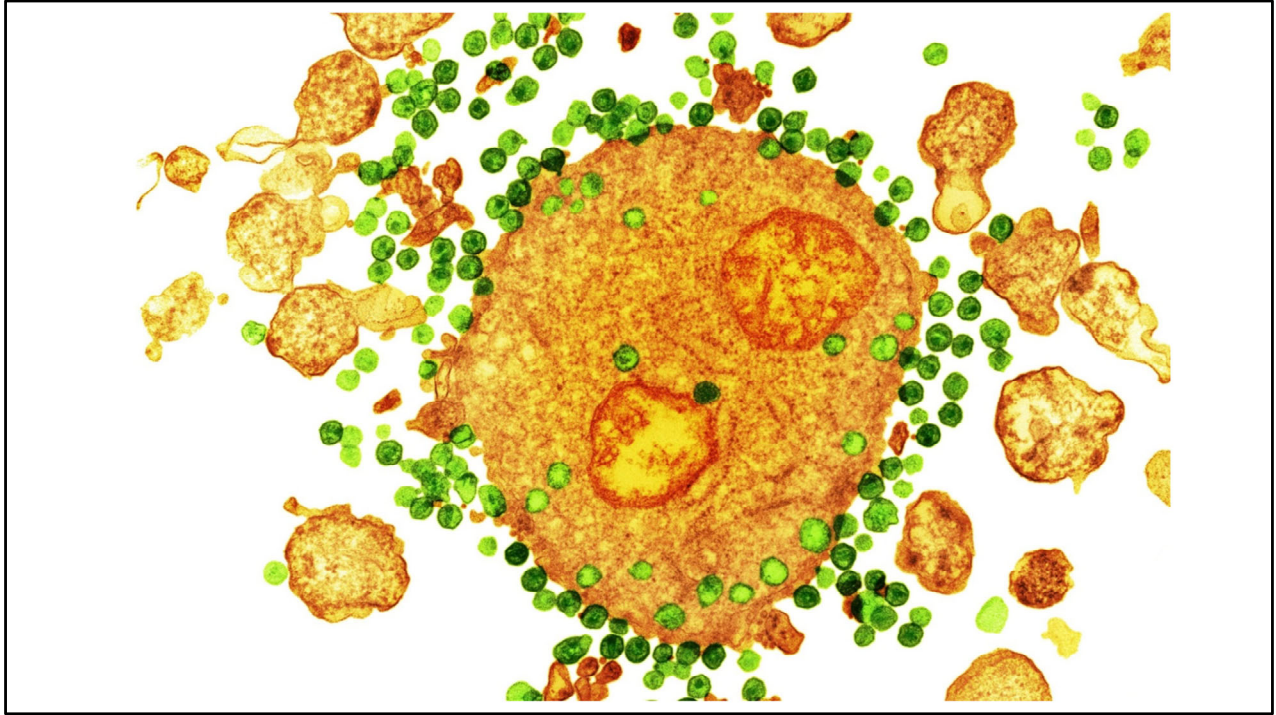




David Kirby died surrounded by his family. But Therese Frare's photograph of the 32-year-old man on his deathbed did more than just capture the heartbreaking moment. It humanized AIDS, the disease that killed Kirby, at a time when it was ravaging victims largely out of public view. Frare's photograph, published in LIFE in 1990, showed how the widely misunderstood disease devastated more than just its victims. It would be another year before the red ribbon became a symbol of compassion and resilience, and three years before President Bill Clinton created a White House Office of National AIDS Policy.

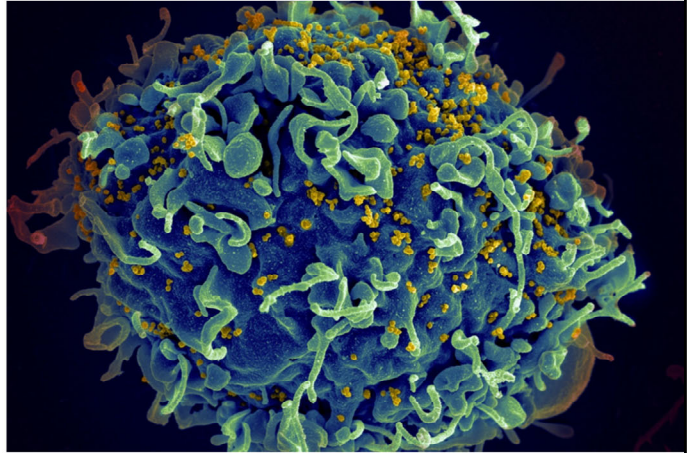
<https://www.life.com/history/behind-the-picture-the-photo-that-changed-the-face-of-aids/>



A colored transmission electron micrograph of the H.I.V. virus, in green, attaching to a white blood cell, in orange. This is the type of white blood cell that HIV attacks, CD4 cells. CD4 cells play an important role in the immune system. Your CD4 cell count gives you an indication of the health of your immune system – your body's natural defense system against pathogens, infections and illnesses. CD4 cells are sometimes also called T-cells, T-lymphocytes, or helper cells.

Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome (HIV-AIDS)

- Global pandemic that emerged in the US in early 1980s.
 - 40 million people globally were living with HIV at the end of 2023.
 - 1.3 million people became newly infected with HIV in 2022.
 - 630 000 people died from AIDS-related illnesses in 2019.
 - 88 million people have become infected with HIV since the start of the epidemic.
 - 42.3 million people have died from AIDS-related illnesses since the start of the epidemic.
 - AIDS-related deaths have been reduced by more than 69% since the peak in 1995.



<https://www.unaids.org/en/resources/fact-sheet>

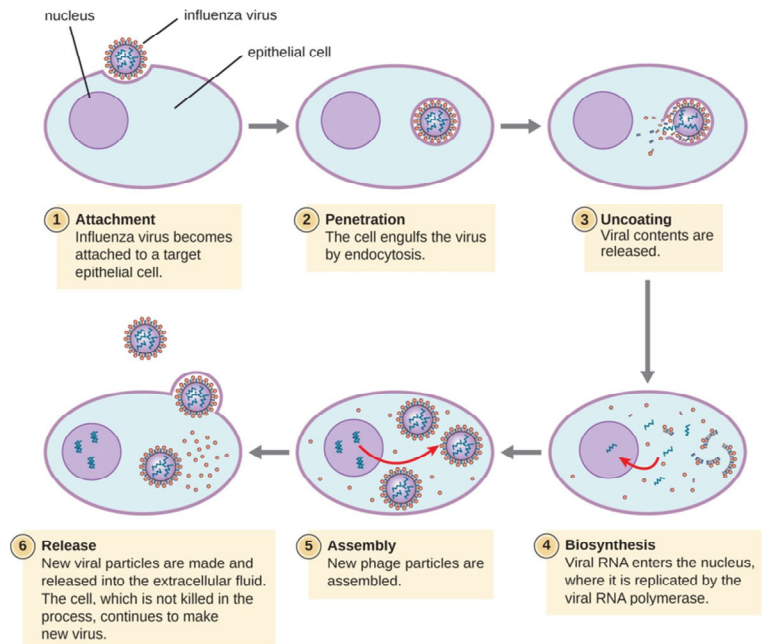
A human white blood cell, blue, under attack by H.I.V., in yellow.

<https://www.nytimes.com/2019/03/05/health/hiv-aids-cure.html>

The Spanish Influenza of 1918 killed between 20-50 million for comparison.
SARS-CoV-2 has killed 7 million people globally

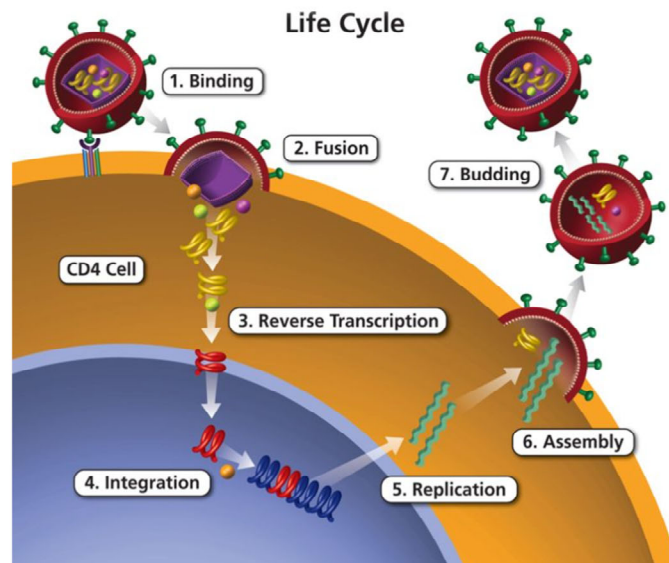
Virus replication

- Note that the viral genetic information is not incorporated into the DNA of the host cell.
- Information enters the nucleus, where the host's cellular machinery is used to make new virus.
- This is how viruses replicate.
- There are also types of viruses called retroviruses. They replicate differently.



HIV is a retrovirus

- A retrovirus is type of virus that uses RNA as its genetic material instead of DNA.
- After infecting a cell, a retrovirus uses an enzyme called reverse transcriptase to convert its RNA into DNA.
- This DNA enters the nucleus and is integrated into the DNA of the host cell
- This DNA sequence is transcribed by the hosts to produce new viral RNA
- HIV writes itself into the DNA of the host organism



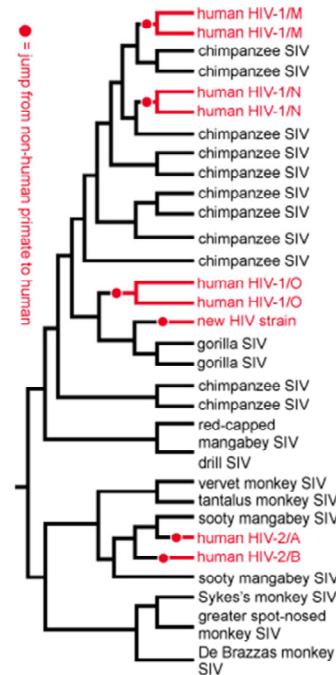
A retrovirus is different because it inserts its genome into the host's genome, thus becoming a part of the host cells.

HIV is a retrovirus and integrates into human DNA shortly after infection, making it difficult for the immune system to detect and eliminate the virus

Retroviruses carry a unique protein called reverse transcriptase (made by the Pol gene in HIV) that is responsible for turning the RNA genome into DNA. This newly synthesized DNA is then cut and pasted into the host cell DNA, and the host cell gets tricked into making a large number of proteins for the virus. The most common retrovirus is the human immunodeficiency virus or HIV, which conveys an idea of how dangerous retroviruses are.

Retroviruses evolve rapidly

- Reverse transcriptase enzyme makes around 10,000 times more errors than human polymerases, the chemicals that copy the human genome sequence when our cells divide
- Every retrovirus that is produced has on average one modification more than the retrovirus from which it originates.
- In a typical untreated HIV-1 patient with a virus load of billions of virus particles and a viral generation time of one to two days, evolution happens rapidly



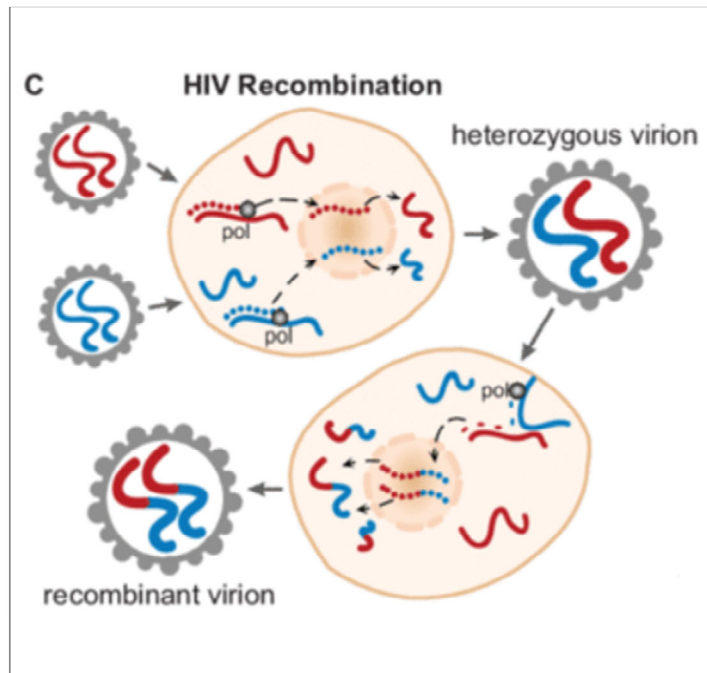
SIV – simian immune virus

HIV evolved from SIV not once but several times.

There are two forms of human AIDS virus, human immunodeficiency virus types 1 and 2 (HIV-1 and HIV-2).

Related simian immunodeficiency viruses (SIVs) are found in more than 30 species of primates in sub-Saharan Africa; each species has its own form of SIV. HIV-1 is classified into three groups, M, N, O. and P. HIV-1 strains are closely related to SIVcpz/s, from the chimpanzee subspecies *Pan troglodytes* SARS-CoV-2

- HIV can also recombine into novel forms
- Genetic material can mix and fuse inside the nucleus of the host's cells



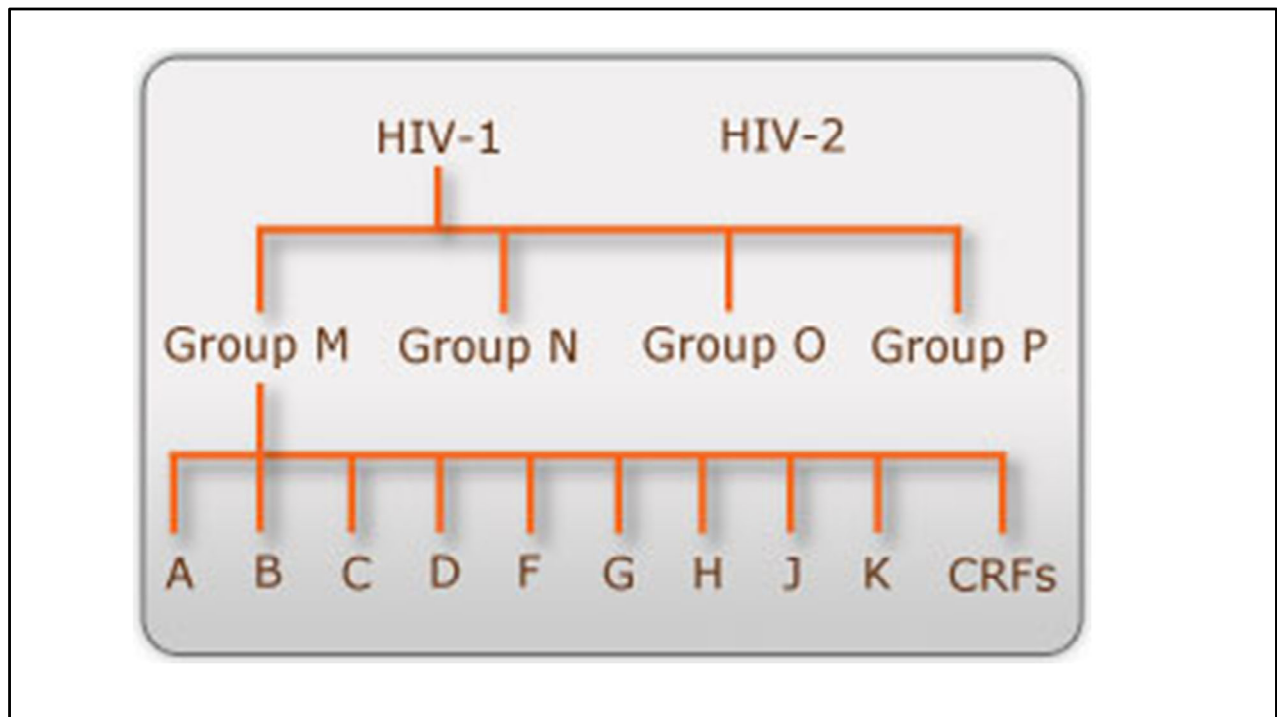
Pol is an HIV gene that makes enzymes that help transcribe the RNA of HIV into the DNA of the host cell. Pol also helps reassemble the HIV viruses made in the host

Two Strains of H.I.V. Cut Vastly Different Paths



Reading/Questions 12

Researchers traced the origins of two subtypes of H.I.V.-1. One strain seems to have passed to humans from gorillas. Matthias Graben/imageBROKER, via Corbis



<https://www.hiv.lanl.gov/content/sequence/HelpDocs/subtypes-more.html>
<https://www.hiv.lanl.gov/content/sequence/HIV/CRFs/CRFs.html>

HIV-1 is classified into three groups, M, N, O. and P.

Group M is the most common and originated from chimp SIV

Group N is rarer and derived from chimp SIV closely related to Group M.

Group O is derived from a spillover of gorilla SIV.

