

OCULAR MANIFESTATIONS OF HIV INFECTION/AIDS IN MAKURDI – NIGERIA

Adeniyi O. S.

Department of Physiology

College of Health Sciences, Benue State University, Benue State, Nigeria.

ABSTRACT

Benue State is rated the highest with regards to HIV Seroprevalence among the ten hyper endemic States in Nigeria. Numerous ocular manifestations are increasingly being seen in this ophthalmic unit. This study is aimed at identifying the prevalent ocular presentations and manifestations of HIV/AIDS patients in Benue, a hyper endemic State. A multidisciplinary, descriptive, retrospective review of all HIV infected patients seen primarily in the unit, referred cases from sexually transmitted infections units and other interdepartmental consultations from June 2002 through June 2006 in the Eye Unit of Federal Medical Centre was carried out. Following documentation of personal data of age, sex, occupation, marital status and presenting ocular complaints, full ocular and systemic examination were done on each patient. The haematological profile and the CD4 count on presentation were recorded. HIV Seroprevalence rate among the study group was found to be 11%. Males accounted for 58% while 42% of the infection occurred in females. The age range was 3 – 70 years. The prevalence of visual impairment in the study group is 45%. Blindness was documented in only 15% of the studied patients. Herpes zoster-related complications were the major causes of visual loss and ocular morbidity. Herpes zoster induced visual impairment and other adnexal related complications constituted the commonest ocular presentations among HIV/AIDS patients in Benue State. Given that these complications are preventable, early presentation, diagnosis and treatment of ocular morbidity is recommended to reduce burden of blindness among HIV/AIDS patients.

Keywords: Ocular HIV/AIDS, Herpes Zoster Ophthalmicus, Hyper Endemic State, Benue, Nigeria.

INTRODUCTION

The infection with Human Immune Deficiency Virus (HIV) which is the causative agent of the Acquired Immune Deficiency Syndrome (AIDS), has posed the greatest threat to humanity in this century (Lambo, 2001). Since the first case was diagnosed in the U.S.A in 1981, the infection has spread dramatically that it has reached a pandemic level with various adverse health and socio-economic implications, particularly the developing world (UNAIDS, 1996). A global summary in 2007 recorded a reduction of six million (16%) compared with the 2006 report of 39.5 million (WHO, UNAIDS, UNICEF, 2007).

The estimated number of persons living with HIV globally in 2007 was 33.2 million (30.6 – 36.1 million). More than two third live in sub-Sahara Africa. 61% of them are women. Nearly 90% of children living with HIV also live in the sub-Sahara Africa. Two broad pattern of the disease have been observed; the generalized epidemic in the sub-Sahara Africa with a uniquely severe situation in southern Africa and concentrated epidemic in the rest of the world affecting groups at risks. (Homosexuals, injecting Drug users, sex workers and their clients) (UNAIDS/WHO, 2007). Sub-Sahara Africa still bears the brunt of the pandemic with AIDS still ranking as the leading cause of death. More than three-quarter (76%) of AIDS deaths occur in sub-Sahara Africa (UNAIDS/WHO, 2007) indicating the need of Anti retroviral therapy in the region.

Even though a lot of effort has been put in scaling up of ART in the developing world, by Development 2006 an estimated 1.3 million people are on ART in the sub-Saharan Africa representing coverage of 28%. This is a lot of improvement over the 2003 report of 100,000 people on treatment, coverage of 2% (WHO, UNAIDS, UNICEF, 2007). On the Nigeria scene, being the largest country in sub-Saharan Africa and the tenth most populous in the world (UNAIDS/WHO, 2007, Mohammed et al, 1988, Ministry of Health, Benue State, 2005), she has not been spared of this pandemic. Since the first case of AIDS in Nigeria was reported in 1986 it has expanded rapidly (Mohammed et al, 1988). The adult HIV prevalence rate has increased from 1.8% in 1991 to 4.5% in 1996, 5.0% in 2003 and 4.4% in 2005. No State is unaffected with general epidemics of over 1%. In some sites of survey, the prevalence rate is higher than 10% (UNAIDS/WHO, 2007); these are the hyper endemic states. Given the current scale of prevalence and government limited capacity of response, it is projected that HIV/AIDS will infect as many as 10 to 15 million Nigerians by 2010 (UNAIDS/WHO, 2007).

