The AIDS Pandemic

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This book is not intended as a substitute for the medical advice of physicians. Readers should regularly consult their doctors in matters relating to health and particularly in respect to symptoms that may require diagnosis or medical attention. It is especially important that people exposed to HIV risk, and their sexual partner(s) seek a proper medical diagnosis and treatment.
Dictionaries define *epidemics* as diseases affecting the greatest number of people in communities at a certain time and moving from place to place. They go on to describe *pandemics* as widespread epidemics. The spread of HIV/AIDS fits these definitions as it has swept around the world and, in recent years, has centred on African countries, particularly in sub-Saharan Africa.

It has done so due to the presence of aggravating circumstances that favour the transmission of the virus, circumstances that vary from country to country. In the early days of HIV transmission in Western countries the virus was spread primarily through homosexual sex, then by heterosexual sex and, more recently, through unsterilized shared drug equipment and experience. HIV has spread rapidly in Africa because, as Shirley Lindenbaum notes: ‘The AIDS pandemic is the painful illustration of an international political economy with its cavernous inequalities in economies, health care, disease and suffering.’

The fact that African countries have taken the full force of the HIV/AIDS pandemic, and that little is known of the origin of the virus, has led to a number of myths circulating about the virus which Africans, naturally, are eager to dispel. Samuel V. Duh, addressing this issue, states: ‘There is a widespread myth that AIDS in Africa, and the way it is transmitted, is somehow different from AIDS in developed countries... African AIDS is transmitted in exactly the same way as AIDS in other societies.’

It seems to have taken the rest of the world a long time to reach the same conclusion. As George C. Bond and colleagues point out, ‘AIDS knows no boundaries. There is no intervening vector; human beings are the carriers.’

**The Epidemiology of HIV/AIDS**

The tracking of epidemics and pandemics is based on human beings, people with disease, and so the numbers of people affected are of particular importance. Epidemiology is, as the word implies, the collection of data concerning epidemics. This information has implications for individual treatment as well as the allocation of community and national resources.

It should be noted, however, that the data collected is only as good as the information received and, for a variety of reasons, may be inaccurate. Alan Whiteside and Clem Sunter state very directly: ‘Precision in the
field of HIV and AIDS is spurious. We do not know exactly how many people are infected and will fall ill and die — or when. We make estimates; and the better the data we start with, the more comfortable we will be with the estimates. But they remain just that — estimates.  

In the following pages you will read many statistics, some perhaps even contradictory. This may depend on who is doing the estimating or the number involved in particular studies. Statistics also date very quickly and new figures are not available immediately. Figures are gathered, collated at a central source, and then published, the later the project the slower the progress. Estimates may be divided into upper estimates and lower estimates with wide variation in the range of projection.

There is also some suggestion that the African epidemiological data is not put together in the same way as data collected in the Western countries. Rosalind J. Harrison-Chirimuuta and Richard C. Chirimuuta state that the World Health Organization did not, and does not, distinguish between symptomatic HIV-infection and AIDS; and other wasting diseases in which, in any case, those infected were found to be HVT-seronegative. This led, they claim, to the appearance that African countries have higher rates of HIV than elsewhere.

Whether or not this is so, what is obvious from data collected to date is that the number of people suffering from HIV/AIDS and dying from the virus has reached pandemic proportions. The United Nations and World Health Organization recognize that AIDS has become the world’s biggest fatal disease and the largest cause of death in Africa. Recent statistical trends — to be confirmed as the data comes in — is that the pandemic in some of the sub-Saharan countries of Africa has peaked and may start to recede. While there is cause for optimism there is no place for complacency or return to the risk behaviours that encouraged the spread of HIV.

The Growth of AIDS in Africa

The starting date anywhere recording the first appearance of HIV/AIDS is not settled and possibly never will be. AIDS cases were brought to notice in the USA in 1981 and in Uganda in 1982. Wealthy Africans seeking treatment in Europe were diagnosed with HIV by Belgian and French doctors. Such cases as had been observed in the general population in Eastern Africa were thought to be suffering from Slim’s disease, a condition in which the immune system was impaired and there is fairly rapid weight loss.

HIV spread slowly in many West African countries, with pockets of faster growth in Nigeria, Eastern Africa and now Southern Africa, including Botswana which has become one of the worst-hit countries. Although countries such as Uganda peaked rapidly, this peak seems to be sustained at around 30 per cent of the population, which may also be the peak percentage in other African countries.

It has been estimated that 1:1000 of the population in Central Africa has HIV, which is ten times the rate of infection in the USA.

Men and women in Africa have been about equally infected, although that varies from region to region, with 50 per cent becoming HIV-positive before age 25 and with a similar percentage of these dying before they reached age 35. African HIV-infected people die at a faster rate than other people in the world with HIV. They usually die within four years, compared with a ten-year life-span in other countries.

Although death-rate patterns are changing with the various anti-viral drugs being introduced in Africa, eighty-five to ninety per cent of the HIV-infected in Africa die within three years.

Between 65-85 per cent of the HIV-infected are found in sub-Saharan Africa. This is a situation that might well change in the future. There are fears that Southeast Asia, and India in particular, with twice the population of Africa, may be next in line to suffer heavily.

The spread of HIV/AIDS can be either insidious or like wildfire. As journalist Johanna McGeary writes, most people do not know how or when they caught the virus, many never know they have it, many who do know don’t tell anyone as they lie dying. Africa can provide no treatment for those with AIDS. They will all die, of tuberculosis, pneumonia, meningitis, diarrhoea, whatever overcomes their ruined immune systems first. To help us understand why this might be, we will take a look at The Immune System in some detail.
Dictionaries define epidemics as diseases affecting the greatest number of people in communities at a certain time and moving from place to place. They go on to describe pandemics as widespread epidemics. The spread of HIV/AIDS fits these definitions as it has swept around the world and, in recent years, has centred on African countries, particularly in sub-Saharan Africa.
The body has a two-part immune system which works together to protect it from harmful micro-organisms such as bacteria, fungi, viruses, and parasites. For convenience these are described separately as the innate and the adaptive immune systems and there is a four- to seven-day delay between their responses as one part of the system takes over from the other.

**Innate Immunity**

Innate immunity is the front-line defence which equips us from before birth to deal with the various micro-organisms that we are likely to meet in our normal everyday lives.

**Innate immunity includes:**
- antibodies formed by the mother and passed on to the developing foetus and through infant breastfeeding
- tears, containing the enzyme lysozyme, to protect one’s eyes from bacteria
- saliva, in the mouth, also containing the antibacterial lysozyme
- hairs in the nose, and a sneeze reflex to trap and get rid of inhaled foreign matter
- mucus; cilia hairs (lining the trachea or windpipe); and a cough reflex to trap and expel matter which might be harmful to the lungs
- skin – fifteen layers of it – to protect the body surface, serviced by sebaceous (sweat) glands producing bacteria-killing chemicals
- acids in the stomach and intestines which destroy most harmful micro-organisms yet, at the same time, permit the presence of helpful bacteria
- mucus and chemicals co-existing but with quite differing functions in the urethra/ureters (water tubes) and vagina

When the barriers of the innate immunity are penetrated, white blood cells, leucocytes (phagocytes or devouring cells) and other white cells (principally cytotoxic or natural cell-killing cells) surround and attempt to destroy the invader. At the same time a number of other naturally-produced substances such as interferon and a range of blood proteins (called the complement system) combine to help in the destructive process. This leads to the mobilization of adaptive immunity.

**Adaptive Immunity**

Adaptive immunity is the second line of defence and is called into service when the defences of the innate immunity are breached well beyond the capability of its response. Its defence, instead of being a general reaction, is much more specific as it adapts to the particular organism present, hence adaptive immunity is often referred to as specific immunity.

The lymphocytes, which are the active agents in this response, collectively carry millions of different specificities, thus being able to single out and respond to particular invaders. This wide-ranging ability is called the receptor repertoire and becomes limited in range with the passing of time.

Where the adaptive response is successful, the lymphocytes of that specificity are cloned and so mediate the adaptive immunity, which means that subsequent exposure to the same invader provokes a swifter and more specific response. This recognition is called immunologic memory, and the person concerned is then said to have acquired immunity or seroconversion to that particular organism. (The practical application of the function of the immunologic memory is the founding principle of vaccination.)

It is the role of the adaptive immune system to identify the invading micro-organism as being foreign to any of the body’s own proteins (these foreign proteins are called antigens [antibody generators] from Greek words meaning against and engender), and to initiate a tailored response to the antigen.

The response can be either humoral or cellular, based on the type of invader:
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1) 5 viruses. Coloured scanning electron micrograph of HIV "dots) budding from a T-lymphocyte white blood cell (yellow & green). HIV (human immunodeficiency virus) is the cause of AIDS (acquired immune deficiency syndrome). The HIV has hijacked this lymphocyte and is forcing it to produce more viruses. This budding process destroys the white blood cell. The viruses then infect more T-lymphocytes, weakening the immune system and causing AIDS. The majority of the victims of AIDS die as a result of everyday infections which a healthy immune system would easily cope with. Magnification unknown.

Top right. HIV viruses. Coloured Transmission Electron Micrograph (TEM) of several Human Immunodeficiency Viruses (HIV), cause of AIDS. Three cross-sectioned viruses (at centre) have spiked outer protein coats (yellow & green) surrounding a triangular core of RNA genetic material (red). HIV attacks T-lymphocyte white blood cells of the immune system. A special protein in its coat attaches the virus to the T-lymphocyte cell. The virus RNA then takes over the cell, turning it into a HIV-making machine. The infected person's immune system is therefore weakened and death can be caused by normally non-fatal diseases. Magnification: x10,000 at 6x7cm size.

Bottom. HIV infected T-cell. Coloured scanning electron micrograph (SEM) of a whole T-lymphocyte white blood cell infected with the HIV virus (red dots). HIV is the cause of AIDS. This T-cell is from a culture cell line known as H9. An infected T-cell typically has a lumpy appearance with irregular rounded surface protrusions. Small spherical virus particles visible on the surface (red) are in the process of budding from the cell membrane. Depletion in the blood of T4 lymphocytes through HIV infection is the main reason for the destruction of the immune system in AIDS. Magnification: x5,600 at 6x7cm size.

Humoral Immunity

- deals with infections arising in the inter-cellular body fluids or humors
- is primarily a response to bacteria
- produces large quantities of lymphocytes in the bone-marrow which enter the lymphoid organs (these are the lymph nodes situated throughout the body; the thymus gland located just behind the sternum or breastbone; and the spleen sited high up in the abdomen and left of the stomach)
- the lymphocytes become B-lymphocytes or T-lymphocytes depending on where they are routed after leaving the lymph tissue. The B-lymphocytes continue to mature in the bone-marrow and the T-lymphocytes migrate to and mature in the thymus gland
- as the B-lymphocytes multiply they form plasma cells which in turn make antibodies which bind to the antigens
- the combined action of the phagocytes and the complement system overwhelm and destroy the micro-organism, a process known as phagocytosis

Cellular Immunity

- responds mainly to viruses and parasites that hide inside the cells. As we have seen, some viruses provoke a reaction that brings lasting protection. Others are latent in the cells and their presence and effect is controlled by the immune response
- three types of T-lymphocytes are activated and produced. They are:
**The Immune System**

**Helper cells**
- which help to recognize antigens by roaming through the system (a process known as immune surveillance)
- carry a glycoprotein molecule (CD4) on their surface
- secrete interleukins (substances that promote the production of B and T cells)
- activate the killer cells

**Killer cells**
- these cells lock on to any foreign matter and endeavour to destroy the affected cells

**Suppressor cells**
- these cells, mainly CD8 cells, halt immune responses and antibody production

**Disorders of the Immune System**

Each stage of the immune response is both complex and critical, with its efficient working relying on the various processes functioning with the appropriate level of reaction. Generally speaking, these systems work well, but when they do go wrong they go horribly wrong.

There are two major areas of disorder that increase rather than decrease the vulnerability of the body to any potential problem:

**Autoimmune**
disorders, in which the body’s own proteins are mistaken for antigens, thus setting in motion a self-destructive reaction, targeting specific organs/tissues such as:
- Addison’s disease (affecting the adrenal glands)
- chronic active hepatitis (affecting the liver)
- diabetes mellitus, type 1 (affecting the pancreas)
- Graves’ disease (affecting the thyroid)
- haemolytic anaemia (affecting the red blood cells); and non-specific as in:
- lupus erythematosus (affecting connective tissue)
- rheumatoid arthritis (affecting the joints). Or,

**Immunodeficiency**
disorders, where the immune system is suppressed or damaged. This may occur genetically or through severe infections such as the human immunodeficiency virus (HIV) leading to the disastrous acquired immunodeficiency syndrome (AIDS)

Other disorders, more easily dealt with, may occur when fairly innocuous antigens (such as pollens) provoke an inappropriate response from the immune system.

**The HTLV Retroviruses**

There are very many different families of viruses, strains and subtypes ranging from the common cold (coryza virus) to the human T-cell leukaemia-lymphoma viruses (HTLV) of which what is now known as HIV is one. These viruses have different actions and degrees of effect.

The HTLV family of viruses are membrane-enveloped retroviruses belonging to a group of retroviruses called lentiviruses (from Latin, lentus = slow) so named because of their slow, gradual action.

When it was first sequenced, the HIV genome was discovered to be a single molecule 9,700 nucleotides in length.

Five HTLV viruses and their subtypes have been identified and are described as mutating faster than any other viruses known to man. They are:

**HTLV-I**
- the virus responsible for adult T-cell leukaemia-lymphoma, a cancer affecting blood and bone-marrow

**HTLV-II**
- a virus relating specifically to hairy-cell leukaemia

**HTLV-III**
- now more commonly referred to as HIV or HIV-1, the cause of most of the AIDS worldwide
- also formerly known as lymphadenopathy-associated virus (LAV)
- was the first HTLV to be associated with AIDS
- HIV-1 can be further subtyped as:
  - HIV-1 Group O, a fairly rare form; or,
  - HIV-1 Group M, which is its most common form. Recently a cross-strain of HIV-1 Groups O and M, has been identified and named as HIV-1 Group N, a group which it is expected will remain rare.
- HIV-1 Group M has ten distinct clades or subtypes of its own. These are:
  - A – found across a west-east axis from Ivory Coast to Djibouti via Kenya
  - B – found mainly in Thailand, Europe and North America
  - C – found mainly in East Africa (Djibouti and Somalia) and running from north to south through Botswana and into South Africa – has become the commonest subtype
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globally and accounts for around fifty per cent of HIV-infection

D - is the main form of HIV found in the Congo, and is particularly prevalent in Kenya, Rwanda-Burundi, Tanzania and Uganda

E - found almost exclusively in Thailand, having displaced the B sub-type, but is also present in Cameroon, and the Central African Republic bordering on the Congo. Clade E favours heterosexual contact

F - found mainly in Cameroon and in the Congo

G - found mainly in the Congo and in Gabon

H to J - are relatively unimportant and rare sub-types although also associated particularly with African countries

HTLV-IV

also known as HIV-2 or LAV-2, and is the prevalent form of the virus found in Africa, especially in Cape Verde, Gambia, Guinea-Bissau, Guinea Conakry, Senegal, Sierra Leone, and Mauritania. It is now also appearing in Angola and Mozambique. This form of the virus was first identified in 1986 in HIV-infected people from Cape Verde and Guinea-Bissau

HTLV-V

this form of the virus has greater immunosuppressive action than I but less than that of III

The action of the types described as HIV-1 and HIV-2 is as follows:
HIV
+ carries two copies of an RNA genome (the total genetic information of the amino-acid sequence of the ribonucleic acid of the virus).
+ transcribes these two RNA copies into the DNA (deoxyribonucleic acid), the cell blueprint, of the host cell, which:
  - produces mRNA synthesising viral proteins; and
  - forms new viral RNA particles which break out of the host cell in their own membrane envelopes
+ enters particular types of cell determined by the specific affinity of the cell surface glycoproteins (gp) to those of the invaders, with different variants of HIV having different glycoprotein and cell affinities. Typically, as an example, gp120 binds with CD4 T-cells so the HIV is able to enter these immune-responding cells, overpower them and kill them.

