An update on survival of people living with HIV in Nigeria.

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Abstract

Human immunodeficiency virus is a threat to human existence, especially in developing countries, including Nigeria. Although many preventive and interventional measures have been taken to reduce the threat of HIV, HIV remains a major cause of public challenge in this part of the world. This review was conducted to update society on the survival of people living with HIV/AIDS in Nigeria. During the course of this review, a number of references were consulted using various search engines including Pubmed Central, Google Scholar, Scopus, Sciago, Web of Science, Researchgate, Academia Edu, Semantics and LiveDna. Life expectancy for people living with HIV/AIDS (PLWHA) has increased significantly since the introduction of highly active antiretroviral therapy (HAART). Declining HIV/AIDS-related deaths and cohorts are increasing the proportion of people with HIV/AIDS who die from non-HIV/AIDS-related illnesses. Poor access to antiretroviral therapy, inadequate laboratory facilities, knowledge and attitudes of some patients, cultural beliefs, anti-gay laws and increasing HIV/TB co-infection continue to affect people living with HIV. It's a problem. HIV/AIDS-related deaths in Nigeria.

Keywords: People living with HIV/AIDS, HIV, AIDS, TB, HAART.

Introduction

The HIV epidemic will remain a major global public health problem until it is completely eradicated. In 2018, 37.9 million men, women and children were infected with HIV/AIDS worldwide, 1.7 million men, women and children were newly infected with HIV in 2018, and 770,000 died of AIDS. “Côte d'Ivoire and Nigeria account for approximately 60% of new HIV infections and 54% of AIDS-related deaths each year was found to be low, and national HIV estimates were revised. This additional information lowers estimates of people living with HIV, AIDS-related deaths, and HIV infection from previous estimates [1].

Due to Nigeria's large population, many people are living with HIV/AIDS, despite relatively low HIV prevalence. Introducing Antiretroviral Therapy (ART) to all people living with HIV would not only benefit those already living with HIV, but also reduce viral load, increase CD4 cell counts, and reduce the risk of HIV infection. Increases chances - human infections are greatly reduced. Countries with large untreated populations, such as Nigeria, will find it difficult to control the HIV epidemic [2-4].

Nigeria is one of six countries facing three threats: high HIV burden, low ART coverage, inadequate reduction in new HIV infections, and inadequate viral suppression. It accounted for half of all new HIV infections in sub-Saharan Africa in 2017 [5]. The number of ART patients in Nigeria has slowly increased over the years, reaching 970,000 in 2016 [6]. That number is far below the requirements needed to achieve disease control. Access to HIV testing (HTS) services and rapid treatment of HIV-positive patients may, over time, lead to cost-effective epidemic control [7,8].

The Joint United Nations Program on HIV/AIDS (UNAIDS) Fast Track Strategy aims to scale up the HIV response in low- and middle-income countries to end the epidemic by 2030 [9]. HIV/AIDS (PLWHA) combined with highly active antiretroviral therapy (HAART) to reduce HIV viral load to a level at which her HIV-infected person is unlikely to transmit her HIV to others decreases, thereby shortening the infection cycle [10].

Life expectancy of people living with HIV/AIDS (PLWHA) has increased considerably since the introduction of the highly active antiretroviral therapy (HAART) in the mid-1990s due to the reconstitution of immune response. HIV/AIDS has gradually been considered as a chronic disease with life expectancy almost comparable to non-HIV chronic illnesses [11].

Survival of people living with HIV / AIDS (PLWHA) has increased since the emergency of High active antiretroviral therapy (HAART) in 1996. Fewer HIV / AIDS-related deaths and cohort have resulted in an increase in the proportion of HIV/AIDS patients dying from non-HIV/AIDS-related disorders. Low level of access to antiretroviral treatment,

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inadequate laboratory facilities (for monitoring their viral load, CD4 cell counts etc.), knowledge and attitude of some patients, cultural believe, punitive laws against homosexual, and increase in HIV and TB co-infection remain an issue for PLWHA, meaning that there are still many HIV /AIDS related deaths in Nigeria [5].

