

HIV/AIDS

Acquired immune deficiency syndrome or **acquired immunodeficiency syndrome (AIDS)** is a disease of the human [immune system](#) caused by the [human immunodeficiency virus](#) (HIV). This condition progressively reduces the effectiveness of the immune system and leaves individuals susceptible to [opportunistic infections](#) and [tumors](#). HIV is [transmitted](#) through direct contact of a [mucous membrane](#) or the bloodstream with a [bodily fluid](#) containing HIV, such as [blood](#), [semen](#), [vaginal fluid](#), [preseminal fluid](#), and [breast milk](#). This transmission can involve [anal](#), [vaginal](#) or [oral sex](#), [blood transfusion](#), contaminated [hypodermic needles](#), exchange between mother and baby during [pregnancy](#), [childbirth](#), [breastfeeding](#) or other exposure to one of the above bodily fluids.

AIDS is now a [pandemic](#). As of 2009, [AVERT](#) estimated that there are 33.3 million people worldwide living with [HIV/AIDS](#), with 2.6 million new [HIV](#) infections per year and 1.8 million annual deaths due to AIDS. In 2007, UNAIDS estimated: 33.2 million people worldwide had AIDS that year; AIDS killed 2.1 million people in the course of that year, including 330,000 children, and 76% of those deaths occurred in [sub-Saharan Africa](#). According to UNAIDS 2009 report, worldwide some 60 million people have been infected, with some 25 million deaths, and 14 million orphaned children in southern Africa alone since the epidemic began.

[Genetic research](#) indicates that HIV originated in west-central Africa during the late nineteenth or early twentieth century. AIDS was first recognized by the U.S. [Centers for Disease Control and Prevention](#) in 1981 and its cause, HIV, identified in the early 1980s.

Although treatments for AIDS and HIV can slow the course of the disease, there is no known cure or [vaccine](#). [Antiretroviral](#) treatment reduces both the [mortality](#) and the [morbidity](#) of HIV infection, but these drugs are expensive and routine access to antiretroviral [medication](#) is not available in all countries. Due to the difficulty in treating HIV infection, preventing infection is a key aim in controlling the [AIDS pandemic](#), with health organizations promoting [safe sex](#) and [needle-exchange programmes](#) in attempts to slow the spread of the virus.

History and origin

AIDS was first reported June 5, 1981, when the U.S. [Centers for Disease Control \(CDC\)](#) recorded a cluster of [Pneumocystis carinii pneumonia](#) (now still classified as PCP but known to be caused by [Pneumocystis jirovecii](#)) in five homosexual men in [Los Angeles](#). In the beginning, the CDC did not have an official name for the disease, often referring to it by way of the diseases that were associated with it, for example, [lymphadenopathy](#), the disease after which the discoverers of HIV originally named the virus. They also used *Kaposi's Sarcoma and Opportunistic Infections*, the name by which a task force had been set up in 1981.

In the general press, the term *GRID*, which stood for [Gay-related immune deficiency](#), had been coined. The CDC, in search of a name, and looking at the infected communities coined “the 4H disease,” as it seemed to single out [Haitians](#), [homosexuals](#), [hemophiliacs](#), and [heroin](#) users. However, after determining that AIDS was not isolated to the [homosexual](#) community, the term GRID became misleading and *AIDS* was introduced at a meeting in July 1982. By September 1982 the CDC started using the name AIDS, and properly defined the illness.

The earliest known positive identification of the HIV-1 virus comes from [the Congo](#) in 1959 and 1960 though genetic studies indicate that it passed into the human population from [chimpanzees](#) around fifty years earlier. A recent study states that a strain of HIV-1 probably moved from [Africa](#) to [Haiti](#) and then entered the United States around 1969.

The HIV virus descends from the related [simian immunodeficiency virus](#) (SIV), which infects [apes](#) and [monkeys](#) in Africa. There is evidence that humans who participate in [bushmeat](#) activities, either as hunters or as bushmeat vendors, commonly acquire SIV. However, only a few of these infections were able to cause epidemics in humans, and all did so in the late 19th—early 20th century. To explain why HIV became epidemic only by that time, there are several theories, each invoking specific driving factors that may have promoted SIV [adaptation](#) to humans, or initial spread: social changes following [colonialism](#), rapid transmission of [SIV](#) through unsafe or [unsterile](#) injections (that is, injections in which the needle is reused without being sterilised), colonial abuses and unsafe [smallpox](#) vaccinations or injections, or [prostitution](#) and the concomitant high frequency of [genital ulcer diseases](#) (such as [syphilis](#)) in nascent colonial cities.

