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Harm reduction and rights-based approaches to reduce monkeypox transmission among sex workers

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Within 6 months (May 6–Oct 3, 2022), the global outbreak of human monkeypox virus has spread to 99 non-endemic countries and disproportionately affected marginalised communities. Although monkeypox virus poses a considerable risk to sex workers, there has been little to no attention to sex workers in the public health response. To date, sex workers have not been prioritised in vaccination campaigns in most settings, with uneven access and prioritisation for men who have sex with men (MSM) being reported. The HIV and COVID-19 pandemics have highlighted the disproportionate burden of infection to sex workers across diverse settings and the urgent need to address the unmet occupational needs of sex workers that must be considered in the monkeypox virus response. Harm reduction and rights-based approaches grounded in public partnership with the sex work community are crucial, including mobile sex worker-led vaccine campaigns. Full decriminalisation of sex work and access to workplace protections, such as paid sick leave and safer work environments, are key to protecting sex workers' health.

A rapidly evolving outbreak of human monkeypox virus has spread to 99 non-endemic countries up to Oct 3, 2022.¹ The epidemiology of the current monkeypox virus is still under investigation, but it appears to be primarily spread through direct skin-to-skin or mucosal contact, but can also be transmitted through fomites (eg, contaminated objects), respiratory secretions,^{2,3} and possibly through short-range aerosols.⁴ Although monkeypox virus infections have historically occurred in endemic settings in west Africa,⁵ most monkeypox cases in the current outbreak have been reported among self-identifying MSM in non-endemic settings.^{6,7} In September, 2022, a report characterising monkeypox virus cases in 41 countries in the WHO Europe region found that less than 3% of infections were attributed to fomite exposure; however, some transmission routes were unknown.⁶

Unofficial reports describe monkeypox virus infection among people living through homelessness^{8,9} and incarceration,¹⁰ leading to guidance for people living in congregate settings.¹¹ In September, 2022, there was a case report published of a man who self-identifies as a sex worker and MSM, who is living with HIV and who shed monkeypox virus DNA in his semen for more than 3 weeks, suggesting that monkeypox virus could be sexually transmitted.¹² Monkeypox virus has also been isolated in blood, faeces, saliva, and nasopharyngeal secretions,^{7,12–16} which raises concerns that the virus could spread quickly to other susceptible populations, such as

sex workers in lower-middle-income and high-income countries.

Unlike HIV and sexually transmitted infections (STIs), whereby transmission can be prevented by internal or external condoms, preventing monkeypox virus acquisition during sex might be complicated by the fact that direct contact with monkeypox virus lesions anywhere on the body could potentially transmit the virus.^{2,3} Sex work often involves long-lasting and extensive face-to-face, skin-to-skin, mucosa-to-mucosa (eg, oral, genital, or anal) contact with multiple people. Objects that have come into contact with a lesion such as bedding, towels, or clothing could serve as fomites¹⁷—and could be more likely to transmit if they touch mucosa (eg, sex toys). For sex workers who use drugs, sharing injection or non-injection drug paraphernalia (eg, pipes, straws, and dollar bills) could theoretically transmit monkeypox virus. Since monkeypox virus can also cross the placenta,¹⁸ the reproductive and sexual health needs of sex workers who are pregnant or might become pregnant need to be considered.

Although it is currently in short supply, the two-dose JYNNEOS smallpox vaccine (Bavarian Nordic, Kvistgaard, Denmark) could confer protection for people who are unexposed but at high risk, or it could be used as post-exposure prophylaxis.^{19,20} If the vaccine results in a decreased monkeypox viral load among people who become infected, it could reduce ongoing transmission as well. However, this vaccine offers optimal immunological protection after receiving the second dose, which should be administered at least 4 weeks after the first dose.¹⁹ As mentioned, sex workers have not been prioritised for monkeypox vaccination campaigns in most settings, and vaccine shortages have led to uneven access.²¹ At times these campaigns have favoured high-income and middle-income MSM, White MSM,²² and MSM who are not sex workers, or have only included cisgender male sex workers to the exclusion of cisgender women, transgender women, and non-binary sex workers. In some settings, vaccination requires health insurance, access to a computer or smartphone to make appointments, a fixed address, photo identification, transportation, or the ability to wait in line for many hours, any of which represent considerable barriers for many sex workers with low incomes or without legal migration status. Furthermore, most sex workers live in low-income and middle-income countries where access to vaccination and treatment is almost non-existent, and where even their most basic health-care needs are not being met.

