

## A Review of Human Immunodeficiency Virus (HIV) in Nigeria

Emmanuel Oranwusi<sup>1</sup> & Abdul-Azeez O. Ibrahim<sup>1\*</sup>

<sup>1</sup>Department of Medicine, College of Health Science, Nile University of Nigeria, Cadastral Zone, Abuja FCT, Nigeria

\*Corresponding Author: Abdul-Azeez O. Ibrahim<sup>1\*</sup>

Email: [theoneadisa@gmail.com](mailto:theoneadisa@gmail.com)

### Abstract

*Human Immunodeficiency Virus (HIV) remains a critical global health challenge, with Nigeria bearing one of the heaviest burdens in sub-Saharan Africa. Despite advances in antiretroviral therapy (ART) and prevention strategies, approximately 1.9 million people in Nigeria are living with HIV as of 2020. The virus, transmitted primarily through unprotected sexual contact, mother-to-child transmission, and contaminated needles, progressively impairs the immune system, leading to acquired immunodeficiency syndrome (AIDS) if untreated. This review examines the pathophysiology, clinical presentation, diagnosis, treatment, and prevention of HIV, with a particular focus on its impact in Nigeria. Persistent challenges such as stigma, limited access to ART, inadequate healthcare infrastructure, and socioeconomic barriers continue to undermine effective control. Strengthening surveillance, expanding ART access, promoting public education, and achieving UNAIDS 95-95-95 targets are essential to mitigating the epidemic's impact and advancing toward ending AIDS as a public health threat.*

**Keywords:** Human Immunodeficiency Virus (HIV), acquired immunodeficiency syndrome (AIDS), Antiretroviral Therapy (ART), Prevention, Public Health, UNAIDS 95-95-95, Nigeria

### INTRODUCTION

Human Immunodeficiency Virus (HIV) is a retrovirus that targets the immune system, specifically CD4+ T cells, leading to progressive immune dysfunction. If left untreated, HIV infection can progress to Acquired Immunodeficiency Syndrome (AIDS), characterized by severe immunosuppression and increased susceptibility to opportunistic infections and malignancies (Deeks et al., 2015). Since its identification in the early 1980s, HIV has become a global pandemic, with an estimated 38.4 million people living with HIV worldwide as of 2021 (UNAIDS, 2022).

### EPIDEMIOLOGY

HIV continues to be a major global public health issue. While new HIV infections have been reduced by 40% since the peak of the epidemic in 1998, significant challenges remain. In 2021, there were approximately 1.5 million new HIV infections and 650,000 AIDS-related deaths globally (UNAIDS, 2022). The epidemic disproportionately affects certain regions and populations, with sub-Saharan Africa accounting for about two-thirds of the global total of new HIV infections (Kharsany & Karim, 2016).

Nigeria has the highest HIV burden in Sub-Saharan Africa, with a prevalence rate of approximately 2.1% among adults aged 15-49 (UNAIDS, 2020). The epidemic is primarily driven by heterosexual transmission and affects diverse demographics across the country.

The HIV prevalence has fluctuated over the years, with significant regional variations. States like Benue and Rivers report higher rates of 5.7% and 5.2%, respectively (National Agency for the Control of AIDS, NACA, 2021). The epidemic is generalized, with no community exempt from its impact.

## AETIOLOGY

HIV belongs to the genus *Lentivirus* within the family *Retroviridae*. There are two types of HIV: HIV-1 and HIV-2. HIV-1 is responsible for the majority of infections globally and is further classified and subtypes. HIV-2 is less pathogenic and primarily found in West Africa (Sharp & Hahn, 2011).

## TRANSMISSION

HIV is transmitted through the exchange of certain body fluids from infected individuals, including blood, breast milk, semen, and vaginal secretions. The most common modes of transmission are:

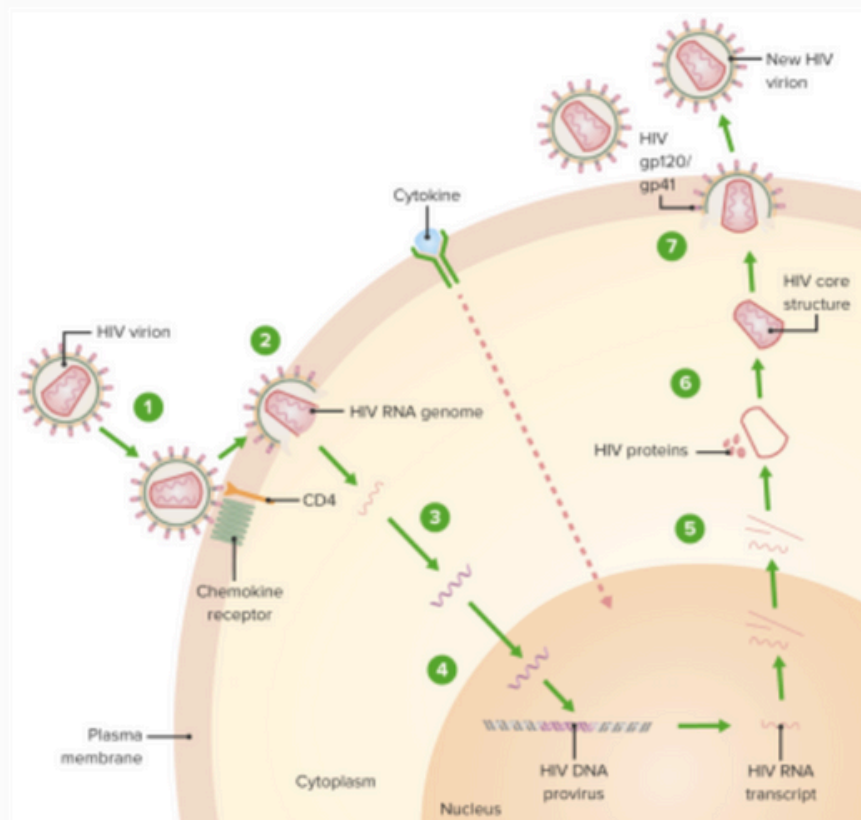
- Unprotected sexual intercourse
- Sharing of contaminated needles and syringes
- Mother-to-child transmission during pregnancy, childbirth, or breastfeeding
- Transfusion of contaminated blood products (rare in countries with robust blood screening programs). (CDC, 2023)

## PATHOPHYSIOLOGY

HIV primarily infects CD4+ T lymphocytes, macrophages, and dendritic cells. The virus binds to the CD4 receptor and co-receptors (typically CCR5 or CXCR4) on the cell surface, facilitating entry into the host cell. Once inside, the viral RNA is reverse-transcribed into DNA, which integrates into the host cell genome. This integrated viral DNA, known as provirus, can remain latent or be transcribed to produce new viral particles (Maartens et al., 2014).

The progression of HIV infection can be divided into three main stages:

- **Acute HIV Infection:** Characterized by high viral replication and a significant drop in CD4+ T cell count.
- **Chronic HIV Infection (Clinical Latency):** A period of clinical stability with ongoing viral replication at lower levels.
- **AIDS:** Defined by severe immunodeficiency (CD4+ T cell count <200 cells/ $\mu$ L) and increased susceptibility to opportunistic infections and malignancies. (Deeks et al., 2015)



<https://cdn.lecturio.com/assets/HIV-replication-cycle.png>

## Clinical Presentation

The clinical manifestations of HIV infection vary depending on the stage of the disease:

### Acute HIV Infection

- Flu-like symptoms (fever, fatigue, myalgia)
- Lymphadenopathy
- Pharyngitis
- Rash

- Headache

These symptoms typically appear 2-4 weeks after infection and may last for several weeks

### Chronic HIV Infection

- Often asymptomatic
- Persistent generalized lymphadenopathy may be present
- Some patients may experience constitutional symptoms or minor opportunistic infections

### AIDS

- Recurrent or severe opportunistic infections (e.g., *Pneumocystis jirovecii* pneumonia, Candidiasis)
- AIDS-defining malignancies (e.g., Kaposi's sarcoma, non-Hodgkin lymphoma)
- Severe weight loss (HIV wasting syndrome)
- Neurological complications (e.g., HIV-associated dementia). (Maartens et al., 2014; Deeks et al., 2015)

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## DIAGNOSIS

Early diagnosis of HIV is crucial for timely treatment initiation and prevention of transmission. The following methods are commonly used for HIV diagnosis:

- **Antibody/Antigen Tests:**
  - Fourth-generation tests detect both HIV antibodies and the p24 antigen
  - Can detect HIV infection as early as 2-3 weeks after exposure
  - Usually performed as an initial screening test
- **Nucleic Acid Tests (NAT):**
  - Detect HIV RNA
  - Used for early diagnosis (can detect HIV about 10-33 days after infection)
  - Also used to monitor viral load in individuals undergoing treatment
- **Western Blot or Immunofluorescence Assay:**
  - Used as confirmatory tests
  - Detect specific HIV antibodies
- **Rapid Tests:**
  - Provide results in 30 minutes or less
  - Useful for point-of-care testing and in resource-limited settings (CDC, 2023; WHO, 2022)

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## TREATMENT

The primary goal of HIV treatment is to suppress viral replication, preserve immune function, and prevent disease progression. The standard of care is antiretroviral therapy (ART), which typically involves a combination of three or more antiretroviral drugs.

