

## ORIGINAL ARTICLES

## A REVIEW OF NATIONAL PROGRAMME DATA ON THE HIV EPIDEMIC IN GHANA: 2005-2010

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### Abstract

**Introduction:** Enormous national efforts have gone into combating the HIV epidemic in Ghana. This study reviewed data from the National AIDS/STI Control Programme over the period 2005-2010, in terms of time, place and person characteristics of the epidemic. It focused on past and current efforts at combating the epidemic and what future efforts are required.

**Methods:** It was a descriptive review of data from HIV sentinel surveys (HSS) and annual reports of the National AIDS/STI Control Programme (NACP) from 2005 to 2010. The review was conducted in 2011. The analysis described reported HIV and AIDS cases in the general population, median prevalence of HIV among pregnant women (15-49years), and AIDS related mortalities. Also, number of clients on ART, and those lost to follow up was analyzed. These characteristics were disaggregated by sex, age groupings, location and by administrative regions.

**Results:** The review demonstrated an increasing trend in the annual new HIV+ cases. However, the median

HIV prevalence amongst pregnant women over the period was declining. There were clear age and regional or urban/rural differences in HIV prevalence in the country. National coverage for ART was 26% in 2009 and 35.2% in 2010. Number of clients on ART lost to follow up increased over the period, especially from 2008 onwards; it was 4.9% in 2008 and 9.2% in 2009. Over the entire review period (2005-2010), number of patients lost to follow up was over a hundred fold.

**Conclusion:** Ghana has made good progress in combating the HIV and AIDS epidemic, however there are challenges. National coverage of ART was low, and patients lost to follow up were high. The unmet need for ART though comparable to that of other African countries, poses major challenges to Ghana's quest to reverse the HIV epidemic. Policy measures to increase ART coverage and limit loss-to-follow up are still paramount.

**Keywords:** Antiretroviral therapy, HIV and AIDS, HIV sentinel survey, Ghana, Median HIV prevalence.

### Introduction

HIV was first confirmed in Ghana at the Noguchi Memorial Institute for Medical Research in 1986<sup>1,2</sup>. The infection has since spread to all parts of the country and is established within the whole society. In 2010, HIV prevalence was 1.5% in the adult population and 2.0% among pregnant women aged 15-49 years<sup>3</sup>. Although the national prevalence is relatively low compared to other African countries<sup>4-8</sup>, there are pockets of high prevalence in select geographic areas and among select risk groups<sup>3</sup>. There is a higher prevalence in urban sites compared to rural sites, as is true worldwide; HIV prevalence in Ghana is

consistently higher among at-risk groups such as commercial sex workers, clients at STI clinics and long distance truck drivers<sup>3,9</sup>. These sub-populations with higher prevalence and risk of transmission constitute a reservoir for sustaining an epidemic<sup>10,11</sup>.

Since the first case of HIV was diagnosed, enormous national and international efforts and resources have been expended through the National HIV and AIDS response to contain the epidemic<sup>9,12,13</sup>. The National response started as the National Technical Committee on AIDS and later became National Advisory Council on HIV and AIDS in 1985. The Council evolved into National AIDS/STI Control Programme (NACP) in 1987. The NACP has since been the lead agency in the health sector response to HIV and AIDS in Ghana<sup>1</sup>. The NACP in combating the epidemic, has been involved in behaviour change communication programmes, HIV testing and counselling, provision of antiretroviral therapy, prevention of mother-to-child transmission of HIV, early infant diagnosis of HIV, prevention and

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management of STIs including condom use, safety in blood and blood products, advocacy and research<sup>1,3</sup>. The NACP has since 1992, been conducting HIV Sentinel Survey (HSS) annually to provide data on the epidemic. In the last six years (using 2011 as base year), HSS data have been used as the primary data source for National HIV and AIDS estimates in Ghana. Over the 19 years, huge efforts have gone into the process of generating high quality data for HIV estimates and projections in the country<sup>14</sup> because the data is critical for planning and implementation of programmes within the National Response<sup>15</sup>. It is useful for understanding the magnitude of HIV and AIDS epidemic and for monitoring impact of interventions.