The ongoing monkeypox virus pandemic has disproportionately affected people living with HIV

Lancet Infect Dis 2022

Published Online
October 12, 2022
[https://doi.org/10.1016/S1473-3099\(22\)00661-2](https://doi.org/10.1016/S1473-3099(22)00661-2)

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infection,^{6,7} sometimes with other concurrent STIs.^{6,7,23} This disparity could suggest that immunosuppression might predispose individuals to monkeypox virus infection, or that HIV or STIs are cofactors of monkeypox virus transmission. Thus, monkeypox virus could pose a high risk to sex workers of all genders who have much higher HIV and ulcerative STI burdens than the general population, although there is substantial heterogeneity within and across regions.^{24,25}

Apart from biological pathways, sex workers could be especially susceptible to monkeypox virus infection due to structural factors in their work environments. For example, both WHO and the US Center for Disease Control and Prevention have advised people at risk to reduce their number of sexual partners, to talk to their partners about monkeypox before sex, and to avoid sexual contact with symptomatic partners. However, for people who rely on sexual transactions to financially support themselves and their families, this advice is probably not feasible, particularly for more marginalised sex workers (eg, low-income and racialised workers, or sex workers who use drugs).

Globally, most countries criminalise selling sex, purchasing sex, or acting as a third party (eg, manager or receptionist) in sex work. Research has consistently shown that sex workers often fear disclosure to health-care providers due to stigma and discrimination and breach of privacy. In addition, sex workers fear that exposure would increase the risk of arrest for them, their clients, or their colleagues, and closure of their workplaces, which would further impede access to care. MSM and transgender sex workers might also fear being targeted by homophobic or transphobic police repression or violence. Sex workers in criminalised settings are probably at increased risk for monkeypox virus infection due to high sex partner concurrency combined with structural barriers to condom use. These structural barriers include scarce workplace protections, scarce condom access, and policing tactics that drive sex work underground.²⁶ Furthermore, the absence of a supportive regulatory environment can hinder sex workers' ability to safely refuse symptomatic clients or high-risk activities that expose them to more contact with skin or bodily fluids.²⁷⁻²⁹ In the most policed contexts, criminalisation restricts sex workers' choice of clients (eg, ability to see repeat clients vs one-time clients) and their ability to take time to openly screen clients for symptoms.^{28,30} As well, in some contexts, MSM and transgender sex workers are particularly targeted with police repression and criminalisation under anti-LGBT laws, creating an additional barrier to accessing health services and to reducing transmission risks at work.^{31,32}

Developing effective monkeypox virus prevention programmes for sex workers should consider decades of experience in HIV prevention. Despite data showing high acceptability of pre-exposure prophylaxis (PrEP) among cisgender female sex workers in high-income

countries, there are also reports of breaches of confidentiality, stigma, and risk of violence, which impeded PrEP access and uptake.³³ Stigma and concerns of privacy have been compounded by homophobia and transphobia for MSM and transgender women,³⁴ including sex workers. Furthermore, similar to monkeypox virus discourse, much of PrEP access has been implemented with MSM sex workers, with little attention to cisgender or transgender women sex workers.

