

**HIV/AIDS AND OTHER
STDS /STIS
AND
DRUG AND SUBSTANCE ABUSE**

HIV/AIDS AND DRUG ABUSE
DEPARTMENT OF COMMUNITY HEALTH
SCHOOL OF PUBLIC HEALTH

To equip the students with the knowledge and skills for identifying the factors that spread HIV/AIDS and drug abuse. In addition, the course would assist in exploring the strategies for minimizing the incidences of the scourge.

Expected Learning Outcomes

By the end of the course unit the learners should be able to:-

- i) Demonstrate an understanding of the factors that lead to the spread of HIV/AIDS and drug abuse.
- ii) Discuss the implications of HIV/AIDS and drug abuse on education, economy and society.
- iii) Discuss factors that lead to the spread of HIV/AIDS and drug abuse.
- iv) Identify factors that lead to the spread of HIV/AIDS and drugs.

WEEK	TOPIC	SUB TOPIC
Week 1	Introduction	<ul style="list-style-type: none"> ➤ Definition of terms, ➤ STIS/STDS,
Week 2	Origin of HIV/AIDS	<ul style="list-style-type: none"> ➤ Various Theories; Mysterious origin, religious, monkey, Conspiracy
Week 3	Biology of HIV	<ul style="list-style-type: none"> ➤ Structure of HIV ➤ Classification of HIV ➤ Transmission of HIV ➤ Clinical staging of HIV/AIDS
Week 4	Diagnosis of HIV Treatment of HIV	<ul style="list-style-type: none"> ➤ Methods. ELISA,PCR ➤ Antiretroviral drugs : mode action and limitations
Week 5	Prevention and control strategies	<ul style="list-style-type: none"> ➤ ABCD strategy ➤ Blood and blood products ➤ Mother to child
Week 6	Management strategies Cat 1	<ul style="list-style-type: none"> ➤ HTC ➤ Role of nutrition
Week 7	Factors fuelling the spread of HIV/AIDS	<ul style="list-style-type: none"> ➤ Myths, ➤ Socio-cultural factors, ➤ Political factors
Week 8	The concept of drugs and drug abuse	<ul style="list-style-type: none"> ➤ Classification of drugs, ➤ administration of drugs, ➤ why people abuse drugs,

		<ul style="list-style-type: none"> ➤ impact of drugs, ➤ relationship between drug abuse and HIV/AIDS Management of drug abuse;
Week 9	Gender and HIV/AIDS	<ul style="list-style-type: none"> ➤ Gender and HIV/AIDS, factors influencing hiv/aids in females
Week 10	Youth and HIV/AIDS Social stigma and discrimination	<ul style="list-style-type: none"> ➤ Youth and HIV/AIDS, factors fueling HIV/AIDS among youths ➤ Effects , causes , types of social and discrimination ➤ Addressing social and discrimination associated with HIV/AIDS
Week 11	Cat 2	
Week 12	Global and national responses tom HIV/AIDS pandemic	<ul style="list-style-type: none"> ➤ Global responses ➤ Kenyan responses
Week 13	Impact HIV/AIDS	Impact HIV/AIDS; on household/family, health sector, industry, agriculture, education
Week 14	revision	<ul style="list-style-type: none"> ➤
15 an 16	EXAMS	

- **Teaching and learning methodologies:** Lectures, Assignments, Discussion, Research assignments
- **Instructional materials and equipment:** Textbooks, Chalkboard/Whiteboard, Handouts, Newspaper and Magazines
- **Recommended Text Books**
- Deanna K. (2002); *AIDS and HIV infections (2nd Edition)*; (ISBN 0-8016-8012)
- Karen B. ; *Aids Source Book*; (ISBN 0-780-022x)
- Sen, Amartya (2000); *Development As Freedom*; New York
- Muindi D.M, Kiio M, Kombo D.K, Kithinji C, Wainaina P.N: (2003); *The status, Impact and Management of HIV/AIDs in Kenya*; ISBN 9966- 909- 32X; CUEA, NAIROBI
- **Textbooks for Further Reading**
- Linda M (2004); *Drugs Alcohol and Tobacco*; (ISBN 0-96300

HIV AND AIDS

HIV

The initials stand for **H**uman **I**mmunodeficiency **V**irus

- ❖ **H** = Infects only **H**uman beings. It is Species specific
- ❖ **I** = Immunodeficiency the virus weakens the immune system and increases the risk of infection. It is a condition in which the body is unable to produce enough antibodies to fight against bacteria's, viruses and other microorganisms and hence resulting in infections and diseases
- ❖ **V** = **V**irus is an infective agent that usually consists of a nucleic acid molecule in a protein coat, is too small to be seen by light microscopy, and is able to multiply only within the living cells of a host.
- HIV (Human Immunodeficiency Syndrome) is a specific type of virus (a retrovirus)
- HIV Virus invades the white blood or helper T cells (CD4 cells) to replicate itself.
- **CD4** stands for **Cluster of Differentiation 4 cell** and they are glycoproteins found on the surface of immune cells such as T helper cells, monocytes, macrophages, and dendritic cells.
- HIV Virus is Preventable, manageable but not curable.

OTHER FORMER NAMES FOR HIV

Former names of the virus include:

- Human T cell lymphotropic virus (HTLV-III)
- Lymphadenopathy associated virus (LAV)
- AIDS associated retrovirus (ARV)

AIDS

The initials stand for **A**cquired **I**mmune **D**eficiency **S**yndrome

- ❖ **A** = **A**cquired means **A**ttained from, not inherited
- ❖ **I** = Weakens the **I**mmune system (the **I**mmune system involves organs and processes of the body that provide resistance to infection and toxins. These organs may include the thymus, bone marrow, and lymph nodes. **The immune system** is made up of a network of cells, tissues, and organs that work together to protect the body)
- ❖ **D** = Creates a **D**eficiency of CD4+ cells in the immune system (**D**eficiency means a lack of or shortage of)

- ❖ **S = Syndrome**, or a group of illnesses taking place at the same time or a group of symptoms which regularly occur at the same time, or a condition characterized by a group of associated symptoms.

Difference between disease and syndrome

- A **disease** is a pathophysiological response to internal or external factors.
- A **disorder** is a disruption to regular bodily structure and function.
- A **syndrome** is a collection of signs and symptoms associated with a specific health-related cause.
- There can be confusion between syndromes, symptoms, and diseases.
A disease usually has a major cause, distinguishing symptoms and treatments. **A syndrome**, on the other hand, is a group of symptoms that might not always have a definite cause.
- **AIDS** (Acquired Immunodeficiency Syndrome) is a disease caused by the HIV virus
- **AIDS** is Preventable, manageable but not curable.
- This disease **AIDS** limits the body's ability to fight infections
- A person with **AIDS** develops a very weak immune system and becomes immunocompromised
- A person is said to have an *immune deficiency* or be *immunocompromised* when their immune system is incapable of working at full capacity.
- It is the opposite of being *immunocompetent*.
- The immune system is how the body fights off diseases and protects itself against new infections. Therefore, someone who is immunocompromised will usually get sick more often, stay sick longer, and be more vulnerable to different types of infections.

Factors that make a person to become immunocompromised

There are many conditions that can lead to a person becoming immunocompromised.

- **Chemotherapy**: The agents used to attack cancer cells also affect any actively dividing cells, including those in the bone marrow that produce the white blood cells that are a key part of the immune system. White blood cells counts often drop for people undergoing chemotherapy.

- **Cancer:** Certain cancers can cause a person to become immunocompromised even without chemotherapy. These include leukemia and lymphoma, in which cancerous white blood cells crowd out functioning white blood cells.
- **Autoimmune diseases:** These include those in which the immune system attacks itself, such as myasthenia gravis and systemic lupus erythematosus.
- **Medications:** Those that inhibit the immune system include corticosteroids, tumor necrosis factor inhibitors, and anticonvulsants.
- **Chronic diseases:** Diabetes mellitus, kidney disease, hepatitis, and alcoholism can inhibit the immune system.
- **Congenital disorders:** Some rare disorders present at birth affect the immune system and can result in immunodeficiency.
- **Aging:** As you age, you produce fewer T cells, macrophages, and complement proteins, which are all key parts of the immune system.
- **Genetic Causes:** The exact genes are known. The genes are passed from mother to child, and on occasion from father to child.
- **Poor balanced diet**
- **Malnutrition**
- **Poor Sanitary Conditions**
- **Drug abuse**

THE HIV VIRUS AND THE IMMUNE SYSTEM

- HIV infection weakens the immune system, hence making it to become unable to protect against opportunistic infections and certain types of cancers.
- The **immune system** is a host defense system comprising many biological structures and processes within an organism that protects against disease.
- The immune system includes the following organs:
 1. **Thymus:** It is a gland between the lungs and just below the neck.
 2. **Spleen:** It is an organ that filters the blood. It sits in the upper left of the abdomen.
 3. **Bone marrow:** It is found in the center of the bones, it also used in the production of the red blood cells.
 4. **Lymph nodes:** It is a small glands positioned throughout the body, linked by lymphatic vessels.

- These organs make and release **lymphocytes**.
- **Lymphocytes** are **white blood cells** and they are classified as **B cells** and **T cells**.
- There are two main types of leukocyte:

1. Phagocytes

These cells surround and absorb pathogens and break them down, effectively eating them. There are several types, including:

1. **Neutrophils**: these are the most common type of phagocyte and tend to attack bacteria.
2. **Monocytes**: these are the largest type and have several roles.
3. **Macrophages**: these patrol for pathogens and also remove dead and dying cells.
4. **Mast cells**: they have many jobs, including helping to heal wounds and defend against pathogens.

2. Lymphocytes

- Lymphocytes help the body to remember previous invaders and recognize them if they come back to attack again.
- Lymphocytes begin their life in bone marrow.
- Some stay in the marrow and develop into B lymphocytes (B cells), others head to the thymus and become T lymphocytes (T cells).
- These two cell types have different roles:
 1. **B lymphocytes**: They produce antibodies and help alert the T lymphocytes.
 2. **T lymphocytes**: They destroy compromised cells in the body and help alert other leukocytes.
- In general the **B cells and T cells** are used to fight the foreign particles and foreign Microorganisms that get into the body.
- The foreign particles and foreign Microorganisms that get into the body are called **antigens**.
- If the immune system encounters the **antigens** in form of a pathogen, for instance, a bacterium, virus, or parasite, it mounts an immune response.

- The **B cells** on detection of **antigens** release **antibodies** usually specific to the **antigen** detected.
- The work of the **T cells** is to destroy the foreign particles, foreign Microorganisms and abnormal cells.

Signs of a Weak Immune System

- Persistent colds.
- Repeated infections.
- Stubborn, swollen lymph nodes.
- Wounds take too long to heal.
- Constant fatigue.

Immune suppression

- Immunosuppression is a reduction of the activation or efficacy of the immune system. Immunosuppression may occur as an adverse reaction to treatment of other diseases and infections and due to other factors such as Malnutrition, drug resistance, co-infection, old age severe stress, HIV subtype and genetic makeup among others.
- HIV attacks white blood cells, called CD4 cells, that protect body from illness
- CD4 cells are white blood cells that play an important role in the immune system.
- **CD4** stands for **Cluster of Differentiation 4 cell** and they are glycoproteins found on the surface of immune cells such as T helper cells, monocytes, macrophages, and dendritic cells.
- The CD4 count is like a snapshot of how well your immune system is functioning.
- CD4 cells (also known as CD4+ T cells) are white blood cells that fight infection.
- The more the CD4 cells you have, the better.
- These are the cells that the HIV virus destroys.
- As HIV infection progresses, the number of these cells declines.
- When the CD4 count drops below 200, a person is diagnosed with AIDS.
- A normal range for CD4 cells is about 500-1,200.

- Usually, the CD4 cell count increases when the HIV virus is controlled with effective HIV treatment.
- When the body's ability to fight common infections is lost then Opportunistic infections occur.

DISEASE PROGRESSION

Progression of HIV disease is measured by:

- **The CD4 count**
 - ❖ The Degree of immune suppression is measured by the CD4 CELLS
 - ❖ The Lower CD4 count means a decrease in the persons immunity
- **Viral load**
 - ❖ This is the amount of HIV virus in the blood
 - ❖ Higher viral load means more immune suppression
 - ❖ The Severity of illness is determined by the amount of the virus in the body (increasing viral load) and the degree of immune suppression (decreasing CD4+ counts)
 - ❖ Higher the viral load, the sooner immune suppression occurs
- Progression from HIV infection to AIDS follows a set pattern, although the rate of progression varies from person to person:
 - Rapid progressors take 3 - 6 years
 - Average progressors take 8 years
 - Slow progressors take 15 years
 - There is also a small group of people who are classified as non-progressors.
 - The slow progression of these individuals is thought to be as a result of Genetical factors.

Steps involved in Disease Progression

- Stage 1 - Primary Infection/Antibody Development
- Stage 2 - Asymptomatic Period (10-12 yrs average)
- Stage 3 - symptomatic
- Stage 4 - AIDS or full blown HIV infection (CD4 200 or below)
- Stage 4 – Death

Stage 1 - Primary Infection/Antibody Development

- HIV quickly replicates in the body after infection.
- Short, flu-like illness - occurs one to six weeks after infection
- Sometimes there are no specific symptoms at all
- Infected person can infect other people
- More severe symptoms may not appear for 10-15 years
- Other Symptoms may include:
 - Fever (raised temperature)
 - Body rash
 - Sore throat
 - Swollen glands
 - Headache
 - Upset stomach
 - Joint aches and pains
 - Muscle pain.
- The Symptoms are nonspecific.
- HIV antibody test often negative but becomes positive within 3 to 6 months, this process is known as sero-conversion or window period.
- Large amount of HIV in the marginal blood.
- Primary HIV can be diagnosed using viral load titer assay or other tests.
- Primary HIV syndrome resolves itself and HIV infected person remains asymptomatic for a prolonged period of time, often many years depending on the strength of the immune system.
- Window Period is also included in the Primary Infection stage
- The window period is the time between initial infection and the time that the body produces anti-bodies to the virus.
- During the Window Period the HIV test doesn't actually test for HIV, but these anti-bodies.
- Antibodies to the HIV virus will appear within 3 months of infection.
- During the window period through the process of seroconversion someone may not know that they have HIV infection in their system.
- The bottom line is getting tested.

Stage 2 - Asymptomatic Period (10-12 yrs average)

- As the name suggests, this stage of HIV infection does not cause outward signs or symptoms.
- A person may look and feel well but HIV is continuing to weaken their immune system.
- It lasts for an average of ten years or more depending on the strength of the immune system and without a HIV test many people do not know they are infected.
- This stage is free from symptoms
- There may be swollen glands
- The level of HIV in the blood drops to very low levels
- HIV antibodies are detectable in the blood
- However, the HIV virus will still be active, and it will still be infecting new cells and making more copies of itself.
- HIV can still be transmitted on during this stage.
- If left untreated, over time, it causes severe damage to the immune system.

Stage 3 - symptomatic,

- The symptoms are mild
- The immune system deteriorates
- emergence of opportunistic infections and cancers start
- HIV continues to reproduce, CD4 count gradually declines from its normal value.
- Once *CD4 count drops below 500*, HIV infected person at risk for **opportunistic infections**.
- The following diseases are ***predictive*** of the progression to AIDS:
 - Persistent herpes-zoster infection (shingles)
 - Oral candidiasis (thrush)
 - Oral hairy leukoplakia
 - Kaposi's sarcoma (KS)
 - TB Infection
- Some other Symptoms in this stage can include:
 - Weight loss
 - Chronic diarrhoea
 - Night sweats

- Fever
- Persistent cough
- Mouth and skin problems
- Regular infections of other diseases
- Serious illness or disease.

Stage 4 - AIDS or full blown HIV infection (CD4 200 or below)

- The immune system gets completely weakened
- The illnesses become more severe leading to an AIDS diagnosis
- *CD4 count drops below 200* person is considered to have advanced HIV disease
- If preventative ARV medications are not taken the HIV infected person will now be at risk for the following symptoms indicating an advanced immune deficiency:
 - Oral and vaginal thrush infections (thrush) that are persistent and recurrent
 - Extra-pulmonary tuberculosis (TB) that affects other parts of the body besides the lungs
 - Recurrent herpes infections such as cold sores (herpes simplex)
 - Bacterial skin infections and skin rashes
 - Bacterial pneumonia
 - Kaposi's sarcoma, or a rare form of skin cancer (painless reddish-brown or bluish-purple swelling on the skin and mucous membranes such as in the mouth). Kaposi's sarcoma can also occur in the lungs and gastro-intestinal tract. It reacts well to chemotherapy or to alpha-interferon, but it can develop invasive open lesions and cause death if not promptly treated. Kaposi's sarcoma is less common in black Africans.
 - Pneumocystis jirovecii pneumonia (PJP) – the most common opportunistic infection in people with HIV
 - Fever for more than a month
 - Persistent diarrhoea for more than a month, leading to wasting syndrome
Weight loss of more than 10% of usual body weight
 - Generalised lymphadenopathy, a disease affecting the lymph nodes (or, in some cases, the shrinking of previously enlarged lymph nodes)
 - Toxoplasmosis of the brain (an infection caused by a common parasite)
 - Cytomegalovirus infection (a common herpes virus)

- Cryptococcal meningitis (an infection of the tissues covering the brain and spinal cord)
- Peripheral neuropathy (damage to the nerves in the hands and feet)
- Abdominal discomfort
- Headache
- Oral hairy leucoplakia (white patches on the tongue)
- Persistent cough and reactivation of tuberculosis
- *If CD4 count drops below 50:*
 - Mycobacterium infection
 - Cytomegalovirus infections
 - TB Infection
 - Most deaths occur with CD4 counts below 50.
- The Aids patient in the final phase is usually plagued by many of the following other problems:
 - The Aids patient is usually very thin due to continuous diarrhoea, nausea and vomiting (which may last for weeks or even for months).
 - Conditions in the mouth (such as thrush and sores) may become so painful that the patient is no longer able to eat.
 - Women suffer from persistent, recurrent vaginal infections and cervical cancer.
 - Severe skin infections, warts and ringworm.
 - Respiratory infections, persistent cough, chest pain and fever.
 - Nervous system problems often complain of pains, numbness or “pins and needles” in the hands and feet.

Stage 4 – Death

- Death comes due to immuno-incompetence
- It is the last stage.
- When the CD4 cells drop below 50 the immune system of the AIDS victims at this point has been completely destroyed and the person may die any time
- This is the time most AIDS victims get admitted in Hospitals.
- Sometimes people say that someone "died of AIDS"; this is not entirely accurate, since it is the opportunistic infections that cause death.

- AIDS is just a condition that lets the opportunistic infection take control.
- The final stages of AIDS are usually characterized by unbearable symptoms, resulting ultimately in death.

1. Opportunistic Infections

- The HIV virus severely weakened the immune system
- The body cannot fight off infections from the numerous microorganisms that constantly come into contact with the body.
- As a result, people with advanced AIDS develop repeated infections of many types of diseases, including
 1. pneumonia,
 2. tuberculosis,
 3. chronic herpes simplex causing recurring sores on the mouth and genitals,
 4. cytomegalovirus,
 5. toxoplasmosis,
 6. meningitis,
 7. cryptosporidiosis and
 8. Septacemia, among others.

2. Decline of Mental Function

- The opportunistic infections and the HIV virus itself can have severely detrimental effects on the brain.

HUMAN IMMUNODEFICIENCY VIRUS (HIV) AND THE BRAIN

- HIV can affect the brain in different ways:
 - a) **HIV-meningoencephalitis** which is an infection of the brain and the lining of the brain by the HIV virus. The patient may develop headache, neck stiffness, drowsiness, confusion and/or seizures over hours or a few days. Although HIV-meningoencephalitis may remain mild and resolve on its own, it can sometimes be severe and occasionally it may lead to uncontrollable seizures, coma and even death. HIV-meningoencephalitis can be treated with anti-HIV treatment (antiretroviral drugs). Some antiretroviral drugs are thought to be more effective in the brain than others, and this may affect the choice of treatment used. Other than antiretroviral drugs, there is no specific treatment for HIV-meningoencephalitis.
 - b) **HIV-encephalopathy (HIV-associated dementia)** which is the result of damage to the brain by longstanding HIV infection. People with HIV-encephalopathy have problems with their concentration and memory. Some of those with HIV-encephalopathy may also lose interest in things they used to enjoy doing. They may become withdrawn and stop socialising. Sometimes it may seem as if their personality has changed or that they have become depressed. HIV-encephalopathy can also cause physical movements to

slow down. Things that are usually quick to do, such as putting on shoes or brushing teeth, may start to take a long time. People may find it hard to do fine movements such as doing up buttons. Some experience difficulty walking, for example they may be slow to get going or tend to shuffle rather than stride out. These problems tend to develop slowly over months or even years but can become quite severe and some people may need help to look after themselves. HIV-encephalopathy can be treated with antiretroviral drugs. Some improvement in the symptoms of HIV-encephalopathy can occur in the first few weeks or months of treatment. If HIV is diagnosed early enough, antiretroviral drugs can prevent progression to AIDS and hence prevent the development of HIV-encephalopathy.

- c) **Mild neurocognitive disorder** which is problems with thinking and memory in HIV, however is not as severe as HIV-encephalopathy. Mild cognitive impairment is not as severe as HIV-encephalopathy, but is more common. Although HIV-encephalopathy only affects those with AIDS, milder impairment can affect people earlier in HIV infection who have high CD4 (type of immune cells) counts and are well in other respects. Some anti-HIV drugs are thought to get into the brain better than others do. These drugs may be better at controlling or preventing mild cognitive impairment. However some anti-HIV drugs may be toxic to the brain and can cause side effects similar to mild cognitive impairment.

NOTE: People in the final stages of AIDS often develop "AIDS dementia" and suffer from trouble concentrating and thinking, memory problems, difficulty moving, trouble speaking, decreased alertness, extreme mood swings and lessening interest .

3. HIV Wasting Syndrome

- Patients often stop eating and drinking, and may lose control of the bladder or bowels.
- Vision and hearing may deteriorate, and the patient may experience periods of restlessness and agitation.
- Frequently, fluids may collect in the back of the throat if the patient is too weak to cough up mucus, causing noisy, rough breathing.

4. Cancer

- As the immune system breaks down in the late stages of AIDS, cancer occurs more frequently.
 - Chances of developing Kaposi's sarcoma, a cancer affecting the intestines, lungs and skin;
 - non-Hodgkin lymphoma, a cancer of the lymph nodes;
 - and invasive cervical carcinoma are all increased during the final stages of AIDS.
- However talking about death with the patient should not be avoided.

CLASSIFICATION OF HIV

There is less known about its general taxonomic classification of the HIV virus and as a result the classification of HIV is a little different than other organisms. The International Committee on Taxonomy of Viruses (ICTV) has classified HIV virus but there is still more research that is going on about HIV and other viruses.

CLASSIFICATION:

Group: Group VI (ssRNA)

Order: Virales - HIV is a viral because it is a virus. It is a small microscopic capsule filled with genetic material.

Family: Retroviridae - HIV belongs to the Retroviridae family because it is a retrovirus. These families of viruses that contain RNA and reverse transcriptase enzyme.

Subfamily: Orthoretrovirinae - HIV belongs to the subfamily of Orthoretrovirinae because it is a virion that is spherical and is a vertebrate virus. It is an RNA tumor virus group.

Genus: Lentivirus - HIV is a Lentivirus because it is a slow virus. It takes a while for the virus to replicate enough to cause symptoms in the host.

Species: HIV-1, HIV-2 - Causes harm to the immune system and causes AIDS.

HIV-1 AND HIV-2

HIV-1 and HIV-2 are closely related, but distinct viruses. They are both retroviruses belonging to the genus *Lentiviridae* and they are both transmitted in the same way.

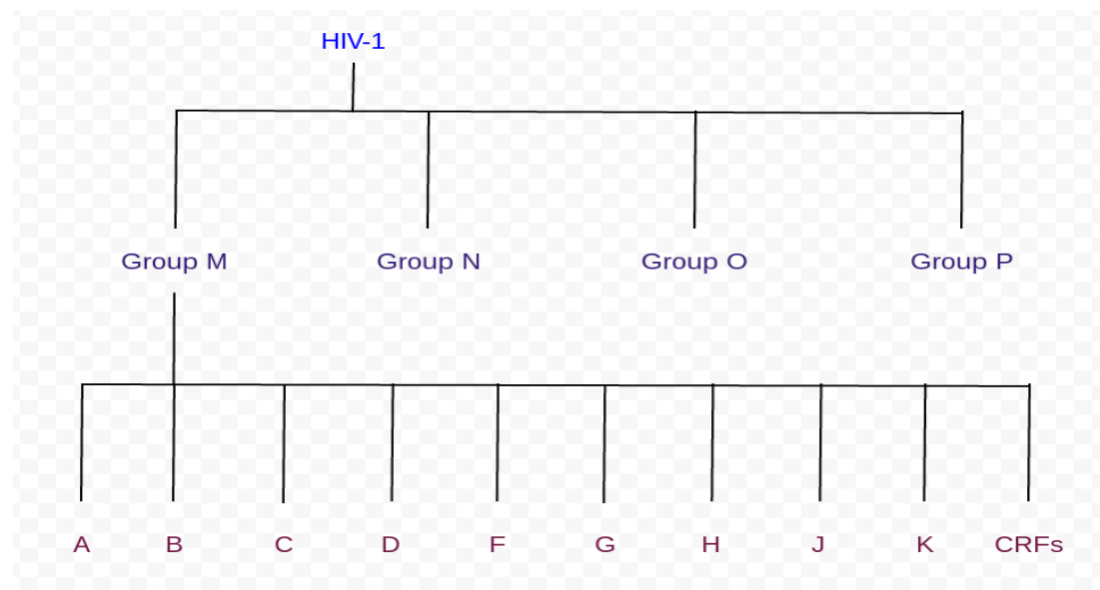
Each of these viruses is thought to have arisen as a result of simian immunodeficiency virus (SIV) being introduced into the human population, although the origin for HIV-2 was the sooty mangabey, while for HIV-1, it was the chimpanzee.

Globally, HIV-1 is the most prevalent type of HIV and is generally the virus that people are talking about if they mention HIV without specifying a type. HIV-2 is relatively uncommon. It is mainly concentrated in West Africa, where it is currently epidemic, although it has been reported in other countries. Cases of HIV-2 were reported in France, Portugal and in countries with colonial links to these nations as a result of immigration from and commercial ties to West Africa.

HIV-2 is associated with lower viral loads and is less infectious than HIV-1. The cells that HIV infects and destroys, called CD4+ cells, therefore decline in number at a slower rate than with HIV-1 and disease progresses more slowly. Around 90% of people with this infection are long-term, clinical non-progressors and recent estimates suggest that people with an undetectable HIV-2 viral load have similar survival chances to that of the general population. However, HIV-2 can suppress the immune system and lead to the development of AIDS, in which case a person develops the same symptoms and infections that are seen with HIV-1.

In general, HIV-1 and HIV-2 share many traits, including how they are transmitted and contracted, their basic genetic makeup, and that both follow similar pathological processes and develop into AIDS (Acquired Immune Deficiency Syndrome). Typically, when you hear HIV mentioned in general, it is in regards to HIV-1 since it is far more prevalent.

HIV-1 is further classified into four groups: M (the major group), N, O (the outlier group), and P. More than 90 percent of HIV-1 cases involve HIV-1 group M. Within group M lie 10 separate subtypes: A, B, C, D, F, G, H, J, and K. Also included are CRFs (circulating recombinant forms) which are essentially hybrid subtypes formed from a mixture of two subtypes they are taken as sub-subtypes.