Generation of HIV prevalence data in Ghana is done using UNAIDS/WHO recommended methods<sup>14</sup>. The method used to calibrate the HSS data is based on the Estimation and Projection Package (EPP) software of the UNAIDS<sup>14,16</sup>. In Ghana, HIV prevalence is primarily based on sentinel surveillance among pregnant women attending Antenatal Care (ANC) clinics and a national population based survey that includes HIV testing<sup>17</sup>. Analysis of combined data from sentinel surveillance and population-based surveys provide a clear picture of both overall trends and geographical distribution of HIV. The HSS Report therefore represents prevalence among pregnant women while the National HIV Prevalence Estimates (derived from HSS data calibrated with Demographic and Health Survey (DHS+) data) indicates the national HIV prevalence rate for Ghana<sup>14,18</sup>.

The goal of this analysis is to describe the HIV epidemic in Ghana over the last six years (2005-2010) in terms of time, place and person characteristics based on HSS data and annual reports of the NACP. It aims at determining who is affected and where in the country, as well as direction of the epidemic in the general population, among high risk groups and in different geographical areas of the country. In addition treatment efforts in combating the epidemic is described in terms of who is getting treatment and from which part of the country. This analysis has potential value for the Ministry of Health/Ghana Health Service and the NACP in their quest to provide universal access to HIV testing and counselling (HTC), PMTCT and Antiretroviral Therapy (ART) for all who need the services and also inform policies on the national response to HIV and AIDS epidemic.

## **Methods:**

### ***Data Source***

The NACP under the Ghana Health Service provides comprehensive HIV and AIDS services to all persons living with HIV and AIDS in Ghana. As of the end of 2010, over 1,000 Testing and Counselling and PMTCT Centres, and over 140 ART Centres were available in the country for HIV and AIDS services<sup>2,8</sup>. HIV testing and counselling (HTC) is done by well

trained counsellors in all health facilities and the HTC services are free. In this study we reviewed HIV sentinel survey (HSS) reports and annual reports of the NACP from 2005-2010. The HSS report is produced annually from sentinel surveys across all sentinel sites in the country and the annual reports provide a summary of all activities and service provision data by the NACP.

The annual reports contain data on reported HIV and AIDS cases. Data on reported AIDS cases is collected using the universal case reporting system i.e. Integrated Disease Surveillance Response (IDSR)<sup>1</sup>. AIDS case reporting has been used by the Ministry of Health to assess the magnitude of the HIV and AIDS problem in all the ten regions and provide an approximate picture of the distribution of AIDS cases and changes over time in the country<sup>1</sup>.

### ***HIV sentinel survey in Ghana***

The HIV Sentinel Survey (HSS) is a cross sectional survey targeting women attending antenatal clinics in selected ANC sites in Ghana. The annual HIV sentinel surveillance system was initiated in 1992. It is based on the premise that prevalence of HIV among pregnant women is a good proxy indicator of the spread of infection among the populace. In the last six years, the HSS data have been the primary data source for National HIV and AIDS estimates in Ghana. Currently forty sentinel sites have been established in all ten regions of Ghana; each region has at least three sites. There are twenty three urban and seventeen rural sites. The number of sites has increased over the years from 24 in 2002, to 35 in 2004 and to 40 since 2005. The increase ensures a balanced representation of rural/urban areas in the determination of HIV prevalence in Ghana. The number of sites has remained same since 2005.

### ***Quality improvement measures in HIV sentinel survey in Ghana***

Measures employed to improve quality of data obtained from the HSS are described below: Selection of sentinel sites follow strict predetermined criteria and aims at ensuring sites are located in different geographic areas and represent each geographical region in the country. Each of the ten regions has at least three sites including a minimum of one rural site. All selected sites provide antenatal care and sexually transmitted infection (STI) services. A standard sampling scheme is used in the selection of the survey population. The populations for HIV sentinel surveillance are adults aged 15 to 49 years including, pregnant women attending antenatal clinics (ANC) and male and female clients seeking treatment for Sexually Transmitted Infections (STIs) at STI Clinics during the survey period.

All first time ANC clients within the survey period are eligible for inclusion and those reporting for repeated visits are excluded. Samples are collected through unlinked anonymous methods (i.e samples have code numbers not names). Basic data including

age, sex, date of collection, name of site; district and region are recorded on site. The World Health Organization's HIV Testing Strategy II for surveillance<sup>14</sup> is used to screen the samples. The laboratories at the peripheral sentinel sites and regional level use Rapid Tests (First Response I and II) and confirmation for HIV is done at the National Public Health Reference Laboratory (PHRL) in Accra using Immunoblot (INNOLIA). Sample screening at the sentinel site is done soon after collection or sera stored at 2-8 degrees centigrade for not more than 3 days. All samples at urban sites are screened at the site and samples from rural sites are stored (not more than 3 days) and transferred to an urban testing site for immediate testing. The Public Health Reference Laboratory currently holds all samples submitted for confirmation for a period not less than three years.