The virus may be carried in infected CD4 T-cells, dendritic cells (cells found within lymphoid tissue and between the adjacent lymphoid cells), and macrophages; or it may be transmitted as a free virus in blood, breast-milk, semen, or vaginal fluids, causing infection in the host body and being passed on to others having contact with these fluids.

In the next chapter The AIDS Infection we will see what effect HIV has on the body and the progress of the condition to overt AIDS.
The recognized routes of HIV-infection are through heterosexual [opposite gender] or homosexual [same gender] sex with an infected partner; the use or contact with contaminated blood either accidentally acquired or through sharing of needles in drug-taking; or transmission from mother to baby in breast-feeding. The HIV-infection has a primary stage and a latency period before it becomes overt AIDS:

Primary Infection
- without symptoms (asymptomatic) in many cases
- with an influenza-like illness lasting up to four weeks and includes headaches, a sore throat, and some glandular swelling
- more marked symptoms may resemble those of glandular fever, with both appetite and weight loss
- along with these symptoms there may well be chronic or intermittent diarrhoea which will also recur in the later stages of HIV-infection; shingles, a herpes zoster skin rash found on the chest, abdomen and/or back; painful lesions and ulceration around the anal, genital and oesophageal areas of the body caused by the herpes simplex virus; unusual bleeding or bruising of the skin; and, thrush, a white cheesy coating of the tongue, mouth and gums
- the early symptoms of the influenza type cause a 
  - profusion of the virus in the peripheral blood areas, and
  - a marked decrease in the circulating CD4 T-cells
- may have a window period when no reaction is detected. This window period may last up to six months
- activation of CD8 T-cells
- antibody production (or seroconversion)

Asymptomatic
(or clinical latency period), when nothing seems to be happening but:
- CD4 T-cells continue to decline. In Africa this takes place between four to six years after infection
- opportunistic infections start to appear
- some HIV-infected persons withstand the presence of opportunistic infections either because they:
  - seroconvert, or their immune response is maintained, or
  - remain seronegative (for whatever reason), their body has resisted the HIV-infection even though they may have had a high exposure to HIV, or, rarely, they may have a genetic resistance to the infection
- The mutant allele (occurring at a particular point on a gene) is found in about ten per cent of the Caucasian population on the CCR5 protein, part of the surface covering the immune cells that HIV attacks. This particular mutation has not been found in black Africans from Western or Central Africa although it would appear that a small percentage do have some immunity due to an as yet unidentified factor.

During the latency period the viral production continues with each HIV cell provoking its host cell to make around 250 HIV clones before destroying the cell. When the viral load reaches critical amounts the immune system is suppressed to such a degree that other infections, which under normal circumstances would not be too difficult to resist, gain entrance (hence the designation opportunistic infections), and the individual is further weakened, and will die of these diseases.

Since particular clusters or syndromes of clinical conditions are associated and observed in people with the increasing viral load, the person is said to have AIDS. The particular make-up of the syndrome may vary from person to person and country to country and may be any combination of some twenty-six or so particular infections. Although the syndrome is different for each person initially, as the AIDS progresses particular infections and a general pattern of disease emerges. The signs and symptoms of infection that begin to emerge through the latency period of HIV-
infection are referred to as the AIDS related complex (ARC).

**AIDS Related Complex**

ARC is diagnosed in HIV-infected people presenting with two or more of the following signs/symptoms which have not responded to symptomatic treatment over a few months:

- an intermittent/continuous fever around or above 38°C
- more than ten per cent weight loss
- intermittent/continuous diarrhoea
- swollen lymph nodes
- night sweats
- fatigue/lethargy

Laboratory tests will indicate the degree to which the viral load has increased and the immune cells have been suppressed. The body now becomes more vulnerable to the opportunistic infections.

The progression of ARC can be seen in a generalized case description written by D. Serwadda and his colleagues about the symptoms of AIDS in Uganda as observed in the mid-80s when the condition first emerged:

In the first six months the patient experiences general malaise and intermittent fevers for which he may treat himself or receive aspirin, chloroquine or chloramphenicol. In due course he develops loss of appetite. In the next six months intermittent diarrhoea starts. There is a gradual weight loss and the patient is pale. . . . After one year the patient typically develops a maculopapular rash, which is very itchy, all over the body. The skin becomes ugly with hyper-pigmented scars. There may be a cough, usually dry but sometimes productive. By this stage, sometimes earlier, the patient is so weak that, if taken to hospital, not much can be done to help him and death follows.

In the light of recent advances in HIV/AIDS treatments the ARC development written about here sounds inevitable and hopeless. Fortunately, advances in the knowledge and management of opportunistic infections now offer greater hope. It is appropriate to look at these in more detail.

**Opportunistic Infections**

*The most common given prominence in bold print*

The main opportunistic infections, and some of their symptoms, making up AIDS may be:

**Bacterial**

*mycobacterium avium intracellulare*

- a tubercular bacillus associated with birds and pigs
- causes chills/night sweats, tiredness, fever, diarrhoea, abdominal pain and weight loss

*mycobacterium tuberculosis*

- a slow-growing and, as its name suggests, tubercular bacillus
- often associated with HIV infection as it shares the socio-economic conditions which favour the spread of disease
- cough, fever/night sweat, and weight loss

*salmonella*

- the agent responsible for food poisoning

**Fungal**

*candida*

- the yeast fungus causing thrush, the white plaque appearing in the mouth and covering the tongue

*coccidioides immitis*

- these spores when inhaled cause respiratory symptoms and/or pneumonia

*cryptococcus neoformans*

- a yeast found in the soil which affects the lungs, and may lead to brain infection and meningitis
- nausea, vomiting, tiredness, fever, confusion and changes in behaviour

*histoplasma capsulatum*

- causing fever, liver and spleen enlargement, and gastrointestinal disorders in children; pulmonary TB-like symptoms in adolescents; and skin conditions in adults

*pneumocystis carinii*

- causing pneumocystis carinii pneumonia (PCP), one of the commonest conditions found in AIDS, and accounting for around 85 per cent of lung infection in people with HIV
The recognized routes of HIV-infection are through heterosexual [opposite gender] or homosexual [same gender] sex with an infected partner; the use or contact with contaminated blood either accidentally acquired or through sharing of needles in drug-taking, or transmission from mother to baby in breast-feeding. The HIV-infection has a primary stage and a latency period before it becomes overt AIDS.

- people with PCP show a:
  - shortness of breath over 6-8 weeks and an inability to take a deep breath
  - non-productive cough
  - mild but persistent fever (37.5°C - 38°C)
- with current drugs the individual usually manages to survive the first infection of PCP; and has longer periods between relapses
- subsequent reinfection brings respiratory problems and death

Parasitic
- *Cryptosporidium*
  - usually through contaminated drinking water and leading to episodic diarrhoeal illness and weight loss
- *Leishmania*
  - an infection transmitted by sandfly bites
- *Microsporidium*
  - ringworm infection
- *Toxoplasma*
  - an infection acquired from cats, and from eating raw or undercooked meat

Viral
- *Cytomegalovirus*
  - any of the herpes virus group
  - distributed throughout the body affecting the lungs, organs, and the eyes
  - most of the AIDS-infected will also be infected with this virus
- *Herpes Simplex*
  - the virus that causes genital herpes

- the infection affects the brain, moving from headaches, sluggishness, fevers and confusion to convulsions and neurological damage
varicella zoster
- the chickenpox virus

Malignancies
Kaposi's sarcoma
- a cancerous, non-painful condition of the connective tissue of blood vessels
- frequently found in Jewish and/or eastern European males and some Africans (where it is referred to as classical Kaposi's sarcoma)
- found in the immunosuppressed such as transplant patients, and more recently as an opportunistic infection of AIDS
- it is a slow, chronic condition producing small, flat bruise-like blotches which may be up to 3 cm in diameter gradually becoming firm nodules or plaques, some of which may be removed by laser surgery
- these lesions occur anywhere on the body but especially along skin-cleavage lines; around the ears; the hard palate; the lower legs; and in the gastrointestinal tract, lungs and brain
- there may also be tissue swelling (oedema) when the lesions affect the face and the legs.

non-Hodgkin's lymphoma
- diseases of the lymph glands including the Epstein-Barr virus-positive Burkitt's lymphoma
- affecting the lymph glands under the arms, in the neck and groin areas and treated with chemotherapy and radiation

primary lymphoma of the brain
- a brain tumour

The HIV may also affect the brain directly – AIDS dementia complex (ADC) – giving rise to:
- loss of concentration
- confusion and mild memory loss
- leg weakness and loss of balance
- depression, withdrawal, apathy
- anxiety

These symptoms occurring over a number of weeks or months eventually lead to Alzheimer-like conditions (described in one instance as 'literally losing your mind an inch at a time'); incontinence; and difficulty in walking. Around 10-45 per cent of people with AIDS develop ADC and may end up bedridden.

In Africa the conditions accompanying the progression to overt AIDS appear to be diarrhoea, fever, and tuberculosis. Additionally, in Central Africa people with this syndrome often have associated oral conditions. In most cases these are thrush; mouth ulcers; destruction of gum tissue (19 per cent of HIV-infected people in Kigali, Rwanda); and, in Kinshasa, swelling of the tissues beneath the jaw.6

Early signs of opportunistic infection have been detected after only a year of infection with HIV. These include the illnesses PCP and Kaposi's sarcoma typical of overt AIDS. Although the various opportunistic infections can be treated as they occur the immune system remains disabled. New immune cells are killed as fast as they are made.

**Immunosuppression and Viral Load**

We have already noted the role of T-cell production as part of the immune response. As the HIV kills off these cells the individual becomes progressively immunosuppressed. Monitoring, and indeed trying to slow this progression, tracks the transition from being HIV-infected to developing overt AIDS.

The healthy immune system has from 600-1500 T-cells per microlitre of blood (µL-1). In the acute influenza-like viral illness associated with the primary infection of HIV and subsequent seroconversion the T-cell count falls below 500 µL-1. The body rallies to the situation and responds by raising the cell level to around 700 µL-1. As the conditions relating to the primary infection become more pronounced in the latent period of the infection the cell count drops to between 200-500 µL-1 and opportunistic infections develop. At this degree of immunosuppression the individual is diagnosed as having overt AIDS.

In the development of AIDS, as the T-cell count decreases there is a corresponding rise in the level of the HIV in the body. The lymph system and body tissues carry around 98 per cent of the virus with the remaining two per cent carried by the blood.

Viral RNA molecules are measured in particles per millilitre of blood, and, as with the T-cell count, the implications of having particular levels is critical. If the individual has 5,000 particles or lower of HIV the expected survival rate is five or more years. When the viral load is between 5,000 and 10,000 particles the disease progression is at fairly low risk. When the viral load increases from 10,000 to 100,000 particles there is a medium risk of the HIV developing. Anything over 100,000 particles places the individual at high risk of the HIV becoming overt AIDS.

This process of viral load increase appears to be speeded up in Africa where it is often referred to as fast-track AIDS.7 It is important to note that even where the viral load has fallen below detectable levels, as is the case with a wide range of anti-viral medications used to control HIV-infection, HIV can still be transmitted to others.

In Testing for HIV we will see how the presence of HIV and the viral levels are monitored.
In the light of recent advances in HIV/AIDS treatments the ARC development sounds inevitable and hopeless. Fortunately, advances in the knowledge and management of opportunistic infections now offer greater hope.
Since many of the areas of infection, immunity and treatment overlap, we have already encountered the general principles of HIV/AIDS transmission in other chapters. It is now the place to consider HIV transmission in more detail. Before we do that it might be fitting to rule out various ways popularly assumed to put people at risk.

You cannot get HIV/AIDS from:

- casual contact with infected persons. This includes handshaking, hugging, caring for people with HIV/AIDS, or visiting them in their homes or hospital. A study of 16,000 close family members and work colleagues in the USA showed no evidence of casual HIV transmission
- food prepared or served by HIV-positive people; or using their utensils
- saliva or tears (that includes the intimate contact of kissing). If anything, the saliva weakens the presence of HIV
- people with HIV coughing or spitting
- toilets or toilet seats, and hand wash basins
- swimming pools or public showers
- visiting your doctor or dentist
- donating blood
- mosquito or other insect bites
- using an infected person's telephone
- contact with animals.

**Transmission Routes**

HIV is transmitted through body fluids by:

**Sexual intercourse,** which, because it poses particular HIV risks, may be categorized as non-marital, extra-marital, or commercial.
- Heterosexual sex accounts for over 80 per cent of HIV transmission in Africa, and may be even higher in some places as in Masaka District, Uganda, where it is the route for 99 per cent of HIV-infection
- AIDS researcher William Check notes that there is a higher level of African heterosexual activity than in the US, and greater use made of commercial sex providers
- Men and women in Kenya and Zambia, with AIDS, have a history of sexual contact with prostitutes and prostitution, and an increased number of sexual partners

**Infected blood,** due to HIV having been transmitted through sexual intercourse or through perinatal transmission (see below).
- HIV can then be passed on by either blood transfusion or by its contamination of needles or surgical instruments which have not been properly sterilized.
  - More recently, the sharing of contaminated unsterilized needles among intravenous drug users has started epidemics in many countries. So far, this is not a major problem in Africa as a whole, but it is showing signs of growth in South Africa, and in Nigeria and Zambia
  - Only relatively few people in Africa have been infected through blood transfusion, although more blood transfusions are used in the treatment of conditions such as malaria. For other therapeutic reasons, women and children also use blood transfusions more frequently. However, the risk of HIV has been greatly reduced by safety measures introduced in the preparation of blood and blood products.
    - Transfusions are reckoned to be at least 99 per cent safe, although this might vary from country to country. Science writer Michael Day states, 'The risk of receiving blood infected with HIV is still very small'.
    - People with haemophilia A are at particular risk of HIV-infection, the more severe the condition the greater the risk
    - There is also a small risk of HIV-infection from donated bone marrow, corneas, heart valves, kidneys, and skin. These would not be used, in any case, if it was thought that there might be any risk from using these tissues.
You cannot get HIV/AIDS from casual contact with infected persons. This includes hugging, kissing, food prepared or served by HIV-positive people; or by using their washcloths or using an infected person's telephone.
In the light of possible risk there are some people who should not give their blood. They are:
- people who either lived in Africa or visited it in the last twenty years, and who had sexual intercourse while there (male or female), or who have emigrated to other countries outside Africa
- sexual partners of the above whether in married or single relationships (casual or regular sexual partners)
- haemophiliacs having possibly received untreated blood/blood products at any time during the last two decades
- injecting drug users, particularly where needles have been shared
- practising homosexuals

**Perinatally**, that is to say, through any stage of the birth process,
- This may be through an infected blood supply in the womb; contact with infected maternal blood at birth; or through breast feeding
- While formula feeding may reduce the HIV risk in the latter, it does increase the risk of death from other causes by not having the protective qualities of breast milk. A Cornell University, USA, study shows that formula-fed babies in poor households are five times as likely to die of disease and infection compared with breast-fed babies. The Report

suggests that the risk of HIV-infection through breast-feeding may not be high. Report author Michael Latham states: ‘There is an exaggerated belief in the risk of viral transmission through breast feeding.’