Subtypes A and C are the most widespread geographically, however subtype B is the most common subtype in Japan, the Americas, Europe and Australia.

DIFFERENCE BETWEEN HIV-1 AND HIV-2

HIV-1	HIV-2
This strain is found worldwide and is more common.	This strain is found predominantly in West Africa.
This strain is more likely to progress and worsen.	This strain is less likely to progress and many of those infected remain lifelong non-progressors. Progression is slower.
Average level of immune system activation is higher.	Average level of immune system activation is lower.
During progression, HIV-1 has lower CD4 counts than HIV-2.	During progression, CD4 counts are higher in this strain.
Plasma viral loads are higher.	Plasma viral loads are lower.

HISTORY AND ORIGIN OF HIV

- When and where the HIV virus first emerged is probably going to remain a unknown for many years to come.
- While several theories have been put forward, there is no conclusive single agreement on the origin of HIV/AIDS.
- Some of the mostly acknowledged theories about the origin of HIV include the following:
 1. Mysterious origins e.g. the tail of the comet theory
 2. Religious theories (God's wrath and witch craft)
 3. Monkey origin theories (with four theories)
 4. Conspiracy theories
 5. The calculation theory

1. Mysterious origin theory

- This theory 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 Sate in people. Although one or two famous astronomers 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.

2. Religious theories (God's wrath and witch craft)

- Certain segments of the population have openly stated that AIDS is God's wrath since the Scriptures condemn the homosexual practice in which AIDS was first observed in the Western world.
- Rather than its being considered a visitation from God, many Africans believe that AIDS is any caused by another supernatural power - witchcraft and they use anti-witchcraft rituals and objects to counteract the infection.

3. Monkey origin theories

- HIV is a lentivirus, and like all viruses of this type, it attacks the immune system.
- Lentiviruses are in turn part of a larger group of viruses known as retroviruses.
- The name 'lentivirus' literally means 'slow virus' because they take such a long time to produce any adverse effects in the body.
- They have been found in a number of different animals, including cats, sheep, horses and cattle.
- The most interesting lentivirus in terms of the investigation into the origin of HIV is the Simian Immunodeficiency Virus (SIV) that affects monkeys.
- The researchers led by Paul Sharp of Nottingham University and Beatrice Hahn of the University of Alabama made the discovery during the course of a 10-year long study into the origins of the virus.
- They claimed that chimpanzees were the source of HIV-1 and that the virus had at some point crossed species from chimps to humans.

THEORIES ON HOW HIV CROSSED SPECIES

Some of the most common theories about how this 'zoonosis' took place, and how SIV became HIV in humans include:

1. The Oral Polio Vaccine (OPV) theory
2. The hunter's theory
3. The Contaminated Needle Theory
4. Colonialism theory

1. The Oral Polio Vaccine (OPV) theory

- In his book, *The River*, the journalist Edward Hooper suggested that HIV could be traced to the testing of an oral polio vaccine called Chat, given to about a million people in the Belgian Congo, Rwanda and Burundi in the late 1950s.
- To be reproduced, live polio vaccine needs strain to be cultivated in living tissue, and Hooper's belief is that Chat was grown in kidney cells as taken from local chimps infected with SIV.
- This, he claims, would have resulted in the contamination of the vaccine with chimp SIV, and a large number of people subsequently becoming infected with HIV-1.

2. The Hunters' Theory

- The most commonly accepted theory is that of the 'hunter'. In this theory, SIVcpz was transferred to humans as a result of chimps being killed and eaten or their blood getting into cuts or wounds on the hunter. Normally the hunter's body would have fought off SIV, but on a few occasions it adapted itself within its new human host and become HIV-1.
- The fact that there were several different early strains of HIV, each with a slightly different genetic makeup (the most common of which was HIV-1 group M), would support this theory: every time it passed from a chimpanzee to a man, it would have developed in a slightly different way within his body, and thus produced a slightly different strain.
- An article published in *The Lancet* in 2004 (Nathan *et al.*, 2004), also shows how retroviral transfer from primates to hunters is still occurring even today.
- All these infections were believed to have been acquired through the butchering and consumption of monkey and ape meat.
- Discoveries such as this have led to calls for an outright ban on bush meat hunting to prevent simian viruses being passed to humans.

3. The Contaminated Needle Theory

- This is an extension of the original 'hunter' theory. In the 1950s, the use of disposable plastic syringes became commonplace around the world as a cheap, sterile way to administer medicines.
- However, to African healthcare professionals working on inoculation and other

medical programmes, the huge quantities of syringes needed would have been very costly.

- It is therefore likely that one single syringe would have been used to inject multiple patients without any sterilisation in between.
- This would rapidly have transferred any viral particles (within a hunter's blood for example) from one person to another, creating huge potential for the virus to mutate and replicate in each new individual it entered, even if the SIV within the original person infected had not yet converted to HIV

4. The Colonialism Theory

- It was first proposed in the year 2000, by Jim Moore, an American specialist in primate behaviour, who published his findings in the journal AIDS Research and Human Retroviruses.
- During the late 19th and early 20th century, much of Africa was ruled by colonial forces.
- In areas such as French Equatorial Africa and the Belgian Congo, colonial rule was particularly harsh and many Africans were forced into labour camps where sanitation was poor, food was scarce and physical demands were extreme.
- These factors alone would have been sufficient to create poor health in anyone, so SIV could easily have infiltrated the labour force and taken advantage of their weakened immune systems to become HIV.
- A stray and perhaps sick chimpanzee with SIV would have made a welcome extra source of food for the workers.
- Moore also believes that many of the labourers would have been inoculated with unsterile needles against diseases such as smallpox (to keep them alive and working), and that many of the camps actively employed prostitutes to keep the workers happy, creating numerous possibilities for onward transmission.
- One final factor Moore uses to support his theory, is the fact that the labour camps were set up around the time that HIV was first believed to have passed into humans - the early part of the 20th century.

5. Conspiracy theories

- Some say that HIV is a 'conspiracy' or that it is 'man-made with ulterior motives'.
- Conspiracy administer theorists have blamed German biological warfare all the way back to the days of Nazi and other dominance in Germany for the escape of HIV-infecting agents.
- Americans who believe HIV was manufactured as part of a biological warfare programme,
- Designed to wipe out large numbers of black and homosexual people.

6. The calculation theory

- This is the latest theory on the origin of HIV.
- Opponents of the simian-human transmission remain unimpressed by the evidence in of the monkey theories and argue that viral sequencing of HIV strains indicate that HIV has been around probably for hundreds of years.
- In 2000 when a team of scientists using computer technology to study on the structure of HIV calculated the rate at which the virus mutates for the HIV viral sub-types to have a common ancestor.
- This process revealed HIV originated around 1930 in rural areas of Central Africa, where the virus may have been present for many years in isolated communities.
- The virus probably did not spread because members of these rural communities had limited contact with people from other areas.
- But in the 1960s and 1970s, political upheaval, wars, drought, and famine forced many people from these rural areas to migrate to cities to find jobs.
- During this time, the incidence of sexually transmitted infections, including HIV Infection accelerated and quickly spread throughout Africa.

STRUCTURE AND GENOME OF HIV VIRUS

The Human immunodeficiency virus (HIV) belongs to the Family *Retroviridae* and consists of two basic components:

1. A core of ribonucleic acid (RNA), called the genome
2. A protein component that surrounds the genome, called a capsid.

The genome

The genome carries the genetic information of the virus, while the capsid gives the virus its shape and protects the genome. The HIV genome consists of three major genes:

1. Group specific antigens (Ags) or capsid proteins (*gag*);
2. Polymerase gene proteins which include the Reverse Transcriptase, Protease, and Integrase enzymes (*pol*)
3. Envelope glycoproteins (*env*).

The capsid

The capsid is made up of subunits called capsomeres. The capsid (dark blue) is the outer membrane of the virion's nucleus and is composed of molecules of a protein known as p24. The contents of the capsid's are:

- The genome (black lines sticking out of the nucleocapsids) consists of two single strands of RNA,
- The capsid also contains several proteins, namely, Reverse Transcriptase (RT), Integrase (IN), Viral Infectivity Factor (Vif), Viral Protein R (Vpr), Negative Regulatory Factor (Nef), and Protein 7 (p7).
 - **Reverse transcriptase (RT)** (black circles with red insides) is the enzyme responsible for reverse transcribing HIV RNA to HIV proviral DNA;
 - **Integrase (IN)** (light blue open circles) is the enzyme responsible for integrating the reverse-transcribed DNA into the host cell's DNA;
 - **Nef (negative regulatory factor)** (one of the circles in the black bracket) is a small protein that causes numerous changes in an infected cell to adapt it to reproducing HIV;
 - **Vpr (viral protein R)** (another of the circles in the black bracket) is a small protein that is essential to HIV viral replication in non-dividing cells, such as macrophages;
 - **Vif (viral infectivity factor)** (another of the circles in the black bracket) is a small protein that is essential to HIV viral replication; and
 - **(Protein 7) p7** is a peptide that facilitates reverse transcription.

Viral proteins are identified as either "gp" for glycoprotein or "p" for protein followed by the molecular weight in kilodaltons. For example, HIV-1 includes the envelope proteins

gp160, gp120, and gp41; the *gag* core gene proteins, *p55*, *p24*, and *p17*; the polymerase gene proteins, *p66*, *p51*, and *p31*.

HIV-2 proteins are similar to HIV-1 proteins. However, some of the proteins differ in molecular weight from those found in HIV-1.

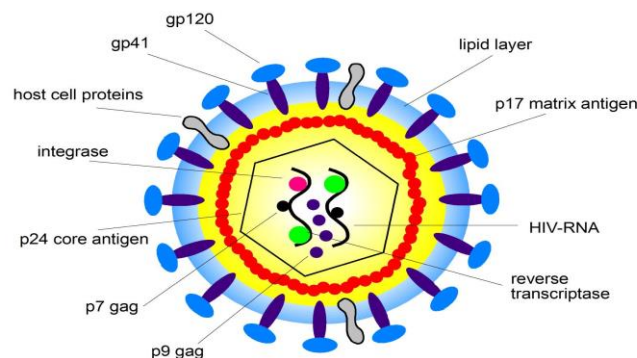
The lipid membrane

The lipid membrane (light yellow) is a fat bi-layer and it accounts for about 30% of the total weight of the virion. The Gag genome accounts for about 50%.

Inside the virus membrane there is a protein layer called the matrix (light blue) made up of matrix protein or p17, which contains essential proteins and the nucleus.

- Protease (black squares with light blue inside) is an enzyme that cleaves newly formed HIV polyproteins during viral replication into their constituent protein components.

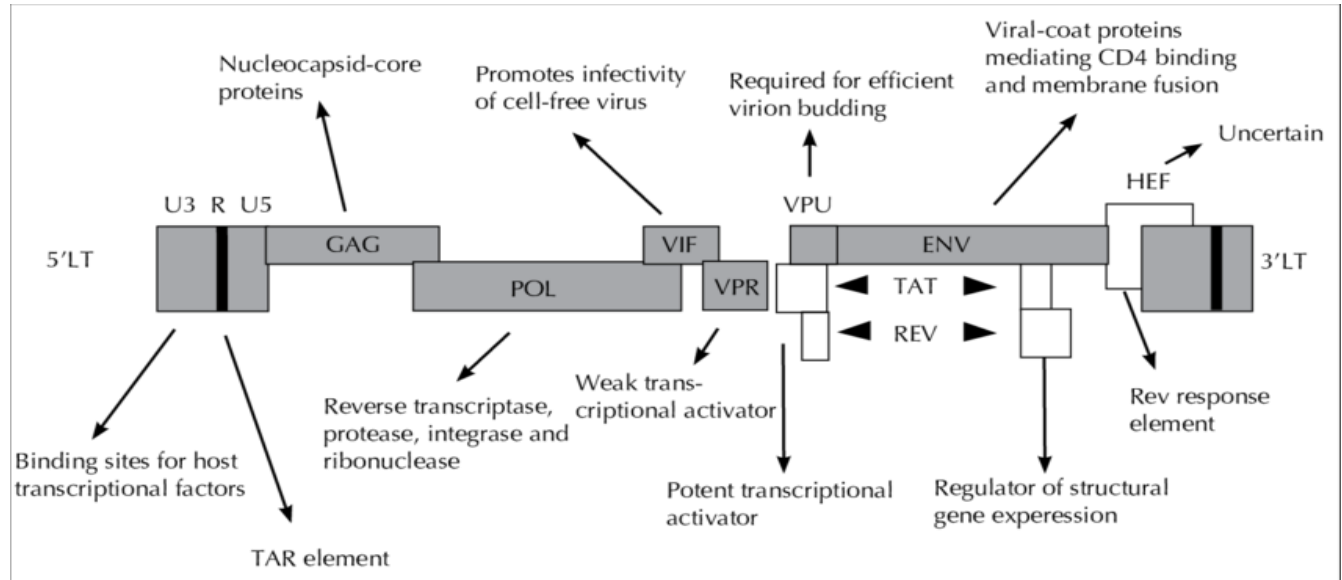
The virion also includes a transfer RNA (tRNA) from the cell that produced the virion that serves to prime insertion of the resulting proviral DNA into the infected cell.



- Shape and size**
 - HIV is a spherical virus of about 90 nm in diameter.
 - Size; 90nm
- Envelope:**
 - HIV is enveloped virus.
 - The envelope is a lipid bilayer surrounding the viral matrix, which is derived from host cell membrane during budding.
 - Below the envelope, there is an icosahedral shell called matrix (P17).
- Core:**
 - The core consists of cylindrical capsid (P24) which surrounds the genome.
- Genome:**
 - HIV is ss RNA virus.
 - The genome consists of two identical copies of +ss RNA and protein which are linked at their 5' end.
 - Genome of HIV consists of 9 genes (3 structural gene and 6 non-structural genes usually refed as regulatory genes).
 - The 3 Structural genes include env, gag and pol
 - The 6 regulatory genes include tat, rev, nef, vif, vpr and vpu in HIV-1 and vpx in HIV-2)
- Enzymes:**
 - Reverse transcriptase (RNA dependent DNA polymerase)
 - Protease
 - Intrigase
 - Ligase
- Replication:**
 - Cell specific (CD+T cell)
 - Virus entry: receptor mediated (gp120 and gp41)
 - RNA Replicates to form DNA intermediate by Reverse transcriptase enzyme
 - Provirus remains permanently associated with host cell
 - Release; budding
- Other properties:**
 - Oncogenic
 - Mutation
 - Species specific
 - Family: Retroviridae

HIV genome and proteins

- HIV has two identical copies of +SS RNA genome. The genome consists of 3 structural gene and 6 regulatory gene.
- Structural gene; *env*, *gag* and *pol* gene
- Regulatory gene; *tat*, *rev*, *nef*, *vif*, *vpr* and *vpu* in HIV-1 and *vpx* in HIV-2)



1. Structural gene:

i. *Gag* gene:

- *Gag* gene encodes the precursor protein P55 which is cleaved by viral protease (P10) to form matrix protein (P17), Capsid protein (P24) and Nucleocapsid protein (P7 & P9). *Gag* gene helps to form core of virus.

ii. *Pol* gene:

- *Pol* gene encodes the precursor protein P100 which is cleaved to form Protease (P10), reverse transcriptase and endonuclease.

iii. *Env* gene:

- *Env* gene encodes the precursor protein gp160 which is cleaved to form surface spike glycoprotein (gp120) and transmembrane protein (gp41).
- Genetic variety of HIV strain resides in *env*

2. Regulatory gene:

i. *Tat* gene: (transactivator of transcription)

- It encodes transactivator protein (P14) which promotes the transcription of viral genome.

ii. *Rev* gene: (regulatory of expression of viral protein)

- It encodes Rev protein (P19) and promotes the expression of viral structural proteins
- iii. *Nef* gene: (Negative expression factors)
- It encodes precursors protein P27
 - It down regulates the expression of CD4 cells, macrophage and MHC-II.
- iv. *Vif* gene: (Virion infectivity factor)
- It encodes the precursor protein p23 and promotes the viral infectivity by suppression the inhibitory actions of host cell proteins.
- v. *Vpr* gene:
- It encodes the precursor protein P15.
 - It promotes the transport of viral pre-initiation complex into nucleus of host cell.
- vi. *Vpu* gene in HIV-I / *Vpx* gene in HIV-II
- It encodes the precursor protein P16.
 - It promotes maturity and releases of progeny virus from host cell.

THE HIV REPLICATION CYCLE

In order for any virus to multiply and form more viruses, they must infect a cell. Viruses fall both under living and non-living things. They are like a brain of a human being without a body. In order to make new viruses, they hijack a cell and use it to make new viruses. Viruses hide their own DNA in the DNA of the cell, and then when the cell tries to make new proteins, it accidentally makes new viruses as well. HIV mostly infects cells in the immune system.

Several different kinds of cells have proteins on their surface that are called CD4 receptors. HIV searches for cells that have CD4 surface receptors, because this particular protein enables the virus to bind to the cell. Although HIV infects a variety of cells, its main target is the T4-lymphocyte also called the “T-helper cell”, a kind of white blood cell that has lots of CD4 receptors. The T4-cell sends warnings that the immune system has been invaded.

Once HIV binds to a cell, it hides its HIV DNA inside the cell’s DNA and this turns the cell into a sort of HIV factory and it replicates itself.

CD4 cells are a type of blood cell that is part of the immune system. They are a type of white blood cell (lymphocyte). CD4 cells are sometimes called T-helper cells or T-cells

The CD4 count is like a snapshot of how well the immune system of a person is functioning. CD4 cells (also known as CD4+ T cells) are white blood cells that help in fighting against antigens that cause infections. The more the CD4 cells a person have, the better the immune system. These are the cells that the HIV virus destroys. As HIV infection progresses, the number of these cells declines. When the CD4 count drops below 200 due to advanced HIV infection and other opportunistic infections, a person is diagnosed with AIDS. The normal range for CD4 cells is about 500-1,200. Usually, the CD4 cell count can increase when the HIV virus is controlled with effective HIV treatment.

STEPS INVOLVED IN THE LIFE CYCLE

Step 1: Binding

A virus consists of an outer envelope of protein, fat and sugar wrapped around a set of genes. In the case of HIV, genetic information is carried as RNA instead of DNA. It also consists of special enzymes.

HIV has proteins on its envelope that are strongly attracted to the CD4+ surface receptor on the outside of the T4-cell. When HIV binds to a CD4+ surface receptor, it activates other proteins on the cell's surface, allowing the HIV envelope to fuse to the outside of the cell.

Entry can be blocked by entry inhibitors. Entry inhibitors, also known as fusion inhibitors, are a class of antiretroviral drugs, used in combination therapy for the treatment of HIV infection. This class of drugs interferes with the binding, fusion and entry of an HIV virion to a human cell. By blocking this step in HIV's replication cycle, such agents slow the progression from HIV infection to AIDS.

Step 2: Reverse Transcription

HIV's genes are carried in two strands of RNA, while the genetic material of human cells is found in DNA. In order for the virus to infect the cell, a process called "reverse transcription" makes a DNA copy of the virus's RNA.

After the binding process, the viral capsid (the inside of the virus that contains the RNA and important enzymes) is released into the host cell. A viral enzyme called reverse transcriptase makes a DNA copy of the RNA. This new DNA is called proviral DNA.

Reverse transcription can be blocked by nucleoside reverse transcriptase inhibitors (NRTIs) and non-nucleoside reverse transcriptase inhibitors (NNRTIs). Reverse transcriptase inhibitors (RTIs) are a class of antiretroviral drugs used to treat HIV infection

or AIDS, and in some cases hepatitis B. RTIs inhibit activity of reverse transcriptase, a viral DNA polymerase that is required for replication of HIV and other retroviruses. Non-nucleoside reverse transcriptase inhibitors are antiretroviral drugs used in the treatment of human immunodeficiency virus. Non-nucleoside reverse transcriptase inhibitors inhibit reverse transcriptase, an enzyme that controls the replication of the genetic material of HIV.

Step 3: Integration

The HIV DNA is then carried to the cell's nucleus (center), where the cell's DNA is kept. Then, another viral enzyme called integrase hides the proviral DNA into the cell's DNA. Then, when the cell tries to make new proteins, it can accidentally make new HIV.

Integration can be blocked by integrase inhibitors. Integrase inhibitors, also known as integrase strand transfer inhibitors (INSTIs), are a class of antiretroviral drug designed to block the action of integrase, a viral enzyme that inserts the viral genome into the DNA of the host cell.

Step 4: Transcription

Once HIV's genetic material is inside the cell's nucleus, it directs the cell to produce new HIV. The strands of viral DNA in the nucleus separate and special enzymes create a complementary strand of genetic material called messenger RNA or mRNA (instructions for making new HIV).

Transcription can be blocked by antisense antivirals or transcription inhibitors (TIs), new classes of drugs that are in the earliest stage of research. α -Amanitin and actinomycin D are commonly used inhibitors of transcription. α -Amanitin binds to the largest subunits of RNA polymerase II (RNAP II)¹ (1,2) and RNAP III (3), with RNAP II being the most sensitive. As a consequence, the incorporation of new ribonucleotides into the nascent RNA chains is blocked.

Step 5: Translation

The mRNA carries instructions for making new viral proteins from the nucleus to a kind of workshop in the cell. Each section of the mRNA corresponds to a protein building block for making a part of HIV.

As each mRNA strand is processed, a corresponding string of proteins is made. This process continues until the mRNA strand has been transformed or "translated" into new viral proteins needed to make a new virus.

Step 6: Viral Assembly and Maturation

The final step begins with the assembly of new virus. Long strings of proteins are cut up by a viral enzyme called protease into smaller proteins. These proteins serve a variety of functions; some become structural elements of new HIV, while others become enzymes, such as reverse transcriptase.

Once the new viral particles are assembled, they bud off the host cell and create a new virus. The virus then enters the maturation stage, which involves the processing of viral proteins. Maturation is the final step in the process, and is required for the virus to become infectious.

With viral assembly and maturation completed, the virus is able to infect new cells. Each infected cell can produce a lot of new viruses.

Viral assembly can be blocked by protease inhibitors (PIs). Maturation, a new target of companies developing anti-HIV drugs, may be blocked using maturation inhibitors. Protease inhibitors are a class of antiviral drugs that are widely used to treat HIV/AIDS and hepatitis C. Protease inhibitors prevent viral replication by selectively binding to viral proteases (e.g. HIV-1 protease) and blocking proteolytic cleavage of protein precursors that are necessary for the production of infectious viral particles.

LATENT HIV

In some cases, HIV does not start replicating immediately upon entering a new host cell. Once the DNA enters the host cell's genome, HIV can persist for years inside the body without causing the symptoms that define AIDS. But even at this stage (called latency), the virus can still be transmitted to others. Latency is one of the greatest challenges to finding a cure or vaccine for AIDS and is why people with AIDS must take antiretroviral drugs for life. Currently, there is no way to get rid of HIV once it has entered the body.

GLOBAL HIV & AIDS STATISTICS 2016 - 2018

- 36.9 million [31.1 million to 43.9 million] people globally were living with HIV in 2017. This are the known cases adding unknown cases may get to 50 million.
- Only 21.7 million [19.1 million to 22.6 million] million people are accessing antiretroviral therapy.
- 50 million [39.9 million to 100 million] people have become infected with HIV since the start of the epidemic.

- 35.4 million [25.0 million to 49.9 million] people have died from AIDS-related illnesses since the start of the epidemic.

People living with HIV

- In 2017, there were 36.9 million [31.1 million to 43.9 million] people living with HIV.
 - 35.1 million [29.6 million to 41.7 million] adults.
 - 1.8 million [1.3 million to 2.4 million] children (<15 years).
- 75% [55–92%] of all people living with HIV knew their HIV status in 2017.
- About 9.4 million people did not know that they were living with HIV.

Number of people who know their status

- In 2017, three out of four people living with HIV (75%) knew their status.
- Among people who knew their status, four out of five (79%) were accessing treatment.
- And among people accessing treatment, four out of five (81%) were virally suppressed.
- 47% of all people living with HIV are virally suppressed.

Women and HIV AIDS infections

- Every week, around 7000 young women aged 15–24 years become infected with HIV.
- In sub-Saharan Africa, three in four new infections among adolescents aged 15–19 years are in girls. Young women aged 15–24 years are twice as likely to be living with HIV as men.
- More than one third (35%) of women around the world have experienced physical and/or sexual violence at some time in their lives.
- In some regions, women who experience violence are one and a half times more likely to become infected with HIV.

HIV IS TRANSMISSION IN THE SUB-SAHARAN AFRICA REGION

1. Sexual Transmission (85%)

- unprotected heterosexual intercourse
- homosexual intercourse between men
- there are no documented cases of sexual transmission between women

2. Blood and blood products (5%)

- transfusion, clinical use of blood products, transplant
- unsterile surgical and injection equipment
- sharing syringes among drug users

3. Mother to child (10%)

- during pregnancy

- at delivery
- through breast feeding

HIV PREVALENCE IN VARIOUS REGIONS

World region	Persons livingwith HIV
Worldwide	50,000,000
Sub-Saharan Africa	23,500,000
South and Southeast Asia	4,000,000
Eastern Europe and Central Asia	1,400,000
East Asia	830,000
Latin America	1,400,000
Middle East and North Africa	300,000
North America	1,400,000
Caribbean	230,000
Western and Central Europe	900,000
Oceania	53,000

HIV/AIDS IN SUB-SAHARAN AFRICA

- **Sub-Saharan Africa** has only 10% of the world's population

(The UN Development Program lists 46 African countries as “sub-Saharan,” excluding Algeria, Djibouti, Egypt, Libya, Morocco, Somalia, Sudan and Tunisia.)

- **Sub-Saharan Africa** is a home of nearly 68% of people living with HIV worldwide with Women comprising 59%. 70% of adults and 80% of children living with HIV/AIDS in the world
- Half of these people live in Eastern Africa
- In W. Africa Nigeria has the largest number at 2.3m
- South Africa has the highest number at 3m

The high prevalence is In Sub-Saharan Africa countries is due to;

- a) Deteriorating public services
- b) Poor employment opportunities
- c) Endemic poverty
- d) Culture and traditions e.g
 - FGM
 - Polygamy
 - body piercing
 - wife inheritance
 - wife's for hire
 - early marriage etc
 - wife swapping

POTENTIAL THREATS OF HIV/AIDS IN KENYA

- Commercial sex workers with poor safe sex awareness mainly in the three major cities eg. Nairobi, Mombasa and Kisumu
- Drug users (1 in 5 infected with HIV)
- Homosexuals reported in major cities
- Annual blood donors not screened for HIV
- 20% of blood transfusions come from professional donors with high prevalence of infectious diseases
- Significantly large number of migrants and refugees.
- Political unrest
- Rape cases are on the increase

IMPACT OF HIV /AIDS

DEMOGRAPHIC IMPACT

- AIDS will continue to affect population growth and other demographic variables. This is because population growth results from two main processes - births and deaths.
- It has contributed to reduction of the average life expectancy

IMPACT ON HOUSEHOLDS

- The available evidence shows that AIDS epidemic is having an enormous effect on households, which include increased medical and health expenditures, funeral expenses, and decreased income.
- The result is a loss of savings, assets and property in the affected households.
- This problem is magnified when the infected person is the breadwinner.
- Absenteeism from work due to poor health as the disease progresses affects household income.
- Affected households are poorer than they would be without HIV/AIDS.
- The vicious cycle of HIV/AIDS and poverty reduces resources to invest in health and education of children, depleting the country of human capital in both the present and the next generation.