One of the first high profile victims of AIDS was the [American](#) actor [Rock Hudson](#), a known homosexual who had been married and divorced earlier in life, who died on 2 October 1985 having announced that he was suffering from the virus on 25 July that year. It had been diagnosed during 1984. A notable British casualty of AIDS that year was [Nicholas Eden](#), a [Member of Parliament](#) and son of the late prime minister [Anthony Eden](#). Eden junior, a lifelong bachelor, was also a known homosexual. The virus claimed perhaps its most famous victim yet on 24 November 1991, when British rock star [Freddie Mercury](#), lead singer of the band [Queen](#), died from an AIDS related illness having only announced that he was suffering from the illness the previous day; however he had been diagnosed as HIV positive during 1987. One of the first high profile heterosexual victims of the virus was [Arthur Ashe](#), the American tennis player. He was diagnosed as HIV positive on 31 August 1988, having contracted the virus from blood transfusions during heart surgery earlier in the 1980s. Further tests within 24 hours of the initial diagnosis revealed that Ashe had AIDS, but he did not tell the public about his diagnosis until April 1992. He died, aged 49, as a result of the AIDS virus on 6 February 1993.

A more controversial theory known as the [OPV AIDS hypothesis](#) suggests that the AIDS epidemic was inadvertently started in the late 1950s in the [Belgian Congo](#) by [Hilary Koprowski](#)'s research into a [poliomyelitis vaccine](#). According to [scientific consensus](#), this scenario is not supported by the available evidence.

The symptoms of AIDS are primarily the result of conditions that do not normally develop in individuals with healthy [immune systems](#). Most of these conditions are infections caused by [bacteria](#), [viruses](#), [fungi](#) and [parasites](#) that are normally controlled by the elements of the immune system that HIV damages.

[Opportunistic infections](#) are common in people with AIDS. These infections affect nearly every [organ system](#).

People with AIDS also have an increased risk of developing various cancers such as [Kaposi's sarcoma](#), [cervical cancer](#) and cancers of the immune system known as [lymphomas](#). Additionally, people with AIDS often have systemic symptoms of infection like [fevers](#), [sweats](#) (particularly at night), swollen glands, chills, weakness, and [weight loss](#). The specific opportunistic infections that AIDS patients develop depend in part on the prevalence of these infections in the geographic area in which the patient lives.

Sexual transmission

Sexual transmission occurs with the contact between sexual secretions of one person with the rectal, genital or oral [mucous membranes](#) of another. Unprotected sexual acts are riskier for the [receptive partner](#) than for the [insertive partner](#), and the risk for transmitting HIV through unprotected anal intercourse is greater than the risk from vaginal intercourse or oral sex.

However, oral sex is not entirely safe, as HIV can be transmitted through both insertive and receptive oral sex. [Sexual assault](#) greatly increases the risk of HIV transmission as condoms are rarely employed and physical trauma to the vagina or rectum occurs frequently, facilitating the transmission of HIV.

Drug use has been studied as a possible predictor of HIV transmission. [Perry N. Halkitis](#) found that methamphetamine usage does significantly relate to unprotected sexual behavior. The study found methamphetamine users to be at a higher risk for contracting HIV.

Other [sexually transmitted infections](#) (STI) increase the risk of HIV transmission and infection, because they cause the disruption of the normal [epithelial](#) barrier by [genital ulceration](#) and/or microulceration; and by accumulation of pools of HIV-susceptible or HIV-infected cells ([lymphocytes](#) and [macrophages](#)) in semen and vaginal secretions. Epidemiological studies from sub-Saharan Africa, [Europe](#) and [North America](#) suggest that genital ulcers, such as those caused by [syphilis](#) and/or [chancroid](#), increase the risk of becoming infected with HIV by about fourfold. There is also a significant although lesser increase in risk from STIs such as [gonorrhea](#), [chlamydia](#) and [trichomoniasis](#), which all cause local accumulations of lymphocytes and macrophages.

