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Concurrent sexual partnerships help to explain Africa's high HIV prevalence: implications for prevention

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As Kiat Ruxrungtham and colleagues describe in today's *Lancet*, HIV transmission in most Asian countries remains strongly associated with particularly high-risk activities—ie, injection-drug use, male-male sex, prostitution and, in China, paid donation of plasma. Although there is understandable concern that the virus could soon spread widely through the general population,^{1,2} HIV has been present in Asia for nearly two decades and such extensive spread has yet to occur. For example, analysis of trends in India suggests that HIV prevalence, both in high-risk groups and in the generally low-risk antenatal clinic population, has probably stabilised in recent years.³ It is possible that large-scale heterosexual epidemics will never emerge in most of Asia, except perhaps on the island of Papua.^{4–6} Furthermore, in some of the world's most populated countries—Pakistan, Bangladesh, Indonesia, and the Philippines, home to some one billion people—nearly all men are circumcised, further restricting the potential for extensive heterosexual spread.^{7,8}

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In chilling contrast, as Emil Asamoah-Odei and colleagues report, also in today's *Lancet*, HIV rates remain very high in much of east and especially southern Africa. The overwhelming burden of HIV/AIDS is still concentrated in this region, which accounts for only 3% of the global population yet some 50% of global HIV cases.¹ For example, infection rates in adults in South Africa, Botswana, Zimbabwe, and western Kenya range from 20 to 40%, roughly an order of magnitude higher than anywhere else in the world.

What might account for this pervasive discrepancy? The strong association between lack of male circumcision and HIV risk^{9–10} helps explain the 4–5-fold difference in HIV rates between southern and western Africa discussed by Asamoah-Odei and colleagues. However, that association does not explain why HIV has spread so much more extensively in southern Africa than in India, or in Europe, where circumcision is similarly uncommon. Although sexual cultures do vary from region to region,¹¹ the differences are not so obvious. Demographic surveys and other studies suggest that, on average, African men typically do not have more sexual partners than men elsewhere. For example, a comparative study of sexual behaviour found that men in Thailand and Rio de Janeiro were more likely to report five or more casual sexual partners in the previous year than were men in Tanzania, Kenya, Lesotho, or Lusaka, Zambia. And very few women in any of these countries reported five or more partners a year.¹² Men and women in Africa report roughly similar, if not fewer, numbers of lifetime partners than do heterosexuals in many western countries.^{13–15} Of increasing interest to epidemiologists is the observation that in Africa men and women often have more than one—typically two or perhaps three—concurrent partnerships that can overlap for months or years (figure). This pattern differs from that of the serial monogamy more common in the west, or the one-off casual and commercial sexual encounters that occur everywhere.

Morris and Kretzschmar¹⁶ used mathematical modeling to compare the spread of HIV in two populations, one in which serial monogamy was the norm and one in which long-term concurrency was common. Although the total number of sexual relationships was similar in both populations, HIV transmission was much more rapid with long-term concurrency—and the resulting epidemic was ten times greater. The effect of such concurrency on the spread of HIV is exacerbated by the fact that viral load, and thus infectivity,¹⁰ is much higher during the initial weeks or months after infection.¹⁷ Therefore, as soon as one person in a network of concurrent relationships contracts HIV, everyone else in the network is placed at risk. By contrast, serial monogamy traps the virus within a single relationship for months or years.

Morris subsequently studied sexual networks in Uganda, Thailand, and the USA.¹⁴ She found that Ugandan men reported fewer lifetime sexual partners than Thai men, but while the Thais mainly had one-off encounters with prostitutes, the Ugandan men's relationships tended to be of much longer duration. Given that the per-act probability of heterosexual HIV transmission is, on average, quite low, the much higher number of cumulative sexual acts—and hence the likelihood of transmission—within any given relationship was much greater in Uganda than in Thailand or the USA. In addition, except for prostitutes, very few Asian women have concurrent partners, whereas a larger proportion of African women do. Even though the Ugandan women in Morris' study reported fewer concurrent relationships than Ugandan men, the multiple partnerships that some of them did have helped maintain the extensive interlocking sexual networks which facilitate the generalised spread of HIV.¹⁴ Although most African women in concurrent partnerships are not prostitutes, such relationships often include a quasitransactional aspect, related to issues of gender inequality, poverty, and the globalisation of consumerism.^{18,19}

These patterns of sexual behaviour might have important implications for HIV prevention. As Ruxrungtham and colleagues discuss, consistent use of condoms has been effectively promoted in Asia's organised brothels, particularly in Thailand and Cambodia, and, for example, in the Sonagachi project in Calcutta²⁰ and among west-African sex workers in Abidjan and Senegal.^{21–23} Yet from the gay communities of Australia and San Francisco to the market towns of Uganda, it has proved much more challenging for people in ongoing longer-term relationships to consistently use condoms.^{19,22–25} Unfortunately in Africa—unlike in most of Asia—such longer-term relationships are often the ones in which HIV transmission takes place. For years, condom promotion has been a mainstay of donor-funded HIV prevention in Africa, but a recent review commissioned by UNAIDS²² concluded that, although condoms are highly effective when used correctly and consistently, “no clear examples have emerged yet of a country that has turned back a generalized epidemic primarily by means of condom promotion”. Condom availability remains a concern, especially in rural areas, but another serious problem is that although people worldwide, including Africans, are likely to use condoms during casual and commercial sexual encounters, condoms are seldom used consistently in longer-term relationships in which there is a sense of commitment and trust.^{22,26,27}

