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HIV/AIDS in Nigeria: Risk Assessment and the Risk Management

Ogbonna Collins Nwabuko[1, 2, 3*], Martin Anazodo Nnoli[4], Thomas Obiora Nnaji[5]

[1]*Department of Haematology and Blood Transfusion, Federal Medical Centre, Umuahia, Abia State, Nigeria*

[2]*Department of Haematology, College of Health Science, Abia State University, Aba Campus, Abia State, Nigeria*

[3]*Department of Public Health Sciences, Walden University, Baltimore, USA*

[4]*Department of Anatomic and Forensic Pathology, University of Calabar, Calabar, Nigeria*

[5]*Department of internal Medicine, Alex Ekwueme Federal University Teaching Hospital, Abakiliki, Ebonyi State, Nigeria*

Corresponding Author:** ***Ogbonna Collins Nwabuko, *Department of Haematology, Federal Medical Centre, Aba Road, PMB 7001, Umuahia, Abia State, Nigeria.* ***Email:*** *ogbollins2002@yahoo.com*

Abstract: *Nigeria bears the second largest HIV disease burden in the world with 1.9 million people living with HIV/AIDS (PLWHA) at a stable prevalence rate of 3.4% since 2013, but currently dropped to 2.8%. This study described the predominant social determinants of heath inequality in Nigeria and how they contributed to the epidemic of HIV/AIDS in the nation. The public health interventions to curb this menace were highlighted. This is a systematic literature review of epidemiology of HIV, health behaviors and practices in Nigeria. Public health interventions in the form of policies (primary, secondary and tertiary legislatures) and behavioral theoretical models to effect desired social changes were explored. Medical Subject Heading (MeSH) was used as search strategy to identify the problems, interventions, comparatives and outcomes of research question. MEDLINE, PubMed, Cochrane Database Systematic Review, Google Scholar and AJOL were search databases reviewed. The identified attributable risk factors were health disparity arising from tribal marginalization of the minority ethnic groups that make up the oil-rich zones, low socioeconomic classes, gender inequalities, community wars, environmental injustices (flaring of gases and pollution), immigration of foreigners, poor HIV awareness/education, poor access to health care, illicit sexual behaviors and weak policies and inactive HIV prevention framework on the target population. The high prevalence of HIV/AIDS in Nigeria is a public health emergency and calls for equity, equality and fairness in the distribution of resources and services. The government, policymakers and public health experts should promote health policies that facilitate early detection and prevention of HIV. The ultimate goal of this legislation is to improve the average life expectancy of PLWHA nationally and globally. A global collaboration is therefore needed to achieve these goals.*

Keywords: *HIV/AIDS, Social Health Determinants, Risk Assessment, Risk Management, Prevention, Nigeria*

1. INTRODUCTION

Human Immunodeficiency Virus/AIDS is an infectious notifiable disease of public health importance. It has posed significant public health challenge in the global population health over the years with a total of 37 million people living with HIV [1]. The Human Immunodeficeiency Virus is the causative agent of Acquired Immunodeficiency Syndrome, hence the term, HIV/AIDS. HIV is an RNA virus and a member of the lentiviridae family of retroviruse. Traditionally, its primary mode of transmission is through unprotected sexual intercourse, transfusion of infected blood or blood products, intravenous drug users, and feto-maternal circulation of infected blood from mother to child. It has a high avidity for CD-4 positive T-lymphocytes and CD-4 bearing cells such as macrophages, B-lymphocytes, haematopoietic stem cells, kupffer cells, rectal mucosal cells and microgial cells of the brain just to mention a few. The virus is able to gain access to its target cells through CCRX receptors on these CD-4 bearing cells, where it undergoes either latent infection (i.e., oncogenic transformation) or replicative infection by replicating itself and causing cell destruction, and subsequent immune suppression [2-3].

HIV/AIDS is a public health disease of our time. It is an economic and social disease of this age.