Immediate initiation of ART irrespective of CD4 cell count was found to be more beneficial compared to treatment initiation after the CD4+ cell count declined to less than 500 cells/ml [12]. Additionally, evidence shows that there is no significant increase in the rate of adverse effects in individuals commenced on treatment irrespective of CD4 levels [13]. As a result of this, the World Health Organization in 2015, recommended that people infected with HIV be initiated on ART irrespective of CD4 cell.6 Therefore it was recommended that, CD4 cell counts as well as other baseline laboratory tests may no longer be required for ART initiation [14]. However, patients on ART may be monitored using CD4 cell count or viral load estimation, with other baseline tests often determined on need basis. Early initiation on ART increases the number PLWHA receiving treatment, lead to better clinical outcomes, suppressed viral load and reduce transmission of new infection, which ultimately changes the course of the HIV epidemic [15]. Commencement of ART without baseline laboratory tests, will expand access to HIV treatment which could ensure the achievement of UNAIDS 95-95-95 goals by 2030, thereby averting over 21 million HIV related deaths and 28 million new HIV infections [16]. Access barriers to HIV treatment and retention include fear of stigma and denial exhibited by linkage-resistant PLWHA who out rightly refused treatment, long distance to ART facilities, competing social priorities such as work, and poor health seeking behaviour [17].

Human Immunodeficiency Virus (HIV)

Human Immunodeficiency Virus (HIV) causes the development of AIDS (Acquired Immune Deficiency Syndrome) in human if not managed timely. It is also the virus that can be transmitted from one person to another through the under mentioned ways; unprotected sexual intercourse; use of infected body piercing materials; use of infected blood and blood products; from an infected mother to her baby during pregnancy, childbirth and through breast feeding [18].

History of HIV/AIDS

HIV was first recognized in the USA in 1981 as a fatal disease of young gay men and intravenous (IV) drug users. The virus was identified as the cause of HIV in 1983, and by 1985 there was a serum test to identify infected individuals. By 1996 in the USA and Western Europe, there was widespread use of effective combinations of antiretroviral drugs initially termed highly active antiretroviral therapy or HAART and now referred to as cART. The death rate from HIV began to fall in 1996 in the USA, and the further availability of cART worldwide saw a global decline in new cases for the first time in 2012. This remarkable reversal of the prognosis of HIV caused a dramatic shift in the demographics of people living with HIV [19].

National status of the epidemic of HIV/AIDS

Nigeria is one of the most populous African countries; it is situated in sub-Sahara Africa and presently have humongous share in the burden of HIV and AIDS. According to the Federal Ministry of Health, HIV prevalence in country is 4.1% [20]. This translates to more than 3 million people infected with HIV in the country. Prevalence ranges from 1% in Kebbi State to 12.7% in Benue State, North Central Nigeria while Enugu State where the health facilities of this study are located has a prevalence of 4.9%. This extension shows that all 36 states and the Federal Capital Territory have prevalence of one percent or over 21.

The HIV sero-surveillance sentinel survey report shows that HIV zonal prevalence for the south East was 4.2%. Enugu state had the highest prevalence (4.9%) while Imo state recorded the lowest (3.1%). Site prevalence ranged from 2.0% to 11.9% with the highest being in Achi (11.9%) and lowest being in Enugu (2.0%). This shows that the epidemic affects both the urban and rural populations in Enugu [21].

Mortality and lifespan of people living with HIV/AIDS

There is great heterogeneity in the mortality figures and life expectancy of people with HIV, driven by factors such as patient virological suppression, CD4 results, and time of diagnosis and IV drug use. Nonetheless, the overall mortality rate has fallen dramatically [22]. Despite these advances, mortality rates in selected HIV-infected populations range from 1.7- to 7.0-times those of HIV-uninfected populations [23,24] and of great interest, subgroup analyses indicate that mortality approaches the uninfected population if the diagnosis of HIV is made early in the course of the disease, the CD4 count is maintained at >350–500 cells/ml, and the viral load is suppressed [23]. Similarly, calculated life expectancy, which is based on mortality data, has risen since the late 1990s, but it is still only two-thirds that of the general population [25,26]. As with mortality data, subgroup analyses indicate that those who achieve a CD4 count of above 350 cells/ml and viral suppression in the absence of other risk factors have a life expectancy that is similar to the general population [26]. Caution regarding these studies, particularly the subgroup analyses, is warranted. Patients in some cohort analyses are not representative of the overall HIV-positive population, appropriate HIV-uninfected controls are difficult to identify, and data on aging are still preliminary for the HIV epidemic. In particular, it is difficult to control for differences in lifestyle factors, socio-economic status, risk factors for co-morbidities, nutrition, safe environment, ethnicity, social isolation, and chronic infections such as those caused by hepatitis and herpes viruses. The issues in identifying appropriate non-HIV-infected control populations have been reviewed recently [27]. A recent article compared life expectancy of HIV-positive and matched HIV-negative individuals (rather than the general population) cared for in the Kaiser Permanente Health System in California from 1996 (at the beginning of widespread cART in the USA) to 2011 [28]. The life expectancy at age 20 years of an HIV-positive individual rose from 19.1 years to 53.1 years by 2011, but was still less than that of HIV-

