The demographic implications of the HIV prevalence trend in Nigeria

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Abstract
This study examined the demographic implications of the HIV prevalence trend in Nigeria. Data from the 2010 National Antenatal Sentinel Survey was used to produce various graphs to determine the trend of HIV at the national level, state levels, urban and rural areas, and various age groups. This study has found that though a decline exists in the national HIV prevalence and the HIV prevalence among women aged 15-24 years, there is a potential for an increased trend if adequate HIV services are not provided in rural areas. This is because the HIV prevalence in many states has risen between 2008 and 2010 owing to a rise in HIV prevalence in rural areas and in women aged 15-39 years. This study has significant implications for achieving Millennium Development Goals 4, 5, and 6 related to HIV in Nigeria and other Sub-Saharan countries.

Introduction
The first HIV sero-prevalence sentinel survey among pregnant women age 15-49 years attending antenatal clinics to monitor the trend of the HIV epidemic was undertaken in 1991. Sentinel survey data show that the HIV prevalence increased from 1.2% in 1991 to 5.8% in 2001. After 2003 the prevalence declined to 4.4% in 2005 before slightly increasing to 4.6% in 2008. Results from the latest round of sentinel survey shows that the national prevalence is 4.1% in 2010. Analysis of the HIV prevalence trend in Nigeria indicates that the epidemic has halted and is showing signs of stabilizing at 4% from 2005 till date.1 The leading route of HIV transmission in Nigeria is heterosexual intercourse, accounting for over 80% of the infections. Mother-to-child transmission and transfusion of infected blood and blood products are generally estimated as ranking next as common routes of infection; arguably, each of these two are believed to account for almost 10% of infections. However, other modes of transmission such as intravenous drug use and same sex intercourse are slowly growing in importance.2

The epidemiology of HIV shows considerable diversity across Nigeria’s geographic landscape, both in terms of the level of infection and the trend. The 2010 national survey by the Federal Ministry of Health shows that the HIV sero-prevalence ranges from 1.0% in Kebbi State to 12.7% in Benue State. Six states have shown a consistent downward trend between 2005 and 2010 while eight states have shown a consistent rise. Trend analysis of HIV prevalence among youth age 15-24 has shown a consistent decline from 2001 to 2010 [i.e. from 6% (2001), through 5.3% (2003), 4.3% (2005), 4.2% (2008) and to 4.1% (2010)].

The data presented show that HIV in Nigeria is stabilizing and may be declining.3 However, at sub-national levels HIV has continues to pose a serious threat to vulnerable populations including women, children and babies.1,2 This study therefore draws it relevance from examining the demographic implications of the HIV prevalence trend on the achievement of Millennium Development Goals 4, 5, and 6 which are related to HIV in Nigeria.

Study area
Nigeria is made up of 36 states and a Federal Capital Territory (FCT), grouped into six geopolitical zones: North Central, North East, North West, South East, South South, and South West. There are also 774 constitutionally recognized local government areas in the country. Nigeria is in the West African sub-region, lying between latitudes 4°16’ and 13°53’ north and longitudes 2°40’ and 14°41’ east. It is bordered by Niger in the north, Chad in the northeast, Cameroon in the east, and Benin in the west. To the south, Nigeria is bordered by approximately 850 km of the Atlantic Ocean. The 2006 Population and Housing Census puts Nigeria’s population at 140,431,790, with a national growth rate estimated at 3.2% per annum;3 with this population, Nigeria is the most populous nation in Africa.4

Materials and Methods
The data used in this study is secondary data collected from reports of the Federal Ministry of Health, National Agency for the Control of AIDS and the National Population Commission all in Nigeria. The bulk of secondary data used in this study was sourced from the ante-natal sentinel survey report conducted by the Federal Ministry of Health in 2010. In the report, an unlinked anonymous method of sample collection and testing was adopted in line with the recommendation of the World Health Organization (WHO). Data were collected over a period of 12 weeks (28th June to 17th September 2010) in 160 sentinel sites (86 urban and 74 rural) in the 36 States in Nigeria and the FCT. A total of 36, 427 samples (from pregnant women, aged 15-49 years) were collected and analyzed. The Spectrum Model and Microsoft Excel 2010 were used in this study to calculate various projections and descriptive statistical analysis to present the trends of the HIV epidemic in Nigeria.