Transmission of HIV depends on the infectiousness of the [index case](#) and the susceptibility of the uninfected partner. Infectivity seems to vary during the course of

illness and is not constant between individuals. An undetectable plasma [viral load](#) does not necessarily indicate a low viral load in the seminal liquid or genital secretions.

However, each 10-fold increase in the level of HIV in the blood is associated with an 81% increased rate of HIV transmission. Women are more susceptible to HIV-1 infection due to hormonal changes, vaginal microbial ecology and physiology, and a higher prevalence of sexually transmitted diseases.

People who have been infected with one strain of HIV can still be infected later on in their lives by other, more [virulent](#) strains.

Infection is unlikely in a single encounter. High rates of infection have been linked to a pattern of overlapping long-term sexual relationships. This allows the virus to quickly spread to multiple partners who in turn infect their partners. A pattern of serial monogamy or occasional casual encounters is associated with lower rates of infection.

HIV spreads readily through heterosexual sex in Africa, but less so elsewhere. One possibility being researched is that [schistosomiasis](#), which affects up to 50% of women in parts of Africa, damages the lining of the vagina.

CDC poster from 1989 highlighting the threat of AIDS associated with drug use

This transmission route is particularly relevant to [intravenous drug](#) users, [hemophiliacs](#) and recipients of [blood transfusions](#) and blood products. Sharing and reusing [syringes](#) contaminated with HIV-infected blood represents a major risk for infection with HIV.

Needle sharing is the cause of one third of all new HIV-infections in [North America](#), China, and [Eastern Europe](#). The risk of being infected with HIV from a single prick with a needle that has been used on an HIV-infected person is thought to be about 1 in 150. [Post-exposure prophylaxis](#) with anti-HIV drugs can further reduce this risk.

This route can also affect people who give and receive [tattoos](#) and [piercings](#). [Universal precautions](#) are frequently not followed in both sub-Saharan Africa and much of Asia because of both a shortage of supplies and inadequate training.

The [WHO](#) estimates that approximately 2.5% of all HIV infections in sub-Saharan Africa are transmitted through unsafe healthcare injections. Because of this, the [United Nations General Assembly](#) has urged the nations of the world to implement precautions to prevent HIV transmission by health workers.

The risk of transmitting HIV to [blood transfusion](#) recipients is extremely low in developed countries where improved donor selection and HIV screening is performed. However, according to the [WHO](#), the overwhelming majority of the world's population does not have access to safe blood and between 5% and 10% of the world's HIV infections come from transfusion of infected blood and blood products.

Perinatal transmission

The transmission of the virus from the mother to the child can occur *in utero* during the last weeks of pregnancy and at childbirth. In the absence of treatment, the transmission rate between a mother and her child during pregnancy, labor and delivery is 25%.

However, when the mother takes antiretroviral therapy and gives birth by caesarean section, the rate of transmission is just 1%. The risk of infection is influenced by the viral load of the mother at birth, with the higher the viral load, the higher the risk. Breastfeeding also increases the risk of transmission by about 4 %.

Cells affected

The virus, entering through which ever route, acts primarily on the following cells:

- Lymphoreticular system:
 - CD₄+ T-Helper cells
 - Macrophages
 - Monocytes
 - B-lymphocytes
- Certain endothelial cells
- Central nervous system:
 - Microglia of the nervous system
 - Astrocytes
 - Oligodendrocytes
 - Neurones – indirectly by the action of cytokines and the gp-120

The effect

The virus has cytopathic effects but how it does it is still not quite clear. It can remain inactive in these cells for long periods, though. This effect is hypothesized to be due to the CD₄-gp120 interaction.

- The most prominent effect of HIV is its T-helper cell suppression and lysis. The cell is simply killed off or deranged to the point of being function-less (they do not respond to foreign antigens). The infected B-cells can not produce enough antibodies either. Thus the immune system collapses leading to the familiar AIDS complications, like infections and neoplasms (vide supra).
- Infection of the cells of the CNS cause acute aseptic meningitis, subacute encephalitis, vacuolar myelopathy and peripheral neuropathy. Later it leads to even AIDS dementia complex.
- The CD₄-gp120 interaction is also permissive to other viruses like Cytomegalovirus, Hepatitis virus, Herpes simplex virus, etc. These viruses lead to further cell damage i.e. cytopathy.

