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# UNIT 4 HISTORICAL PERSPECTIVE OF HIV AND AIDS EPIDEMIC

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## Structure

- 4.1 Introduction
- 4.2 Objectives
- 4.3 Clinical Description
- 4.4 History of HIV and AIDS in the World
- 4.5 History of HIV and AIDS in India
- 4.6 Theories of the Origin of HIV and AIDS
- 4.7 Let Us Sum Up
- 4.8 Unit-end Exercises
- 4.9 Suggested Readings
- 4.10 Answers to Check Your Progress

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## 4.1 INTRODUCTION

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In the past the world has faced many pandemics like cholera and plague. At the turn of the 20<sup>th</sup> century the world faced influenza pandemic. Every fifty to sixty years, the world has faced a new disease that has been of the nature of an epidemic. These diseases have left a trail of death and morbidity. There has been wide spread fear and stigma attached to the victims due to ignorance and fear. As the diseases have progressed people have studied how, what and why of those diseases. They have found the cause of most of the diseases. They have also found how these diseases spread. Many times they have found cures and vaccines to prevent the spread of the disease. A new disease appeared and affected mankind in the early 1980's. This disease is called AIDS (Acquired Immuno Deficiency Syndrome).

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## 4.2 OBJECTIVES

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Whenever, a new disease appears, people speculate on the origin of the disease. Various theories have been proposed for the origin of HIV. Similarly, history of the origin and time of the first appearance of the disease can vary from country to country. Whenever a new disease has been introduced into a population from another population, it has produced severe disease and death among the origin population. We are now faced with one of the most dreaded diseases of the twentieth century. In this unit we shall try to examine the history of HIV and AIDS in the world and in India. After going through this unit, you should be able to:

- recall the clinical description of HIV and AIDS;
- trace the history of HIV and AIDS in the world; and
- discuss the theories of the origin of HIV and AIDS.

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## 4.3 CLINICAL DESCRIPTION

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In 1981 physicians working in Los Angeles came across a serious illness among young males. These patients had a severe form of rare pneumonia. The organism of this pneumonia was identified as *Pneumocystis carinii*. This organism is a very rare organism. It was mainly seen among patients who had received chemotherapy for cancer. Now these young males without any evidence of chemotherapy were suffering from this infection. Michael Gottlieb collected five cases of these infections and published it in NEJM, a scientific journal.

At the same time in New York, physicians were seeing a rare form of skin cancer. It was known as Kaposi sarcoma. Before 1981 only 500 odd cases of Kaposi sarcoma had been reported in the world of medical literature. Now many cases were seen at the same time. Alvin E. Friedman-Kien reported these cases in one of the medical journals. In both these groups the patients were young males and they had profound defects in their body's defense (immune) system.

### Route of Infection

All these male patients had sex with other men (homosexuals or Gay's). They had multiple sex partners. Some of them also used sexual stimulants. Intravenous drug users also suffered from a similar problem. Both males as well as females were affected. In 1983, an elderly male patient was found to be suffering from *Pneumocystis pneumonia*. Unlike the younger patients he did not have any history of gay behaviour. He had been suffering from hemophilia. He had received multiple blood transfusions. Similar cases were reported from Denver, U.S.A.

In 1984, children born to mothers who were abusing intravenous drugs suffered from severe immune deficiency. It was postulated that they also were suffering from the same disease as their mothers. In the United States this immuno deficiency was also seen among persons of Haitian origins. In France, many Africans sought treatment for severe immuno deficiency. By the end of 1984, a picture of how this disease was being spread was known and that the disease was becoming global was evident. By the end of 1985 it was clear that the disease spread through sex, blood and blood products and from mother to child.

### Naming of the Disease

In the beginning the disease had no entity. As this disease was seen among Homosexuals, it was called as Gay Related Immuno Deficiency (GRID) syndrome. By the end of 1983 this disease was also being discovered among other groups. The Center for Disease Control, Atlanta, USA named this disease as Acquired Immuno Deficiency Syndrome. Since then the disease is known as AIDS.