IMPACT ON FAMILY

- HIV/AIDS has increased the number of orphans in Kenya
- These orphans in some cases are taken care of by the older generation, whose level of income is low, and in other cases are in child-headed households, which may not be able to provide essential requirements, including education and health services.
- They do not have the basic material needs that their family would supply i.e food security, shelter, clothing, schooling, access to health and medical services (including psychological support services), and parental love and the feeling of belonging.

IMPACT ON INDUSTRY AND THE BUSINESS SECTOR

- They form the basis for production and supply of goods and services in an economy.
- The effect of HIV/AIDS on businesses is transmitted through its effect on labour.
- The consequences of HIV/AIDS include increased absenteeism, decreased productivity, and reduced number of employees through death, loss of accumulated skills and declining morale.
- Businesses with health schemes incur increased medical costs.
- The declining productivity and increasing medical costs result in declining profits.

IMPACT ON AGRICULTURE

- o Agriculture remains the mainstay of Kenya's economy next to tourism.
- o The impact is evident through lower productivity in farming areas due to illness, absenteeism, death and subsequent loss of farming skills.
- o Less land under cultivation, less labour - intensive crop production
- o These translate into, less crop variety and less livestock production.
- Family members' time is also diverted to care for the sick and attend funerals, which also contributes to loss of household income and farm assets.
- o The end results are declines in agricultural income and food production and increased food insecurity.

IMPACT ON EDUCATION

- HIV/AIDS impact negatively on the education system.
- The effect of increased morbidity, absenteeism and attrition of teachers, the reduced number of school-aged children attending school, and poor performance in the classroom are a combination of factors wreaking havoc in the education sector and resulting in a decline in the quality of education.
- Higher costs on the education system

IMPACT ON THE HEALTH SECTOR

- HIV/AIDS has increased demand for health services due to the number of infected persons.
- More health resources and workforce are diverted to HIV/AIDS treatment, creating shortages for other health care needs.
- Half or more beds in public hospitals are occupied by HIV-infected patients, creating a big burden on the health sector.
- HIV/AIDS reduces the morale of health workers as patients with AIDS respond poorly to treatment or die.
- HIV - infected health workers also may have low productivity and morale.
- HIV/AIDS takes about 15% of the resource requirements for the entire health sector.
- Taking into account resources required for diagnosis and treatment of STIs and TB, HIV/AIDS consumes about 20% of all health sector resources.

IMPACT ON ECONOMIC GROWTH

- Economic growth is dependent on a sustained increase in productive

capacity and real output resulting in a growing national income.

- The most critical factors that determine economic growth are labour, capital and technical progress.
- HIV and AIDS slow economic growth by their effect on labour and capital investment.
- It slows or reverses growth in labour supply as it affects mainly the most productive members of the population.
- It also reduces the productivity of infected workers.
- Increased medical costs associated with HIV/AIDS reduce the level of domestic savings and investment that are crucial for capital formation.
- Furthermore, reduced income and increased poverty in the household imply decreased purchasing power of the household, which translates to deficient demand for goods and services, hence undermining economic growth

SIGNS AND SYMPTOMS OF HIV AIDS INFECTION

Symptoms of AIDS are caused by the deterioration of the immune system and the decline of CD4+ T cells, which are the immune system's key infection fighters. Some common symptoms include:

- Diarrhea that lasts for more than a week
- Dry cough
- Memory loss, depression and neurological disorders
- Pneumonia
- Unexplained fatigue
- Rapid weight loss
- Recurring fever or a lot of sweating at night
- Red, brown, pink or purplish marks/spots on the skin or inside the mouth, nose or eyelids
- Swollen lymph glands in the armpits, groin or neck
- White spots or unusual marks on the tongue, mouth, or throat

Opportunistic infections Associated with AIDS

Because people with AIDS have weakened immune systems, they're more prone to infections, called opportunistic infections. Opportunistic infections are caused by organisms that typically don't cause disease in healthy people but affect people with damaged immune systems. These organisms attack when there's an opportunity to infect.

Deterioration of the immune system is caused by the decline in CD4+ T cells, which are key infection fighters. As soon as HIV enters the body, it begins to destroy these cells. Common Symptoms of opportunistic infections include:

- Coma
- Coughing and shortness of breath
- Difficult or painful swallowing
- Extreme fatigue

- Fever
- Mental symptoms such as confusion and forgetfulness
- Nausea, abdominal cramps and vomiting
- Seizures and lack of coordination
- Severe, persistent diarrhea
- Severe headaches
- Vision loss
- Weight loss

Many opportunistic infections associated with AIDS cause serious illness however some may be prevented. Some few examples of opportunistic infections associated with AIDS and how they affect the body include

Opportunistic Infections of the Brain

- **Cryptococcal Meningitis:** This is a yeast-like fungus infection that usually involves the brain and lungs, although it can affect almost any organ. The fungus that causes this condition is found in soil throughout the world. It is most common in soil contaminated by bird droppings. This disease most often occurs when a person's CD4+ T cell count falls below 100 cells per cubic millimeter of blood.
- **HIV-related Encephalopathy:** Encephalopathy is a term for diseases that alter brain function or structure, leading to problems with cognitive function, or mental processes, and memory. In people with HIV and AIDS, encephalopathy is usually caused by an infectious agent, such as a bacteria, virus or prion. Encephalopathy most often occurs when a person's CD4+T cell count falls below 50 cells per cubic millimeter of blood. Toxoplasma-seropositive patients who have a CD4+T cell count of less than 100 cells per cubic millimeter of blood should be treated with prophylaxis to prevent developing encephalopathy.
- **Progressive Multifocal Leukoencephalopathy (PML):** Progressive multifocal leukoencephalopathy is a rare disorder of the nervous system caused by a common human polyomavirus, JC virus. It leads to the destruction of the myelin sheath that covers nerve cells. The myelin sheath is the fatty covering that acts as an insulator on nerve fibers in the brain. Symptoms include mental deterioration, vision loss, speech disturbances, inability to coordinate movements, paralysis and ultimately coma. In rare cases, seizures may occur. This disease can occur when the CD4+T cell count falls below 200 cells per cubic millimeter of blood.
- **Toxoplasmosis:** This condition occurs when a parasite infects the brain. Symptoms include confusion or delusional behavior, severe headaches, fever, seizures and coma. It can affect the eye, causing eye pain and reduced vision. Toxoplasmosis most likely occurs when the CD4+ T cell count falls below 100 cells per cubic millimeter of blood. Preventative treatment usually with trimethoprim-sulfamethoxazole, also called Septra and Bactrim may be administered when the CD4+ T cell count falls below 100 cells per cubic millimeter of blood.

Opportunistic Infections of the Eyes

- **Cytomegalovirus (CMV):** Although this virus can affect the entire body, it commonly affects the eye's retina, causing blurry vision and in severe cases, blindness. Other common symptoms include chronic diarrhea and nerve problems. It is most likely to occur when a person's CD4+ T cell count falls below 100 cells per cubic millimeter of blood.

Opportunistic Infections of the Gastrointestinal Tract

- **Cryptosporidiosis:** This is a parasite that can cause chronic diarrhea. Other symptoms include stomach cramps, nausea, fatigue, weight loss, appetite loss, vomiting and dehydration. This infection is difficult to treat and there is no definitive effective treatment. Symptom control and treatment of HIV are necessary.
- **Cytomegalovirus:** Although this virus can affect the entire body, it commonly occurs in the stomach, causing fever, diarrhea and stomach pain. It most likely occurs when the CD4+ T cell count falls below 50 cells per cubic millimeter of blood.
- **Mycobacterium Avium Complex:** This is a bacterial infection that can cause persistent fever, night sweats, fatigue, weight loss, anemia, abdominal pain, dizziness, diarrhea and weakness. The bacteria that cause this infection is found in water, dust, soil and bird droppings. This disease most likely occurs when the CD4+T cell count falls below 50 cells per cubic millimeter of blood. Preventive treatment, usually with azithromycin, is administered when CD4+ T cells are less than 50 cells per cubic millimeter of blood.

Opportunistic Infections of the Genitals

- **Candidiasis:** Candidiasis is an infection caused by the candida fungi. Also known as a yeast infection, it's the most common HIV-related fungus infection. It can affect the entire body, but most commonly occurs in the mouth, called thrush, or vagina. An overgrowth of yeast in the vagina can cause irritation, itching, burning and thick white discharge.
- **Herpes Simplex:** This virus causes genital herpes, which are painful blisters in the genital area, or cold sores. Severe conditions are more common in the advanced stage of AIDS.
- **Human Papilloma Virus (HPV):** This condition is considered the most common sexually transmitted disease (STD) in the United States. It can cause warts on the anus, cervix, esophagus, penis, urethra, vagina and vulva. Studies have shown that certain types of HPV can contribute to the development of cervical and anal cancer. Individuals with HIV and AIDS are at increased risk for developing precancerous and cancerous lesions.

Opportunistic Infections of the Liver

- **Liver Disease:** Liver disease is one of the leading causes of death among AIDS patients, especially liver disease caused by the hepatitis B and hepatitis C virus. Many drugs used in the treatment of HIV and AIDS can cause liver disease or hepatitis. It is important that patients infected with hepatitis receive treatment and follow-up care.

Opportunistic Infections of the Lungs

- **Coccidiomycosis:** This infection is caused by inhaling an infective fungus called *Coccidioides immitis*, found mainly in contaminated soil in the southwestern United States, Mexico, Central America and parts of South America. The lungs are most commonly affected by this infection. In severe cases, it can involve the kidneys, lymph system, brain and spleen. Symptoms include cough, weight loss and fatigue. Meningitis is a common complication when left untreated.
- **Histoplasmosis:** This infection almost always involves the lungs, although other organs may be affected. The fungus that causes this condition is found in southern parts of the United States and South America. It is usually found in soil contaminated with bird droppings and must be inhaled to cause infection. Signs and symptoms include high fever; weight loss; respiratory complaints; an enlarged liver, spleen, or lymph nodes; depressed production of white cells, red blood cells and platelets from the bone marrow; and life-threatening, unstable, low blood pressure.
- **Pneumocystis Carinii:** This condition occurs when a fungus infects the lungs. Symptoms may include fever, cough, difficulty breathing, weight loss, night sweats and fatigue. It is most likely to occur when the CD4+ T cell count falls below 200 cells per cubic millimeter of blood. Preventative treatment may be administered when the CD4+ T cell count falls below 200 cells per cubic millimeter of blood. Treatment is usually trimethoprim-sulfamethoxazole, also called Septra or Bactrim, dapsone or atovaquone.
- **Recurrent Pneumonia:** People with AIDS are at risk for recurrent bacterial pneumonia. Bacteria can infect the lungs, which may lead to problems ranging from a mild cough to severe pneumonia. Recurrent pneumonia is most likely to occur when the CD4+ T cell count falls below 200 cells per cubic millimeter of blood.
- **Tuberculosis (TB):** This is a serious, and often deadly, bacterial infection that primarily infects the lungs. TB is transmitted when a person with active TB coughs or sneezes, releasing microscopic particles into the air. If inhaled, these particles may transmit the condition. Once infected by TB, most people remain healthy and develop only latent infection. People with latent infection are neither sick nor infectious. However, they do have the potential to become sick and infectious with active TB. It can occur at any CD4+ T cell level but especially when the CD4+ T cell count falls below 350 cells per cubic millimeter of blood.

Opportunistic Infections of the Lymphatic System

- **Non-Hodgkin's Lymphoma:** Non-Hodgkin's lymphoma is a disease in which tumors develop from white blood cells in the lymphatic system. It is another common disease associated with AIDS. See AIDS-related lymphoma.

Opportunistic Infections of the Mouth and Throat

- **Candidiasis:** This is the most common HIV-related fungus infection. It can affect the entire body, but most commonly occurs in the mouth (thrush) or vagina. An overgrowth of yeast causes white patches on gums, tongue or lining of the mouth,

pain, difficulty in swallowing and loss of appetite. Candida in the esophagus, trachea, bronchi or lungs is AIDS defining.

Opportunistic Infections of the Skin

- **Herpes Simplex:** This virus causes cold sores or genital herpes, which are painful blisters in the genital area. Chronic herpes simplex virus (HSV) lesions and severe mucocutaneous HSV disease are common in the advanced stages of AIDS.
- **Kaposi's Sarcoma:** This is the most common AIDS-related cancer. It causes reddish-purple lesions that usually appear on the skin. They also can appear on the lymph nodes, mouth, gastrointestinal tract and lungs.
- **Shingles:** Shingles are caused by a reactivation of the chicken pox virus. It may cause a painful rash or blisters that follow the path of nerves.

TRANSMISSION OF HIV

HIV is transmitted by:

- Direct contact with infected blood
- Sexual contact and sexual activities:
 - a) Oral sex
 - b) Anal sex
 - c) Vaginal sex or
 - d) Digital sex
- Direct contact with semen or vaginal and cervical secretions
- HIV-infected mothers to infants
 - a) During pregnancy,
 - b) During delivery, or
 - c) During breastfeeding
- Direct contact with semen or vaginal and cervical secretions
- Deep kissing
- Sharing of personal effects eg toothbrush
- Pre-chewing food from an infected person
- Body piercing/ear piercing
- Tattoos same machine used with an infected person without sterilization
- Biting an infected person for self-defense and vice versa
- Sharing a tooth pick with an infected person
- FGM
- Sharing of earrings with an infected person

HIV is not transmitted by

- Coughing, sneezing
- Insect bites
- Touching,

- Hugging
- Water, food
- Kissing
- Public baths
- Handshakes
- Work or school contact
- Using telephones
- Sharing cups, glasses, plates, or other utensils

DIAGNOSIS OF HIV/AIDS

Antibodies

- They are also known as immunoglobulins (Ig)
- These are proteins that are found in the blood and are used by the immune system to identify and neutralize foreign objects, such as bacteria and viruses.

Antigens

- These are substances that when introduced into the body they stimulate the production of antibodies (a foreign substance)

Analyte

- This is the sample being analyzed.

Immunoassay

- This is a laboratory technique that makes use of the binding between an antigen and an antibody in order to identify a specific antigen or antibody in a sample

Window Period

- This is a period of 4-6 weeks after HIV infection when antibodies to HIV are not detectable in the blood
- Each person who initially tests negative should be retested after 3 months to confirm the diagnosis

CD4 Cell Count

- CD4 (**cluster of differentiation 4**) are glycoproteins found on the surface of immune cells such as T helper cells, monocytes, macrophages, and dendritic cells.
- CD4 cells are white blood cells that play an important role in the immune system.
- They give an indication of the health or status of the immune system
- The body's natural defence system against pathogens, infections and illnesses. CD4 cells are sometimes also called T-cells, T-lymphocytes, or helper cells.
- Once a patient is diagnosed positive, the extent of damage to the immune system is determined by CD4 cell count.
- The number of CD4 cells present acts as a direct indicator of the immune system's ability to fight against opportunistic infections.
- The test to measure the CD4 cells requires a sample of blood to be taken.

- A measurement is made of the number of CD4 cells in a cubic milliliter of blood and will give an overall picture of the health of the immune system whether it is improving or declining.
- The CD4 count of a person who is not infected with HIV may lie anywhere between 500 and 1200 and in some cases even more.
- A drop in an HIV positive persons CD4 count usually occurs over a number of years.
- A CD4 count between 500 and 200 indicates that some damage to the immune system has occurred and that person should consider anti-HIV treatment.
- Since the CD4 cell count helps in knowing the strength of the immune system it is necessary to monitor it over time to identify its trends.

Measuring viral load

- Measuring viral load is essential to determine how active the viral replication is.
- It acts as a direct indicator of how successful anti-HIV medication are working on an individual if they are suppressing the viral replication.
- The viral load test requires a blood sample and estimates of the number of HIV particles in the sample are made by looking for the HIV genes.
- The level of viral load is a good indicator of whether to start an anti-HIV treatment.

SELECTION OF THE HIV TEST

Selection of an HIV Test to be used is sometimes site-specific based on:

- National policies
- Availability of supplies and laboratory support
- Availability of trained personnel
- Evaluation of specific tests in the country
- Costs

TYPES OF TESTING TECHNIQUES

1. Antibody test

- This test is designed to find antibodies that are created when the body is fighting HIV.
- Antibody tests are conducted either with a blood sample or a saliva sample taken from a mouth swab.
- Because this test is looking for antibodies to HIV that take some time for the body to develop, antibody tests may not detect an infection that has occurred very recently.

2. Antigen/antibody test

- This type of test looks for both antibodies and antigen which is part of the virus in the blood.
- This combination test can detect the disease much faster than testing for antibodies alone, allowing a diagnosis to be made as early as weeks after exposure.

3. Nucleic acid (RNA) test

- RNA tests can detect HIV directly within ten days of exposure.
- However, they are costly and are not generally used to initially screen for the virus.

4. OraQuick In-Home HIV Test

- It can be done at home.
- The OraQuick In-Home HIV Test provides results within 20 minutes of testing saliva obtained by swabbing inside of the mouth.
- However it is still important to get a test from a doctor in order to confirm the results.

5. Home Access HIV-1 Test System

- This test is a convenient way to test for the virus.
- Users can prick their finger and send a blood sample to a licensed lab. The individual then gets a call from the lab the next day and if the results are positive, they take a second test to confirm.

THE HIV TESTING TECHNIQUES

THE ELISA TEST

- ELISA (Enzyme-Linked Immuno-sorbent Assay) is a screening test that looks for
- HIV antibodies in a blood sample taken from a person exposed to HIV risk.
- Some of the blood sample is poured into an HIV antigen-coated vial and a binding enzyme added. Any antibodies present in the blood migrate to the lining surface of the vial.
- Excess antigen is flushed out by rinsing, and a chemical which can produce a color reaction is poured in.
- The color reaction only takes place if there are HIV antibodies present, in which case the individual is said to be HIV positive.
- Conversely, if the reaction is not present the person is regarded as being HIV negative.
- HIV antibodies do not reach detectable levels in the blood for one to three months.
- This period is known as sero-conversion during which antibody production to viral proteins take place.
- Window period is the time during which antibody detection using ELISA is negative.
- In some cases it may take even six months for the antibody levels to get high enough for detection.

Materials needed in ELISA Testing

1. Pipettes, washer system, ELISA plate reader: Readers, washers and pipette are available as manual or automated system. One of the main factors affecting equipment selection is the number and types of test samples being run.

- a) **ELISA Readers:** Readers need to have appropriate filter (650 nm and 450 nm).
 - b) **Pipette:** Are available as fixed as well as adjustable volume as well as single channel and multi-channel.
 - c) **Washing system:** It can be manual system that washes one row or column at a time or semi-automated systems that wash one strip or plate at a time or fully automated systems that can process multiple plates
2. **Reagents needed for the testing**– Concluded in the kit (coated plates, sample diluents, controls, wash concentrate, conjugate, substrate, stop solution)
- a) **Coated plates:** The **96-well plates** are made of polystyrene and are coated with either inactivated antigen or antibody. The function of the plate has to hold the immobilized either antigen or antibody. Antigen or antibody present in the sample will bind to the plate. This coating acts as the binding site for the antibodies or antigens in the sample.
 - b) **Controls:** Negative and positive controls are provided in each kit. The controls help to normalize or standardize each plate. Controls are also used to validate the assay and to calculate sample results. Controls might be pre-diluted and ready to use. (Please refer to kit for specific instructions).
 - c) **Conjugates:** ELISA conjugates are enzyme labeled antibodies that react specifically to plate bound sample analytes. Unbound conjugates are washed away after incubation and before the addition of substrate.
 - d) **Wash Concentrate:** It acts as a buffered solution containing detergent to wash unbound material from the plate. (Not all test kits have wash concentrate; in that case distilled water can be used for washing; please refer to kit insert for specific instructions)
 - e) **Stop solution:** It stops the enzyme substrate reaction and color development.

Principle of ELISA Test

- In ELISA, various antigen-antibody combinations are used, always including an enzyme-labeled antigen or antibody, and enzyme activity is measured calorimetrically.
- The enzyme activity is measured using a substrate that changes color when modified by the enzyme. Light absorption of the product formed after substrate addition is measured and converted to numeric values.
- Depending on the antigen-antibody combination, the assay is called **a direct ELISA, indirect ELISA, sandwich ELISA, competitive ELISA etc.**
- Most ELISA methods developed for the detection of antigen or antibody consist of use of corresponding antibody or antigen in question which is firmly fixed on solid phase, such as plastic surface of polyvinyl plate or polystyrene tube. Such systems are also called **Solid Phase Immunosorbent Assay (SPIA)**.

- Test sample is added in the microtitre plate, if there is presence of Ag or Ab in the test sample, there will be Ag-Ab reactions (with immobilized Ab or Ag). Later enzyme labelled antibody is added in the reaction mixture, which will combine with either test antigen or Fc portion of test antibody.

The enzyme system consists of;

1. **An enzyme:** horse radish peroxidase, alkaline phosphatase which is labelled or linked, to a specific antibody.
2. **A specific substrate:**
 - o-Phenylenediamine dihydrochloride for peroxidase
 - P Nitrophenyl Phosphate (PNPP)- for Alkaline Phosphatase

Substrate is added after the antigen-antibody reaction. The enzyme catalyses (usually hydrolyses) the substrate to give a color end point (yellow compound in case of alkaline phosphatase). The intensity of the color is proportional to the amount of antibody or antigen present in the test sample, which can be quantified using ELISA reader.

Western blot (WB) test

- Unlike the ELISA test which shows in a general way whether or not there are HIV antibodies present, the Western Blot test reacts to the presence of specific elements of the HIV antibodies, the proteins gp120, gp41 and p24.
- It does this by separating light and heavy chain proteins in an electric field into their constituent parts.
- These separated proteins are graded by size and placed on the surface of a specially prepared gel.
- The density of the separated proteins determine, to what level they sink into the gel layers, with the heaviest sinking lowest.
- Since the molecular weight of each protein is known, they can be identified. Once identified, the proteins are relocated to nitrocellulose sheets which are cut into strips to which blood from the ELISA- determined HI V-positive person is added.
- The strips are washed, and an anti-human antibody enzyme label introduced. A visible enzyme marker, following this procedure, indicates an HI V-positive result, thus confirming the ELISA test.
- This is a method that detects very low viral antigen levels such that one may test HIV negative by ELISA but test positive through Western blot (V/B).
- Babies born of HIV mothers have antibodies to HIV that were passed on during pregnancy through the placenta.
- However, these antibodies diminish with time such that by 15 months the child may test negative.
- Use of Western blot confirms presence of HIV antigen and this rules out whether babies are positive due to HIV itself or because of maternal antibodies.

Polymerase chain reaction (PCR) tests

- This method is used to detect the presence of the virus itself.
- It involves combining a DNA sample (taken from the suspected HIV infected person), some short strands of DNA (primers), four nucleotides (adenosine, cytosine, guanine and thymine), an enzyme, and a buffer solution.
- These items are heated to separate double-stranded DNA into single strands which when cooled adhere to the single strand primers.
- Reheating allows the enzyme to make new double-stranded DNA using the ingredients already present.
- The resultant DNA is stretched over repeated similar processing, amplifying the material over one million times.
- Sequencing of the DNA identifies any HIV isolate present in the strands.
- A drawback to the use of PCR is that samples may be easily contaminated.

PCR (polymerase chain reaction) is a method to analyze a short sequence of DNA (or RNA) even in samples containing only minute quantities of DNA or RNA. PCR is used to reproduce (amplify) selected sections of DNA or RNA. Previously, amplification of DNA involved cloning the segments of interest into vectors for expression in bacteria, and took weeks. But now, with PCR done in test tubes, it takes only a few hours. PCR is highly efficient in that untold numbers of copies can be made of the DNA. Moreover, PCR uses the same molecules that nature uses for copying DNA:

- Two "primers", short single-stranded DNA sequences that are synthesized to correspond to the beginning and ending of the DNA stretch to be copied;
- An enzyme called polymerase that moves along the segment of DNA, reading its code and assembling a copy; and
- A pile of DNA building blocks that the polymerase needs to make that copy.

PCR (polymerase chain reaction) process

Three major steps are involved in a PCR. These three steps are repeated for 30 or 40 cycles. The cycles are done on an automated cycler, a device which rapidly heats and cools the test tubes containing the reaction mixture. Each step denaturation (alteration of structure), annealing (joining), and extension takes place at a different temperature:

1. **Denaturation:** At 94 C (201.2 F), the double-stranded DNA melts and opens into two pieces of single-stranded DNA.
2. **Annealing:** At medium temperatures, around 54 C (129.2 F), the primers pair up (anneal) with the single-stranded "template" (The template is the sequence of DNA to be copied.) On the small length of double-stranded DNA (the joined primer and template), the polymerase attaches and starts copying the template.
3. **Extension:** At 72 C (161.6 F), the polymerase works best, and DNA building blocks complementary to the template are coupled to the primer, making a double stranded DNA molecule.

With one cycle, a single segment of double-stranded DNA template is amplified into two separate pieces of double-stranded DNA. These two pieces are then available for

amplification in the next cycle. As the cycles are repeated, more and more copies are generated and the number of copies of the template is increased exponentially.

RT PCR

RT-PCR (Reverse transcriptase-polymerase chain reaction) is a highly sensitive technique for the detection and quantitation of mRNA (messenger RNA). The technique consists of two parts:

- The synthesis of cDNA (complementary DNA) from RNA by reverse transcription (RT) and
- The amplification of a specific cDNA by the polymerase chain reaction (PCR).

RT-PCR has been used to measure viral load with HIV and may also be used with other RNA viruses such as measles and mumps.

P 24 ANTIGEN TESTS

Other Names for P 24 test

- HIV Antigen (p24) Blood Test
- p24 Core Protein Antigen Blood Test
- p24 Protein Blood Test

Background Information

- p24 is a protein component of human immunodeficiency virus (HIV). Specifically, it is present in the virus' outer shell, or capsid. p24 is used as a marker for HIV infection; the levels of p24 directly correlate with the levels of HIV
- HIV is spread through blood and sexual fluids. Upon entering the host, HIV rapidly proliferates, which causes a spike in p24 levels. Flu-like symptoms emerge as the immune system reacts to the foreign invader
- After some time, the immune system manages to contain the HIV virus. Thus, the levels fall; this is mirrored by falling levels of p24. However, the virus survives through what is known as the latent phase of infection
- The HIV hibernates inside a specific type of white blood cell called a helper T cell. After a period of time, HIV re-emerges. When this happens, the HIV bursts open the T cell, releasing more of the virus. In this way, levels of helper T cells decline dramatically
- The immune system begins producing antibodies against HIV soon after it encounters the virus. Antibodies are bodily defense proteins meant to clear such foreign invaders
- The recognition targets of antibodies are called antigens; p24 is one such target in the case of HIV. Antibodies to p24 can be isolated and their levels gauged. This is the principle of the p24 Antigen Test
- The p24 Antigen Blood Test is a test to assess the levels of p24 in blood. It indirectly measures the levels of the HIV virus, which is also called the viral load

Specimen Collection for p24 Antigen Blood Test

Following is the specimen collection process for p24 Antigen Blood Test:

Sample required: Blood

Process of obtaining blood sample in adults:

- A band is wrapped around the arm, 3-4 inches above the collection site (superficial vein that lies within the elbow pit)
- The site is cleaned with 70% alcohol in an outward spiral, away from the zone of needle insertion
- The needle cap is removed and is held in line with the vein, pulling the skin tight
- With a small and quick thrust, the vein is penetrated using the needle
- The required amount of blood sample is collected by pulling the plunger of the syringe out slowly
- The wrap band is removed, gauze is placed on the collection site, and the needle is removed
- The blood is immediately transferred into the blood container, which has the appropriate preservative/clot activator/anti-coagulant
- The syringe and the needle are disposed into the appropriate "sharp container" for safe and hygienic disposal

Preparation required: No special preparation is needed prior to the test.