Results
Figure 1 shows the population of Nigeria by states and sex as obtained from the 2006 National Census conducted by the National Population Commission. The states with the highest total population include Kano and Lagos States while the states with the lowest population include the Federal Capital Territory and Bayelsa. There are more males than females in most of the states and in Nigeria as highlighted in Figure 1. The Urban-Rural ratio of HIV prevalence in Nigeria calls for concern as shown in Figure 2. Rural HIV prevalence has clearly surpassed the urban prevalence in 8 states including Adamawa, Akwa Ibom, Benue, Jigawa, Kaduna, Kebbi, Ondo, and Yobe. Even though urban HIV prevalence surpasses rural prevalence in the remaining states, the ratio is quite close in at least 10 states. The HIV prevalence in 20 states is above the current national prevalence of 4.1%.

Figure 3 shows the HIV prevalence among age groups for the various geo-political zones in Nigeria. The North-Central and South-South zones consistently had HIV prevalence rates above the national rate for all age groups. The South-East zone also had higher than national HIV prevalence rates for all age groups except the 15-19 age group. The age...
group 30-34 had the highest HIV prevalence while the age group 15-19 had the lowest prevalence and at least three zones have HIV prevalence above 3% across all age groups. Figure 4 shows the trend of HIV in Nigeria in comparison to the trend of HIV among women in the age group 15-24 years. The HIV prevalence among women in the age group 15-24 is declining as shown in Figure 4 with a rate of 4.1% in 2010. However the decline in national HIV prevalence may be brief if efforts are not intensified to keep it on the decline slope. This is because the trend line in Figure 4 suggests a possible rise in the coming years.

The average HIV prevalence for all the states was calculated from 1991 to 2010 and compared with the national average HIV prevalence for the same period. This is highlighted in Figure 5 while the trend of the epidemic in five of the states with the highest HIV prevalence from 1991 to 2010 is shown in Figure 6. It should be mentioned here that the antenatal sentinel survey was initiated in 1996 in 4 states and in 1999 in 16 states. However in the remaining 17 states the survey was initiated in 1991. As shown in Figure 5, 10 states have HIV prevalence rates which are higher than the national average of 4.38% for 1991-2010. Benue, Plateau, Akwa Ibom, Kaduna and Cross River states have the highest average HIV prevalence for the period 1991-2010. However as shown in Figure 6, the trend of HIV in Benue, Plateau, and Akwa Ibom is rising while that of Kaduna and Cross River is showing a decline. Ogun, Katsina, Jigawa and Ekiti states have the lowest average HIV prevalence calculated for the period 1991-2010 presented in Figure 7. No data is recorded for Ogun, Katsina, Jigawa, and Ekiti for 1991 to 1996. The important issue however is that the trend of HIV in Ogun and Ekiti states is on the increase while that of Katsina and Jigawa is showing a decline.

Figures 8 and 9 are graphs showing the projection of Nigeria’s population from 2010 to 2015 using the spectrum model. The graph shows that the population of Nigeria will continue to rise by 14% from about 164 million in 2010 to about 188 million in 2015. Figure 9 shows the population growth by sex and age. It shows a trend which is similar to the one presented in Figure 8. The trend of HIV in the 37 states in Nigeria between 2008 and 2010 as indicated in Figure 10 indicates a rise in 19 states.

Discussion

More than 60% of the population of Nigeria live in rural areas. This percentage is a challenge given the inadequacy of rural infrastructure and basic amenities as highlighted in
The provision of amenities including basic health care for citizens in both urban and rural areas continues to witness a huge disparity in sub-Saharan Africa. The inadequacy of basic health care services in many rural areas in Nigeria can be adduced as contributing to the lingering public health issues such as Maternal and Child mortality, Polio, Malaria, Tuberculosis, and HIV. Primary health care (PHC), which is supposed to be the bedrock of the country’s health care policy, is currently catering for less than 20% of the potential patients with most PHC facilities in disrepair, without equipment, infrastructure, and proper referral systems. In Ademiluyi and Aluko-Arowolo, it was firmly suggested that the distribution of health facilities and human resources in Nigeria be reviewed.