### Search for a Cause

Since the disease was first seen among the homosexual males, it was believed that their behaviour put them at a risk. It was felt that the immune system was being exhausted due to constant stimulation of the immune system by various types of foreign proteins present in the semen. Similarly it was felt that patients with hemophilia were exposed due to repeated transfusions. This concept did not explain the occurrence of the disease among IVD users.

Gays used amyl and butyl nitrates as poppers to enhance their sexual powers. IVD users may have used drugs, which may have some toxic substances. It was thought that the immuno deficiency was due to toxic reactions to these substances. The theory did not explain the occurrence of the disease among the hemophiliacs and among children.

As the disease was seen in various groups, it was postulated that an infectious agent might have caused the disease. Studies among gay men revealed that they had multiple sex partners. It strengthened the search for an infectious agent. It is easy to identify bacterial agents. Since bacteria were not identified, a viral agent was sought.

Robert Gallo an American scientist had discovered a virus that produced a cancer in the human lymphocytes. It was known as HTLV virus. It was a retrovirus. These tumors were more common in Africa. The virus was spread by blood transfusion and through sexual contact. It was postulated that the agent that caused AIDS might be a mutant of that virus. French physicians were seeing patients from Africa who manifested the disease that was similar to the disease seen in the Americans. French scientists started looking for this virus.

A lymph node that was removed from one of the patients was processed in the Pasteur Institute in Paris. Luc Montagnier, Head of the Virology Section and Françoise Barré-Sinoussi isolated the virus in 1983. Barré-Sinoussi first presented this information at a conference on retrovirus. It was photographed using the electron microscope by the end of 1983. Since it was different from HTLV viruses, the French called it the lymphadenopathy-associated virus (LAV). It differed from the HTLV virus. It destroyed the lymphocytes while the HTLV stimulated it. In 1984, it was renamed as Human Immunodeficiency virus (HIV). Thus the cause for AIDS was established, namely, the HIV.

### Search for a Cure

Sam Border in 1984 used Suramin to treat HIV infection. Suramin was used for treatment of sleeping sickness. It had an antiretroviral activity. It was approved for use in the United States. Hence, he used it on HIV positive patients. It was found to be very toxic and its use was given up early.

In 1964, Jerome Herovitz synthesized a nucleoside known as azidothymidine. At that time it did not have any clinical use. In 1984 scientist at Burroughs Wellcome laboratory reinvestigated the drug and found it was effective against the HIV virus. It was the first hope that HIV could be cured. Since then numerous drugs have been synthesized.

In 1990 single drug regimens were shown to be ineffective in controlling the infection. In 1992 two drug regimens were used. It was found that it reduced the incidence of opportunistic infections. In 1996 three drug regimens were used. These regimens reduced the viral burden as well as improved the quality of life. These regimens are known as highly active **antiretroviral therapy**. At the beginning of the twentieth century treatment of HIV infection appears to be similar to that for any other chronic disease. There is hope that the disease will be cured one day. We have to wait with patience.

### Check Your Progress

Notes: a) Use the space provided for your answer.

b) Check your answer with those provided at the end of this unit.

1. Briefly explain the efforts made towards finding a cure for HIV and AIDS.

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## 4.4 HISTORY OF HIV AND AIDS IN THE WORLD

Theoretically, it should be possible for us to find out when and where the first case of AIDS occurred. However, in practice this is not so easy. We know how HIV is transmitted.

- a) through sexual activities
- b) Through infected blood, via blood transfusion and via the sharing of syringes.
- c) From an infected mother to her baby, before or during birth which is known as perinatal transmission, it is usually possible to work out how each AIDS patient became infected.

