

- Better integration and consideration of human rights and structural risk measures in biomedical interventions from the outset to ensure uptake of scientific advancements of PrEP, early ART initiation and self-HIV testing
- Better inclusion and integration of structural and community empowerment within and alongside biomedical interventions
- Increase in community-led and sex worker tailored implementation science and biomedical interventions
- Increased resource investment in structural and community empowerment implementation research (beyond Avahan), particularly in SSA

Policy evaluation and human rights monitoring

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- Integrating evidence on human rights of health into global funding indicators (e.g. UNAIDS, Global Fund, etc)
- Considering that many countries are currently reviewing legislation around sex work and that community-based randomised trials are unlikely to be possible in most settings, it is crucial that researchers plan in advance rigorous monitoring and evaluation of the effect of these changes on sex workers' health, safety, and human rights

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Search strategy

We updated the search done through 2013 for the *Lancet* series on sex work and HIV to include reports and manuscripts published from January 1, 2006 through September 6, 2017, focusing on biologic estimates of HIV prevalence. Search strategies were developed based on a combination of controlled vocabulary including medical subject headings (MeSH) and other keyword searches with terms associated with sex work including sex work, sex worker, prostitute, male sex workers, *banthas, fletes, hijra, khotkis, khusras*, or money boys. MeSH terms including HIV, Acquired Immunodeficiency Syndrome, HIV Infections, human immunodeficiency virus, acquired immunodeficiency syndrome, with key words including HIV, AIDS, HIV1, and HIV2.

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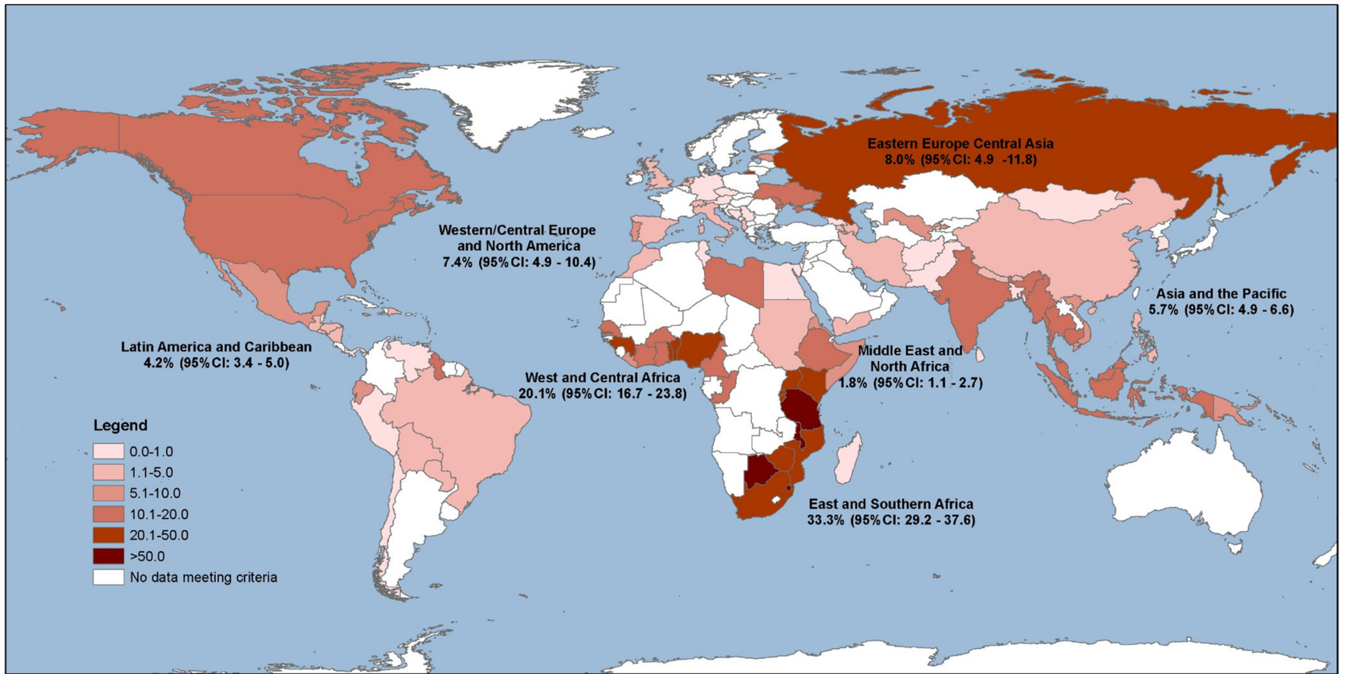