**Vulnerable routes**

Not every person exposed to HIV risk becomes infected on exposure, and researchers are trying to find out the ‘whys?’ and ‘why nots?’ Royal Free Hospital AIDS specialist Dr Margaret Johnson, speaks for clinicians when she says, ‘we need to find out why it is that some people can become infected with HIV after only very few contacts with the virus – during unprotected sex for instance – whereas other people take a long time to (or don’t) become infected, despite repeated exposure.’ Regina McNamara reports that women are more frequently infected with sexually-transmitted disease from a single act of intercourse than men.

Virologist Dr Clive Loveday, of the Middlesex Hospital, London, states, ‘what is not clearly understood is the exact mechanism by which the virus crosses the membranes into the body.’ Recent research has shown that part of the answer to the
questions raised by HIV/AIDS researchers lie in the vulnerability of the tissues of the vagina, foreskin and anus.

We have already noted that skin is one of the components of the innate immune system acting as a barrier to the entry of various micro-organisms to the body. The outermost layer of skin, the epidermis, has a waterproof seal particularly rich in a substance called keratin. Where the keratin is thin or breached the skin becomes vulnerable to any pathogens present. The skin around the vagina, foreskin and anus is, by virtue of its sensitivity, easily damaged and, in any case, thinner than the protective skin in other parts of the body. Other factors which increase susceptibility to HIV and other sexually-transmitted diseases are:

- **vagina**
  - thinner tissue lining of the vagina in adolescent girls; and the position of a zone of cells around the cervix which are more exposed in younger women, and progressively less exposed during the ageing process
  - less profuse mucus in the vagina
  - the presence of vesico-vaginal fistula, in which urine continuously leaks through an opening between the bladder and the vagina
  - other conditions referring to female genital problems may be found in the chapter Women and Children with AIDS
  - HIV also targets lymphocytes and macrophages which may be present in the vagina as a result of any inflammation however caused

- **foreskin**
  - has less keratin than the penis, so while intact, easily allows HIV to penetrate the skin and affect semen directly and indirectly
  - studies in Kenya showed that uncircumcised males
exposed to HIV risk had a four- to five-fold increase in the likelihood of becoming HIV-positive.\textsuperscript{12}

\textbullet is liable to tears and ulceration, but even without these being present, uncircumcised men are eight times more likely to get HIV from an infected woman

\textbullet circumcision can reduce HIV risk by around 60 per cent\textsuperscript{13} (although there are cultural reasons why circumcision may not be considered a therapeutic option)

\textbullet according to Professor Bertram Auvert, of the French National Institute of Health, circumcision of all male Africans could lower the HIV rate to 10-15 per cent of the population rather than the 32 per cent or so that is the present reality.\textsuperscript{14}

\textbullet studies in Benin, Cameroon, Kenya and Zimbabwe concluded that there was a lower rate of HIV where men were circumcised.\textsuperscript{15}

\textbullet a South African study of 228 couples in which the men were HIV-positive found that circumcised men were unlikely to transmit the HIV to their partners.\textsuperscript{16}

\textbullet AIDS in Kenyan and Zambian men was found in studies to have a high correlation with a previous history of sexually-transmitted diseases, genital ulcers, and uncircumcision.\textsuperscript{17}

\textbullet the extreme thinness of protective tissue lining the rectum makes it easily liable to damage

\textbullet unprotected anal intercourse carries the greatest HIV risk, with homosexual men having a higher prevalence than receptive women because of both passive and active roles

What has been said about the tissues of the vagina, foreskin and anus is also true of the tissues of the mouth. People who engage in variant sexual practices that involve any combination of these areas cited place themselves at high risk in the presence of HIV-infection.

The risks in any case are high enough not only from the virus but also from the medications used to control the condition and its subsequent infections. These are listed in The A-Z of AIDS Medications, which follows.

"We need to find out why it is that some people can become infected with HIV after only very few contacts with the virus — during unprotected sex for instance — whereas other people take a long time to (or don't) become infected, despite repeated exposure."

Dr Margaret Johnson
Non-Nucleoside Reverse Transcriptase Inhibitors

This smaller family of drugs inactivate the transcription of the HIV RNA into the cell DNA.

<table>
<thead>
<tr>
<th>Generic name:</th>
<th>Trade name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delavirdine</td>
<td>Rescriptor</td>
</tr>
<tr>
<td>Efavirenz, DMP-266</td>
<td>Sustiva</td>
</tr>
<tr>
<td>Nevirapine</td>
<td>Viramune</td>
</tr>
</tbody>
</table>

Protease Inhibitors

Drugs in this family inhibit the activity of an enzyme (protease) essential to the virus replication process.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Trade name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indinavir</td>
<td>Crixivan</td>
</tr>
<tr>
<td>Nelfinavir</td>
<td>Viracept</td>
</tr>
<tr>
<td>Ritonavir</td>
<td>Norvir</td>
</tr>
<tr>
<td>Saquinavir</td>
<td>Invirase, Fortovase</td>
</tr>
</tbody>
</table>

Effects and side-effects

Other drugs or combinations of drugs are being added to the A-Z of AIDS medications at a steady rate. Many of these require clinical trials before they become part of the everyday arsenal of weapons acting either against HIV; the undesirable effects of drugs currently in use; and/or the opportunistic infections that arise during the progress from HIV to overt AIDS.

For those prescribed HIV drugs, the list of undesirable side-effects of the various drugs may be viewed from two extremes. Some may think that many of the conditions listed, while being uncomfortable or incapacitating, are but a small price to pay for the remission of their HIV and the prolongation of life. Others may view the list with dread as the thought of having yet another condition or conditions to contend with is a burden too many. It should be noted that while the list of undesirable effects is long, most people either will not have them or suffer them to a mild degree. Indeed, in many cases, only a small percentage of HIV medication users will be affected.

The rapidity of the advance of HIV/AIDS and the various twists and turns in the course of disease patterns is hard to keep up with therapeutically. Drugs developed to treat the main symptoms that have emerged are in the process of fine tuning.
Undesirable effects (for medical terms see Glossary):

- arthralgia, diarrhoea, dream disturbance, fatigue, nausea, rash
- dizziness, headache, light-headedness, nightmares, rash
- abnormal liver function, blistering, conjunctivitis, fatigue, fever, general malaise, headache, mouth ulcers, muscle/joint aches, nausea, severe and life-threatening skin reactions, tissue swelling
- abdominal pain, acid regurgitation, diarrhoea, dizziness, dry mouth, dry skin, dyspepsia, dysuria, flatulence, headache, insomnia, myalgia, nausea, paraesthesia, pruritis, taste perversion, vomiting, weakness, fatigue
- diarrhoea, flatulence, hepatitis, nausea, rash
- abdominal pain, affected taste, anorexia, anxiety, bronchospasm, cough, decrease in thyroxine output, diarrhoea, dizziness, dry mouth, dyspepsia, fever, flatulence (gaseous belching), headache, hyperlipemia, hypersensitivity, loss of feeling, loss of sleep, mild skin eruptions, mouth ulcers, myalgia, nausea, pain, pharyngitis, sleepiness, throat irritation, urticaria, vasodilation, vomiting, weakness, weight loss
- abdominal discomfort/pain, anaemia, ascites, ataxia and weakness, attempted suicide, confusion, diarrhoea, dizziness, fatigue, flatulence, fever, headache, jaundice, leukaemia, mouth ulcers, nausea, numbness of extremities, pain, pancreatitis, paraesthesia, peripheral neuropathy, pruritis, rash, vomiting
- abdominal discomfort/pain, anxiety, constipation, depression, diarrhoea, dyspepsia, fatigue, flatulence, headache, insomnia, libido disorders, musculoskeletal pain, nausea, taste alteration, verruca, vomiting

ple, two particular side-effects of HIV drugs have been those of disfiguring fat redistribution in the body and diabetes. These side-effects are caused by the protease inhibitors affecting a protein that carries sugar into cells, the glucose transporter 4 (Glut 4). The fine-tuning research is now focused on modifying protease inhibitors so that, in future, Glut 4 will not be affected. Similarly, research has shown that particular brain proteins may help or hinder the absorption of protein inhibitors targeting AIDS-related dementia. P-glycoprotein (Pgp) levels were seen to be critical. The lower the levels, the better the absorption. Keeping these low could also mean, in the future, lowering the effective dose level of the protease inhibitors, thus reducing the undesirable effects and helping to reduce treatment costs.

The effect of routinely-prescribed drugs such as ZDV (AZT) may be time limited. In the case of ZDV it is about four hours per dose. So it has to be taken in liquid or pill form many times a day. A missed dose will undo the work already started by the drug. Time limitation is not the only problem, around fifty per cent of patients cannot tolerate the drug. Clearly there is a need to find a drug – rather than a combination of drugs – which can give a sustained round-the-clock effect. Since many people with HIV are taking a variety of drugs, at particular times and in specified circumstances (such as not on an empty...
stomach or conversely at a prescribed time before eating, etc) the fewer drugs the better. Faulting in any way on the drug-taking routine, especially where this is complicated, has its inherent setbacks. Many of the drugs being rushed into service such as the South African developed drug Virodene are as yet unproven. There has been so much controversy that the drug has been withdrawn. A timely withdrawal, perhaps, since the active ingredient of Virodene is dimethylformamide (a highly toxic industrial solvent). This ingredient is a known liver irritant and poison. It causes stomach pains even if just inhaled, and is also known to affect the heart, the kidneys and the nervous system.

The known harmful and time-limited effects of HIV drugs are receiving close attention and the prospect for their replacement is good. A new drug, Lamivudine, produced in Italy, is one such candidate. The Lamivudine pill is taken once a day at bedtime and its active ingredient is reported to last between 13 and 15 hours inside cells, stopping HIV replicating. At this stage in its development Lamivudine has to be taken with two other HIV drugs for maximum effect. Reports indicate that of 77 patients tested 93 per cent had consistently undetectable levels of virus in their blood. Much wider clinical trials are needed before such drugs become readily available. Other drug trials are at the laboratory culture stage.

One of these laboratory culture projects at West Point, Pennsylvania, has identified two chemicals that inhibit the entrance of HIV into the host cell. In the case of reverse transcriptase and protease (which gives the new virus particle its protein coat) the research has found two organic chemicals — diketones — that interfere with the integrase process and, in particular, stop the bonding of the invading DNA to the host DNA. The implications of this effect, if practical on a large scale, are tremendously important.

**Highly active antiretroviral therapy**

The taking of a combination of HIV drugs is aimed at: decreasing cell mutation; boosting the immune system by decreasing the resistance to a particular therapy; halting or delaying conditions favourable to the development of opportunistic diseases (by up to 90 per cent of cases so far in a range of trials). This combination is usually referred to as highly active antiretroviral therapy, or HAART, and uses drugs from the three groups listed in the A-Z above and briefly summarized as follows:

<table>
<thead>
<tr>
<th>NARTs</th>
<th>NNRTIs</th>
<th>PIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>abacavir</td>
<td>delavirdine</td>
<td>indinavir</td>
</tr>
<tr>
<td>adeovir</td>
<td>efavirenz</td>
<td>nelfinavir</td>
</tr>
<tr>
<td>didanosine</td>
<td>nevirapine</td>
<td>ritonavir</td>
</tr>
<tr>
<td>lamivudine</td>
<td>zidovudine</td>
<td>saquinavir</td>
</tr>
<tr>
<td>stavudine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>zalcitabine</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Depending on a person’s overall condition and individual needs, some combinations of drugs work better than others. Particular combinations may show initial and hopeful benefit but fail in the long-term due to tolerance developed to the drugs used. Finding the appropriate combination with optimum potential may be a matter of experimentation. Sadly, the affected person has to put up with the adverse effects of drugs until that balance of combination is found.

In any case the medication should be taken exactly as prescribed:
- it must not be taken less than or for a longer time
- missed doses should be taken as close as possible to the scheduled time, if this is not possible then the regular amount at the next scheduled time
- bottles, glasses, and medicine spoons should be kept separate from other medication apparatus, thus keeping uniformity of dosage and avoiding accidental use by others
- medications should be stored according to the manufacturer’s recommendations.

The use of other medications either prescribed or bought over-the-counter should be brought to the attention of the HIV medication prescriber, since they might not be compatible with the HIV treatment regime and, at worse, may even be dangerous.

In some cases the standard medication may not be prescribed. Babies, young children and women — pregnant or breast-feeding — may be given alternative medications or reduced dosages, then modified prescriptions before being placed on a more regular therapeutic regime. Naturally, even standard medications will be changed depending on personal prevailing conditions, and to new drugs as these come onto the market or are reduced in price.

Fear of possible exposure to HIV has led to the development of what has been called the ‘morning after’ treatment. This is something of a misnomer since in reality the individual commences a month-long course of ZDV and 3TC within 72 hours of a
possible risk of acquiring HIV. The treatment regime started as a response to the need of health-care workers accidentally needle-pricked while dealing with people having HIV-infected blood. The prompt treatment measures and avoidance of further HIV risk-related behaviour was shown, in a Centre for Disease Control and Prevention Study (in Atlanta, Georgia), to lead to an 80 per cent reduction in the likelihood of the person being or becoming HIV positive.

The optimism generated by the success rate of the ‘morning after’ approach led many concerned by their possible exposure to HIV to seek a similar kind of treatment. To some extent this led to a ‘hit them hard and quickly’ attitude on the part of health professionals towards the treatment of people in general with HIV and the popularity of the HAART regime. This is an attitude that is changing quite rapidly now for a variety of reasons.

Professionals initially opposed to the rapid and hard-hitting response expressed three main concerns: they were worried that the message sent out would be risk-takers would encourage them in their risk-taking; that early drug intervention would hasten the emergence of drug-resistant strains of HIV; and, not least, that people not really at risk would be treated with extremely potent drugs and suffer permanently as a result of the nasty side-effects.