Chronologically speaking, the origin of HIV may be traced from the 1950's. At the end of World War II, only a handful of viruses were known. Hundreds more have been discovered since, partly as a result of advanced techniques for culturing them in the laboratory. Viruses are parasites which infect almost every form of life, from single-celled bacteria up to humans. The roughly simultaneous appearance of AIDS in the United States, Europe, Africa and Haiti prompted the question. Had AIDS been around for some time, unnoticed? After combing through medical histories of past patients, investigators found a small number of probable cases of AIDS going back over thirty years over three continents. Working back in time, they found AIDS-like symptoms in patients as early as 1959 (Renee, 1988)

The first case of HIV in USA was reported in 1981. In 1979 a forty-four year old homosexual man died with Kaposi sarcoma in New York City. Kaposi sarcoma is a kind of cancer now found commonly among AIDS patients in the West. In 1977, a twenty seven year old Rwandan mother had developed the similar symptoms and died. In the same year a thirty four year old Zaian woman, who sought treatment in Belgium later died of what could be opportunistic infections in Kinshasa in 1978. In 1975 a previously healthy seven-month-old black infant from New York had pneumocystis and succumbed. In 1969 a fifteen year old black US boy with Kaposi sarcoma and opportunistic infection died in St. Louis. Earlier in 1959 a British sailor with Kaposi sarcoma and pneumocystis died in Manchester.

In a few of these cases the retrospective diagnosis of AIDS are now being supported by positive blood tests for HIV. Most of them however, have been identified as possible early cases of AIDS on the basis of the symptoms alone. The search goes on, and it is possible that eventually earlier possible cases will be found somewhere some time.

The earliest known blood sample registering sero-positive by means of several different antibody tests was drawn in Kinshasa and Zaire in 1959. Efforts are still on to trace the history of AIDS through investigations in a less scientific way by going back to the earliest North American cases, and asking friends of AIDS patients about their sex lives, in an attempt to identify the original "Patient Zero". Investigations are going on to find "Patient Zero". One unproved suggestion is that US cases all go back to a homosexual Air Canada steward who infected a large number of people across North America. No one knows from where this man caught the disease or if this assumption was true.

### Check Your Progress

Notes: a) Use the space provided for your answer.

b) Check your answer with those provided at the end of this unit.

2. Trace the history of HIV and AIDS cases in the West prior to 1980s.

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## 4.5 HISTORY OF HIV AND AIDS IN INDIA

When the disease appeared in the West, many people in India thought that the disease would not affect the Indians. It was seen as disease due to promiscuity. Indians have strong family ties and consider themselves as very religious people. Homosexuality is thought to be very rare in India. HIV was seen as a disease of the West.

Others viewed it as an impending public health problem which would affect Indians. Some predicted a devastation as in Africa. Still others took a balanced view, predicting that it will be a public health problem but of lower severity than in Africa.

In 1985 the Indian Council of Medical Research (ICMR), set up a sero-surveillance programme. In 1986 the presence of the virus was first detected in sex workers in Chennai. The first Indian patient to suffer from AIDS was reported from Mumbai. In 1987 the ICMR warned the country about the impending epidemic.

Soon after the reporting of the first few HIV and AIDS cases in the country in 1986, Government recognized the seriousness of the problem and took a series of important measures to tackle the epidemic. By this time AIDS had already attained epidemic proportion in the African region and was spreading rapidly in many countries of the world. Government of India without wasting any time initiated steps and started pilot screening of high-risk population. A high-powered National AIDS Committee was constituted in 1986 itself and a National AIDS Control Programme was launched in the year 1987.

### National AIDS Committee

To formulate strategy and plan for implementation of prevention and control of HIV and AIDS in the country, Ministry of Health and Family Welfare constituted a National AIDS Committee in the year 1986, under the chairmanship of the Union Minister of Health and Family Welfare with representatives from various sectors. The committee was formed with a view to bring together various ministries, nongovernment organizations and private institutions for effective co-ordination in implementing the programme. The committee acts as the highest-level deliberation body to oversee the performance of the programme and to provide overall policy directions, and to forge multi sectoral collaborations.

In the initial years the programme focused on generation of public awareness through communication programmes, introduction of blood screening for transfusion purposes and conducting surveillance activities in the epicenters of the epidemic.

Every state began testing for HIV and several cases of HIV infection started emerging.