Antiretroviral therapy (ART) has improved outcomes significantly; however, only about 44% of those living with HIV have access to treatment (World Health Organization, WHO, 2021). The Nigerian government aims to achieve the UNAIDS 95-95-95 targets by 2030 through enhanced surveillance and expanded access to treatment (UNAIDS, 2020).

The main classes of antiretroviral drugs include:

- Nucleoside Reverse Transcriptase Inhibitors (NRTIs)
- Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs)
- Protease Inhibitors (PIs)
- Integrase Strand Transfer Inhibitors (INSTIs)
- Entry Inhibitors

Current guidelines recommend initiating ART in all individuals diagnosed with HIV, regardless of CD4+ T cell count (DHHS, 2023). The choice of regimen depends on various factors, including drug resistance, comorbidities, and potential drug interactions.

- In addition to ART, the management of HIV involves:
  - Regular monitoring of CD4+ T cell count and viral load
  - Screening and prophylaxis for opportunistic infections
  - Management of comorbidities and drug toxicities

- Adherence support and counseling (DHHS, 2023; Saag et al., 2020).
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## PREVENTION

HIV prevention strategies have evolved significantly over the years and now include a combination of behavioral, biomedical, and structural approaches:

- **Behavioral Interventions:**
    - Promotion of safer sex practices (condom use, reduction in number of sexual partners)
    - Education and counseling
  - **Biomedical Interventions:**
    - Treatment as Prevention (TasP): Effective ART reduces the risk of HIV transmission
    - Pre-exposure prophylaxis (PrEP): Daily antiretroviral medication for high-risk HIV-negative individuals
    - Post-Exposure Prophylaxis (PEP): Short-term antiretroviral treatment after potential HIV exposure
    - Voluntary Medical Male Circumcision: Reduces the risk of female-to-male sexual transmission
  - **Structural Interventions:**
    - Needle exchange programs for people who inject drugs
    - Laws and policies to reduce stigma and discrimination
    - Efforts to address social and economic factors that increase HIV risk
  - **Prevention of Mother-to-Child Transmission (PMTCT):**
    - ART for HIV-positive pregnant women
    - Antiretroviral prophylaxis for infants
    - Safe infant feeding practices (WHO, 2022; UNAIDS, 2022)
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## CHALLENGES

Key challenges include persistent stigma, inadequate funding, and insufficient integration of prevention strategies into healthcare systems (Okonkwo et al., 2022). Stigma remains a barrier to testing and treatment uptake, contributing to ongoing transmission rates.

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## RECOMMENDATIONS

- To strengthen the response to HIV in Nigeria:
  - Increase funding for HIV programs.
  - Enhance community education to reduce stigma.
  - Expand access to testing and ART.
  - Integrate prevention strategies into primary healthcare.
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## IMPACT OF HIV/AIDS IN NIGERIA

Nigeria remains a focal point in the global fight against HIV/AIDS, currently ranking second in the world for the highest burden of the disease. As of 2020, approximately 1.9 million people are living with HIV (PLHIV), which accounts for a significant proportion of the global burden (UNAIDS, 2020). In 2019 alone, an estimated 107,112 new infections were recorded, reflecting approximately 38% of new infections in the West and Central African region.

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## HEALTH IMPACT

The health implications of HIV/AIDS are profound, straining Nigeria's healthcare system. The progression from HIV to Acquired Immunodeficiency Syndrome (AIDS) increases susceptibility to opportunistic infections, leading to significant morbidity and mortality, particularly among young adults. The World Health Organization (WHO) estimates that Nigeria accounted for about 20% of global AIDS-related deaths in 2020, underscoring the urgent need for improved access to treatment and care services. In 2015, approximately **260,000 children aged 0-14 years** were living with HIV, with 41,000 new infections occurring that year. Alarming, only 17% of these children had access to antiretroviral therapy (ART), highlighting critical gaps in pediatric care.