In addition to the above measures, early selection and evaluation of test kits and training of laboratory staff are done prior to each annual survey. All reactive samples are re-tested at the PHRL for confirmation and 10% of all non reactive samples are also randomly selected from each sentinel site and tested at PHRL. External Quality Assurance Testing is also employed; two reactive samples and three non-reactive samples from each site are sent to the Noguchi Memorial Institute for Medical Research (NMIMR) in Accra, for testing. NMIMR is the external quality assurance institution<sup>14</sup>.

#### Data Analysis

Data on outcome measures of interest for this analysis were pooled from Annual HSS reports and NACP Annual reports from 2005 to 2010. Outcome measures analyzed included; annual reported HIV and AIDS cases in the general population, median prevalence of HIV among pregnant women (15-49years) and annual AIDS related deaths in the country (AIDS related deaths are deaths in clients living with HIV and AIDS attributable to opportunistic infections or causes directly attributable to HIV infection). Current number of clients on ART, annual proportions of clients who stopped treatment, and clients on ART lost to follow up or lost due to AIDS related mortalities were analyzed. Outcome measures were disaggregated by sex, age groupings, location (urban/rural) and by administrative regions for the period 2005-2010.

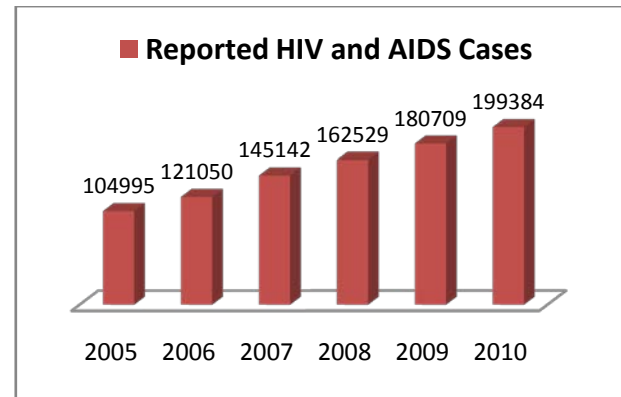
Missing data from HSS and annual reports were minimal accounting for less than 1% of data source, and therefore data from all regions and sentinel sites were included in the analysis. Data were entered into Excel files (Microsoft Excel 2007) and imported into SPSS (version 19) for analysis. Descriptive statistics (e.g. frequencies, ratios, proportions, percentages and median) were used for the analysis. Clearance on use of data was given by authorities of the NACP of the Ghana Health Service.

## Results

### 1. Pattern of HIV and AIDS epidemic among all age groups in Ghana

#### i. Pattern of reported HIV cases from 2005-2010

As demonstrated in Figure 1, there has been a progressive increase each year, in the annual HIV and AIDS cases reported from health institutions from 2005-2010. In the year 2005, 104,995 HIV cases were reported compared to 2010, where 199,384 HIV cases were reported; a percentage change in the number of HIV+ persons of 90.0%.



**Figure 1:** Overall annual reported HIV and AIDS cases from health institutions in Ghana (2005-2010). Source: Annual Report, National AIDS/STI Control Programme, Ghana Health Service, 2010

#### ii. Reported HIV cases across the regions, 2005-2010

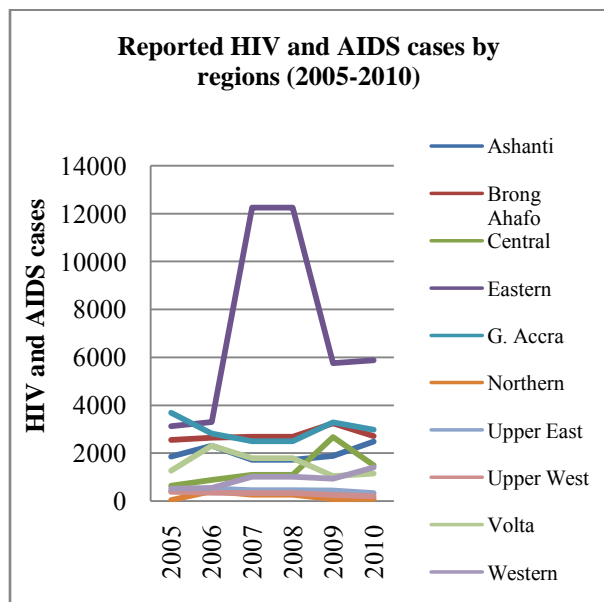
The annual reported HIV+ cases varied across the ten regions of Ghana as indicated in Figure 2. The pattern in Eastern region varied completely from the others. Except in year 2005, during which Greater Accra region reported the highest number of new cases, Eastern region had the highest number of cases over the period 2006-2010. Figure 2, shows a huge jump in the annual HIV cases reported from 3287cases in 2006 to 12259 in 2007 in Eastern Region. In terms of percentage contribution to total reported HIV+ cases seen in Ghana, Eastern region contributed over 50% in 2007 and 2008 and over 30% in 2009 and 2010.

