An evaluation of the current distribution pattern of HIV & AIDS in Akwa Ibom State using Geographic Information System

Awodeji Babafemi Awoga¹, Robert Etim Ekpenyong²

¹Awodeji Babafemi Awoga Department of Geography and Regional Planning
University of Uyo, Nigeria

²Robert Etim Ekpenyong Department of Geography and Regional Planning
University of Uyo, Nigeria

Abstract: This study was on the evaluation of the distribution pattern of HIV&AIDS in Akwa Ibom State using Geographic Information Systems (GIS) technology. Density mapping overlay analysis, inverse distance weighted (IDW) interpolation, spatial auto correlation (Moran I) and statistical technique (regression analysis) were the techniques of analysis used. To ascertain if the distribution pattern of HIV&AIDS was clustered, random or scattered, spatial auto correlation (Moran I) was used. The null hypothesis that, there is no spatial clustering of HIV&AIDS in the study area was tested and accepted. The regression analysis revealed that unemployment was the major factor that influenced the distribution pattern of HIV&AIDS in the study area. Other factors were found to have some degree of contribution but were not statistically significant. The hotspots of HIV&AIDS were found in the central, south eastern and southern parts of the state. Creation of employment opportunities, publication of HIV&AIDS prevalence in urban centers and the establishment of more health centers were some of the recommendations to alleviate the problem.

Keywords: HIV & AIDS, Distribution Pattern, Geographic Information Systems, Poverty, Illiteracy, Unemployment, Health facilities.

1. Introduction

HIV&AIDS is one of the most deadly and dreaded infectious diseases of our time because it is responsible for several infections and deaths of humans. This is despite advancements in medical science and technology (Udoikpong, 2014). By the end of 2011, it was estimated that about 34 million people were living with HIV&AIDS worldwide (The Global Fund, 2014). In Nigeria, the spread of HIV has continued to increase since the official report of the first case in 1986. Periodic national surveys carried out among ante-natal clinic attendees revealed a progressive increase in the adult HIV sero-prevalence rate from 1.8% in 1991 through 4.5% in 1996 to 5.8% in 2001 before declining to 5% and 4.4% in 2003 and 2005, respectively (Federal Ministry of Health, 2010). The national prevalence in 2010 was 4.1% and now 3.4%. Approximately 190,000 people are estimated to be living with HIV, while 1,577,750 people are living with HIV&AIDS (Federal Ministry of Health, 2012). The number of newly infected persons is put at 323,000 adults and 57,000 children. The rate of infection among young people aged 15-19 is put at 3.3%; 20-24 at 4.6% and for those aged 25-29, 5.6% (Federal Ministry of Health, 2008). Akwa Ibom State is one of the 36 states in Nigeria and the epidemic of HIV&AIDS has attained a high degree of severity and destructiveness in the state. The first case of HIV&AIDS in Akwa Ibom was discovered among blood touts. The prevalence of HIV&AIDS in Akwa Ibom state is 6.5%. It occupies
second position in the south-south zone and sixth position in the country (Federal Ministry of Health, 2012). The youths which form the base of energetic working population are the worst hit. This group has been defined as “the mainstay of family, the pillars of the society and very heart of the work force”. Elderly people, having lost their adult children to AIDS, live out their last few years impoverished alone or having to look after their grandchildren and themselves. (Akwa Ibom State Agency for Control of Aids, 2013). Undoubtedly, there is so much literature on HIV&AIDS epidemic. Unfortunately, investigations concerning the spatial dimensions of the infection are not common. Most of the studies on the distribution of HIV&AIDS in Nigeria have focused on investigating behavioural risk factors. These are associated with the distribution of infection in small socio-geographic areas (Obidoa and Cromley, 2012).

2 Aim and Objectives

The aim of this study is to evaluate the current distribution pattern of HIV&AIDS in Akwa Ibom State, Nigeria. This will help to among other things, direct the attention of policy/decision makers to areas(locations requiring serious and urgent intervention. There are three objectives for the study:

a. Determination of the distribution pattern of HIV&AIDS in the study area.

b. Identification of the factors responsible for the distribution pattern of HIV&AIDS in the study area.

c. Analysis of the implications of the distribution pattern of HIV&AIDS in the study area.

3 Methodology

The data sets for this study were obtained from secondary sources. These included the following:

3.1 Administrative Map of the Study Area

The Administrative map of Akwa Ibom State was used to determine the political boundary of the study area. It provided information on the 31 Local Government Areas [LGAs]. These administrative units [LGAs] provided the minimum mapping unit for the study.