Now even the professionals who used the ‘hit hard, hit early’ approach recognize that they ought not to use ‘powerful antiviral drugs until the immune system of HIV patients shows significant signs of decline’. They retrospectively realize ‘the risk of drug toxicity is greatly enhanced by taking these drugs early’. In fact HIV workers in the USA and the UK recommend that triple therapy only commence when the infected person’s CD4 count falls to less than 350 per millilitre of blood. Apart from the experience of the toxicity induced by the early and powerful drug intervention, which will now be delayed by a later therapeutic intervention, those affected will not have to cope with the difficulties of sticking to their often complicated treatment schedules.

Newer drugs such as Trizivir may eventually eliminate both of these drawbacks. Trizivir is a combination of abacavir, lamivudine and zidovudine in one tablet and can be taken twice a day without the worry of a complicated therapeutic regime. Ghana and Malawi are the first African countries to use the new product introduced at the beginning of 2001.

Encouragement for an early treatment is being fostered by a ‘moment-after’ injection which is still at the laboratory stage. Researchers are working on an injectable substance, 5-helix, which may block the fusion of the HIV with the cell membrane. If this should prove effective in clinical trials it is hoped that the 5-helix be converted into a pill form for convenient and widespread use.

On a positive note, it is reported that some combination or multiple drug therapy trials have shown a reduction in blood HIV levels to below the detectable level in around 90 per cent of patients. While this result should inspire hope and give encouragement, it is probably only the highly motivated individuals in whom this result is to be found, since other trials show this reduction in only 45-50 per cent of HAART recipients. In any case, some doctors are concerned that little is known about how much viral load has to fall by, or for how long, in order for people to benefit.

The effectiveness of drugs to lower viral loads or combat opportunistic infections is purely academic in some countries. In many cases whatever is available elsewhere is not affordable where it is most needed (although a new initiative has been announced by three of the world’s leading pharmaceutical companies. They have struck a deal to supply cheap HIV/AIDS drugs to the government of the Ivory Coast, a deal that might be repeated in other African countries). Also, there are ethical concerns which have been expressed by many African countries: they do not want to be ‘guinea-pigs’ for overseas drugs companies; nor, in the light of present infection and death-rates, do they want to be given placebos in the place of effective drugs.

Hopes are pinned on having an affordable vaccine. Are these hopes justified? An AIDS Vaccine? looks at the pros and cons of a readily-available effective vaccine.
Science writer Michael Day states: 'The casual observer could be forgiven for thinking that AIDS researchers had proved that their new drugs extend the lives of people with HIV. But that, although recent developments probably do hold out new hope, the truth is far more complex.' He goes on to say, 'The data on survival simply are not available yet, not by a long chalk.'

Even if the new drugs could be proven to be highly effective in influencing quality of life and survival rates, it has been pointed out that 90 per cent of the people around the world infected with HIV cannot afford them.

With the potential for an ever-wider pandemic not only in Africa but also in Asia and South America, where similar economical difficulties in procuring drugs would prevail, it makes sound clinical sense to focus on the search for a vaccine.

As Patricia Fultz, of the University of Alabama, Birmingham USA, says, ‘With 40 million people infected in the world, there is a great need for a vaccine.’ However, finding a risk-free vaccine is proving difficult for the following reasons:

- With HIV’s ability to keep mutating and producing new strains a single vaccine may not be possible. This fact alone could stop the search or if continued gives rise to a number of questions: Would it be possible to combine various HIV strains for vaccination purposes? How many shots would be needed? How often would these be given?
- How much would all the above cost? If drug treatment is already unaffordable what hope for a series of vaccinations given over perhaps a lifetime?
- The introduction of live vaccine, however weak, carries the risk of inducing HIV-infection. Ruth Ruprecht, researcher at the Dana-Farber Cancer Institute, Boston, USA, states: 'Weakening the virus’s ability to replicate is not a safe vaccine strategy... It can still cause AIDS.'

Dead vaccine has not provoked a response, so weakened forms of HIV have been used in animal experiments. The outlook for weakened HIV as a vaccination is not good. Science writer Nell Boyce reports: 'People infected with a weakened form of HIV have finally started to develop signs of AIDS after more than a decade of good health, dashing hopes that a similar mutant virus could be used as a live vaccine.'

This setback is not an encouragement for the researchers who are trying to make a vaccine specifically for Africa. The experimental African vaccine is based on a modified horse virus (Venezuelan Equine Encephalitis – VEE) and containing the HIV proteins gag, pol, and nef. It is hoped that VEE will enter the host cell and copy its own DNA, amplifying the HIV proteins but not causing a VEE infection.

Using data from Zimbabwe, computer models at the University of California suggest that weakened forms of HIV vaccine could be made and used, and might be fifty to ninety-five per cent effective against wild-type HIV. It is thought that if such a vaccine really existed it would take up to fifty years to eradicate HIV from Zimbabwe. However, there is a high price to be paid in that a fraction of the population would die in the process. Even if death in a percentage of the population did not take place, many fear that following 15-20 years of seemingly harmless incubation, suddenly everyone vaccinated or infected may die.

There is still the risk of spreading HIV. Susan Moir and her colleagues at the National Institute of Allergy and Infectious Diseases, Washington, USA, think that boosting antibodies with a vaccine might trigger complement [protein] binding to the covering of B-cells, and thus help spread HIV around the body, an effect which they have observed experimentally.

Michael Day comments on these and similar results of experiments: 'If infection by live HIV doesn’t protect against infection by another strain of the virus, what hope is there that a vaccine made
from weakened or inactivated viruses, or HIV substitutes, can offer protection?"  

Any vaccine used might itself prove harmful in that the antibodies produced, following the initial inoculation, may absorb viruses into host cells thus harming the cells in ways yet to be discovered.

In an attempt to overcome this problem, Flossie Wong-Staal and others at the Centre for AIDS Research, University of California, San Diego, have created an HIV and other virus hybrid that can enter cells but not replicate there. The hybrid contains four HIV genes coated with the virus that causes vesicular stomatitis (inflammation associated with mouth ulcers). The purpose of the technique is to alert dendritic cells to spot HIV invaders and activate antibody production early and strongly enough to fight HIV.

Encouragement for the above technique can be found in the results of animal experiments having similar routes used to vaccinate mice against the sexually-transmitted disease chlamydia. In the experiment, based on techniques already used to treat cancer, dendritic cells are cultured to recognize quickly and react to foreign molecules. Success in these experiments suggests that a similar response would be made in the case of HIV.

Not all views of the present situation are optimistic. Even where cautious optimism existed in the case of one vaccine being developed it has been shown to require repeated exposure to HIV to have any kind of effect. Other experimental vaccines have given some initial protection and then the individuals have progressed to overt AIDS. Science writer Rachel Nowak says, in the light of these results, 'Hopes for a vaccine that can completely prevent HIV infection are fading, however, so attention is shifting towards vaccines that might slow the progression to AIDS.' A variety of these attempts has been referred to in the chapter on AIDS medications.

Such 'vaccines' might include some kind of gene therapy or genetic modification of HIV constituents or of the host cell components. Clinicians at the National Institutes of Health, Washington, DC, are experimenting with gene therapy which might be used to ward off opportunistic infections. They have genetically modified a harmless retrovirus to carry and disrupt the proteins Tat and Rev needed by HIV to reproduce itself. In tests involving rhesus monkeys and eight pairs of identical twins the cells with the therapeutic genes survived better, with as much as a twenty-fold difference in one case.

Genetic therapies are not without their drawbacks. A gene, vpr, found in HIV and previously thought to be harmless, has recently been identified as an immune system suppressor. This is a setback to vaccine hopes. The immune system needs boosting when exposed to HIV; removing the vpr may not present itself as the real thing to the immune system's recognition.

In the light of all the concerns regarding the unique problems of HIV-infection, many clinicians believe that not enough is known about vaccines in general to be able to design an HIV-specific vaccine. The best hopes for the present lie in therapies that can boost the immune system. Preliminary studies by Marie Estcourt and others at the Australian National University, Canberra, are moving forward along this path. Their experimental vaccine shows a 30 per cent increase in CD8 T-cells, and they hope to be able to enter clinical tests soon. However, in general, the path to finding a suitable vaccine is littered with conflicting results.

Conflicting Results

Other research favours a simpler approach to an HIV vaccine by provoking an immune response to a wide range of pathogens to which some HIV fragments have been added. Researchers at the University of Maryland, Baltimore, USA, are using a weakened version of salmonella typhi in this regard. A vaccine made from this typhoid fever bacterium will be tested in Nigeria and Uganda. Clinical scientists at the University of Pennsylvania Medical School, Philadelphia, USA, are manipulating the bacterium listeria monocytogenes (a common cause of miscarriage; and meningitis in the immuno-suppressed) to the same end. It is hoped that if these vaccines go into production they can be taken orally and manufactured cheaply, although it is likely that they may need to be taken with some frequency to maintain immunity.

Studies at the University of California, Davis, USA, follow a similar research approach. The scientists involved believe that the immune system can be challenged with a pot-pourri of small proteins into responding better to viral newcomers. Experiments with mice show a greater response to a variety of viral proteins than to single-strain viruses.

Some clinicians at the University of Washington, Seattle, USA, are working on a 'second-line' of defence drugs. They aim to increase the HIV mutation rate so high that the viral population peaks and burns out. Such drugs, when developed, could be used when viruses become resistant to standard drugs or in addition to these drugs for maximum effect.

A study at the Public Health Laboratory Service
Antiviral Susceptibility Reference Unit, Birmingham, UK, casts shadows over the expectations of much of the current drug research. It seems from their research that individuals returning to their original drug regimes, after prescription changes, had a recurrence of resistant viruses more quickly and at higher levels. Other studies show the reverse of this, indicating that people taken off particular drugs and resuming the regime at a later date do, in fact, have a reduction in the virus, and that drug-resistant strains of HIV, in some UK studies, show ‘life immunity’ to particular drugs.

Given the rapid mutation rate of HIV, and the dangers inherent in vaccinating with live viruses, it is unlikely that a vaccine for HIV will be found in the short-term, although efforts to find one will not cease. Former US president Bill Clinton expressed the hope in 1997: ‘If the 21st century is to be the century of biology, let us make an AIDS vaccine its first great triumph.’ Billions of pounds/dollars have been spent on that search – a search that was thought to offer fairly quick results. It was not to be. Clinical Medicine professor Rodney Phillips, Oxford, UK, says: ‘People initially assumed that using vaccines would give quick results and then, when drugs came along, that there would be little incentive to continue research in this field.’ Researchers have been disappointed in both respects, and the world is still waiting for the great triumph of the century.

The urgency in finding a suitable vaccine is highlighted in the grim reading of National HIV/AIDS Statistics. When we look at these appalling figures it is clear that something needs to be done about the tragic human situation as soon as possible.
The following tables of national HIV/AIDS statistics are composed from data extracted from UNAIDS material. They represent the latest available collated figures for the year-end of 2003 (there is always a gap between the collection of data and presentation in collated form). It is not always possible for countries to provide all the information they would like to due to: difficulties in accessing and resourcing collection; inconsistency of recording methods; other epidemics claiming attention; and instability through change of government, natural disasters, and war adding to the problem of producing accurate figures.

Basic statistics have been recorded for the following African countries followed by more detailed data for the rest of Africa:

<table>
<thead>
<tr>
<th></th>
<th>Total adults with HIV</th>
<th>Percentage of population</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALGERIA</td>
<td>11,000</td>
<td>0.07</td>
</tr>
<tr>
<td>COMOROS</td>
<td>no data</td>
<td>-</td>
</tr>
<tr>
<td>EGYPT</td>
<td>12,000</td>
<td>0.1</td>
</tr>
<tr>
<td>EQUATORIAL GUINEA</td>
<td>no data</td>
<td>-</td>
</tr>
<tr>
<td>GUINEA-BISSAU</td>
<td>no data</td>
<td>-</td>
</tr>
<tr>
<td>LIBYAN ARAB JAMAHIRIYA</td>
<td>10,000</td>
<td>0.3</td>
</tr>
<tr>
<td>MAURITIUS</td>
<td>500</td>
<td>0.08</td>
</tr>
<tr>
<td>MOROCCO</td>
<td>15,000</td>
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</tr>
<tr>
<td>REUNION</td>
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<td>-</td>
</tr>
<tr>
<td>SEYCHELLES</td>
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<td>-</td>
</tr>
<tr>
<td>SIERRA LEONE</td>
<td>no data</td>
<td>-</td>
</tr>
<tr>
<td>SOMALIA</td>
<td>no data</td>
<td>-</td>
</tr>
<tr>
<td>SUDAN</td>
<td>380,000</td>
<td>2.3</td>
</tr>
<tr>
<td>TUNISIA</td>
<td>2,300</td>
<td>0.2</td>
</tr>
</tbody>
</table>
### Angola

- Children (23,000)
- Women (130,000)
- Men (87,000)

- Percentage of adult population HIV-infected: 3.9%
- Estimated number of adults and children who died of AIDS: 21,000
- Current living orphans: 110,000

### Benin

- Children (5,700)
- Women (35,000)
- Men (28,000)

- Percentage of adult population HIV-infected: 1.9%
- Estimated number of adults and children who died of AIDS: 5,800
- Current living orphans: 34,000

### Botswana

- Children (25,000)
- Women (190,000)
- Men (135,000)

- Percentage of adult population HIV-infected: 37.3%
- Estimated number of adults and children who died of AIDS: 33,000
- Current living orphans: 120,000

### Burkina Faso

- Children (31,000)
- Women (150,000)
- Men (115,000)

- Percentage of adult population HIV-infected: 4.2%
- Estimated number of adults and children who died of AIDS: 29,000
- Current living orphans: 260,000

### Burundi

- Children (27,000)
- Women (130,000)
- Men (93,000)

- Percentage of adult population HIV-infected: 6%
- Estimated number of adults and children who died of AIDS: 25,000
- Current living orphans: 200,000

### Cameroon

- Children (43,000)
- Women (290,000)
- Men (227,000)

- Percentage of adult population HIV-infected: 6.9%
- Estimated number of adults and children who died of AIDS: 49,000
- Current living orphans: 240,000
National HIV/AIDS Statistics

Central African Republic

Children (21,000) 8%
Women (130,000) 50%
Men (109,000) 42%

Percentage of adult population HIV-infected: 13.5%
Estimated number of adults and children who died of AIDS: 23,000
Current living orphans: 110,000

Chad

Children (18,000) 9%
Women (100,000) 50%
Men (62,000) 41%

Percentage of adult population HIV-infected: 4.8%
Estimated number of adults and children who died of AIDS: 18,000
Current living orphans: 96,000

Congo

Children (10,000) 12%
Women (45,000) 50%
Men (35,000) 38%

Percentage of adult population HIV-infected: 4.9%
Estimated number of adults and children who died of AIDS: 9,700
Current living orphans: 97,000

Cote d'Ivoire

Children (40,000) 8%
Women (300,000) 56%
Men (190,000) 36%

Percentage of adult population HIV-infected: 7%
Estimated number of adults and children who died of AIDS: 47,000
Current living orphans: 310,000