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Nigeria which used to rank fourth in HIV prevalence in the world after South Africa, Ethiopia and India has now overtaken Ethiopia and India to occupy second position. South Africa still maintains its unfortunate leading position worldwide with over five million people living with the killer virus. The lowest prevalence rate has been found in the Independent State of Samoa with only twelve (12) reported cases of HIV/AIDS in the entire country. Fortunate for countries like Bosnia, Herzegovina, Philippines, Japan, Germany, Saudi Arabia, Peoples Republic of China and Afghanistan have very low prevalence rate of 0.01% (Biswas et al, 2000; Holland et al, 1982; Cunningham and Magolis et al, 1998).

Benue State, located in North central zone, happens to be among the ten hyper endemic States for HIV in Nigeria. Prior to the availability of highly Antiretroviral therapy (HAART) the seroprevalence rate of Benue State rated as high as 16.8%, the highest in the entire country (1.6% in 1991, 4.7% in 1993, 16.8% in 1999, 13.5% in 2001, 9.3% in 2003, 10% in 2005-2008. (See appendix I Fig. I – IV).

Holland et al, (1982) were the first to report ocular manifestation of HIV/AIDS. It has been documented that 70 to 80% of adult HIV/AIDS patients will experience ocular complication at some point of their illness (Federal Ministry of Health, Nigeria, 2001, Holland et al, 1982). The burden of ocular manifestations and complications of this spectrum of disease has had considerable increase in the recent patients load on the ophthalmic practice in recent times. Like any systemic disease, HIV infection can virtually affect any part of the eye. Numerous ophthalmic manifestations of HIV infections may involve the orbit, ocular adnexae, anterior segment, posterior segments and neuro-ophthalmic structures, multiple structures in different ocular segments may be involved at any point in time (Holland et al, 1982; Freeman et al, 1984)). In a study in Kaduna, northern Nigeria, Kehinde et al, (2005), reported Herpes Zoster Ophthalmicus (HZO) as the commonest form of presentation. In another study in Ile-ife, western Nigeria, Adegbehingbe (2006) reported that among high risk patients, a significant proportion of those suspected of HIV/AIDS were actually infected and Herpes Zoster Ophthalmicus also was the commonest ocular presentation. Osahon et al, (1999) from Benin City Nigeria reported a prevalence rate of 4.0%. Herpes Zoster Ophthalmicus was reported the commonest ocular disease encountered, occurring in 2.7% of the study population. Nwosu (2008) reported from eastern Nigeria, Onitsha, apart from Herpes Zoster Ophthalmicus being the most common ocular disease, also reported 73.4% of the affected eyes were already blind on presentation. Herpes Zoster is the marker of the disease in Africa. Ebana et al, (2007) reported from Cameroon, a non linear correlation between the CD4 level and occurrence of ocular complications.

The aim of this study is to identify the prevalent ocular presentation of HIV/AIDS in a hyper endemic state, since no similar study has been done in this region.

METHODOLOGY

A register was opened in the Eye Department of Federal Medical Centre between June 2002 and June 2006. Recorded in this register were the bio-data of the patients, their ocular presentations, corrected visual acuity and ocular diagnosis of all seropositive HIV/AIDS patients that were reviewed in the period. The documentation was done exclusively by the consultant ophthalmologist.

Included in this study were:

- All diagnosed cases of HIV/AIDS referred from other units for ocular assessment.
- All patients primarily presenting to the eye clinics, testing positive for HIV infection.
- All in-patients established cases of AIDS patients seen through interdepartmental consultations.

Excluded from the register are all those who objected to participation in the exercise after the counseling sessions. In the span of 60 months during the documentation in the register, the age, sex, address, and occupation of participants were recorded. History and full ocular examination were then carried out in all participants. This included visual acuity measurement using relevant Snellen's chart, which were carried out by the ophthalmic trained nurses. Using the pen torch, external eye inspection was done, pupillary light reaction both direct and consensual were done. Extra ocular motility was tested using a white hat pin target. Slit lamp examination using Haag strait slit lamp was done on all patients except in un-cooperation children. Direct ophthalmoscope was done using Keeler's brand of ophthalmoscope. Tonometry and perimetry were done in selected cases using Goldmann applanation technique and target screen Bjerum's screen respectively where indicated. Examination under Anaesthesia (EUA) was only carried out in some paediatric cases. Refraction was done by the optometrist to get the best corrected vision in patients whose visual acuity improved with pin hole. The initial CD4 count, packed cell volume (PCV) and Erythrocyte Sedimentary Rate (ESR) of each patient were recorded.