3.2 HIV & AIDS Data

The data on HIV&AIDS which comprises the numerical data of those that tested positive to HIV&AIDS was obtained from the Ministry of Health in the State. The data covered individuals that tested positive to HIV&AIDS between January and December, 2013. The data covered both male and female population of all categories in the local government areas. The data was used to determine and analyze the current distribution pattern of HIV&AIDS in the study area. The data was also used to identify the hot spot of HIV&AIDS in the state. The HIV&AIDS data was entered into the GIS database for modeling and analyses. The GIS software used was ArcMap 9.2.

3.3 Socio-economic Data

The socio-economic data used for this study was obtained from the Ministry of Economic Development.
The data covered a range of socio-economic activities namely: poverty level, illiteracy level, unemployment and health establishment. This was used to model and analyze the factors responsible for the distribution pattern of HIV & AIDS in Akwa Ibom state since the data on HIV and AIDS did not have information on the socio-economic characteristics of those who tested positive to the disease. Details of the datasets are given in table 1 below:

**Table 1: Incidence of HIV & AIDS and Socio Economic Factors**

<table>
<thead>
<tr>
<th>L.G.A</th>
<th>Population 2006</th>
<th>Number of Patients with HIV&amp;AIDS</th>
<th>Number of Pregnant women with HIV&amp;AIDS</th>
<th>Number of Unemployed in 2013</th>
<th><strong>Depth of Poverty in 2013</strong></th>
<th>Number of Health Est. as at 2013</th>
<th>No. of Illiteracy registered in 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abak</td>
<td>139069</td>
<td>410</td>
<td>22</td>
<td>349</td>
<td>35.90</td>
<td>31</td>
<td>1125</td>
</tr>
<tr>
<td>Eastern Obolo</td>
<td>59970</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eket</td>
<td>172856</td>
<td>1302</td>
<td>92</td>
<td>242</td>
<td>22.88</td>
<td>48</td>
<td>820</td>
</tr>
<tr>
<td>Esit Eket</td>
<td>63358</td>
<td>63</td>
<td>-</td>
<td>127</td>
<td>29.84</td>
<td>10</td>
<td>347</td>
</tr>
<tr>
<td>Essien Udim</td>
<td>193257</td>
<td>677</td>
<td>112</td>
<td>261</td>
<td>44.18</td>
<td>26</td>
<td>1308</td>
</tr>
<tr>
<td>Etim Ekpo</td>
<td>105922</td>
<td>344</td>
<td>38</td>
<td>59</td>
<td>35.67</td>
<td>18</td>
<td>570</td>
</tr>
<tr>
<td>Etinan</td>
<td>168924</td>
<td>454</td>
<td>21</td>
<td>210</td>
<td>43.86</td>
<td>23</td>
<td>574</td>
</tr>
<tr>
<td>Ikono</td>
<td>74840</td>
<td>28</td>
<td>51</td>
<td>44</td>
<td>39.91</td>
<td>18</td>
<td>84</td>
</tr>
<tr>
<td>Ibiono Ibom</td>
<td>188605</td>
<td>90</td>
<td>2</td>
<td>239</td>
<td>37.63</td>
<td>24</td>
<td>941</td>
</tr>
<tr>
<td>Ika</td>
<td>72772</td>
<td>20</td>
<td>-</td>
<td>209</td>
<td>52.19</td>
<td>10</td>
<td>492</td>
</tr>
<tr>
<td>Ikono</td>
<td>131673</td>
<td>175</td>
<td>27</td>
<td>208</td>
<td>38.58</td>
<td>17</td>
<td>823</td>
</tr>
<tr>
<td>Ikot Abasi</td>
<td>132608</td>
<td>125</td>
<td>26</td>
<td>176</td>
<td>30.58</td>
<td>22</td>
<td>321</td>
</tr>
<tr>
<td>Ikot Ekpene</td>
<td>141408</td>
<td>196</td>
<td>94</td>
<td>229</td>
<td>28.27</td>
<td>47</td>
<td>446</td>
</tr>
<tr>
<td>Ini</td>
<td>99084</td>
<td>38</td>
<td>17</td>
<td>109</td>
<td>49.94</td>
<td>17</td>
<td>715</td>
</tr>
<tr>
<td>Itu</td>
<td>127856</td>
<td>99</td>
<td>67</td>
<td>100</td>
<td>31.93</td>
<td>13</td>
<td>480</td>
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<tr>
<td>Mbo</td>
<td>102173</td>
<td>87</td>
<td>87</td>
<td>202</td>
<td>35.29</td>
<td>17</td>
<td>516</td>
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<tr>
<td>Mkpat Enin</td>
<td>177293</td>
<td></td>
<td>21</td>
<td>477</td>
<td>34.12</td>
<td>17</td>
<td>862</td>
</tr>
<tr>
<td>Nsit Atai</td>
<td>73395</td>
<td>32</td>
<td>12</td>
<td>67</td>
<td>45.57</td>
<td>8</td>
<td>395</td>
</tr>
<tr>
<td>Nsit Ibom</td>
<td>108095</td>
<td>28</td>
<td>-</td>
<td>84</td>
<td>35.87</td>
<td>9</td>
<td>469</td>
</tr>
<tr>
<td>Nsit Ubium</td>
<td>127083</td>
<td>0</td>
<td>-</td>
<td>150</td>
<td>37.44</td>
<td>13</td>
<td>504</td>
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<tr>
<td>Obot Akara</td>
<td>147286</td>
<td>70</td>
<td>-</td>
<td>160</td>
<td>46.82</td>
<td>19</td>
<td>596</td>
</tr>
<tr>
<td>Okobo</td>
<td>102753</td>
<td>267</td>
<td>70</td>
<td>163</td>
<td>34.01</td>
<td>15</td>
<td>365</td>
</tr>
<tr>
<td>Onna</td>
<td>123193</td>
<td>36</td>
<td>1</td>
<td>423</td>
<td>36.71</td>
<td>16</td>
<td>664</td>
</tr>
<tr>
<td>Oron</td>
<td>87209</td>
<td>161</td>
<td>290</td>
<td>49</td>
<td>13.81</td>
<td>19</td>
<td>129</td>
</tr>
<tr>
<td>Oruk Anam</td>
<td>171839</td>
<td>34</td>
<td>0</td>
<td>287</td>
<td>41.47</td>
<td>19</td>
<td>1264</td>
</tr>
<tr>
<td>Udung Uko</td>
<td>53060</td>
<td></td>
<td>22</td>
<td>94</td>
<td>27.54</td>
<td>9</td>
<td>122</td>
</tr>
</tbody>
</table>
An evaluation of the current distribution pattern of HIV&AIDS in Akwa Ibom State using Geographic Information System