Importance of the p24 Antigen Blood Test Result

- A positive test result may indicate infection with HIV
- The p24 Antigen Blood Test is rarely performed as a stand-alone test. Instead, it is used alongside the HIV antibody blood test

The laboratory test results are NOT to be interpreted as results of a "stand-alone" test. The test results have to be interpreted after correlating with suitable clinical findings and additional supplemental tests/information. Your healthcare providers will explain the meaning of your tests results based on the overall clinical scenario.

Other HIV tests

- There are three tests using the ELISA technique relying on a reaction to identify HTV antibodies. They are:
- **EIA (enzyme immunoassay):** Where the individual is said to be HIV-positive if the reagent changes color
- **IFA (immuno fluorescence assay):** Similar to the above but using a fluorescent medium
- **RIPA (radioimmunoprecipitation):** Rather like the EIA and IFA but using a radioactive medium
- **Orasure:** Analyses a sample of saliva. While antibodies are only found in small amounts in the saliva of infected people, an American Association report says that the test is 99.9% accurate.

CD4+ Cell Count

- Once a patient is diagnosed positive, the extent of damage to the immune system is determined by CD4 cell count (T-helper cell count).

- The number of CD4 cells present is direct indicator of the immune system's ability to fight off opportunistic infections.
- The test to measure your CD4 count requires a sample of blood to be taken.
- A measurement is made of the number of CD4 cells in a cubic milliliter of blood and will give an overall picture of the health of the immune system- whether it is improving or declining.
- The CD4 count of a person who is not infected with HIV may lie anywhere between 500 and 1200.
- A drop in an HIV positive persons CD4 count usually occurs over a number of years.

A CD4 count between 500 and 200 indicates that some damage to the immune system has occurred and a count below 350 or rapid decline is an indication that one should consider anti-HIV treatment.

- Since your CD4 count will fluctuate in response to infection, stress, smoking, exercise, the menstrual cycle, the contraceptive pill, the time of day and even seasons of the year. it is necessary to monitor it over time to identify trends,

Measuring viral load

- Measuring viral load is essential to determine how active the viral replication is.
- If one is taking anti-HIV medication, then it is also a direct indicator of how successful it is in suppressing viral replication.
- The viral load test requires the collection of a blood sample 'and estimates the number of HIV particles in the sample by looking for HIV genes.
- The level of viral load is generally seen as a good indicator of whether to start anti-HIV treatment.
- Effective anti-HIV treatment will result in a reduction in viral load and one may even attain an undetectable viral load. This does not mean that the virus is no longer present, but merely that the sensitivity of the test performed can no longer detect the virus.
- An undetectable viral load is an indication that both the risk of developing AIDS and the risk of developing drug resistance has been reduced.

TREATMENT

INTRODUCTION

- Human Immunodeficiency Virus (HIV) research has made remarkable progress since the virus was discovered in the early 1980s (Embretson *et al.* 1993; Laurence, 1995, Pantaleo and Fauci, 1995., Safrit and Koup, 1995).
- Preventive efforts have reduced the number of new cases of the disease, and for people already living with HIV/AIDS; the survival rate is increasing because of advances in drug therapy.
- However, the majority of those affected by the disease are unable to afford the

- latest drug therapies and their lives are still seriously threatened by the disease.
- While no medical treatment cures AIDS, in the relatively short time since the disease was first recognized, new methods of treating the disease have developed rapidly.
 - Health-care professionals focus on three areas of therapy for people living with HIV infection or AIDS:
 - a) Antiretroviral therapies that use drugs, nutrition and counselling to suppress HIV replication
 - b) Medications and other treatments that fight the opportunistic infections and cancers that commonly accompany HIV infection,
 - c) Support mechanisms that help people deal with the emotional repercussions as well as the practical considerations of living with a disabling, potentially fatal disease.

Antiretroviral Drugs (ARVs)

- The primary goal of anti-retroviral therapy is to slow down disease progression, thereby preventing opportunistic infections and an AIDS diagnosis.
- It is through controlling the HIV replication process and subsequent damage to the immune system that this is achieved (Panteleo and Fauci, 1995).
- The three main classes of drugs developed so far and are used against HIV are:-
 - Nucleoside analogues
 - Non-nucleoside reverse transcriptase inhibitors
 - Protease inhibitors
 - Entry inhibitors

Nucleoside analogues

- These impede the action of reverse transcriptase, the HIV enzyme that converts the virus's genetic material into DNA.
- During this conversion process, these drugs incorporate themselves into the structure of the viral DNA, rendering the DNA useless and preventing it from instructing the infected cell to make additional HIV.
- The nucleoside analogue known as azidothymidine (AZT), which became available in 1987, was the first drug approved by the United States Food and Drug Administration (FDA) to treat AIDS.
- AZT slows HIV replication in the body, permitting an increase in the number of CD4+ cells, which boosts the immune system.
- AZT also prevents transmission of HIV from an infected mother to her newborn. Since the introduction of AZT, additional nucleoside analogues have been developed, including didanosine (sold under the trade name Videx), zalcitabine (HIVID), stavudine (Zerit), lamivudine (Epivir), and

abacavir (Ziagen). These drugs are not particularly powerful when used alone, and often their benefits last for only 6 to 12 months.

- But when nucleoside analogues are used in combination with each other, they provide longer-lasting and more effective results.

Non-nucleoside reverse transcriptase inhibitors (NNRTIs)

- They use a different mechanism to block reverse transcriptase. These drugs bind directly to reverse transcriptase, preventing the enzyme from converting RNA to DNA. Three NNRTIs are available: nevirapine (Viramune), delavirdine (Rescriptor), and efavirenz (Sustiva). NNRTIs work best when used in combination with nucleoside analogues

Protease inhibitors

- Target protease, the enzyme vital in the formation of new HIV.
- These drugs block protease, hence defective HIV forms are unable to infect new cells.
- Protease inhibitors are more powerful than nucleosides and NNRTIs, producing dramatic decrease in HIV levels in the blood.
- Drugs are taken orally and act against HIV directly.
- As the chemicals produced by the new DNA attempts to make copies of HIV, the protease inhibitors act against them and prevent them from working correctly.
- New particles of HIV produced in the presence of protease inhibitors are immature and non-infectious.
- Reduced viral load, in turn, enables CD4+ cell levels to rise.
- The first protease inhibitor, saquinavir (Invirase), was approved in 1995.
- Since then other protease inhibitors have been approved, including ritonavir (Norvir), indinavir (Crixivan), nelfinavir (Viracept), and amprenavir (Agenerase). (MOH, 2001)

Entry / Fusion inhibitors

- Latest class of antiretroviral drugs developed.
- They target the first stage of the entry stage of the HIV replication cycle
- This drug is specifically designed to fit between the HIV particle and the point of the CD4+ cell to which it needs to bind to gain entry and therefore preventing the HIV from entering the CD4+ cell.
- Best known drug in this class is T-20, which is given as an injection into a muscular part of the body.

The Limitations of antiretroviral drugs

ARVs have a number of limitations which include i.

Drug resistance.

Benefits are short-lived when a single drug is used alone. This short-term effectiveness results when HIV mutates, or changes its genetic structure,

becoming resistant to the drug. The genetic material in HIV provides instructions for the manufacture of critical enzymes needed to replicate the virus. Scientists have designed current antiretroviral drugs to impede the activity of these enzymes. The structure of the virus's enzymes changes if the virus mutates and the drugs no longer work against the enzymes, making the drugs ineffective against viral infection and resistance sets in. Since gene mutation occurs during the course of viral replication, the best way to prevent mutation is to halt replication. Studies have shown that the most effective treatment to halt HIV replication employs a combination of three drugs taken together for instance, a combination of two nucleoside analogues with a protease inhibitor. This regimen, called triple therapy (also known as Highly Active Antiretroviral Therapy- (HAART)), maximizes drug potency while reducing the chance for drug resistance.

ii. **Side effects.**

Common side effects include nausea, diarrhoea, headache, fatigue, loss of appetite, skin rushes, pancreatitis, fever, abdominal pain, kidney stones, anemia, and tingling or numbness in the hands and feet, and Diabetes mellitus, deposition of fat in the abdomen or back etc

iii. **High cost of treatment.**

The greatest drawback to triple therapy is its high cost, which is well **beyond** the means of people with low incomes or those with limited healthcare facilities. As a result, the most effective therapies currently available remain beyond the reach of the majority of HIV-infected people worldwide.

iv. **Stigma.**

v. **Non-adherence to recommended dose and treatment schedule.**

Treatment of opportunistic infections

- It very necessary to prevent infections before they begin to avoid burdening a patient's already weakened immune system.
- An HIV-infected person must avoid as much as possible exposure to infectious agents that produce opportunistic infections common in people with a weakened immune system.
- Doctors try to Doctors usually prescribe more than one drug to forestall infections.
- For example, for those who have a history of pneumocystic pneumonia and a CD4 cell count of less than 200 cells per microliter, doctors may prescribe the antibiotics, sulfamethoxazole and trimethoprim to prevent further bouts of pneumonia.

Support mechanisms

- There are many challenges faced by people living with HIV and AIDS, including choosing the best course of treatment, paying for health care, and providing for the needs of children in the family while ill.

- Other include emotional stress, social stigma, loneliness, anxiety, fear, anger, and other emotions often require as much attention as the medical illnesses common to HIV infection.
- Counseling centers and churches should provide individual or group counseling to help people with HIV infection or AIDS share their feelings, problems, and coping mechanisms with others.

Alternative Therapies for HIV/AIDS

Many people use alternative therapies to improve their health in addition to the medical care given by health professionals. These therapies are usually called alternative because they don't fit into the Western ways of looking at medicine and health care in general. Some alternative therapies are used alongside the standard medical care that is usually given to patients. Even healthy people use these kinds of therapies to make their immune system stronger and feel better in general. People with diseases or illnesses, such as HIV use these therapies to help them deal with the symptoms of the AIDS disease or the side effects from the medications that they use. Some examples of common alternative therapies include:

1. Nutritional therapy
2. Herbal therapy
3. Vitamin c therapy for HIV patients
4. Physical (body) therapies, such as yoga, massage, and acupuncture
5. Relaxation techniques, such as meditation and visualization
6. Homeopathy therapy

NUTRITIONAL THERAPY

Nutritional needs of people living with HI V/AIDS

- Nutrition implies the process of absorbing nutrients from food and processing them in the body in order to keep healthy or to grow.
- Adequate food security in the household is requisite for optimum nutrition, health and survival.
- However, HIV/AIDS reduces the household's ability to produce and buy food by taking away the adult labour that would otherwise be engaged in agricultural production or in earning an income.
- At the same time, HIV/AIDS increases health expenditure.
- The capacity of an affected household to obtain an adequate amount and variety of food, and to adopt appropriate health and nutritional responses to HIV/AIDS, especially for the already vulnerable ones, is grossly reduced.
- On the other hand both HIV/AIDS and malnutrition compromise the immune system, resulting in increased susceptibility to severe illnesses, which reduce the quality of life and shorten life expectancy.
- Malnutrition due to HIV/AIDS is linked to inadequate food intake, poor uptake of food into the body, and poor use and storage of nutrients.

- Each of these factors must be considered in providing the most appropriate nutritional care for the HIV-positive person.
- Studies show that nutrition interventions can positively affect nutrition status, the immune system and even personal esteem, by maintaining body weight, improving effectiveness of medication and prolonging life.
- Supplementing micronutrients has been shown to increase life expectancy of subjects with fewer than 200 CD4 cells per milliliter.
- A number of micronutrient supplements including vitamin A, zinc and iron have been found to boost the immune system in a person with HIV infection. Multivitamins can reduce the risk of death and improve immune function.
- Good nutrition can therefore play an important role in the comprehensive management of HIV/AIDS, as it improves the immune system, boosts energy, and helps recovery from opportunistic infections

Reduced food intake

Reduced food intake in persons with HIV may be due to painful sores in the mouth and throat, loss of appetite, or fatigue. The main causes of loss of appetite are infections and depression. Other causes include side effects of medication such as nausea and vomiting, and inadequate access to and availability of appealing foods.

Poor nutrient absorption

Poor absorption of nutrients results when HIV damages the small intestine and alters the healthy bacteria of the digestive system, causing malabsorption of fats and carbohydrates and frequent episodes of diarrhea. Intestinal infections also cause diarrhoea, with loss and waste of nutrients.

Increased metabolism

Infections, including HIV itself, lead to increased requirements for energy and protein, inefficient use of nutrients, and loss of nutrients. Energy requirements are likely to increase by 10% to maintain body weight and physical activity in adults and growth in symptomatic children.

Nutritional requirement for people living with HI V/AIDS

HIV/AIDS patient require the following nutrients in a well-balanced diet:

- **Vitamins:** A good multivitamin should be considered
- **Proteins:** Sources of protein are red meat, fish, poultry, eggs, nuts, beans, peas and other pulses.
- **Carbohydrates:** are required for energy and for the purpose of PLWAs, they may be categorized into insoluble and soluble dietary fibres.
- **Fats:** Fats are high in calories (energy). They are needed for many membranes in the body. Fish, beef, and vegetables all supply fats.
- **Vitamins and minerals:** Vitamins and minerals are also needed by the immune system. While our foods contain vitamins and minerals, it is important to recognize that available data indicate food alone does not supply enough in the

presence of HIV, and that supplementation is very important.

- **Water** is also very important.

Advantages of good nutrition to for people living with HI V/AIDS

Good nutrition entails eating a well-balanced diet that contains all the nutrients the body needs for growth and proper functioning

Balanced nutrition helps the body to:

- Increase resistance to infection and disease and improve the energy supply
- Boost the immune system and therefore reduce the frequency of episode of morbidity.
- Lessen severity of infection, improve the response to treatment for opportunistic infections such as TB, and speed the rate of recovery.
- Replace lost micronutrient and provide the body with all essential nutrient required for good health.
- Preserve muscle mass, slow or stop the loss of lean tissue, prevent weight loss, and improve body strength and energy.
- Delay the rate of progression of HIV to AIDS and the further advance of AIDS itself.
- Keep PLWAs alive and able to lead an active life; this in turn reduces their dependence, thus allowing them to take care of themselves and to delay early orphan hood of their children.

Basic Nutritional principles advocated for all HIV/AIDS patients

The following basic principles are advocated for HIV/AIDS patient management, counselling or education;

- Nutritional education and counselling
- Water and food safety intervention to prevent diarrhoea
- Income-generating activities to enhance food security
- Nutritional supplementation
- Meal designing and planning using locally available foodstuffs

HERBAL THERAPY

- An herb is a plant or plant part used for its scent, flavor, or therapeutic properties. Herbal medicines are one type of dietary supplement. They are sold as tablets, capsules, powders, teas, extracts, and fresh or dried plants. People use herbal medicines to try to maintain or improve their health.
- Many people believe that products labeled "natural" are always safe and good for them. This is not necessarily true. Herbal medicines do not have to go through the testing that drugs do. Some herbs, such as comfrey and ephedra, can cause serious harm. Some herbs can interact with prescription or over-the-counter medicines.
- Herbal medicines constitute the main component of traditional medicine, which have been used since thousands of years. They have made significant contribution to human health through their health promotive, curative and rehabilitative

properties and in the prevention of illnesses. Indeed, many herbal remedies used traditionally have become modern medicines being used.

- Herbal medications should be used with caution. There isn't enough evidence to support the use of these drugs for relieving HIV symptoms.

VITAMIN C THERAPY FOR HIV PATIENTS

- Vitamin C (also called L-ascorbic acid or ascorbate) is a nutrient that humans must get from food or dietary supplements since it cannot be made in the body.
- Vitamin C is an antioxidant and helps prevent oxidative stress. It also works with enzymes to play a key role in making collagen.
- When taken by intravenous (IV) infusion, vitamin C can reach much higher levels in the blood than when it is taken by mouth.
- Studies suggest that these higher levels of vitamin C may cause the death of cancer cells in the laboratory.
- A severe deficiency (lack) of vitamin C in the diet causes scurvy, a disease with symptoms of extreme weakness, lethargy, easy bruising, and bleeding.
- The lack of vitamin C in patients with scurvy makes collagen thinner in texture; when vitamin C is given, collagen becomes thicker again.
- High-dose vitamin C may be given by intravenous (IV) infusion (through a vein into the bloodstream) or orally (taken by mouth). When taken by intravenous infusion, vitamin C can reach much higher levels in the blood than when the same amount is taken by mouth.
- High-dose vitamin C has been studied as a treatment for patients with colonic illnesses such as HIV and cancer.
- Laboratory studies have shown that high doses of vitamin C may slow the growth and spread of prostate, pancreatic, liver, colon, and other types of cancer cells. Other studies have also shown that certain forms of vitamin C may make chemotherapy less effective

Side effects of High-Doses of Vitamin C

Intravenous high-dose ascorbic acid has caused very few side effects in clinical trials. However, high-dose vitamin C may be harmful in patients with certain risk factors.

- In patients with a history of kidney disorders, kidney failure has been reported after ascorbic acid treatment. Patients with a tendency to develop kidney stones should not be treated with high-dose vitamin C.
- Case reports have shown that patients with an inherited disorder called G-6-PD deficiency should not be given high doses of vitamin C, due to the risk of hemolysis (a condition in which red blood cells are destroyed).
- Since vitamin C may make iron more easily absorbed and used by the body, high doses of the vitamin are not recommended for patients with hemochromatosis (a condition in which the body takes up and stores more iron than it needs).

Drugs Interaction with High-Doses Vitamin C

- A drug interaction is a change in the way a drug acts in the body when taken with certain other drugs. High-dose vitamin C, when combined with some anticancer drugs, may cause them to be less effective. Eg
- Combining vitamin C with an anticancer drug called bortezomib may blocks several molecular pathways in a cell, causing cancer cells to die.
- An oxidized form of vitamin C called dehydroascorbic acid has been studied in cell cultures and in animals with tumors. Several studies have also found that high doses of dehydroascorbic acid can interfere with the anticancer effects of several chemotherapy drugs.

Physical (body) therapies

- Physical, or body, therapies include such activities as
 1. Yoga
 2. Massage
 3. Acupuncture
 4. Aromatherapy and
 5. Relaxation techniques
- These types of therapies focus on using a person's body and senses to promote healing and well-being.

Yoga

- Yoga is a set of exercises that people use to improve their fitness, reduce stress, and increase flexibility.
- It also involves breathing exercises, stretching and strengthening poses, and meditation.
- Many people, including people with HIV, use yoga to reduce stress and to become more relaxed.
- Some people think that yoga helps make them healthier in general, because it can make a person's body stronger.

Massage

- Many people believe that massage therapy is an excellent way to dealing with stress and side effects that go along with having an illness, including HIV.
- During massage therapy, a trained therapist moves and rubs ones's body tissues such as the muscles.
- Massage therapy is said to aim at reducing muscle and back pain, headaches, and soreness.
- Massage is also said to have a positive effect in improving the flow of blood (circulation) and reduce tension.

Acupuncture

- Acupuncture is part of a whole healing system known as traditional Chinese medicine.
- During acupuncture treatment, tiny needles (about as wide as a hair) are inserted into certain areas of a person's body.

- Most people say that they don't feel any pain from the needles and many people with HIV use acupuncture.
- Some people think that acupuncture can help in the treatment of symptoms of HIV and the side effects from the ARV medication, like fatigue and nausea.
- Some people say that acupuncture can be used to help with neuropathy (body pain caused by nerve damage from HIV or the medications that are used to treat HIV).
- Some other people say that acupuncture gives them more energy.

Aromatherapy

- Aromatherapy is based on the idea that certain smells can change the way a person feels.
- The smells used in aromatherapy come from plant oils and they can be inhaled (breathed in) or used in baths or massages.
- People use aromatherapy to help them deal with stress or to help with fatigue. For example, some people report that lavender oil calms them down and helps them sleep better.

Relaxation techniques

- Relaxation therapies such as meditation and visualization focus on the person's mind and imagination to promote the overall health and well-being by reducing stress.

Meditation

- Meditation is a certain way of concentrating that may allow the person's mind and body to become very relaxed.
- Meditation helps people to focus and be quiet.
- There are many different forms of meditation and most of them involve deep breathing and paying attention to the body and the mind.
- Sometimes people sit still and close their eyes to meditate.
- Meditation also can be casual. For instance, one can meditate when he or she is taking a walk or watching the sunrise.
- People with HIV can use meditation to relax and deal with the stress that comes because of the illness.
- Meditation makes people with HIV to calm down and get focused when they are feeling overwhelmed.

Visualization

- Visualization is another method people use to feel more relaxed and less anxious.
- People who use visualization imagine that they are in a safe relaxing place such as a beach.
- Most of people use visualization without realizing it. For example, when one daydreams or remembers a fun or happy time in his/her life and smiles.
- Focusing on a safe, comfortable place can help a person to feel less stress, and sometimes it lessens the pain or side effects from HIV or the medicines the person is taking.

Homeopathy therapy

- Homeopathy is a medical system based on the belief that the body can cure itself by taking small doses of toxic substances.
- Those who practice it use tiny amounts of natural substances, like plants and minerals.
- They believe these substances stimulate the healing process of the person.
- This small toxic substance on the other hand when taken in large doses they end up with symptoms of the illness.
- There is no scientific evidence that it can prevent or treat cancer.

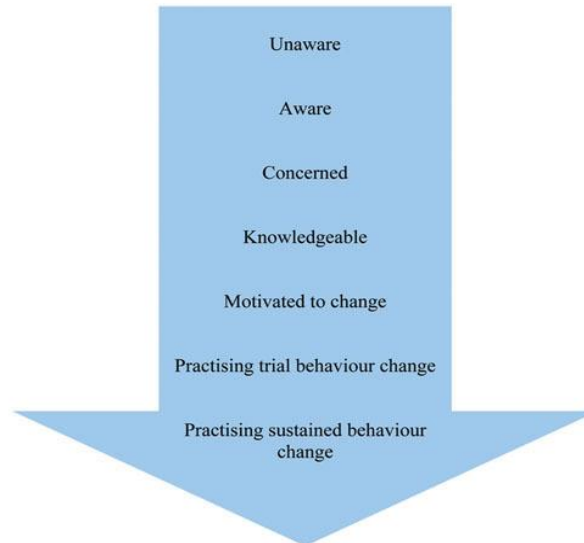
HIV/AIDS PREVENTION

General principles for HIV prevention

- The main AIM for HIV/AIDS prevention is to avoid & minimise the risk of transmission of the HIV virus from an infected person to an uninfected person.
- Prevention measures currently recommended at individual and community levels are based on our knowledge on how the virus is transmitted.
- There are two main Strategies involved in prevention HIV transmission
 1. Personal strategies
 2. Public health strategies

Personal strategies

- Abstinence
- Monogamous Relationship
- Protected Sex
- Sterile needles
- Avoid drugs and alcohol
- Keeping healthy/strong immune system
- Avoid stress
- Develop a positive attitude
- Behaviour change: the stages of Behaviour change that an individual passes through, from being completely unaware to making positive Behaviour changes include.



The most widely known strategy is the use of the **'ABCD rules'**:

- **'A'** stands for **'Abstinence'**, which means refraining from sexual intercourse.
 - It is the only 100 % effective method of not acquiring HIV/AIDS.
 - Refraining from sexual contact: oral, anal, or vaginal.
 - Abstinence is the most effective way to prevent sexual HIV transmission, as there is no possibility of direct contact between infected blood or sexual fluids and the other person's body.
 - However, many sexually active people find it difficult to maintain abstinence for long periods, hence making it an unrealistic option.
 - The only disadvantage is that it cannot be applied in circumstances of forced sexual relations e.g. rape.
- **'B'** stands for **'Be faithful'**, which means maintaining faithful relationships with a long-term partner.
 - Faithfulness (the 'B' rule of Being faithful)
 - To minimise transmission of HIV, it is essential for both partners or the multiple partners in polygamous relationships to be faithful to each other.
 - They should also know their status of HIV before starting unprotected sexual intercourse.
 - However it is advisable to maintain a Monogamous relationship
 - A mutually monogamous (only one sex partner) relationship with a person who is not infected with HIV
 - HIV testing before intercourse is necessary to prove your partner is not infected
- **'C'** stands for **'use of Condoms'**, which means maintaining consistent use of condoms in sexual relations.
 - A new condom should be used for each sexual act.
 - A damaged condom can allow HIV to be transmitted and should

never be used.

- Many condoms have expiration dates and you should always check the package before use.
- Avoid damage of condoms by always using water-based lubricants. Oil-based lubricants, such as Vaseline or creams, can cause condoms to break and should not be used.
- Use condoms (female or male) every time you have sex (vaginal or anal)
- Always use latex or polyurethane condom (not a natural skin)

When Using A Condom Remember To:

- Make sure the package is not expired.
 - Make sure the package is of good quality.
 - Make sure to check the package for damages
 - Do not open the package with your teeth for risk of tearing
 - Never use the condom more than once
- 'D' stands for 'use of **Drugs (ARV Drugs)**' or it can also stand for **Distigmatization**

Strategies to prevent Blood transmission includes

- Avoiding the sharing & use of toothbrush
- Avoiding the sharing & use of sharps objects e.g. blades, needles
- Avoiding harmful traditional practices e.g. (milk teeth extraction, female genital mutilation, Tattoos/body piercing, Mid – wife – giving birth at home).

PUBLIC HEALTH STRATEGIES

- Screening all blood and blood products.
- Educating the public with safer sex practices and provide free VCT services.
- Identifying & treating STDs & STIs infections.
- Use of sterile needle and syringe.
- Supply of condoms for safe sex practices.

OTHER METHODS FOR PREVENTION

- Reduce sexual transmission of HIV by having protected sex
- Ensure that people living with HIV receive treatment.
- Mouth to mouth recovery to be minimised
- Health care workers with open sores should be off from duty until the condition heals
- Health care workers to wear gloves and aprons when handling patients.
- Protecting drug users from becoming infected with HIV.
- Empowering young people to protect themselves from HIV.
- Ensure blood donors are HIV negative

Mother to child prevention

- Can be achieved by
 - Knowing their HIV status early
 - Having Skilled care at birth

- Early postnatal visit
- Exclusive breastfeeding
- Having good maternal nutrition
- Completing timely immunization

RELATIONSHIP BETWEEN HIV/AIDS AND STIS

- STDs enhances HIV transmission (Cohen, 1998) by causing open sores and skin injuries in sex organs through which the HIV enters.
- A lot of T-lymphocytes are mobilized to fight the STD infections and since these are the targets of HIV, a lot of them are destroyed and the person or individual goes down faster with the HIV.
- The mode of transmission for the STDs is also the same as the mode of transmission of HIV.