Group P is derived from a spillover of a chimp-gorilla SIV

HIV-1 Group M subtype distribution

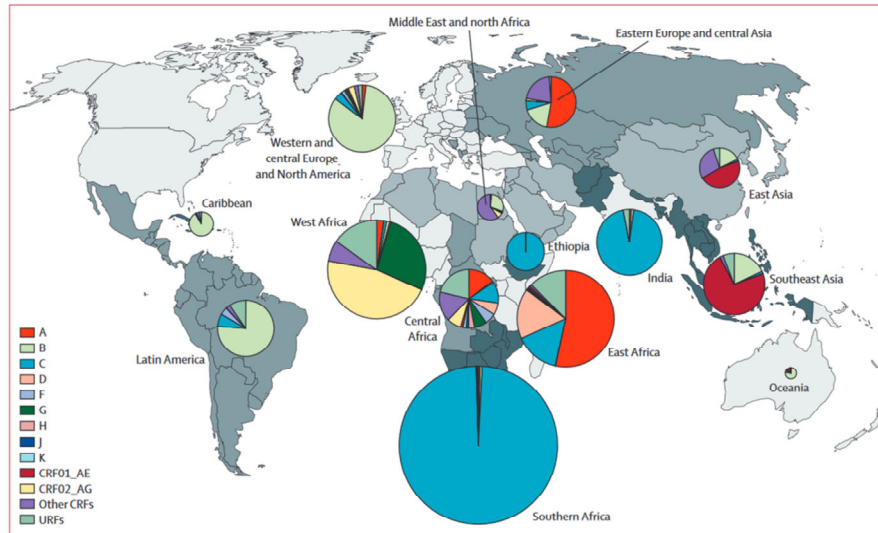
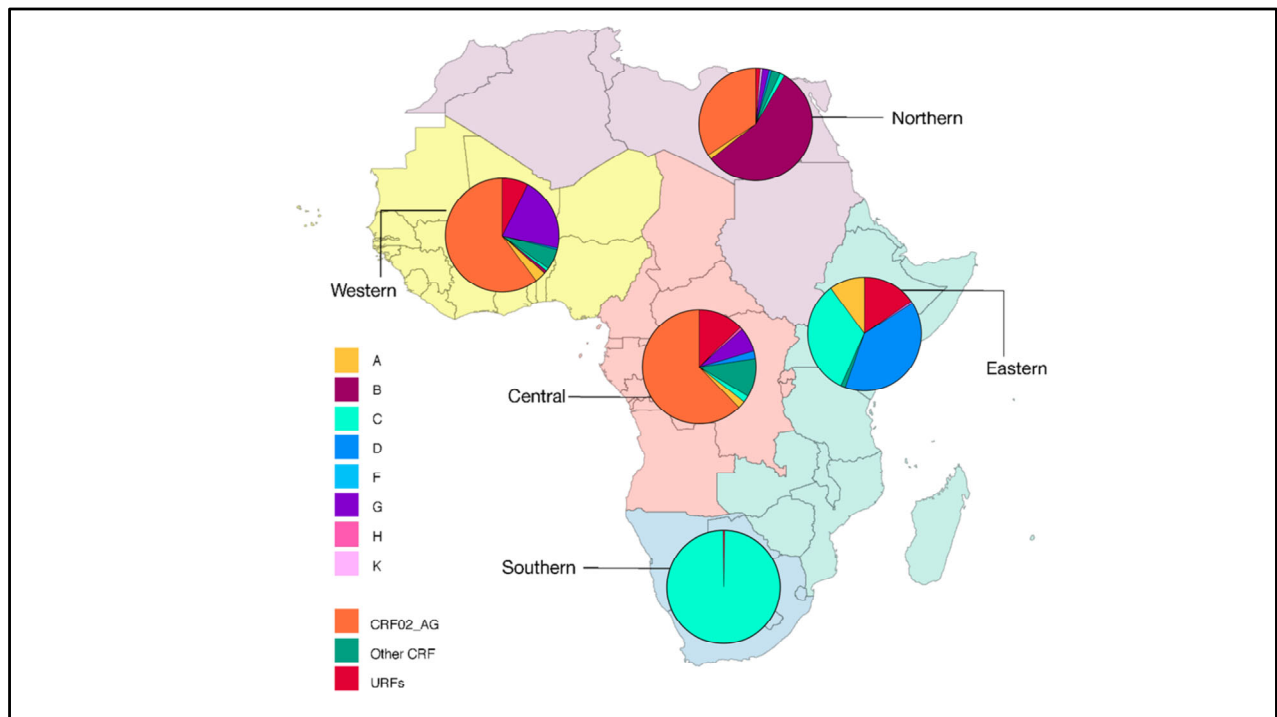


Figure 3: Regional distributions of HIV-1 subtypes, CRFs, and URFs, 2010–15
We grouped countries into 14 regions (appendix p 9). Countries forming a region are shaded in the same colour on the world map. The surface area of each pie-chart corresponds to the number of people living with HIV in each region. Equivalent maps for 1990–99, 2000–04, and 2005–09 are given in the appendix (p 16).

Each of the major HIV 1 subtypes are present in Africa and Kinshasa, a Congo city considered an early focal point for the spread of HIV.

Hemelaar, J., Elangovan, R., Yun, J., Dickson-Tetteh, L., Fleminger, I., Kirtley, S., ... & Shao, Y. (2019). Global and regional molecular epidemiology of HIV-1, 1990–2015: a systematic review, global survey, and trend analysis. *The Lancet infectious diseases*, 19(2), 143-155.



Giovanetti M, Ciccozzi M, Parolin C, Borsetti A. Molecular Epidemiology of HIV-1 in African Countries: A Comprehensive Overview. *Pathogens*. 2020 Dec 21;9(12):1072. doi: 10.3390/pathogens9121072.

This figure show the HIV-1 Group M subtypes in Africa

The spillover of HIV

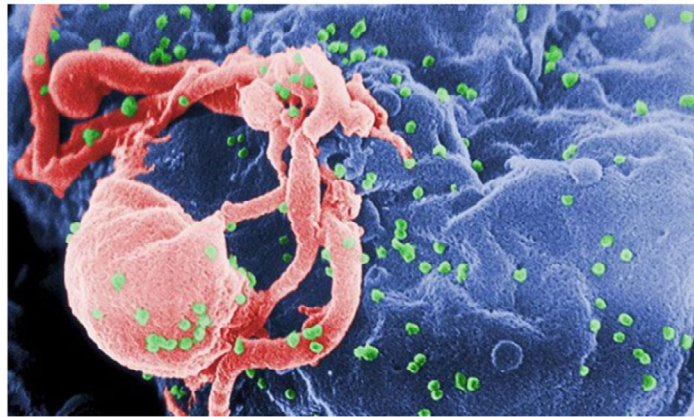
- A chimpanzee consumes two or more different monkey each with their own version of SIV (simian immune virus)
- Chimp SIV arose from the recombination of several different monkey SIV viruses
- Chimpanzee SIV was also transmitted to gorillas

The Cell That Started a Pandemic

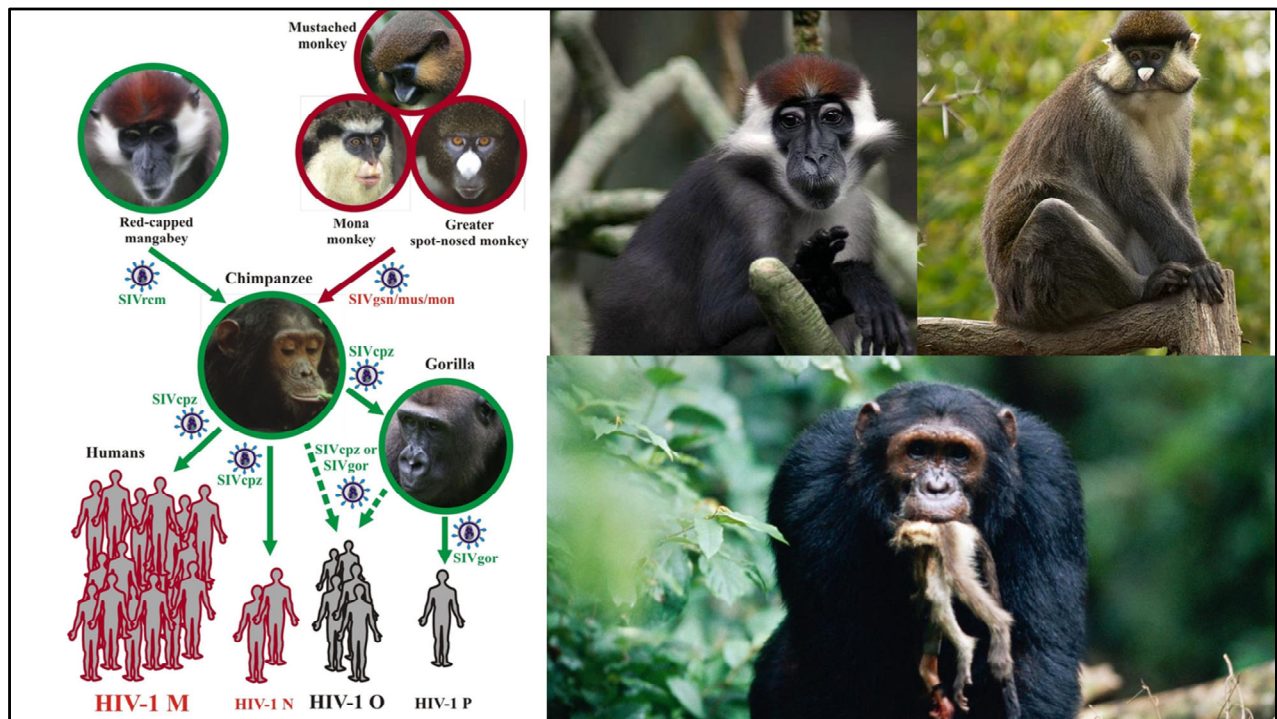
[▶ LISTEN](#) [Download](#) [Embed](#)

November 14, 2011

Podcast/Questions 12



Scanning electron micrograph of HIV-1 budding (in green) from cultured lymphocyte. This image has been colored to highlight important features.

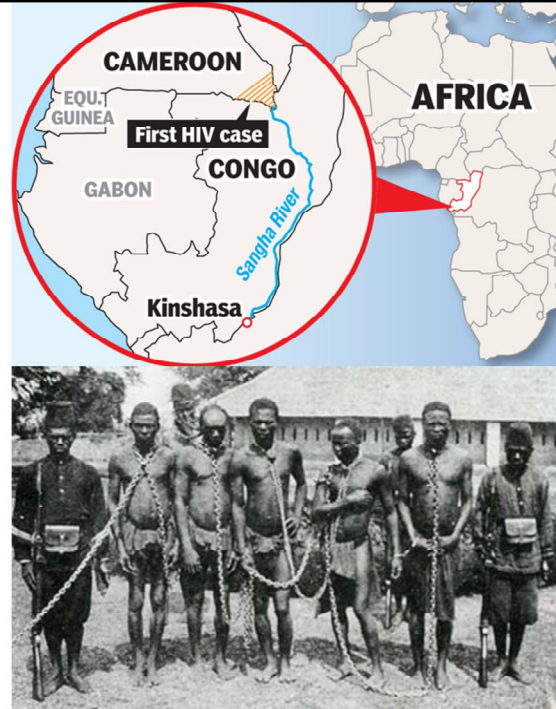


Note that the four groups of humans at the bottom represent the four spillover events of SIV into humans that formed the Groups M, N, O and P of the HIV-1 virus.

Monkeys, not chimpanzees, a primate, are where HIV began. Red-capped mangabeys and greater spot-nosed monkeys were eaten by chimpanzees. Chimps acquired SIV, the simian immunodeficiency virus, from these monkeys. When humans hunted, cleaned and consumed chimpanzees, the virus jumped into the human population. But as the figure on the left communicates, it was far more complex than this and there were multiple jumps or spillovers occurred between chimps and humans and gorillas and humans.

<https://www.nytimes.com/2015/03/02/science/two-strains-of-hiv-cut-vastly-different-paths.html>

- 1885: Belgium begins colonizing central Africa and set up the Congo 'Free' State
- In early 1900s: hunting or consumption of bushmeat leads to spillover of SIV to humans from chimpanzees, and from there humans take it to Kinshasa where it can spread
- Under Belgian political and economic rule of the 1920s, young Congolese men were coerced to leave rural villages and work for Belgian companies. HIV travels with them.



King Leopold II of Belgium sought to establish Belgium as an imperial power. He led the first European efforts to develop the Congo River basin, making possible the formation in 1885 of the Congo Free State, annexed in 1908 as the Belgian Congo and now the Democratic Republic of the Congo. Although he played a significant role in the development of the modern Belgian state, he was also responsible for widespread atrocities committed under his rule against his colonial subjects.

- During late 1800s campaigns to immunize Africans began
- Run by European colonial governments
- Involved injections of large numbers of Africans often with the reuse of needles.
- Continued through the middle 20th century although hypodermic needles had become cheaper and easier to produce
- These practices, particularly in the early immunization campaigns, may have enhanced the evolution of HIV and its spread among Africans

Table 2. Major Colonial Era Undertakings with Potential for Iatrogenic Transmission of Blood-Borne Viruses in Central Africa. Disease Treatments All Involved Injections.

Dates	Project	References
1893-1910	Up to 35 000 smallpox arm-to-arm vaccinations	25
1920-1935	Massive French anti-sleeping sickness campaign with from 60 000 to 600 000 injections per year	24,28
1930s-1950s	Campaigns undertaken against yaws, syphilis, kala-azar, and leprosy	24,30
Late 1940s-1954	Tens or hundreds of thousands of injections yearly in Leopoldville STD clinics. Many received injections prophylactically or with misdiagnosed as having STDs	24,33
1950s-1970s	Large-scale polio, yellow fever, and smallpox vaccinations. After 1960, oral polio vaccine took the place of injections	30
1940s forward	Widespread use of transfusions to treat anemia of malaria, pregnancy, sickle cell, and other diseases	29

<https://www.blackhistorymonth.org.uk/article/section/real-stories/the-history-of-aids-in-africa/>

Vance, M. A. (2019). Conflicting Views in Narratives on HIV Transmission via Medical Care. *Journal of the International Association of Providers of AIDS Care (JIAPAC)*, 18, 2325958218821961.

<https://pmc.ncbi.nlm.nih.gov/articles/PMC6748459/>

- 1950s -1960s: Emigration of Haitians to Congo to take jobs left vacant by departing Belgians, who have relinquished colonial rule of Congo.
- International travel in general is starting to become more common.
- 1960s: Haitians return to Haiti due to political transition in Congo and take HIV with them.



https://www.washingtonpost.com/national/health-science/colonialism-in-africa-helped-launch-the-hiv-epidemic-a-century-ago/2012/02/21/gIQAyJ9aeR_story.html

Haitians spoke French like the Belgians

Haitian workers went to work in the newly independent Congo in the 1960s. They went because the Belgians who had ruled over the Congo spoke French, and many Haitians spoke French. Haitian civil servants were recruited by the United Nations. They filled many of the jobs vacated by the Belgians when they left. Later, when Congo changed governments again, the Haitians were told to leave so that native Congolese could have their jobs. However, some of the Haitians had acquired HIV while in the Congo and took it back to Haiti.

- HIV detected in tissue samples from central Africa preserved from the years of 1959-1960. (see right)
- In 1969, a 16-year old dies of what is now thought to be AIDS in US Midwest suggesting HIV may have been coming into the US well before the 1980s.
- In 1976, a 29-year old Norwegian sailor and truck driver dies from what will later be determined to be HIV based on archived blood samples

Published online 1 October 2008 | Nature | doi:10.1038/news.2008.1143

News

Tissue sample suggests HIV has been infecting humans for a century

48-year-old lymph node biopsy reveals the history of the deadly virus.

Heidi Ledford

A biopsy taken from an African woman nearly 50 years ago contains traces of the HIV genome, researchers have found. Analysis of sequences from the newly discovered sample suggests that the virus has been plaguing humans for almost a century.

Although AIDS was not recognized until the 1980s, HIV was infecting humans well before then. Researchers hope that by studying the origin and evolution of HIV, they can learn more about how the virus made the leap from chimpanzees to humans, and work out how best to design a vaccine to fight it.



These paraffin-embedded tissue blocks from Kinshasa date from around 1960, and hold fragments of the HIV genome.

Dirk Teuwen

THE NEW YORK TIMES, WEDNESDAY, OCTOBER 28, 1987

Boy's 1969 Death Suggests AIDS Invaded U.S. Several Times

By GINA KOLATA

New evidence that a St. Louis teenager died of AIDS in 1969 suggests that the AIDS virus may have been introduced into the United States several times before touching off the current epidemic, according to experts in disease transmission.

Until now, many experts have assumed that the virus that causes acquired immune deficiency syndrome first appeared in the country sometime in the mid-1970's. Evidence indicates to many experts that the disease originated before then in Africa, although this has not been proved.

The patient, identified only as Robert R., died in 1969 of an illness that baffled

cities to be hit by the AIDS epidemic, which was first detected in New York and California.

In 1968 Robert R. appeared at a clinic associated with Washington University suffering from an assortment of illnesses. Most striking, said Dr. William Drake, a St. Louis pathologist who is now retired, were swollen lymph nodes in Robert R.'s neck and "swelling of the legs, lower torso and genitalia for no apparent reason."

Dr. Drake said Robert R.'s physicians tried unsuccessfully to treat him by surgically draining his lymph nodes.

Although the St. Louis doctors tried for 15 months to help Robert R., his dis-

ease followed an unremittingly downhill course. He was exhausted, he lost weight, and he was plagued with a severe infection with chlamydia, a bacteria that frequently infects gay men and that is sexually transmitted. His physicians treated him with a battery of antibiotics, but the youth died in 1969 after a bout with bronchial pneumonia, Dr. Drake said.