In the other nine regions, the highest annual reported new HIV+ cases over the six-year period was 3690 in Greater Accra region in 2005 and the lowest number was 39, in Northern region in the same year. Northern region had the lowest number of new HIV+ cases in each of the six years (except in 2006 when Upper West region had the lowest number).

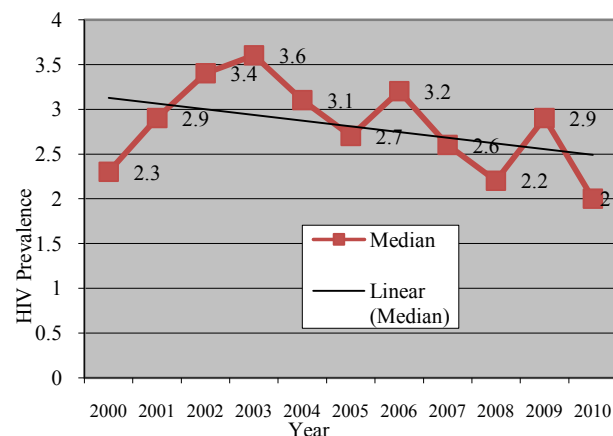
### 2. Pattern of the epidemic among pregnant women (15-49 years) and other High risk groups, 2005-2010

#### i. National and regional median HIV prevalence in Antenatal Women, 2005-2010

Figure 3 demonstrates the median HIV prevalence linear trend analysis curve over the last decade (2000-2010); included to show the prevailing trend prior to the review period. It shows a steady increase in median prevalence from 2.3% in 2000 to 3.6% in 2003.



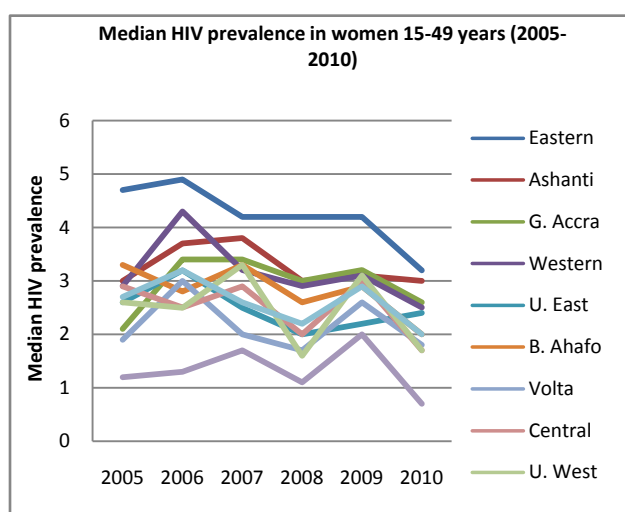
**Figure 2:** Reported annual new HIV+ cases across the ten regions (2005-2010). Source: Annual Report, National AIDS/STI Control Programme, Ghana Health Service, 2010



**Figure 3:** Median HIV Prevalence with Linear Trend, 2000- 2010. Source: HIV Sentinel Survey Report, National AIDS/STI Control Programme, Ghana Health Service, 2010.

The median HIV prevalence by region is demonstrated in Figure 4, and Eastern region had the highest median HIV prevalence among the regions and Northern region had the lowest in antenatal women from all sentinel surveys over the period 2005-2010, (similar to trends in reported HIV+ persons in all age groups). Most of the regions had median HIV prevalence declining during the review period; regional median HIV prevalences were relatively higher in 2005 in most of the regions than in 2010, except Upper East region which had indeed showed progressive increases in prevalence since year 2008. In 2005, the highest median prevalence was 4.9% (in Eastern region) and decreased to 3.2% in 2010 (also in Eastern region).