HIV test

Many people are unaware that they are infected with HIV. Less than 1% of the sexually active urban population in Africa has been tested, and this proportion is even lower in rural populations. Furthermore, only 0.5% of pregnant women attending urban health facilities are counseled, tested or receive their test results. Again, this proportion is even lower in rural health facilities. Therefore, [donor blood](#) and blood products used in medicine and medical research are screened for HIV.

HIV tests are usually performed on venous blood. Many laboratories use *fourth generation* screening tests which detect anti-HIV antibody (IgG and IgM) and the HIV p24 antigen. The detection of HIV antibody or antigen in a patient previously known to be negative is evidence of HIV infection. Individuals whose first specimen indicates evidence of HIV infection will have a repeat test on a second blood sample to confirm the results.

The [window period](#) (the time between initial infection and the development of detectable antibodies against the infection) can vary since it can take 3–6 months to [seroconvert](#) and to test positive. Detection of the virus using polymerase chain reaction ([PCR](#)) during the window period is possible, and evidence suggests that an infection may often be detected earlier than when using a fourth generation EIA screening test.

Positive results obtained by PCR are confirmed by antibody tests. Routinely used HIV tests for infection in [neonates](#) and [infants](#) (i.e., patients younger than 2 years), born to HIV-positive mothers, have no value because of the presence of maternal antibody to HIV in the child's blood. HIV infection can only be diagnosed by PCR, testing for HIV pro-viral DNA in the children's [lymphocytes](#).

Prevention

The three main transmission routes of HIV are [sexual contact](#), exposure to infected body fluids or tissues, and from mother to [fetus](#) or child during [perinatal](#) period. It is possible to find HIV in the [saliva](#), [tears](#), and [urine](#) of infected individuals, but there are no recorded cases of infection by these secretions, and the risk of infection is negligible. Anti-retroviral treatment of infected patients also significantly reduces their ability to transmit HIV to others, by reducing the amount of virus in their bodily fluids to undetectable levels.

Sexual contact

The majority of HIV infections are acquired through [unprotected sexual](#) relations between partners, one of whom has HIV. The primary mode of HIV infection worldwide is through sexual contact between members of the opposite sex.

During a sexual act, only male or female [condoms](#) can reduce the risk of infection with HIV and other STDs. The best evidence to date indicates that typical condom use reduces the risk of [heterosexual](#) HIV transmission by approximately 80% over the long-term, though the benefit is likely to be higher if condoms are used correctly on every occasion.

The male [latex](#) condom, if used correctly without oil-based lubricants, is the single most effective available technology to reduce the sexual transmission of HIV and other sexually transmitted infections. Manufacturers recommend that oil-based lubricants such as [petroleum jelly](#), butter, and [lard](#) not be used with latex condoms, because they dissolve the [latex](#), making the condoms [porous](#). If lubrication is desired, manufacturers recommend using [water](#)-based lubricants. Oil-based lubricants can be used with [polyurethane](#) condoms.

[Female condoms](#) are commonly made from [polyurethane](#), but are also made from [nitrile](#) and latex. They are larger than male condoms and have a stiffened ring-shaped opening with an inner ring designed to be inserted into the vagina keeping the condom in place; inserting the female condom requires squeezing this ring. Female condoms have been shown to be an important HIV prevention strategy by preliminary studies which suggest that overall protected sexual acts increase relative to unprotected sexual acts where female condoms are available. At present, availability of female condoms is very low and the price remains prohibitive for many women.

Studies on couples where one partner is infected show that with consistent condom use, HIV infection rates for the uninfected partner are below 1% per year. Prevention strategies are well-known in developed countries, but epidemiological and behavioral studies in Europe and North America suggest that a substantial minority of young people continue to engage in high-risk practices despite HIV/AIDS knowledge, underestimating their own risk of becoming infected with HIV.

[Randomized controlled trials](#) have shown that male [circumcision](#) lowers the risk of HIV infection among heterosexual men by up to 60%. It is expected that this procedure will be actively promoted in many of the countries affected by HIV, although doing so will involve confronting a number of practical, cultural and attitudinal issues. However, programs to encourage condom use, including providing them free to those in poverty, are estimated to be 95 times more cost effective than circumcision at reducing the rate of HIV in sub-Saharan Africa.

Some experts fear that a lower perception of vulnerability among circumcised men may result in more sexual risk-taking behavior, thus negating its preventive effects. However, one randomized controlled trial indicated that adult male circumcision was not associated with increased HIV risk behavior.