AIDS-Linked Cancer Found

An autopsy showed that the Robert R. had Kaposi's sarcoma, a skin cancer that is almost a hallmark of AIDS infections in gay men. The youth had just one outward sign of the cancer, a tiny

purple spot on his thigh, Dr. Drake said. But when Dr. Drake performed an autopsy, he found other Kaposi sarcoma lesions throughout the soft tissues of the youth's body.

Dr. Memory Elvin-Lewis, a chlamydia specialist at Washington University, said she was fascinated by Robert R.'s illness and wanted to study his tissues to determine the extent of his chlamydia infection. When the autopsy was done, Dr. Elvin-Lewis requested that tissues from the body be frozen so she could examine them at a later time.

Several of Robert R.'s doctors, who had since moved to the University of Arizona College of Medicine in Tucson,

<https://timesmachine.nytimes.com/timesmachine/1987/10/28/issue.html>

<https://www.nytimes.com/1987/10/28/us/boy-s-1969-death-suggests-aids-invaded-us-several-times.html>

<https://www.stlmag.com/The-Pre-Pandemic-Puzzle/>

Robert R.'s HIV was a rare, early strain—almost identical to the strain researchers first identified in Paris, but *not* the strain that became known in the late 1970s and continues to spread AIDS worldwide. Robert R.'s case teaches us something important about the history of the retrovirus. Rather than making a single blitzkrieg attack, HIV started with guerilla warfare. There may have been several different strains of the virus at low levels making incursions in different countries, At some point one of those strains got established, and that's what spread the pandemic

- 1969: Blood plasma industry in Haiti set up by Miami company.
- Sterilization procedures not practiced. Plasma shipped to US and abroad.
- 1970s: HIV is silently going global through international tourism in Caribbean and via contaminated plasma shipments



Impoverished Haitians Sell Plasma for Use in the U.S.

By RICHARD SEVERO

Special to The New York Times

PORT-AU-PRINCE, Haiti, Jan. 26—An American-owned company here is buying blood plasma from impoverished Haitians who need the money and exporting 5,000 to 6,000 liters of it every month to the United States.

The company, Hemo Caribbean, has been in operation for about eight months and reports a net profit of \$4 to \$5 a liter. A liter, which is slightly less than a quart, is the standard unit of measurement for blood and plasma in the United States.

Hemo Caribbean is owned by Joseph B. Gorinstein, a stockbroker with interests in New York and Miami. He has a 10-year contract with the

plasma is more valuable because it can be used to make other tetanus shots. They then receive \$5 a liter.

Because they are selling their plasma, and not whole blood, which contains vital red cells, the Haitians can give frequently. Mr. Thill says that some sell their plasma once a week and earn from \$150 to \$250 a year.

Blood Test Is Given

Blood plasma is used for transfusions in emergencies and for the protein elements it contains. Among other things, it yields gamma globulin, used to inoculate against hepatitis.

When a Haitian comes to

In Haiti, HIV spread because a Miami-based plasma company operating there did not observe proper medical protocols. Like here in the US and in many countries, the poor often sell their plasma (the clear component of your blood) for money. HIV-infected poor in Haiti sold their plasma to a company called Hamo-Caribbean. HIV made its way to the US in plasma sent to doctors and hospitals. Some of the first people to get HIV were hemophiliacs, who depended upon plasma to lessen the impacts of their illness. Plasma is used to obtain clotting factor, a compound given to hemophiliacs, who lack clotting factor in their own blood. In the 1970s through the 1980s, HIV began appearing in four groups here in the US, among Haitians who had immigrated to Florida, hemophiliacs who had used contaminated plasma, gay men, and heroin users. The operation paid inadequate attention to the safety of the donors and to screening of plasma for diseases and, combined with the deficiency in sterile supplies and techniques characteristic of health-care delivery in impoverished lands, that would create another “perfect storm” for HIV spread

- In early 1980s, HIV appears in gay men and a town in southeast Florida with a large Haitian population
- By this time, HIV had already likely spread to five continents (North America, South America, Europe, Africa and Australia)
- AIDS was recognized as more common in certain populations: hemophiliacs, homosexuals, Haitians, and heroin users.

Poverty-Scarred Town Now Stricken by AIDS

By JON NORDHEIMER
Special to The New York Times

BELLE GLADE, Fla., April 25 — Just 40 miles from the polo fields and glittering malls of West Palm Beach, in a farm community long locked in penury and squalor, there have been 31 cases of AIDS in the last three years.

New York City has the greatest number of victims of AIDS, or acquired immune deficiency syndrome, but the rate per million in New York is 369. For Belle Glade, where more than 20,000 people live amid flat sugar cane and vegetable fields, the rate per million is 1,500 or higher, according to Dr. Jeffrey Sacks, epidemiologist for the State of Florida.

The AIDS rate in Belle Glade "is the highest rate of occurrence that I am familiar with," Dr. Sacks said by telephone from the state capital in Tallahassee.

higher risk of contracting AIDS than the general population. Haitians have been moving into Belle Glade since the beginning of the decade, and it is estimated that 6,000 Haitian farm workers now live here.

All but five of the AIDS victims were men. "What's interesting to me," Dr. Sacks said, "is that the six victims with no risk factor are all men. I don't know how these folks got the disease but I am very suspicious of heterosexual contact. When you live in a small impoverished area like Belle Glade one of the main recreational activities is sex, and what we're seeing is a number of men who are clearly heterosexual telling us of multiple contacts with prostitutes."

"What Belle Glade tells me is that AIDS, rather than a big city phenomenon, can easily insert itself into a small

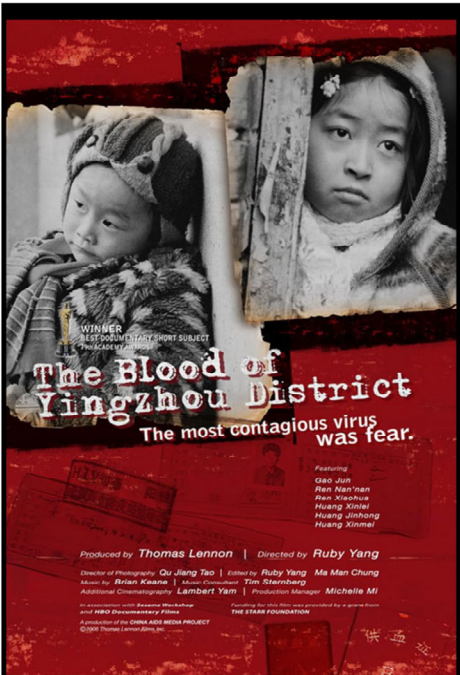
<https://www.sun-sentinel.com/news/fl-xpm-1985-04-21-8501150319-story.html>

<https://www.palmbeachpost.com/article/20101219/NEWS/812033220>

https://www.youtube.com/watch?v=pKNh_7P4pwM
Start video at 1:35

HIV-AIDS arrival and spread in China

- First detected in 1985 in foreign tourist, and shortly after in Chinese
- HIV initially appeared in intravenous drug users because parts of China are near the Golden Triangle where poppy is cultivated
- 1990s saw spike in cases among individuals who donated blood
- In rural areas of Henan, Anhui, and Shanxi provinces, blood collection stations operated with government oversight but little regulation
- They used unsafe practices, such as pooling blood from multiple donors, extracting plasma, and reinfusing blood cells back into donors
- Thousands of rural villagers became infected, creating a public health crisis that was initially covered up.



BY SIMINA MISTREANU
Updated 6:25 AM EST, December 11, 2023

Renowned Chinese doctor and activist Gao Yaojie who exposed the AIDS virus epidemic in rural China in the 1990s died Sunday at the age of 95 at her home in the United States.

Gao's outspokenness about the virus outbreak — which some gauged to have infected tens of thousands — embarrassed the Chinese government and drove her to live in self-exile for over a decade in Manhattan, New York.

<https://www.youtube.com/watch?v=FwaWZMd75hg>



This is the woman who identified the first cases in India

Thirty years ago, India discovered the dreaded HIV virus had reached its shores when blood samples from six sex workers tested positive. It was largely due to the efforts of one young scientist - but until now, her pioneering work has been all but forgotten. When it was first suggested she screen people for HIV/Aids, Sellappan Nirmala balked. It was at the end of 1985 and the 32-year-old microbiology student at the medical college in Chennai (Madras), was looking for a topic for her dissertation. The idea came from her professor and mentor, Suniti Solomon. Formal tracking of Aids cases had begun in the United States in 1982 and the medical authorities in India didn't want to be caught napping if the disease reached India. But at the time, the idea of that happening was widely considered "unthinkable", Nirmala recalls. The press at the time wrote that HIV was a disease of the "debauched West" where "free sex and homosexuality" were prevalent. Indians, on the other hand, were portrayed as heterosexual, monogamous and God-fearing.

- The first HIV cases in India were detected in 1986 in female sex workers in the city of Chennai.
- Introduced through
 - Commercial sex work, a major factor throughout Asia
 - Prostitution operates in a legal grey area in India
 - Intravenous drug use in the northeastern part of India also contributed
 - Human mobility within India and internationally played a large role here than in China

HIV-AIDS arrival and spread in India



<https://www.bbc.com/news/magazine-37183012>

Indian press saw HIV as a disease of the "debauched West" where "free sex and homosexuality" were prevalent. Indians, on the other hand, were portrayed as heterosexual, monogamous and God-fearing.

Hysteria and discrimination at the start of the pandemic

- Targeted people living with HIV–AIDS, particularly the four high-risk groups: homosexuals, heroin addicts, hemophiliacs, and Haitians.
- Various politicians called for quarantining of anyone who tested positive for HIV,
- There was an AIDS-quarantine ballot initiative in California, and various states threatened or passed conditional quarantine measures.
- Some HIV-positive children were excluded from school; two such cases — those of the three Ray brothers in Arcadia, Florida, and of Ryan White in Kokomo, Indiana — received national attention



Ryan White, a teenager from Indiana, USA who acquired AIDS through contaminated blood products used to treat his hemophilia was banned from school. On 8 April 1990, Ryan White died of an AIDS-related illness aged 18.

Terrified Americans wanted someone to blame. Federal health officials said homosexuals, Haitians, hemophiliacs and heroin users were all victims — thus effectively calling them all carriers. Many individuals felt the sting of suspicion, including Ryan White, a 13-year-old hemophiliac bullied and barred from middle school after he contracted H.I.V. from a blood-clotting factor.

The seductive lie of 'Patient Zero' and the outbreak narrative

Leyla Mei is a writer and medical historian in New York City. She has a PhD in American history and writes on topics of disease, risk and race.



Listen here

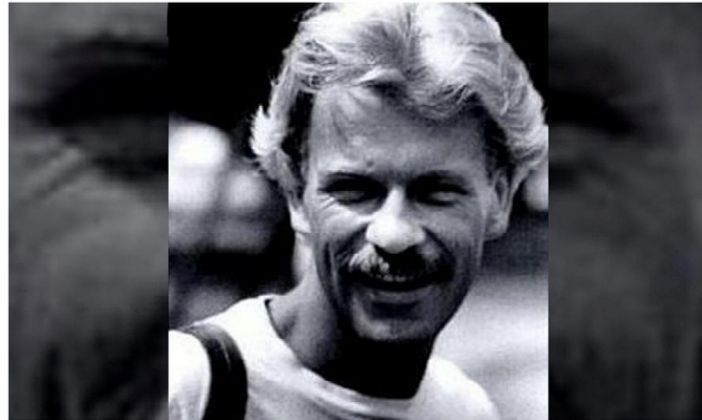
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1,400 words

Edited by Pam Weintraub



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Gaetan Dugas. Photo by Die Welt/Wikipedia

web&utm_source=header-support-banner-default

<https://aeon.co/ideas/the-seductive-lie-of-patient-zero-and-the-outbreak-narrative>

Gaetan Dugas was not the first person to spread HIV in North America. In 2016, evolutionary biologists announced that the virus likely came to New York City in 1971 and was linked to viral isolates then circulating in Haiti and other Caribbean countries. Gaetan Dugas acquired the virus domestically, in the US, rather than bringing it to the US from the Caribbean.

H.I.V. Arrived in the U.S. Long Before 'Patient Zero'

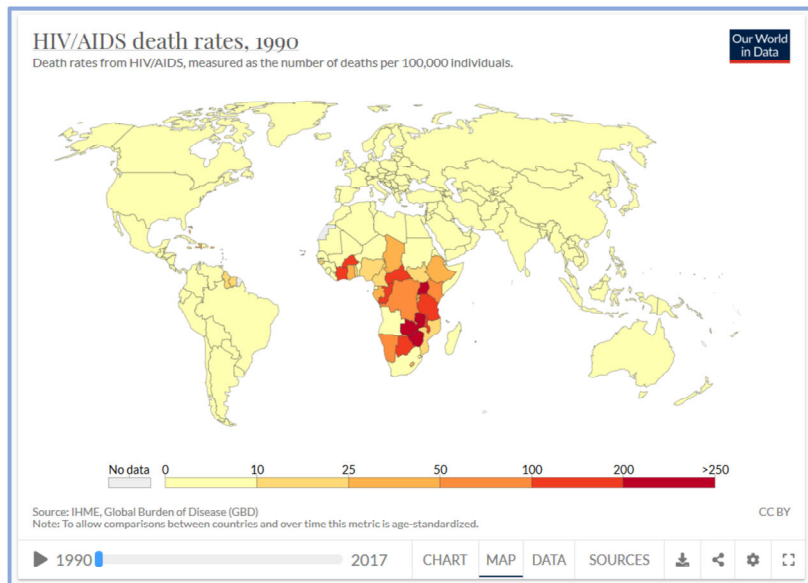


Reading/Questions 12

<https://www.nytimes.com/2016/10/27/health/hiv-patient-zero-genetic-analysis.html>

In the tortuous mythology of the AIDS epidemic, one legend never seems to die: Patient Zero, a.k.a. Gaétan Dugas, a globe-trotting, sexually insatiable French Canadian flight attendant who supposedly picked up H.I.V. in Haiti or Africa and spread it to dozens, even hundreds, of men before his death in 1984. Mr. Dugas was once blamed for setting off the entire American AIDS epidemic, which traumatized the nation in the 1980s and has since killed more than 500,000 Americans. But after a new genetic analysis of stored blood samples, bolstered by some intriguing historical detective work, scientists on Wednesday declared him innocent. The strain of H.I.V. responsible for almost all AIDS cases in the United States, which was carried from Zaire to Haiti around 1967, spread from there to New York City around 1971, researchers concluded in the journal *Nature*. From New York, it spread to San Francisco around 1976. The new analysis shows that Mr. Dugas's blood, sampled in 1983, contained a viral strain already infecting men in New York before he began visiting gay bars in the city after being hired by Air Canada in 1974.

- 1984: HIV identified as cause of AIDS
- By 1995, complications from AIDS was leading cause of death for adults 25 to 44 years old in US.
- However, recognition of HIV-AIDS and the development of drugs was delayed because federal government was slow to respond



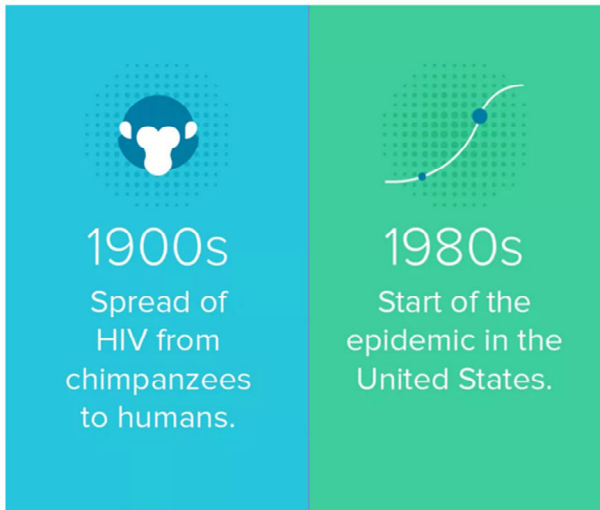


Timeline of HIV-AIDS



Why wasn't AIDS detected earlier in central Africa?

- Its capacity cause mortality may have not evolved yet
- High background mortality rates from infectious disease
- Many died outside of the few hospitals available
- Weak to non-existent public health monitoring
- Very little historical evidence available to document its early emergence
- Not enough people had it, it was only by the 1960s that several thousand people in the Congo region were likely carrying HIV



[https://en.wikipedia.org/wiki/Grethe_Rask#Illness_and_death_\(1975%E2%80%931977\)](https://en.wikipedia.org/wiki/Grethe_Rask#Illness_and_death_(1975%E2%80%931977))

- By 1970s, likely that there were surges in opportunistic infections in patients in large cities of the Democratic Republic of Congo.
- Ordinarily these are treatable diseases but can become serious in the immunocompromised and lead to death.
- Cryptosporidiosis - a diarrheal disease caused by a tiny parasite called *Cryptosporidium*.
- Cytomegalovirus - can infect multiple parts of the body including the eye, where it can lead to blindness in immunosuppressed



HIV positive person in Myanmar receiving treatment for infection of the eye with cytomegalovirus

- Kaposi's sarcoma - type of cancer caused by a herpesvirus. Small blood vessels grow abnormally and form firm pink or purple raised spots on the skin. Life-threatening when it affects organs inside the body
- Pneumocystis pneumonia (PCP)
 - PCP is a lung infection caused by a fungus



<https://www.cdc.gov/hiv/basics/livingwithhiv/opportunisticinfections.html>

Factors shaping initial spread of HIV in Africa

- Truck drivers, soldiers, and migrant laborers facilitated the movement of HIV-1 out of central Africa, as they engaged with sex workers and spread HIV along transport and trade routes.
- In mid 1980s, estimated that 30% of Ugandan truck drivers and military personnel were HIV positive
- HIV-AIDS in Africa was not predominantly a disease of gay men, heroin users, hemophiliacs and Haitians. It spread mainly through heterosexual sex.