<table>
<thead>
<tr>
<th>Local Government Area</th>
<th>Population</th>
<th>Positive Tests</th>
<th>Positive Rate</th>
<th>Poverty Gap</th>
<th>Depth of Poverty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ukanafun</td>
<td>125473</td>
<td>271</td>
<td>0.215</td>
<td>36.14</td>
<td>18</td>
<td>1166</td>
</tr>
<tr>
<td>Uruan</td>
<td>117169</td>
<td>58</td>
<td>0.499</td>
<td>33.90</td>
<td>14</td>
<td>610</td>
</tr>
<tr>
<td>Urue Offong Onuko</td>
<td>70740</td>
<td>113</td>
<td>0.159</td>
<td>35.52</td>
<td>13</td>
<td>864</td>
</tr>
<tr>
<td>Uyo</td>
<td>305961</td>
<td>1318</td>
<td>0.431</td>
<td>23.18</td>
<td>100</td>
<td>18314</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,902,051</strong></td>
<td><strong>7,562</strong></td>
<td><strong>0.194</strong></td>
<td><strong>36.53</strong></td>
<td><strong>659</strong></td>
<td><strong>18314</strong></td>
</tr>
</tbody>
</table>

Sources: Akwa Ibom State Agency for Control of Aids and the Ministry of Economic Development.
* The depth of poverty (poverty gap index), which indicates how far off households are from the poverty line, which captures the mean aggregate income or consumption shortfall relative to the poverty line across the whole population