The **2018 Nigeria HIV/AIDS Indicator and Impact Survey (NAIIS)** revealed an HIV prevalence rate of **1.3%** among individuals aged **15–49 years**, an improvement from the 3.4% reported in the 2012 National HIV/AIDS Reproductive Health and Survey (NARHS). Despite these gains, the total number of individuals affected by HIV/AIDS remains alarmingly high, necessitating ongoing public health efforts.

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## PREVALENCE AMONG KEY POPULATIONS

The 2014 Integrated Biological and Behavioural Surveillance Survey (IBBSS) highlighted that key populations, including men who have sex with men (MSM), female sex workers (FSW), and people who inject drugs (PWID), have particularly high prevalence rates. MSM exhibited a prevalence rate of **22.9%**, followed by FSW at **14.4%** and PWID at **3.4%**. Recent modeling studies have estimated a national HIV prevalence of **2.1%** (95% CI: **1.5–2.7%**) among adults aged **15–49 years**, translating to approximately 2 million PLHIV. This figure contrasts with previous estimates of **1.4%** from the 2018 NAIIS and **1.8 million** as estimated by UNAIDS in 2022. The prevalence varies significantly across states, with **Benue** having the highest rate at 5.7%, followed by **Rivers** (5.2%), **Akwa Ibom** (3.5%), **Edo** (3.4%), and **Taraba** (3.0%), while **Jigawa** exhibits the lowest prevalence at 0.3%.

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## SOCIOECONOMIC IMPACT

The socioeconomic repercussions of the HIV epidemic are substantial, imposing costs on individuals, families, and communities. Stigma and discrimination against people living with HIV often lead to social exclusion and loss of employment, exacerbating poverty. Households affected by HIV may experience reduced income due to illness and increased healthcare expenditures, creating a cycle of poverty and health disparities. Children orphaned due to AIDS face significant challenges, including limited access to education and basic needs, perpetuating the cycle of disadvantage.

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## IMPACT ON PUBLIC HEALTH INITIATIVES

The response to HIV in Nigeria is impeded by persistent stigma and discrimination, which discourage individuals from seeking testing and treatment. This stigma not only affects the mental well-being of those living with HIV but also poses significant barriers to public health initiatives aimed at reducing transmission rates. Furthermore, inadequate funding and resource allocation for HIV programs hinder the implementation of effective prevention and treatment strategies. Although improvements in access to ART have been made, only about 44% of people living with HIV are currently receiving treatment, highlighting the urgent need for policy changes and increased investment in healthcare infrastructure (World Health Organization, 2021).

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## POLICY AND COMMUNITY RESPONSES

In response to the HIV epidemic, the Nigerian government has set ambitious goals, including the UNAIDS 95-95-95 targets, which aim for 95% of people living with HIV to know their status, 95% of those diagnosed to receive ART, and 95% of those on ART to achieve viral suppression by 2030. Achieving these targets requires a multi-sectoral approach involving collaboration among government agencies, civil society, and international partners. Community-based interventions that promote awareness, education, and testing can help reduce stigma and increase access to services.

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## CONCLUSION

Despite significant progress in HIV prevention and treatment, the virus remains a major global health challenge. Continued efforts in research, prevention, and care are essential to achieve the UNAIDS 95-95-95 targets (95% of people living with HIV know their status, 95% of those diagnosed receive ART, and 95% of those on ART achieve viral suppression) and to ultimately end the AIDS epidemic (UNAIDS, 2022).

While Nigeria has made strides in managing HIV, a multi-faceted approach addressing social determinants of health is essential for further progress. Continued collaboration among government agencies, international partners, and civil society is vital for achieving long-term goals in combating the epidemic.

Future directions in HIV research include the development of long-acting antiretroviral formulations, novel approaches to target the HIV reservoir, and ongoing efforts towards an effective HIV vaccine. Additionally, addressing social and structural barriers to HIV prevention and care remains crucial in the global response to the epidemic.

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## OUR INTERVENTION AND MANDATE

As future healthcare professionals, we have witnessed firsthand the transformative power of quality information on Nigeria's healthcare landscape. Driven by this insight, we are committed to addressing the pressing health challenges facing our communities. On August 24, 2024, the Nile University Medical Students Association (NUMSA) collaborated with the NAOWA Hospital Army Command to execute a comprehensive HIV awareness and screening outreach program at Guzape Village. This initiative sought to:

- Educate the public on HIV/AIDS prevention and management.
- Dispel misconceptions and stigma surrounding the disease.
- Provide complimentary HIV testing services.
- Facilitate referrals for further care and support.

This outreach program exemplifies our commitment to enhancing healthcare outcomes and promoting wellness in underserved communities.