negative individuals (64.9 years). After controlling for risk factors including cART therapy, smoking, substance abuse, and hepatitis virus infection, a gap between HIV-positive and HIV-negative individuals of almost 6 years of life expectancy was still demonstrated. Thus the best data, i.e. HIV-positive individuals compared to match HIV-negative individuals rather than the general population, indicate a continuing gap in life expectancy for HIV-positive individuals compared to those who are uninfected [19].

Diagnosis and treatment of HIV

Many PLWHA in Nigeria are unaware of their status. Nigeria continues to fall short of providing the recommended number of HIV testing and counselling site [29].

The diagnosis of HIV remains a problem in older patients, as screening and diagnosis of older patients for HIV has not been emphasized and is frequently overlooked by both physicians and patients. Data indicate that 18% of newly diagnosed patients are over the age of 50 years [30]. Treatment with cART should be offered to all HIV-positive patients unless there is a medical or pharmacological contraindication. A recent study indicated that patients in the age range 45–60 years have a higher mortality than younger patients if antiretroviral treatment is delayed [31].

Theoretical framework

Current WHO figures estimate that in 2017 there were 17 million PLWHA who were receiving HAART worldwide. Nigeria has the second largest HIV epidemic in the world [1]. Although HIV prevalence among adults is much less (2.8%) than other sub-Saharan African countries such as South Africa (18.8%) and Zambia (11.5%). About 3.1 million Nigerians were living with HIV in 2017 [32]. It is estimated that around two-thirds of new HIV infections in West and Central Africa in 2017 occurred in Nigeria. Together with South Africa and Uganda, the country accounts for around half of all new HIV infections in sub-Saharan Africa every year.14 This is despite achieving a 5% reduction in new infections between 2010 and 2017 [33].

Unprotected heterosexual sex accounts for 80% of new HIV infections in Nigeria, with the majority of remaining HIV infections occurring in key affected populations such as sex workers [16]. Six states in Nigeria account for 41% of people living with HIV, including Kaduna, Akwa Ibom, Benue, Lagos, Oyo, and Kano.15 HIV prevalence is highest in Nigeria's southern states (known as the South South Zone), and stands at 5.5%. It is lowest in the southeast (the South East Zone) where there is a prevalence of 1.8%. There are higher rates of HIV in rural areas (4%) than in urban ones (3%) [34].

Approximately 150,000 people died from AIDS-related illnesses in Nigeria in 2017 [12]. Since 2005, the reduction in the number of annual AIDS-related deaths has been minimal, indicative of the fact that only 33% of those with a positive diagnosis in Nigeria are accessing antiretroviral treatment [13].

Many people with HIV have higher rates of smoking, substance abuse including alcohol [35], and low fitness and physical activity levels [36].

Empirical study

In Nigeria, Sex workers, men who have sex with men and people who inject drugs make up only 3.4% of the population, yet account for around 32% of new HIV infections [37]. In 2017, prevalence in this group stood at 23%, significantly more than the next highest prevalence group - sex workers - at 14.4% of all new HIV infections in the country, 10% occur among men who have sex with men [38]. In 2014, the Nigerian government increased the punishment for homosexuality to 14 years in jail. Anyone 'assisting couples' may face up to 10 years in prison [39].

Criminalizing laws such as these have made it harder for civil society organizations to work with LGBT communities and have pushed men who have sex with men underground, making them more vulnerable to HIV [40]. Although the NACA state that 'no provision of this law will deny anybody in Nigeria access to HIV treatment and other medical services', studies have shown that since the law came into action, more men who have sex with men report they are afraid to seek healthcare [41].