All these information were all documented in the register for all the patients seen within the period. These data were collected and analyzed using the Statistical Package for Social Sciences (SPSS) version 11.

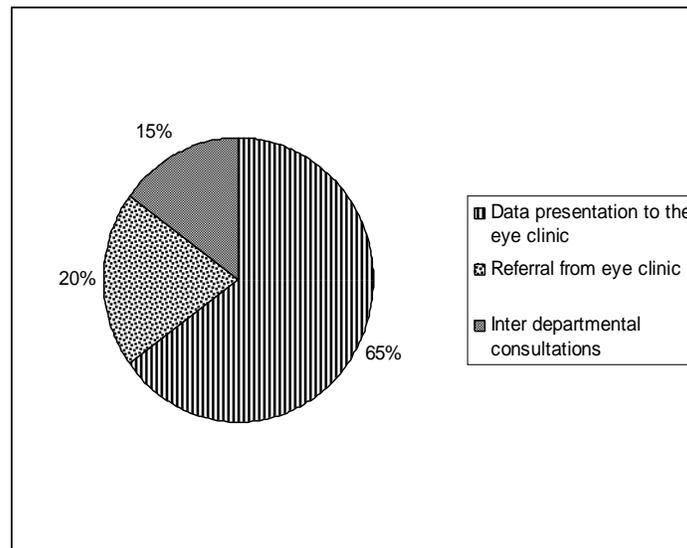
RESULTS

The total number of patients seen in the unit for the period of study was 28,800. Out of this 28,800, 56.8 % (16,350) were males and 42.2 % (12,450) were females with an age range of 4-70yrs. 11% (3168) were seropositive for HIV comprising 57.7% (1826) male and 42.3% (1342) female. 65% (2050) primarily presented to the eye unit, 20% (625) were referred cases from sexually transmitted infections clinic and 15% (475) were seen via interdepartmental consultations for ocular assessments. 35% were established cases of AIDS with various defining illnesses of all the seropositive patients seen. Majority (94.8%) of the HIV positive patients are in the age range of 17-50yrs which is the active age group. Paediatric HIV affectations only accounts for 5% (158). Occurrences of HIV between age 51 and above were rare. The two male cases seen were in very aged polygamous men who were married to teenage wives. The three female cases seen were in retired sexual workers. The number of cases seen was decreasing progressively as the years went by. See table 2

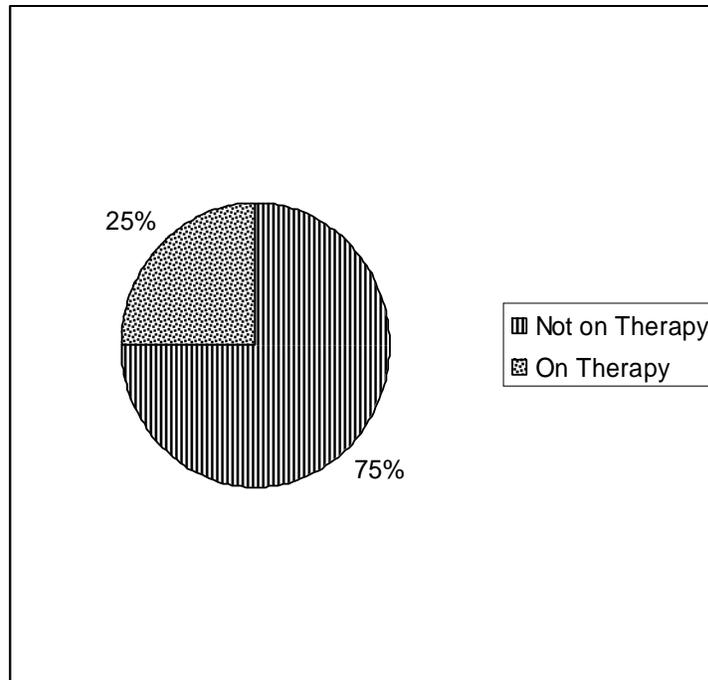
Majority (75%) of the patients seen had not commenced therapy. Only 25% (792) had commenced anti-retroviral therapy (See table I, II and III). The visual acuity profile of the patients revealed that 15% became totally blind (2% bilateral, 13% unocular). 45% of all seropositive patients were visually impaired. Decreasing vision or blurring of vision ranked highest as the reasons for presentation/consultations and referral constituting 85% (See table IV). The posterior segment affectations far outnumbered other segments but fortunately, most lesions seen were asymptomatic and inconsequential as far as visual loss is concerned. Herpes zoster ophthalmicus related complications were the commonest causes of ocular morbidity and visual loss responsible for 47% of orbital/adnexal affectations followed by acute conjunctivitis (26%). See table VIII. In the anterior segment affectations, HZO-related corneal perforation/opacity accounted for over 50% (See table IX). Retinal microangiopathy ranked highest among the posterior segment affectations accounting for 51.9%. This was followed by pre senile atherosclerosis 10.6%, central retinal vein occlusion 4.2%, central retinal artery occlusion 2.8%, toxoplasmosis chorioretinitis 2.3% and endophthalmitis 2.8% (See table X).

