

---

# Did doctors jumpstart the HIV pandemic?

Thu, Sep 23 2010

By Frederik Joelving

NEW YORK (Reuters Health) - Perhaps it wasn't sex workers and fast-growing cities that launched HIV onto its deadly global rampage, but well-meaning doctors using dirty needles in the first half of the 20th century.

While it's hard to know for sure today, more than 90 years after the virus emerged, two new studies hint that campaigns to eradicate tropical diseases in Africa might have helped HIV gain an early foothold among humans.

"This is sort of an example of good intentions gone wrong," said Dr. Thomas Strickland, an expert in infectious diseases at Baltimore's University of Maryland, who was not involved in the research.

"They were saving lives. They just didn't know that they were also setting up the pandemic of HIV."

The virus jumped from chimps to humans -- morphing from simian immunodeficiency virus, or SIV, to human immunodeficiency virus -- in central Africa in the early 1920s.

Most likely, scientists speculate, a hunter got infected through a bite or a scratch as he prowled for bush meat and butchered it west of the Ubangi River in what is now the Democratic Republic of the Congo.

What is still a matter of debate is how a blood-borne disease infecting one or a few individuals in a remote area could ever spread to the more than 33 million people who were infected by 2008, and kill two million of them.

To try to answer that question, Dr. Jacques Pepin, of the Universite de Sherbrooke in Montreal, Canada, hopped on a plane to central Africa. His goal was to track the spread of less lethal viruses -- as proxies for HIV -- among villagers who remembered the colonial era.

For one of two studies published this month, Pepin's team knocked on doors in dozens of villages in the Central African Republic to find seniors who'd been exposed to the sleeping sickness epidemic that ravaged the area between 1936 and 1950.

They asked a bunch of questions of more than 900 villagers, including whether or not they'd been treated for sleeping sickness -- at the time a grueling, hard-to-forget series of injections, Pepin said.

The researchers also took blood samples. Because the villagers who first caught HIV would be long dead today, Pepin decided to use the less-deadly hepatitis C virus as well as another blood-borne virus (human T cell lymphotropic virus 1, or HTLV-1) as models for how HIV could have been inadvertently transmitted by the French colonial doctors treating sleeping sickness.

What they found was striking: if a person had been treated for the sleeping disease before 1951, the chances that he or she had been infected with hepatitis C tripled. And HTLV-1 showed a similar pattern.

"What happened is that for a long time, the needles and syringes used to administer the intravenous drugs were not single-use," Pepin told Reuters Health. "There were a lot of patients and not a lot of needles, so the sterilization of needles was not very efficient."

"If HIV was present in one of these patients 50 years ago, we can assume that they probably transmitted HIV," he said. "It is exactly like intravenous drug users who share needles."

According to Pepin, that would also explain why the number of people 65 years and older who'd been treated for sleeping sickness was six times lower than would be expected from historical data: the missing seniors could have died of AIDS, the immune system breakdown caused by HIV.

"Everybody now is getting infected from having sex," said Strickland, who wrote an editorial about the new findings, published in the journal *Clinical Infectious Diseases*.

"But that is not very good transmission. You can have heterosexual sex ten or fifteen times without getting infected. But if you get injected with a contaminated needle, the risk is much higher."

Pepin's other study shows that in Cameroon, a neighboring state that also used to be under French rule, massive outbreaks of hepatitis C in the first half of the 19th century were related to malaria treatment with the drug quinine.

More than half the hundreds of graying heads he rounded up had traces of an earlier hepatitis C infection in their blood.

"The most important mode of infection was the intravenous treatment of malaria," said Pepin. "If we put all of this together, it shows that there was a lot of transmission of different viruses through different interventions for tropical diseases."

"Probably HIV was transmitted as well," he argues.

But nobody is left to bear witness of what really happened, and not all scientists believe Pepin's explanation.

"It is a wonderful study on the hepatitis C virus," said Michael Worobey, a biologist at the University of Arizona in Tucson who studies the origins of HIV. "I'm not so convinced it should have been sold on the HIV/SIV angle."