Democratic Republic of the Congo

Children (110,000) 11%
Women (570,000) 51%
Men (420,000) 36%

Percentage of adult population HIV-infected: 4.2%
Estimated number of adults and children who died of AIDS: 100,000
Current living orphans: 770,000

Djibouti

Children (680) 7%
Women (4,700) 52%
Men (3,720) 41%

Percentage of adult population HIV-infected: 2.9%
Estimated number of adults and children who died of AIDS: 690
Current living orphans: 5,000
The AIDS Pandemic

Eritrea

Children (5,600)

Women (31,000)

51%

Men (23,400)

39%

10%

Percentage of adult population HIV-infected: 2.7%
Estimated number of adults and children who died of AIDS: 6,300
Current living orphans: 32,000

Ethiopia

Children (120,000)

Women (770,000)

51%

Men (610,000)

40%

9%

Percentage of adult population HIV-infected: 4.4%
Estimated number of adults and children who died of AIDS: 120,000
Current living orphans: 720,000

Gabon

Children (2,500)

Women (25,000)

54%

Men (19,500)

40%

6%

Percentage of adult population HIV-infected: 8.1%
Estimated number of adults and children who died of AIDS: 3,000
Current living orphans: 14,000

Gambia

Children (500)

Women (3,600)

53%

Men (2,700)

40%

7%

Percentage of adult population HIV-infected: 1.2%
Estimated number of adults and children who died of AIDS: 600
Current living orphans: 2,000

Ghana

Children (24,000)

Women (180,000)

51%

Men (146,000)

42%

7%

Percentage of adult population HIV-infected: 3.1%
Estimated number of adults and children who died of AIDS: 30,000
Current living orphans: 170,000

Guinea

Children (9,200)

Women (72,000)

51%

Men (56,000)

42%

7%

Percentage of adult population HIV-infected: 3.2%
Estimated number of adults and children who died of AIDS: 9,000
Current living orphans: 35,000
Lesotho
Children (22,000)

Men
(128,000)
40%

Women
(170,000)
53%

Percentage of adult population HIV-infected: 6.7%
Estimated number of adults and children who died of AIDS: 29,000
Current living orphans:

Men
(380,000)
31%

Women
(720,000)
60%

Kenya
Children (100,000)

Men
(460,000)
51%

Women
(720,000)
60%

Percentage of adult population HIV-infected: 28.9%
Estimated number of adults and children who died of AIDS: 150,000
Current living orphans:

Men
(380,000)
31%

Women
(170,000)
53%

Percentage of adult population HIV-infected: 6.7%
Estimated number of adults and children who died of AIDS: 150,000
Current living orphans:

Men
(55,400)
40%

Women
(54,000)
54%

Madagascar
Children (8,600)

Men
(38,000)
38%

Women
(76,000)
54%

Percentage of adult population HIV-infected: 1.7%
Estimated number of adults and children who died of AIDS: 7,200
Current living orphans:

Men
(38,000)
38%

Women
(54,000)
54%

Malawi
Children (83,000)

Men
(567,000)
39%

Women
(460,000)
51%

Percentage of adult population HIV-infected: 14.2%
Estimated number of adults and children who died of AIDS: 84,000
Current living orphans:

Men
(567,000)
39%

Women
(460,000)
51%

Mali
Children (13,000)

Men
(56,000)
40%

Women
(71,000)
50%

Percentage of adult population HIV-infected: 1.9%
Estimated number of adults and children who died of AIDS: 12,000
Current living orphans:

Men
(56,000)
40%

Women
(71,000)
50%
The AIDS Pandemic

Mauritania

- Percentage of adult population HIV-infected: 0.6%
- Estimated number of adults and children who died of AIDS: 500
- Current living orphans: 2,000

Mozambique

- Percentage of adult population HIV-infected: 12.2%
- Estimated number of adults and children who died of AIDS: 110,000
- Current living orphans: 470,000

Namibia

- Percentage of adult population HIV-infected: 21.3%
- Estimated number of adults and children who died of AIDS: 15,000
- Current living orphans: 57,000

Niger

- Percentage of adult population HIV-infected: 1.2%
- Estimated number of adults and children who died of AIDS: 4,800
- Current living orphans: 24,000

Nigeria

- Percentage of adult population HIV-infected: 5.4%
- Estimated number of adults and children who died of AIDS: 310,000
- Current living orphans: 1,800,000

Rwanda

- Percentage of adult population HIV-infected: 5.1%
- Estimated number of adults and children who died of AIDS: 22,000
- Current living orphans: 160,000
Narionail-1/V/AIDS Statistics

South Africa

Children (230,000) 5%

Men (2,170,000) 41%

Women (2,900,000) 54%

Percentage of adult population HIV-infected: 21.5%

Estimated number of adults and children who died of AIDS: 370,000

Current living orphans: 1,100,000

Senegal

Children (3,100) 8%

Men (23,000) 52%

Women (23,000) 48%

Percentage of adult population HIV-infected: 0.8%

Estimated number of adults and children who died of AIDS: 3,500

Current living orphans: 17,000

Swaziland

Children (16,000) 8%

Men (94,000) 42%

Women (110,000) 50%

Percentage of adult population HIV-infected: 38.8%

Estimated number of adults and children who died of AIDS: 17,000

Current living orphans: 65,000

Togo

Children (9,300) 8%

Men (46,700) 42%

Women (54,000) 50%

Percentage of adult population HIV-infected: 4.1%

Estimated number of adults and children who died of AIDS: 10,000

Current living orphans: 54,000

Uganda

Children (84,000) 15%

Men (170,000) 34%

Women (270,000) 51%

Percentage of adult population HIV-infected: 4.1%

Estimated number of adults and children who died of AIDS: 78,000

Current living orphans: 940,000

United Republic of Tanzania

Children (140,000) 10%

Men (620,000) 39%

Women (840,000) 52%

Percentage of adult population HIV-infected: 8.8%

Estimated number of adults and children who died of AIDS: 160,000

Current living orphans: 980,000
The percentage of the adult population HIV-infected is markedly different from country to country, ranging from 0.6 per cent to 38.8 per cent, thus highlighting the problems that many countries face.

The figures could be even higher as not all deaths recorded will be documented as AIDS. Many of these will be listed, for example, as TB or one of the many other opportunistic infections. Recording death as due to another cause may deflect some of the stigma attached to having AIDS and so avoid family embarrassment. This is a conscious policy on the part of many practitioners, as Johanna McGeary observes: ‘Doctors bow to social pressure and legal strictures not to record AIDS on death certificates.’ She quotes the example of South African physician, Dr Mull. He says, ‘I write TB or meningitis or diarrhoea but never AIDS. It’s a public document and families would hate it if anyone knew.’

These half-truths have helped to save face in many communities but the truth becomes more obvious in the gender statistics. These consistently show that of the HIV-infected:
- 31-42 per cent are men
- 50-60 per cent are women
- 5-15 per cent are children

The special reasons why women and children are particularly vulnerable are addressed in the next chapter: *Women, Children, and AIDS.*
It is estimated that 17 million Africans have died since the AIDS epidemic began back in the later half of the 1970s. In excess of 3.7 million of them were children. Added to that 12 million children have become orphans as a result of AIDS. In the region of 8.8% of adults in Africa are infected by HIV/AIDS.

Out of 36 million adults and children from around the world suffering with AIDS in the year 2000, over 70% of them were from the sub-Saharan region of Africa. In 2000 alone, 3.8 million Africans were newly infected.

The role of women in society has engaged the attention of sociologists around the world for many years. Women are seen as disadvantaged in many areas of life. Sadly, this is also reflected in the clinical statistics surrounding HIV and AIDS and, in particular, in developing countries. It has been estimated that two and a half million women — representing eighty per cent of the global total of HIV-infected women — are to be found in sub-Saharan Africa. One woman in every forty women is infected with HIV.

Much has been made of the spread of AIDS by sex-workers in various African countries. In spite of the one in forty statistic, researchers point out that sixty to eighty per cent of all infected women have one and only one sexual partner. Through no fault of their own, 1,500 faithful wives are infected every day with HIV. The majority of women worldwide who become infected are frequently monogamous, living out their lives as good wives and mothers in a variety of situations. However, there are other circumstances that might make women vulnerable to HIV-infection.

**Female Vulnerability**

Professor Gary Hopkins and colleagues from Loma Linda University, California, in an analysis of a Centre for Disease Control study, reports that there has been a dramatic increase in adolescent females engaging in premarital sexual intercourse over the decades studied from 1970. Well over a quarter of girls aged 15-19 admitted to premarital sexual activity with the highest increase in the 15-year-old end of the age range. Around 4.6 per cent of the 15-year-old girls engaged in sex in 1970, the figure leaping to 25.6 some two decades later. The same study showed that one in every six young women in high school had experienced sexual intercourse with at least four different partners. Similar results were obtained in other research into adolescent sexual behaviour.

Not all youthful sexual activity is the result of liberal sexual attitudes carrying the risk of HIV infection. Rape and especially gang rape have become, in the African context, exceedingly unpleasant ways of spreading HIV infection. Still other young people in Africa marry young.

Young women in Central and East Africa are more likely to have sexual intercourse before the age of 15 and to marry older men as compared with similar-aged women in West Africa. This may be due to older men seeking young girls in the belief that they are less likely to have HIV. Unfortunately, the girls concerned often pay for their early marriage by contracting HIV from the men and are, in turn, likely to transmit the HIV to their own babies. One of the greatest risk fac-
tors for HIV-infection that these young women face is that forty per cent of the men over 35 years of age carry HIV. In Mauritania, fifteen per cent of girls give birth by age 15. For whatever reason, in one region of Uganda around fifty per cent of 13 to 18-year-old girls are infected – forty per cent more than males in the same area. Across sub-Saharan Africa teenage and young women are up to six times more likely to be infected with HIV as same-age males.

Just over one and a half million women are infected with HIV each year. HIV/AIDS is now the number one killer for black and Hispanic women and the fourth leading killer of white women aged 24-44. Where there were two infected men for every woman in 1995 there are now six infected women for every five HIV-infected men. It has been estimated by the World Health Organization that there are seven and a half million women infected with HIV in Africa. The HIV-infection peaks in women aged 20-24 years with the highest rate of infection in the under 25s and also among married women. Women infected at these ages are also reported as dying earlier. Many girls and women are forced into unwanted sexual relations to 'get on' in school or business and to pay favours to teachers and bosses, thus acquiring HIV in the process.

Social and cultural differences exist, affecting infection rates in various African countries. One study shows that in Kisumu, Kenya, and Ndola, Zambia, thirty per cent of the women were infected with HIV. These cities were compared with Cotonou, Benin, and Yaoundé, Cameroon, which showed that four per cent of the women were HIV-positive. This latter result was something of a surprise to the researchers since the women of Yaoundé had a higher turnover of sexual partners compared even to towns known to have a higher incidence of HIV.

Clearly cultural and social mores play a part in

Female Genital Mutilation (FGM) is a destructive, invasive procedure that is usually performed on girls before puberty. Part or all of the clitoris is surgically removed. This leaves them with reduced or no sexual feeling. Many health problems result from the surgery.

The operation is forced on approximately 6,000 girls per day worldwide – about one every 15 seconds. Since FGM is practised when the girls are young, they are unable to give their informed consent.

Because of poverty and lack of medical facilities, the procedure is frequently done under less than hygienic conditions, and often without anaesthetic by other than medically trained personnel. Anaesthesia is rarely used. Razor blades, knives or scissors are usually the instruments used. In the rural Mosi areas of Burkina Faso, group female circumcisions are scheduled every three years in many villages. Girls aged 5 to 8 are assembled by their mothers into groups of up to 20. The circumciser uses a knife-like instrument, the banga, reserved specifically for this purpose; after each operation she simply wipes the knife on a piece of cloth, sometimes rinsing it in water first. In some areas of Africa, FGM is delayed until two months before a woman gives birth. This practice is based on the belief that the baby will die if shehe comes into contact with her mother’s clitoris during birth.
these regional differences. There may be many cultural reasons why African women are particularly at risk. One such reason must be the role played by female circumcision.

Female Circumcision

Female circumcision has been described as genital mutilation and may be one of three types:

- **Sunna**
  along with the second type is the most widely practised form of circumcision in sub-Saharan Africa and the Middle East and involves removal of the tip of the clitoris
- **Intermediate**
  in which the whole clitoris and adjacent parts, such as the labia minora, are removed
- **Pharonic**
  this is the removal of the clitoris, labia minora, labia major and where the two sides of the vulva are drawn together and fastened (infibulation) leaving a small opening for urination and menstruation childbirth necessitates the surgical opening of the infibulated area

The transmission of HIV is accelerated where ritual circumcision is by the use of shared knives. Around one hundred million African women have undergone one of these three forms of circumcision. This involves approximately fifteen per cent of Sudanese women having the Sunna type to about eighty-two per cent of Sudanese, Ethiopian, Southern Egyptian, Somalian and others in the Red Sea coastal areas undergoing the most severe form.

These various forms of circumcision lead to:
- an abnormal anatomy with anatomical distortion
- partial closure of the vagina
- incomplete healing
- scar tissue formation (keloids) which may be excessive
- urinary tract infections
- inflammation of the genital area
- chronic urinary retention

STDs and especially HIV flourish under the conditions that the effects of circumcision lead to. If that were not enough, other forms of female genital mutilation also are prevalent in Africa. These include:
- traumatic injury occurring through sexual intercourse
- gishuri (or the ‘salt cut’): a cure for genital ailments and/or fertility performed by traditional birth attendants; traditional healers; or self-administered, especially in Nigeria
- objects inserted into the vagina: such as herbs; special traditional preparations to enhance the prospect of fertility; to tighten the vagina; and, silica, crystals and pumice-like stone to increase male sexual pleasure. Twelve per cent of the women at a Malawian hospital clinic, for example, admitted to such practices.

The practices are common to many other African countries where the men show a preference for dry sex. Johanna McGeary writes regarding this preference: ‘To please men, women sit in basins of bleach or saltwater or stuff astringent herbs, tobacco or fertilizer inside their vagina. The tissue of the lining swells up and natural lubricants dry out. The resulting dry sex is painful and dangerous for women. The drying agents suppress natural bacteria, and friction easily lacerates the tender walls of the vagina.’

These techniques and practices tear, inflame and cause abrasions, thus doubling the risk of an HIV-infection on exposure to the virus. Childbirth itself also adds to the likelihood of infection through tears and incisions.

Complications of Infection

African women are at particular risk of acquiring HIV in association with other prevailing sexually transmitted diseases such as:
- genital herpes (caused by the herpes simplex virus)
- genital ulcer disease (related to the above in Western countries and to both of the following) and often associated with genital warts caused by the human papilloma virus (HPV) which can lead to cervical cancer
- syphilis
- chancroid

The women are at increased risk where gonorrhea, chlamydial infection of the cervix, and trichomonas induced vaginal discharge are present.

Chlamydia, gonorrhea and other reproductive tract infections are the major causes of female infertility, along with the difficulties posed in trying to maintain genital hygiene through water shortage, drought and...
the social conditions of the nomadic and other lifestyles.