*ii. Patterns of median HIV prevalence by age group, location, among high risk groups and virus type, 2005-2010*



**Figure 4:** Regional median HIV prevalence in antenatal women, 2005-2010. Source: Annual Report, National AIDS/STI Control Programme, Ghana Health Service, 2010

The prevalence of HIV among antenatal women has varied within the various age groups and over the period 2005 to 2010 as indicated in Table 1. Women in age group 25-29 years have consistently had relatively high median prevalence; indeed this age group had the highest prevalence from 2006 to 2009. The highest prevalence for this age group was 4.2% in 2006 and the lowest was 2.5% in 2010. In 2010 however, age groups 30-34 and 35-39 years had the highest prevalence of 2.8%. Over the review period the highest prevalence rate ever recorded was 5.0% among the 45-49 years group in 2005, and the lowest ever was 0.8% in the 15-19 years group. The 15-19 years group has consistently had the lowest prevalence among all the age groups from 2005-2010.

**Table 1:** Median HIV Prevalence by Age groups, location and among a high risk group (STI clients)

Age Group (Years)	2005	2006	2007	2008	2009	2010
15-19	0.8	1.4	1.6	1.2	1.9	1.1
20-24	2.4	2.9	2.9	2.3	2.2	2.7
25-29	3.6	4.2	3.5	3.0	3.7	2.5
30-34	3.2	3.7	2.9	2.8	3.4	2.8
35-39	2.4	2.8	3.5	2.9	3.6	2.8
40-44	3.7	3.3	1.7	1.8	4.0	2.1
45-49	5.0	2.5	1.3	2.6	1.8	2.7
Geographical Location						
Urban	2.9	3.4	3.4	2.6	3.6	2.4
Rural	2.6	2.8	1.9	2.1	2.2	1.6
High Risk Groups						
STI clients	7.0	4.1	5.1	10.5	5.5	5.3
<b>National</b>	<b>2.7</b>	<b>3.2</b>	<b>2.6</b>	<b>2.2</b>	<b>2.9</b>	<b>2.0</b>

The median HIV prevalence has always been higher in women from urban sentinel sites than rural sites for each of the years reviewed as shown in Table 1. Among clients from sexually transmitted clinic sites (male and females ages 15-49 years), the median HIV prevalences were much higher than the national rates in each of the years reviewed. It ranged from 4.1% in 2006 to 10.5 % in 2008. Indeed, median prevalence among STI clients in 2008 was four times that of the national rate.

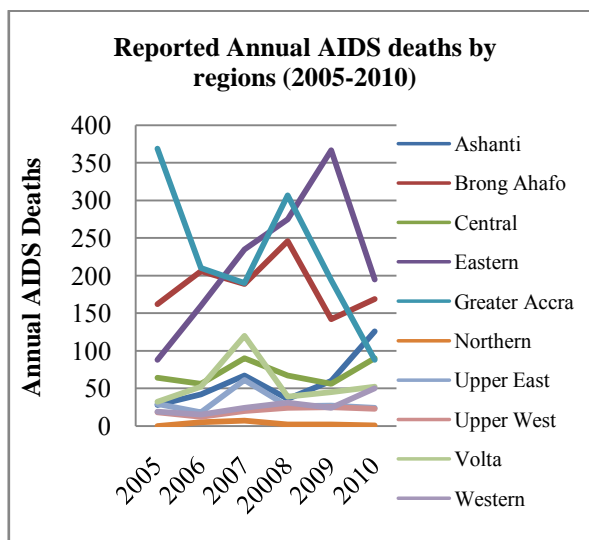
**Distribution of HIV Types:** Overall, the distribution of HIV type responsible for all HIV infections in the sentinel survey showed HIV type1 to be the most predominant form accounting for over 90% of all infection from 2005-2010. HIV type 2 only infections ranged from a low of 1.4% in 2007 to 5.2% in 2009. Mixed HIV 1 and 2 infections also ranged from 0.4% in 2005 to a high of 4.7% in 2006.

### 3. Reported HIV and AIDS mortality patterns across the regions

As indicated in Figure 5, pattern of reported annual AIDS-related deaths was highest in three regions: Eastern, Greater Accra and Brong Ahafo. Greater Accra region had the highest mortalities in 2005 but the numbers decreased between 2009 and 2010. Interestingly, from being the region with highest mortality in 2005, Greater Accra (the capital region) had the fifth highest rate by end of 2010.