Poverty, abnormal behavioural lifestyles such as illicit sexual orientation and practices could predispose to the disease. The 2007 Joint United Nations report on HIV/AIDS recorded that over 6800 persons become infected with HIV while 5700 persons die from AIDS-related illnesses everyday worldwide [4]. This was mostly because of inadequate access to HIV prevention and treatment services. Sub-Saharan Africa has been worse hit by HIV/AIDS epidemic than any other region of the world where about 68% of people living with HIV/AIDS (PLWHA) globally reside. At the end of 2007, the Joint United Nations Program on HIV/AIDS (UNAIDS) estimated that, globally, 33.2 million adults and children were living with HIV/AIDS, out of which 22.5 million were in sub-Saharan Africa. The global HIV new infection for 2007 was 2.5 million while 2.1 million deaths due to HIV-associated diseases were recorded. However, global HIV new infection has dropped to 1.8 million while AIDS-related deaths have reduced to about 940, 000 based on 2018 report (i.e., a 51% reduction from 2004 survey). About 76% of global AIDS-related deaths occur in the 43 countries of sub-Saharan Africa. Sub-Saharan Africa, therefore, remains the most seriously affected region with AIDS remaining the leading cause of death. The estimated number of deaths due to AIDS in this region in 2007 was about 1.6 million [4-5].

In Nigeria, the prevalence of HIV/AIDS has been steadily decreasing annually since 2003, when the Africa's most populous nation recorded its highest prevalence rate of 5.0%. The current prevalence rate of HIV/AIDS in Nigeria has dropped from 2.8% recorded in 2017 to 1.4% in 2018. That is, 1.9 million Nigerians of adult age group (15-49 years) are living with HIV/AIDS according to Nigeria National HIV/AIDS Indicator and Impact Survey (NAIIS) conducted between July and December 2018 [6]. The Niger Delta Region states bear the highest burden of HIV/AID in Nigeria with a cumulative prevalence of 15.2% [2,7-8]. The impact of HIV/AIDS on the socio-economic development of Nigeria has been quite enormous. It has contributed significantly to the decrease in average life expectancy of the Nigerian populace; increase the number of orphans and vulnerable children. The cost of achieving developmental goals and the level of poverty in the land has increased with the emergence of this deadly disease in Nigeria [2].

2. Potential Health Risk and Target Population of HIV/AIDS in Nigeria

The possible risk factors contributory to high burden of HIV/AIDS in Nigeria include:

2.1. High Income Gap between the Rich Class and the Poor (Poverty)

The income gap in Nigeria is of unprecedented magnitude where the minimum-wage salary is less than USD 50 as against about USD 97,000 per month received by the government officials (i.e., Nigerian Senator). Nigeria is not a ''caring and sharing society and this deviation from an egalitarian society is the root of many health problems in the country including the proliferation of commercial sex workers. A typical display of the scenario of the impact of the high income gap on the population health is what happens in the oil-rich Niger Delta cosmopolitan cities where you have the highest prevalence of HIV/AIDS. As a result of its strategic importance to the Nigerian economy, there is a regular influx of job-seekers, businessmen, expatriates and young ladies, who want a share of the lucrative petroleum industries, hence, leading to population increase (currently 5,000,000 from 2006 population census), increase number of commercial sex workers, high level of promiscuity, and other social and behavioral lifestyle that will foster the spread of HIV infection [9].The impact of the epidemic on the socio-economic development of Niger Delta states has been substantial. In Rivers State, for instance, where the prevalence rate of 8% in 2002 rose up to 15.2% in 2013 was statistically significant. It has contributed to the present decrease in life expectancy, increased the number of deaths of young adults (decrease in manpower) and increased the number of orphans in the country (estimated at one orphan in every 15-24 HIV/AIDS-related death). Despite the industrialization and the fact that Rivers state is an oil-rich cosmopolitan city, the level of poverty is alarming.

2.2. Lack of awareness of HIV/AIDS by the target population

Despite the industrialization in some of the oil-rich cosmopolitan cities of Niger Delta regions of Nigeria, the level of awareness campaign, environmental and social injustices in this region were alarming. This may be contributory to high level of promiscuity in the zone as many indulge in illicit sex as means of livelihood. Recent study on the knowledge, attitude, and perception among adolescents in the Rivers

States of Nigeria leaves much to be desired as majority of the respondents (about 93%) had knowledge of HIV/AIDS, but it did not appear to improve their attitude and perception of the disease. One-third of the respondents believed that HIV/AIDS could be contacted through mosquito bites while 60% admitted that none or a few of their friends use condoms during sexual intercourse [10].