His version of what happened follows the traditional line of argument among scientists: as colonial powers began building cities and railroads, they transformed former woodlands into densely populated towns rife with prostitution -- perfect hotbeds for blood-borne diseases.

Eventually an infected villager made his way to the city, setting off the HIV epidemic like a spark falling on a dry savanna.

"I think a train is a much better way to get a virus to a city than a needle," Worobey told Reuters Health.

He said the idea that doctors kicked off the HIV pandemic has been around for years. And while the new experiments are probably the first to test it, he added, they don't settle the question.

To Pepin, the two explanations aren't mutually exclusive. Dirty needles "played a substantial role that was probably as important as prostitution," he said.

Although single-use needles are now commonplace in most of the world, and unprotected sex is the major reason people get HIV, Pepin said some wisdom might still be gleaned from what he found.

"Hopefully it will make doctors a bit more prudent about novel medical interventions," he said.

SOURCE: [link.reuters.com/rak25p](http://link.reuters.com/rak25p) and [link.reuters.com/sak25p](http://link.reuters.com/sak25p) and [link.reuters.com/tak25p](http://link.reuters.com/tak25p) Clinical Infectious Diseases, online August 24, 2010.

---

© Thomson Reuters 2010. All rights reserved. Users may download and print extracts of content from this website for their own personal and non-commercial use only. Republication or redistribution of Thomson Reuters content, including by framing or similar means, is expressly prohibited without the prior written consent of Thomson Reuters. Thomson Reuters and its logo are registered trademarks or trademarks of the Thomson Reuters group of companies around the world.

Thomson Reuters journalists are subject to an Editorial Handbook which requires fair presentation and disclosure of relevant interests.

This copy is for your personal, non-commercial use only.

Friday 10 September 2010

## Needle reuse 'jump-started' HIV pandemic

Research finds injections behind early spread of the virus in Africa



Image credit:  
SXC/iwanbeijes

Changes in sexual behaviour at a time when cities were growing in sub-Saharan Africa are often cited as reasons behind the spread of the human immunodeficiency virus (HIV) after it emerged. But two research studies<sup>1,2</sup> published in *Clinical Infectious Diseases* now lend support to a less prominent hypothesis: that the virus spread through needles and syringes used to treat endemic infections, such as malaria and trypanosomiasis.

"Iatrogenic exposures may have jump-started the HIV pandemic from a few isolated cases of infected persons exposed to 'bush meat'," writes Thomas Strickland, of the University of Maryland School of Medicine, USA, in a commentary<sup>3</sup> that accompanies the articles. "This markedly increased the reservoir of infection and led to sustained human-to-human sexual transmission."

Although medical procedures are now safer, the research suggests that other zoonotic pathogens could take hold in human populations in this way once they cross the species barrier.

The hypothesis that medical interventions played a part in the early emergence of HIV was investigated by a team of researchers led by Jacques Pépin of the Université de Sherbrooke in Québec, Canada. Working in rural parts of southern Cameroon and southeastern Central African Republic, they found that two blood-borne viruses — hepatitis C and human T lymphotropic virus (HTLV)-1 — were passed on to people treated with reused medical equipment during infection control programmes in the first half of the 20th century.

The two viruses served as surrogates for HIV. "Both of the rural areas... are near sites where SIV<sub>cpz</sub> [simian immunodeficiency virus], believed to be the precursor of [HIV]-1, has been isolated from chimpanzees," says Strickland.

### Data "convincing"

In Cameroon, Pépin and colleagues surveyed people over 60 years of age, collecting basic demographic information and asking about their medical history, also testing their blood for antibodies and gene fragments of the hepatitis C virus — respectively indicating past and current infection. Getting treated for malaria intravenously, having blood transfusions, and being circumcised were each associated significantly with a high risk of infection with the virus.

The researchers adopted a similar approach in a study of over 55-year-olds in the Central African Republic. They found the risk of infection with HTLV-1 to be associated primarily with intramuscular injections of medicine against trypanosomiasis between 1947 and 1953. Treatment for this disease was also associated with the spread of a genotype of the hepatitis C virus.