There are also lessons from the COVID-19 pandemic, which have disproportionately affected sex workers in lower-middle-income and high-income countries. In some studies, sex workers had higher SARS-CoV-2 prevalence than other vulnerable populations (eg, people who use drugs and people who are homeless),^{35,36} probably due to the fact that public health recommendations (eg, physical distancing) were not realistic for sex workers who faced economic hardships and food insecurity.^{35,37} As a result of criminalisation, most sex workers did not have access to paid sick leave or other government subsidies during COVID-19,³⁸⁻⁴⁰ which would further complicate the recommended 10-day isolation requirements for monkeypox virus. Several studies reported that sex workers had less access to HIV care and prevention services (eg, condoms and HIV tests) during the COVID-19 pandemic than they had before.^{37,41-43}

By contrast, in decriminalised settings, although fear of stigma in health care remains a concern,⁴⁴ sex workers report greatly improved workplace health and safety, access to justice, and partnership with public health authorities. Of key relevance to monkeypox virus prevention, in a meta-analysis, community empowerment approaches to HIV responses among sex workers in low-income and middle-income countries were associated with reductions in HIV, gonorrhoea, chlamydia, and syphilis.⁴⁵ Other promising models that should be extended to monkeypox virus include sex-worker led COVID-19 or hepatitis B vaccination clinics offered in sex work venues in partnership with medical or public health staff, mobile health services in sex work and drug use establishments in partnership with street nurses, and initiatives providing food and income support to sex workers needing to quarantine that were developed during the COVID-19 pandemic.⁴⁶⁻⁴⁸ Hepatitis B vaccination clinics held in sex worker workplaces recorded far higher vaccine coverage for sex workers than traditional health services.⁴⁹ Mobile health services have been identified as key interventions for sexual and reproductive health for sex workers⁵⁰⁻⁵² in low-income, middle-income, and high-income contexts. In a community randomised trial, mobile health services for sex workers were associated with a decrease in STI prevalence.⁵² Sex worker contact with outreach services (eg, street nurses and mobile outreach) was associated with positive health outcomes, such as increased cervical screening.

Both the HIV and COVID-19 pandemics underscore the severely harmful effects of the criminalisation of sex work and stigma and the urgent need to address the unmet occupational needs of sex workers that must be considered in the monkeypox virus response.^{47,48,53,54} Harm reduction and rights-based approaches to sex work³¹ in the context of monkeypox virus are imperative. These approaches need to include sex workers of all genders—particularly racialised and marginalised sex workers—in public health planning and messaging alongside structural interventions. Full decriminalisation of sex work and access to workplace protections (eg, paid sick leave and safer work environments) are key to protecting sex workers' health.^{26,55} Sex workers of all genders have often been among the first hit by epidemics and the last to be protected—it is long past time to change that.

Contributors

SAS conceived the Personal View and drafted the initial manuscript and revision. KS and A-LC contributed to the writing, revisions, and editing of the manuscript.

Declaration of interests

We declare no competing interests.

Acknowledgments

KS is partly supported through the National Institutes of Health (NIH; R01DA028648). SAS is partly funded by R01 DA049644-03S3. The NIH had no involvement in the writing of this manuscript or the decision to submit this Personal View for publication. The views expressed in this Personal View do not reflect that of A-LC's current employer.