2.3. The at-risk population group

This group include female sex workers, LGBT (Lesbians, Gays, Bisexuals, Transgenders), young females between 20-24 years age group (i.e., they are three times more vulnerable than age-matched males), pregnant women and immune-suppressed people. These are the categories that need supportive care through HIV counselling, testing and treat policy when they are sero-positive to the virus. The sero-positive pregnant women will benefit from regular antenatal care and institution of anti-retroviral therapy to prevent mother to child transmission of the virus (PMTCT). The current advocacy slogan is: ''support treatment of HIV-Positive Pregnant Mothers to Prevent Transmission of the Virus to the next generation.'' The current HIV prevalence in children (0-14 years) in Nigeria is 0.2% based on NAIIS report [6]. This showed a much better improvement in the preventive framework when compared to previous prevalence.

2.4. Unemployment

The high HIV/AIDS burden in some of the high-endemic states of Nigeria is due to health disparity arising from marginalization of the minority group (i.e., Ijaw ethnic group) that make up this oil-rich cosmopolitan zone. Immigrants form a high proportion of the population that make up oil-rich zones. Ironically, it is mainly immigrants that work in most of the oil companies in these zones leaving majority of the indigenes unemployed. It is this group that constitute the social vices in the environment.

3. Potential Determinants of Health Risk of HIV/AIDS in Nigeria

Generally speaking, factors such as poverty, physical abuse, sexual abuse, illiteracy, homelessness, stigmatization, drug addiction, violence, mental health problems, unemployment, powerlessness, lack of choice, lack of policies and legislations, no access to healthcare, environmental injustice and lack of social support could be contributory determinants of health risk of HIV/AIDS [11].

Evidence-based studied in Nigeria showed that low Socio-economic Status (i.e., poverty and unemployment) [12], gender inequality (lack of female empowerment) [13], tribal or ethnic marginalization (minority group), community wars and environmental injustices (i.e., environmental degradation or explorations of the oil without adequate compensation , unequal treatment of the individuals and lack of inclusiveness) are the major determinants of health inequalities, which probably could account for the high prevalence of HIV/AIDS in this region [10].

4. Risk Level Matrix of HIV/AIDS in Nigeria (Risk Stratification of HIV/AIDS)

Although Nigeria has made some level of progress in the care of PLWHA, there is a need to pay more attention to the at-risk categories in order to adopt a strategic leadership approach to eradicate this ravaging menace in the country. The stratification of risk levels of HIV/AIDS is one of the public health approaches to solve this problem.

According to NAIIS report:

- Female gender is a high risk category compared to male gender
- Women 15-49 years old are two times at risk than age-matched counterpart (1.9% versus 0.9%)
- Female 20-24 years higher risk (three times greater than age-matched male counterpart)
- People living with HIV/AIDS who have attended viral suppression compared to those who have not (about 42.3% compared to 57.7% who have not attend viral suppression). When a viral suppression is attended in a HIV positive patient, the person will remain healthy and viral transmission is prevented. Based on UNAIDS Press report [6], more Nigerians living with HIV/AIDS are virally active and infectious. These categories are high risk.
- Pregnant women (immune-suppressed group) and commercial sex workers are high risk group
- The LGBT group especially Male who have sex with males MSM (23 times more risk category) - Extremely risk group.

- IV drug abusers are high risk group.
- Based on prevalence in the various (6) geopolitical zones that make up Nigeria: South-South (3.1%) and North Central (2.0%) high risk group; South East (1.9%), South West (1.1%) and North East (1.1%) Moderate Risk; North West (0.6%) Low Risk
- Sexual Behaviours: Protected Sexual intercourse – Low Risk; Unprotected sexual intercourse, anal sex and oral sex- High /Extreme Risk
- Based on therapy: PLWHA on Treatment and supportive care are Low risk category; PLWHA who cannot access Treatment and supportive care are High Risk
- Mutation/Resistance/Heterogeneity or Serotypes of the viral particles – Multiple Drug Resistance Virus – High/Extreme High Risk; High viral load – High Risk; HIV-1 –High risk; HIV-2 –low Risk category