Studies of HIV infection rates among women who have undergone [female genital cutting](#) (FGC) have reported mixed results.

A three-year study in South Africa, completed in 2010, found that an [anti-microbial vaginal gel](#) could reduce infection rates among women by 50% after one year of use, and by 39% after two and a half years. The results of the study, which was conducted by the Centre for the Aids Programme of Research in South Africa ([CAPRISA](#)), were published in [Science](#) magazine in July 2010, and were then presented at an international aids conference in [Vienna](#).

Body fluid exposure

Health care workers can reduce exposure to HIV by employing precautions to reduce the risk of exposure to contaminated blood. These precautions include barriers such as gloves, masks, protective eyewear or shields, and gowns or aprons which prevent exposure of the skin or mucous membranes to blood borne pathogens. Frequent and thorough washing of the skin immediately after being contaminated with blood or other bodily fluids can reduce the chance of infection. Finally, sharp objects like needles, scalpels and glass, are carefully disposed of to prevent needlestick injuries with contaminated items. Since intravenous drug use is an important factor in HIV transmission in developed countries, [harm reduction](#) strategies such as [needle-exchange programmes](#) are used in attempts to reduce the infections caused by drug abuse.

Mother-to-child

Current recommendations state that when replacement feeding is acceptable, feasible, affordable, sustainable and safe, HIV-infected mothers should avoid breast-feeding their infant. However, if this is not the case, exclusive breast-feeding is recommended during the first months of life and discontinued as soon as possible. It should be noted that women can breastfeed children who are not their own.

Education

One way to change risky behavior is health education. Several studies have shown the positive impact of education and health literacy on cautious sex behavior. Education works only if it leads to higher health literacy and general cognitive ability. This ability is relevant to understand the relationship between own risky behavior and possible outcomes like HIV-transmission. In July 2010, a [UNAIDS](#) Inter-Agency Task Team (IATT) on Education commissioned literature review found there was a need for more research into non-African (especially non-South African contexts), more research on the actual implementation of sex-education programmes (such as teacher training, access to related services through schools and the community, or parental attitudes to HIV and AIDS education) and more longitudinal studies on the deeper complexities of the relationship between education and HIV.

Management

There is currently no publicly available [vaccine](#) for HIV or cure for [HIV](#) or AIDS. The only known methods of prevention are based on avoiding exposure to the virus or, failing that, an antiretroviral treatment directly after a highly significant exposure, called [post-exposure prophylaxis](#) (PEP). PEP has a very demanding four week schedule of dosage. It also has very unpleasant side effects including [diarrhea](#), [malaise](#), [nausea](#) and [fatigue](#).

Current treatment for HIV infection consists of [highly active antiretroviral therapy](#), or HAART. This has been highly beneficial to many HIV-infected individuals since its introduction in 1996 when the protease inhibitor-based HAART initially became available. Current optimal HAART options consist of combinations (or "cocktails") consisting of at least three drugs belonging to at least two types, or "classes," of [antiretroviral](#) agents.

Typical regimens consist of two [nucleoside analogue reverse transcriptase inhibitors](#) (NARTIs or NRTIs) plus either a [protease inhibitor](#) or a [non-nucleoside reverse transcriptase inhibitor](#) (NNRTI). Because HIV disease progression in children is more rapid than in adults, and laboratory parameters are less predictive of risk for disease progression, particularly for young infants, treatment recommendations are more aggressive for children than for adults. In developed countries where HAART is available, doctors assess the [viral load](#), CD4 counts, rapidity of CD4 decline and patient readiness while deciding when to recommend initiating treatment. Traditionally, treatment has been recommended for otherwise asymptomatic patients when CD4 cell counts fall to 200-250 cells per microliter of blood. However, beginning treatment earlier (at a CD4 level of 350 cells/microliter) may significantly reduce the risk of death.

Standard goals of HAART include improvement in the patient's quality of life, reduction in complications, and reduction of HIV viremia below the limit of detection, but it does not cure the patient of HIV nor does it prevent the return, once treatment is stopped, of high blood levels of HIV, often HAART resistant. Moreover, it would take more than the lifetime of an individual to be cleared of HIV infection using HAART.