<https://link.springer.com/article/10.1007/s11904-016-0318-8>

- Many parts of Africa then and today not as open to gay lifestyles
- Underuse of condoms, and how women were not empowered to resist unprotected relations enhanced spread
- Children could acquire it from their mothers through the placenta or during birth. Most children would die in the first few years of life from opportunistic infections

Uganda Arrests Man on Antigay Charge Punishable by Death

Prosecutors used the death penalty provision of a newly passed law to charge a 20-year-old man. The measure has sown widespread fear among gay Ugandans.

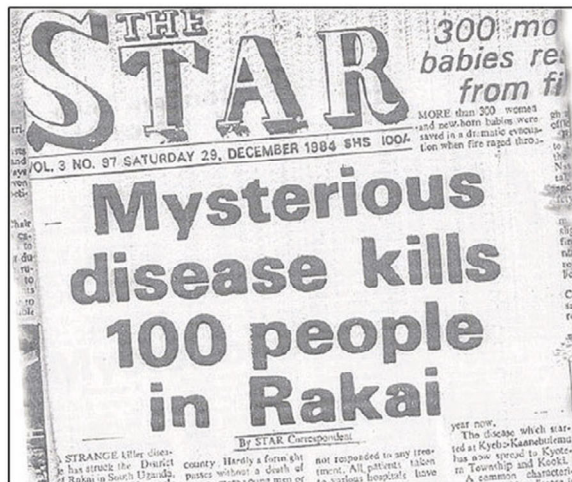
Share full article



The Ugandan Parliament in May during the passage of a bill imposing severe penalties for same-sex sexual acts. It drew condemnation from human rights groups and the United Nations. Abubaker Lubowa/Reuters

As of November 16, 2024, there have been no reported executions in Uganda under the Anti-Homosexuality Act, which was enacted in May 2023. This law includes provisions for the death penalty in cases of "aggravated homosexuality," but no such sentences have been carried out to date. However, the legislation has led to increased discrimination and violence against LGBTQ+ individuals in Uganda.

<https://www.nytimes.com/2023/08/29/world/africa/uganda-anti-lgbtq-law-charges.html>
<https://www.nytimes.com/2024/01/19/health/uganda-lgbtq-hiv.html>



How HIV/AIDS fight started in Uganda

By Agnes Kyotalengerire Added 5th November 2018 02:20 PM

It all started in a small fishing community. Patients lost so much weight that residents began to call the disease 'slim'.



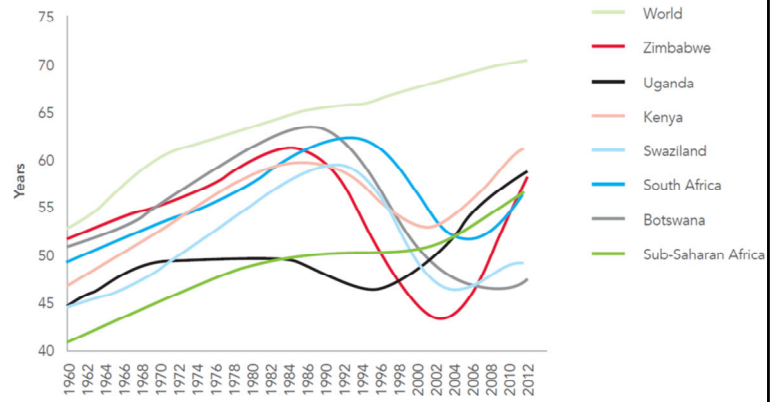
Early 1980s, in Uganda, doctors reported cases of a new, fatal wasting disease locally known as 'slim'.

https://www.newvision.co.ug/new_vision/news/1488954/hiv-aids-fight-started-Uganda

http://endeavors.unc.edu/the_first_sparks_of_the_aids_epidemic

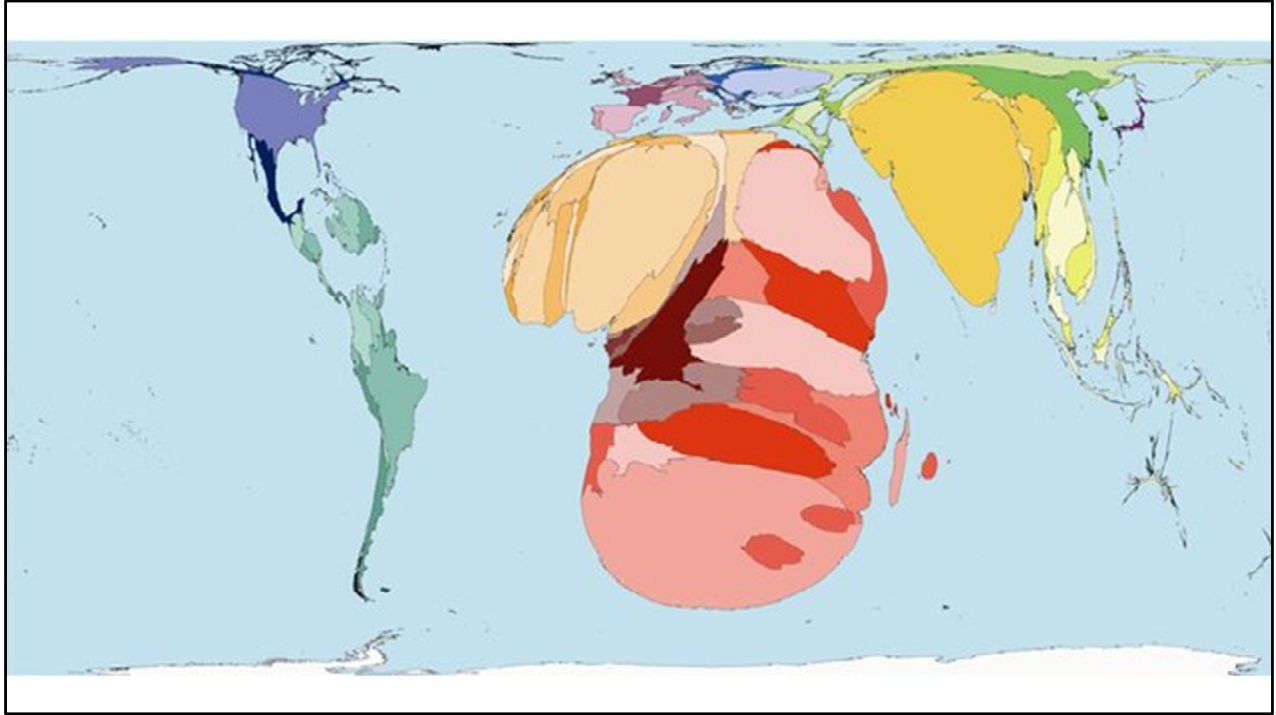
- 1980s
 - Growing epidemic in central-west Africa spreads to eastern African nations.
 - North to south transportation routes bring HIV to southern Africa.
- 1990s
 - Epidemic explodes
 - Worse in central-eastern and southern Africa than the central west African countries where it started.
 - In parts of south Africa, 25% of sexually active people have HIV

TRENDS IN LIFE EXPECTANCY DURING THE AIDS EPIDEMIC



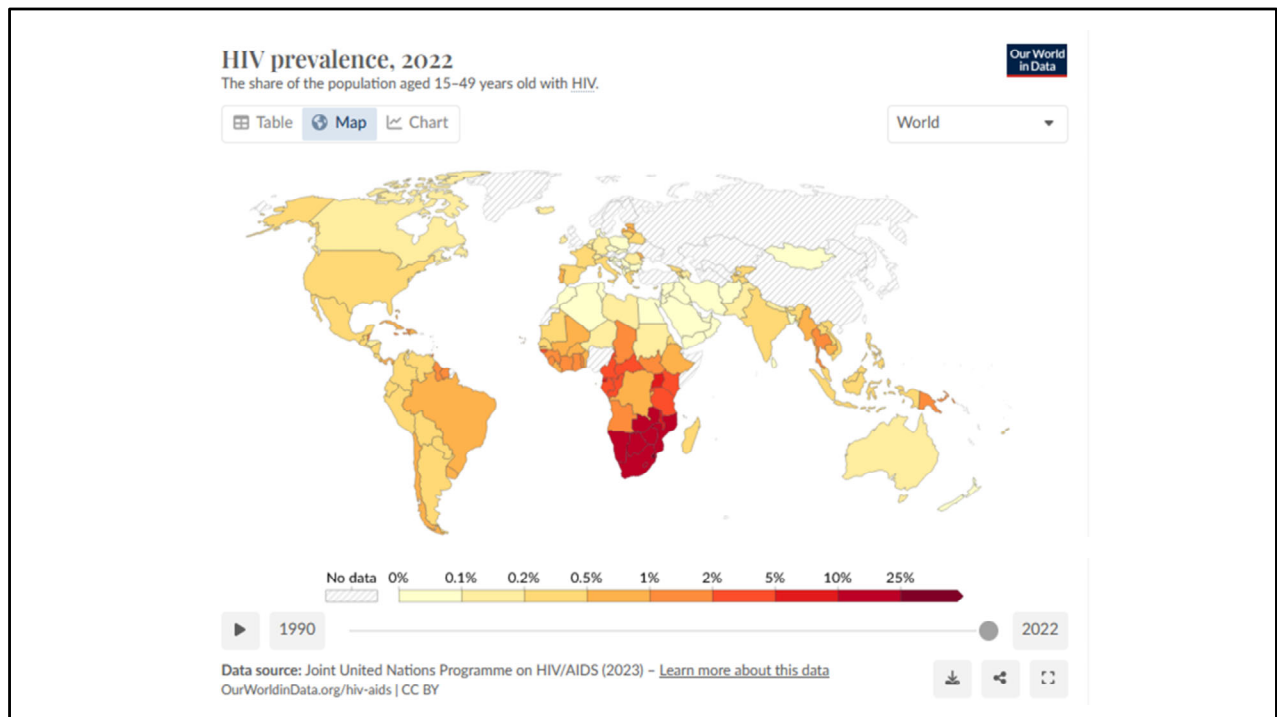
Source: The World Bank life expectancy data. <http://data.worldbank.org/indicator/SP.DYN.LE00.IN>. Accessed 15 September 2014.

<https://www.blackhistorymonth.org.uk/article/section/real-stories/the-history-of-aids-in-africa/>
 2014 UNAIDS 90-90-90



HIV/AIDS Prevalence in Africa, 2004

https://www.researchgate.net/publication/6411307_Worldmapper_The_Human_Anatomy_of_a_Small_Planet



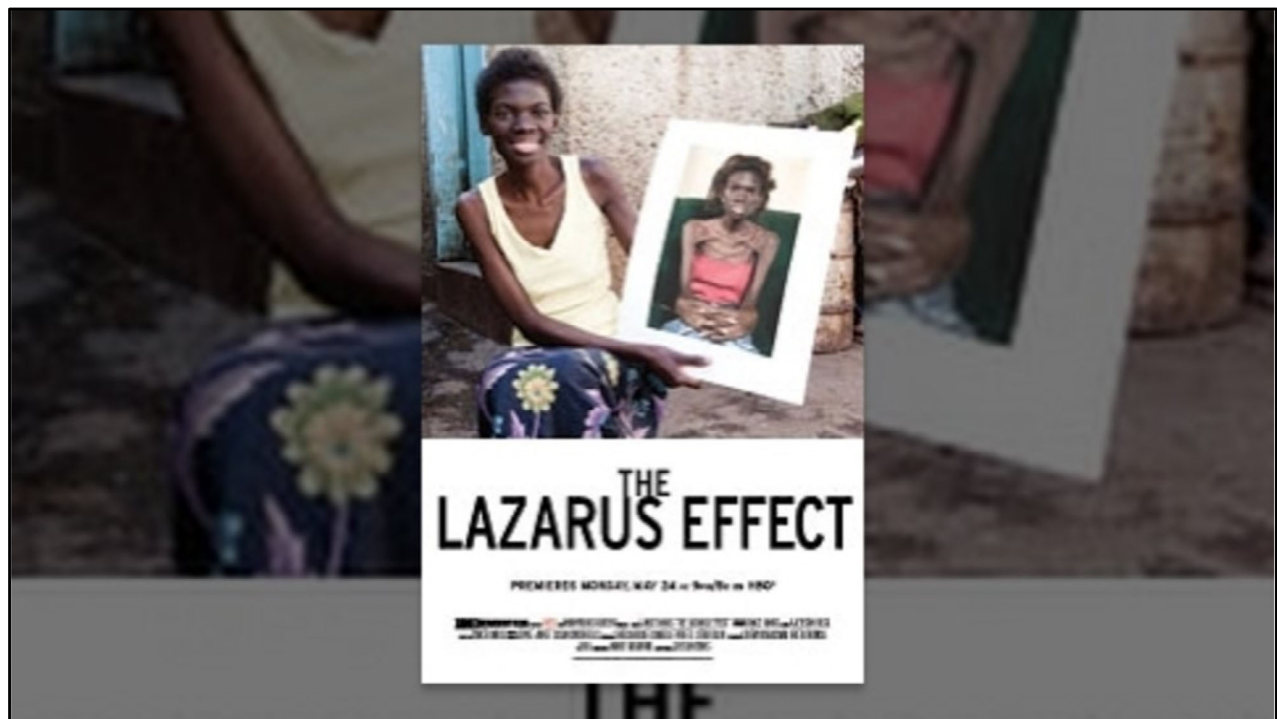
<https://ourworldindata.org/hiv-aids>

<https://www.healthdata.org/research-analysis/library/subnational-mapping-hiv-incidence-and-mortality-among-individuals-aged-15>

Both maps show data from 2019



<https://www.blackhistorymonth.org.uk/article/section/real-stories/the-history-of-aids-in-africa/>



This is the video The Lazarus Effect, from 2010. It conveys the dramatic impact of the low-cost to free HIV drugs in Africa. How did we get to this point? From where HIV was a death sentence to one in which it could be a disease to be controlled?

Start at 4:30

How did HIV-AIDS become a controllable disease?

- Social protest and activism initiated it
- Education and awareness campaigns kept it going
- Research into new drug treatments were speeded up
- Availability of generic drugs made treatments inexpensive
- Global funding initiatives distributed treatments



HIV infections have dropped by 73 percent in the past 40 years in the US

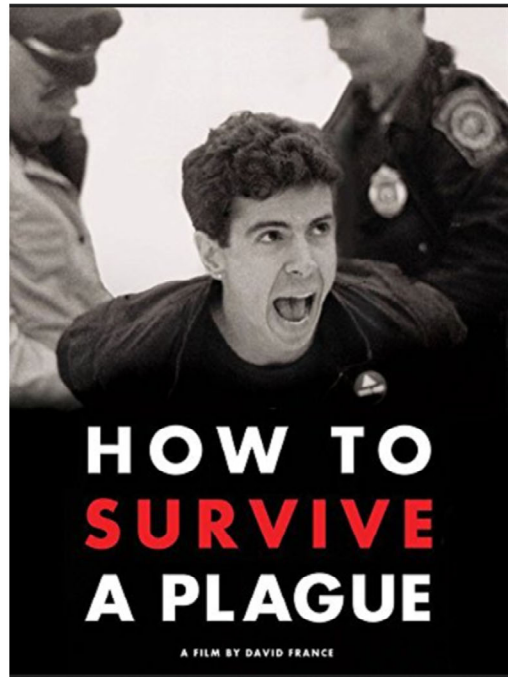
ART and PrEP

- In 1995, US FDA approved the first protease inhibitor
- This began the era of highly active **antiretroviral treatments** (ART).
- ARTs brought immediate decline of 60-80% in rates of AIDS-related deaths and hospitalizations
- Viral loads in patients on ART can become low enough to be undetectable and untransmissible
- In 2012, prep-exposure prophylactic (PrEP) drugs became available so that at risk people could prevent HIV infection

Protease inhibitors prevent viral replication by selectively binding to viral proteases and blocking production of protein precursors that are necessary for the production of new viral particles.

ACT UP (AIDS Coalition to Unleash Power) and TAG (Treatment Action Group)

- Expanded access to drugs still in the experimental stage
- Made the drug approval process for life-saving medicines faster
- Helped get highly effective HIV drugs (protease inhibitors) to the world
- Made drug trials more inclusive of diverse populations
- Created a model for health activism at local and global scales
- Set the stage for ongoing initiatives to eliminate HIV



This film documents the social protest and activism that sped up the process of testing and making available HIV drugs

- ACT UP is an example of a civil society organization.
- Civil organizations are well suited to deliver relevant HIV prevention services to key populations where and when governments be unable or choose not to.
- Governments in low- and middle-income countries often cannot provide adequate funding and support to these civil society organizations

Civil society organizations



CSOs are non-governmental organizations that operate independently from the government and for-profit businesses. CSOs include grassroots organizations, advocacy groups, charities, non-profits, community-based organizations, and think tanks

HIV Grants for Civil Society Organizations

HIV Grants Programme - UNODC Global HIV/AIDS Programme Supports Community Based Organizations, Key Partners in the HIV Response

February 2020, Vienna - The UNODC Global HIV/AIDS programme is very pleased to announce that HIV grants for Civil Society Organizations have been awarded in January 2021 to a total of nine organizations from around the globe to implement projects in three thematic areas: HIV among people in prison, HIV among people who use drugs, and HIV and law enforcement.