Figure 1.
Global Burden of HIV Among Female Sex Workers, 2006–2017

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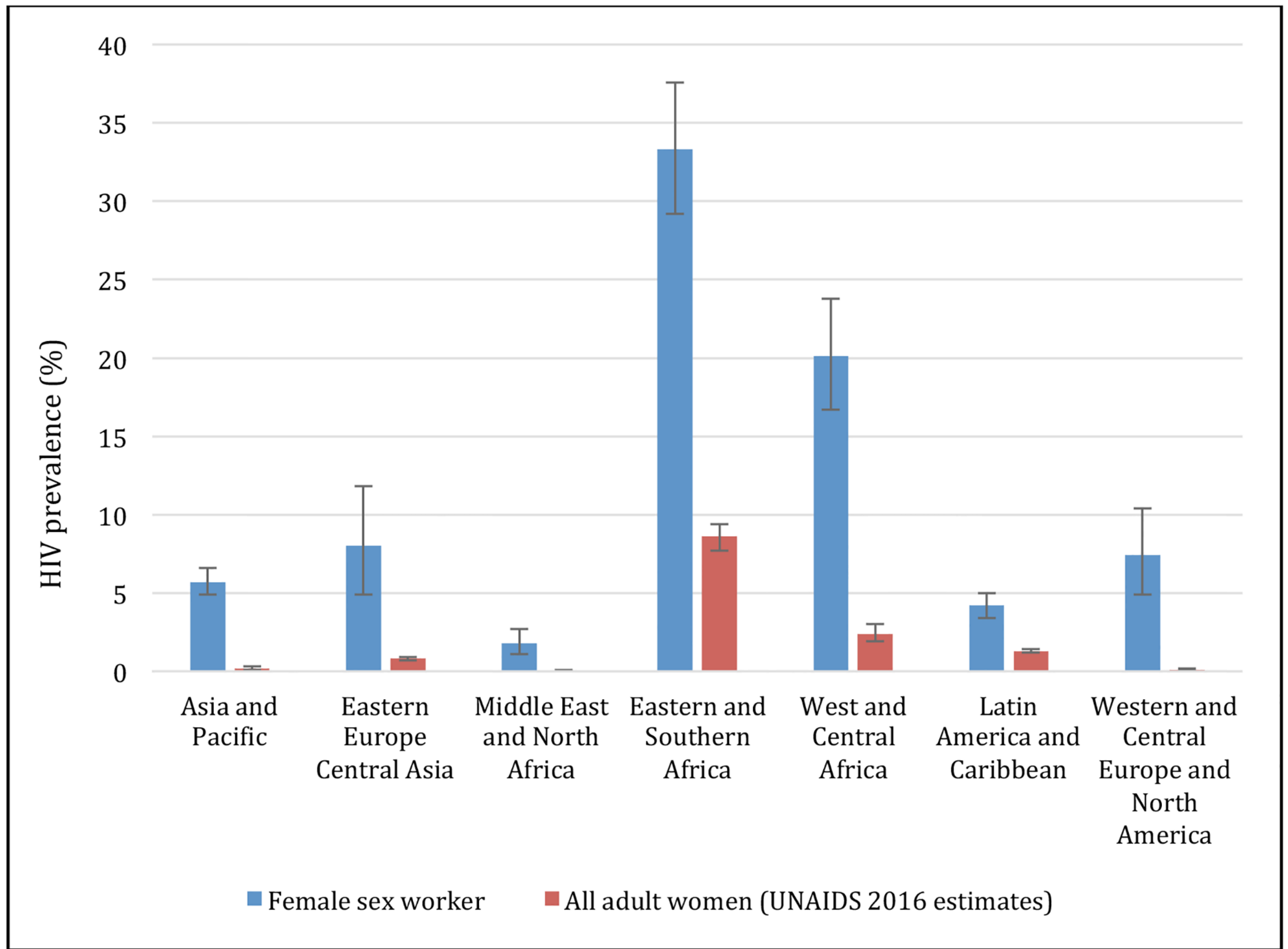

Figure 2. Regional HIV prevalence estimates among female sex workers and all adult women74

Note: error bars represent 95%CI.

