

RESEARCH NEWS

HIV pandemic originated in Kinshasa around 1920, say scientists

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The current HIV pandemic almost certainly originated in Kinshasa in the Democratic Republic of the Congo around 1920, a new analysis has concluded.

The city's transport links, particularly its railways, made Kinshasa one of the best connected of all central African cities and contributed to the spread of the virus, said a report published in *Science*.¹ By the end of the 1940s over a million people were travelling through Kinshasa on these railways each year.

HIV is known to have been transmitted from primates and apes to humans at least 13 times, but only one of these transmission events led to a human pandemic. Scientists from the University of Oxford in the United Kingdom and the University of Leuven in Belgium developed a statistical framework to reconstruct the genetic history of the HIV-1 group M pandemic. They concluded that from 1920 to 1950 a "perfect storm" of factors arose including urban growth, strong railway links during Belgian colonial rule, and changes to the sex trade, which contributed to HIV spreading out from Kinshasa through sub-Saharan Africa.

Oliver Pybus, a zoologist at Oxford and a study author, said, "Our research suggests that following the original animal to human transmission of the virus (probably through the hunting or handling of bush meat) there was only a small 'window' during the Belgian colonial era for this particular strain of HIV

to emerge and spread into a pandemic. By the 1960s transport systems, such as the railways, that enabled the virus to spread vast distances were less active, but by that time the seeds of the pandemic were already sown across Africa and beyond."

Nuno Faria, also a zoologist at Oxford and the study leader, said, "Our genetic data tells us that HIV very quickly spread across the Democratic Republic of the Congo (a country the size of western Europe), travelling with people along railways and waterways to reach Mbuji-Mayi and Lubumbashi in the extreme South and Kisangani in the far North by the end of the 1930s and early 1950s.

"This helped [to establish] early secondary foci of HIV-1 transmission in regions that were well connected to southern and eastern African countries. We think it is likely that the social changes around the independence in 1960 saw the virus 'break out' from small groups of infected people to infect the wider population and eventually the world."

1 Faria N, Rambaut A, Suchard M, Baele G, Bedford T, Ward M, et al. The early spread and epidemic ignition of HIV-1 in human populations. *Science* 2014;346, 56-61. doi:10.1126/science.1256739.

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