3.4 Data Analysis

The integration of spatial and non-spatial data into the GIS database provided the framework for the production of a variety of maps required for this study. First, map showing the distribution of persons who tested positive to HIV&AIDS was produced using the dot mapping technique. To create a more realistic visual impression of the pattern of distribution, a statistical surface was produced using the data. The surface was created using Inverse distance weighted (IDW) interpolation. The IDW is a method that assumes that the unknown value of a point is influenced more by nearby points than those further away. The degree of influence is expressed by the inverse of the distance between points raised to a power. A power of one means a constant rate of change in values between points, and a power of two or higher suggests that the rate of change in values is higher near a known point and levels off away from it (Robinson et al. 1995; Kraak et al. 1996; Chang, 2000). The IDW interpolation scheme is appropriate because studies have shown that villages/communities lying close together have more homogeneous socio-economic characteristics and the population is subject to the same agroclimatic and geographic conditions (Bigman et.al., 2000; Bigman and Fofack, 2000)). Relating this to this study, HIV&AIDS is spread through contact and so, those people/communities that are closer to those that have been infected are more likely to be infected than those that are further away. With this technique, the gaps existing between points on dot maps as well as the erroneous impression that a certain number of persons are located at the point where the dot is placed are closed and corrected respectively. Such a map if overlaid on another showing settlements, enables us identify settlements that are located within the hotspots and those outside the hotspots. Moreover, to analyze the pattern of distribution of HIV&AIDS in the study area, spatial auto correlation (Moran I) was used. This made it possible to determine whether the pattern of distribution was clustered, dispersed or random. A Moran index value of + 1.0 indicates clustering, while an index of – 1.0 indicates dispersion. However, we have to look at the Z score in order to make decision. If the Z score is between –1.96 and +1.96, the null hypothesis cannot be rejected. When this happens, the pattern could very likely be one version of a random pattern. If the Z score falls outside that range e.g. –2.5 or +5.4, the pattern exhibited is too unusual to be just another version of random chance. If this happens, then the null hypothesis is rejected. However, the reason for the unusual pattern must be figured out (Getis and Ord 1992; Mitchell, 2005).

**Hypothesis:**

**H_0:** There is no spatial clustering of the incidence of HIV&AIDS in the study area

**H_1:** There is spatial clustering of the incidence of HIV&AIDS in the study area.
Furthermore, to show how socio-economic factors influence the distribution pattern of HIV&AIDS in the study area, choropleth mapping technique was used to produce maps showing the distribution pattern of the socio-economic factors in the area. The dot map showing the distribution of HIV&AIDS was then overlaid on the choropleth maps showing various socio-economic factors. Moreover, regression analysis was carried out to determine the factor that contributed more to the observed pattern of HIV&AIDS distribution in Akwa Ibom State.


Figure 1: Location of Akwa Ibom State, Nigeria

3.5 Multiple regression analysis

According to Udofia (2011), multiple regression analysis is used to predict the value of a variable based on the value of two or more other variables. The variable to be predicted is called the dependent variable while the variables used to predict the value of the dependent variable are called the independent variables. In this study, multiple regression was used to understand whether the pattern of HIV&AIDS distribution can be predicted based on socio-economic factors such as Illiteracy, Unemployment, Health
facility and Poverty. It also allows the determination of the overall fit of the model and the relative contribution of each of the independent variables to the total variance explained. For example, in this study, we were interested in establishing how much of the variation in the pattern of HIV&AIDS distribution can be explained by Illiteracy, Unemployment, Health facility and Poverty, as well as the "relative contribution" of each independent variable in explaining the variance.

4 Study Area

Akwa Ibom State is situated in South Eastern Nigeria. It lies between latitude 4°30" and 5°30"N and longitudes 7°30" and 8° 30"E (Figure 1). This location is within the equatorial region. According to Ayoade (2003), the equatorial climate is characterized by its uniformity of temperature throughout the year. The mean monthly temperatures are always around 27°C with very little variation. Rainfall is usually between 1524mm and 2699mm and well distributed throughout the year. There are two periods of maximum rainfall and usually a distinct dry season.

The distribution of population as at 2006 is shown in figure 2. It is obvious from the map that the concentration of people in some local government areas was very high. Etinan, Uyo, Eket, Mkpat Enin, Ibiono Ibom, Essien Udum and Ukanafun had very high population while there were vast areas of permanent swamps along the coastal areas of Eastern Obolo, Ibene, Udung Uko which were either sparsely populated or totally uninhabited.

4.1 Analysis of Results and Discussion

4.2 The pattern of HIV&AIDS distribution in the Study Area

The result of the dot density mapping is presented as figure 3. The map shows the pattern of HIV&AIDS distribution in the study area using dots to represent a certain value (in this case one dot represented (4) people). It is obvious from the map [fig. 2] that, higher incidence of HIV &AIDS was found in the Southern Local Government Area of Eket and South Eastern Local Government Area of Oron. The highest incidence was recorded in Uyo (the capital city). These Local Government Areas were all located in the central, south Eastern and southern parts of the state. Also, there was high incidence in the north western Local Government Area of Essien Udum, Abak, Etim Ekpo and Ukanafun. The high incidence was also observed in Etinan, Ibesikpo and Ikot Ekpene. The lowest incidences were visible in Local Government Areas in the north and some in the south western part of the state.
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Figure 2: Akwa Ibom: Population Distribution in 2006
Source: table 1

Figure 3: Akwa Ibom State: Distribution of Persons with HIV and AIDS
4.3 Surface Analysis

The map [Figure 4] is the result of surface analysis based on the data on the incidence of HIV&AIDS in the area. It is obvious from the map, that Eket, Oron and Uyo were the major hot spots of HIV&AIDS in the study area. Fig. 3 revealed that significant spatial clustering of highest value was vivid in these areas. The high and low values can easily be discerned by a simple visual analysis of the map.

