

HIV's history traced

US virus arrived early and spread fast.

Helen Pearson

New evidence has emerged that HIV was racing through the US population long before doctors woke up to a new killer disease called AIDS. The study might also help the hunt for an HIV vaccine.

Researchers have reconstructed the virus' past using the few remaining blood samples taken during the 1980s from AIDS patients in New York, California and Georgia¹.

They fed the HIV genetic sequences into a new type of statistical analysis that compares them with more contemporary ones, to estimate how fast the virus has changed and spread. The technique "looks back in time", says team member Kenneth Robbins at the Centers for Disease Control and Prevention in Atlanta, Georgia.

The results support the idea that HIV arrived in the United States around 1968, long before the first AIDS cases appeared. AIDS was first reported in 1981 and was retrospectively recognized as having struck in the late 1970s. This is compatible with HIV's roughly ten-year incubation period.

From the start, the virus probably spread like wildfire, the team says.

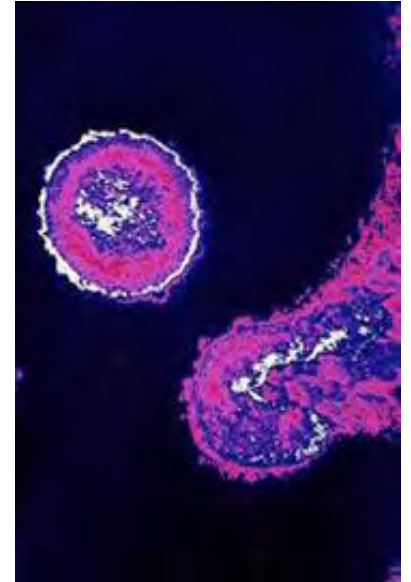
The rapid spread of the virus might help to explain why the disease finally came to light, says Michael Worobey, who studies HIV evolution at the University of Oxford, UK. It could have been because spiraling numbers passed a critical point.

Family history

HIV is thought to have jumped from African chimpanzees into humans, perhaps when they ate infected meat. One strain, called HIV-1, then spread all over the world.

Researchers are still unclear exactly how HIV arrived in the United States. One hypothesis suggests that Canadian air steward Gaetan Dugas - dubbed Patient Zero - brought in the disease and spread it to many homosexual partners.

The latest study, which includes Patient Zero's genetic sequence, fits a different scenario: that the disease entered many different times independently. Even early in the epidemic, the group found, the viruses in different cities were distinct from one another.



Contemporary strains are closely related to ancestral ones.

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“It's the first time anyone's attempted to reconstruct the epidemic history using sequences”

This supports another popular theory: that HIV may have hitched a ride with tourists arriving from Haiti. "It's the first time anyone's attempted to reconstruct this epidemic history using sequences," says Worobey.

The historical reconstruction also contains a lesson for today's vaccine researchers. Contemporary strains are more closely related to their ancestral ones than they are to each other.

This suggests that future vaccines, which researchers hope will prime the immune system to attack any HIV strain that they encounter, would be best based on an ancestral sequence. Early work on such vaccines is already under way, says Kalish.

References

1. Robbins, K.E. *et al.* U.S. Human immunodeficiency virus type 1 epidemic: date of origin, population history and characteristics of early strains. *Journal of Virology*, 77, 6359 - 6366, (2003). | [Article](#) | [ISI](#) | [ChemPort](#) |

HIV arrived in the US in the 1960s

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New evidence has emerged that HIV was racing through the US population long before doctors became aware of a new devastating disease called Aids.

Researchers have reconstructed the history of the virus using the few remaining blood samples taken during the 1980s from Aids patients in New York, California and Georgia. They used a new type of statistical analysis to compare the HIV genetic sequences of the patients with more contemporary ones to estimate how fast the virus has changed and spread. The technique "looks back in time", says team member Kenneth Robbins at the Centres for Disease Control and Prevention in Atlanta, Georgia.

The results support the idea that HIV arrived in the United States in about 1968, a long time before the first Aids cases appeared. Researchers are yet to determine how the virus arrived in the country, however.

One hypothesis suggests that Canadian air steward Gaetan Dugas - dubbed Patient Zero - unwittingly brought the disease into the US and then spread it to a substantial number of homosexual partners. The latest study, however, which includes Patient Zero's genetic sequence, fits a different scenario: that the disease entered many different times independently. Even early in the epidemic, the group found, the viruses in different cities were distinct from one another.

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