VOLUNTARY HIV COUNSELLING AND TESTING

Voluntary Counselling and Testing Services (VCT)

- VCT stands for voluntary counseling and testing.
- VCT is when a person chooses to undergo HIV/AIDS counseling so that they can make an informed decision about whether to be tested for HIV.
- Counseling is a process that involves listening to people talk about their problems, and helping them to work out what to do about the problems.
- Counselor guides the counselee in making alternative choices to either cope or overcome the problem.
- Counselors are people who are trained to help others to understand their problems, identify and develop solutions, and make their own decisions about what to do.
- Counseling requires that counselors spend time with the counselees, listening to them talk about their problems and fears, helping them to increase their own self-esteem, and when necessary giving correct and useful information based on what they need to know at that point in time.
- It is a powerful weapon in the fight against HIV/AIDS since it is associated with behavior change that reduces HIV transmission and serves as a point of entry into care for those testing HIV positive
- One can get tested, even if not sick, this will help the person to lessen the amount of stigma associated with the HIV test.
- When a person finds out he is infected at an earlier stage, he can
 - a) Learn more about the virus and how it affects the body.
 - b) Look after his health so that he may stay as healthy as possible for as long as possible
 - c) Get information and counseling around how to live positively with the virus. This means he will
 - Learn to accept the fact that he is HIV-infected,

- Seek for emotional support,
 - Eat a healthy diet,
 - Learn how to control the amount of stress in his life,
 - Make sure he does not become re-infected, and
 - Plan for the future.
- d) Learn to recognize the signs of opportunistic infections so he can get them treated promptly
 - e) Find out about the resources available within the community to help him manage the HIV status
 - f) Find out about prophylactic drugs. These drugs do not cure HIV/AIDS, but can prevent us from getting some opportunistic infections that are common with people living with HIV/AIDS e.g. T.B and some kinds of Pneumonia
 - g) Access Nevirapne drug. This is a drug available at a number of hospitals and clinics that lessens the chance of a pregnant mother passing the virus onto her baby.
 - h) Get emotional support by seeking counseling and joining support groups.
 - i) Make sure that he does not infect anyone else or get re-infected
 - j) Learn how to manage the stress in his live
- If the person is not infected with HIV, VCT can motivate the person to stay keep on being HIV negative, and to accept those who are infected.

VCT models of service delivery

Keya national VCT programme uses four models of service delivery:

1. **Integrated sites**: A VCT centre is usually located within the grounds of health facilities such as hospitals, health centres or dispensaries. Their main advantages include easier referral to medical care services and low start-up costs that allow for rapid scale-up.
2. **Stand-alone sites**: These are not associated with any existing medical institution and usually have staff fully devoted to VCT. Their main advantages are that the staff can work full time on VCT services, and they may have donor funds that facilitate their work.
3. **Community-based sites**: VCT is either integrated into other social services or implemented as the sole activity of a local community-based organization (CBO) or a faith-based organization (FBO). There is widespread scale-up of VCT at the grassroots, given the widespread distribution of CBOs and FBOs in many countries
4. **Mobile sites**. VCT is provided as an outreach to remote or hard-to-reach communities where other models of VCT are either not feasible or unavailable. Most mobile VCT services are offered by standalone or community-based VCT programmes.

Reasons for testing

- Medical reasons: Pregnancy, STDs, or Legal reasons
- Voluntary testing

THREE MAIN STEPS IN THE VCT PROCESS

1. Pretest counseling

HIV counseling is an effective public health intervention because it promotes the health of HIV infected persons and plays a role in reducing HIV transmission.

Aims of pretest counseling

- Help to identify risk factors and symptoms that may indicate that the person is HIV infected.
- Help the person to identify one with whom he/she will share the results with.
- To ensure the person has a full understanding of the implications of the test and is able to make an informed decision whether to take the test or not
- Ensure informed consent to carry out the test is obtained from the person
- Give the person the opportunity to discuss modes of HIV transmission
- Discuss the implications and support needs that may follow either a positive or negative test result.
- Consider ways to reduce transmission or contraction of HIV in future.
- Encourage the person to consider and evaluate the impact the result may have on him/her, emotionally, physically and in relation to his/her lifestyle.
- Reduce the internalized stigma by providing information about HIV in a neutral environment.

Some other issues the counselor may discuss with person are

- 1) Describe the test that is available and how it is performed
- 2) Explain AIDS and the way HIV infection is spread
- 3) Discuss ways to prevent the spread of HIV
- 4) Explain the confidentiality of the test results
- 5) Discuss the meaning of the possible test result
- 6) Ask what impact the person thinks the results of the test will have on him
- 7) The kind of support system that the person has including and whom the person might tell the results
- 8) Discuss the importance of telling the results to the sex partner or drug-using partner(s) that is if the results come out as positive
- 9) Reasons why the person decided to come for counseling
- 10) What counseling is and the role of the counselor
- 11) The personal history of the person
- 12) Whether the person has any health problems
- 13) The risk of being HIV infected
- 14) What the person knows about HIV/AIDS

- 15) Information about HIV/AIDS, including the test procedure and what people who are HIV infected can do to make sure that they stay as healthy as possible for as long as possible.
- 16) Available alternatives for solving the persons problems
- 17) The advantages and disadvantages for having the test
- 18) How the person has managed with problems in the past.

Advantages of testing

They include:

- 1) Ability to seek early medical intervention which prevents complications of AIDS
- 2) Prevention of transmission to others,
- 3) Making healthy life style changes; (e.g. eating a balanced diet and regular exercising).
- 4) Understanding the cause of various symptoms.

Disadvantages of a positive test include:

- 1) Increased fear of illness and death
- 2) Fears related to family relations/parenting
- 3) Guilt of past relationships and sexual behaviour iv. Stigma associated with HIV/AIDS

If results are negative benefits include: Increased self-confidence by knowing that one is not HIV positive. However, this self-confidence if not well handled may lead to risky behaviour.

N.B:

- **Positive test** mean the person is HIV infected except for infants who may carry the mother's antibodies and may test positive even when they don't carry the HIV.
- There is a period of 3-6 months during which antibodies may not show up in the blood and test will reveal the person to be negative.
- This is the 'window period'. Western blot is used to confirm the positive results.
- Because of the window period, tests giving negative results should be repeated again after 3 and 6 months respectively.

2. THE PERSON DECIDES TO HAVE THE HIV TEST:

- The person must sign a consent form before the test can be administered.
- Informed consent is a crucial part of the VCT process and it is important that the individual is aware of their right to refuse any medical procedure, to be informed about it and to agree to it.
- There is a statement which they should be asked to read before hand stating that they have been informed about the HIV-antibody testing procedure and that they understand, and have given their consent to have the test performed.
- There are three common types of HIV antibody tests:
 - 1) The Elisa test,
 - 2) The Western blot test and
 - 3) The Rapid test.

- The Elisa and Western blot test will require that the person to have a sample of blood taken.
- This blood sample will be sent to a laboratory for testing and the results will be received a week later depending on the number of samples being processed.
- The Rapid test requires a drop of blood by pricking the finger.
- The drop of blood is placed on the test kit where a chemical agent will be added and the results will be available within 15 minutes.
- If the test is positive, a second Rapid test will be done to confirm the result.
- Current HIV antibody tests can only detect the antibodies when sufficient quantities have been produced.
- With new technology the time it takes before antibodies can be detected is decreasing, but there is still a period during which the antibodies cannot be detected in the blood.
- This is called the window period and can last up to 42 days.
- During the window period, the person may receive a negative HIV test result, but still have the virus in the body.
- It is recommended that the person should have a second HIV test done six weeks later to confirm the result.

3. **Post-test counseling**

- It is also referred to as Ongoing counseling
- This is the kind of counseling the person will get after the test.
- **HIV test results are never given over the phone. The person can only receive the result face-to-face**
- After the test has been done the counselor gives the results to the person in the post-test counseling session
- **If the person tests positive**, the counselor should explain to him/her that there is a chance of not developing full blown **AIDS** through medical intervention by ARVs, antibiotics and antifungal drugs, good nutrition and reducing stress, and change of lifestyle through positive living.
- HIV-positive means the person has HIV
- The person is referred to medical specialists and other counselors in order to aid them in receiving treatment and support.

During this session the counselor will:

- Give the person the test result.
- Let the person express his feeling about being HIV positive, negative or indeterminate.
- Help the person to revisit the issues he raised during the pre-test counseling session; including any plans he many have made.
- Discuss any immediate problems with the person and help the person to decide on a plan of action

- Answer any questions the person may have and provide the person with useful information
- Discuss about positive living and
- Give the person positive information on what resources there are in the community to help him/her.

If results are negative, then,

- The counselor will clarify that the test did not yield positive results but this does not mean that the person does not have the HIV since one may be in the window period.
- The counselor will let the person know that there is need to repeat the test after 3 months.
- The counselor will also congratulate the person.
- The counselor will discuss methods of reducing the risk of transmission and avoid risky behaviour.
- The counselor will discuss the current risk situations of patients and help to develop strategies to increase prevention of transmission.

The main aims of Post-test counseling are to:

- Help the person to manage the impact that HIV has on the person's own life, and the lives of the people around him.
- Encourage the person to take control of his health and take charge of his life.
- Help the person to accept the result and live positively with HIV/AIDS
- Explore the advantages and disadvantages of telling other people about his status.
- Assist the person in tackling his problems
- Provide emotional and psychological support to the person
- Help the person to strengthen his support system
- Help the person to plan for the future
- Explore issues around death and dying
- Refer the person to community resources

Role of VCT centers:

- 1) Enlightening and guiding people on issues relating to HIV/AIDS.
- 2) Contributed immensely in the control of HIV/AIDS by offering counseling services and even treatment.
- 3) Offer testing and avail the results to people within short period.
- 4) The clients are prepared for both positive and negative results before and after testing then allowed to know their HIV status.
- 5) Through counseling, infected people, majority of who have lost hope are with offered an opportunity for positive living
- 6) They reduce the revenge attitude for those innocently infected and may opt to die with many or commit suicide
- 7) They enable the public who include the relatives of the infected to stop him/ stigmatizing those infected to be able to live normal lives knowing that

someone cares for them

- 8) They also help the government to keep statistics on the prevalence of the disease hence policy development or strategic planning.
- 9) They enhance peer counselling - which is a more effective tool as it applies peer pressure.

General reactions to testing HIV positive

- Shock
- Denial
- Anger
- Bargaining
- Fear
- Loneliness
- Self-consciousness
- Depression
- Acceptance

LIVING POSITIVELY WITH HIV/AIDS

The following steps may be taken to cope with the situation:

1. Breath

When one gets overwhelmed, he/she should take three deep breaths. Body ventilation improves everything from chronic health problems, stress related disorders to sporting performance. Whether one wants to boost one's workout, ease stress or improve one's health, learning to breathe properly can enhance one's quality of life.

2. Refuse to be a victim by:

- Focusing on positive thoughts like living with HIV and not dying
 - Living one day at a time,
 - Seeking support not pity.
4. Educate one's self about HIV by attending HIV/AIDS seminars, workshops or any education forum
 4. **Physical exercise** - exercise regularly to keep muscle tone and reduce stress
 5. Keep busy and avoid self-pity by concentrating on development but one must be careful not to overwork
 6. Express one's self and ask for support by;
 - Talking to friends
 - Sharing feelings with a partner, friends and family
 - Consulting a professional counselor, therapist and clergy
 7. Embrace one's own spirituality - Faith based organizations have ministers who support HIV positive people these should be consulted for spiritual support.
 8. Think and act positively in all things.

9. Seek out people who are honest, trustworthy and supportive.
10. Cry when one needs to let it out, as it creates room for positive feelings
11. Accept responsibility: Pledge that HIV stops with me. Do not deliberately seek to infect others. Use condoms to protect others and to avoid re-infection.
12. Join HIV/AIDS support groups that offer group therapy as infected people share experiences.
13. Eat a well balanced diet with lots of proteins and vitamins. Avoid alcohol, drug and substance abuse
14. Attend to opportunistic infections immediately xv. Have hope about many things. For example that;

- One will live for long
- Their baby will be healthy
- Each sickness will be treated as it comes
- They are loved and accepted for who they are
- Scientists will find a cure
- There is life after death.

CONTROL THE STRESS

Stress is known to make a person's immune system weak. If the immune system becomes weak it will not be able to fight infections well. An HIV positive person can manage stress in his life by:

- Finding out how to live positively with HIV
- Seeking counseling
- Sharing his feelings with friends or a counselor
- Joining some support group
- Setting goals for the future
- Making sure that he eats a well balanced diet
- Putting aside some time every day to relax maybe by listening to music, reading novels, going for a walk or meditating.
- Tackling problems one at time.

HEALTH MANAGEMENT

There are a lot of things that the person can do to help himself stay as healthy as possible for as long as possible:

- Make sure that he gets treatment for infections quickly. This will keep his immune system stronger.
- Find out about antiretroviral drugs
- Try and avoid getting a sexually transmitted disease (STD) or sexually transmitted infections (STI's) as they can weaken the immune system and make it easier for re-infection with HIV.
- Use condoms to prevent re-infection with HIV and other STD's.
- Exercise for at least 20 minutes three times a week.
- Attend an HIV clinic.

- Ask doctors about prophylactic treatment
- Eat a well-balanced diet
- Eat lots of fruit and vegetables and get advice on good nutrition from a nutritionist.
- Take a multivitamin supplement if you can afford.
- Don't smoke or drink alcohol.

CHALLENGES THAT PEOPLE FACE IN WHEN ACCESSING VCT SERVICES

- Some of the barriers to VCT include limited availability, legal issues and accessibility of VCT services.
- Waiting times and costs
- Pressure by health staff to notify partners
- Worries about confidentiality and fear that the results of HIV tests would be shared with partner(s) or parent(s) without consent.
- Fear of being stigmatized and labeled by friends, families and communities.
- Inadequate prevention, care and support from health care providers (i.e. councilors, doctors, nurses etc.) to effectively meet the needs of the person undergoing the test.

HOME BASED CARE

Home-based care is the care of persons with chronic or terminal illnesses, extended from the hospital or health facility to the patients' homes through family participation and community involvement, within available resources and in collaboration with health care workers.

It is a holistic, collaborative effort by the hospital, the family of the client, and the community, in order to enhance the quality of life of people living with HIV/AIDS (PLWHA) and those with other chronic disabling diseases (clients) and their families. In home base care, the care of the patients is extended from the hospital or health facility where they are initially seen to their homes. It is a comprehensive care across the continuum of care. This therefore implies that these patients require certain services.

These services encompass clinical care, nursing care, counselling and psycho-spiritual care and social support. These services form the components of home-based care and are complementary. Actors in each team of service providers should understand the role of the other service providers.

COMPONENTS OF HOME-BASED CARE

There are four components of comprehensive Home-based care. They include the following:

- **Clinical Care:** comprises early diagnosis, rational and targeted treatment and planning for the follow-up care. The patients and clients who are assessed and referred for home-based care need the continuum of care extended rationally. If a

patient has not been well diagnosed and treated, don't you think the purpose and spirit of home-based care would be defeated?

Well, I hope you thought of the complications that may arise from the disease that the patient is suffering from. When a patient is well diagnosed and rationally cared for at a health facility, it is easier to anticipate and plan for complications and how to manage them.

- **Nursing Care:** Includes care to promote and maintain good health, hygiene and nutrition. It is your responsibility as a health care worker to provide this care and extend it to the home. By training family and community members, it is possible to extend the continuum of care to the home. Don't forget that all those patients whom we discharge from hospital with residual effects of diseases and complications need further care and families, friends and community can provide some form of nursing care. In Home-based care, we try to extend care by contributing our skills together with other professionals and also training family and community members to give care to those that require it.
- **Counselling and Psycho-spiritual care:** The main aim of providing care to people with chronic and terminal illnesses and injuries is to prolong their life and make it bearable. This cannot happen unless there is positive living and decisions are made on the basis of informed choice. Counselling and psycho-spiritual care reduces stress and anxiety for both the clients and their families. It also helps individuals to make informed decisions on HIV-testing, plan for the future, make behavioural changes, make risk reduction plans and involve sexual partner(s) in such decisions.
- **Social support:** On many occasions when we discharge patients from health facilities, we fail to realize the network of social and support services that they can benefit from.

Well, they need information and referral to support groups such as church organizations, youth groups and other social organizations. They also need to be referred to welfare services provided by social workers, children's department and other services, which may be provided by various governmental and non-governmental organizations. These individuals and their families may also require legal advice and material assistance. You should never forget that these services compliment the care we give in our health facilities.

The concept of Home-based care as you may have realized does not just address any disease condition but is intended for debilitating diseases that make patients unable to care for themselves. In HIV/AIDS for instance, we do not provide HBC to those who are HIV positive but to those with advanced AIDS illness. HBC concerns those who are sick but still able to care for themselves as well as those who are bedridden and unable to care for themselves.

BASIS FOR HOME-BASED CARE

Big problem presented by HIV/AIDS to the health care services in our country. Demand for health services has increased due to the increasing numbers of individuals who have become ill as a result of HIV infection. This has resulted in increased workload and congestion of health facilities. Hospital bed occupancy rates have increased with over 55% of beds occupied by PLWA. Apart from HIV/AIDS, other chronic diseases such as cancer have made people require long-term care.

In addition, to the above, there are other reasons why the Home-based concept has been adopted. It has been noted that:

- People with AIDS and other debilitating illnesses are discharged from health institutions where there are trained professionals and sent home to be cared for by untrained relatives with no professional back up support;
- The care givers at home often are women with no training in nursing or how to protect themselves from risks related to infections and injuries as a result of the care they give;
- People with chronic debilitating illnesses for example HIV/AIDS need continuity of care to prolong their lives and reduce their suffering;
- Health institutions have many limitations such as shortage of health workers, limited hospital beds and a shortage of other material resources.

This means that many clients have failed to get the quality care that they deserve. Taking into consideration these reasons, the following objectives and principles of Home-based care were adopted.

OBJECTIVES AND PRINCIPLES OF HOME-BASED CARE

Objectives of a Home-based care program

The main objectives of the HBC program are to:

- facilitate the continuity of the client's care from the health facility to the home and community;
- promote family and community awareness of disease prevention and care related to chronic illnesses;
- empower the clients, the family and the community with the knowledge needed to ensure long-term care and support;
- raise the acceptability of PLWHAs by the family/community, hence reducing the stigma associated with AIDS;
- streamline the patient/client referral from the institutions into the community and from the community to appropriate health and social facilities;
- facilitate quality community care;
- mobilize the resources necessary for sustainability of the service.

To ensure that the foregoing benefits are realized, home-based care should be regarded as a holistic system of care with provisions for the following principles or ideologies. These principles need to be well understood as they are the basis of the HBC program.

PRINCIPLES OF HOME-BASED CARE

The principles of home-based care include the following:

- Ensuring appropriate, cost-effective access to quality health care and support to enable persons living with HIV/AIDS and other clients to retain their self-sufficiency and maintain quality of life;
- Encouraging the active participation and involvement of the client and their family;
- Fostering the active participation and involvement of those most able to provide support to the community at all levels;
- Targeting social assistance to all affected families especially children including orphans and vulnerable children (OVC) ;
- Caring for caregivers, in order to minimize the physical and spiritual exhaustion that can come with the prolonged care of the terminally ill;
- Ensuring respect for the basic human rights;
- Developing the vital role of home-based care as the link between prevention and care;
- Taking a multi-sector approach to care and support;
- Addressing the reproductive health and family planning needs of persons living with HIV/AIDS;
- Instituting measures to ensure the economic sustainability of home care support;
- Building and supporting referral networks/linkages and collaboration among participating entities;
- Building capacity at the household, community and institutional levels;
- Addressing the differential gender impact of the HIV/AIDS epidemic and care for persons living with HIV/AIDS.

ADVANTAGES OF HOME-BASED CARE

Many studies have shown that Home-based care has a positive impact on the social, economic, psychological and physical well being of the patient, the family, the community and the general health care system. Let us look at the advantages of HBC to each of these sections of society, starting with the patient or client.

The following are the advantages of HBC to the client, family, community and health care system.

To the client

- The patient is cared for in a familiar environment. Such a patient usually suffers less stress and anxiety compared to the one in hospital, clinic or nursing home. When people are in a familiar environment their illness is more tolerable;
- When people are in their homes, they continue to participate in family matters. Those who are heads of their families continue doing so and can be consulted on various family issues. It is quite difficult when one is in hospital or a clinic to make a decision about, for example, which goat to sell in order to pay for school fees or which part of the farm should be tilled;

- When one is at home close to family members, friends and relatives, there is a sense of belonging. This is not the case if one is in a hospital setting where the caregivers are strangers who keep changing with every shift;
- Finally when one is in close contact with familiar people they are likely to accept their conditions and illnesses. The acceptance contributes to quicker recovery or in the case of HIV/AIDS it may assist in better management of the syndrome. What about the family? Let us next look at the advantages to the family.

To the family

- Care given in the home can be less expensive than that in the hospital. You are aware that patients will pay for bed charges, food and other items, which will normally be available and shared at home;
- Makes it easy to provide care and support to the client while attending to other responsibilities;
- Caring for sick people at home prevents separation and holds family members together. I am sure you have heard of patients being divorced or separated because of illness. Others get into adulterous relationships because their spouses are not at home. This can be prevented through Home-based care;
- When family members are given education and information on diseases, it helps them to understand these diseases better and accept the patients;
- Enables family members to be present at the time of death.

To the community

- Training in home-based care helps community members to be aware of the various illnesses affecting members of their communities.
- Helps the community to understand the nature of the disease and counteract myths, beliefs and misconceptions especially in relation to HIV/AIDS and other diseases;
- The costs of going to visit a person who is sick in hospital are reduced;
- Makes it easier and convenient to provide support;
- Community cohesiveness is maintained. This ensures that the community is able to respond to other members' needs.

To the Health Care System

- HBC improves access to quality care: There are areas where a hospital is not accessible to some people. Imagine a bedridden client suffering in a village in Turkana which is hundreds of kilometres away from the nearest health facility. How can this person's wounds or sores be prevented and properly dressed or how can he be offered basic nursing care like bathing within the home environment? This can be achieved through training of caregivers in home-based care;
- HBC reduces the pressure on the already overcrowded hospital services and hence the health system. Through care at the home, hospitals will have fewer

people to attend to and as such they will be able to have more time to provide quality services to those patients who require short-term care;

- Reduces the workload of the health care providers. One of the obstacles within the health system in Kenya is limited human resources. HBC helps to overcome this constraint.
- Helps to reduce demand on the health facility under limited resources

KEY PLAYERS / PROVIDERS OF HOME-BASED CARE

- The patient or client
- Family members and care givers
- Home care team
- Health workers
- Community
- Government

All of these providers have a role to play in the delivery of HBC. Some aspects of the roles are unique to the specific players, but others may overlap to some extent. Every function is important, and none should be thought inferior to the others, because they all make vital contributions to the total home-based care system.

THE ROLE OF EACH KEY PLAYERS / PROVIDERS OF HOME-BASED CARE

Role of the patient

The patient is one of the main players in home-based care. When the patients are not very sick, they may provide their own care. However, in some cases they are too sick and require somebody else to care for them. Their role in HBC is to:

- Identify the primary or alternative caregiver;
- Participate in the care process, but not passively, especially in making decisions on own welfare;
- If possible, give consent on caregivers and where the care will be provided, for example, home or hospital especially during the terminal phase of the disease

Role of Family members and care givers

The sick person's family members, relatives, friends and other care givers play an important role in the provision of home-based care. Their role is to:

- Learn to accept and adjust to the situation, including that of the terminally ill with AIDS
- Collaborate with other care providers, for example, religious institutions, support groups, health and social institutions
- Be able to volunteer or agree on other possible caregivers to be involved in providing the services in the family. This becomes shared responsibility on issues of referral and networking
- Learn to consult with the clients on matters concerning them

- Involve the client in all care activities and any other family activities without discrimination
- Emphasize the need to prepare for death as inevitable and sensitise the client about the importance of ensuring the continuing care of family members who are left behind
- Encourage and help the client to write a will
- Remember that being present is a major support

Role of Home Care Team

Home care teams are supervised by a medical or social work professional, and may be associated with a local or health centre or community organization. They are organized to provide a variety of services to clients and their families. The community health worker is a key member of this team.

The Home Care teams should be able to:

- Manage AIDS-related and the client's disease-related conditions
- Provide home nursing care
- Arrange voluntary HIV counselling and testing
- Provide supportive counselling
- Refer the patients for further specialized care such as treatment, radiotherapy, counselling, and emotional/spiritual support ;
- Educate PLWHA/client/family on HIV/AIDS and other related diseases
- Arrange spiritual/pastoral care
- Mobilize material support
- Train the caregiver on all HBC services.
- Provide supervision of the caregiver.
- Train the clients on how to care for themselves.

Role of Health Workers

Their role is to:

- Initiate and market the HBC process by recruiting the PLWHA/clients to the programme; identifying needs at various levels, and preparing the PLWHA/client for discharge home.
- Prepare and educate the family caregiver for the caring responsibility at home.
- Make initial diagnosis, institute relevant nursing and medical care, help identify psychological and social needs.
- Initiate referral and networking systems, which may change over time as the client's condition and needs change.
- Care for the terminally ill depending on their wish.

Role of the Community

- Accept the situation of the PLWHA/client and learn to collaborate and work with existing agencies around to meet the needs of those infected/affected such as religious groups, women's groups, and other social and health agencies

- Prepare a Memory Book to provide their children with family history and a tangible record of caring
- Encourage the client to write a will
- Identify own spiritual/pastoral needs
- Be open to the caregiver and share any worries
- Take personal responsibility to prevent further transmission of HIV
- Advocate for behaviour change

Role of the Government

- Create a supportive policy environment
- Develop policies and guidelines
- Develop and maintain standards
- Provide/coordinate training
- Provide drugs and commodities
- Help in the formation of support groups, which in turn would lobby and advocate for the rights of the PLWHA.

In order to succeed in your role in HBC, you need to cooperate with the other providers of HBC in your community. You must link the patient or client to the available support services right from the beginning when you identify that the patient needs Home-based care. Let us now look at the process of linking patients to support services.

The process of linking patients to support services involves:

- Assisting patients and their families to identify the support that is needed.
- Identifying groups/agencies/individuals that can provide the support
- Informing patients about the existence of the individuals, agencies and the services that are offered
- Introducing the identified agencies and individuals to the patients and their families.
- Helping patients to evaluate the individuals and agencies and allowing them to close those who meet their needs.
- Helping them set up home visits and transportation if needed.
- Following up to ensure that there is coordination of services.

HIV/AIDS AND HUMAN RIGHTS

INTRODUCTION

HIV continues to spread throughout the world, shadowed by increasing challenges to human rights, at both national and global levels. The virus continues to be marked by discrimination against population groups: those who live on the fringes of society or who are assumed to be at risk of infection because of behaviors, race, ethnicity, sexual orientation, gender, or social characteristics that are stigmatized in a particular society.

In most of the world, discrimination also jeopardizes equitable distribution of access to HIV-related goods for prevention and care, including drugs necessary for HIV/AIDS care and the development of vaccines to respond to the specific needs of all populations, in both the North and South. As the number of people living with HIV and with AIDS continues to grow in nations with different economies, social structures, and legal systems, HIV/AIDS related human rights issues are not only becoming more apparent, but also becoming increasingly diverse.

Human rights are broadly concerned with defining the relationship between individuals and the state. International human rights law dictates that governments should not do things such as torture people, imprison them arbitrarily, or invade their privacy. Governments should, however, ensure that all people in a society have shelter, food, medical care, and basic education. The concept of human rights has a long history, but the modern human rights movement dates back about 50 years to when the promotion of human rights was set out as one of the purposes and principles of the newly created United Nations.

Human rights are inextricably linked with the spread and impact of HIV on individuals and communities around the world. A lack of respect for human rights fuels the spread and exacerbates the impact of the disease, while at the same time HIV undermines progress in the realization of human rights. This link is apparent in the disproportionate incidence and spread of the disease among certain groups which, depending on the nature of the epidemic and the prevailing social, legal and economic conditions, include women and children, and particularly those living in poverty. It is also apparent in the fact that the overwhelming burden of the epidemic today is borne by developing countries, where the disease threatens to reverse vital achievements in human development. AIDS and poverty are now mutually reinforcing negative forces in many developing countries.