### **Medium Term Plan for HIV/AIDS Control**

In year 1989, with the support of WHO, a medium term plan for HIV and AIDS Control was developed with a US \$ 10 million budget to be provided from external sources. Project documents for the implementation of this plan were developed and implemented in 5 states and UTs which were most affected, namely, Maharashtra, Tamil Nadu, West Bengal, Manipur, and Delhi. Initial activities focused on the reinforcement of programme management capacities as well as targeted IEC and surveillance activities. Preventive activities further 1992-implementation of education and awareness programme, blood safety measures, control of hospital infections condom promotion to prevent HIV/AIDS and strengthening of clinical services for both STD and HIV and AIDS, gained further momentum in 1992 with a massive input of international funding.

### **National AIDS Control Organisation (NACO)**

In 1991, a number of donors indicated their interest to support India and accordingly a “**Strategic Plan for Prevention and Control of AIDS in India**” was prepared for the five-year period 1992-1997. The strategic plan has to date received support from the World Bank, WHO and other international agencies. The aim of the plan was to establish a comprehensive, multi-sectoral programme for the prevention and control of HIV and AIDS in India through a separate management structure.

In order to achieve their objectives the Government of India established the National AIDS Control Organisation in 1992, as an executive body in the Ministry of Health and Family Welfare at New Delhi, to work for the prevention and control of AIDS in the country. An Additional Secretary posted as its Project Director heads National AIDS Control. Its Secretariat consists of an Additional Project Director (Technical), subject specialists and other technical and administrative staff.

### **National AIDS Control Board**

A National AIDS Control Board has been constituted at the National level under the chairmanship of Secretary (Health), Ministry of Health and Family Welfare in order to review NACO policies, to expedite sanction, approve procurement and to undertake and award contracts to private agencies. The other major functions of the board pertain to the approval of annual operation plan budget, reallocation of funds between programme components, formation of the programme managerial teams and appointment of senior programme staff. The board exercises all financial and administrative powers, which are beyond the powers of the Additional Secretary and Project Director, NACO and which the Department of Health, Government of India can exercise with the approval of the department of Expenditure, Ministry of Finance. No separate reference to Ministry of Finance for funding planned activities is required as the Ministry of Finance is represented on the board.

The National AIDS Control Board has also been entrusted with all the functions, which hitherto were being performed by the technical Advisory Committee under the Chairmanship of the Director General of Health Services (DGHS).

NACO has close collaboration and effective co-ordination among Central and State Governments, various Government departments, local bodies, partnership with NGOs, corporate bodies, international and bilateral collaboration for implementing and monitoring various programmes.

NACO has been in the forefront for the fight against HIV and AIDS. In 2002 NACO announced the National Policy for fight against HIV and AIDS.

## 4.6 THEORIES OF THE ORIGIN OF HIV AND AIDS

Four theories have been propounded regarding the origin of HIV. The debate still goes on. Let us briefly discuss these theories.

### Old Human Disease

The first theory is that HIV has been around among mankind for a very long period and has recently become more virulent. One possibility is that the virus comes from a small and isolated ethnic group, which had acquired immunity to it, so that it has rarely caused death. When it spread outside this group, and reached people who had no such immunity, it became a killer disease.

This theory states that diseases common in one part of the world, when carried to “virgin” territory have often proved a mortal danger to the newly exposed population. European diseases, such as measles and smallpox, virtually wiped out some North American Indians in the eighteenth and nineteenth centuries. This theory is important for a key reason. If this was the origin of the HIV, then the isolated groups immunity might enable a vaccine to be developed to protect the rest of the world.

There are few completely isolated people left in the world, mainly in the rain forests of New Guinea, Amazon, and perhaps Central Africa. In fact we have in India the nearly extinct Great Andamanese, a tribe having only 35 members according to the 1991 census. Since one of the early locations of AIDS was Central Africa, much speculation was focused on this possibility. By its nature, this is a theory that is very difficult to disprove, but there is some evidence which argues against it.

### Animal Disease

The second theory is that HIV has existed for a long time as an animal disease, and has only recently managed to infect and trigger off epidemic in humans. There are other examples of diseases “crossing over” from an animal to mankind, and since a rather similar virus has been found in a species of monkey, this possibility has received considerable attention.