The result of analysis presented in this paper shows that the population of Nigeria will continue to rise and by implication, the population of people in the rural areas will continue to rise with a corresponding rate of rural-urban migration. The states with high rural HIV prevalence have become reservoirs of the epidemic and could witness a rapid spread to urban areas and other states. This is because the productive age group of 15-39 in Nigeria has a high HIV prevalence rate. Health care services including HIV services in Nigeria are concentrated in urban areas. It is therefore feared that if an aggressive action is not taken to move adequate HIV services to rural areas, efforts aimed at addressing HIV in the urban areas may be passively undermined by persons within the age group of 15-39 who form the bulk of interactions between rural and urban areas. The trend of the age group 15-39 in Nigeria is currently rising.

According to the United Nations HIV country report on Nigeria, Majority of persons living with HIV in Nigeria (over 60%) are women of reproductive age. It is stated in that report that Nigeria accounts for a 30% gap in the global burden of the vertical transmission of HIV from HIV positive mothers to their babies. This gap has led to the annual birth of over 69,300 babies with HIV in Nigeria. It is safe to say here that most of these births occur in rural areas and to also caution that even though Figure 4 shows a decline in national HIV prevalence and among women aged 15-24, the trend in many states as shown in Figures 5, 6 and 7 indicates a rise in HIV prevalence. This is also suggested in the trend line shown in Figure 10.

It is therefore imperative to take health services including HIV services to rural areas in Nigeria to consolidate our approach to halt the HIV epidemic. This would make HIV services accessible to majority of Nigerians including women and the most affected age groups of 15-39. Given the health care structure in Nigeria and its limited health care facilities, Figure 5, 6 and 7 show a rapid increase in HIV prevalence in the rural states. This is because the productive age group 15-39 in the rural areas has a high HIV prevalence rate. Health care services including HIV services in Nigeria are concentrated in urban areas. It is therefore feared that if an aggressive action is not taken to move adequate HIV services to rural areas, efforts aimed at addressing HIV in the urban areas may be passively undermined by persons within the age group of 15-39 who form the bulk of interactions between rural and urban areas. The trend of the age group 15-39 in Nigeria is currently rising.11

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Nigeria as highlighted in another study, the PHC facilities are the closest to the rural areas in Nigeria. Taking HIV services to PHCs has witnessed tremendous successes elsewhere. If Nigeria must make grounds on the Millennium Development Goals 4, 5, and 6 which are all related to HIV and AIDS, then health policy makers must move adequate health services including HIV services to rural areas.

Conclusions

This study has examined the demographic implications of the HIV prevalence trend in Nigeria from 1991-2010. Using available data, graphs have been produced to give a picture of HIV prevalence at the national level, state level, urban and rural prevalence, and various age groups. The study found that though the national HIV prevalence declined between 2005 and 2010, the prevalence in many states is on the rise. More worrisome is the fact that rural HIV prevalence has surpassed urban prevalence in many states in Nigeria. This paper suggests that further studies be undertaken to investigate the actual reason for the national decline in prevalence of HIV/AIDS. The number of HIV positive persons in Nigeria receiving antiretroviral therapy (ART) is limited and available data on compliance to treatment is inadequate. It is therefore important to understand the factors responsible for the decline in HIV and to what degree. More studies that examine the role of sexual abstinence, condom use and low viral copies HIV patients who receive ART would be relevant to stakeholders. This would support a positive and sustained move towards providing adequate services to rural areas where majority of young people within the age bracket of 15 and 39 years live. The main secondary datasets used in this study include only pregnant women ages 15-49 attending antenatal clinics in 160 sites that were selected according to geopolitical zones and urban-rural dichotomies. Even though this study provides useful information that is acceptable for planning HIV programmes, it is necessary to consider inherent limitations when planning HIV programmes for general populations or in local communities.

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