References

- Global.health: a Data Science Initiative. Monkeypox 2022 global epidemiology. 2022. <https://www.monkeypox.global.health/> (accessed Sept 19, 2022).
- WHO. Monkeypox. 2022. <https://www.who.int/news-room/fact-sheets/detail/monkeypox> (accessed Sept 19, 2022).
- Centers for Disease Control and Prevention. How it spreads. July 29, 2022. <https://www.cdc.gov/poxvirus/monkeypox/if-sick/transmission.html> (accessed Sept 19, 2022).
- Gould S, Atkinson B, Onianwa O, et al. Air and surface sampling for monkeypox virus in UK hospitals. *medRxiv* 2022; published online July 21. <https://doi.org/10.1101/2022.07.21.22277864> (preprint).
- Jezek Z, Grab B, Szczeniowski MV, Paluku KM, Mutombo M. Human monkeypox: secondary attack rates. *Bull World Health Organ* 1988; **66**: 465–70.
- Vaughan AM, Cenciarelli O, Colombe S, et al. A large multi-country outbreak of monkeypox across 41 countries in the WHO European Region, 7 March to 23 August 2022. *Euro Surveill* 2022; **27**: 2200620.
- Thornhill JP, Barkati S, Walmsley S, et al. Monkeypox virus infection in humans across 16 countries—April–June 2022. *N Engl J Med* 2022; **387**: 679–91.
- Portnoy JDC. reports monkeypox cases among homeless, expands vaccine program. *The Washington Post*, Aug 4, 2022. <https://www.washingtonpost.com/dc-md-va/2022/08/04/homeless-monkeypox-dc-vaccines/> (accessed Sept 19, 2022).
- The Canadian Press. Person with monkeypox at Toronto homeless shelter moved to isolation centre. *Global News*, Aug 2, 2022. <https://globalnews.ca/news/9030426/toronto-monkeypox-homeless-shelter/> (accessed Sept 19, 2022).
- Simon S. Prison health experts are worried about monkeypox. *National Public Radio (NPR)*, July 30, 2022. <https://www.npr.org/2022/07/30/1114705987/prison-health-experts-are-worried-about-monkeypox> (accessed Sept 19, 2022).
- Centers for Disease Control and Prevention. Considerations for reducing monkeypox transmission in congregate living settings. 2022. <https://www.cdc.gov/poxvirus/monkeypox/community/congregate.html> (accessed Sept 19, 2022).
- Lapa D, Carletti F, Mazzotta V, et al. Monkeypox virus isolation from a semen sample collected in the early phase of infection in a patient with prolonged seminal viral shedding. *Lancet Infect Dis* 2022; **22**: 1267–69.
- Adler H, Gould S, Hine P, et al. Clinical features and management of human monkeypox: a retrospective observational study in the UK. *Lancet Infect Dis* 2022; **22**: 1153–62.
- Antinori A, Mazzotta V, Vita S, et al. Epidemiological, clinical and virological characteristics of four cases of monkeypox support transmission through sexual contact, Italy, May 2022. *Euro Surveill* 2022; **27**: 2200421
- Peiró-Mestres A, Fuertes I, Camprubí-Ferrer D, et al. Frequent detection of monkeypox virus DNA in saliva, semen, and other clinical samples from 12 patients, Barcelona, Spain, May to June 2022. *Euro Surveill* 2022; **27**: 2200503.
- Noe S, Zange S, Seilmaier M, et al. Clinical and virological features of first human monkeypox cases in Germany. *Infection* 2022; published online July 11. <https://doi.org/10.1007/s15010-022-01874-z>.
