

# Migration played key role in HIV spread in South Africa

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Using data collected from nearly 500 men and women living in bustling towns and rural villages, researchers from Brown University, Harvard Medical School and Imperial College London created a mathematical model that shows that migration of South African workers played a major role in the spread of HIV mainly by increasing high-risk sexual behavior.

South Africa has one of the world's highest rates of HIV infection. According to UNAIDS, the Joint United Nations Programme on HIV/AIDS, an estimated 5.5 million South Africans were living with HIV in 2005 and roughly 1,000 AIDS deaths occur in South Africa every day.

"The AIDS epidemic in South Africa is devastating – and the migration of workers played an incredibly important role in its spread," said Mark Lurie, an assistant professor in the Department of Community Health at Brown. "While the epidemic is already pervasive in South Africa, our findings have policy implications for other countries with high rates of population mobility. Countries like India and China could see a surge in HIV rates unless there is proper prevention and treatment efforts among migrants and their partners."

Lurie is a native South African and social epidemiologist. For more than a decade, he has studied HIV transmission in his home country, with a particular interest in the millions of internal and foreign labor migrants circulating among South Africa's nine provinces.

This movement is circular, Lurie explains. To earn a living, many South Africans, mostly young men, leave their rural homes to work in urban factories or mining towns then return to their villages a few times each year. After visiting their families – and reuniting with their wives – they return to dig for gold or titanium or to make paper or aluminum. This migration escalated with the end of apartheid, when travel restrictions were lifted for millions of

black South Africans.

From October 1998 to November 2000, Lurie and his team studied a total of 488 migrant and non-migrant men and women in the South African province of KwaZulu/Natal. They gathered a variety of biological and behavioral data, including HIV status, number of sexual partners, and condom use.

Using this data, Lurie led a team that studied precisely how this migration helped fuel the spread of HIV. Did the virus proliferate mainly because this movement created connections between higher-risk urban areas and lower-risk rural areas? Or did HIV spread mainly because men at work – and women at home – were separated from their sexual partners for long periods of time and therefore more likely to have unprotected sex to fill that absence?

The team created a mathematical model to find the answers. They found that without migration – and without migration-induced increases in unsafe sex – peak HIV prevalence would be less than 5 percent for migrants and non-migrants alike, as well as their sexual partners. By contrast, Lurie's primary data showed HIV prevalence to be 26 percent among migrant men and 21 percent among their partners.

"Our model showed that migration primarily influences HIV spread by increasing high-risk sexual behavior," Lurie said. "Migrant men were four times as likely to have a casual sexual partner than non-migrant men. So, when coupled with an increase in unprotected sex, we found the frequent return of migrant workers to be an important risk factor for HIV."

The model also allowed the research team to do what could not be done in the real world: Calculate HIV prevalence as if apartheid-era travel restrictions were still in place. The results were stunning: If travel restrictions had remained, and migrants were only allowed to return home

infrequently as they were under apartheid, HIV prevalence among adults would be about 4 percent, not today's 18 percent prevalence rate.

"There are lots of reasons why HIV spread rapidly in South Africa," Lurie said. "Now we know that migration is at least one critical driver. While this knowledge comes too late to stop the epidemic in South Africa, it provides a warning for countries elsewhere in Africa and Asia. In other highly mobile places, HIV prevention programs need to address increased risk behavior – and do so early, when these efforts can make a difference."

Source: Brown University

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