Strickland finds the data convincing, adding that the circumstances described by the authors "meet several requirements for iatrogenic blood-borne infection epidemics".

Back then doctors didn't know that blood could transmit infections, and had no access to disposable needles or syringes, he explains. People usually received more than one treatment to complete the course, and in some cases several patients would be treated at the same time. Older people with a higher chance of carrying a virus would often receive medical care at the same location as children.

### Proof by proxy

"The hypothesis that transmission of HIV-1 during parenteral therapy of endemic infectious diseases... jump-started the HIV pandemic in Equatorial Africa is exceedingly insightful," says Strickland.

This explanation has been favoured by some scientists for several years. But it was "impossible to prove", explains Strickland, because HIV would have killed those infected at the time

David Gisselquist, an independent consultant based in Pennsylvania, USA, points to publications that have put across the same theory. Although in some cases the details on timing of spread vary, they suggest that unsterile injections and transfusions had a role in the spread of blood-borne viruses.

Gisselquist believes that this is a more plausible explanation of HIV emergence than changes in sexual behaviour and **urbanisation**. "Hetero[sexual] transmission alone did not transmit HIV fast enough for it to survive and spread. So why should African sex suddenly change so dramatically in the early 20th century to cause epidemics?"

What did change at that time was the introduction of invasive healthcare interventions on a large scale, says Gisselquist, first through colonial infection control programmes and subsequently with international aid-funded projects. Pépin and colleagues agree, saying the well intentioned programmes had serious unintended consequences.

"I don't know of any other plausible explanation for increasing the reservoir of infection this much," notes Strickland in an email. But he adds that after a "pool" of infection was built up, social changes leading to an increase in sexual transmission of the virus would have come into play.

### Not just HIV

"There is a definite possibility that unsafe health care is spreading not only HIV in Africa, but also other and unknown pathogens," says Gisselquist.

Writing in the commentary, Strickland highlights the public health burden of hepatitis C. Infections picked up years ago, now chronic, are leading to liver cirrhosis and driving up the incidence of hepatocellular carcinoma worldwide, he says.

Both HIV and hepatitis C viruses survive for prolonged periods outside the body. The first study to determine the survival of hepatitis C in syringes, **published recently** in the *Journal of Infectious Diseases*, found that the virus can persist for up to two months — underscoring the **importance of needle-exchange programmes** in reducing transmission.

"The only countries in the world in which HIV invades the general population are countries which do not enforce standard precautions in health care," says Gisselquist. "Those are also countries with parallel epidemics of HCV [hepatitis C] and/or HBV [hepatitis B]."

Medical practices have improved but remain unsafe in Africa, according to Gisselquist — but although UN institutions warn their own staff about the risk, the problem is "routinely neglected" in fear of causing alarm among the public. "The health aid community and international health agencies have not responded to clean up Africa's health care practices, but have rather tried to silence those who would raise issues."

But he stresses that for HIV, exposures from sex as well as infected blood need to be addressed to tackle the problem.

### References and links

1. Pépin J, Lavoie M, Pybus OG, Pouillot R, Foupouapouognigni Y, Rousset D, *et al*. Risk factors for hepatitis C virus transmission in colonial Cameroon. *Clin Infect Dis* 2010, **51**:768–76. doi: [10.1086/656233](https://doi.org/10.1086/656233)
2. Pépin J, Labbé AC, Mamadou-Yaya F, Mbélesso P, Mbadingai S, Deslandes S, *et al*. Iatrogenic transmission of human T cell lymphotropic virus type 1 and hepatitis C virus through parenteral treatment and chemoprophylaxis of sleeping sickness in colonial Equatorial Africa. *Clin Infect Dis* 2010, **51**:777–84. doi: [10.1086/656232](https://doi.org/10.1086/656232)
3. Strickland GT. An epidemic of hepatitis C virus infection while treating endemic infectious diseases in Equatorial Africa more than a half century ago: did it also jump-start the AIDS pandemic? *Clin Infect Dis* 2010, **51**:785–87. doi: [10.1086/656234](https://doi.org/10.1086/656234)

[World Health Organization information](#) on HIV/AIDS

[World Health Organization information](#) on patient safety