



**AMREF DIRECTORATE OF LEARNING SYSTEMS  
DISTANCE EDUCATION COURSES**

**MALARIA MANAGEMENT, PREVENTION  
AND CONTROL**

**UNIT 10  
HIV/AIDS And Malaria**



**Allan and Nesta  
Ferguson Trust**

## Unit 10: HIV/AIDS and Malaria

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A distance learning course of the Directorate of Learning Systems (AMREF)

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## **Unit 10: HIV/AIDS and Malaria**

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### **INTRODUCTION**

In the early 1980s, a new pandemic emerged known as Acquired Immunodeficiency Syndrome (AIDS). It is caused by infection with the Human Immunodeficiency Virus (HIV). In 2005, the Global AIDS Report from UNAIDS estimated that there were between 33.4 to 46.0 million people living with HIV in the world. The Sub-Saharan Africa region is the worst affected, being home to almost 64% of all people living with HIV (21.6 million–27.4 million] in the world. The effects of HIV/AIDS are widespread ranging from health to socio-economic. A great majority of those infected are people in the reproductive and economically productive age group of 15 – 45 years. It is estimated that by 2010, over 40 million people worldwide shall be infected or living with HIV/AIDS.

In Kenya, the National AIDS/STD Control Program (NAS COP) estimates that by end of 2002, the national prevalence of HIV was 9.2% representing a reduction from the previous year when it was 13.4%. The Kenya Demographic and Health Survey (KDHS) of 2003 in a population survey found the prevalence rate to be 6.7%.

The distribution of HIV/AIDS in Africa seems to follow the following pattern:

- It is common in towns situated along main lines of transport, communication and business areas;
- Vertical transmission is the main route of infection among children.

Both Malaria and HIV/AIDS are major health problems in Africa. The chance of meeting a person who is suffering from both the diseases is common because of the high prevalence of both illnesses in the community. In cases of co-infection

there is a tendency for HIV/AIDS to influence malaria at least in its frequency, persistence and severity.

According to the WHO, recent studies there is a growing body of knowledge on the interactions between malaria and HIV/AIDS. Co-infected pregnant women are particularly at high risk of anaemia and malaria infection of the placenta. As a result children born to women with HIV and malaria infection have low birth weight and are more likely to die during infancy. Among adult men and non pregnant women, HIV/AIDS may augment the risk of malarial illness, especially in those with advanced immunosuppression.

Well, let us start by looking at our objectives for this unit.

## **LEARNING OBJECTIVES**

By the end of this unit you should be able to:

- Define the terms HIV/AIDS;
- Describe mode of transmission of HIV/AIDS;
- Explain the common issues between HIV/AIDS and Malaria;
- Describe signs and symptoms of HIV/AIDS;
- Explain the interaction between HIV/AIDS and Malaria.

### **10.1 Definition of HIV/AIDS.**


HIV is acronym for Human Immuno-deficiency Virus. A person infected with HIV virus develops specific anti-bodies towards the infection. HIV Antibodies are commonly used in testing HIV infection. A person infected with HIV can remain asymptomatic for a long time before developing AIDS.

AIDS is an acronym for Acquired Immune Deficiency Syndrome. A HIV positive person is said to have AIDS when the signs and symptoms of the disease appear. These may include the presence of opportunistic infections such as: oral candidiasis, toxoplasmosis and other disease such as recurrent pneumonias, *pneumocystis carinii* pneumonia, Tuberculosis etc.

Having defined HIV/AIDS, let us now learn the mode of transmission of HIV/AIDS in the population.

## 10.2 Mode of Transmission of HIV/AIDS.

Before you read on do the following activity. It should take you 5 minutes to complete.



**ACTIVITY 1**

List down the various modes of transmission of HIV/AIDS.