The empowerment of community based organizations to develop and implement HIV prevention, treatment and care services is a critical enabler for an effective response to ending AIDS by 2030.

The nine grantees are: The Al Shehab Foundation for International Development (Egypt), Best Shelter (Myanmar), the Dhaka Ahsania Mission (Bangladesh), the Dream Weaver Foundation (Malawi), Lighthouse (Viet Nam), Médecins du Monde (Tanzania), the Milestones Rehabilitation Foundation (Nigeria), Spin Plus (Tajikistan), and the Support, Research and Development Centre (Ukraine).

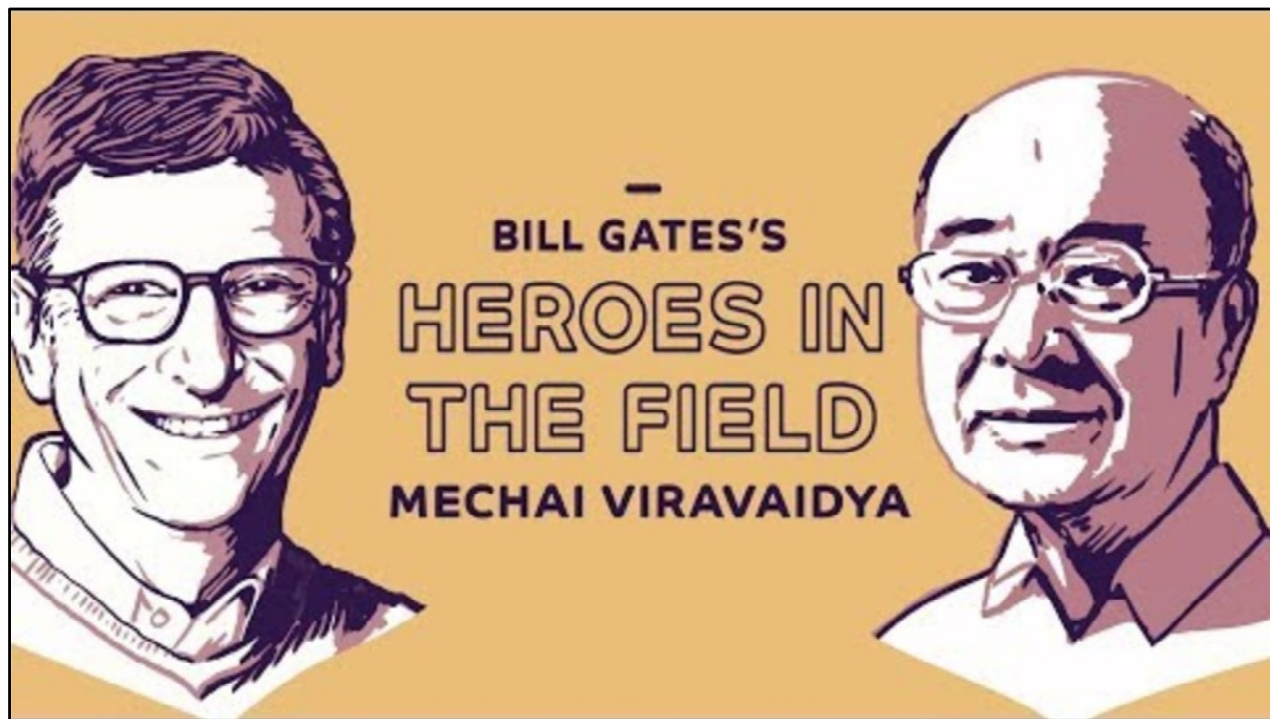
Based on the initial success of this grants programme, initiated in 2020, another round of grants will be issued further down the line in 2021.

The three largest organizations implementing the global reduction in HIV

- UNAIDS (Joint United Nations Program on HIV/AIDS) in 1996
- The Global Fund to Fight AIDS, Tuberculosis, and Malaria in 2001)
- PEPFAR (US Presidents Emergency Plan for AIDS Relief) in 2003



PEPFAR
U.S. President's Emergency Plan for AIDS Relief



https://www.youtube.com/watch?v=MZ42XmzAzJQ&t=76s&ab_channel=BillGates
<https://www.nytimes.com/2022/08/05/world/asia/thailand-aids-overpopulation-mechai.html>

Is PEPFAR neocolonialist?

- Countries, international organizations and individuals providing financial and material aid for HIV-AID are seen by some as paternalistic and reflective of negative older colonial relationships
- Criticism raised that not enough emphasis placed on addressing larger economic improvements addition to providing lifesaving HIV treatments

British colonial law linked to higher HIV rates among women in sub-Saharan Africa

The likelihood that a woman in sub-Saharan Africa has HIV today is linked to whether her country was once colonized by Britain or a continental European country.

by Carmen Nobel | June 23, 2018 |

HIV/AIDS



<https://journalistsresource.org/economics/colonial-law-hiv-africa-women/>

HIV TREATMENT CAN NORMALIZE SURVIVAL

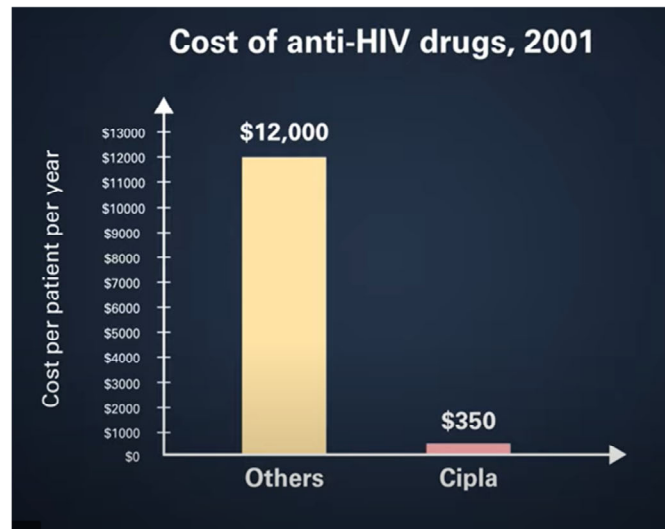


Expected impact of HIV treatment in survival of a 20 years old person living with HIV in a high income setting (different periods)

Source: Samji H et al., PLoS ONE, 2013.

Cipla

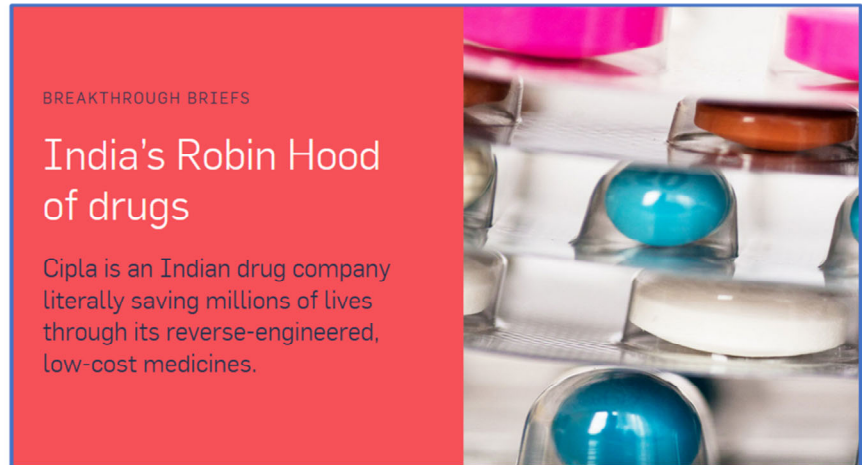
- ART was expensive and unavailable in low and middle income countries until the Indian drug company Cipla made inexpensive versions available in 2001



<https://www.livehistoryindia.com/story/eras/ciple-pharma>

<http://breakthrough.unglobalcompact.org/briefs/cipla-indias-robin-hood-of-drugs-yusuf-hamied/>

- Since 1972, India views patents as only applying to a product not the process. By making the same drug through a different process, they make drugs available at a lower price



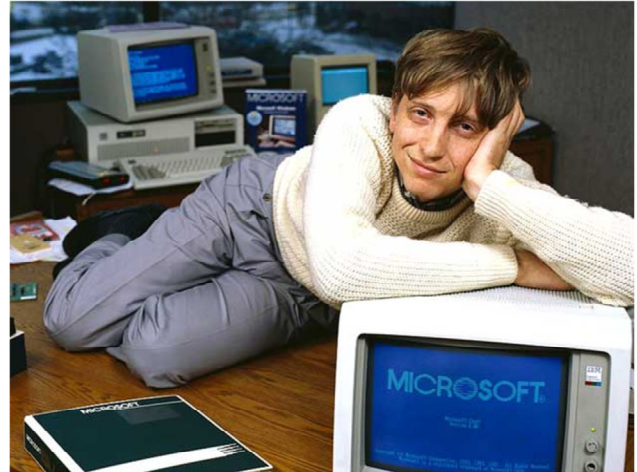
Since 1972, Indian Government policy has dictated that, in food and health, you cannot patent a product; you can only patent a process. Cipla and other drug companies reverse engineer medicines, they take a drug and figure out a way to make it through a different process. Then this drug can be sold as a generic without breaking patent laws. But it is not an entirely unproblematic enterprise politically economically.

<https://www.livehistoryindia.com/story/eras/ciple-pharma>

<http://breakthrough.unglobalcompact.org/briefs/cipla-indias-robin-hood-of-drugs-yusuf-hamied/>

- In 2002, the Global Fund to Fight AIDS, Tuberculosis and Malaria was established with \$1.9 billion in pledges from the G8 nations, and charitable non-profit organizations
- The G8, or the Group of 8 is made up of Canada, France, Germany, Italy, Japan, Russia, the USA and the UK.
- Bill and Melinda Gates Foundation is a major supporter. Bill Gates was the inventor of Microsoft and the Windows operating system

Global HIV-AIDS initiatives after Cipla



- In 2003, President George W. Bush announced creation of the President's Emergency Plan for AIDS Relief (PEPFAR)
- Began with a budget of \$15 billion for 5 years and was intended to bolster treatment and prevention in the hardest-hit countries, particularly in sub-Saharan Africa
- Pays for ART and efforts to prevent the spread of the virus

Bush demanded billions for AIDS in Africa at his 2003 State of the Union. It paid off.

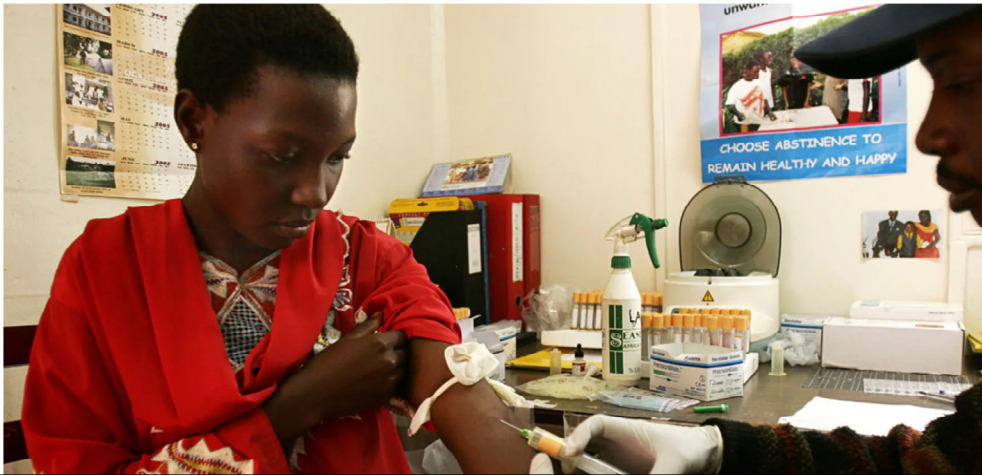
President George W. Bush stunned the world by proposing what many thought impossible: providing wide access to HIV treatment in poor countries devastated by AIDS.



GLOBAL HEALTH

The U.S. Program That Brought H.I.V. Treatment to 20 Million People

Over two decades, Pepfar may have saved an estimated 25 million lives, helping to slow the AIDS pandemic.



In Uganda, one of the first countries supported by Pepfar, the program has prevented nearly half a million H.I.V. infections since 2004 and saved more than 600,000 lives.
Per-Anders Pettersson/Getty Images

<https://www.nytimes.com/2023/03/14/health/pepfar-hiv.html>

PEPFAR has saved 20 million lives

- “That’s more than all the Jews killed in the Holocaust and all the people killed in the genocides of Armenians, Cambodians, Rwandans, Bosnians, Darfuris and Rohingya; all the confirmed deaths from Covid worldwide; all the deaths of American troops in all wars in the country’s history back to 1776; all the gun deaths in the United States in the last half-century; and all the auto deaths in the United States in the last half-century — combined”

<https://www.nytimes.com/2023/04/08/opinion/aids-pepfar-bush.html>

- PEPFAR received short-term reauthorization from Congress in March 2024.
- Extends the program until March 2025, but it does not include the typical five-year renewal granted in previous cycles
- Negotiations for a longer-term reauthorization have been stalled due to disagreements in Congress revolving around party politics
- PEPFAR continues to operate under the current funding, but its long-term future remains uncertain without a more stable reauthorization

Bush's Institute Issues an Urgent Plea for Congress to Renew His AIDS Program

PEPFAR, created by President George W. Bush in 2003 to combat the disease, faces an uncertain future now that its authorizing legislation has lapsed.

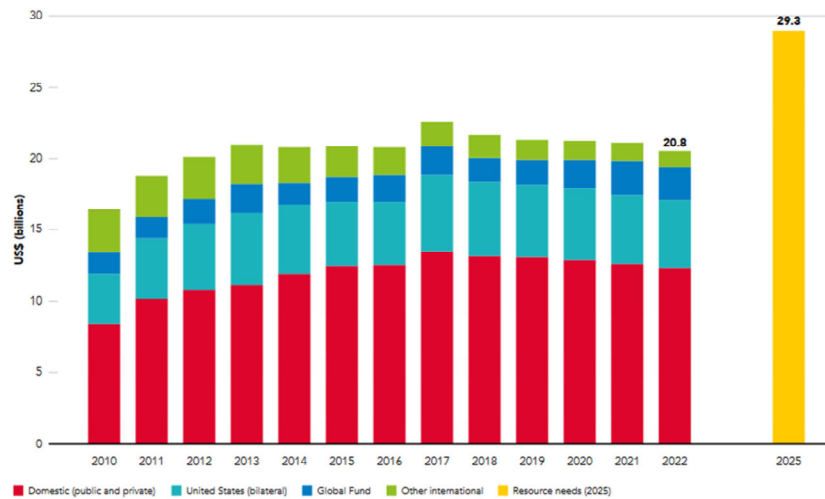
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Although former President George W. Bush did not sign the letter urging Congress to renew his AIDS program, he has made no secret that he wants the program reauthorized. Alex Wong/Getty Images

The global HIV funding gap is widening

Figure 0.3 Resource availability for HIV in low- and middle-income countries by source, 2010–2022 and 2025 target



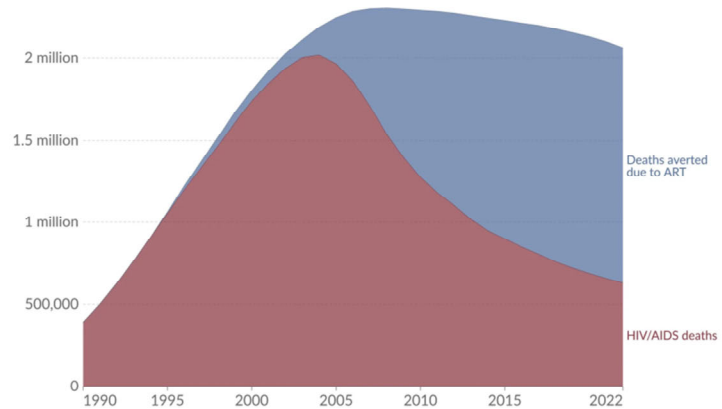
Source: UNAIDS financial estimates and projections, 2023 (<http://hivfinancial.unaids.org/hivfinancialdashboards.html>); Stover J, Glabius R, Teng Y, et al. Modeling the epidemiological impact of the UNAIDS 2025 targets to end AIDS as a public health threat by 2030. *PLoS Med.* 2021;18(10):e1003831.
 Note: the resource estimates are presented in constant 2019 US dollars (billions). The countries included are those that were classified by the World Bank in 2020 as being low- or middle-income countries.

UNAIDS (1996), Global Fund (2002) and PEPFAR (2003)

- Helped fund, advise, distribute, and monitor
 - HIV testing
 - ART
 - Pre-exposure prophylaxis (PrEP)
 - Treatments for opportunistic infections
 - Education and outreach

HIV/AIDS deaths averted due to antiretroviral therapy, World

The annual number of deaths from HIV/AIDS. This is shown with the estimated number of deaths averted due to antiretroviral therapy.