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Table 1

Progress on Calls to Action For Research on HIV and Sex Work

Calls to Action	Achieved	Comments
For governments…		
Increased number of countries or regions decriminalize sex work	No	Increasing move to end- demand criminalisation models. One notable exception, South Africa.
Increased number of countries or regions end impunity for crimes and abuses against sex workers	No	
Evidence of advanced evidence-based policies and practices in partnership with SW-led organizations	No	Number of countries adopting SWIT rights-based health and HIV programming limited
Evidence of countries ending discriminatory laws, policies and practices against female, male and trans sex workers	Very slow	South Africa NAC moves to decriminalize sex work, following substantial advocacy
Evidence of increased inclusion of sex workers in HIV epidemiological surveillance and make results publically available	No	
Recognize sex work as work, and develop occupational health and safety standards, mechanisms to redress violence and other labour and rights violations	No	
For donors…		
Evidence of increased funding for HIV response among sex workers	Limited	PEPFAR; Global Fund
Raise support for the research agenda for combination HIV prevention and care services for sex workers	Yes	Increased demonstration and feasibility studies
Novel and enhanced combination prevention need to be investigated	Partial	
Support sex work-led organizations at global, regional and country levels	Slow	In November 2015, USAID and UNAIDS gave four-day workshop on SWIT in West Francophone Africa to national representatives who work with sex workers.
Funding of empowerment models to community- led organizations	Limited	
Reliable data for HIV and sex work needed including ART and condom coverage, comprehensive SRH services, migration, trafficking in persons, gender-based violence and human rights violations towards sex workers	Partial	Some progress on violence and other structural measures in heavy burden settings; Lack of adequate denominators still limit HIV burden and ART coverage estimates No integration of violence or rights-based measures in global funding indicators (e.g. UNAIDS fast track 90-90-90)
For research…		
Increased number of HIV seroprevalence and testing surveys	Yes	HIV burden data now available from 70% of countries for FSW; Still scarce HIV data for male and TG women sex workers
Increased HIV incidence data in SW	No	
Evidence of increased research for MSW and TGSW on HIV prevention and treatment	Very Slow	Limited PrEP studies include TGSW
Increased HIV data for transgender women sex workers (In 2014, only 15 countries available HIV TGW data)	Slow	In 2017, HIV TGW data available in only 18 countries
Phase 1 and 2 trials (oral and injectable PrEP; vaginal and rectal microbicides) should include SW in sufficient sample size for stratified results and for all genders	Partial	
Test feasibility and acceptability of prevention packages and trials of efficacy	Yes	Widespread roll-out of feasibility and acceptability studies of PrEP with sex workers
Increased continuum of HIV of care studies for SW	Limited	Very slow progress
Increased implementation science, community empowerment and stigma reduction studies for SW	Slow	Still majority of community empowerment interventions from South Asia (Avahan), with only 3 new studies outside South Asia

Calls to Action	Achieved	Comments
Increase studies of structural measures (risks or protective) of HIV	Partial/Slow	Increased studies of structural measures of HIV in Africa; Largely cross-sectional
Increased integration of violence, discrimination and other human rights measures into SW and HIV studies	No	Violence, discrimination and human rights measures still not included in most biomedical and implementation science studies
New studies on effect of decriminalisation on health outcomes, police, violence prevention and community empowerment interventions	Limited	Two ecological studies of decriminalisation and legalization on violence, HIV and STI outcomes (Reeves, 2017; Cunningham, 2017); No new modeling studies

SW= sex workers; TGSW=transgender women sex workers; MSW=male sex workers; ART=antiretroviral therapy; PrEP= pre-exposure prophylaxis; STI = sexually transmitted infections; SWIT= Sex Worker Implementation Tool

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Table 2

. Global burden of HIV among female sex workers from 101 countries between 2006–2017 (N=2,103,380)

Region	Number of data points	Numbers of countries with data	Sample size by region	Estimated regional HIV prevalence, % (95%CI)	I^2
Asia and Pacific	183	23	1,825,054	5.7 (4.9–6.6)	*99.8%*
Eastern Europe Central Asia	20	10	17,266	8.0 (4.9–11.8]	*98.4%*
Middle East and North Africa	19	9	11,615	1.8 (1.1–2.7)	*88.2%*
Eastern and Southern Africa	81	15	66,256	33.3 (29.2–37.6]	*99.2%*
West and Central Africa	46	14	56,640	20.1 (16.7–23.8]	*99.1%*
Latin America and Caribbean	56	17	61,196	4.2 (3.4–5.0)	*95.1%*
Western and Central Europe and North America	45	13	63,986	7.4 (4.9–10.4]	*99.2%*
Global	*451**	*101*	*2,103,380**	*10.4 (9.5–11.5)*	*99.8%*

* Includes additional manuscript that reports data from 3 countries and regions (Benin, Uganda, and India)