On the other hand, AIDS related mortalities in Eastern region increased progressively from 2005 to 2009. Although mortality rate declined between 2009 and 2010 in Eastern region, the region still had the highest number of AIDS related deaths amongst all 10 regions in the last two years of the review period (2009 and 2010).

It is important to note the mortality pattern in Ashanti region (the most populous region in Ghana), from being the region contributing only 3.5% of the national AIDS related deaths in 2005, the rate had increased progressively to 15.4% of the annual national AIDS related deaths by the end of year 2010.



**Figure 5:** Reported Annual AIDS related deaths in the regions (2005-2010). Source: Annual Report, National AIDS/STI Control Programme, Ghana Health Service, 2010

### 4. Treatment efforts at combating the epidemic (ART Service provision in Adult and Children, 2005-2010)

In 2005, the cumulative number of persons on ART (adults and children) was 4,060 and this number increased over the period to 47,559 by December 2010, (as shown in Table 2) and represents an increase of over eleven-fold. This increase is for both adult and children and corresponds to increases of over eleven-fold among adults and a much higher increase of over seventeen-fold for children. Despite this progressive increase in enrolment of HIV+ on ART, AIDS related deaths even in clients on ART have also increased from 162 deaths in 2005 to 2550 deaths in December 2010; over fourteen-fold increase in persons of all ages, 14 fold increase among adults and over 30 fold increase in children. Although absolute numbers of AIDS related deaths were fewer in children, there were increases over the period 2005-2010.

From Table 2, some HIV+ clients on ART stopped the treatment and others could no longer be traced (i.e described as lost to follow up). Number of client who stopped treatment increased from 57 in 2005 to 243 in 2010, a change of 326%. However, in clients who were lost to follow up on ART, there were increases over the period especially from 2008 onwards.

Table 2: Characteristics of ART Service provision in Adult (15 years+) and Children (0-14 years), 2005-2010

End of Year	Age group	Cumulative number initiated on ART	Number of Deaths on ART	Clients who stopped treatment	Clients lost to follow up	Clients currently on ART (%)
2005	Adults	3,914	157	56	38	3,663 (94)
	Chn	146	5	1	3	137 (94)
	<b>Total</b>	<b>4,060</b>	<b>162</b>	<b>57</b>	<b>41</b>	<b>3,800 (94)</b>
2006	Adults	7,070	208	60	66	6,736 (95)
	Chn	268	6	2	3	257 (96)
	<b>Total</b>	<b>7,338</b>	<b>214</b>	<b>62</b>	<b>69</b>	<b>6,993 (95)</b>
2007	Adults	12,850	482	73	518	11,777 (92)
	Chn	579	29	5	7	538 (93)
	<b>Total</b>	<b>13,429</b>	<b>511</b>	<b>78</b>	<b>525</b>	<b>12,315 (92)</b>
2008	Adults	22,585	991	96	896	20,602 (91)
	Chn	1,029	64	6	13	946 (92)
	<b>Total</b>	<b>23,614</b>	<b>1,055</b>	<b>102</b>	<b>909</b>	<b>21,548 (91)</b>
2009	Adults	31,994	1,620	134	1,592	28,648 (90)
	Chn	1,751	96	9	29	1,617 (92)
	<b>Total</b>	<b>33,745</b>	<b>1,716</b>	<b>143</b>	<b>1,621</b>	<b>30,265 (90)</b>
2010	Adults	44,914	2,368	223	4,135	38,188 (85)
	Chn	2,645	182	20	56	2,387 (90)
	<b>Total</b>	<b>47,559</b>	<b>2,550</b>	<b>243</b>	<b>4,191</b>	<b>40,575 (85)</b>

Chn = Children (0-14 years).

It was 4.9% in 2008 and 9.2% in 2009; almost a doubling of the proportions lost to follow up. Indeed, increase in number of clients lost to follow (2005-2010) was over a hundred fold (10122%); the highest change in any of the outcome measures of interest. In spite of these losses to follow up and termination of treatment by clients, in all the six years reviewed (except 2010), HIV+ clients eligible for ART who were on treatment were in excess of 90% in both adults and children. In 2010, the last year of review, ART coverage was however, much lower 85% (in adults).

## Discussion

This study reviewed National AIDS/STI Control Programme data by describing the time, place and person characteristics of Ghana's HIV epidemic over the period 2005 to 2010 and found an increasing trend in the annual new HIV+ cases. However, the median HIV prevalence amongst pregnant women over the period shows a linear trend downwards towards the right, indicating a decreasing trend. National and international efforts that have contributed to this level of attainment should be sustained.