Nevertheless recent years have seen an improvement in HIV prevention among men who have sex with men. In 2010, only 18% of men who have sex with men were reached with HIV prevention programming, while recent reports show 82% of men who have sex with men used a condom at last sex with male partner and 97% had tested for HIV in the last 12 months [34].

In 2016, it was estimated that 14.4% of sex workers were living with HIV in Nigeria. This is a significant drop since 2013 when it was estimated that 24.5% of sex workers were living with HIV [6]. HIV prevalence among sex workers is still eight times higher than the general population. There are a number of factors that make sex workers more vulnerable to HIV. HIV prevalence is higher among female sex workers at 24.5% compared to male sex workers at 18.6% [42]. Similarly, brothel-based sex workers face greater HIV risk in Nigeria, with a prevalence of 27.4%.52 Progress in HIV prevention meant that, in 2016, 98.1% of sex workers reported using a condom with their last sexual partner and 97.1% of female sex workers had received an HIV test in the last 12 months [6].

Sex work is illegal in Nigeria [43]. The law states that those wholly or partly supporting themselves through sex work can face two years imprisonment. There is no law that prevents healthcare workers from providing sex workers with health services, yet the criminalising law makes it difficult for individuals to disclose that they are sex workers to healthcare workers. The new law also makes sex workers more vulnerable to abuse from law enforcers [44].

People Who Inject Drugs (PWID)

HIV prevalence among people who inject drugs (sometimes referred to as PWID) in Nigeria was 3.4% in 2017. Women who inject drugs are particularly affected with a prevalence of 13.9% compared to 2.6% among men [45]. Female sex workers who inject drugs face the highest HIV prevalence at around 43% [46]. It is thought that 9% of new HIV infections

in Nigeria every year are among people who inject drugs [47]. In 2015, the National Agency for Control of AIDS (NACA) reported that around half (52.7%) of people who inject drugs share needles and syringes. Approximately 7.3% share needles and syringes all the time and more than a third (36.4%) shared needles some of the time. Although this is lower than in 2010, helped in part by efforts to reach people who inject drugs with HIV prevention services, these rates remain very high [48]. Harm reduction services such as opioid substitution therapy and clean needle exchanges are currently not available in Nigeria. Available services are limited to targeted information, education and communication, condom distribution and hepatitis C treatment. However, discussions on developing a national harm reduction strategy began in 2015 [49].

Young people

In 2016, 240,000 adolescents (between the ages of 10-19) were living with HIV, making up 7% of the total number of people with HIV in Nigeria.50 HIV prevalence among this age group varies regionally, with 4.3% of 15-19 year olds living with HIV in the South, compared to 1.3% in the South East. Health outcomes for adolescents living with HIV in Nigeria are poor, and Nigeria is the only country in the world where mortality in 10-14 year olds is rising [49].

Young women have a higher HIV prevalence and are infected earlier in life than men of the same age group [47]. In 2016, more than 46,000 young women were infected with HIV compared to 33, 900 young men from former report [6].

There are a number of factors that increase HIV vulnerability among young people, including a lack of knowledge and appropriate sexual reproductive health services. Reports from a 2017 National Health Survey showed that only 29% of women and 27.9% of men between the ages of 15 to 24 could correctly identify ways of preventing sexual transmission of HIV, and reject major myths around transmission [50]. Early sexual debut is common in Nigeria, with 15% of girls and 4% of boys having sex before they are 15 years old. Inter-generational relationships are also common in Nigeria.

A 2017 survey found that 41.2% of women between the ages of 15 and 24 had had a sexual partner ten or more years older than them in the last 12 months. This increases HIV risk among this group as often the virus is passed from older men to younger women [50]. Despite their elevated risk, reports show that few adolescents test for HIV regularly. In 2017 only 2% of males between 15 and 19 and 4% of females had tested for HIV in the last 12 months [50]. National targets commit to 90% treatment coverage and 50% testing rate among young people by 2020 [47].

In addition to the National Strategic Framework, Nigeria released a National HIV Strategy for Adolescents and Young People in 2016, which provides a set of guidelines co-created with young people. This recognises negative provider attitudes towards young people and their sexual activities, limited access to youth-friendly services, low awareness of HIV and fear of stigma as being key challenges preventing young people from taking up sexual health services [47].