- Centers for Disease Control and Prevention. Safer Sex, Social Gatherings, and Monkeypox. 2022. <https://www.cdc.gov/poxvirus/monkeypox/sexualhealth/index.html> (accessed Sept 19, 2022).
- Mbala PK, Huggins JW, Riu-Rovira T, et al. Maternal and fetal outcomes among pregnant women with human monkeypox infection in the Democratic Republic of Congo. *J Infect Dis* 2017; **216**: 824–28.
- Rao AK, Petersen BW, Whitehill F, et al. Use of JYNNEOS (Smallpox and Monkeypox Vaccine, Live, Nonreplicating) for preexposure vaccination of persons at risk for occupational exposure to orthopoxviruses: recommendations of the advisory committee on immunization practices—United States, 2022. *MMWR Morb Mortal Wkly Rep* 2022; **71**: 734–42.
- Centers for Disease Control and Prevention. Considerations for Monkeypox Vaccination. 2022. <https://www.cdc.gov/poxvirus/monkeypox/considerations-for-monkeypox-vaccination.html> (accessed Sept 19, 2022).
- Cole S. Sex workers struggle to get vaccinated against monkeypox. *Vice*, Aug 5, 2022. <https://www.vice.com/en/article/3add9v/sex-workers-struggle-to-get-vaccinated-against-monkeypox> (accessed Sept 19, 2022).
- Gounder C. To stem the spread of monkeypox, health departments tap into networks of those most at risk. *Kaiser Health News*, July 27, 2022. <https://khn.org/news/article/monkeypox-health-departments-target-risk/> (accessed Sept 19, 2022).
- Ortiz-Martínez Y, Zambrano-Sánchez G, Rodríguez-Morales AJ. Monkeypox and HIV/AIDS: when the outbreak faces the epidemic. *Int J STD AIDS* 2022; **33**: 949–50.
- Baral S, Beyrer C, Muessig K, et al. Burden of HIV among female sex workers in low-income and middle-income countries: a systematic review and meta-analysis. *Lancet Infect Dis* 2012; **12**: 538–49.
- Oldenburg CE, Perez-Brumer AG, Reisner SL, et al. Global burden of HIV among men who engage in transactional sex: a systematic review and meta-analysis. *PLoS One* 2014; **9**: e103549.
- Shannon K, Strathdee SA, Goldenberg SM, et al. Global epidemiology of HIV among female sex workers: influence of structural determinants. *Lancet* 2015; **385**: 55–71.
- Yi H, Zheng T, Wan Y, Mantell JE, Park M, Csete J. Occupational safety and HIV risk among female sex workers in China: a mixed-methods analysis of sex-work harms and mummies. *Glob Public Health* 2012; **7**: 840–55.
- Shannon K, Strathdee SA, Shoveller J, Rusch M, Kerr T, Tyndall MW. Structural and environmental barriers to condom use negotiation with clients among female sex workers: implications for HIV-prevention strategies and policy. *Am J Public Health* 2009; **99**: 659–65.
- Erausquin JT, Reed E, Blankenship KM. Police-related experiences and HIV risk among female sex workers in Andhra Pradesh, India. *J Infect Dis* 2011; **204** (suppl 5): S1223–28.
- McBride B, Shannon K, Pearson J, Krüsi A, Braschel M, Goldenberg SM. Seeing pre-screened, regular clients associated with lower odds of workplace sexual violence and condom refusal amidst sex work criminalization: findings of a community-based cohort of sex workers in Metro Vancouver, Canada (2010–2019). *BMC Public Health* 2022; **22**: 519.