The HIV epidemic is established within the whole society, and sub-populations with higher prevalence and risk of transmission constitute a reservoir for sustaining the epidemic<sup>2,3</sup>. Thus, although Ghana's

national HIV prevalence is low, the epidemic continues to pose enormous challenges to health and social systems of the nation. This review showed that prevalence was highest among ages 20-49 years agreeing with global trends of HIV infections<sup>19</sup> and previous description of the pattern of HIV infection in Ghana<sup>20</sup>. This has health, economic and social implications for the entire population and especially among the active and productive population groups.

It is recognized that both sentinel surveillance and population-based surveys each have strengths and weaknesses but together provide complementary information. HIV Sentinel surveillance (HSS) provides samples that are consistent over time so that good estimates of HIV trends can be obtained. Population-based surveys, on the other hand, provide much better geographic coverage of the general population<sup>13</sup>. Analysis of combined data from sentinel surveillance and population-based surveys do provide a clear picture of both overall trends and geographical distribution of HIV. In Ghana, the HSS Report thus represents prevalence among pregnant women while the National HIV Prevalence Estimates which is derived from HSS data calibrated with Demographic and Health Survey (DHS+) data provides the national HIV prevalence rate<sup>14</sup>.

Efforts at sustaining the annual HIV sentinel surveys are essential while other innovative measures (such as the use of HIV service provision data for national estimates) need to be pursued.

As the nation moves forward in its effort to halt the HIV epidemic, stakeholders, Government ministries/agencies and international partners should not see the low prevalence as an incentive for relaxing their efforts but more as a motivation to do more. It has taken enormous efforts and expense to achieve this level of prevalence<sup>3</sup>. Significant investments have been made by the Ghanaian government and their international partners in capital infrastructure and human resources for HIV related activities over the past decade<sup>12</sup>. In 2009, funds expended by the Ghana Health Service/National AIDS/STI Control Program on HIV services excluding the cost of Antiretroviral Therapy (ART) exceeded seven million US dollars. Almost half of this amount went into training health personnel for the provision of HIV Testing and Counselling (HTC) and ART related activities<sup>3</sup>. More resources are required to support existing initiatives to further reduce prevalence trends. However with current global economic downturn and resultant dwindling donor funds, African governments need to demonstrate greater commitment to this fight by investing more in HIV related activities. Governments in Africa need to commit resources (especially in the context of dwindling donor funds) to combating HIV epidemic, through support for behaviour change communication programmes, HIV testing and counselling, provision of antiretroviral therapy, prevention of mother-to-child transmission of HIV, early infant diagnosis of HIV, prevention and management of STIs including condom use, safety in blood and blood products, advocacy and research.

The review clearly demonstrates disparities in HIV prevalence rates across the 10 regions, between rural and urban locations and among clients with sexually transmitted infections (STI) and the general population. Over the period, urban HIV prevalence was higher than rural and much higher among clients with STI, demonstrating the socioeconomic dimensions of the epidemic. Eastern region had the highest number of HIV case among the 10 regions between 2005 and 2010. Indeed the Eastern region contributed over 50% of reported HIV+ cases for year 2007 and 2008. The high number of HIV+ cases reported in 2007 compared to 2006 in Eastern region may be attributed to the introduction of community based HIV testing campaigns-Know Your Status- introduced in 2007<sup>3</sup>. These campaigns increased overall testing in all regions; Eastern region being the region with highest HIV prevalence may likely have garnered more HIV+ results from the campaigns.

Distribution of type of HIV responsible for HIV Infections in the country from HIV sentinel surveys showed that HIV type I is the most predominant form accounting for over 90% of all infections. Type 2 only

infections and mixed infections (type I and 2) constituted a small proportion. This pattern agrees with previously described pattern of HIV infection in the late 1980s in Ghana<sup>21,22</sup>. A policy implication of this finding is that although HIV type I is more infectious and progresses from infection to AIDS relatively more rapidly than HIV type<sup>23,24</sup>, the type I is more responsive to first line antiretroviral (ARV) treatment regime in the country. Any further increase in prevalence of type 2 only or mixed infection will have consequences for therapeutic decisions and outcomes for these clients. Second line antiretroviral regime (ARV) may be required which is more expensive and available only at tertiary and regional health centres in the country.