HIV Testing and Counselling (HTC) in Nigeria

In 2016, 34% of adults living with HIV were aware of their status [6]. Across the country testing rates are low: only 15.1% of people between the ages of 15-49 had tested in the last 12 months and knew their results [50]. Nigeria aims to reach the UNAIDS target, with 90% of people living with HIV knowing their status by 2021.46 Surveys have also shown that only 60.4% of women and 70.8% of men knew where they could go to be tested for HIV [50].

There are a number of reasons why more people are not testing for HIV in Nigeria. These include supply problems with testing kits and logistic issues getting further supplies. There is also a common belief that HTC Clinics are where HIV-positive people go to access care, rather than them being testing Clinics for those who don't know their status [47].

A push on the number of sites providing HTC services has resulted in a huge increase, from around 1,000 in 2010 to more than 8,000 in 2014 [47]. However, this number is woefully short of the estimated 23,600 sites needed to provide universal coverage. Targets set in the most recent National Strategic Framework commit to 60% of the general population and 100% of key populations and children of mothers living with HIV to have access to HIV testing services. The plan also hopes to integrate screening for other co-infections into HIV testing and counselling services [46].

HIV Prevention Programmes in Nigeria

Nigeria accounted for 59% of all new HIV infections in West and Central Africa in 2016.5 This rate of new infections has remained relatively stable in recent years, with only a 5% decrease between 2017 and 2010 [45].

The National Strategic Framework lay out by the NACA, outlined key targets for the next five years: aiming to provide 90% of the general population with HIV prevention interventions by 2021 and for 90% of key populations to be adopting HIV risk reduction behaviours by 2021. They identify strengthening community structures as being a main way to achieve this.

Condom use

According to 2017 data, 57.6% of men between the ages of 15-49 reported using a condom when they last had sex, compared to 39.8% of women. Condom use varies across different groups, and is lowest among people who inject drugs at 83.2% [45].

The end of term review of the 2010-2015 national HIV strategy identified condom uptake as having been a major area of challenge, identifying cost, low availability and resistance to condom promotion from certain key religious and cultural groups to have been some of the main barriers to progress [47].

The review also identified low uptake of lubricants, as having been a key failing, with only 45.9% of participants reporting using lubricants consistently [47].

The National Strategic Framework aims to increase condom use, particularly among young people and those who have

never been married. It aims for 90% of people to be using condoms regularly by 2021 [46].

Pre-exposure prophylaxis (PrEP)

PrEP is not available to the general public in Nigeria, however some serodiscordant couples have been able to access the drug through demonstration projects. In 2016, 242 people were on PrEP in Nigeria [5]. According to the new national guidelines for HIV prevention and care, future expansion of PrEP will include serodiscordant couples, commercial sex workers, people who inject drugs, and 'individuals who engage in anal sex on a prolonged and regular basis [51].

Prevention of Mother-to-Child Transmission (PMTCT)

Just over a quarter (26.9%) of all cases of mother-to-child transmission (MTCT) of HIV in the world happen in Nigeria [45]. In 2016, just 32% of pregnant women living with HIV received antiretroviral treatment to prevent mother-to-child transmission and only 34.7% were tested for HIV as part of their antenatal care [6,50]. As a result the rate of mother-to-child transmission has remained high, at an estimated at 22% in 2016. Only 18,556 infants born to mothers living with HIV were tested after two months [45]. As such, reducing mother-to-child transmission remains a major target area. Nigeria was selected as one of UNAIDS'23 priority countries for PMTCT – being one of the nations with the highest HIV burden yet low levels of treatment coverage during pregnancy. Of these 23 countries, Nigeria has the second lowest level of ART coverage in pregnant women [6].

The number of pregnant women visiting health facilities remains low, as does the number of health facilities providing PMTCT services, with only 7,265 health facilities providing PMTCT in 2015 [50,47]. To address this, Nigeria aims to have 95% of health facilities providing PMTCT services by 2021 [16].

Antiretroviral availability (ART) in Nigeria

Nigeria is a long way off meeting the global target of enrolling 90% of people diagnosed with HIV on antiretroviral treatment (ART). Just 33% of all people living with HIV were receiving treatment in 2017. Among children this is even lower, with just 26% on ART. Out of 96% of the people on HIV treatment, only 24% had achieved viral suppression in 2016 [5].