Data source: UNAIDS (2023)

[OurWorldInData.org/hiv-aids](https://ourworldindata.org/hiv-aids) | CC BY

<https://ourworldindata.org/hiv-aids>

Pre-exposure prophylaxis (PrEP)

- In 2012, FDA approved Truvada for HIV-negative people to prevent sexual transmission of HIV. Patent owned by the drug company Gilead Sciences.
- Recommended for people at high risk of HIV infection.
- The drugs in Truvada had been used to treat HIV infections.
- PrEP can reduce risk of HIV infection 90% if used properly, but is far less effective if not taken as recommended
- Can even be used for post-exposure if started within 72 hours



The pill Truvada is used to prevent HIV infection. Research released Tuesday shows that a new long-acting drug injected every two months is even more effective at preventing HIV. (Joel Saget/AFP/Getty Images)

- In 2018, less than 10% of the 1.2 million Americans who might benefit from PrEP could not afford it
- US company Gilead Sciences maintained a monopoly on the drug
- In other countries, a one-month supply of generic Truvada cost less than \$6, but Gilead was charging Americans, on average, more than \$1,600
- PrEP use in US black and Hispanic populations was small fraction of that among whites
- In US South, where a majority of HIV infections occur, use was half what it is in the Northeast.

Why Don't More Americans Use PrEP?

It could wipe out H.I.V. in America, but its high price keeps it out of reach for too many.

July 16, 2018



Truvada, the brand name for a type of pre-exposure prophylaxis, or PrEP, is up to 99 percent effective at preventing H.I.V. infection. Dado Galdieri for The New York Times

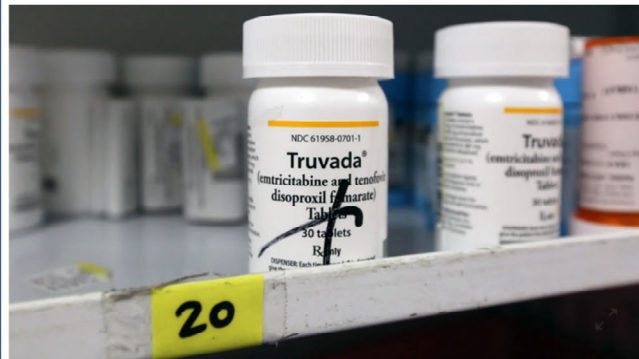
<https://www.nytimes.com/2018/07/16/opinion/prep-hiv-aids-drug.html>

American taxpayers and private charities — not Gilead — paid for almost all of the clinical research used to develop Truvada as PrEP.

- Women were using PrEP at drastically lower rates than men
- One million Americans were at risk for HIV infection should be taking the pills, but only about 270,000 are doing so.

Gilead Will Donate Truvada to U.S. for H.I.V. Prevention

The manufacturer will provide enough of the drug to supply 200,000 patients annually for more than a decade. Critics said it would not be enough to end the AIDS epidemic and questioned the company's motives.



Truvada, made by Gilead Sciences, currently costs about \$20,000 annually. The company has been under pressure to make the drug more widely available. Nicole Bengiveno/The New York Times

Patchwork of health insurance, Medicaid, assistance programs from Gilead can reduce the price, especially for Truvada since it is now a generic

Slow walking the next PrEP drug

- Truvada's patent expired in 2020. It is now a generic drug that costs less than \$400 year
- A newly patented and improved PrEP drug from Gilead, Descovy, went on the market in 2016. It initially had a price of \$26,000 annually.
- Truvada had harmful side effects from one of the two drugs in it, tenofovir
- Gilead invented a version of tenofovir in 2014 that was less toxic, but did not put it into Truvada because it had several more years of patent protection and high profits
- Gilead incorporated the improved tenofovir into the new patented and pricey version of PrEP, Descovy.

How a Drugmaker Profited by Slow-Walking a Promising H.I.V. Therapy

Gilead delayed a new version of a drug, allowing it to extend the patent life of a blockbuster line of medications, internal documents show.



Descovy, one of Gilead's newer H.I.V. products, has a sticker price of \$26,000 annually.
Rich Pedroncelli/Associated Press

Reading/Questions 12

<https://www.nytimes.com/2023/07/22/business/gilead-hiv-drug-tenofovir.html>

In 2023, US federal panel endorsed expanded coverage of HIV prevention strategies for Americans

- This means that prescription to Truvada or Descovy, the two approved forms of PrEP, should now be totally free for almost all insured individuals.
- A prescribing physician, however, must persuade an insurer that Descovy in particular is medically necessary for any specific patient to qualify for zero cost sharing for that drug's use as HIV prevention.
- This federal requirement is being challenged in some states and it is likely that PrEP availability will become a patchwork of coverage nationally

<https://www.nytimes.com/2023/08/22/health/hiv-prep-truvada-descovy.html>

Missing the target: The 1996 United Nations Program on AIDS: 90-90-90 by 2020

- Optimism about eliminating HIV-AIDS rose in response to the availability of ART
- Scientists estimated that the HIV epidemic would peter out if 90% of infected people know their HIV status, 90% of that group receives antiretrovirals, 90% on treatment have undetectable viral levels.
- However, as of 2024, only 19 countries have achieved the 90–90–90 HIV treatment targets. New target is now 95-95-95 in 2025

PRESS RELEASE

UNAIDS report on the global AIDS epidemic shows that 2020 targets will not be met because of deeply unequal success; COVID-19 risks blowing HIV progress way off course

<https://www.unaids.org/en/resources/fact-sheet>

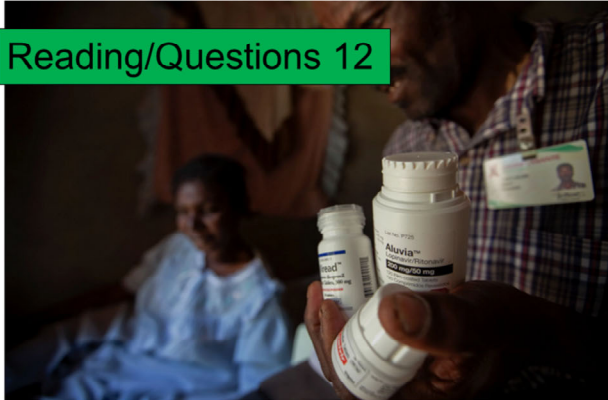
Achieving the 90–90–90 target results in a minimum of 73% of people living with HIV having suppressed viral loads. At the end of 2019, 14 countries three regions had achieved the 73% target—Australia, Botswana, Cambodia, Eswatini, Ireland, Namibia, the Netherlands, Rwanda, Spain, Switzerland, Thailand, Uganda, Zambia and Zimbabwe.

A U.N. Declaration on Ending AIDS Should Have Been Easy. It Wasn't.

Even with U.N.'s previous goals unmet, delegates tried to water down provisions regarding protections for vulnerable populations and patents for essential drugs.



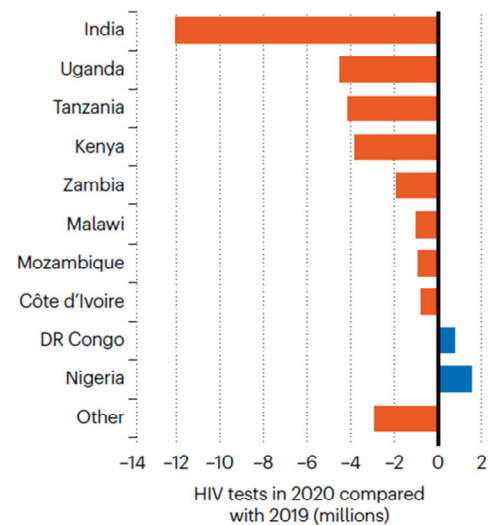
Reading/Questions 12



A patient with AIDS receiving her medication in Haiti in 2009. Ramon Espinosa/Associated Press

TESTING TROUBLE

Many countries where the Global Fund supports health care have seen a drop in HIV testing during the COVID-19 pandemic.



<https://www.nytimes.com/2021/06/08/health/unaid-declaration-patents.html>
 Roberts, L. (2021). How COVID is derailing the fight against HIV, TB and malaria. *Nature*, 597(7876), 314-314

In 2020, across Africa and Asia HIV testing fell over 40% due to Covid disruptions

The New York Times

3 Lessons the AIDS Pandemic Taught Us About Covid

June 8, 2021

Reading/Questions 12



Illustration by The New York Times; photographs by Pete Marovich for The New York Times, Catherine McGann and Yulia Reznikov via Getty Images

<https://www.nytimes.com/2021/06/08/opinion/hiv-aids-covid.html>

The HIV-AIDS pandemic helped us respond better to SARS-CoV-2...



..but HIV-AIDS is far from over

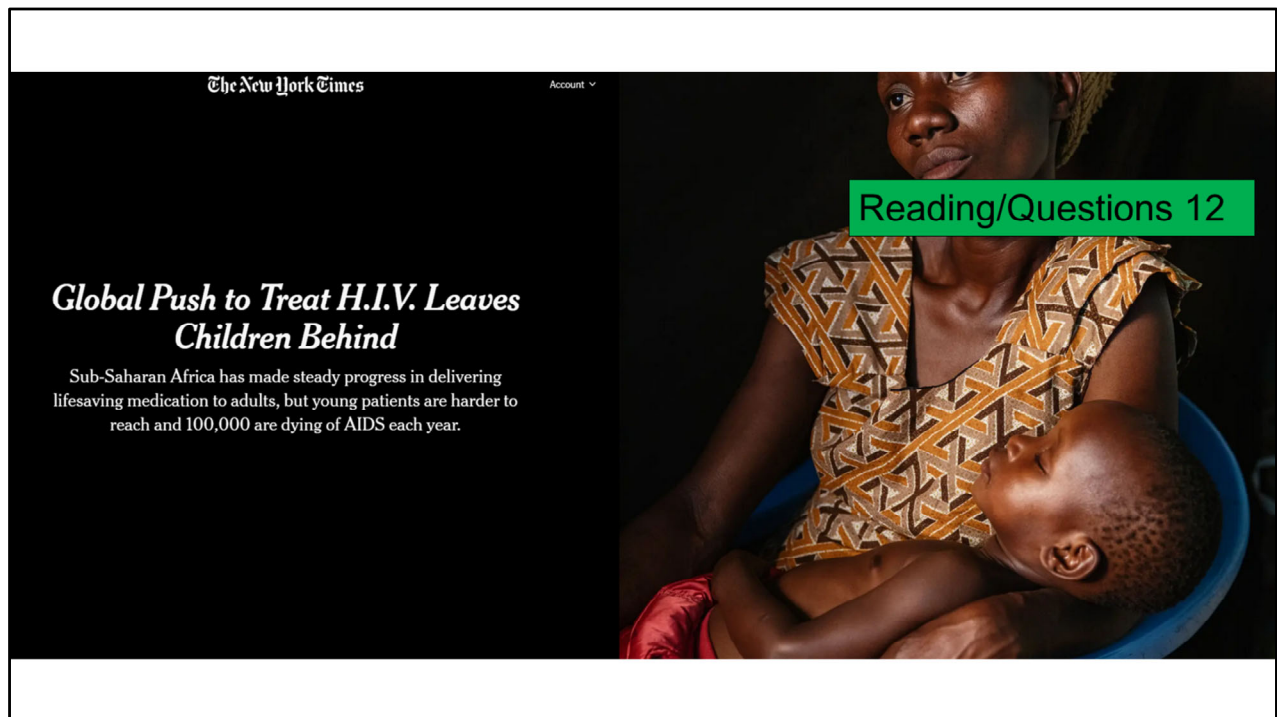
More than science is needed – the challenge is also social, political, and economic

Ongoing global strategies to reduce HIV

- Preventing transmission from mothers
- Addressing stigma
- Closing the treatment and prevention gap
- Targeting high-risk populations for HIV
- Resurgence due to familiarity of HIV and availability of ART



<https://www.theglobalfund.org/en/hivaids/>
<https://thepath.unaids.org/>



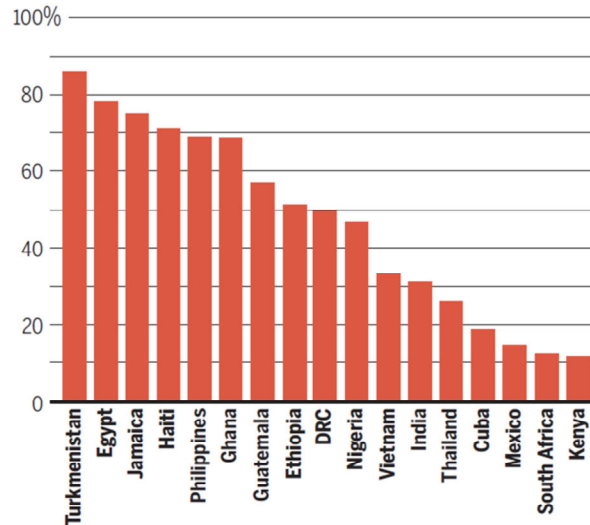
<https://www.nytimes.com/2023/01/17/health/child-hiv-kenya-africa.html>

Stigmatization

- People with HIV who perceived high levels of social stigma were 2.5 times as likely to delay entering care until very ill,
- 1 in 5 living with HIV avoided going to medical facilities because they feared discrimination
- Stigma responsible for 35-50% of infant infections with HIV because it reduced mothers' adherence to treatment

Quantifying fear

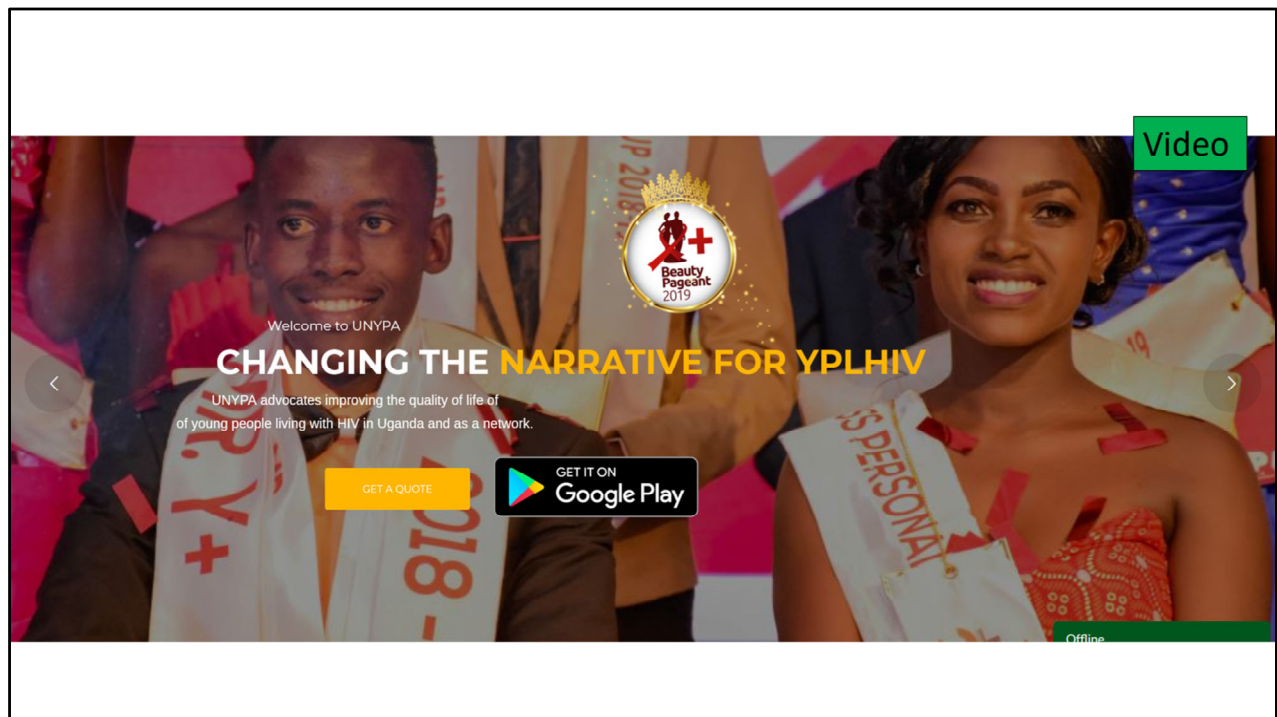
In some countries, most people said they wouldn't buy vegetables from a seller who had HIV. But people in other nations were less fearful.



<https://science.sciencemag.org/content/369/6510/1419.abstract>

The social processes of stigmatization can spur the spread of disease.

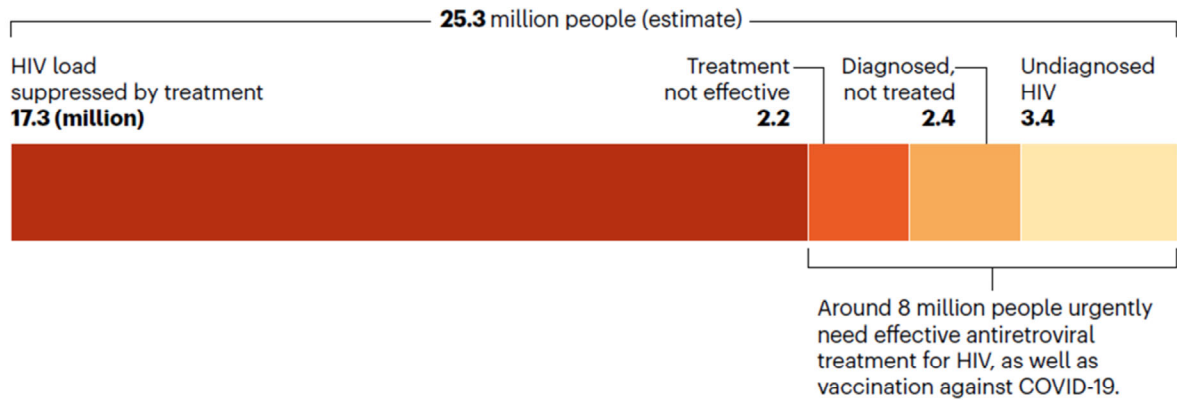
Stigmatization is compounded when the person or population is already marginalized.