History has recorded many great human disease epidemics, which have been traced back to an infectious organism carried by animals or insects. It is a fact, that domestic and wild animals can harbour germs which, when contracted by humans can lead to an infection that in some cases can be passed on from person to person independent of the original animals source. Source books written in the 1960s before AIDS, listed eighty-four diseases of major significance to public health that can be transmitted from animals to humans.

Like the malaria parasite, in many cases the human host is essential to the lifecycle of the infective organism. It can also be that the human may be an accidental host, contracting the infection from an animal in rare or unusual circumstances, sometimes with the result that the ensuing disease is more severe in the human than it was in the original hosts.

Since AIDS is a sexually transmitted disease, the theory that it originated among monkeys has in some cases given rise to the idea that the original transmission from monkey to human was via sexual relationship. Recent molecular epidemiological data has indicated that HIV virus has evolved from the *Pantroglodytes* sub species of the chimpanzees. It was present in that species for centuries. It does not cause any infection among the chimpanzees. It is remarkably similar to a virus known as **Simian immuno deficiency** which is endemic among

monkeys. If the virus was present among the chimps and monkeys how did it enter the human beings?

The most likely explanation is found in the cultural practices of the people in Central Africa. Chimpanzees have traditionally served as a source of food to certain people in sub-Saharan Africa. A person may have been infected with the virus during the process of butchering the chimps, he may have had an open wound. The wound may have been contaminated by Chimp's blood. Intermittently this type of contact would have occurred through out the centuries.

In Central Africa the disease must have spread from the infected person to their spouse and if both of them died then the epidemic would not have spread. If the epidemic had to spread, certain conditions have to be present. This century provided that ideal condition for the spread of the disease. These conditions included migration, and break up of the traditional family system. Migratory nature of employment brought about increased interaction with sex workers. Sexual promiscuity of the times added to the spread. Blood transfusion became common. Hence, contaminated blood or sexual inter course could have spread the virus.

The Gay (male homo-sexuals) revolution of 1969 with high risk homosexual practices was one of the perfect settings for the spread of the infection. A similar pattern was seen in other industrialised countries as well.

### **Man-made virus**

The third theory is that of a man-made virus, perhaps from a germ warfare laboratory. Unlike the first two, this is not a scientific theory posed in terms which are open to experimental confirmation. Rather it has been propagated like a campaign with different versions picked up and reported in various newspapers and magazines around the world. The other theory is that it may be due to contaminated or mutated vaccines that were developed against polio virus. There are no accepted proofs for this theory.

According to Renee Sabatier, like all conspiracy theories AIDS as-germ- warfare is impossible to disprove, but it does seem improbable. The first argument against it is that Genetic Engineering was not sufficiently advanced to develop such a man made virus at the time HIV first appeared. The AIDS virus must have been in existence several years before 1980, when widespread cases of AIDS started to appear in US hospitals. If one accepts the evidence for AIDS cases as early as 1959, it must have been in existence since the mid 1950s. Virologists are emphatic that even if such a virus could be developed today, the science of genetic engineering was not sufficiently advanced in the late 1970s, for this to be possible.

The second argument is that a virus like HIV is not the sort of bug a germ warfare laboratory would wish to develop. There is no point in developing a virus as a weapon unless one's own side can be protected against it. The ideal germ warfare organism would be one that caused disease very quickly that did not spread by itself but only infected those deliberately infected with it, and for which there was vaccine to be used to protect one's own side. The HIV differs from this in every respect. A few virologists take seriously the theory that HIV is the result of a scientific conspiracy. So far, there is no substantive evidence whatever that this is where AIDS came from, while there are number of convincing arguments that this origin is unlikely. However, it is possible that, the HIV appeared as an unintended outcome of human endeavours in the laboratory or community.