Poor treatment coverage and adherence means that the number of AIDS-related deaths in the country has remained high with 150,000 deaths in 2017. Although Nigeria adopted a 'test and treat' policy in 2015, which means that anyone with a positive diagnosis is eligible for treatment, this is far from a reality. Nevertheless, efforts have been made to scale-up treatment access, and 212,000 more people were enrolled on antiretroviral treatment between 2016 and March 2017 [45]. Yet weaknesses in the health system exist and create a barrier to many people accessing or staying on treatment. Even when ART can be accessed, drug supplies are known to run out and cause stockouts [16]. In an attempt to address this, the National Strategic Framework for the HIV response has made strengthening supply chains and improving logistics around treatment a priority [46].

The UNAIDS catch-up plan for Nigeria, also identifies removing 'user-fees' as being a key next step in expanding treatment coverage [6]. Although accessing the antiretroviral drugs themselves is free, often patients will be asked to pay for other services, for example running other tests. Studies have shown that these fees and high costs of travel to clinics can be a barrier to many people accessing care [52].

Nigeria aims to triple treatment coverage in the next three years, ensuring that 90% of the population living with HIV is on treatment by 2021. To do this they will also need to address stigma and discrimination around the virus, and have committed to work to foster an enabling environment for people living with HIV to come forwards [46].

Nigeria was also selected as a key focus country for the World Health Organization's drug resistance strategy in 2017 [7].

Barriers to the HIV response in Nigeria

Cultural barriers: The national strategic framework identifies certain cultural practices that increase HIV vulnerability among the general population in Nigeria. These include female genital mutilation (FGM), denial of women's access to inheritance, widowhood rites, encouragement of multiple sexual partners for males, and marriage of young girls to much older men [46].

These stigmas remain the key barriers to the HIV response in Nigeria, with 46.8% of people reporting that they would not buy vegetables from a shopkeeper living with HIV, in 2016. As such reducing stigma and discrimination has been identified as being a key action point for the country in the West and Central Africa catch-up plan [6].

Legal barriers: In early 2015, President Jonathan signed a new antidiscrimination bill into law which secured the rights of people living with HIV, protecting HIV-positive employees from unfair dismissal and from mandatory HIV testing [16]. However, in 2016 UNAIDS reported that 21% of people living with HIV had been denied access to health services and reproductive health services due to their status [53].

One of the major barriers to accessing HIV prevention programmes for men who have sex with men are laws that criminalise their activities. For example, same-sex relations in Nigeria can be punished with 14 years' imprisonment. This is not only limiting access to HIV prevention programming for this community, but causing nationwide stigma and discrimination against people based on their sexual orientation [54].

Structural barriers: A simple lack of sites that deliver HIV services (testing sites, PMTCT sites, and treatment sites) presents problems for the Nigerian population. In 2015 there were only 1,078 facilities providing HIV treatment, according to the national strategic framework [46].

Although rates are low (0.5% and 1.2% of new HIV infections in 2010 respectively) blood transfusions and unsafe medical injections do result in some new cases of HIV [47]. As a result, enhanced efforts could almost eliminate this risk. Although there are guidelines for certain practices, the lack of universal

precautions and failure to record blood safety information in all circumstances means this transmission route remains. By 2021, the NACA aims to ensure that 100% of blood transfusions and blood products are safe [46].

Adherence to medical care

The burden of HIV pandemic varies between countries and regions with sub-Saharan Africa being most affected where nearly 1 in every 20 adults is infected accounting for 71% of the global burden [55]. The use of Highly Active Antiretroviral Therapy (HAART) has transformed HIV from a rapidly fatal disease to a chronic medical condition. Adherence, on the other hand refers to the persistence and tenacity that patient needs to achieve in sticking to a therapeutic regimen [56]. In Nigeria HAART was introduced in 2002 and today ≥ 500,000 people are using HAART out of ≥ 1,500,000 eligible clients [2]. In Kano, the use of HAART was commenced in 2005 and by the end of 2015 ≥ 27,000 patients were receiving Antiretroviral Therapy (ART). The new 2014 guidelines from the World Health Organization (WHO) recommend that people living with HIV should start ART much earlier and in some instances immediately upon diagnosis. Consequently, about 26 million people worldwide will now be eligible for ART, an additional 9.2 million from the previous 2010 guidelines [57]. Previous studies suggest that anti-retroviral drug resistance evolves largely as a result of poor adherence to drugs by patients and were attributed to extensive use of ART in the developed nations [58].