The haematological indices assessed were packed cell volume (PVC) and erythrocytic sedimentation rate (ESR) showed that 0.10% (205) of those presenting primarily to the eye unit were anaemic, 35% (219) of the referred cases from the STI clinic were anaemic, while 85% (403) of all patients seen via interdepartmental consultations were anaemic. Half of all the seropositive patients had raised ESR (See table VI). Over half of the patients had good CD4 count (600-800 cells/mm). Only 3% had CD4 count of below 200.

Title: Mode of Presentation of HIV/AIDS Patients to the Unit.



Title: A Pie Chart Showing the Number of HIV/AIDS Patients on Therapy/Not on Therapy.



DISCUSSION

The prevalence rate of HIV/AIDS in this study group was 11%. This high rate though comparable to that of Uganda (Mohammed et al, 1988) of 12% is not surprising due to the fact that the center where the study was carried out happened to be one of the pioneer centers established in the region, coupled with the hyper endemic status of this state (Ministry of Health, Benue State, 2005).

In this study 65% (2059) of the patients presented primarily with an ocular problem before their seropositivity were ascertained in Table II. This makes it pertinent for the ophthalmologist to show a high index of suspicion in his clinical judgment. In this study, only 35% of all seropositive patients were cases of full blown AIDS. This could be more in magnitude if not for the initial problem of denial and stigmatization associated with this disease. More so, other centers have been developed to cater for AIDS patients. Most patients prefer the services of mission hospitals in the suburbs to avoid stigmatizations. Contrary to the findings of Kestelyn et al, (1990) that identified a posterior segment complication (cytomegalovirus retinitis) as the commonest cause of visual loss, in this study anterior segment and ocular adnexal related complications (anterior iritis, keratitis, herpes zoster ophthalmicus) ranked highest as cause of visual loss. This may not be unconnected with the fact that the patients in the developing world may not live long enough to the stage when the opportunistic infections such as cytomegalo-virus (CMV) retinitis may manifest. Coupled with the fact that these patients present very late for proper attention and by the time of presentation, numerous harmful traditional eye medications must have caused a lot of damage even more that the complications of the disease itself. Table I shows that the majority of the patients 75% were within the active age-group (16 – 49yrs). This is very significant in that in an agrarian society like Benue, the food basket of the nation, the productive workforce is being gradually wiped out. This will worsen the global food crisis, since Benue State is one of the pivotal food producers in Nigeria (Ministry of Health, Benue State, 2005).

Table II shows that there is apparent greater number of posterior segment affection, but in the real sense more than half (59%) of these posterior segment lesions are retinal micro-vasculopathy which were asymptomatic as far as visual functions is concerned. In this study, herpes zoster related complications were responsible for about half of the blindness. This study, similar to that of Ateenyi Agaba (1995) in Uganda, has demonstrated a strong correlation between conjunctival squamous-cell carcinoma and HIV infection, tuberculosis, syphilis and herpetic eye disease. A study by Hodge et al, (1998) showed a relative incidence risk of 6.6/1 of Herpes Zoster Ophthalmicus (HZO) in HIV positive patients compared to HIV negative patients. Report suggests that HZO have a high rate of painful and sight threatening complications. 41% of the patients studied by Lewalles and Courtright (1997) in Malawi developed corneal perforation and 17% of patients studied by Sellitii et al Miami developed necrotizing retinitis. The severity of the skin rash has been known to be an important prognostic parameter of subsequent ocular involvement. In this study HZO anterior segment complications were the commonest cause of visual loss.