The global expansion of Antiretroviral Treatment (ART) to HIV patients has transformed what was once a deadly disease into a manageable chronic condition. ART restores health of most HIV patients and also reduces likelihood of forward transmission, whether through sex, delivery, or breastfeeding<sup>25</sup>. There is undeniable evidence that antiretroviral therapy decreases mortality and morbidity in persons living with HIV<sup>26-28</sup>.

Efforts by World Health Organization, Global Fund and other public and private organizations have ensured the scale-up of ART in resource-constrained settings over the last decade<sup>3,29</sup>. In Ghana, a total of 33,745 people were receiving ART by end of 2009, and 90% of these were still on ART at time of review. Over the period (2005-2010), national efforts have increased access to ARVs through expansion of ART centres in the country. Despite these efforts, data from Ghana Health Service/NACP annual report of 2010 indicate the national coverage for ART was 26% in 2009 and 35.2% in 2010<sup>3,11</sup>. This unmet need is comparable to other African countries, for example neighbouring Nigeria, where HIV treatment coverage was only 21% at the end of 2009.

From the review, two regions with the highest AIDS related deaths (Eastern and Greater Accra) showed declines between 2009 and 2010, most of the other regions with lower AIDS related deaths however, showed increases. Estimates from national programme data expect AIDS related mortalities to decline in the coming years<sup>30</sup> if current national efforts continue. National efforts at combating the epidemic however, need to be targeted. Annual reports of NACP indicate rapid increases in HIV Testing and Counselling (HTC) centres across all 10 administrative regions in Ghana<sup>3</sup>. Establishment of these HTC centres has been strategic, responding to needs of high prevalence geographic areas. For instance, Eastern region has had the highest percentage increase in establishment of these centres over the period 2005 to 2010<sup>3</sup>. The tendency to concentrate attention on areas with relatively higher prevalence while underserving areas with much lower HIV prevalence should be vigorously guarded against.

Mortality from AIDS remains high in Africa due to extensive unmet treatment needs and Ghana, despite its efforts in the fight against HIV/AIDS, still has a long way to go. Regarding age-specific mortalities, it is instructive to note that, HIV epidemic exerts higher toll of mortality among younger and economically productive groups. Implying greater number of HIV orphans and its social ramifications and decreased economic productivity. In sub-Saharan Africa, it was estimated that by 2010, about 18 million children would have lost one or both parents to AIDS. Even in countries where HIV infections have plateaued, number of orphans continue to rise due to the time lapse between infection and death of parents<sup>31</sup>. Children (0-14 years) the cherished next generation is not being spared by the epidemic.

While globally, HIV prevalence - percentage of people infected with HIV has levelled off, the total number of people living with HIV is increasing because of ongoing acquisition of HIV infection, combined with longer survival times, in a continuously growing general population<sup>32</sup>. This increased number of HIV patients implies an increase in numbers requiring ART. ART have proven to reduce mortality in persons living with HIV and AIDS. To reduce annual mortality in clients living with HIV demands that no effort is spared in putting as many clients who require ART in Ghana, on treatment. Numbers of clients being lost to follow up or terminating their ARV treatment was observed to have increased over from 2005 to 2010. Thus, while attempting to put more HIV+ persons requiring ARVs on treatment, policy attention should be directed towards reducing the number of clients who are already on treatment and are being lost to follow up, or are terminating their treatment. A policy to qualitatively assess issues regarding this phenomenon is worth pursuing by the Ghana Health Service/ NACP as they continue to lead key HIV intervention areas (such as research, surveillance, prevention, treatment, care and support services) in the nation.

### Limitation of study:

Review was for the period 2005-2010, a rather short period of six years which may be a potential limitation of the analysis. The period was however, chosen to reflect current trends of HIV infection in Ghana and also to be able to compare annual trends with a period where similar methods were used in estimating prevalence of HIV among the target population included in the review.

### Conclusion:

Ghana's HIV and AIDS epidemic is on the decline, however there are challenges. The low coverage of ART and increases in numbers of clients already on ART who are being lost to follow up or are terminating treatment (from 2005 to 2010) are major challenges. The decline in Ghana's HIV epidemic has

been due to deliberate and sustained efforts from the nurse conducting HIV testing at the most peripheral of the health system, the midwife enforcing adherence to PMTCT guidelines in her clients, the doctor, pharmacist, laboratory personnel and counsellors at the various ART centres, the regional HIV coordinators, national level personnel and all local and international partners. It is not time to retreat and relax or relent in the battle against the HIV epidemic in Ghana.

### Disclaimer

The views expressed in this paper are those of the authors. No official endorsement by GHS/NACP is intended or should be inferred.

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