HUMAN RIGHT AND PRINCIPLES RELEVANT TO HIV/AIDS

Human right and principles that are most relevant to HIV/AIDS individuals include

- ❖ The right to Non discrimination
- ❖ The right to equal protection
- ❖ The right to equality before law
- ❖ The right to Life
- ❖ The right to the highest attainable standard of physical and mental health.
- ❖ The right to Liberty and security of persons
- ❖ The right to Freedom of movement
- ❖ The right to Seek and enjoy protection
- ❖ The right to Privacy
- ❖ The right to Freedom of opinion and expression
- ❖ The right to freely receive & pass on information
- ❖ The right to Freedom of association
- ❖ The right to Work

- ❖ The right to Marry and have a family
- ❖ The right to Equal access to education
- ❖ The right to Adequate standards of living
- ❖ The right to Social security, assistance & welfare
- ❖ The right to Share scientific advancement and its benefits
- ❖ The right to Participate in public and cultural life

THE RELATIONSHIP BETWEEN HIV/AIDS AND HUMAN RIGHTS

The relationship between HIV/AIDS and human rights is highlighted in three areas:

- a. Increased vulnerability:** Certain groups are more vulnerable to contracting the HIV virus because they are unable to realize their civil, political, economic, social and cultural rights. For example, individuals who are denied the right to freedom of association and access to information may be precluded from discussing issues related to HIV, participating in AIDS service organizations and self-help groups, and taking other preventive measures to protect themselves from HIV infection. Women, and particularly young women, are more vulnerable to infection if they lack of access to information, education and services necessary to ensure sexual and reproductive health and prevention of infection. The unequal status of women in the community also means that their capacity to negotiate in the context of sexual activity is severely undermined. People living in poverty often are unable to access HIV care and treatment, including antiretroviral and other medications for opportunistic infections.
- b. Discrimination and stigma:** The rights of people living with HIV often are violated because of their presumed or known HIV status, causing them to suffer both the burden of the disease and the consequential loss of other rights. Stigmatization and discrimination may obstruct their access to treatment and may affect their employment, housing and other rights. This, in turn, contributes to the vulnerability of others to infection, since HIV-related stigma and discrimination discourages individuals infected with and affected by HIV from contacting health and social services. The result is that those most needing information, education and counseling will not benefit even where such services are available.
- c. Impedes an effective response:** Strategies to address the epidemic are hampered in an environment where human rights are not respected. For example, discrimination against and stigmatization of vulnerable groups such as injecting drug users, sex workers, and men who have sex with men drives these communities underground. This inhibits the ability to reach these populations with prevention efforts, and thus increases their vulnerability to HIV. Likewise, the failure to provide access to education and information about HIV, or treatment, and care and support services further fuels the AIDS epidemic.

These elements are essential components of an effective response to AIDS, which is hampered if these rights are not respected.

GOVERNMENT RESPONSIBILITIES FOR HUMAN RIGHTS IN THE CONTEXT OF HIV/AIDS

For the applicability of international law to HIV/AIDS, governments are publicly accountable for their actions toward people in the context of HIV/AIDS. Given the reality of violations that continue to occur, it is useful to consider the specific human rights responsibilities of governments. Governments are responsible for not violating rights directly, as well as for ensuring the conditions that enable people to realize their rights as fully as possible. It is understood that, for every human right, governments have responsibilities at three levels:

- a) They must respect the right
- b) They must protect the right
- c) They must fulfill the right

As an illustration, consider governmental obligations in the context of HIV, using one right the right to education:

Respecting the right means that states cannot violate the right directly. This means that the right to education is violated if children are barred from attending school on the basis of their HIV status.

Protecting the right means a state has to prevent violations of rights by nonstate actors and offer some sort of redress that people know about and have access to if a violation does occur. A state has to ensure, for example, that religious groups are not successful when they try to stop adolescents from accessing reproductive health education.

Fulfilling the right means states have to take all appropriate measures- legislative, administrative, budgetary, judicial, and otherwise-toward fulfilling the right. If a state fails to provide essential HIV/AIDS prevention education in enough languages and media to be accessible to everyone in the population, this in and of itself could be understood to be a violation of the right to education.

In most countries, resource and other constraints can render it impossible for a government to fulfill all rights immediately and completely. The mechanisms responsible for monitoring governmental compliance with human rights obligations recognize that, in practical terms, a commitment to the right to basic education will require more than just passing a law. It will require financial resources, trained personnel, facilities, textbooks, and a sustainable infrastructure.

Therefore, realization of rights is generally understood as making steady progress toward a goal. This principle of "progressive realization" is fundamental to the achievement of human rights. It is critical for resource-poor countries, which are responsible for striving toward human rights goals to the maximum extent possible; however, it is also important because it imposes an obligation on wealthier countries to engage in international assistance and cooperation. In addition, as member states of

intergovernmental and multilateral institutions, governments can be challenged to account for the impact of the actions of these institutions on health and development. Despite the importance attached to human rights, there are situations where it is considered legitimate to restrict rights to achieve a broader public good.

As described in the International Covenant on Civil and Political Rights, the public good can take precedence to "secure due recognition and respect for the rights and freedoms of others; meet the just requirements of morality, public order, and the general welfare; and in times of emergency, when there are threats to the vital interests of the nation."

Public health is one such recognized public good. Traditional public health measures have generally focused on curbing the spread of disease by imposing restrictions on the rights of those already infected or considered most vulnerable to becoming infected. Coercion, compulsion, and restriction have historically been significant components of public health measures. Although the restrictions on rights that have occurred in the context of public health have generally had as their first concern protection of the public's health, the measures taken have often been excessive.

Interference with freedom of movement when instituting quarantine or isolation for a serious communicable disease for example, Ebola fever, syphilis, typhoid, or untreated tuberculosis is an example of a restriction on rights that may in some circumstances be necessary for the public good and therefore could be considered legitimate under international human rights law. However, arbitrary measures taken by public health authorities that fail to consider other valid alternatives may be abusive of both human rights principles and public health "best practice." There are countless examples from around the world of this sort of abuse in the context of HIV/AIDS.

Certain rights are absolute, which means that restrictions may never be placed on them, even if justified as necessary for the public good. These include such rights as the right to be free from torture, slavery, or servitude; the right to a fair trial; and the right to freedom of thought. Interference with most rights can be legitimately justified as necessary under narrowly defined circumstances. Limitations on rights, however, are considered a serious issue under international human rights law, regardless of the apparent importance of the public good involved. When a government limits the exercise or enjoyment of a right, this action must be taken only as a last resort and will only be considered legitimate if the following criteria are met:

- a) The restriction is provided for and carried out in accordance with the law.
- b) The restriction is in the interest of a legitimate objective of general interest.
- c) The restriction is strictly necessary in a democratic society to achieve the objective.
- d) There are no less intrusive and restrictive means available to reach the same goal.

- e) The restriction is not imposed arbitrarily, ie, in an unreasonable or otherwise discriminatory manner.

Whereas this approach has long been recognized by those concerned with human rights monitoring and implementation as relevant to analyzing a government's actions, it has also recently begun to be considered a useful tool in a number of places by those responsible within government for HIV/AIDS-related policies and programs.

GOVERNMENTS POLICIES AND RESPONSES TO HIV/AIDS PANDEMIC

GLOBAL POLICIES ON HIV/AIDS

- A policy is a program of actions adopted by an individual, group, or government, or the set of principles on which actions are based.
- The United Nation AIDS (UNAIDS) and United Nation High Commission for Human Rights (UNHCHR) have set policies to assist states in translating human rights values into practical observation in the context of HIV/AIDS.

The policies are in two parts

- Guidelines on action oriented measures to be employed by governments in the areas of law, administrative policy and practice that will protect human rights and achieve HIV related public goals
- Principles of human rights underlying the positive response to the pandemic

The Guidelines

That there will be:

- National frameworks in response to HIV/AIDS
- Political and financial support (in consultation with communities) in response to HIV/AIDS
- Address on public health issues related to HIV/AIDS, e.g. tuberculosis out breaks
- No criminal law violations in the context of HIV/AIDS
- No discrimination/vulnerability to discrimination in both public/private sectors based on HIV/AIDS
- Availability of qualitative preventive measures and services at an affordable price
- Education of people affected by HIV/AIDS - about their rights, including free legal services
- Supportive and enabling environment for women, children and other vulnerable groups
- Wide spread education through training and media programmes designed to change stigmatization associated with HIV/AIDS
- Translation of human rights to codes of conduct regarding HIV/AIDS issues
- Guaranteed protection to HIV/AIDS infected people, families and communities
- International cooperation on HIV/AIDS related matters, including knowledge dissemination, data and experience transfer

Human rights principle relevant to HIV/AIDS

- Countries have an obligation to respect, protect and fulfill all human rights including HIV/AIDS related human rights (NACC, 2002).
- Human right principles that are most relevant to HIV/AIDS include the right to:

- Non discrimination, equal protection and equality before law
- Life
- The highest attainable standard of physical and mental health.
- Liberty and security of persons
- Freedom of movement
- Seek and enjoy asylum
- Privacy
- Freedom of opinion and expression and the right to freely receive and impart information
- Freedom of association
- Work
- Marry and found a family
- Equal access to education
- Adequate standards of living
- Social security, assistance and welfare
- Share in scientific advancement and its benefits
- Participate in public and cultural life
- Be free from torture and cruelty, in human or degrading treatment or punishment

INTERNATIONAL RESPONSES TO THE HIV/AIDS PANDEMIC

- The epidemic is not out of control everywhere; some countries and communities have managed to stabilize HIV rates or achieve a turnaround, and some have maintained very low prevalence rates, due to a range of factors that are not yet fully understood. Other communities have made significant progress on care and support for people both infected and affected.
- The initial reaction of many countries to the pandemic was to try to persuade individuals and selected groups to change their behaviour by providing information about HIV/AIDS. However,
- Behavior change was later understood to require more than mere information and the importance of decision-making and negotiation skills, accessibility of commodities and services, and supportive peer norms became increasingly apparent.
- It was well appreciated that individuals do not always control their own risk situations. This led to the development of prevention programmes aimed at enabling particular groups or communities such as sex workers and men who have sex with men to adopt safer sexual behaviour.
- At the same time, as individuals infected with HIV earlier in the epidemic gradually fell ill and died, challenging family and community structures alike, the need to provide health care and cushion the epidemic's impact became increasingly obvious.
- Work on non-discrimination, protection and promotion of human rights, and against stigmatization brought by HIV/AIDS essential.
- Advancing other social goals such as education, empowerment of women and human rights protection are important for reducing overall societal vulnerability to infection, as well as critical in their own right.

Successful national responses

Successful national responses have generally comprised the following features:

Political will and leadership

- Political will expresses the national commitment and provides overall leadership to the nation in response to AIDS.
- Effective responses are characterized by political commitment from community leadership up to a country's highest political level.

Societal openness and determination to fight against stigma

- To be effective, programmes need to make HIV visible and the factors leading to its spread, discussible.
- Programmes need to make people aware of the existence of HIV and how it is spread, without stigmatizing the behaviours that lead to its transmission.
- They also need to facilitate discussion about an individual or community's own vulnerability, and how to reduce it.
- This involves dissipating fear and prejudice against people who are already living with HIV/AIDS
- Successful programmes impart knowledge, counter stigma and discrimination, create social consensus on safer behaviour, and boost AIDS prevention and care skills.

Strategic response

- Powerful national AIDS plan involving a wide range of actors - government, civil society, the private sector and donors (where appropriate), is a highly valuable starting point.
- The development of a country strategy begins with an analysis of the national HIV/AIDS situation, risk behaviours and vulnerability factors, with the resulting data serving to prioritize and focus initial action.
- It is essential to find out where people in the country are already infected, where they are most vulnerable, and why.
- Effective strategy development then involves drawing on evidence-based methods of HIV/AIDS prevention, care and impact alleviation - "best practices"- recognizing that some of these may be culturally sensitive (e.g. sex education in schools) or require hard political choices (e.g. needle exchange for injecting drug users).
- Effective strategies offer both prevention and care. As illness mounts in the epidemic, so does the need for health care and social support. Care services have benefits that extend beyond caring for sick individuals. They help convince others that the threat of HIV is real and they therefore make prevention messages more credible.

Multisectoral and Multilevel action

- Successful programmes involve multisectoral and multilevel partnerships between government departments and between government and civil society, with AIDS being routinely factored into individual and joint agendas.
- Only a combined effort will "mainstream" AIDS and establish it firmly on the development agenda.
- Multisectoral and multilevel partnerships make sense for all stakeholders.
- Government sectors and businesses are affected in multiple ways by a serious epidemic and hence have an important stake in participating in AIDS prevention, care and support at all levels, but especially in ensuring

sustained, large-scale programmes.

Community-based responses

- The eventual outcome of the AIDS epidemic is decided within the community.
- People, not institutions, ultimately decide whether to adapt their sexual, economic and social behaviour to the threat of HIV infection.
- Responses to HIV are in the first instance local: they imply the involvement of people in their homes, neighbourhoods and their workplaces.
- Community members are also indispensable for mobilizing local commitment and resources for effective action.
- In particular, people living with HIV/AIDS must play a prominent role and bring their unique experiences and perspective into programmes, starting from the planning stage.

Social policy reform to reduce vulnerability

- HIV transmission is associated with specific risk-taking behaviour.
- These behaviours are influenced by personal and societal factors that determine people's vulnerability to infection.
- To be effective, risk-reduction programmes must be designed and implemented in synergy with other programmes, which, in the short and long term, increase the capacity and autonomy of those people particularly vulnerable to HIV infection.
- Issues such as gender imbalance and the inability of women to negotiate when, how and with whom they have sex is a social policy issue.
- The chronic poverty of urban households that leads to their eventual breakdown and the migration of children to the street is not an issue that can be easily addressed at a household or community level alone

Long - term and sustained response

- Measurable impact may take four to five years to develop. Therefore, a long-term approach must be taken, which involves building societal resistance to HIV
- Begin with the youngest generation, to reinforce of safer attitudes and behaviour that will gradually fortify a generation against the spread of AIDS, and in time have a significant impact on incidence.
- To begin with, using existing resources, it makes strategic sense to focus on important vulnerable populations and geographic areas where rapid HIV spread takes on the characteristics of an emergency.

Learning from experience

- The last 26 years of HIV prevention and care have led to the development of a rich body of experience and expertise.

Adequate resources

- Reassignment of national priorities must be reflected in a reallocation of budgets.
- Redirecting to AIDS existing project resources already programmed for social funds, education and health projects, infrastructure and rural development is fully justified, as the AIDS epidemic is undermining the very goals of these other investments.

- Including information on HIV/STDs and life skills in a school curriculum has only marginal costs, but the resulting decision-making and negotiation skills may bring about extra benefits such as decline in STDs, unwanted pregnancies and drug use.
- Similarly, boosting the educational and economic opportunities of young girls in rural areas not only reduces HIV transmission by providing alternatives to commercial sex, but also contributes to sustainable rural development and an improvement in the status of women.
- Even though international financial assistance is not always necessary, international assistance is crucial in many poor countries with limited public budgets.

International support for national responses

- Donor assistance to HIV/AIDS has increased substantially over time.
- It has not kept pace with the spread of the epidemic - or even the most basic requirements for HIV programmes of the most affected countries
- However, recent indications from donors are encouraging.
- The donor response to the International Partnership against AIDS in Africa has also been positive.
- In addition, there is increasing recognition that HIV/AIDS is not only a major threat to development, but also a threat to peace-building and human security in Africa.
- Emphasis must be placed on building partnerships between donors and the most-affected countries. In this way a sense of shared responsibility can be created both for improving prevention and care as well as for addressing the formidable, multifaceted development challenges this epidemic presents.

KENYA'S RESPONSE TO THE PANDEMIC

Responses are divided into three phases

Phase 1 (1984-1993)

- 1st HIV case in Kenya – 1984
- Government didn't acknowledge presence of HIV and AIDS
- Government remained silent about pandemic
- There were no government supported mechanisms put in place to respond to the pandemic.
- Government lost valuable time and missed opportunity to deal with the HIV/AIDS before it would spread
- If it would have sounded alarm measures would have been put in place.

Phase 2 (1994 – 1998)

- Civil society started to pressurize the government to set up mechanisms to deal with HIV and AIDS.
- NASCOP – National AIDS and STIs control programme was established and sessional paper No. 4 of 1997 on AIDS in Kenya was developed.
- Paper provided a policy framework and a roadmap within which HIV prevention and control efforts were to be coordinated
- The need for a policy framework was foreseen as a prerequisite to effective leadership in efforts to combat the epidemic.

Phase 3 (1999-date)

- Started on the 25th Nov. 1999 when the president of Kenya declared HIV/AIDS a National disaster.
- Was meant to facilitate the mobilization of resources on emergency measures.
- Government put in place the mechanisms to address HIV/AIDS
- National AIDS control council (NACC) was established under legal notice No.170 of 1999.
- It was put in the office of the president and its Functions included:
 - Supervise all HIV/AIDS activities in Kenya
 - Mobilize resources
 - Formulate and Implement related policies
- Structure were put in place to operationalize the responses from the National level to the grassroots
- At the grassroots constituency AIDS control committee (CACCs) were established and mandated to coordinate HIV/AIDS activities within the constituencies.
- At the District level a technical team was put in place to offer or provide guidance on the operations of CACCs.
- The framework of operation was articulated through:
 - Kenya National AIDS Strategic plan (KNASP) 2000 – 2005
 - Kenya National AIDS Strategic plan (KNASP) 2005/6 – 2009/10
 - Kenya National AIDS Strategic plan (KNASP) 2009/10 – 2012/13

Kenya National AIDS Strategic plan (KNASP) 2000 – 2005

- Plan sets out a multi-sectoral response to the pandemic as jointly agreed by stakeholders within government, civil society, private sector and development partners
- This signified the shift from sectoral response to comprehensive multi-sectoral approach.
- Planned activities were coordinated under Kenya HIV and AIDS disaster response project (KHADREP)
- Each ministry within the government had to establish an AIDS control Unit (ACU) to undertake the mainstreaming of HIV/AIDS activities in all its core functions.
- In the new structure, constituency AIDS control committees were the focal points for spear leading the fight against the pandemic at grassroots level
- CACCs were designed to emphasize community- based activities through CBOs, FBOs and individuals
- According to the strategic plan CACCs were to operate under five components namely
 - Prevention and advocacy
 - Treatment, continuum of care and support
 - Institutional arrangement, government and coordination
 - Monitoring and evaluation (M&E), and research
 - Mitigation of socio-economic impact.

Kenya National AIDS Strategic plan (KNASP) 2005/6 – 2009/10

- Drawing the plan was high participatory in which more than 100

- other stakeholders were involved
- It Carried the theme “Total War on HIV/AIDS (TOWA)
- This indicated a call on action to operationalize the commitment of Kenya Government and all stakeholders including development partners and civil society involved in the fight against HIV/AIDS
- Goal was to reduce the spread of HIV, improve the quality of life the infected and the affected and mitigate the social economic impact of the pandemic.
- TOWA build on the Kenya HIV/AIDS Disaster Response Project (KHADREP) which came to an end in Dec. 2005.
- It gave hope to the continued fight against HIV/AIDS.
- Under TOWA the following vulnerable groups were targeted including:
 - Sexual workers
 - Migrants workers
 - People living with disabilities
 - Workers in small/medium enterprises
 - Micro enterprises
 - Informal sector
- Strategic plan estimated that approximately 65000 Kenyan adults and 25000 children became infected with HIV/AIDS related diseases annually.
- Twice the No. of those children died in 1998.
- The aim of the plan was to ‘reduce the no. of new infection among the vulnerable groups and general population by improving in treatment and care of the infected and affected as well as ensuring access to effective services
- Key priority areas included:
 - Prevention of new infections by reducing the no. of new HIV infections in both vulnerable groups and general public
 - Improvement of the quality of life of people infected and affected by HIV and AIDS by improving treatment and care, protection of the rights and access to effective services for affected and infected.
 - Mitigation of the socio-economic impact of HIV by adapting existing programs and developing innovative responses to reduce it.

Kenya National AIDS Strategic plan (KNASP) 2009/10 – 2012/13

- The strategic emphasis of this plan is to effectively respond to the evidence base and provide coordinated, comprehensive, high-quality combination prevention, treatment and care services, mobilized and strengthened of communities for ‘AIDS competence’ and effective sectoral mainstreaming of HIV.
- It is acknowledged that in order to provide Universal Access to essential services strategic decisions will be needed to prioritize interventions which realize maximum efficiency gains and optimal progress towards the expected results.
- Under KNASP III, by 2013, the following four impact results will be achieved:
 - Number of new infections reduced by at least 50%
 - AIDS- related mortality reduced by 25%
 - Reduction in HIV related morbidity and

- Reduce socio-economic impact of HIV and AIDS at household and community level.
- At the outcome level this strategic plan aims to achieve:
 1. Reduce risk behavior among the general, infected, most-at-risk and vulnerable populations
 2. Proportion of eligible PLWHIV on care and treatment increased and sustained
 3. Health systems deliver comprehensive HIV services
 4. HIV mainstreamed in sector-specific policies and sector strategies
 5. Communities and PLWHIV networks respond to HIV within their local context;
 6. KNASP III stakeholders aligned and held accountable for results.
- KNASP III will achieve the above impact results and outcome through implementation of the following four strategies:
 - Provision of cost effective prevention, treatment, care and support services, informed by an engendered rights-based approach, to realize Universal Access.
 - HIV mainstreamed in key sectors through long- term programming addressing both the root causes and effects of the epidemic
 - Targeted, community-based programmes supporting achievement of Universal Access and social transformation for an AIDS competent society
 - All stakeholder coordinated and operating within a nationally – owned strategy and aligned results framework, grounded in mutual accountability, gender, equality and human rights

SOME OF THE STRATEGIES ADOPTED BY THE KENYAN GOVERNMENT TO FIGHT THE SPREAD OF HIV/AIDS

- **Public educational campaigns**
 - The government through its state owned media has set up sensitization programmes to try and educate the public on the dangers of the disease and also advise them to stay healthy.
 - This is done through plays; poetry and reality show programs where HIV/AIDS individuals take the opportunity to air their views and encourage others to take measures to avoid contracting the virus.
 - The government has also increased creating awareness campaigns on AIDS prevention using billboards, posters, public lectures, pamphlets, performing AIDS groups.
 - Sensitize people through community barazas where government officials get the chance to give out the much needed information on the prevention of AIDS.
- **HI V/AIDS seminars and workshops**
 - Aimed at strengthening prevention activities.
 - People are educated and enlightened by professionals on the ways of contracting the virus and the consequences of the disease.
- **Mainstreamed HI V/AIDS lessons in formal education system**

- HIV/AIDS has become a core unit that is studied in primary schools, secondary schools, middle level colleges and universities.
- Students gain knowledge on the mode of transmission, prevention and control.
- This has helped in the reduction of spread of HIV since most sexually active Kenyans, the youths are taught about the dangers of casual sexual behaviour and unprotected sexual relations.
- **Destigmatization campaigns**
 - Done through awareness campaigns and education - programmes to reduce stigma.
 - This has encouraged free talk about AIDS and thus created awareness amongst Kenyans.
- **Provision of treatment to HI V/AIDS patients**
 - The government plays a role in availing treatment to HIV/AIDS patients.
 - It provides free or subsidizes ARV drugs and other health services to people suffering from HIV/AIDS.
 - It has taken the initiative to help prevent mother to child transmission. HIV positive mothers are given antiretroviral drugs during pregnancy and at delivery this includes AZT which helps in the reduction of the viral load.
- **Provision of VCT centers**
 - The government has established and opened VCT centers all over the country. VCT services are offered free in most government health facilities.
- **Discouragement of detrimental socio-cultural practice**
 - The government in conjunction with NGO's is trying to fight socio-cultural practices that increase the risk of contracting HIV/AIDS.
 - It is at the forefront of trying to eradicate practices such as; Female Genital Mutilation (FGM), unsafe circumcision as is practiced traditionally, wife inheritance and early marriages.
- **Gender advocacy**
 - The government is also advocating for gender equality and thus is teaching women on their basic rights and has enacted a sexual abuse bill to protect women against sexual abuse.
 - It has enhanced laws against violence on women and other vulnerable groups in the society including HIV/AIDS individuals to protect them from victimization.
- **Poverty eradication**
 - The government has been at the forefront in trying to eradicate poverty.
 - It has started constituency development fund through which constituencies throughout the country receive funds from the central government and channel them to projects that help elevate the living standards of the local people by creating income-generating activities.
 - It has also allowed formation and operation of NGOs which help people at the grass root fight poverty.

SEXUALLY TRANSMITTED DISEASES AND INFECTIONS

MYTHS OF STDs

(True or False)

- Most people with an STD experience painful symptoms.
- Birth control pills prevent the spread of STDs.
- Douching will cure an STD. (a stream of water directed against a part of the body or into a cavity for hygienic or therapeutic purposes)
- Abstinence is the best way to prevent STDs.
- If you get an STD once, and are treated, you can't get it again.
- A person does not need to see a doctor if she/he notices sores on his/her genitals once, but then they go away.
- Condoms help prevent the spread of STDs

(How well do you know the 15 people you had sex with last night?)

PUBLIC HEALTH AND HYGIENE

Public health can be defined as the protection and the improvement of health of the entire populations through community wide action, primarily by governmental agencies. Public health work deals with the assessment of health status of a community. The goals of public health are comparable to those of HIV/AIDS education and they include:-

1. To prevent human disease, injury, and disability
2. Protect people from environmental health hazards
3. Promote behaviors that lead to good physical and mental health
4. Educate the public about health; and assure availability of high-quality health services

Therefore public health programs and HIV/AIDS education complement one another. Most people think of public health workers as physicians and nurses, but a wide variety of other professional work in the public health sector including; veterinarians, sanitary engineers, microbiologists, laboratory technicians, statisticians, economists,

administrators, attorneys, industrial safety and hygiene specialists, psychologists, sociologists, and educators.

Public health workers may engage in activities such as inspecting and licensing restaurants; conducting rodent and insect control programs; and checking the safety of housing, water, and food supplies. In assuring overall community health, public health officials also act as advocates for laws and regulations such as drug licensing or product labeling requirements. Some public health officials are epidemiologists, who use sophisticated computer and mathematical models to track the incidence of communicable diseases and to identify new diseases and health trends. Others conduct state-of-the-art medical research to find new prevention and treatment methods.

Hygiene is defined as the science dealing with the preservation of health or the practice or principles of cleanliness. In the public domain, public health officers mainly manage this practice.

Public health programs

Public health programs may include:-

Vaccination:

This is the deliberate process of making the body resistant to a specific disease by using a vaccine (a suspension or a product of an infectious agent that is used to produce active immunity). Vaccination programs [protect people against diseases such as measles, mumps, polio, diphtheria and other childhood infectious diseases. When small outbreaks of infectious disease threaten to grow into epidemics, public health officials may initiate new vaccination programs.

Several infectious diseases have been virtually eradicated through immunization. By 1979, a worldwide vaccination program had eliminated smallpox, a viral disease once responsible for more than 2 million deaths a year. Poliomyelitis, commonly known as polio, has been virtually eliminated from most developed nations of the world, and the incidence of tetanus, whooping cough, and diphtheria has been drastically reduced worldwide through immunization.

Rural and urban health

clinics:

Public health agencies operate local; clinics that provide free or reduced cost medical services to individuals, especially infants and children, pregnant and nursing women, people with drug abuse problems, physical disabilities, and other conditions. These clinics provide prenatal and pediatric care for children who have no regular access to medical care.