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Similar to the report of the study by Ateenyi Agaba in Uganda (Ateenyi-Agaba and Newton, 1999; Ateenyi-Agaba, 1995), this study has demonstrated a correlation between cases of conjunctival squamous cell carcinoma, Tuberculosis, syphilis, herpetic eye diseases and HIV infections. The early stage of the cancer typically presents as a typical pterygia. These tumors have been linked to exposure to ultra violet light and high frequency of papilloma virus conjunctiva infections. The commonest cause of severe visual impairment and blindness was herpes zoster ophthalmicus. This is in line with previous reports from Kaduna, Enugu and Benin City (Kehinde et al, 2005; Nwosu, 2008; Adegbehingbe, 2006).

From Table VI, it is evident that at presentation, over half of the patients had good CD4 count. Only 3% had CD4 count of below 200cell/mm. This is not surprising since only very few cases of CMV retinitis was found in this series. At the initial period of this pandemic, most terminal cases were rejected and taken home to await the ultimate-death. This can explain why patients with low CD4 count do not present to the clinic. The most devastating ocular complications were mostly as a result of adnexal and anterior segments complication resulting from herpes zoster ophthalmicus and conjunctival squamous cell carcinomas. This is in line with other reports from other parts of the country (Mohammed et al, 1988; Ministry of Health, Benue State, 2005; Federal Ministry of Health, Nigeria, 2001; Holland et al, 1982). Table III reveals that eye-related disorders are common hence, the first point of consultation of some undetected HIV patients. In this study 65% of the patients presented primarily to the ophthalmologist ever before their HIV/AIDS status became established. Table V shows that of all the visually impaired, 60% were related to uveitis of infective cause. This implies that such patients need to be thoroughly investigated for proper and precise diagnosis so that treatable causes are treated timely enough to avert blindness. This is very significant in that this blindness is avoidable

CONCLUSION

Herpes Zoster induced visual impairment and other adnexal related complications constituted the commonest ocular presentations among HIV/AIDS patients in Benue state. Fortunately these complications are preventable, thus early presentation, diagnosis and appropriate management of these ocular morbidity is necessary to reduce the additional burden of blindness in this vulnerable group of persons.

RECOMMENDATIONS

There is need to create awareness through health education among this HIV/AIDS patients on how to recognize the early signs and symptoms of herpetic eye diseases, the dangers of using traditional eye medications (TEM), and the need for early presentation for appropriate management, this will go a long way in averting disastrous consequences of blindness.

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Table 1: Age/Sex Distribution of Ocular HIV/AIDS Patients

Age	Sex			
	MALE		FEMALE	
	No	%	No	%
0 – 16	86	2.7	72	2.3
17 – 33	1025	32.4	951	30.0
34- 50	713	22.5	316	10.0
51 - 70	2	0.06	3	0.9
Total	1826	57.7	1342	43.3

Table II: Anatomical Distribution Site of Ocular Diagnosis in HIV/AIDS patients

Site	Orbit/ Adnexial	Anterior segments	Posterior segments	Mixed picture
2002	190	294	408	207
2003	176	208	368	181
2004	154	191	108	115
2005	80	103	88	65
2006	60	89	88	40
Total	660	840	1060	608

Table III: Mode of Presentation

	No	%
Direct presentation to the eye clinic	2059	65
Referral from STI Clinic	634	20
Inter departmental consultations	475	15
Total	3168	100

Table IV: Commencement of Antiretroviral Therapy

Commencement of Therapy	No	%
Not on therapy	2376	75
On therapy (HAART)	792	25
Total	3168	100

Table V: Visual Acuity Profile

	No	%
Normal Vision	1267	40
Visual Impairment	1426	45
Severe Visual Impairment and blindness	475	15
Total	3168	100