However ART scale up in resource-poor settings could accelerate the emergence of HIV drug resistance due to insufficient viral load monitoring, inconsistent drug supply and possible unregulated use of antiretroviral (ARV) drugs which could potentially reverse the gains recorded from the use of ART. Where non-adherence is wide spread, transmitted Drug Resistance (TDR) or primary resistance develop which increases the risk of virologic failure to first line ARTs [59].

In the United States, women are more likely to fail treatment than men on the same medication. Determinants of poor adherence include non-white ethnicity, low education and income less than $10,000 per year, incarceration, being a single parent, alcohol abuse and psychiatric morbidity [60]. A study from Kwazulu-Natal South Africa in 2010 indicated that factors that favor adherence include urban residence, the absence of discrimination experience, better adherence information, not using herbal medicine and higher social support [61]. In Benin City south-southtern Nigeria, it was reported in 2008 that poverty, medication adverse effects, confidentiality, occupational factors, stigma and discrimination were determinants of the level of adherence which was in line with the in-depth interview of this study on those survived after five years on ART [62]. A similar study on determinants of adherence from Keffi Nasarawa State, north-central Nigeria in 2013 found that adherence was positively associated with disclosure of HIV status and living with family, patient's educational level, marital status and occupation. Reasons for non-adherence were forgetfulness, side effects, living far away from the medical center and inability to afford the cost of transportation to the medical center [63]. Iliyasu et al. from Kano showed that the educated patients were more likely to be compliant whereas age and sex variables had no significant influence on compliance. Reasons for non-adherence were non-availability of drugs, forgetfulness and lack of funds [64]. Community Treatment Initiative has been shown to be effective in improving client linkage to ART in low resource settings like Nigeria and therefore may be adopted as a way of increasing ART Uptake following community testing. This has positive implication if we must end HIV epidemic in low and middle income countries with poor health systems and limited number of facilities which culminate into positive clients delay in accessing care from causes such as long distance from home to facility, access barriers (financial and physical), and perceived level of stigma and discrimination against PLWHA by health workers in health facilities [65].

Access barriers to HIV treatment and retention include fear of stigma and denial exhibited by linkage-resistant PLWHA who out rightly refused treatment, long distance to ART facilities, competing social priorities such as work, and poor health seeking behaviour [17].

Access to medicines is the cornerstone in the effective treatment of HIV/AIDS patients. With the huge financial support from many non-governmental and international organizations including PEPFAR, the Global Fund and the World Bank, access to ART in Nigeria has greatly improved in the last 4 years. Under the emergency plan, Nigeria received more than US$70.9 million in 2004, more than US$110.2 million in 2005 and approximately US$163.6 million in 2006 while US$304.9 million was approved in 2007 [66-68].

This is also priority at the national level, with the 2018 national budget setting aside 1 percent of its projected revenue toward UHC. Nigeria is a key to maintaining control of Africa's epidemic. But total PEPFER funding for the country, including both new funds and those in the applied pipeline, has dipped, falling from $409.1 million in 2016 to $383.6 million for 2017 [67].

Despite an additional US$17 million of domestic funds having been allocated to the HIV response for 2017, the vast majority of funding still comes from international donors [5].

To increase domestic funding further, Nigeria has launched a new initiative to make each of the 36 states contribute up to 1% of their monthly allocations from the federal government to the HIV response. Nigeria also aims to increase private sector investment in the response from 2.1% in 2014 to 10% in 2018 [6].

Funding problems arose in 2016 following an audit of NACA by the Global Fund to Fight AIDS, Malaria and Tuberculosis. The audit found evidence of "fraud and collusion in the amount of US$3.8 million", causing the Global Fund to suspend its funds (Vanguard, 2016). However, the Global Fund has reinstated its support following the creation of the West and Central Africa Catch up Plan, which saw the fund commit to providing another US$214 million to cover an additional 215,000 treatments [6].

Conclusion

Low level of access to antiretroviral treatment, inadequate laboratory facilities (for monitoring their viral load, CD4 cell counts etc.), knowledge and attitude of some patients, cultural believe, punitive laws against homosexual, and increase in HIV and TB co-infection remain an issue for PLWHA, meaning that there are still many HIV /AIDS related deaths in Nigeria.

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