Table1. *Risk Stratification of HIV/AIDS*

LOW RISK CATEGORY	**Gender**: Male. **Gender-Age-group**: 15-14 years Male age group. **Sexual behaviour**: Protected Sexual Intercourse. Serotype: HIV-2. **HIV RNA Viral Load**: Low viral copies (0-50 HIV RNA copies). **CD-4 T-lymphocyte count**: > 500 cells/micro-litres. **Therapy:** PLWHA on treatment and supportive care, who have achieved viral suppression (Complete Remission) **Geo-political zone of Nigeria**: North-West (0.6%) based on 2019 NAIIS report.
MODERATE RISK CATEGORY	**Gender**: Female **Gender-Age-Group**: 15-49 years Female age group. **Sexual behaviour**: Partially protected sexual intercourse. **CD-4 T-lymphocyte count**: 200-499 cells /micro-litres. **Therapy**: PLWHA on ARV who have attended viral suppression. **Geo-political zones of Nigeria**: Southeast (1.9%), South-west (1.1%) and Northwest (1.1%) based on 2019 NAIIS report.
HIGH RISK CATEGORY	**Gender-Age-Group:** 20-24 years Female age group. **Sexual behaviour:** Unprotected sexual intercourse. **At Risk group**: Pregnant Women, Commercial sex workers/Multiple sexual partners, LGBT, IV Drug abusers. **Serotype**: HIV-1 **CD-4 T-lymphocyte count**: 200-299 cells/micro-litres. HIV RNA Viral Load: Very High viral copies **Therapy**: PLWHA who are not on treatment or supportive care. PLWHA who have not achieved viral suppression. **Geo-political zone of Nigeria:** North-central (2.0%) based on 2019 NAIIS report.
EXTREME RISK CATEGORY	In addition to the qualities of the high-risk category, they may also have the followings: **Sexual behavior:** Anal and oral sexual intercourse **Sero-type**: HIV 1 and 2 **CD-4 T-lymphocyte count**: < 200 cells/micro-litres **LGBT**: MSM **Mutation/Resistance/Heterogeneity**: Multi-drug resistance HIV variants.

5. System Description of HIV/AIDS Risk Factors

Having identified the various component risk factors and their functionality a SWOT (Strength, Weakness, Opportunity and Threat) analysis will play significant role in proffering possible solutions on how to handle the risk factors of HIV/AIDS in Nigeria. The vulnerable groups in the society include the pregnant mothers, the commercial sex workers, the sexually active girls, the female gender, the unemployed, the uneducated, the female gender who is not empowered, the sexually abused, the mentally handicapped, the physically abused, the poor, the destitute, the orphan and orphanage, the low-income in high-income gap society, the HIV sero-positive who cannot assess treatment and supportive care, the HIV-

positive who have not attend viral suppression, the marginalized in the society, the LGBT especially the MSM, the oral and anal sex addicts, the multiple sexual partners, the multi-drug resistant HIV patients, the South-southern Nigerians who live in oil-rich Niger Delta region of Nigeria, just to mention a few. The threats to these risk factors ironically appear to be the likely factors that make the target population vulnerable. These may include low socioeconomic status, lack of education, unemployment, no accessible health care, lack of policies and legislation that are health protective.

A planned counter-measure to each of these threats will be a strategy towards prevention of HIV/AIDS in the target population. For instance Public Health Awareness Campaign on HIV/AIDS. While conducting this awareness campaign one should target both the urban and rural communities using mass media as the vehicle of information dissemination. This may include radio, TV adverts; social media (i.e., Face book, WhatsApp, Blog, Flicker, Twitter and Instagram, etcetera), posters and bills as modes of communication. In such information dissemination, the campaign language must be culturally friendly, relevant and understandable in order to mitigate the challenges of health literacy and culture barriers. There is a need to continually engage community using Community-Based Participatory Research (CBPR) members [14]. Another important measure to handle the HIV risk includes adequate health insurance of people living with HIV/AIDS in Nigeria.

6. Risk Management Plan for HIV/AIDS in Nigeria

The essence of public health practice is to improve the quality of life of people living with HIV/AIDS in Nigeria through:

1. Prevention and treatment of the disease.
2. Health protection via infectious disease control, emergency preparedness response and improvement of environmental health.
3. Promotion of good health.