Given all of the above circumstances, many women believe that a vaginal discharge is a normal condition and do not report or treat infections which, if left to worsen, can lead to more severe conditions such as pelvic inflammatory disease (PID).

PID is an acute inflammation of the pelvic cavity caused by sexually-transmitted disease, notably, though not exclusively, by chlamydial infection. Men who carry the infection have painful urination and a discharge from the penis but the disease can be symptomless in women until well-advanced, the first signs being a history of varied infections, severe cramping, and erratic menstruation. PID, if untreated, can result in infertility and the possibility of tubal pregnancy (where the foetus develops in the fallopian tubes rather than the womb). An HIV infection enhances the severity of PID.

AIDS in Pregnancy

The incidence of HIV/AIDS varies in the different countries of Africa and for a variety of reasons. In the regions worst-affected almost fifty per cent of all pregnant women – double the incidence in the general population – are now infected with HIV; the West African rate is one-third of this. The UK Department of Health estimates that as many as sixty per cent of HIV-infected pregnant women give birth unaware that they are infected. In Britain around three hundred babies are born to HIV-positive women each year, and of that figure up to one in five of these children will be, or become, infected by their mother’s HIV.

This occurs:
- in the womb
- during birth
- through breast-feeding

It may be encouraging to know that – worldwide at least – approximately seventy per cent of babies born to mothers with HIV will not be infected.

Studies with mice show that HIV drugs administered during pregnancy cross the placenta and end up in greater concentration in the developing foetus. In the light of this finding, scientists are now looking for drugs that will stop the placenta-crossing activity of HIV drugs so that HIV-positive mothers will not pass the infection to their unborn child. Research is centred on P-glycoprotein (P-gp) which has this ability. If an effective drug can be found, it will be of vital use since currently, in a minority of babies, AIDS drugs can cause serious birth-defects. In one study, eight out of 1,000 women gave birth to HIV-negative babies who nevertheless died in infancy from neurodegenerative conditions which in the general population would normally be found in 1 in 10,000 or 1:100,000 births.

The science writer Michael Day says: ‘Without medical intervention, a pregnant woman with HIV has a 25 to 35 per cent chance of infecting her baby.’ Many African women have little choice in the matter as James McIntyre points out: ‘Only 50 per cent of women in developing countries deliver in a health service setting.’
In spite of the risks associated with taking HIV drugs through pregnancy, specialists still agree that the benefits outweigh the risks. In fact data from a number of African countries show that taking ZDV (AZT) during pregnancy cuts the maternal transmission rate of HIV to less than a ten per cent risk of the baby being infected.

One Ugandan drug trial treating mothers and infants with either ZDV or nevirapine showed that nevirapine may be better than ZDV in reducing infant HIV-infection. At fifteen weeks babies treated with nevirapine had half the infection levels of ZDV. The nevirapine readily crossed the placenta and broke down slowly so giving smaller sustained doses of the drug. One dose of the drug was given to the mother during pregnancy and a follow-up dose was given to the baby within three days of birth.

Many countries now routinely treat expectant mothers with ZDV while others are concerned about the cost of protecting one segment of the population while not being able to afford – in the case of South Africa – to treat the 4.2 million others at risk. Botswana has been able to accommodate such treatment in its health budget, while its near neighbour South Africa has not yet agreed to do so.

The South African problem is a growing one as in almost a decade the HIV-infection rate in women of child-bearing age has seen a thirty-four-fold increase with one third of all babies born to HIV-infected women being infected in the womb, and this against a background of an across-the-board rise in infant mortality by as much as 25 per cent in some areas. This is not surprising if we note that one in three pregnant women is HIV-positive in much the same regions. In the general population the HIV-infection rate for young South African women is 22 per cent.

The increase in infection observed in women and children is a worldwide phenomenon. By 1995 the Centres for Disease Control in the US reported that AIDS itself had become the fourth leading cause of death in the child-bearing age range, and that the HIV-infection in women showed an eight per cent increase. In the US, of the 7,000 or so HIV-infected women giving birth each year 2,000 of their babies were infected. In sub-Saharan Africa around 25-35 per cent of babies born to HIV-infected women also become infected. These are likely to acquire the infection either through exposure to maternal blood through the process of birth or subsequent breast-feeding – typically around ten per cent as in Uganda.

Mother to child transmission of HIV has raised concerns as to whether or not breast-feeding is still to be the recommended practice for infant feeding. Since only one limited study has looked at the practice; and a few even smaller projects have considered making breast milk safe (by, say, heating expressed breast milk); the consensus is that it is far too early, if at all, to consider abandoning breast-feeding. In any case breast milk is rich in a variety of anti-infective and anti-viral agents which will help to protect the baby from a range of conditions if not HIV-infected. The benefits of such protection are thought to outweigh the risks.

There are 1.6 million children with HIV worldwide and 1.4 million (88 per cent) are to be found in sub-Saharan Africa, and added to at the rate of one thousand a day. By 2005 it is estimated that in South Africa, sixty-one out of every thousand babies born to
HIV-infected women will die before their first birthday; without AIDS the mortality figure would be thirty-eight out of one thousand babies. Across Africa more than 700,000 children will be born to HIV-positive women. There are already 1 million children infected with HIV and of these around forty per cent will die before they reach the age of five.

**Children with AIDS**

Their immature immune system places children at special risk when exposed to the HIV-infection. If they do acquire it, their brains and body deteriorate more rapidly than adults with HIV. Where adults have an approximate latency period of eight years (in practice averaging about three to five years) the latency period for overt AIDS in children is much shorter.

The difficulty in treating HIV/AIDS in children is compounded by two important factors: as many adults would concur, AIDS medications are unpalatable and the treatment regimes are complex; and the drugs taken cannot always just be scaled down in dosage. The drug dosage is critical, and drugs are metabolized more quickly by children. The little of a drug might cause the virus to mutate, too much of a drug might kill the child. Research has shown that if protease inhibitors are started too soon the infected child becomes resistant to that whole group of drugs. Currently the outlook for children with HIV is not good. However, even children who are not HIV-infected will, in many cases, be affected by HIV in the home and, increasingly, may be orphaned as a direct consequence of parental HIV-infection.

**Orphaned Children**

There are estimated to be around four million orphaned children across Africa. About half of these are to be found in Kenya, Rwanda, Uganda and Zambia. For this kind of statistical research, being orphaned is defined as losing one’s mother, at least, before reaching the age of 15. It is reported that the parents died of AIDS as opposed to war, famine or other conditions.

Various authorities predict that the number of AIDS-orphaned children could rise to around forty million over the next five years. Of these, South Africa alone, it is reckoned, will have one million AIDS orphans during this same period.

Many of these children will lose the security of their home and may not even be cared for by other family members as might have been the case in the past. Some of these children will gravitate to brothels in search of easy money and to satisfy the need of some men for younger sexual partners. As has already been noted above, they will most likely increase their exposure to HIV risk. In any case, many of these children will be involved in petty crime purely for survival. Even if not orphaned, life will be more difficult for the family with AIDS than it would usually be.

**Older Women and AIDS**

One report tells of a qualified midwife who lost her job and her home when she became HIV-positive in 1992. Forced into the most sporadic and menial labour she barely makes $12 monthly in the slum where she now lives and has to bring up a family on that income. The stigma of AIDS is the curse on already blighted lives.

Due to social taboos on discussing sexual matters in the home, across generations, or even with other women singly or in groups; personal modesty; and the mild nature of some of the symptoms of infection by sexually-transmitted disease, many women are unaware that they have an HIV problem.

The taboos and the stigma associated with HIV stop men and women from seeking treatment. Clinic counsellor Kennedy Fugewane says ‘people are so stigmatized even if they walk in the door’ of an AIDS clinic. Fugewane goes on to say, ‘If a man comes here, people will say he is running around... If a woman comes, people will say she is loose. If anyone says they’ve got HIV, they will be despised.’

Misreporting of conditions may also occur. One study in Southern Uganda showed that seven per cent of the women having clinical examination reported having a vaginal discharge while clinicians observed discharges in sixty-eight per cent of the women being examined.

Then, on top of these problems, perhaps being denied permission to travel by their spouses/families, and actual difficulty in travelling, these women may never get the medical attention they need.

Even if these difficulties are overcome by the women, their prospect for treatment is not high. Research shows that many of these women do not receive clinical diagnosis or screening for HIV at the family planning, ante-natal, or maternal and child health clinics, and may be put off attending sexually-transmitted disease centres heavily frequented by men.

Sexually-active women experience other susceptibilities to HIV infection as they age. These include the discomfort or damage sustained through un lubricated
intercourse; irritation of the vaginal and/or cervical tissues from the use of spermicides; and atrophic vaginitis (inflammation of the vagina by small ulcers).\textsuperscript{60}

These susceptibilities are not seen for what they are. Perhaps through lack of knowledge and understanding of the human body illness is attributed to supernatural or traditional causes related to culture.

Some will say ‘it is the work of witchcraft. You have done something bad and have been bewitched. Your neighbour’s jealousy has invaded you. You have not appeased the spirits of your ancestors, and they have cursed you.’\textsuperscript{61}

In the light of these ideas our next chapter looks at the various theories concerning \textit{The Origin of AIDS}. 

\textbf{There are estimated to be around four million orphaned children across Africa. Around half of these are to be found in Kenya, Rwanda, Uganda and Zambia. Various authorities predict that the number of AIDS-orphaned children could rise to around forty million over the next five years. Of these, South Africa alone, it is reckoned, will have one million AIDS orphans during this same period.}
The title, while suggestive of insight and certainty, is deliberately misleading and is meant to reflect the assertions of many speculators about the origin of the present HIV pandemic. In truth, nobody yet knows the origin of HIV-infection, although there are very many theories purporting to account for it. Some of these are simplistic and bizarre. Others, frankly, are deeply offensive to various people who are HIV-infected. Still other theories have an air of plausibility about them which means that they resurface with a fair degree of regularity, particularly if another ‘proof’ can be added to the theory.

It is regrettable that HIV has become associated so closely with sub-Saharan Africa, especially since the effects of HIV are more than clinical, affecting as they do the economies of nations and national dignity. One can easily understand the bitterness of some Africans who believe that AIDS stands for American Invention to Discourage Sex; and the Congolese who similarly state that the French equivalent of AIDS, SIDA, stands for Syndrome Imaginaire pour Decourager les Amoureux.

Yet, like it or not, AIDS has become inseparably connected to various African nations. Researchers D. Serwadda and E. Katongole-Mhidde, commenting on this situation, say that the speculation about the African origins of HIV brought an ‘influx of scientists trying to prove this theory . . . but early emphasis on “discovering the origin of AIDS in Africa” was pejorative and unfortunate. Many African politicians strongly resented the emphasis.’

They had every right to resentment as many researchers say that this influx led to bad science and racism, and that the scientific literature concerning the early research is contradictory, insubstantial and unsound. Coupled with wide-ranging theories as to the origin of HIV, these comments highlight the uncertainties of the African AIDS pandemic.

Comets and Curses

Under the heading bizarre theories for the origin of HIV/AIDS are two which journalist Edward Hooper calls ex caelo (from the skies). These are:

♦ The tail of the comet theory which tries to account for the seemingly mysterious origin of HIV by locating it out of this world.

It suggests that viral material was carried in the tail gases of a comet passing close to the earth and that this material was deposited, subsequently infecting nearby people.

Although one or two famous astronomer’s names have been linked to this theory in the popular press, these scientists deny the possibility of this extraterrestrial phenomena and any personal connection to the theory.

♦ God’s wrath. As I wrote in the 1980s, certain segments of the population have openly stated their belief that AIDS is God’s wrath since the Scriptures condemn the homosexual practice in which AIDS was first observed in the Western world. If one adds to this belief the mysterious origin of the virus, and the apparently hopeless prospects for a cure, it will readily be under-
stood how many have come to believe in Divine intervention, with AIDS being God's way of destroying sinners. If this were so, it would be difficult to see why God, after watching over thousands of years of vastly differing 'sins', should suddenly decide to settle His score with homosexuals and drug addicts rather than any other 'sinners'.

The Bible clearly speaks of a future (and imminent) judgement time when all sinners – no matter what their specific practice – will have to pay the penalty for their sins. It does not tell, however, of a God who prejudices particular situations and who picks out special groups for early condemnation. Clearly, there are God-given laws which govern the harmonious interaction of body, mind and spirit. The origin of HIV/AIDS may be traced to an abuse of some of those laws pertaining to the physical and emotional or moral development of man and the presence of sin in the world. However, it should be recognized that once the process has started, 'guilty' and 'innocent' suffer alike. Nowhere is this more obvious or more poignant than in the AIDS pandemic.

Rather than its being considered a visitation from God, many Africans believe that AIDS is caused by another supernatural power – witchcraft – and they use anti-witchcraft rituals and objects to counteract the infection.  

Conspiracy Theories

If God or witchcraft are not responsible for HIV, then secretive human agencies must be, so popular wisdom
The Origin of AIDS

dictates! Who more likely than governments with heavy bureaucracies and hidden agendas?

Conspiracy theorists have blamed German biological warfare all the way back to the days of Nazi dominance in Germany for the escape of HIV-infecting agents. Then, depending on one’s particular political affiliation, others have blamed either the American Central Intelligence Agency or the Russian secret service for deliberately using destructive viruses, including HIV, to destabilize countries for their own political aims.

There is a lack of information to support these theories. It is that very lack which fuels such theories since it can easily be claimed that confirming data is being withheld by the interested parties.

Accidental Emergence

The ‘chance’ occurrence of HIV as part of other clinical research and advance is the theory of origin receiving the most attention. As links, however tenuous, can often be established between the emergence of HIV and the outbreak or control of other infections, the theory seems plausible.

Early theories suggested that African swine-fever had infected Haitians, and homosexual men who holidayed in Haiti, who subsequently introduced the virus into the homosexual community of North America.

Others have suggested that HIV was a freak side-effect of the hepatitis B vaccine used to treat the hepatitis prevalent in North American homosexuals in the early 1980s. Since the treatment was given as part of the therapy for what was already described as Gay-Related Immune Deficiency (GRID), it suggests that contaminated hepatitis B vaccine arrived too late on the scene to be said to be the origin of HIV.

Other accidental emergences of HIV have been put down to the use of unsterile antibiotic needles being reused, and to the destruction of the human nervous system as a result of nuclear tests and the subsequent radioactive fall-out worldwide.

By far, most interest in HIV origin has centred around contaminated vaccines used in other areas of preventive medicine, namely smallpox and polio. In fact, when HIV erupted onto the Ugandan medical scene it was widely believed to be as a result of the World Health Organization anti-smallpox campaign of the 1970s. It is the contaminated polio vaccine which is attracting the most attention at the present time.

Monkey Business

Monkey business, or, more precisely, primate business lies at the heart of most theories concerning AIDS in Africa, since they concern the transmission of Simian Immune Viruses (SIV) to humans. Some virologists claim that these viruses crossed to humans from a reservoir of such animal viruses many times in the past.