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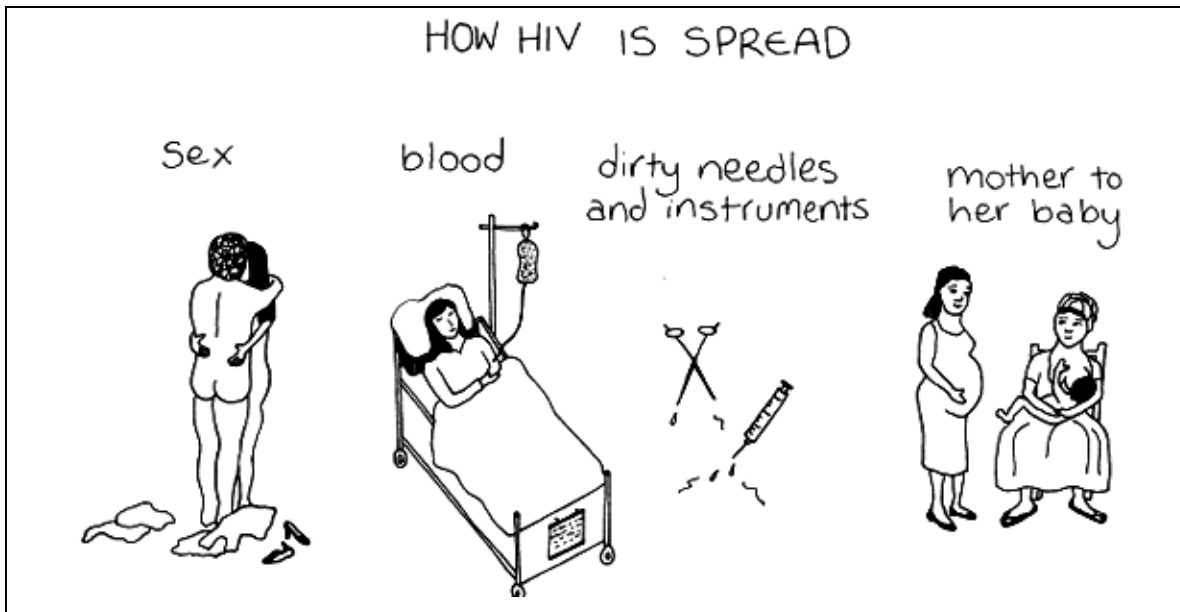
I believe your answer included the following modes of HIV/AIDS transmission:

- Sexual intercourse with an infected person (both hetero/homo sexuality) other antisocial acts such as rape, defilement increase the risk of infection.
- Transfusion with HIV infected blood OR blood products
- Mother to child transmission (vertical transmission);

- Cuts or pricks with tools contaminated with blood or blood products from a person with HIV, such as may occur in circumcision, tattooing, skin cutting, injection pricks etc.

HIV is known to be in high concentration in the following body fluids:

- Blood;
- Cerebro spinal fluid (CSF);
- Cervical/vaginal secretion;
- Semen;
- Wound fluids.




*Figure 10.1: How HIV is spread*

Having looked at the mode of transmission of HIV/AIDS, let us now turn to common issues and interaction between HIV/AIDS and Malaria.

## Similarities Between HIV/AIDS and Malaria.

It is now evident that both HIV/AIDS and Malaria are common major health problems in Africa. As we mentioned earlier it is common practice to diagnose Malaria and HIV/AIDS in the same person.

Before you read on, do Activity 1, it should take you 5 minutes to complete.



**ACTIVITY 2**

From your experience and what you know about Malaria and HIV/AIDS, what are the similarities between the two diseases?

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We hope you have noticed that the similarities mainly revolve around the disease burden, transmission, clinical presentation and the socio-economic impact of these diseases.

Some of the similarities are that both diseases are:

- Transmitted by blood or blood products for example during blood transfusion;
- Among the top five killer diseases in Africa;
- present with fever;
- may sometimes present with splenomegaly;
- A burden to our socio economic sector in terms of treatment and prevention cost as well as direct interference with service delivery;
- Transmissible through the mother-to-child route.



Having learnt about the similarities of the two diseases, let us now turn to the signs and symptoms of HIV/AIDS.

### **Signs and Symptoms of HIV/AIDS**

Some of the signs and symptoms of HIV/AIDS include

- Weight loss of over 10% especially in adults;
- Failure to thrive in children;
- Chronic diarrhoea for more than 1 month;
- Chronic fever for more than 1 month;
- Generalised lymphadenopathy;
- Oral thrush;
- Repeated common infections;
- Extensive/generalised dermatitis;
- Enlarged liver and/or spleen.