The HIV/AIDS preventive options available could be primary, secondary and tertiary. Each of these options will be useful in creating a HIV-free environment either by immediate or long-term implementation strategies.

The primary preventive measure will focus on education of the populace on the significance of HIV/AIDS. Recent study on the HIV/AIDS knowledge, attitude and opinions among adolescents in Rivers state showed that enough awareness of HIV/AIDS has not been created among the youths that form the sexually active group of the society. Education of the masses must be adequate in order to achieve the desired result. Public health is beginning to make much impact in the reduction of HIV/AIDS prevalence through various initiative programs which centre on promoting healthy behavioral lifestyles such as Abstinence (A), being faithful to the partner (B), and the use of Condom (C). The trio popularly known as ‘’ABC of HIV prevention’’ are the primary preventive approaches used in reducing the burden of HIV/AIDS in the region. In addition, addressing the issues on contributory factors enumerated above such as poverty alleviation, women empowerment, environmental justice, equity in the distribution of resources will go a long way to re-shape the behavioral lifestyles of the populace, hence contributing to healthy living [10].

The Secondary Prevention include early screening (diagnosis/detection) and staging (baseline investigation) of the HIV-seropositive individuals and commencing them on Highly Active Anti-Retroviral Therapy (HAART). This serves two purposes viz: it delays the progression of clinical course of the disease to AIDS-defining illness which ultimately improves the quality of life of people living with HIV/AIDS. It also reduces the virulence and infectivity of the virus, hence, useful in prevention of mother to child transmission of the virus (PMTCT). This accounts for the reason why ARVs are introduced during ante-natal period and child birth. In developed countries, mother to child transmission below 2% has been achieved using combination antiretroviral chemotherapy as against 90% previously recorded before the introduction of the drugs [15].

The Tertiary Prevention: This centres mainly on improving quality of life of those who have progressed into the AIDS-defining illness. It encompasses holistic care geared toward relieving of pains, psychosocial and spiritual problems-otherwise known as palliative care. Opportunistic infections (i.e., tuberculosis, candidiasis, CNS lymphoma, KS, etc) and other surgical conditions are handled at this stage. The tertiary care is minimally preventive, but

maximally curative and it is capital intensive [16].

HIV/AIDS is a disease of public health importance. In order to curb the HIV/AIDS scourge globally, laws must be enacted to guide daily practices and to prevent the continuous spread of the virus. Such laws should ensure that all stakeholders are committed towards ensuring HIV/AIDS-free environment. These laws may include –

- Universal safety precautions which must be observed by all healthcare providers while handling patients in the laboratories, wards or theatres.
- Provision of anti-retroviral drugs at all levels of healthcare especially in developing countries.
- HIV/AIDS Education in the curricula at the primary and secondary levels
- Condoms liberalization to prevent HIV/AIDS, Sexually Transmitted Infections, and unwanted pregnancies.
- De-stigmatisation of People Living With HIV/AIDS (PLWHA).

The strategic leadership approach to curb the ravaging menace of HIV/AIDS in Nigeria requires improved understanding of the country's HIV epidemic, HIV response investment through emergency response plan and effective provision plan for HIV prevention, care and treatment services; and a focus on the at-risk target population [5]. It is expected that with the adoption of strategic policies such as the test and treat policy, and the population-location approach to deliver services to where people and areas most needed, the prevalence of HIV/AIDS will be minimised to the barest minimum. Other strategies include scaling up the PMTCT and HIV treatment facilities in the country to twice the current number. The government should strengthen the existing HIV/AIDS prevention agencies (i.e., National Agency for Control of AIDS, NACA) and establish other new preventive frameworks such as HIV/AIDS Treatment Agency (HTA), Vaccine Against HIV/AIDS Agency (VAHA) and HIV/AIDS Surveillance Agency (HSA) for monitoring and evaluation of therapeutic interventions [17]

7. Conclusion

The risk assessment of HIV/AIDS in Nigeria is one of the possible public health approach of preventing the ravaging menace in the country. It provides the countermeasures which could be useful in its management. The role of health protection cannot be over-emphasized in this approach as it provides the tools such as surveillance, screening tests, health needs assessments and policies required to manage the condition.

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