Uganda

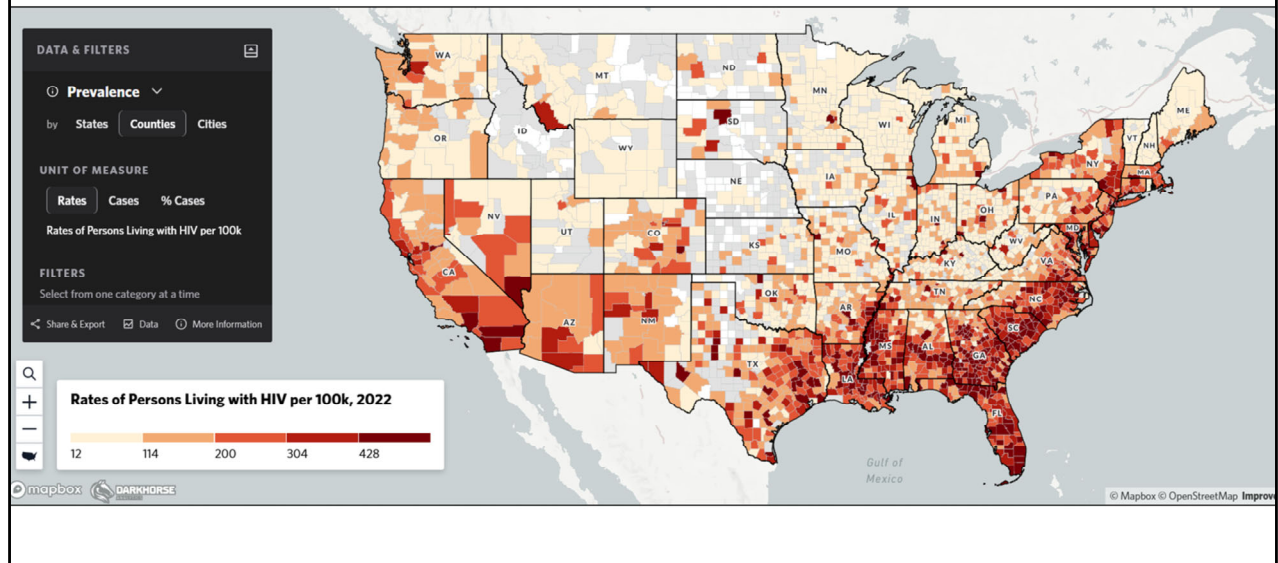
AFRICA'S HIV TREATMENT GAP

Around one-third of people living with HIV in sub-Saharan Africa in 2020 were not getting effective antiretroviral treatment.



Msomi, Nokukhanya, Richard Lessells, Koleka Mlisana, and Tulio de Oliveira. "Africa: tackle HIV and COVID-19 together." (2021): 33-36.

Targeting high-risk populations for HIV



<https://map.aidsvu.org/prev/county/rate/none/none/usa?geoContext=national>



<https://www.nytimes.com/2017/06/06/magazine/americas-hidden-hiv-epidemic.html>

HIV-AIDS in US rural versus urban locations:

- Large urban areas that have dealt with similar health and substance crises in the past. They have networks of service providers and consumers in place
- Small rural health jurisdictions often lack the infrastructure and have little history of dealing with comparable health issues
- Lack of transportation and stigma are biggest barriers to testing and care in rural communities.
- Those who live in large cities can get tested and treatments while feeling relatively anonymous in a clinic in ways rural dwellers cannot.
- Rural areas are less likely to promote needle-exchange programs

<https://www.nytimes.com/2019/12/01/opinion/hiv-aids-rural-america.html>

- Austin, Indiana is a small city of about 4,000 people 80 miles south of Indianapolis.
- In February 2015, the first 30 cases of HIV were reported. A year later there were 190 cases.
- All were linked to opioid injections.

An Indiana town recovering from 190 HIV cases

Shari Rudavsky IndyStar

Published 12:31 a.m. ET Apr. 8, 2016 | Updated 7:15 a.m. ET Apr. 11, 2016



Austin, Ind., is the epicenter of an HIV outbreak linked to intravenous drug use in Scott County. Kelly Wilkinson / IndyStar

After a hepatitis C and H.I.V. outbreak in Scott County, Ind., in 2014 and 2015 that was fueled by deindustrialization and opioids.

Hepatitis C is also epidemic and a more pervasive problem than HIV

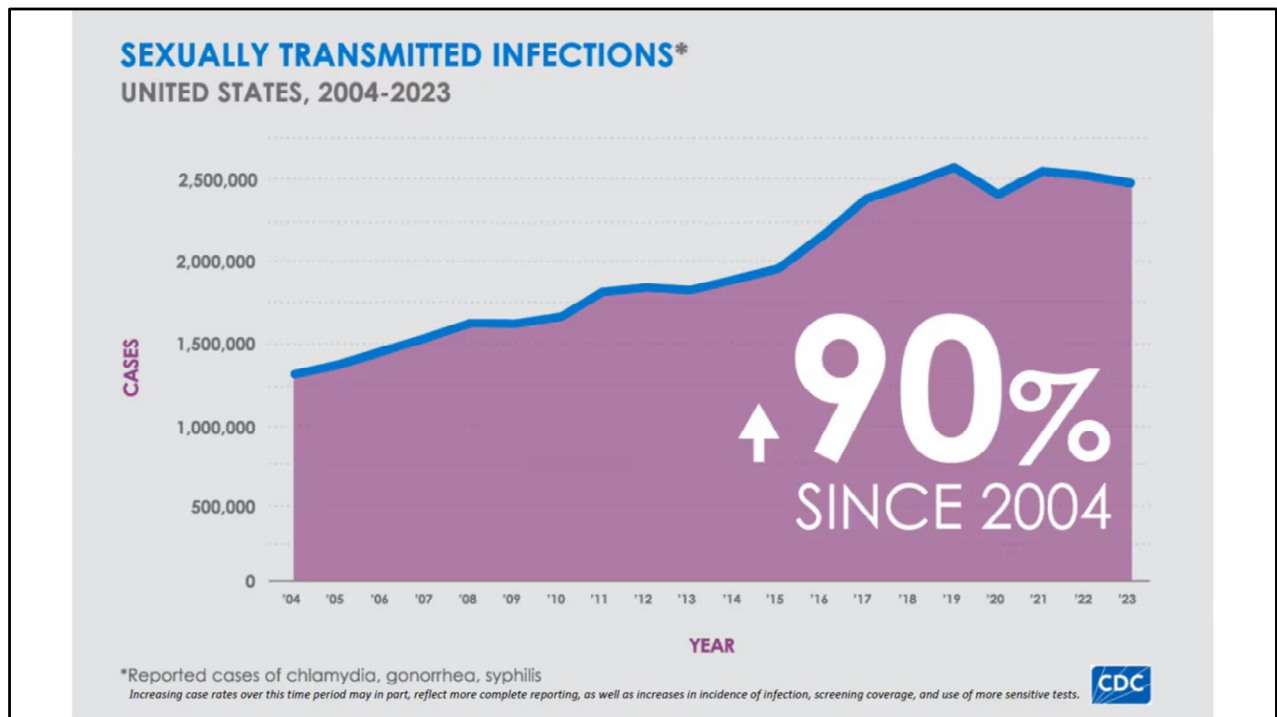
<https://www.indystar.com/story/news/2016/04/08/year-after-hiv-outbreak-austin-still-community-recovery/82133598/>

A Fading Weapon in the H.I.V. Fight: Condoms

Some H.I.V. experts worry that the public health focus on prevention medication has accelerated a decline in condom use.



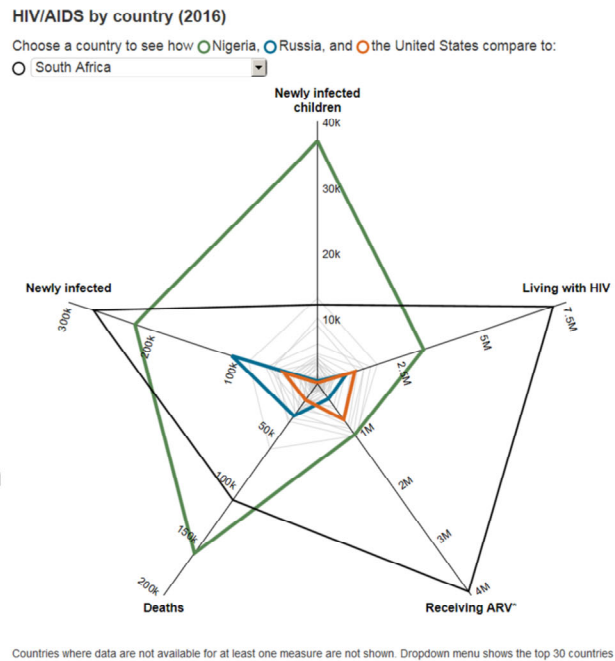
<https://www.nytimes.com/2024/02/27/health/condoms-hiv-prevention.html>



<https://www.cdc.gov/media/releases/2024/p1112-sti-slowng.html>

Former USSR

- HIV spread mainly by intravenous drug use and heterosexual sex
- 80-100 new cases of HIV infections among women a day, mostly 25-35 years age
- Cold war politics and a conservative, nationalistic Russian culture contributed to slow, ineffective initial response to HIV.



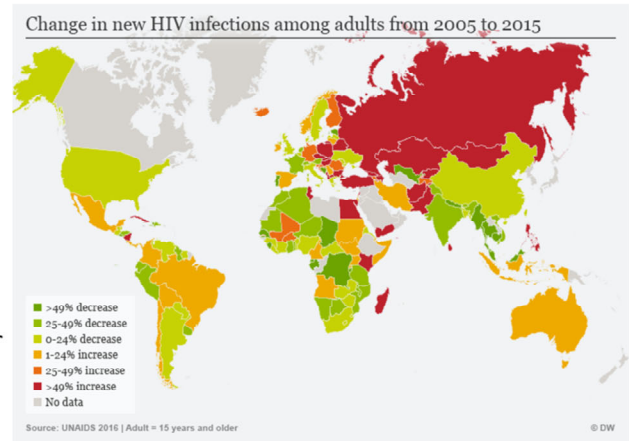
<https://www.sciencemag.org/news/2018/06/ending-aids-these-three-places-show-epidemic-far-over>

<https://www.sciencemag.org/news/2018/06/russia-s-hivaids-epidemic-getting-worse-not-better>

<https://www.avert.org/professionals/hiv-around-world/eastern-europe-central-asia/russia>

Few on ART so more AIDS deaths and new infections

- Drug users, gay men, and HIV positive people stigmatized
- Drug treatment programs and needle exchange program seen as 'weak' Western responses and are not common in Russia
- Many high-risk populations rely on international NGOs (non-governmental organizations) and volunteer groups for HIV services
- NGOs left country after President Putin in 2013 enacted law that forced many of them to register as "foreign agents."



HIV took off in Russia in the mid-1990s, later than in Western European countries

<https://www.sciencemag.org/news/2018/06/russia-s-hiv-aids-epidemic-getting-worse-not-better>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9994792/>

<https://www.dw.com/en/russian-hiv-epidemic-at-a-tipping-point/a-36594412>

Recent evidence suggests that HIV-AIDS has become a more generalized epidemic and less concentrated in high risk populations

'A Quick Death or a Slow Death': Prisoners Choose War to Get Lifesaving Drugs

An estimated 20 percent of Russia prisoner recruits are H.I.V. positive. To some, the front lines seemed less risky than prisons where they said they were denied effective treatments.

A captured Wagner fighter loyal to Russian forces being escorted by a Ukrainian guard at a prison in Dnipro, central Ukraine. Mauricio Lima for The New York Times



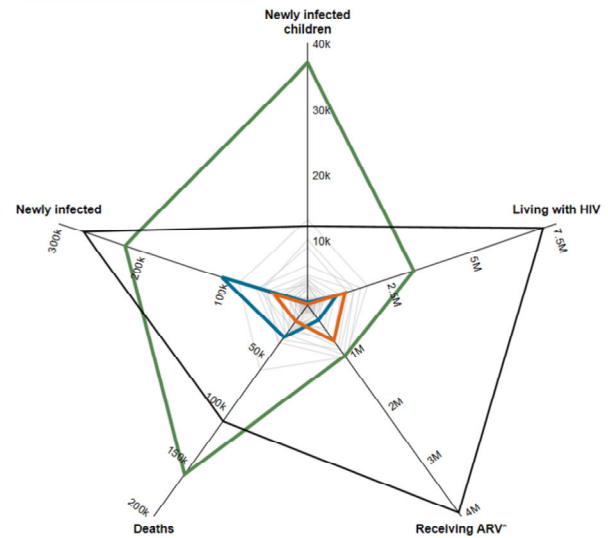
<https://www.nytimes.com/2023/04/21/world/europe/russia-wagner-group-hiv-prisoners-ukraine.html>

Nigeria

- One of the world's most populated countries
- Nigeria has more HIV-infected babies than anywhere in the world.
- Culture and stigma plays a large role, as having HIV implies a moral failure
- Access to ART can also be difficult in some regions, as is making sure that they are continually taken
- Making progress through programs like the Baby Shower program

HIV/AIDS by country (2016)

Choose a country to see how ○ Nigeria, ○ Russia, and ○ the United States compare to:
○ South Africa



Countries where data are not available for at least one measure are not shown. Dropdown menu shows the top 30 countries

<https://www.sciencemag.org/news/2018/06/ending-aids-these-three-places-show-epidemic-far-over>



Why Nigeria has more HIV-positive infants than anywhere else



Watch later



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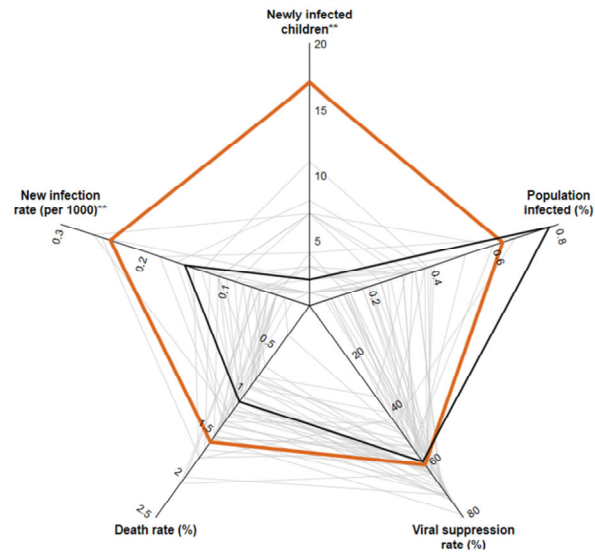


Florida

- As of 2022, more infections than any other state, including California and New York
- State's population has doubled to nearly 22 million people: many are immigrants from Latin America or the Caribbean.
 - HIV is more prevalent in several Caribbean islands than in the US
 - Florida has a large black and Latino population: surge in HIV infections among men of these groups

HIV in U.S. states

Choose a state to see how ○ Florida compares to: New York



States where data are not available for at least one measure are not shown.

Compared with other U.S. states, Florida has a big problem. Georgia has the highest rates of new infection, but half the population of Florida. New York has a larger infected population, but has a lower death rate and fewer new infections.

Cohen, Jon. "The Sunshine State's dark cloud." (2018): Science 360(6394) 1176-1179.
DOI: 10.1126/science.360.6394.1176

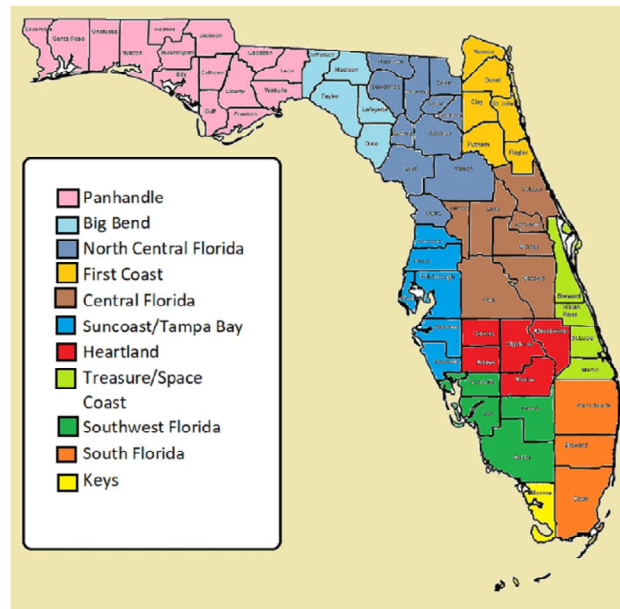
- 15% of HIV infected Floridians did not know their HIV status
- HIV infections progresses to AIDS here more than any other state largely because many infected people who start ART don't continue.
- Nearly 33% are, 'lost to follow up' for reasons such as transportation difficulties, stigma concerns, relocation, homelessness, lack of social support, substance abuse, and poverty.
- In New York City, by contrast, 88% were retained in care.