- 31 Lyons CE, Schwartz SR, Murray SM, et al. The role of sex work laws and stigmas in increasing HIV risks among sex workers. *Nat Commun* 2020; **11**: 773.
- 32 Baral SD, Friedman MR, Geibel S, et al. Male sex workers: practices, contexts, and vulnerabilities for HIV acquisition and transmission. *Lancet* 2015; **385**: 260–73.
- 33 Shannon K, Crago AL, Baral SD, et al. The global response and unmet actions for HIV and sex workers. *Lancet* 2018; **392**: 698–710.
- 34 Quinn KG, Dickson-Gomez J, Craig A, John SA, Walsh JL. Intersectional Discrimination and PrEP use Among Young Black Sexual Minority Individuals: The Importance of Black LGBTQ Communities and Social Support. *AIDS Behav* 2022; published online July 5. <https://doi.org/10.1007/s10461-022-03763-w>.
- 35 Strathee SA, Abramovitz D, Harvey-Vera A, et al. Prevalence and correlates of SARS-CoV-2 seropositivity among people who inject drugs in the San Diego-Tijuana border region. *PLoS One* 2021; **16**: e0260286.
- 36 Eriksen ARR, Fogh K, Hasselbalch RB, et al. SARS-CoV-2 antibody prevalence among homeless people and shelter workers in Denmark: a nationwide cross-sectional study. *BMC Public Health* 2022; **22**: 1261.
- 37 Kavanagh NM, Marcus N, Bosire R, et al. Health and economic outcomes associated with COVID-19 in women at high risk of HIV infection in rural Kenya. *JAMA Netw Open* 2021; **4**: e2113787.
- 38 Adebisi YA, Alaran AJ, Akinokun RT, Micheal AI, Ilesanmi EB, Lucero-Prisno DE. Sex workers should not be forgotten in Africa's COVID-19 response. *Am J Trop Med Hyg* 2020; **103**: 1780–82.
- 39 Pearson J, Shannon K, Krüsi A, et al. Barriers to Governmental Income Supports for Sex Workers during COVID-19: Results of a Community-Based Cohort in Metro Vancouver. *Soc Sci (Basel)* 2022; **11**: 383.
- 40 Platt L, Elmes J, Stevenson L, Holt V, Rolles S, Stuart R. Sex workers must not be forgotten in the COVID-19 response. *Lancet* 2020; **396**: 9–11.
- 41 Moyo I, Tshivhase L, Mavhandu-Mudzusi AH. Utilisation of HIV services by female sex workers in Zimbabwe during the COVID-19 pandemic: a descriptive phenomenological study. *Afr J AIDS Res* 2022; **21**: 183–93.
- 42 McClarty L, Lazarus L, Pavlova D, et al. Socioeconomic Burdens of the COVID-19 Pandemic on LMIC Populations with Increased HIV Vulnerabilities. *Curr HIV/AIDS Rep* 2022; **19**: 76–85.
- 43 Pollard R, Gopinath U, Reddy YA, et al. HIV service delivery in the time of COVID-19: focus group discussions with key populations in India. *J Int AIDS Soc* 2021; **24** (suppl 6): e25800.
- 44 Abel G. Sex workers' utilisation of health services in a decriminalised environment. *N Z Med J* 2014; **127**: 30–37.
- 45 Kerrigan D, Kennedy CE, Morgan-Thomas R, et al. A community empowerment approach to the HIV response among sex workers: effectiveness, challenges, and considerations for implementation and scale-up. *Lancet* 2015; **385**: 172–85.
- 46 Dickson EJ. Who needs CVS? How strip clubs are bringing COVID-19 boosters to the masses. *Rolling Stone*, Jan 5, 2022. <https://www.rollingstone.com/culture/culture-news/strip-club-covid-vaccine-booster-drives-maggies-toronto-1278290/> (accessed Sept 19, 2022).
- 47 Benoit C, Unsworth R. COVID-19, Stigma, and the ongoing marginalization of sex workers and their support organizations. *Arch Sex Behav* 2022; **51**: 331–42.
- 48 UN Population Fund. A rapid scoring assessment of the impact of COVID-19 on sex worker programmes in east and southern Africa. 2021. https://esaro.unfpa.org/sites/default/files/pub-pdf/condom_programme_strategy_summary-ia.pdf (accessed Sept 19, 2022).
- 49 Mak R, Traen A, Claeysens M, Van Renterghem L, Leroux-Roels G, Van Damme P. Hepatitis B vaccination for sex workers: do outreach programmes perform better? *Sex Transm Infect* 2003; **79**: 157–59.
- 50 Schwartz S, Lambert A, Phaswana-Mafuya N, et al. Engagement in the HIV care cascade and barriers to antiretroviral therapy uptake among female sex workers in Port Elizabeth, South Africa: findings from a respondent-driven sampling study. *Sex Transm Infect* 2017; **93**: 290–96.
- 51 Duff P, Ogilvie G, Shoveller J, et al. Barriers to cervical screening among sex workers in Vancouver. *Am J Public Health* 2016; **106**: 366–73.
- 52 Campos PE, Buffardi AL, Cárcamo CP, et al. Reaching the unreachable: providing STI control services to female sex workers via mobile team outreach. *PLoS One* 2013; **8**: e81041.
- 53 Wong NS, Powers KA, Tucker JD, et al. Modelling the impact of a sex work crackdown on syphilis transmission among female sex workers and their clients in South China. *Sex Transm Infect* 2021; **97**: 45–50.
- 54 Global Network of Sex Work Projects. Impact of COVID-19 on sex workers in Asia and the Pacific. 2020. <https://www.nswp.org/news/impact-covid-19-sex-workers-asia-and-the-pacific> (accessed Sept 19, 2022).
- 55 Decker MR, Crago AL, Chu SK, et al. Human rights violations against sex workers: burden and effect on HIV. *Lancet* 2015; **385**: 186–99.

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