Table VI: Profile of CD4 count on presentation

CD4 Count (T4 Count Cells/mm)	No. of patient	%
800 – 600	2281	72
500 – 300	792	25
< 200	95	3
Total	3168	100

Table VII: Major Ocular Presentation in HIV/AIDS Patients

Symptoms	No. of patient	%
Visual deterioration/loss	2693	85
Light intolerance (photophobia)	1584	50
Painful red eye/per orbital pain	1109	35
Excessive lacrimation	950	30
Growth on the eye surface	950	30
Floater/ashes of light	950	30
Periocular rashes/swelling	891	25
Grittiness (sandy sensation/itching)	316	10
Ocular discharges	158	5
Double vision (diplopia)	158	5
Protrusion of the eyeball (proptosis)	5	0.2

*Some patients had multiple presenting complaints.

Table VIII: Orbital/Adnexal Manifestations of HIV

Ocular Diagnosis	No. of patients	Percentage (%)
Acute conjunctivitis	170	25.8
Acute Herpes Zoster ophthalmicus	132	20.0
Squamous cell carcinoma	87	13.2
Ruptured globe	66	10.0
Phthisis Bulbi	33	5.0
Orbital cellulitis	33	5.0
Kaposi sarcoma	33	5.0
Chalazion (recurrent)	33	5.0
Conjunctival microangiopathy	26	3.9
Post-operative empty orbit	13	2.0
Chronic dacryocystitis	13	2.0
Stephen Johnson's Syndrome	13	2.0
Sicca syndrome	5	0.8
Molluscum contagiosum	3	0.5
Total	660	100

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Table IX: ANTERIOR SEGMENT DISORDERS IN HIV/AIDS PATIENTS

Ocular Diagnosis	No. of patients	Percentage (%)
Dendritic corneal ulceration	168	20.0
Perforated corneal ulcers	150	17.8
Vascularised pannus	125	14.9
Diffuse corneal opacity	88	10.5
Hypo yon keratitis	68	8.0
TB – associated uveitis	48	5.7
Staphyloma	40	4.8
Reiters uveitis	35	4.7
Geographical corneal ulcer	21	2.5
Idiopathic uveitis	20	2.4
Episcleritis	15	1.8
Scleritis	15	1.8
Syphilitic – uveitis	15	1.8
Fungal keratitis	12	1.4
Mooren’s keratitis	10	1.2
Reiters uveitis	8	0.9
Betcet’s uveitis	2	0.2
Total	840	100

Table X: Posterior Segment Disorders in HIV/AIDS Patients

Ocular diagnosis	No. of patients	Percentage (%)
Retinal microangiopathy	550	51.9
Presenile atherosclerosis	169	15.9
Optic neuritis	106	10.0
Central retinal vein occlusion	45	4.2
Optic atrophy	35	3.3
Endophthalmitis	30	2.8
Central retinal artery occlusion	30	2.8
Toxoplasmosis	25	2.4
Progressive outer retina necrosis	26	2.5
Ocular Neovascularisation	15	1.4
Cytomegalo virus retination	8	0.8
Syphilitic retinochoroiditis	10	0.9
Per phlebitis	5	0.5
Retinal Detachment	2	0.2
Maculopathy	4	0.4
Total	1060	100

Table XI: Neuro – Ophthalmic Manifestation of HIV/AIDS Patients

Ocular Diagnosis	No. of patients	Percentage (%)
Optic atrophy	35	41.7
Ocular muscle paresis	25	29.8
Papilloedema	15	17.9
Post herpetic neuralgia	8	9.5
Nystagmus	1	1.2
Total	84	100

Fig. 1

Nigeria HIV Prevalence Survey

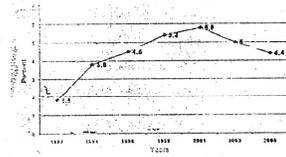


Fig. II

Nigeria HIV/AIDS Statistics- 2003

Parameter	Figure
Total population	130,000,000
Adult prevalence rate	5.0%
Living with HIV/AIDS	3,500,000
•Adults (15-49)	3,200,000
•Women (15-49)	1,700,000
•Children (0-15)	270,000
AIDS Deaths (annual)	325,000
AIDS orphans	1,500,000

• In Nigeria, the HIV prevalence has increased steadily by over 200% in the past 9 years.

Fig. III

10 Highest Prevalence States



Fig. IV