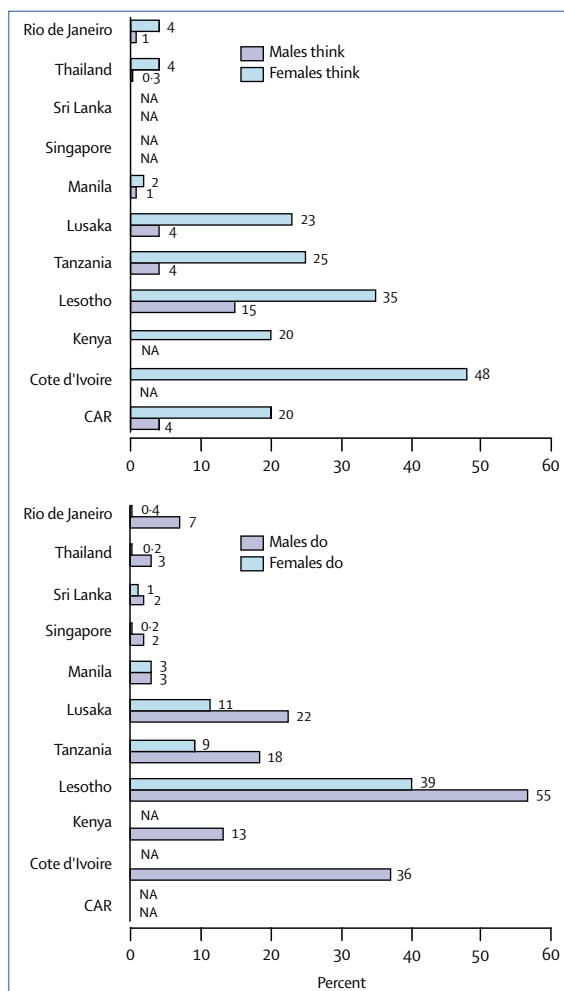


Figure: Frequency of concurrent and suspected concurrent sexual relationships Percentage of 15–49-year-olds reporting more than one regular partner or spouse (bottom), and percentage of those who believe that their partner has other regular partners (top). NA=data not available, CAR=Central African Republic. Redrawn with permission from reference 12.

Although no simple solution exists to this complex problem, we believe that in addition to condom availability and other prevention approaches in Africa, there needs to be franker discussion and concerted public-health efforts addressing the dangers of having more than one long-term sexual partner at a time. Because most Africans do not have exorbitant numbers of partners, they may not fully realise how dangerous, especially in regions of high HIV-prevalence, such behaviours actually are. In southern Africa, even people with only two lifetime partners—hardly high-risk behaviour by western standards—need to appreciate just how risky that one extra partner can be if the relationships are long-term and concurrent. The now famously successful Zero Grazing (partner reduction and faithfulness) campaign in Uganda,^{19,22,23,28,29} coupled with encouraging evidence from other places such as Zambia,^{25,29} Addis Ababa,^{1,29} and Kenya,²³ suggests that fundamental society-wide changes in sexual norms can occur in Africa, just as in other regions faced with the scourge of AIDS.

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Seizing the opportunity to capitalise on the growing access to HIV treatment to expand HIV prevention

Access to antiretroviral therapy is expanding in resource-poor settings. This long-awaited action has the potential to improve the health of millions of HIV-infected people and stabilise societies in regions hardest hit by HIV/AIDS. Little discussed, however, is the fact that expanded access to treatment also offers critical new opportunities to simultaneously strengthen HIV-prevention efforts.

More widespread access to treatment has the potential to attract millions of people into health-care settings, in which HIV-prevention messages can be delivered and reinforced. The availability of HIV treatment will provide new incentives for HIV testing, which in turn will increase opportunities for counselling on HIV prevention. And increased knowledge of serostatus will enable prevention programmes to develop interventions that are specifically tailored to the different needs of HIV-positive, HIV-negative, and untested individuals.

To achieve a sustainable response to HIV/AIDS, prevention and treatment services must be brought to scale simultaneously. Unless annual HIV incidence falls sharply from its

current level of 5 million, treatment programmes will be unable to keep pace with the number of people in need, and will become financially unsustainable.

However, there is a dynamic tension between the provision of HIV prevention and treatment. The scale-up of HIV prevention and treatment must be carefully coordinated and integrated to ensure the maximum synergistic effect. Increased availability of antiretroviral therapy can bolster prevention efforts by significantly enhancing incentives for voluntary testing,¹ reducing the stigma associated with HIV,² and potentially lowering the infectivity of HIV-positive individuals who are on antiretrovirals.³

But treatment access will also present new prevention challenges. As antiretroviral therapy reduces AIDS deaths in areas where treatment is available, the number of people living with HIV will grow. As HIV-infected people on antiretroviral therapy become healthier, they are likely to become more sexually active, potentially creating additional opportunities for HIV transmission to occur. Although knowledge of HIV infection prompts most people to take steps to avoid