We have so far learnt about the signs and symptoms of HIV/AIDS let us now turn to the interaction between Malaria and HIV/AIDS.

### **10.3 Interaction Between Malaria - HIV/AIDS**

Studies have shown that HIV/AIDS infection, a major problem in Africa, reduces resistance to malaria and causes malaria treatment to be less effective.

HIV/AIDS infection during pregnancy predisposes the mother to increased risk of malaria related problems, irrespective of the parity.

Evidence of interactions between malaria and HIV in non-pregnant adults is accumulating. In areas with stable malaria, HIV increases the risk of malaria infection and clinical malaria in adults, especially in those with advanced immunosuppression. In areas with unstable malaria, HIV-infected adults are at

increased risk of complicated and severe malaria and death. Reports also suggest that antimalarial treatment failure may be more common in HIV-infected adults with low CD4-cell counts compared to those not infected with HIV.

The effects of interactions between malaria and HIV are particularly harmful to maternal and infant health. HIV infection impairs the ability of pregnant women to control *P. falciparum* infection. They are more likely to develop clinical and placental malaria, more often have detectable malaria parasitaemia and have higher malaria parasite densities. The presence of HIV results in a poorer response to both prophylaxis and treatment of malaria during pregnancy. Furthermore, there is a risk of adverse drug reactions if sulfadoxine-pyrimethamine for the prevention of malaria in pregnant women and cotrimoxazole for opportunistic infection prophylaxis are taken together, as both are sulfa containing drugs.

In addition, HIV infected women have a much higher risk of giving birth to babies who have had Intra-uterine Growth Retardation (UGR). This leads to low birth weight and/or pre-term babies. These mothers may also suffer from anaemia.

Research has also shown that HIV infected mothers can infect their babies with HIV during pregnancy, at delivery and through breast-feeding. This process is called mother-to-child transmission (MTCT) of HIV/AIDS. Babies infected with HIV tend to have reduced resistance to Malaria.

The **effects of HIV on malaria** can be summarised as follows:

- Increased risk of infection with malaria;
- Increased malaria parasite density;
- Decreased response to standard treatment.


The **effects of Malaria on HIV** are increased HIV viral load. Acute malaria episodes cause a temporary increase in viral replication of HIV and hence plasma viral load. It also leads to increased risk of HIV transmission.

Table 10.1 below further illustrates this interaction.

**Table 10.1: Interactions between HIV and malaria. Source:WHO Malaria and HIV/AIDS Technical Consultation, 2004.**

<b>OVERVIEW OF THE INTERACTIONS BETWEEN HIV AND MALARIA</b>			
<b>Type of interaction</b>	<b>Pregnant women</b>	<b>Children</b>	<b>Adult men and non-pregnant women</b>
<b>The effect of HIV on Malaria</b> - Increased risk of infection with malaria - Increased malaria parasite density - Decreased response to standard antimalarial treatment	+ + +	? ? ?	+ + +
<b>The effect of Malaria on HIV</b> - Increased HIV viral load - Increased risk of HIV transmission	+ ? <sup>(1)</sup>	? + <sup>(2)</sup>	+ ?
<b>Effects of dual infection</b> - Increased risk of illness - Increased risk of anaemia - Increased risk of low birth weight	+ + +	+ + -	+ + -
<b>Key for footnotes and signs:</b> + Evidence for interaction available ? Lack of direct evidence or data - Interaction is not applicable <sup>(1)</sup> Through mother-to-child transmission <sup>(2)</sup> Through unscreened blood transfusions to treat anaemia			

Before you read on do Activity 2, it should take you 5 minutes to complete.



**ACTIVITY 3**

The list on side A has either one or more explanations to match on side B.

Match the items accordingly:

<b>A</b>	<b>B</b>
1. Malaria .....	a) Haemolysis by <i>P. falciparum</i>
2. Anaemia .....	b) HIV/AIDS
3. Sexually Transmitted .....	c) Incubation period of 7-14 days
4. No cure .....	d) Mosquitoes
5. Insecticide treated nets .....	e) Prevents mosquitoes
6. Breed in stagnant water .....	f) Curable

Now compare your answers with the ones given below and find out how well you faired.