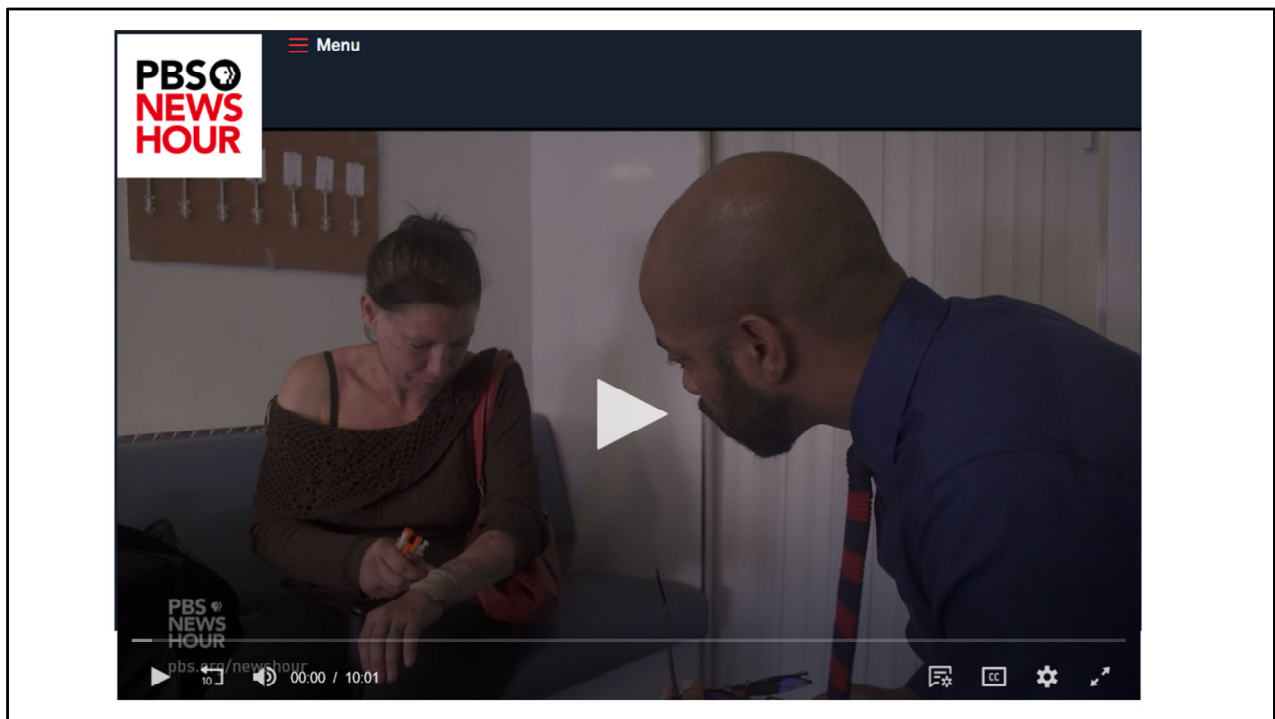
Cohen, Jon. "The Sunshine State's dark cloud." (2018): Science 360(6394) 1176-1179.
 DOI: 10.1126/science.360.6394.1176

<https://www.science.org/content/article/we-re-mess-why-florida-struggling-unusually-severe-hiv-aids-problem>

- Florida is also socially and politically diverse –like different countries when you compare, for example, rural Panhandle to neighborhoods of Miami
- Any campaign to prompt testing and treatment in at-risk populations must be customized to appeal to different cultural backgrounds and levels of disenfranchisement
- State lawmakers have turned away federal funding for HIV prevention and care, and limited sex education



Florida has been slow to approve needle and syringe exchange programs compared to the other 45 states that have them



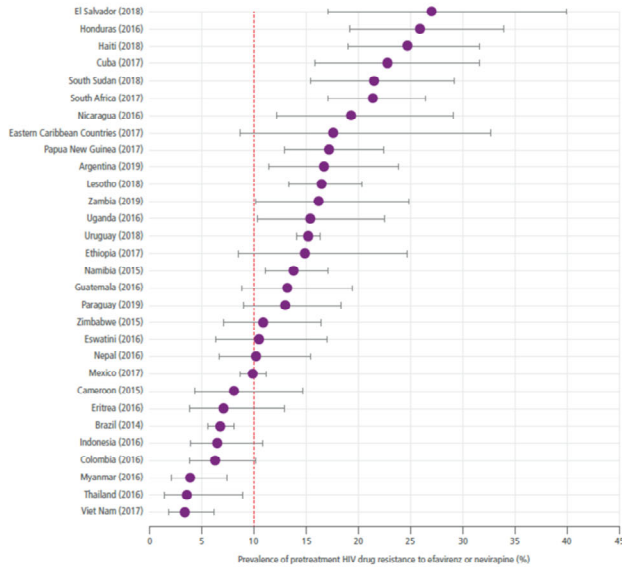
Why pursue a cure for HIV infections?

- ART has to be taken for the rest of a HIV positive person's life
- Side effects develop with long-term use of antiviral drugs
- Potential for resistance to develop
- ART programs in many countries heavily reliant on international donor partners
- Not all HIV positive people receive ART.
- Effective cure might boost HIV control by encouraging disenfranchised individuals with HIV to proactively seek testing and treatment

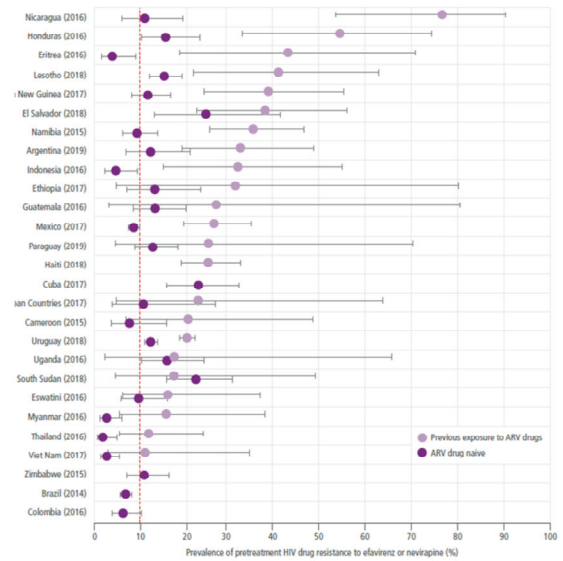
Ndung'u, T., McCune, J. M., & Deeks, S. G. (2019). Why and where an HIV cure is needed and how it might be achieved. *Nature*, 576(7787), 397-405.

<https://doi.org/10.1038/s41586-019-1841-8>

Fig. 1.3. Prevalence of pretreatment HIV drug resistance to efavirenz or nevirapine among adults initiating antiretroviral therapy, 2014–2020



Prevalence of pretreatment HIV drug resistance to efavirenz or nevirapine among adults initiating ART, by previous exposure to ARV drugs, 2014–2020



<https://www.who.int/publications/i/item/9789240038608>

Adults who have taken ART in the past are more likely to have HIV that is resistant to the drugs

Twice yearly injection instead of daily oral ART

- Gilead has developed long-acting injectable targeting **treatment** and **prevention** of HIV.
- Administered biannually, lenacapavir (Sunlenca) is alternative to daily oral regimen, aiming to improve adherence and reduce new HIV infections.
- In 2022, FDA approved Sunlenca for **treatment**, of adults with multi-drug resistant HIV-1 infection.
- 100% efficacy in recent a clinical trial for **prevention**

Gilead Agrees to Allow Generic Version of Groundbreaking H.I.V. Shot in Poor Countries

Many middle-income countries are left out of the deal, widening a gulf in access to critical medicines.

▶ Listen to this article - 8:50 min [Listen more](#) [Share full article](#) [🔗](#) [📌](#) [🔔](#) 18



A vial of lenacapavir, an injectable H.I.V. prevention drug. A generic version will be sold in 120 countries, but a few large countries, which together account for 20 percent of new infections, will not have access to a low-cost version. Nardus Engelbrecht/Associated Press

Lenacapavir is a capsid inhibitor that disrupts multiple stages of the HIV lifecycle, including viral assembly, release, and capsid core formation. By targeting the viral capsid, it impedes the virus's ability to replicate and infect new cells.

<https://www.nytimes.com/2024/10/02/health/lenacapavir-hiv-shot-prep.html>

- Challenges to develop a vaccine
 - HIV is a retrovirus and integrates into human DNA shortly after infection, making it difficult for the immune system to detect and eliminate the virus
 - Incredible diversity of HIV strains circulating in the world.
 - HIV viruses can mutate rapidly

There is no vaccine for HIV, yet.



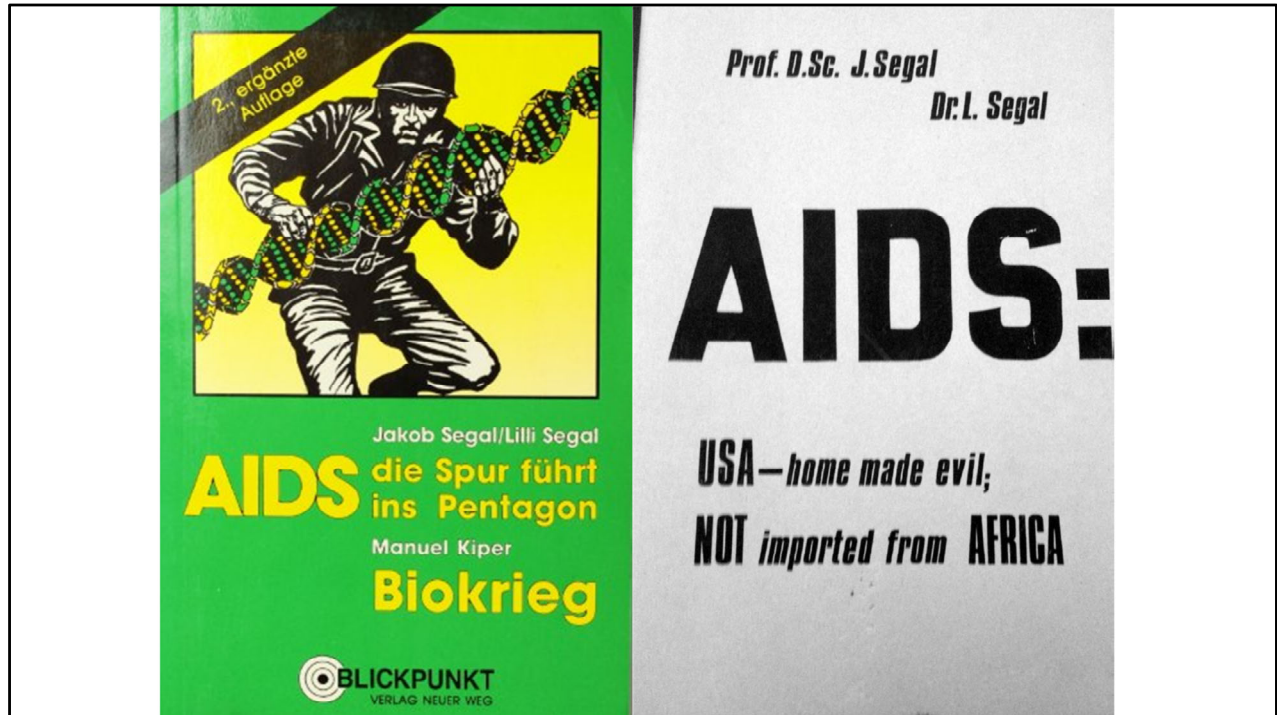
<https://science.sciencemag.org/content/367/6478/611.summary>

<https://www.niaid.nih.gov/news-events/nih-and-partners-launch-hiv-vaccine-efficacy-study>

<https://www.hiv.gov/blog/final-hiv-research-highlights-aids-2020>

<https://www.nature.com/articles/d41586-024-02840-5>

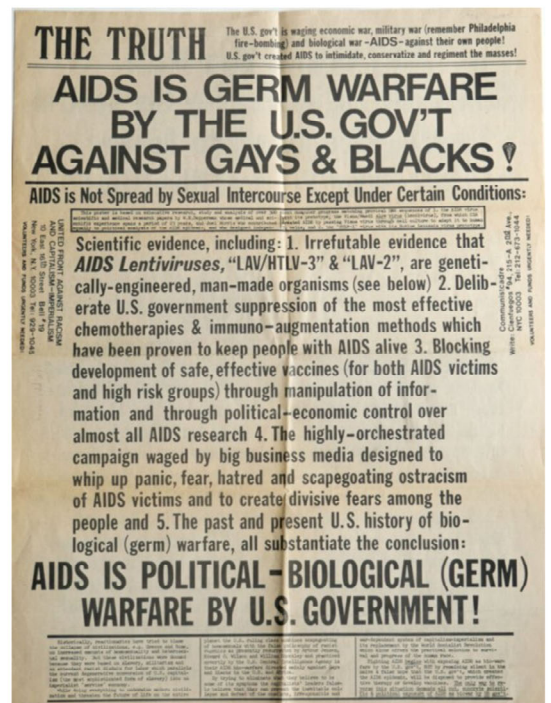
mRNA vaccines and traditional vaccines that stimulate the production of neutralizing antibodies are being tested



https://lsa.umich.edu/history/history-at-work/reverbeffect/episode3/episode3_transcript.html

HIV-AIDS conspiracy theories

- As early as 1990 a New York Times/CBS poll found that 10% of black New Yorkers believed HIV was 'deliberately created in a laboratory in order to infect black people'
- 2009 survey of young adults in Cape Town South Africa found that 16% of black respondents agreed that 'AIDS was invented to kill black people' and that 'AIDS was created by scientists in America'.



The 'HIV as US bioweapon' conspiracy theory

- Began in 1983 when the Soviet Union planted fake news articles in Indian newspapers as part of Operation Infektion
- The articles stated that the US Army had manufactured the AIDS virus.
- Content was republished in newspapers in Zimbabwe, Kenya and Senegal.
- In 1987 the theory was broadcast on the CBS evening news and disseminated throughout the world



<https://www.wilsoncenter.org/blog-post/operation-denver-kgb-and-stasi-disinformation-regarding-aids>

- [illegible]

98

- The 'HIV as bioweapon' conspiracy theory resonated with African-Americans and Africans

Genocidal origins of HIV

AIDS is a form of genocide against the black race (1990)	979 churchgoers in five US cities ^a	35
AIDS is a form of genocide against the black race (1990)	800 households in Maryland ^a	15
AIDS was deliberately created in a laboratory in order to infect black people (1990)	408 New Yorkers (10 said it was true, 19 said it might be true) ^b	10-39
The government deliberately spread the AIDS virus in the black community (1992)	Phone survey, New Jersey, 74 respondents ^c	31
AIDS is intended to wipe blacks off the face of the Earth (1996)	715 black parishioners of 35 Louisiana churches ^h	27
The AIDS virus was deliberately created to infect black people (1998)	91 Northeastern college students ⁱ	60
AIDS was created to kill blacks and poor folks (1997-1998)	1546 people involved in a programme for drug addicts, Baltimore ^b	25
AIDS is an agent of genocide created by the United States government to kill off minority populations (1997-1998)	441 respondents in shopping malls, Houston ^c	29
HIV/AIDS is a man-made virus that the federal government made to kill and wipe out black people (1999)	520 households in San Bernardino County ^d	27
I believe that AIDS is intended to wipe blacks off of the face of the earth (2004)	170 locally elected officials in Louisiana ^l	30
AIDS is a form of genocide against African Americans (2001)	US sample: 71 adults aged 18-45 ^e	26

Nattrass, N. (2013). Understanding the origins and prevalence of AIDS conspiracy beliefs in the United States and South Africa. *Sociology of Health and Illness*, 35(1), 113-129.



Start 7:34 minutes in for segment on how the Russian KGB conducted a fake news campaign to malign the US and make it look like it was responsible for making and deploying the HIV virus as a biological weapon. Some African Americans as well as Africans expressed belief in this conspiracy theory, the idea that the US had made HIV in a lab to kill gays and people of color became viral in this pre-Internet time.



A Treatment Action Campaign (TAC) activist holds a banner in Cape Town, South Africa, August 10, 2007. Former President Thabo Mbeki has come under heavy criticism for defending his stance on HIV/AIDS while in office.

<https://www.nature.com/news/south-africa-ushers-in-a-new-era-for-hiv-1.20253>

<https://www.newsweek.com/thabo-mbeki-south-africa-hiv-aids-436012>

Nattrass, N. (2013). Understanding the origins and prevalence of AIDS conspiracy beliefs in the United States and South Africa. *Sociology of Health and Illness*, 35(1), 113-129.

HIV policies in South Africa

- HIV policies of former South African President Thabo Mbeki contributed to AIDS deaths between 1999 and 2008
- More than 330,000 people died prematurely from HIV-AIDS between 2000 and 2005 due to the Mbeki government's obstruction of life-saving treatment, and at least 35,000 babies were born with HIV infections that could have been prevented.
- Mbeki delayed launching an ART drug program, charging that the drugs were toxic and an effort by the West to weaken his country. He also withdrew support from clinics to prevent mother-to-child transmission of HIV.

<https://www.hsph.harvard.edu/news/magazine/spr09aids/>

The HIV as US bioweapon conspiracy theory had large impacts in South Africa, a highly segregated society until official apartheid policies were dismantled in 1994