Public health clinics routinely screen for a number of infectious diseases, such as sexually transmitted infections (STI) and diseases (STD), and may provide free treatment if patients test positive. Each clinic tracks the incidence of certain communicable diseases in this area, and reports this information to national and international public health offices. Public health clinics may also track down past sexual partners of STD patients, inform them that they may have been infected with an STD, and urge them to come in to a clinic to be tested.

Disease tracking and

epidemiology:

Public health officers are also involved in epidemiology. Threats to public health concerns change over time and epidemiologists and other officials continuously evaluate epidemiological trends to determine how best to meet future public health needs. For example, recent epidemiological reports show that tuberculosis, an infectious disease believed to be under control just 30 years ago, is now responsible for more deaths worldwide than any other infectious disease, killing more people per year than AIDS and malaria combined. This resurgence is due to new drug-resistance strains of the bacterium that cause tuberculosis. The tuberculosis epidemic, or pandemic, has been declared a global public health emergency, promoting intensive international public health efforts to curb its spread.

Epidemiologists and other public health officials attempt to break the chain of disease transmission by notifying people who may be at risk of contracting an infectious disease. For example, when epidemiologists learn that a restaurant worker has infectious hepatitis, they place announcement in local media, such as radio and newspaper, urging people who ate at the restaurant in recent weeks to be checked for the disease and to seek treatment so that they will no longer risk infecting

others. Public health officials may also ensure that infected people complete treatment programs, so that the diseases are completely eliminated and the patients are no longer carriers of the infection.

Sanitation and pollution

control

Disease causing organisms are often transmitted through contaminated drinking water. The single most effective way to limit water-borne diseases is to ensure that drinking water is clean and not contaminated by sewage. In many parts of the world, public health officials establish sewage disposal and solid waste disposal systems, and regularly test water supplies to ensure they are safe.

Many diseases such as hepatitis A and these caused by bacteria are transmitted through food. When food is not washed or thoroughly cooked, or when food is stored at temperatures that are hospitable to disease-causing organisms, people who eat the food are subject to infection. Public health programs establish and enforce laws for safe food storage and preparation. For example, in most nations, food processing plants, restaurants, and grocery stores are legally required to follow strict food-safety guidelines established by public health officials.

Public health officials also establish and oversee programs to control flies, rodents, and other animals that spread disease-causing microbes.

Environmental pollution is another preventable cause of disease and disability and in most countries public health officials address the adverse health effects of air and water pollution. Public health officials may also work in conjunction with pollution control organizations to establish and enforce pollution limits and advise the general population when pollution levels exceed safe limits.

Medical

research

Another component of public health is scientific and medical research. Cadres of doctors and scientists work in laboratories to establish new ways to prevent, diagnose, treat, and cure diseases and disability. They also investigate the safety and effectiveness of existing pharmaceuticals and treatment programs and test the safety of hundreds of the products that we use every day, such as new food products, household cleaners, and nonpolluting forms of gasoline. Scientists and doctors

employed by the government conduct some biomedical research in public health facilities to find better ways to protect the human health.

Public education campaigns

Many diseases are preventable through health living, and a primary public health goal is to educate the general public on how to prevent the noninfectious diseases. Public health campaigns teach people about the value of avoiding smoking, getting treatment for high blood pressure, avoiding foods high in cholesterol and fat, and maintaining a healthy body weight. Other campaigns educate the public on ways to prevent birth defects, such as abstaining from alcohol during pregnancy to prevent fetal alcohol syndrome.

Health promotion also encourages people to take advantage of early diagnostic tests that can make the outcome of disease more favorable (Bres, 1986). Regular mammograms encourage early detection of breast cancer, for instance, increasing the chances of cure. Detection and proper treatment of high blood pressure reduces the risk of stroke, the leading cause of permanent disability in older people.

Accidents, particularly automobile accidents, pose a major threat to public health, and officials have undertaken campaigns to reduce the number of automobile accidents by encouraging seat belt use and discouraging drinking and driving.

SEXUALLY TRANSMITTED DISEASES

STDs were formerly referred to as venereal diseases. They are diseases and infections which are capable of being spread from person to person through:

- Sexual intercourse
- Non-sexual ways and
- Drugs

Sexual activities that can transfer infections include:

- Oral sex
- Vaginal sex
- Anal sex
- Digital sex
- Skin-to-skin contact for some infections

Infections can be transferred through the exchange of bodily fluids like:

- Blood
- Semen
- Vaginal secretions
- Saliva
- Breast milk
- Fluid in sores or blisters
- Urine

Symptoms of STD and STI infection

- Sores (either painful or painless)
- Blood in urine
- Burning sensation when urinating
- Rashes
- Itching
- Bumps
- Warts
- Unusual discharge

Types of Sexually Transmitted Infections

Bacterial

- Chlamydia
- Gonorrhea
- Syphilis

Viral

- HPV (Genital Warts)
- HIV
- Herpes
- Hepatitis B

Parasitic

- Pubic Lice (“crabs”)
- Trichomoniasis

CHLAMYDIA

- The **most** common bacterial STI
- It is caused by bacteria called Chlamydia trachomatis
- It can infect both men and women
- Greatest number of infections found in people 15 to 24 years old
- Women can get chlamydia infections in the cervix, rectum, or throat.

- Men can get chlamydia infections in the urethra (inside the penis), rectum, or throat.
- Untreated, it can affect the cervix and urethra, and occasionally the rectum, throat and eye
- Can be treated with antibiotics

Symptoms

- Around 70% percent of women and 50% of men with chlamydia have no symptoms
- When symptoms do occur, they might only appear several weeks after initial exposure to the bacteria
- Chlamydia is typically more serious for women than for men, but women are also less likely than men to have symptoms

Female symptoms:

- Vaginal bleeding after intercourse or between menstrual periods
- Vaginal discharge
- Pain in the abdomen or in the lower back
- Pain during intercourse



Male symptoms:

- Itchy urethra
- Clear, watery or milky discharge from the penis
- Testicular pain or swelling



Both female and male symptoms:

- Pain or burning while urinating

- Pain, itching, bleeding, and/or mucus discharge of the rectum (for chlamydia in the anus)
- Redness, itching, and/or discharges of the eyes (for chlamydia in the eyes)
- Sore throat, cough, swollen lymph nodes, and/or fever (for chlamydia in the throat)

Complications

If left untreated, chlamydia can cause serious health complications:

- In women, chlamydia can spread from the cervix to the uterus and fallopian tubes, an infection called Pelvic Inflammatory Disease (PID). This can then lead to chronic pelvic pain, ectopic pregnancies, and infertility.
- In men, chlamydia can cause inflammation of the testicles, prostate and scrotum. It can also cause infertility in rare cases.
- Chlamydia can also cause another form of STI called lymphogranuloma venereum, also known as LGV or venereal disease. LGV can cause ulcerating sores or lumps inside or outside of the genitals.
- For pregnant women, chlamydia can also cause miscarriage, preterm birth and low birth weight. The infection can also be passed from mother to child during birth, causing an eye infection or even pneumonia.
- If left untreated, chlamydia can cause rashes, sores, and joint pain in both men and women.

Diagnosis

- Swabs can be used to test the cervix, urethra, vagina, rectum, nose, throat, and eyes (depending on where the infection is thought to be)
- A urine sample is preferred for women not otherwise needing a pelvic exam
- A blood test is only useful for infants less than 3 months of age.

Treatment

- Uncomplicated genital infections can be treated with Penicillin as the drug of choice taken as a single dose or several doses over the course of one week
- Sexual partners who have had contact with an infected person within 60 days of diagnosis, or whomever is your most recent sexual partner if it has been longer than 60 days, require testing and treatment
- Anyone treated for chlamydia should be re-tested 6 months afterwards
- Complicated chlamydial infections (for example, pelvic inflammatory disorder, neonatal infections, or epididymitis) usually require a longer course of treatment and may require hospitalization for treatment with IV antibiotics

Prevention

- Using condoms can help prevent the spread of chlamydia. Condoms and dental dams can also be used for protection during oral sex.

GONORRHEA

- It is the 2nd most common bacterial STI
- It is a sexually transmitted disease (STD) caused by *Neisseria gonorrhoeae* bacteria.
- It is a gram negative bacteria
- It is very sensitive
- Can easily be destroyed by drying
- Can also be destroyed by any weak detergent
- Most common in people aged 15 to 29
- It often affects the urethra, rectum or throat. In females, gonorrhea can also infect the cervix.
- Gonorrhea can also spread to the blood and cause a life-threatening infection, which is marked by arthritis, tendon inflammation, and skin rash.

Risk factors for gonorrhea include:

- A younger age (sexually active people under 25 are at greatest risk)
- Multiple sex partners
- Inconsistent condom use
- Having had a past gonorrheal infection
- Having had other STDs in the past

Development stages

- Acute stage
- Chronic stage

Gonorrhea Symptoms

Symptoms in women include:

In women, gonorrhea often doesn't cause symptoms. If it does, symptoms are often so mild they are misdiagnosed as a urinary tract infection.

- Strong-smelling vaginal discharge
- Pain and burning while passing urine
- urinating more often than usual
- Pain during vaginal sex
- Sore throat
- Fever and severe lower abdominal pain, if the infection has spread to the fallopian tubes and stomach area
- Rectal gonorrhea can cause anal discharge, itching, pain, bleeding, as well as painful bowel movements.
- Gonorrhea in the throat can cause a sore throat, but it usually doesn't lead to any other symptoms. However, in rare cases, it can be passed on to other people through kissing and oral sex.

Symptoms in men include:

- White, yellow, or green discharge from the penis when urinating
- Pain and burning while urinating
- urinating more often than usual

- Red or swollen urethral opening
- Sore throat
- Rectal gonorrhea can cause anal discharge, itching, pain, bleeding, as well as painful bowel movements.
- Gonorrhea in the throat can cause a sore throat, but it usually doesn't lead to any other symptoms. However, in rare cases, it can be passed on to other people through kissing and oral sex.



Symptoms in Babies

- In addition to sexual transmission, gonorrhea can be passed from mother to child during pregnancy. This usually doesn't happen while the baby is in the womb (as the fetal tissues provide protection against infection). Rather, the transmission can occur during delivery when the baby is exposed to the mother's genital secretions.
- When this happens, the bacteria may be transferred to the newborn's eyes and cause ophthalmia neonatorum, a form of conjunctivitis characterized by eye redness, pain, and discharge. The condition is largely avoided today due to the routine administration of an antibacterial eye ointment in all babies at the time of birth.
- If the infection isn't averted, symptoms will usually develop within two to five days. In addition to conjunctivitis, scalp infection, respiratory inflammation, vaginitis, and urethritis are common. Complications include vision loss, meningitis, septic arthritis, and blindness.

Complications

- If left untreated, gonorrhea can lead to serious complications affecting the female and male reproductive tract and, less commonly, the joints, skin, heart, and central nervous system.

Effects of Gonorrhea

Untreated gonorrhea can cause serious and permanent health problems in both women and men.

- **In women**, gonorrhea is a common cause of Pelvic Inflammatory Disease (PID). Women with PID do not necessarily have symptoms. PID can damage the fallopian tubes enough to cause infertility. PAMF recommends yearly chlamydia testing of all sexually active women age 25 or younger.

- Gonorrhea can also cause arthritis.
- **In men**, gonorrhea can cause epididymitis, a painful condition of the testicles that can lead to infertility if left untreated.
- **Gonorrhea can spread to the blood or joints.** This condition can be life threatening. In addition, people with gonorrhea can more easily contract HIV.

Diagnosis

There are three tests commonly used to diagnose gonorrhea, each of which has its appropriate use and limitations:

- **Nucleic acid amplification test (NAAT)** is genetic test recommended in the first-line diagnosis of uncomplicated gonorrhea of the cervix/vagina or penis. While the NAAT is extremely fast and accurate, it is not approved for the diagnosis of rectal or pharyngeal gonorrhea.
- **Bacterial cultures** can be used to diagnose gonorrhea of the genitals, rectum, throat, and eyes. While useful, a culture is a specialized, non-automated test that can be interfered with by lab error and improper sample collection.
- **Gram staining** is an old form of diagnosis in which dyes are used to differentiate bacteria under the microscope. While the procedure can render a definitive result in men, it is less able to do so in women.

Treatment

- Penicillin is the drug of choice given in a single dose

Preventing gonorrhea

Gonorrhea and other STIs can be successfully prevented by using appropriate contraception and taking other precautions, such as:

- using male condoms or female condoms every time you have vaginal sex, or male condoms during anal sex
- not sharing sex toys, or washing them and covering them with a new condom before anyone else uses them
- treatment of infected people

SYPHILIS

- Syphilis is an infection by the *T. pallidum* bacteria
- *T. pallidum* bacteria is spiral in shape
- It has 8-15 spirals
- The spirals help the organism to pass through cracks on the skin or mucous membrane during sex into the body



- It is transmitted by direct contact with a syphilitic sore on the skin, and in mucous membranes.



- A sore can occur on the vagina, anus, rectum, lips, and mouth.
- It is most likely to spread during oral, anal, or vaginal sexual activity. Rarely, it can be passed on through kissing.
- The first sign is a painless sore on the genitals, rectum, mouth, or skin surface. Some people do not notice the sore because it doesn't hurt.
- These sores resolve on their own, but the bacteria remain in the body if not treated.
- The bacteria can remain dormant in the body for decades before returning to damage organs, including the brain.
- Syphilis is a sexually transmitted infection (STI) that can worsen severely without treatment.
- Syphilis will not come back after treatment, but it can recur with further exposure to the bacteria.
- Having syphilis once does not prevent a person from contracting it again.
- Women can pass syphilis to their unborn child during pregnancy, with potentially fatal consequences.
- The infection can lie dormant for up to 30 years before returning as tertiary syphilis.

TYPES OF SYPHILIS

Acquired syphilis

- Adults get infected through sex while children get the disease through kissing

Congenital syphilis

- Babies born to women who have syphilis can become infected through the placenta or during birth.
- Most newborns with congenital syphilis have no symptoms, although some experience a rash on the palms of their hands and the soles of their feet.
- Later symptoms may include deafness, teeth deformities and saddle nose where the bridge of the nose collapses.

Transmission

- The most common route of transmission is through contact with an infected person's sore during sexual activity.
- The bacteria enter your body through minor cuts or abrasions in your skin or mucous membranes.
- Syphilis is contagious during its primary and secondary stages, and sometimes in the early latent period.
- Less commonly, syphilis may spread through direct unprotected close contact with an active lesion (such as during kissing)
- Through an infected mother to her baby during pregnancy or childbirth (congenital syphilis).
- Syphilis can't be spread by using the same toilet, bathtub, clothing or eating utensils, or from doorknobs, swimming pools or hot tubs.

Risk factors

Increased risk of acquiring syphilis can be due to:

- Engage in unprotected sex
- Have sex with multiple partners
- Are a man who has sex with men
- Are infected with HIV, the virus that causes AIDS

SYMPTOMS

STAGES

Syphilis develops in stages, and symptoms vary with each stage. But the stages may overlap, and symptoms don't always occur in the same order. You may be infected with syphilis and not notice any symptoms for years.

Primary syphilis (3 days – 3 months)

- The first sign of syphilis is a small sore, called a chancre.
- The sore appears at the spot where the bacteria entered the body. While most people infected with syphilis develop only one chancre, some people develop several of them.
- The chancre usually develops about three weeks after exposure.
- Many people with syphilis infection may not notice the chancre because it's usually painless, and it may be hidden within the vagina or rectum.

- The chancre heals on its own within three to six weeks.



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Secondary syphilis (2 – 24 weeks)

- Within a few weeks of the original chancre healing, the person experiences a rash that begins on the trunk but eventually covers the entire body even the palms of your hands and the soles of the feet.
- This rash is usually not itchy and may be accompanied by wart like sores in the mouth or genital area.
- Some people also experience hair loss, muscle pain, fever, sore throat and swollen lymph nodes.
- These signs and symptoms may disappear within a few weeks or repeatedly come and go for as long as a year.

Latent syphilis

- If the person is not treated for syphilis, the disease moves from the secondary to the latent (hidden) stage, where the person has no symptoms.
- The latent stage can last for years. Signs and symptoms may never return, or the disease may progress to the tertiary (third) stage.

Tertiary (late) syphilis

- About 15 to 30 percent of people who get infected with syphilis and don't get treatment develop complications known as tertiary (late) syphilis.
- Untreated syphilis may lead to tertiary syphilis, which can damage:
 - The cardiovascular system (heart & blood vessels)
 - The neurological system
 - Other major organs of the body nerves, eyes, liver, bones and joints
 - Complications may lead to death
- These problems may occur many years after the original, untreated infection.

Complications

- Without treatment, syphilis can lead to damage throughout the body.
- Syphilis also increases the risk of HIV infection and, for women, can cause problems during pregnancy.
- Treatment can help prevent future damage but can't repair or reverse damage that's already occurred.

Small bumps or tumors

- Called gummas, these bumps can develop on the skin, bones, liver or any other organ in the late stage of syphilis. Gummas usually disappear after treatment with antibiotics.

Neurological problems

Syphilis can cause a number of problems with your nervous system, including:

- Stroke
- Meningitis
- Hearing loss
- Visual problems
- Dementia
- Loss of pain and temperature sensations
- Sexual dysfunction in men (impotence)
- Bladder incontinence
- Sudden, lightning-like pains

Cardiovascular problems

- These may include bulging (aneurysm) and inflammation of the aorta your body's major artery and of other blood vessels. Syphilis may also damage heart valves.

HIV infection

- Adults with sexually transmitted syphilis or other genital ulcers have an estimated two to fivefold increased risk of contracting HIV.
- A syphilis sore can bleed easily, providing an easy way for HIV to enter your bloodstream during sexual activity.

Pregnancy and childbirth complications

- If a mother is pregnant, she can pass syphilis to her unborn baby.
- Congenital syphilis greatly increases the risk of miscarriage, stillbirth or the newborn's death within a few days after birth.

Diagnosis

- syphilis is difficult to diagnose clinically during early infection.
- Confirmation is either through a blood tests or direct visual inspection using dark field microscopy.
- Blood tests are more commonly used, as they are easier to perform.
- Diagnostic tests are unable to distinguish between the stages of the disease.

Treatment

- Penicillin is an effective drug of choice for treatment of syphilis at all stages, it is an antibiotic medication that can kill the organism that causes syphilis.
- When diagnosed and treated in its early stages, syphilis is easy to cure.

Prevention

There is no vaccine for syphilis. To help prevent the spread of syphilis, follow these suggestions:

- **Abstain or be monogamous.** The only certain way to avoid syphilis is to forgo having sex. The next-best option is to have mutually monogamous sex with one partner who is uninfected.
- **Use a latex condom.** Condoms can reduce your risk of contracting syphilis, but only if the condom covers the syphilis sores.
- **Avoid recreational drugs.** Excessive use of alcohol or other drugs can cloud your judgment and lead to unsafe sexual practices

PUBIC LICE

- Pubic lice, commonly called crabs,
- They are tiny insects found in your genital area.
- They are a different type of louse from head lice and body lice.
- They Measure 1/16 inch (1.6 millimeters) or less, pubic lice received their nickname because their bodies resemble tiny crabs.
- The most common way to acquire pubic lice is through sexual intercourse.
- In children, pubic lice may be found in their eyebrows or eyelashes and can be a sign of sexual abuse. However, it may be possible to catch pubic lice after sharing clothing, bed linens or towels with an infected person.
- Pubic lice feed on your blood, and their bites can cause severe itching.
- Treatment includes applying over the counter creams and lotions that kill the parasites and their eggs.

Symptoms

Symptoms may include intense itching in genital region. Pubic lice can spread to other areas with coarse body hair, including the:

- Legs
- Chest
- Armpits
- Beard or mustache
- Eyelashes or eyebrows, more commonly in children

Transmission

- Pubic lice are most commonly transmitted during sexual activity. You may also acquire pubic lice from contaminated sheets, blankets, towels or clothes.

Risk factors

- People who have other sexually transmitted infections are more likely to also have pubic lice.

Complications

Pubic lice infestations can usually be treated with a louse-killing lotion or gel. However, a pubic lice infestation sometimes leads to complications such as:

- **Discolored skin.** Pale blue spots may develop where pubic lice have been feeding continually.

- **Secondary infections.** If itchy lice bites cause you to scratch yourself raw, these wounds can become infected.
- **Eye irritations.** Children who have pubic lice on their eyelashes may develop a type of pink eye (conjunctivitis).

Prevention

- To prevent pubic lice infestation, one needs to
- Avoid having sexual contact
- Avoid sharing bedding or clothing with anyone who has an infestation.
- Taking a shower daily for general cleanliness
- Decontamination of beddings or clothing from anyone who has an infestation

TRICHOMONIASIS

- Trichomoniasis is a sexually transmitted disease (STD).
- Trichomoniasis affects both men and women
- It is caused by a single-celled parasitic organism known as ***Trichomonas vaginalis***.
- It is one of the most common STDs and may be referred to as "trich."
- The parasite is able to live in and around the vagina or inside the penis
- In women, trichomoniasis causes a vaginal infection called vaginitis.
- In men, it infects the urethra, the tube inside the penis that carries sperm and urine.
- The parasite invades the layer underneath the skin and produces an inflammatory reaction.
- The presence of the parasite and the resulting inflammation produces the characteristic itching, pain, discharge, and odor associated with trichomoniasis.
- It is caused by a parasite, can be diagnosed with a physical exam and a microscopic analysis, and it is treatable with Flagyl (metronidazole), an antimicrobial.
- Symptoms in women are usually more noticeable than the symptoms in men. Women generally experience symptoms of trichomoniasis within 1 to 4 weeks of initial infection.

Symptoms

- The symptoms of trichomoniasis may begin between several days to a month after infection, and there can even be a delay of several months before symptoms even surface.
- The symptoms include itching, irritation and discharge in women, and pain with urination in men.
- In fact, many people do not have symptoms at all, but can still spread the infection to others.

- Women are more likely than men to experience symptoms if they become infected

Symptoms in Women

The symptoms of trichomoniasis in women include:

- Irritation and itching of the vagina and surrounding area
- foul-smelling vaginal discharge which might be white, gray, yellow or green
- Strong vaginal odor
- Pain with intercourse
- Pain when urinating
- Trichomoniasis can also negatively affect the outcome of a pregnancy. Pregnant women infected with the parasite are more likely to have a pre-term birth and are more likely to give birth to a low birth weight baby.

Symptoms in Men

Most men with trichomoniasis don't have any symptoms. When they do, their symptoms are generally mild and include:

- Pain when urinating
- Pain when ejaculating
- Discharge from the penis
- Irritation inside the penis

Transmission

- The infection is sexually transmitted
- Can also be spread by skin-to-skin contact involving the vagina or penis.
- It is not spread by shaking hands, touching, or kissing.

Complications

Pregnant women who have trichomoniasis might:

- Deliver prematurely
- Have a baby with a low birth weight
- Transmit the infection to the baby as he or she passes through the birth canal

Having trichomoniasis also appears to make it easier for women to become infected with HIV.

Diagnosis

- The symptoms of trichomoniasis are somewhat unclear and similar to the symptoms of other skin conditions or other STDs.

Identification of the causative Organism

- For both men and women, samples can be visualized under a microscope.
- A polymerase chain reaction (PCR) test, which can detect the genetic components of the parasite, may be also used in diagnosing the infection.
- A swab of the vagina, urethra (tube for urine), or cervix provides a small sample of vaginal secretions.
- The parasite that causes trichomoniasis is not always visible on a wet mount

- The physical examination is rarely abnormal in men who have trichomoniasis infection.

Treatment

- The treatment of trichomoniasis is generally effective if the person is in good health. It is generally treated with a single oral dose of Flagyl (metronidazole) 2 grams or Tindamax (tinidazole) 2 grams.
- If treated and the infection did not resolve, the person may need a prescription for 500 mg of metronidazole taking twice per day for seven days.
- The person should not drink alcohol for several days when using these medications as the combination can induce a severe physical reaction characterized by high blood pressure, shortness of breath, nausea, and vomiting.
- After using the medications, it is recommended that the person abstains from unprotected sexual activity for a week and until the symptoms completely clear.
- This is because it takes approximately one week for the medication to get rid of the infection.
- It is also important that the person's sexual partners be treated for trichomoniasis at the same time to reduce the risk of reinfection.

Prevention

- Practise safer sex.
- No sex until antibiotic treatment is completed and your usual sexual partner has completed treatment.
- All sexual partners need to be contacted, tested and treated, if indicated. Even if partners have no symptoms they may be able to transmit infection to other sexual partners.
- Testing to exclude other sexually transmitted infections is advisable.

BACTERIAL VAGINOSIS - (BV):

- Not strictly an STD as it is not transmitted via sexual intercourse. However, it can be exacerbated by sex and is more frequently found in sexually active women than those who have never had intercourse.
- It is caused by an imbalance in the normal healthy bacteria found in the vagina and although it is relatively harmless and may pass unnoticed, it can sometimes produce an abundance of unpleasant fishy smelling discharge.
- A woman can't pass BV to a man, but it is important she receives treatment as BV can occasionally travel up into the uterus and fallopian tubes and cause a more serious infection.
- Treatment for BV consists of applying a cream to the vagina or taking antibiotics.

BALANITIS:

- Often referred to as a symptom of infection, and not necessarily

an infection in its o right.

- It is not strictly an STD but more of a consequence of sexual activity. It only affects men and usually presents itself as an inflammation of the head of the penis, and is more common in men who are not circumcised.
- It can be caused through poor hygiene, irritation due to condoms and spermicides, using perfumed toiletries and by having thrush.
- It can be prevented through not using certain toiletries and by washing under the foreskin.
- Treatment can consist of creams to reduce inflammation and antibiotics if necessary.

EPIDIDYMITIS

- Refers to inflammation of the epididymis, a tube system above the testicles where sperms are stored.
- It is not always the result of an STD, but if it is, it is usually due to the presence of a chlamydial infection or gonorrhoea.
- Symptoms will present themselves in the form of swollen and painful testicles and scrotum.
- The best way of preventing it is to use condoms during intercourse, as this is the most effective way to prevent chlamydial and gonorrhoea.
- Treatment usually involves treating the underlying infection with antibiotics.

GUT INFECTIONS:

- Two of the most common infections are amoebiasis and giardiasis. They are protozoan infections, and when they reach one's gut they can cause diarrhoea and stomach pains.
- Gut infections can be passed on when having sex with someone who is infected, especially during activities that involve contact with faeces, such as rimming and anal sex.
- Infection can be prevented through using condoms, dental dams or latex gloves.
- Sex toys should be thoroughly cleaned after use and hands washed after any contact with faeces.
- Anti-diarrhoea treatments should be enough to treat most infections.

MOLLUSCUM:

- This is a skin disease caused by the *Molluscum Contagiosum Virus*. It appears as small bumps on the skin, and can last from a couple of

weeks to a few years.

- Molluscum cause small, pearl-shaped bumps the size of a freckle on the thighs, buttocks, genitalia and sometimes the face.
- They are passed on through body contact during sex and through skin-to-skin contact.
- Transmission can be prevented by using condoms, by avoiding skin-to-skin contact with someone who is infected and by not having sex until they have been treated.
- In most cases molluscum do not need treatment and will disappear over time.

NON-SPECIFIC URETHRITIS (NSU):

- It is an inflammation of a man's urethra. This inflammation can be caused by several different types of infection, the most common being chlamydial infection.
- NSU may be experienced months or even in some cases years after exposure.
- The symptoms of NSU may include pain or a burning sensation when passing urine, a white/cloudy fluid flow from the tip of the penis that may be more noticeable first thing in the morning, frequent need to pass urine.
- Often there may be no symptoms, but this does not mean that one cannot transmit the infection on to sexual partner(s).