1. f	5. e
2. a	6. d
3. b	
4. b	

## CONCLUSION

We have now come to the end of unit 10. In this unit we discussed the relationship between malaria and HIV/AIDS. We saw that the interaction between malaria and HIV/AIDS seems to be a function of immunity. The lowered immunity of people suffering from HIV/AIDS reduces their resistance to Malaria.

You may be wondering why we choose to discuss this topic! There were two reasons: HIV/AIDS and Malaria may occur in the same person; and patients with HIV/AIDS may have recurrent malaria or persistent malaria, sometimes in the severe form.

Treatment of Malaria in HIV/AIDS patients follows the same protocol as in general population.

Remember, research on the interaction between malaria and HIV/AIDS is still going on. So we encourage you to take an interest in these developments to stay up-to-date. If you attend seminars or conferences where this topic is being discussed ask questions relating to this subject. You could get the latest information from such occasions.

You should now go back and review the objectives we outlined at the beginning of this unit. If there is anything you are not sure about, read the relevant section again. If you feel confident you have achieved them all, complete the attached Tutor Marked Assignment before you proceed to the next unit. Remember to also do the practical activities outlined below and return your feedback to the tutor.

### **PRACTICAL ASSIGNMENT**

#### **Instructions:**

1. Visit a blood transfusion centre and note the following:
  - frequency of Malaria and HIV among the donors in the last 6 months and match them by age.

#### **Feedback:**

Document your findings and send them to the tutor for marking.

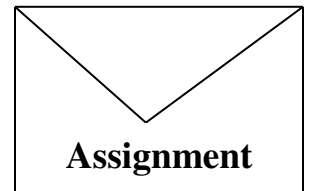


**AMREF DIRECTORATE OF LEARNING SYSTEMS  
DISTANCE EDUCATION PROGRAMME**

Student Name \_\_\_\_\_

Student Number: \_\_\_\_\_

Student Postal Address: \_\_\_\_\_  
\_\_\_\_\_



**DISTANCE LEARNING COURSE ON MALARIA  
Tutor Marked Assignment  
Unit 10: HIV/AIDS and Malaria**

**Instructions:** Answer all the questions in this assignment. When you complete them all mail the assignment or bring it in person to AMREF.

1. Complete the following in full.

HIV .....

AIDS .....

2. Give the mode of transmission of.

(i) HIV

.....  
.....

(ii) Malaria

.....  
.....

3. Answer the following questions by indicating whether the statement is True (T) or False (F)

- a) HIV positive women have a lower immunity to Malaria.....
  - b) HIV/AIDS infection has no effect on Malaria.....
  - c) Resistance to Malaria is higher in people with HIV/AIDS than those without.....
  - d) The common sign of Malaria is fever.....
  - e) Both malaria and HIV can be transmitted by transfusion of Non-screened blood products.....
  - f) HIV is transmitted by mosquito bites.....
  - g) HIV/AIDS can be prevented by sleeping under ITN.....
  - h) Malaria is not sexually transmitted.....
  - i) Condoms are known to prevent Malaria.....
  - j) A combination of Chloroquine and SP is First line choice for treatment of Malaria.....
- If the answer is F. Give the current Policy in your country .....

4. **Case study**

You receive a client who complains of headache and fever. He tells you that he is HIV positive and is attending follow up at nearby VCT Centre. You assess him and suspect that he has Malaria. Basing on the above information and your own experience answer the following questions:

(i) What investigations would you do on him to exclude Malaria?  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(ii) If all the results show that he has no Malaria, what further investigations would you do and for what reasons?

	<b>Investigation</b>	<b>Reasons</b>
a)	..... .....	a) ..... .....
b)	..... .....	b) ..... .....
c)	..... .....	c) ..... .....



- (iii) Assume that one of the investigations in (ii) above is positive, how would you manage him for this condition?

.....  
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.....  
.....  
.....  
.....

Congratulations! You have come to the end of this assignment. If you experienced any problems in this unit or assignment write it down and send it to us. We shall be happy to give you relevant responses to enable you cope with the course.

Post it or bring this assignment in person to AMREF. We shall mark it and return it to you with our comments. Remember to clearly indicate your name and student number on the assignment.

***Enjoy the rest of the course!***