Despite this, many HIV-infected individuals have experienced remarkable improvements in their general health and quality of life, which has led to the plummeting of HIV-associated morbidity and mortality. In the absence of HAART, progression from HIV infection to AIDS occurs at a [median](#) of between nine to ten years and the median survival time after developing AIDS is only 9.2 months. HAART is thought to increase survival time by between 4 and 12 years.

For some patients, which can be more than fifty percent of patients, HAART achieves far less than optimal results, due to medication intolerance/side effects, prior ineffective antiretroviral therapy and infection with a drug-resistant strain of HIV. Non-adherence and non-persistence with therapy are the major reasons why some people do not benefit from HAART. The reasons for non-adherence and non-persistence are varied. Major psychosocial issues include poor access to medical care, inadequate social supports,

psychiatric disease and drug abuse. HAART regimens can also be complex and thus hard to follow, with large numbers of pills taken frequently.

Side effects can also deter people from persisting with HAART, these include [lipodystrophy](#), [dyslipidaemia](#), [diarrhoea](#), [insulin resistance](#), an increase in [cardiovascular risks](#) and [birth defects](#). Anti-retroviral drugs are expensive, and the majority of the world's infected individuals do not have access to medications and treatments for HIV and AIDS. However, the costs of anti-retroviral drugs have fallen recently in low-income countries. Moreover, patients' quality of life indices benefit from anti-retroviral treatment especially if healthcare services are adequate. In the absence of a cure for AIDS, anti-retroviral treatment is likely to be a cost-effective strategy for enhancing well-being of AIDS patients and their dependents.

Complementary and alternative medicine

In the US, approximately 60% of HIV patients use various forms of [complementary or alternative medicine](#) (CAM). Despite the widespread use of CAM by people living with HIV/AIDS, the effectiveness of these therapies has not been established. A 2005 Cochrane review of existing high-quality scientific evidence concluded: "There is insufficient evidence to support the use of herbal medicines in HIV-infected individuals and AIDS patients." [Acupuncture](#) has only been proposed for symptomatic relief, but not to treat or cure HIV or AIDS.

Vitamin or mineral supplementation has shown benefit in some studies. Daily doses of [selenium](#) can suppress HIV viral burden with an associated improvement of the CD4 count. Selenium can be used as an adjunct therapy to standard antiviral treatments, but cannot itself cure the infection. More evidence is needed before it can be established that selenium supplementation reduces mortality rates. There is some evidence that [vitamin A](#) supplementation in children reduces mortality and improves growth. A large Tanzanian trial in immunologically and nutritionally compromised pregnant and lactating women showed a number of benefits to daily multivitamin supplementation for both mothers and children. Dietary intake of micronutrients at [RDA](#) levels by HIV-infected adults is recommended by the [World Health Organization](#) (WHO). The WHO further states that several studies indicate that supplementation of vitamin A, zinc, and iron can produce adverse effects in HIV positive adults.

Prognosis

Without treatment, the net median survival time after infection with HIV is estimated to be 9 to 11 years, depending on the HIV subtype, and the median survival rate after diagnosis of AIDS in resource-limited settings where treatment is not available ranges between 6 and 19 months, depending on the study. In areas where it is widely available, the development of [HAART](#) as effective therapy for HIV infection and AIDS reduced the death rate from this disease by 80%, and raised the life expectancy for a newly diagnosed HIV-infected person to about 20 years.

As new treatments continue to be developed and because HIV continues to [evolve](#) resistance to treatments, estimates of survival time are likely to continue to change. Without antiretroviral therapy, death normally occurs within a year after the individual progresses to AIDS. Most patients die from opportunistic infections or [malignancies](#) associated with the progressive failure of the immune system. The rate of clinical disease progression varies widely between individuals and has been shown to be affected by many factors such as host susceptibility and immune function health care and co-infections, as well as which particular strain of the virus is involved.

Even with anti-retroviral treatment, over the long term HIV-infected patients may experience [neurocognitive disorders](#), [osteoporosis](#), [neuropathy](#), [cancers](#), [nephropathy](#), and [cardiovascular disease](#). It is not always clear whether these conditions result from the infection, related complications, or are side effects of treatment.

The largest cause of AIDS morbidity today, globally, is [tuberculosis](#) co-infection, In Africa, HIV is the single most important factor contributing to the increase in the incidence of TB since 1990.

(Extracts from en.Wikipedia.org/wiki/AIDS)