The current interest in the theory has led to scientists with ‘upturned umbrellas and plastic sheeting’ dashing around the chimp habitats of Africa trying to catch faeces and urine droppings for analysis. The material collected contains, it is hoped, small amounts of nucleic acid present in SIV-carrying chimps. The scientists plan to chart the viral family tree of SIV and HIV.

Interest in the monkey connection has centred around the theory, painstakingly elaborated by journalist Edward Hooper, that simian tissues used as culture mediums for the polio virus may accidentally have introduced immuno-suppressive virus into human beings. He sees the origin of AIDS as collated with areas of polio inoculation (with the CHAT form) in African countries. The developers of the CHAT polio vaccine have not only refuted his claims but also report that stored CHAT samples have been tested in their laboratories and have been shown to be clear of SIV and HIV material.

Other closely related theories suggest that various monkey species were caught and prepared as ‘bush meat’, with the simian virus thus transmitted becoming particularly virulent in its consumer.

The fact that at least 35 million people are sick or infected with HIV; and over 16 million have died of AIDS; with another 6,000 people infected daily, makes the prospect of accidental infection frightening. If HIV were to be traced to a drug company the liability claims would be astronomical.

It may or may not be possible to prove either a direct or indirect simian connection, but the fact remains that the monkey family carry viruses having a similar effect to that of HIV on humans. French researchers have discovered that chimpanzees and gorillas carry previously unknown herpes viruses closely related to the one responsible for Kaposi’s sarcoma, which is endemic in Central African people even if not HIV-infected.

A roundup of candidates for viral transmission in the monkey world include, then, gorillas, chimpanzees, sooty mangabeys, macaques, African green and other monkeys. The concern is that viruses harboured by these animals might either infect humans directly or create dangerous new pathogens if fused with human viral material. One particular route by
which such fusion may have taken place in the past, other than by vaccination, was the use of monkey testes as a rejuvenation therapy in the West.\textsuperscript{22}

Opponents of the simian-human transmission remain unimpressed by the evidence in support of the monkey theories and argue that viral sequencing of HIV strains indicate that HIV has been around probably for hundreds of years. Rather than acquiring HIV from SIV it is thought that HIV mutated to become ever more infectious.\textsuperscript{23} Even Edward Hooper wrote that in 1988: 'it became apparent that the African green monkey SIV was actually only distantly related to HIV-1 and HIV-2, which meant that although SIVagm [a particular simian strain] might be an ancestor of the HIVs, it could not have been the immediate source [as many thought].'\textsuperscript{24} Hooper also quotes researcher Preston Marx as saying, 'shown... by itself, natural transfer of SIV to humans is not enough – it does not result in AIDS.'\textsuperscript{25}

**Out of or Into Africa?**

It is hard to establish from the 'evidence' of the various theories concerning the origin of HIV whether or not the infection started in Africa or has become, through no fault of its own, an African infection. Contaminated blood products, before these were adequately screened, and sexual tourism\textsuperscript{26} have no doubt contributed to cross-infection, hence the different strains of HIV present in African countries.

One can understand the urge to find somewhere to point the finger of blame. The prevalence of HIV in particular countries has led to stigma and unfair stereotyping which has harmed individuals and nations. If only they knew the origin of HIV, many think, compensation might be forthcoming. Given the pandemic situation, compensation from a culpable source is unlikely. Whatever its origin, HIV/AIDS is here and in need of massive resourcing to reduce and, where possible, eliminate its effects.

Obviously, the more we can learn about HIV's origin the better we shall be able to protect ourselves in the future since scientists believe that other devastatingly deadly diseases are waiting to emerge. Rather than approach present and future problems with condemnation, we need to show all possible compassion. Nowhere will this be more necessary than in the area of HIV/AIDS Counselling.
A roundup of candidates for viral transmission in the monkey world include, then, gorillas, chimpanzees, sooty mangabeys, macaques, African green and other monkeys. The concern is that viruses harboured by these animals might either infect humans directly or create dangerous new pathogens if fused with human viral material.
The possibility that one might have an illness brings its own anxieties, especially where the person has enjoyed good health previously. If the illness has long-term implications then a number of anxieties will surface. In the case of HIV-infection these might include:

**Shock:**
- on hearing the diagnosis and considering its implications
- through disappointment on not hearing good news

**Anxiety/Fear,** due to:
- not knowing what course the infection will take and
- worrying about the effects of the treatment/medication
- rejection by family/friends/community
- isolation through sexual rejection because of the fears of others concerning infection
- anticipating the partner/family's inability to cope with the situation
- concerns about job and/or skill losses
- the possibility of physical deterioration and/or disability over time

**Despair,** because of:
- little hope of a cure
- persistent worries about one's inevitable physical decline
- recriminations about being infected and/or spreading the infection
- the limiting effects of the virus
- the effect on one's family of being infected
- the stigma of being HIV-infected

**Areas of Counselling**

The two main areas of HIV counselling are:
- educating the infected person so that they will understand the nature of their problem; explanation of the available treatment options; outlining ways to prevent others from being infected by them; and,
- support through anxieties and other physical needs met by people in the course of their illness

Counselling opportunities will exist at different stages and be provided by different individuals. Appropriate counselling interventions include:
- initial attendance at a clinic or medical centre where the at-risk person will have the HIV testing procedures explained
- the communication of the test results
- personal counselling of the HIV-positive person, and the partner/family where this is possible and applicable
- available treatment regimes
- instruction in safer sexual practices
- explanation of the development and effects of opportunistic infections and their delay/treatment
- issues surrounding loss/bereavement/grief
- counselling the family of the bereaved

**Support Networks**

Counsellors and counselling facilities vary from country to country so there is hardly a standard approach. All community agencies should be alert to their opportunities to provide support to the sick in their midst and to help people with HIV/AIDS and their dependants. This network of support will include:
- families, friends, work colleagues
- medical and paramedical staff
- social services/charitable organizations
- professional counsellors/psychologists
- faith communities
- special organizations working specifically with HIV/AIDS-infected people and their families

Counselling materials and messages will need to be particularly relevant to specific target groups, whether these be families, women, sex workers, or youth.
The support given to all concerned needs to be easily accessible, consistent, genuine, caring, subtle and confidential. At a corporate level, along with the faith communities, businesses and other communities could adopt as a policy the aims of the Interfaith Declaration set out on page 71. This would provide the right kind of social climate in which understanding and compassion could flourish, and remove the stigma associated with contracting HIV/AIDS, a stigma that has often resulted in the deaths of the individuals concerned. It is so important to get the people-part right.

Voluntary testing and counselling therefore needs to be handled with sensitivity but can be effectively used with:
- engaged couples as part of their marriage preparation
- couples planning their families
- pregnant women
- others seeking a healthy lifestyle and who want to be informed in matters of health

As former president of South Africa Nelson Mandela stated in his closing address to the XIIIth World AIDS Conference: “The challenge is to move from rhetoric to action, and action at an unprecedented intensity and scale. There is a need to focus on what we know works. We need to break the silence, banish stigma and discrimination, and ensure total inclusiveness within the struggle against AIDS; those who are infected with this terrible disease do not want stigmas, they want love. Together we can make a difference.”

*Health Promotion and HIV/AIDS should be the concern of all of us.*
We are members of different faith communities called by God to affirm a life of hope and healing in the midst of HIV/AIDS.

The enormity of the pandemic itself has compelled us to join forces despite our differences of belief. Our traditions call us to embody and proclaim hope, and to celebrate life and healing in the midst of suffering. AIDS is an affliction of the whole human family, a condition in which we all participate. It is a scandal that many people suffer and grieve in secret. We seek hope amid the moral and medical tragedies of this pandemic in order to pass on hope for generations to come.

We recognize the fact that there have been barriers among us based on religion, race, class, age, nationality, physical ability, gender and sexual orientation which have generated fear, persecution and even violence. We call upon all sectors of our society, particularly our faith communities, to adopt as highest priority the confrontation of racism, classism, ageism, sexism.

As long as one member of the human family is afflicted, we all suffer. In that spirit, we declare our response to the AIDS pandemic:

1. **WE ARE CALLED TO LOVE**: God does not punish with sickness or disease but is present together with us as the source of our strength, courage and hope. The God of our understanding is, in fact, greater than AIDS.

2. **WE ARE CALLED TO COMPASSIONATE CARE**: We must assure that all who are affected by the pandemic (regardless of religion, race, class, age, nationality, physical ability, gender or sexual orientation) will have access to compassionate, non-judgmental care, respect, support and assistance.

3. **WE ARE CALLED TO WITNESS AND DO JUSTICE**: We are committed to transform public attitudes and policies, supporting the enforcement of all local and national laws to protect the civil liberties of all persons with AIDS and other disabilities. We further commit to speak publicly about AIDS prevention and compassion for all people.

4. **WE PROMOTE PREVENTION**: Within the context of our respective faiths, we encourage accurate and comprehensive information for the public regarding HIV transmission and means of prevention. We vow to develop comprehensive AIDS prevention programmes for our youth and adults.

5. **WE ACKNOWLEDGE THAT WE ARE A GLOBAL COMMUNITY**: The scourge of AIDS is devastating wherever it is found. We recognize our responsibility to encourage AIDS education and prevention policies, especially in the global religious programmes we support.

6. **WE DEPLORE THE SINS OF INTOLERANCE AND BIGOTRY**: AIDS affects men, women and children of all races. We reject the intolerance and bigotry that have caused many to deflect their energy, blame those infected, and become preoccupied with issues of sexuality, worthiness, class status, or chemical dependency.

7. **WE CHALLENGE OUR SOCIETY**: Because economic disparity and poverty are major contributing factors in the AIDS pandemic and barriers to prevention and treatment, we call upon all sectors of society to seek ways of eliminating poverty in a commitment to a future of hope and security.

8. **WE ARE COMMITTED TO ACTION**: We will seek ways, individually and within our faith communities, to respond to the needs around us.

Adapted from material produced by the American Association for World Health and the African-American Clergy's Declaration of War on HIV/AIDS.
AIDS SPREADS THROUGH SEX
TO PROTECT YOURSELF;

HAVE AN UNINFECTED, SEXUALLY-FAITHFUL
PARTNER FOR LIFE, OR

USE A NEW CONDOM PROPERLY EVERY
TIME YOU HAVE SEX.

REMEMBER: IT’S NOT NECESSARY TO DIE OF AIDS
The only true hope for the entire world is prevention — education efforts, new forms of protection, and the development of a vaccine. While the pharmaceutical scientists are searching for the latter, progress is being made with all the former. "Health promotion activities are of central importance to efforts to prevent and control AIDS." Both of these statements, by Dr Peter Piot (Executive Director UN AIDS), and Maeve Moynihan (Royal Tropical Institutes, Amsterdam), respectively, are to be viewed in the context of factors influencing health in the wider picture.

Multiple Contingent Risks

S. Moses and F. A. Plummer write: 'As long as there is widespread poverty, marginalization of risk groups, counter-productive labour practices and denial of women's rights, the fundamental transformation of individuals and societies which is required to ultimately control AIDS in Africa will not occur.' These varying factors having a bearing on the health of individuals have been termed Multiple Contingent Risk and include:

- exploitation
- loneliness and isolation
- low cost housing
- minimal access to HIV education or information
- poverty
- separation from one's spouse/family/community
- underemployment and unemployment
- vulnerability

Facets of the above that contribute to the problems are:

- alienation of farm workers from traditional lands
- break-up of former family structures
- colonial and post-colonial models of industrial employment
- gender issues and hierarchies
- growth of 'shanty' towns around towns and cities
- inequality of income

- land reform measures
- worker relocation

The instability of war, drought and famine with its malnutrition and the spread of other diseases has added to the problems and provided the climate for the spread of HIV/AIDS. Clearly, HIV/AIDS can be traced along the trading and commercial routes and to sex workers congregating at these centres. As Dr Piot states, 'We need to reduce not only the risk but also the vulnerability of people infected because of social factors in their lives.' He continues, 'The epidemic will not be under control in any single country if it is not under control everywhere.'

The ABC of Prevention

The principal message of HIV prevention has been summed up in the ABC slogan:

A — abstain
B — be faithful
C — condom if necessary

While the slogan may be simple to remember, its practice has been less easy to uphold for a variety of practical and cultural reasons.

Former Health Commissioner of Illinois, USA, Dr Herbert Ratner wrote: "Today, abstinence and monogamy are no longer distastefully dismissed as religious dictates. Rather they are seen as the pragmatic answer to a pressing problem. . . . abstinence before marriage and monogamy thereafter are sexual norms protective of homo sapiens which serve the survival needs of the human animal." Dr Saleem Farag points out that 'strategies which focus on technological interventions, to prevent the potential consequences of behaviour, fail to recognize the fact that the problem associated with prevention strategies of HIV and other sexual diseases and teenage pregnancies is associated more with the frequency of sexual involvement.
and not only the effectiveness of the barriers used." He goes on to quote Mr. Yoweri Museveni, President of Uganda, as saying, "Young people must be taught the virtues of abstinence and self-control." These virtues used to be instilled by the faith communities and other social agencies to young and old alike. As Hilary Dixon and Jane Springham comment: "The values and attitudes of those around us were in their turn shaped by the whole range of religious, moral, legal, ethical, and social mores of the society in which we live." Sadly, these constraining features have become casualties in the outworking of the multiple contingency risks noted above, and cannot be relied on at the present time.

It is the condom part of the slogan which has received the greatest emphasis as a preventative measure for HIV-infection. An emphasis that many now view as adding to the problem as much by its use as its lack. President Museveni says, "In countries like ours where a mother has to walk 20 miles to get an aspirin for her sick child... the practical question of getting a constant supply of condoms or using them properly may never be resolved." In many places in Africa condoms are unavailable or unaffordable and, in some instances, culturally or morally unacceptable. Even where condoms are used, there is growing evidence that they are also unreliable.

Retail services for contraceptives in Africa was first introduced in Ghana in 1971. Even now, as Elizabeth Reid points out, in Africa men tend not to use condoms and, although they might be available in some areas, the female condom is not widely obtainable or convenient for women to use. So whether they want protection or not, women often have little choice in the matter.

Where condoms are available, and with the appropriate level of health promotion, the up-take in condom use has been quite marked. For example, sex workers in Nairobi, made increasingly aware of the HIV risk, started to insist on condom use by their clients. Use of condoms went up from eight per cent to fifty per cent in just one year and averaged about seventy-two per cent at peak use. A correspondingly lower rate of HIV seroconversion was observed in women insisting on the use of condoms.

While these statistics from Kenya might appear encouraging, other research is less heartening concerning the use of condoms. These concerns are summarised in a statement made by Dr. Timothy Stamps, Zimbabwean Minister of Health and Child Welfare:

"Condoms, which was the only method prescribed for casual sex, was not totally safe and a lot of its weaknesses were starting to surface as a result of its increased use."
Some of the weaknesses which were not much talked about in the past included bursting, leaking and slipping off inside the women. Although leaking was not always noticed even after sex, cases of condoms slipping off had become frequent and they reached the attention of health officials because sometimes they had to be removed by the doctor.