SCABIES:

- Scabies caused by a parasitic mite can get under the skin and cause itching.
- The mites are very small and cannot be seen by the naked eye, and many people do not know they have them.
- They can cause itching, and this can start between 2 to 6 weeks after infection.
- Signs of infection can be red lines under the skin of the hands, buttocks and genitals.
- The most common way of becoming infected is through body contact during sexual intercourse and through sharing towels and clothes with someone who is infected.
- There is no effective way to prevent one from becoming infected, though one can prevent others becoming infected by washing clothes and bedding on a hot wash.
- Lotions can be bought from pharmacies and applied to the body to kill off the parasites.

CANDIDIASIS (THRUSH):

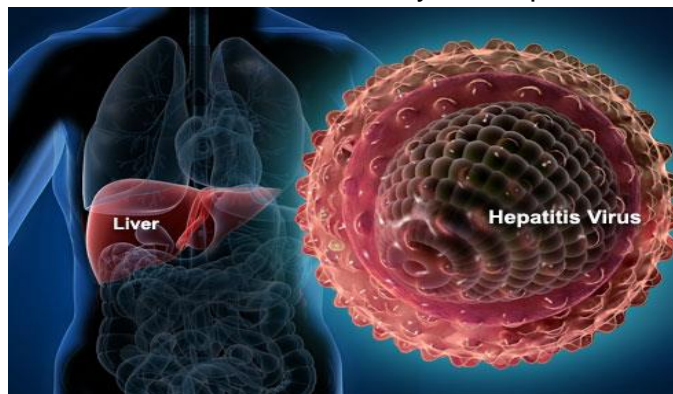
- The causative agent is a yeast, *Candida albican* which a commensal of the alimentary canal and the vagina.
- Males are infected by females during sexual intercourse and also from the patient's own commensals especially the rectum and finger nails.
- The yeast generally lives on the skin and is normally kept in check by harmless bacteria. Under favourable conditions i.e warm moist environment, the yeast multiplies and can cause itching, swelling, soreness and discharge in both men and women.
- Women may experience a thick white discharge and pain when passing urine.
- Men may experience the same discharge in the penis and difficulty pulling back the foreskin.
- Thrush can be passed on when having sex with someone who is infected, but also if one wears too tight nylon or lycra clothes or if one is taking certain antibiotics

CHANCROID (SOFT SORE):

- It is a genital ulcer caused by a bacterial infection due to *Haemophilus ducreyi*.
- The incubation period is week, and the ulcers are normally multiple.
- They are painful ulcers which respond to treatment with sulphonamides.

HEPATITIS B

- Hepatitis B is the only human representative of a family of DNA viruses (Herpadnaviradae)
- Hepatitis B is a serious liver infection caused by the hepatitis B virus (HBV).



- For some people, hepatitis B infection becomes chronic, meaning it lasts more than six months.

- Having chronic hepatitis B increases the person's risk of developing liver failure, liver cancer.
- Most adults with hepatitis B recover fully, even if their signs and symptoms are severe.
- Infants and children are more likely to develop a chronic (long-lasting) hepatitis B infection.
- A vaccine can prevent hepatitis B, but there's no cure.
- Once infected, taking certain precautions can help to prevent spreading the virus to others.

Symptoms

Signs and symptoms of hepatitis B range from mild to severe. They usually appear about one to four months after infection, although they can be seen as early as two weeks post infection. Some people, usually young children, may not have any symptoms.

Hepatitis B signs and symptoms may include:

- Abdominal pain
- Dark urine
- Fever
- Joint pain
- Loss of appetite
- Nausea and vomiting
- Weakness and fatigue
- Yellowing of the skin and the whites of eyes (jaundice)

Transmission

- The virus is passed from person to person through blood, semen or other body fluids.
- **Sexual contact.** unprotected sex with someone who is infected. The virus can pass through blood, saliva, semen or vaginal secretions.
- **Sharing of needles.** HBV easily spreads through needles and syringes contaminated with infected blood. Sharing IV drug paraphernalia puts one at high risk of hepatitis B infection.
- **Accidental needle sticks.** Hepatitis B is a concern for health care workers and anyone else who comes in contact with human blood.
- **Poor sanitation.** Especially on eating utensils such as spoons and cups if not properly washed
- **Mother to child.** Pregnant women infected with HBV can pass the virus to their babies during childbirth. However, the newborn can be vaccinated to avoid getting infected in almost all cases. Talk to your doctor about being tested for hepatitis B if you are pregnant or want to become pregnant.
- It does not spread by sneezing or coughing.

Acute vs. chronic hepatitis B

Hepatitis B infection may be either short-lived (acute) or long lasting (chronic).

- **Acute hepatitis B infection** lasts less than six months. Your immune system likely can clear acute hepatitis B from your body, and you should recover completely within a few months. Most people who get hepatitis B as adults have an acute infection, but it can lead to chronic infection.
- **Chronic hepatitis B infection** lasts six months or longer. It lingers because your immune system can't fight off the infection. Chronic hepatitis B infection may last a lifetime, possibly leading to serious illnesses such as cirrhosis and liver cancer.

Complications

Having a chronic HBV infection can lead to serious complications, such as:

- **Scarring of the liver (cirrhosis).** The inflammation associated with a hepatitis B infection can lead to extensive liver scarring (cirrhosis), which may impair the liver's ability to function.
- **Liver cancer.** People with chronic hepatitis B infection have an increased risk of liver cancer.
- **Liver failure.** Acute liver failure is a condition in which the vital functions of the liver shut down. When that occurs, a liver transplant is necessary to sustain life.
- **Other conditions.** People with chronic hepatitis B may develop kidney disease or inflammation of blood vessels.

Prevention

The hepatitis B vaccine is typically given as three or four injections over six months.

The hepatitis B vaccine is recommended for:

- Newborns
- Children and adolescents not vaccinated at birth
- Those who work or live in a center for people who are developmentally disabled
- People who live with someone who has hepatitis B
- Health care workers, emergency workers and other people who come into contact with blood
- Anyone who has a sexually transmitted infection, including HIV
- Men who have sex with men
- People who have multiple sexual partners
- Sexual partners of someone who has hepatitis B
- People who inject illegal drugs or share needles and syringes
- People with chronic liver disease
- People with end-stage kidney disease

Precautions

Other ways to reduce the risk of HBV infection include:

- **Knowing the HBV status of any sexual partner.** Don't engage in unprotected sex unless you're absolutely certain your partner isn't infected with HBV or any other sexually transmitted infection.
- **Use of condoms every time you have sex** especially if you don't know the health status of the other partner.

- **Don't use illegal drugs.** If you use illicit drugs, get help to stop. If you can't stop, use a sterile needle each time you inject illicit drugs. Never share needles.
- **Be cautious about body piercing and tattooing tools.** If you want to get a piercing or tattoo clean the equipment by sterilization before use.
- **Go for hepatitis B vaccine when necessary.** The hepatitis B vaccine is usually given in a series of three injections over a period of six-month.

HERPES

The herpes simplex virus, also known as HSV, is an infection that causes herpes. Herpes can appear in various parts of the body, most commonly on the genitals or mouth. There are two types of the herpes simplex virus.

- **HSV-1:** Also known as oral herpes, this type can cause cold sores and fever blisters around the mouth and on the face.
- **HSV-2:** This type is generally responsible for genital herpes outbreaks.

The herpes simplex virus is a contagious virus that can be passed from person to person through direct contact. Children will often contract HSV-1 from early contact with an infected adult. They then carry the virus with them for the rest of their lives.

HSV-1

Infection with HSV-1 can happen from general interactions such as:

- eating from the same utensils
- sharing lip balm
- kissing

The virus spreads more quickly when an infected person is experiencing an outbreak. It's also possible to get genital herpes from HSV-1 if someone who performed oral sex had cold sores during that time.

HSV-2

HSV-2 is contracted through forms of sexual contact with a person who has HSV-2. The infections can also spread through contact with a herpes sore.

Signs of herpes simplex infections

People who are infected may not have visible sores or symptoms but they can transmit the virus to others.

Some of the symptoms associated herpes simplex infections include:

- Blistering sores (in the mouth or on the genitals)
- Pain during urination (genital herpes)
- Itching

One may also experience symptoms that are similar to flu such as.

- fever
- swollen lymph nodes
- headaches
- tiredness
- lack of appetite

HSV can also spread to the eyes, causing a condition called herpes keratitis. This can cause symptoms such as eye pain, discharge, and a gritty feeling in the eye.

Diagnosis

Blood tests looking for antibodies to HSV-1 and HSV-2 can help in diagnosis. Especially when there are no sores present.

Treatment

There is currently no cure for this virus. But treatment aims at getting rid of signs and symptoms and also limiting outbreaks using the following medications:

- acyclovir
- famciclovir
- valacyclovir

These medications can help infected individuals reduce the risk of spreading the virus to others and also help to lower the intensity and frequency of outbreaks.

Prevention

- Avoid direct physical contact with people that you do not know.
- Avoid sharing of items that can pass the virus around, such as cups, towels, silverware, clothing, makeup, or lip balm.
- Avoid oral sex, kissing, or any other type of sexual activity
- Wash hands thoroughly with soap and apply medication with cotton swabs on sores reduce chances of infection.

HUMAN PAPILLOMAVIRUS HPV (GENITAL WARTS)

- Genital warts are soft growths that appear on the genitals.
- Genital warts are caused by the human papillomavirus (HPV).
- Human papillomavirus HPV is the most common viral STI.
- There are 30 to 40 strains of HPV that specifically affect the genitals, but just a few of these strains cause genital warts.
- They're a sexually transmitted infection (STI).
- Genital warts can cause pain, discomfort, and itching.
- Men and women who are sexually active are vulnerable to HPV infection.
- Human papillomavirus HPV infection is especially dangerous for women because some types of HPV can also cause cancer of the cervix and vulva.
- Treatment is can be done to manage the infection.
- The Genital warts are not always visible to the human eye.



- They may be very small and the color of the skin or slightly darker.
- The top of the growths may resemble a cauliflower and may feel smooth or slightly bumpy to the touch.
- They may occur as a cluster of warts, or just one wart.
- Genital warts on males may appear on the penis, scrotum, groin, thighs, inside or around the anus
- For females, these warts may appear inside of the vagina or anus, outside the vagina or anus, on the cervix, they may also appear on the lips, mouth, tongue, or throat of the person who has had oral sexual contact with a person who has HPV infection.
- In fact, HPV is so common that the Centers for Disease Control and Prevention (CDC) say that most sexually active people get it at some point.
- However, the virus doesn't always lead to complications such as genital warts. In fact, in most cases, the virus goes away on its own without causing any health problems.

symptoms of genital warts infection

Symptoms may include:

- Increased vaginal discharge
- itching on the affected area
- bleeding on the affected area
- burning sensation on the affected area
- When they spread or become enlarged, the condition can be uncomfortable or even painful.

Transmission

Genital warts are transmitted through

- Sex and sexual activities, including oral, vaginal, digital and anal sex.
- skin-to-skin contact

Risk factors for genital warts

Any sexually active person is at risk of getting HPV. However, genital warts are more common in:

- People who are under the age of 30
- People who smoke
- People who have a weak immune system
- People who have a history of child abuse and
- Children of a mother who had the virus during childbirth

Complications of HPV

- HPV infection is the main cause of cancer in the cervix.
- It can also lead to precancerous changes to the cells of the cervix, a condition known as dysplasia.
- Other types of HPV may also cause cancer of the vulva, which are the external genital organs of women.
- They can also cause penile and anal cancer.

Diagnosis

If genital warts aren't visible, one or more of the following tests can be done:

- **Vinegar (acetic acid) solution test.** A vinegar solution applied to HPV infected genital areas turns them white. This may help in identifying difficult to see flat lesions.
- **Pap test.** The doctor collects a sample of cells from the cervix or vagina for laboratory analysis. Pap tests can reveal abnormalities that can lead to cancer.
- **DNA test.** This test, conducted on cells from the cervix, can recognize the DNA of the high risk varieties of HPV that have been linked to genital cancers. It's recommended for women of 30 years and older in addition to the Pap test.

In women because warts can occur deep inside a woman's body, doctors may need to do a pelvic examination. They may apply a mild acidic solution, which helps to make the warts more visible.

Treatment

While visible genital warts often go away with time, HPV itself can linger in the skin cells. This means one may have several outbreaks over the course of his or her life. So managing symptoms is important because to avoid transmitting the virus to others. Genital warts can be passed on to others even when there are no visible warts or other symptoms.

Some drugs available for treatments might include:

- Imiquimod (Aldara)
- Podophyllin and podofilox (Condylox)
- Trichloroacetic acid

If visible warts do not go away with time, the person may need minor surgery to remove them or through:

- Electrocautery (burning warts with electric currents)
- Cryosurgery (freezing warts)
- Laser treatments
- Excision (cutting off the warts)

- Injections of some drugs (Interferons)

Prevention

- Abstinence
- Safer Sex practice
- Condoms
- Reduce number of Sex Partners
- HPV Vaccination
- Male Circumcision

DRUG ABUSE

A drug is any substance (other than food that provides nutritional support) that, when inhaled, injected, smoked, consumed, absorbed through the skin, or dissolved under the tongue causes a physiological (and often psychological) change in the body.

- A drug is a chemical which is given to people in order to treat or prevent an illness or disease.
- Drugs are substances that some people take because of their pleasant effects, but which are usually illegal.
- A drug is any chemical substance which when taken into the body can affect one or more of the body's functions.
- For instance, when one feels pain and is given aspirin, the pain reduces or disappears.
- The aspirin modifies how the body works so that the pain is not felt at all.
- Similarly, when one smokes bhang, he experiences changes in the mind for example he may see or hear things that are not there.
- The term drug therefore, includes those substances useful to the body and those that harm the body. They may be legal or illegal.
- The use of narcotic drugs and other substances that harm or threaten the physical, mental, social and economic well-being of the user, his or her family and society at large is referred to as drug abuse or substance abuse.
- Drug and substance abuse is one of the major challenge facing Kenya today and

has implications on political, economic, and social stability of the country

- Drugs and substance abuse has also brought about social economic hardships contributing misery which has increased crime, violence and a drain on human material resources.
- Drug and substance abuse is a silent disaster that claims many lives every year in Kenya.
- There is also a strong link between drug abuse and HIV/AIDS

MODES OF DRUG ADMINISTRATION

- Administered orally - through the mouth
- Administered by injection
- Through inhalation
- Applied directly to the skin
- Inserted in the rectum

SOME OF THE REASONS FOR USING DRUGS INCLUDE

- Pain relief and treatment
- Control emotion
- Relaxation
- tension relief
- boredom relief
- Increase sexual performance
- As sedative to induce sleep

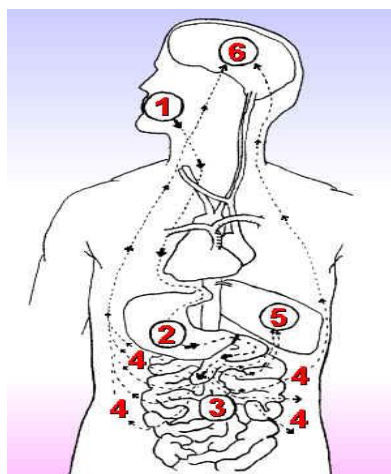
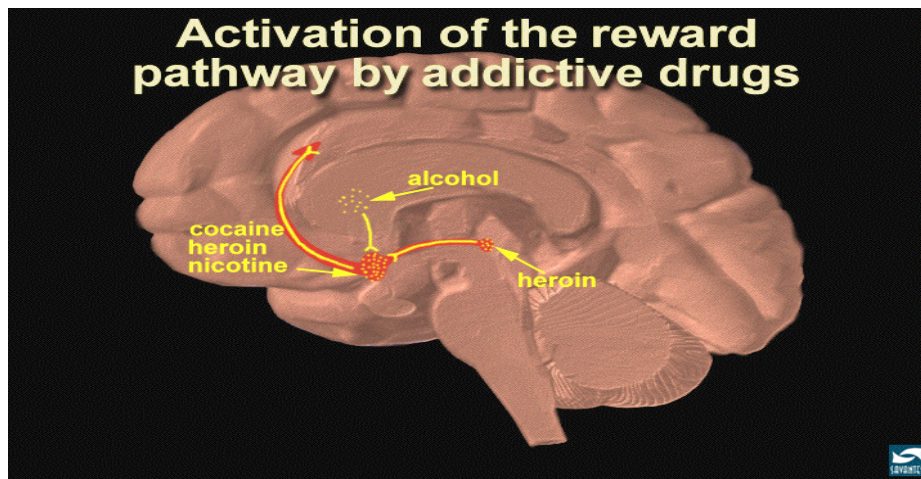
DRUG ABUSE IS CHARACTERIZED BY

- Taking more than the recommended dose of prescription drugs such as depressants without medical supervision, or using government-controlled substances such as marijuana, cocaine, heroin, or other illegal substances.
- Abusing Legal substances, such as alcohol and nicotine,

Abuse of drugs and other substances can lead to physical and psychological dependence

INTOXICATION & DRUNKENNESS

- Eg when one takes Alcohol, the Alcohol goes directly from the digestive system into the blood and within minutes it spreads to the entire body, including the brain.
- The brain gets the highest concentration because it gets more blood than any other part of the body.
- The more the blood the more the alcohol
- Intoxication & drunkenness starts in the brain



1. Mouth
2. Stomach
3. Small Intestine
4. Bloodstream
5. Liver
6. Brain

DRUGS COMMONLY ABUSED IN KENYA

- Tobacco
- Alcohol
- Cocaine
- Marijuana
- Bhang
- Heroin etc

CLASSIFICATION OF DRUGS

- Drugs are classified chemically according to how they affect the brain and the body.
- Common classifications include stimulants, depressants, hallucinogens, and opioids.
- Additionally, drugs are classified based on their medical use and potential for abuse and dependence.
- Drugs can be categorized in a number of ways. In the world of medicine and pharmacology,
- A drug can be classified by its chemical activity or by the condition that it treats. Anticonvulsant medications, for example, are used to prevent seizures, while mucolytic drugs break down mucus and relieve congestion.
- In regards to addiction treatment and rehabilitation, the drug classifications used most often are the following five classes regulated by the Controlled Substances Act:
 - a) Narcotics
 - b) Depressants
 - c) Stimulants
 - d) Hallucinogens
 - e) Anabolic steroids
- All of these drugs, with the exception of anabolic steroids, are considered to be psychoactive meaning they affect one or more of the mental faculties including mood, feelings, thoughts, perception, memory, cognition, and behavior.
- Additionally, use of these drugs can be associated with a host of physical, mental health, and personal complications, including alcoholic liver cirrhosis, cannabis-induced psychosis, social problems like stigma, occupational difficulties, financial problems, and even legal problems.

Substances from any of these classes may lead to the development of chemical dependence in one or both of the following forms:

- **Physical dependence** to a drug suggests that the body has become habituated to the presence of a drug. Consequently, physical dependence is reflected in both the development of tolerance and the presence of a withdrawal syndrome. Tolerance refers to reduced effects compared to what was experienced with a previous amount of the substance. Withdrawal develops when excessive or prolonged use of a drug is sharply reduced or stopped. The onset of withdrawal often prompts the dependent individual to resume use of the drug (or one similar to it) to avoid withdrawal. For example, withdrawal symptoms such as shaking, sweating, nausea, vomiting, or seizures may occur once alcohol use is stopped after regular or excessive use.
- **Psychological dependence** is manifested in the form of craving for a drug. A person with psychological dependence has an excessive, irresistible,

uncontrollable desire to use the drug. Psychological dependence may not cause physical symptoms, but can lead to drug-seeking behavior.

CHEMICAL CLASSIFICATIONS OF DRUGS

Each of the regulated drugs that act on the central nervous system or alter your feelings and perceptions can be classified according to their physical and psychological effects. The different drug types include the following:

- **Depressants.** Drugs that suppress or slow the activity of the brain and nerves, acting directly on the central nervous system to create a calming or sedating effect. Depressants are taken to relieve anxiety, promote sleep and manage seizure activity.
- **Stimulants.** Drugs that accelerate the activity of the central nervous system. Stimulants can make you feel energetic, focused, and alert. This class of drugs can also make you feel edgy, angry, or paranoid. Stimulants include drugs such as cocaine, amphetamine, and methamphetamine.
- **Hallucinogens.** Also known as psychedelics, these drugs act on the central nervous system to alter your perception of reality, time, and space. Hallucinogens may cause you to hear or see things that don't exist or imagine situations that aren't real. Hallucinogenic drugs include psilocybin (found in magic mushrooms), lysergic acid diethylamide (LSD), peyote, and dimethyltryptamine (DMT).
- **Opioids.** These are the drugs that act through the opioid receptors. Opioids are one of the most commonly prescribed medicines worldwide and are commonly used to treat pain and cough. These include drugs such as heroin, codeine, morphine, fentanyl, hydrocodone, oxycodone, buprenorphine, and methadone.
- **Inhalants.** These are a broad class of drugs with the shared trait of being primarily consumed through inhalation. Most of the substances in this class can exist in vapor form at room temperature. As many of these substances can be found as household items, inhalants are frequently abused by children and adolescents. These include substances such as paint, glue, paint thinners, gasoline, marker or pen ink, and others. Though ultimately all of these substances cross through the lungs into the bloodstream, their precise method of abuse may vary but can include sniffing, spraying, huffing, bagging, and inhaling, among other delivery routes.
- **Cannabis.** Cannabis is a plant-derived drug that is the most commonly used illicit drug worldwide. It acts through the cannabinoid receptors in the brain. Cannabis is abused in various forms including bhang, ganja, charas, and hashish oil.
- **New psychoactive substances (NPS).** These are drugs designed to evade the existing drug laws. Drugs such as synthetic cannabinoids, synthetic cathinones, ketamine, piperazines, and some plant-based drugs such as khat and kratom are examples of NPS.

General Symptoms of Drug Abuse

- Isolating from family and friends who don't use drugs
- Spending time with new friends or friends who get high or drink
- Never having money or often asking to borrow money, even for small items
- Showing up late to work/school or not showing up at all
- Losing a job
- Doing little to find a job if out of work
- Paying less attention to basic hygiene
- Changes in sleeping habits
- Extremely private about possessions, including their bag, room, or car
- Lying about using or drinking
- Sneaking away to get high or drunk

The Stages of Drug Addiction

Stage 1: Experimentation

Experimentation is defined as the voluntary use of drugs without experiencing any negative social or legal consequences. For many, experimenting may occur once or several times as a way to “have fun” or even to help the individual cope with a problem. For many, experimentation can occur without any desire to continue using the drug. For others, it can start to become a problem when it moves into the next stage of addiction: regular use.

Stage 2: Regular Use

Some people will be able to enter the stage of regular use without developing a dependence or addiction. These people will be able to stop the drug use on their own. The problem with regular use is that the risk for substance abuse greatly increases during this stage. It also increases risky behaviors such as driving under the influence, unexplained violence, and symptoms of depression and anxiety.

Stage 3: Risky Use/Abuse

The line between regular use and risky use/abuse is a very thin one, but is usually defined as continued use of drugs in spite of severe social and legal consequences. What might have begun as a temporary form of escape can quickly lead to more serious problems. This is the stage where the warning signs of addiction will begin to appear: craving, preoccupation with the drug, and symptoms of depression, irritability and fatigue if the drug is not used.

Signs of the second stage include the following:

- Missing days at work or school or showing up late because of recovering from a drug or alcohol taken
- Continued use in spite of threats of getting fired or expelled
- Scheduling entire day around obtaining, using or recovering from drug use
- Choosing to attend events or spend time with friends only if drugs or alcohol will be available

- Unexplained personality changes
- Sudden need for money
- Excessive need for privacy
- Possession of drug

Stage 4: Drug Addiction and chemical Dependency

Physical dependence on a drug is often intertwined with addiction. Characteristics of dependence and drug addiction include withdrawal symptoms and compulsive use of the drug despite severe negative consequences to his or her relationships, physical and mental health, personal finances, job security and criminal record.

Signs of this stage depend on the substance, but may include the following:

- Agitation, anxiety, panic
- Insomnia, depression, paranoid thinking
- Fatigue, muscle pain, feeling shaky
- Headaches, dizziness, seizures
- Nausea, vomiting, chills, cramps
- Shakes, sweats, tremors
- Psychotic reactions

Drug abuse can cause a wide variety of adverse physical reactions.

- Long-term drug use may damage the heart, liver, and brain.
- Drug abusers may suffer from malnutrition if they habitually forget to eat, cannot afford to buy food, or eat foods lacking the proper vitamins and minerals.
- Individuals who abuse injectable drugs risk contracting infections such as hepatitis and HIV from contaminated needles shared with other infected abusers.
- One of the most dangerous effects of illegal drug use is the potential for overdosing. A drug overdose may cause an individual to lose consciousness and to breathe inadequately
- Without treatment, an individual may die

Successful treatment methods vary and include psychological counseling, or psychotherapy, and detoxification programs which are medically supervised to gradually wean an individual from a drug over a period of days or weeks. Detoxification and psychotherapy are often used together.

IMPACT OF DRUG ABUSE

Drug abuse leads to:

- Irresponsible Behaviour
- Mental illness
- Addiction
- School dropouts
- Pregnancy
- Increase in crime
- Lack of social interaction

- Abortions
- Spread of HIV and other STDs through casual sex
- Poor judgment.
- Impaired memory.
- Injury due to intoxication.
- Lifelong legal problems.
- Development of mental health issues.
- Serious, irreversible physical health problems, such as HIV, Hepatitis C, or damage to major organs.
- Overdose or death.

RELATIONSHIP BETWEEN DRUG USE AND HIV/AIDS

- Shared needles/syringes for use in drug application can carry HIV and hepatitis viruses, Infected blood drawn into the needle is injected along with the drug by the next user
- Drug use is linked with unsafe sexual activity
- A lot of people believe that sex and drugs should go together. Drug users might trade sex for drugs
- Others claim that sexual activity is more enjoyable when they are using drugs
- Drug use including alcohol increases the chance of not using protection during sex, leading to acquiring/transmitting HIV/AIDS
- A lot of drugs interfere with the proper functioning of the antiretroviral drugs
- One who is a drug addict might forget to take his ARV therapy leading to a delay in treatment and increment of viral load
- There may be also an overdose which can be disastrous

THE ROLE OF ALCOHOL IN THE SPREAD OF HI V/AIDS

- People with alcohol use disorders are more likely to contract HIV than the general populations as they are more likely to engage in behaviors that place them at risk of contracting HIV.
- Similarly people with HIV are more likely to abuse alcohol in their life time. In persons already infected, the combination of heavy drinking and HIV has been associated with increased medical and psychiatric complications, delay in seeking treatment and poor HIV treatment outcome.
- Heavy alcohol use has been correlated with a high risk sexual behaviors including
 - 1) Multiple sex partners
 - 2) Unprotected sexual intercourse
 - 3) Sex with high risk partners

BREVIATIONS

ARC	AIDS-related complex
ART	Antiretroviral therapy
ARV	Antiretroviral
C&T	Counseling and testing

CBO	Community-based organization
CHBC	Community home-based care
HAART	Highly active antiretroviral therapy
HBC	Home-based Care
HCW	Health care worker
IEC	Information, Education and Communication
IGA	Income Generating Activities
IV	Intravenous
MTCT	Mother-to-child transmission
OI	Opportunistic infection
OVC	Orphans and Vulnerable Children
PLHA	People living with HIV/AIDS
PMTCT	Prevention of mother-to-child transmission