### **Mutation Theory**

The fourth theory is called the "mutation theory". According to this theory, viruses are continually changing and mutating into new strains. It is possible that a mutation

took place in a virus, which produced a new virus with the deadly properties of HIV. As reported earlier, the first recorded cases for the traces of HIV infection were from North America (1969), and Zaire (1959). However it is possible that there were other cases of HIV and AIDS in other countries of which we have no knowledge. With increased migration, market economy, liberalization and expansion of global tourism industry, lot of travel has taken place among people within and outside the country since 1950s. This has increased interaction among people. Thus, it is easy for disease to cross over from one person/community to another. It was believed that HIV was a virus that had undergone mutation or it was produced by recombination of the viral particles. Since the oldest sample was obtained from Africa, it was postulated that it began in Africa and then spread to rest of the world. This theory was not accepted. More sensitive tests showed that this theory was not acceptable. With all these theories in the background, the struggle to find a cure for HIV and AIDS continue globally.

### Check Your Progress

Notes: a) Use the space provided for your answer.

b) Check your answer with those provided at the end of this unit.

3. Briefly describe the Mutation theory.

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## 4.7 LET US SUM UP

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Every disease has a history of evolution. However the origin of HIV and AIDS is shrouded in mystery. No one exactly knows where HIV actually came from. In this unit we have tried to explain the clinical description of HIV and AIDS and its historical existence in the world by tracing back to the initial cases of HIV and AIDS in the world. We have also traced the historical background of the disease in India from 1986 when it was first detected in Chennai. There are four theories of the origin of HIV which are usually a curiosity for most learners to know about. Although there is no proof about any of those theories, it will certainly answer many doubts of people and avoid blaming others.

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## 4.8 UNIT-END EXERCISES

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1. Analyze the significance of studying the origin and historical background of HIV and AIDS.
2. Try and find out the history of other epidemics such as cholera or plague and see how the social conditions of the time influenced their development.

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## 4.9 SUGGESTED READINGS

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Randy, Shills, (1987): *And the Band Played On*, St. Martin's Press: New York.

Priya, Ritu (1994): *AIDS, Public Health and the Panic Reaction, Part I & II*, National Medical Journal of India, 7 (5 & 6).

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## 4.10 ANSWERS TO CHECK YOUR PROGRESS

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1. Sam Border in 1984 used Suramin to treat HIV infection. Suramin was used for treatment of sleeping sickness. It had an antiretroviral activity. It was approved for use in the United States. Hence he used it on HIV positive patients. It was found to be very toxic and its use was given up early.

In 1964, Jerome Herovitz synthesized a nucleoside known as azidothymidine. At that time it did not have any clinical use. In 1984 scientist at Burroughs Wellcome laboratory reinvestigated the drug and found it was effective against the HIV virus. It was the first hope that HIV could be cured. Since then numerous drugs have been synthesized.

In 1990 single drug regimens were shown to be ineffective in controlling the infection. In 1992 two drug regimens were used. It was found that it reduced the incidence of opportunistic infections. In 1996 three drug regimens were used. These regimens reduced the viral burden as well as improved the quality of life. These regimens are known as highly active anti retroviral therapy. At the beginning of the twentieth century treatment of HIV infection appears like any other chronic disease. There is hope that the disease will be cured one day. We have to wait with patience.

2. The first case of HIV in USA was reported in 1981. In 1979 a forty-four year old homosexual man died with Kaposi sarcoma in New York city. Kaposi sarcoma is a kind of cancer now found very commonly among AIDS patients in the west. There is some evidence that, in 1977 a twenty-seven years old Rwandan mother developed the immuno deficiency symptoms and died. In the same year a thirty four year old Zaiean woman, who sought treatment in Belgium later died of opportunistic infection in Kinshasa in 1978. In 1975 a previously healthy seven month old black infant from New York had pneumocystis carinii and succumbed. In 1969 a fifteen year old black US boy died with Kaposi sarcoma and opportunistic infections in St. Louis. Earlier in 1959 a British sailor with Kaposi's sarcoma and pneumocystis had died in Manchester.
3. According to "Mutation theory" viruses are continually changing and 'mutating' into new strains. It is possible that a mutation took place in a virus which produced a new virus with the deadly properties of HIV.