The condoms are becoming less and less reliable than we had thought. They frequently slip off, leak and burst, exposing both the male and female partners to the AIDS virus. The only reliable method to avoid AIDS is to stop having casual sex, and for school children it is waiting until you have a faithful partner in marriage.13

Where a condom is used – and the stronger the latex the better – it is firmly urged that a spermicide also be used.16 In any case it is a mistake to think that other contraceptive methods such as birth-control pills or the diaphragm can prevent HIV-infection.

In many societies sex is a taboo subject,17 so any counsel with regard to condom use may not be available. Some faith communities may feel inhibited from promoting condoms in case it is thought they are also promoting the promiscuous behaviours often associated with their use. These are issues that must be resolved by all concerned in the fight to control HIV/AIDS. Only by bringing all the facts into the open will people be able to make intelligent decisions.

**Dying of Ignorance**

When the UK started its HIV/AIDS campaign in 1987 it used as its leaflet and poster slogan AIDS: Don’t die of ignorance. Since little was known at the time about the origin of HIV and its progression to overt AIDS, that ignorance was fairly widespread. It was a common belief in Africa, for example, that insect bites were the major cause of HIV and its spread and only 15 per cent of people interviewed knew that AIDS was incurable.18

Bites have been ruled out now as a means of acquiring or spreading HIV, and one would expect that present knowledge concerning the virus would have advanced immeasurably in the intervening years since HIV was first reported. While this may be true, generally speaking, in some areas of Africa the level of knowledge is still very low.

In one study in Nigeria, involving doctors and nurses, only 46.7 per cent surveyed identified HIV as leading to AIDS. Sixteen per cent thought that HIV was an unspecified virus or a complication of other sexually-transmitted diseases. Mosquito bites still fig-
ured high on the list of causes in 30.5 per cent of the surveyed along with handshaking and kissing! Over 60 per cent of the medical personnel said they were not willing to manage people with HIV-infection. This attitude can probably be traced to a lack of knowledge concerning the infection, and therefore a biased attitude towards the infected.

A national survey of 12-17-year olds in South Africa, commissioned by the Henry J. Kaiser Family Foundation based in the USA, documented the appalling level of ignorance in that country still prevailing after a decade of AIDS. It showed that the topic of sex remains taboo in most households, and many parents feel squeamish about tackling it head-on. But this doesn’t prevent young girls from trading their bodies for a few rands and a Coca-Cola and young boys from believing it’s their right to have sex — when their “partner” says no.

Staggeringly, the survey shows that one in three girls is forced to have sex, and that the boys think the girls should protect themselves! While nine out of ten children have heard of AIDS, only twenty per cent of them know that the infection can be transmitted homosexually. Two out of five of the children surveyed thought that AIDS could be cured, and many of the same group believed that having sex with a virgin would cure AIDS. The blame for this youthful ignorance is put down to lack of sex health education from the government, parents and the churches. So, in spite of the advances made in understanding AIDS, it looks as if it is still possible for the HIV-infected to die of ignorance!

**Lifestyle Factors**

People who are otherwise physically fit fare better at every stage of HIV-infection: the initial primary infection may be virtually symptomless; the latency period of infection may be extended; and they may show fewer of the various symptoms of opportunistic infections. The high-fruit, high-vegetable regime rich in antioxidants recommended for the prevention of heart disease and cancer helps to boost the immune system and ongoing response in the HIV-infected.

Researchers Michio Kushi and Alan Jack go a stage further by suggesting that acid-producing foods and ‘dietary habits rich in acid-producing factors and over-consumption of foods rich in simple sugars appear to preserve, protect, and activate AIDS viruses.’ It is hard to see how this observation squares with the often impoverished diet found in many regions of Africa and the high rate of infection prevalent in those same areas. In fact, malnutrition along with malaria are even bigger killers than HIV/AIDS in some African countries.

Kushi’s solution to what is, in his opinion, an AIDS-promoting diet is to severely restrict dietary intake as advocated in his *yin/yang* eating regime. Cancer specialists William A. Fintel and Gerald R. McDermott comment on this approach: ‘This sort of diet is dangerous because, depending on the combination of foods, it can be deficient in calories, vitamins C and D, and/or iron. Both children and adults on this diet have shown nutritional deficiencies. Most important, there is no scientific evidence that this diet prevents or retards the growth of cancer [or, by implication, boosts the immune system in HIV].’

Does this mean that diet is not important? Of course not. There is, for example, evidence to show that children with HIV, having candida infection and weight loss, regain weight and loose their fungal infection if dosed daily with lactobacillus plantarum 299v. This is a natural bacteria normally found in the gut, and, while it did not prolong the life of the children in the study, it helped to give them a better quality of life.

In an ideal world a well-balanced diet, exercise and weight management programme, along with sexual abstinence/monogamy as appropriate, would appear to give the best protection. As we do not live in an ideal world we must do the best we can with what we have.

**The Faith Community Response**

The less than ideal world we live in is also the problem facing faith communities and their responses to the HIV/AIDS infections devastating the populations that they serve. Rabbi Ron Hendler observes, ‘A liberal, sexual environment is akin to a death sentence being imposed on many unsuspecting people.’

All the major religions are opposed to a liberal sexual environment and to the distribution of condoms which appear to endorse that lifestyle. To some extent, as a result of this opposition, the reaction to the HIV/AIDS problem has been muted, thus giving the impression that faith communities have no answers to the tremendous needs of society.

The silence has been interpreted as ineffectiveness and has provided the grounds for the non-faith agencies to lead the way. As Dr Nelda Swart, the South African National Co-ordinator of the Religious AIDS Programme, says: ‘In the absence of any significant response to the AIDS epidemic from religious
The high-fruit, high-vegetable regime rich in antioxidants recommended for the prevention of heart disease and cancer helps to boost the immune system and ongoing responses in the HIV-infected.
communities, the government and other secular organizations have embarked on condom distribution campaigns as the only logical way of trying to prevent the spread of HIV.27

Clearly the problem is what to do with people who already have HIV/AIDS while preventing further problems in the future. Dr Swart goes on to express the Christian viewpoint: 'The only "cure" for the AIDS epidemic is the uplifting of God-given moral guidelines as worthwhile and feasible, helping people choose behaviour patterns that are both good for them and pleasing to God.'28 Christian writer John Miller states: 'AIDS and HIV offer Christians nationwide an incredible opportunity to reach out in love, understanding and compassion to many. We also have the chance of preparing a new generation to live by Godly principles and values.'29 We need to remember, as Swart points out: 'When we do become involved, let it not be in a judgmental way, but let it be in a way that will demonstrate God's good intentions for us.'30

Health Promoters

Example has always been one of the best ways of health promotion. We can learn from the experiences of others. Writers John D. Dupree and Stephen Beck state: 'One of the most significant factors influencing knowledge, attitudes and behaviour in relation to AIDS is acquaintance with someone who is known to be infected with HIV, or with that person's family, friends, and fellow workers.'31

They go on to suggest that the best HIV/AIDS prevention promoters will be people with AIDS relating their experience to others like themselves – children to children, adults to adults, in whatever society or groups they find themselves.

Even prostitutes to prostitutes. Such approaches have been successful in the reduction of HIV transmission in many African countries, as in the Kenyan study of Nairobi sex workers referred to above. Not only did these women encourage a greater use of condoms, thus affecting the HIV-infection rate, but many of the women gave up prostitution.32

It is the responsibility of parents, young people, teachers, faith communities, and medical personnel to become as knowledgeable about HIV-infection as they can and to know what resources are available locally to deal with the problem should it arise. In one study, health education reduced the risk by 13 per cent in the area targeted. When this education was supported by voluntary HIV-antibody testing and counselling the risk behaviour of the community dropped by 35 per cent.33 Using as many of the available resources as possible clearly helps to achieve prevention goals.34

As each individual acquires that knowledge of resources they can be supportive of those already infected and can also play their part in local strategies for HIV/AIDS prevention. There are many innovative ways in which the preventive message can be spread. See the HIV/AIDS AWARENESS CAMPAIGNS material for ideas already in place in some countries that could be copied in your own community.

Keep in mind the thought: 'The "war" against AIDS is won every time a person makes an effort to prevent its spread.'35 Be in the forefront of that war and do all that you can do to halt the AIDS pandemic.
Community AIDS Awareness Initiatives

You might like to . . .

- donate audio tapes and brochures on HIV/AIDS for taxi drivers
- sponsor family-life workshops involving parents and children
- organize an AIDS poster campaign for children
- have fund-raising events for people with AIDS
- train young people to work with other young people using various life-skills
- collect HIV/AIDS materials in a section of a library or faith community building with easy access for youth and adults
- invite health professionals to speak about HIV/AIDS
- show videos about HIV/AIDS, where these are available and there are good viewing facilities
- have a question box in the classroom where students can ask questions about HIV/AIDS anonymously and have their questions answered through special programmes
- give HIV/AIDS research projects as homework to school children
- have panel discussions on social issues related to HIV/AIDS in the community
- organize support groups for families where AIDS is causing handicap or other difficulties
- invite AIDS patients to share in the social and spiritual activities of your faith community
- have a ‘brain-storming’ session and come up with ideas of your own to promote AIDS awareness and ways of caring

All known measures that reduce the risk of HIV/AIDS should be encouraged.
HIV/AIDS Awareness Campaigns

initiated by the
Adventist Development and Relief Agency (ADRA)

During the past 12 years more than 1.2 million people in Africa and Asia have heard and seen lifesaving strategies in AIDS care and prevention through music and drama presentations conducted by over 1,500 ADRA volunteers.

Over 800,000 school notebooks specially printed with AIDS prevention messages have been donated to African school children.

More than 350 African schools have AIDS education clubs for school children. They can learn about HIV/AIDS, and how to relate to and care for the HIV-infected without being afraid, while enjoying football or netball.

Radio programmes featuring real-life situations help people deal with AIDS in their families and communities.

An internationally-recognized non-governmental organization, ADRA is active in more than 120 nations. ADRA was granted general consultative status by the Economic and Social Council of the United Nations in 1997.

ADRA is an independent humanitarian agency established with the specific purpose of individual and community development and disaster relief. Without regard to age, ethnicity, or political or religious association, ADRA assists around 20 million people annually.
A

Addison’s disease
a disease of the adrenal glands causing extreme weakness
alopecia
baldness
Alzheimer’s disease
a degeneration in the nerve cells of the brain leading to dementia
amnesia
loss of memory
anaemia
inadequate red blood cells and/or lack of haemoglobin in the blood
anorexia
loss of appetite
arthralgia
joint pain, heat, redness, sensitivity to touch
ascites
fluid swelling of the abdomen
ataxia
loss of power of movement
atrial fibrillation
tremoring of the heart muscles

B

Bell’s palsy
paralysis of the seventh or facial nerve
benign skin growths
non-malignant skin growths
bronchospasm
spasmodic spasm of the bronchi of the lungs
bullous eruptions
bubblelike eruptions of the skin

cardiomyopathy
disease of the muscle layer of the heart

chancroid
a tropical sexually-transmitted disease with painful genital ulcers and swollen lymph nodes in the groin
congestive heart failure
excessive blood in the lungs as a result of heart failure
conjunctivitis
inflammation of the conjunctiva of the eye
cyanosis
blueness of face and extremities due to insufficient oxygenated blood supply

dermatitis
inflammation of the skin
diabetes mellitus
diminished power of the muscles and other tissues to utilize sugar due to a lack of insulin. The accumulated sugar is excreted in the urine
dyspepsia
indigestion
dysphagia
difficulty in swallowing
dysphonia
distortion of the voice
dyspnœa
difficulty in breathing
dysuria
difficulty in passing urine

E

Epstein Barr virus
a virus causing glandular fever and also associated with Burkitt’s lymphoma, a cancer of the lymph tissues of the jaw and/or abdomen
crythematous papules
red blistering of the skin
The AIDS Pandemic

G

gastritis
  inflammation of the stomach
gastrointestinal haemorrhage
  bleeding anywhere throughout the digestive system
glossitis
  inflammation of the tongue
gout
  excess uric acid in the blood and the deposit of urate of soda in the joints

H

haemophilia
  a mainly male heredity disease in which a factor for clotting the blood is missing
hairy-cell leukaemia
  a cancer of the blood cells characterized by the hairy appearance of the affected cells
hyperkinesia
  a state of intense agitation
hyperlipaemia
  greater than normal level of blood lipids
hypertension
  high blood pressure
hypertonia
  increased muscle tone
hyperuricaemia
  greater than normal level of uric acid or urates in the blood
hypokinesia
  reduction in the normal range of movement

J

jaundice
  yellow discoloration of the skin due to the presence of bile

L

leukaemia
  permanent increase in the white blood corpuscles and enlargement of the spleen and lymph glands of the body
libido disorders
  dampening or heightening of the sex drive

M

maculopapular rash
  discoloration of the skin appearing as spots or stains
myalgia
  muscle pain
myopathy
  muscle wasting

N

neuralgia
  nerve pain
neuritis
  inflammation of a nerve or nerves
neurodegenerative
  anything which causes the nerve cells to degenerate

O

oedema
  an excess of fluid in the tissues
oesophageal pain
  pain in the gullet
oesophagitis
  inflammation of the gullet

P

pancreatitis
  inflammation of the pancreas
paraesthesiae
  unusual feelings such as hot flushes, numbness, tingling or itching and not related to an external cause
peripheral neuritis
  inflammation of the nerves in the body extremities
pharyngitis
  inflammation of the wall of the throat
pneumonia
  inflammation of the tissues of the lungs
polyuria
  passing an excess amount of urine
pruritis
  itchy skin
rectal haemorrhage
bleeding from the anus

rectal ulcers
ulceration of the rectum or anus

renal calculus
a stone in the kidney

renal cyst
a cyst or swelling in the kidney

retrovirus
a virus of the retroviridae family synthesizing DNA from RNA templates

rigors
shivering

Slim’s disease
a name given to a wasting disease in East Africa before AIDS was identified

somnolence
heavy sleep

stomatitis
inflammation of the stomach

stupor
an insensible state

syncope
faintness

thyrotoxicosis
a swelling of the thyroid gland associated with a deficiency of dietary iodine

tinnitus
noises in the ear without apparent cause

toxic neuropathy
a destructive poisoning of the nerves

trichomoniasis
a single-celled micro-organism causing inflammation of the vagina, usually sexually transmitted

urticaria
nettle-rash-like skin eruptions

vasodilation
dilation of the blood-vessels

verruca
warts, appearing on the soles of the feet

vertigo
giddiness

xerophthalmia
a vitamin A deficiency causing a thickening of the conjunctiva and conjunctivitis of the eye
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The AIDS Pandemic

Anton Chekhov (1904) said, 'When a lot of remedies are suggested for a disease, that means it can't be cured.' If AIDS had been around then, he might have had it in mind. His statement is truer of AIDS than almost any other disease, and particularly so in Africa. The AIDS Pandemic focuses on the situation facing the Continent of Africa.

The author, Richard Willis, has worked with sexually-transmitted diseases in Special Treatment Centres while serving in the medical branch of the Royal Navy; sat his professional qualification in STD at University College Hospital, London; and has subsequently worked and travelled in Africa.