![Figure 4: Akwa Ibom State: HIV&AIDS Hot Spots](image)

4.4 Hypothesis Testing

1. There is no spatial clustering of the incidence of HIV&AIDS in the study area.

Using spatial auto correlation (Moran 1), this was carried out using the spatial statistics tool in Arc map 9.2 GIS software package [see details in the appendix].

Results from the spatial auto correlation analysis showed normal Z (standardized) values of -1.007195 (p=0.313841). The index value = -0.158067

- Moran index = -0.158067
- P value = 0.31384
- Variance = 0.015337
- Z score = -1.007195

**Decision:** Since the P value is larger than 0.05 significant level and the Z score is -1.01, the null hypothesis is accepted. That is, there is no spatial clustering of the incidence of HIV&AIDS in the study area. Moreover, given the Z score of 1.01, the pattern does not appear to be significantly different than random. In other words, the pattern exhibited by the areas with high incidence of HIV&AIDS in the study area is random.
4.5 Determination of the influence of socio-economic factors on the distribution pattern of HIV & AIDS in the Area

Figures 5, 6, 7 and 8 show the results of overlay analysis involving the map showing distribution pattern of the incidence of HIV & AIDS and the ones on the distribution of socio-economic factors. It is obvious from figure 5 that illiteracy was high in Uyo and Eket Local Government Areas [L.G.As] where HIV & AIDS incidence was high. Illiteracy level was higher in Essien Udim, Abak and Ukanafun Local Government Areas which also had high incidence of HIV&AIDS. Etinan, Ibesikpo, Ikot Ekpene and Etim Ekpo which also had high incidence of HIV&AIDS, had moderate illiteracy level. This indicates that there was positive relationship between incidence of HIV & AIDS and level of illiteracy in the study area.

Figure 5: Akwa Ibom State: Distribution of HIV and AIDS and Literacy level

Figure 6 shows the relationship between the incidence of HIV & AIDS and poverty in the state. It reveals that poverty was low in Oron, Eket and Uyo Local Government Areas where incidence of HIV&AIDS was high. These locations are predominantly urban centres. This proves that there was negative relationship between incidence of poverty and incidence of HIV&AIDS in the study area.
Figure 6: Akwa Ibom State: Distribution of HIV and AIDS and level of Poverty

Figure 7 shows that unemployment was high in Uyo the state capital, where incidence of HIV&AIDS was high. It was also high in Essien Udim, Abak and Ukanafun where there was equally high prevalence of HIV&AIDS. Eket and Oron which had moderate and low level of unemployment respectively had high prevalence of HIV&AIDS. Unemployment was moderate in Etinan, Ibesikpo, Okobo and Ikot Ekpene. These Local Government Areas also had high prevalence of HIV&AIDS. Etim Ekpo had low level of unemployment but maintained high prevalence of HIV&AIDS. Unemployment was very high in Mkpat Enin and Onna but incidence of HIV&AIDS was very low in these areas. It is obvious from the foregoing that, most of the LGAs with high incidence of unemployment also had high or moderate incidence of HIV&AIDS. This is an indication that, there was a positive relationship between incidence of HIV&AIDS and unemployment in the study area. Figure 8 shows that the number of health facilities was high in Uyo and Eket Local Government Areas where there was high incidence of HIV&AIDS. Health facilities were also high in Abak and Ikot Ekpene where there was high prevalence of the epidemic. However, other parts of the state maintained low level of health facilities including Oron where there was high incidence of HIV&AIDS. Despite the high prevalence in Essien Udim, Etim Ekpo, Ukanafun, Etinan and Ibesikpo, there was relatively low level of health facilities. This proves that there was no significant relationship between incidence of HIV&AIDS and the distribution of health facilities in the study areas.
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Figure 7: Akwa Ibom State: Distribution of HIV and AIDS and Unemployment level

Figure 8: Akwa Ibom State: Distribution of HIV and AIDS and Health Facilities
4.6 Regression Analysis

The multiple regression analysis was used to examine the factors that must have contributed more to the observed pattern of HIV&AIDS distribution in Akwa Ibom State. Four independent variables were used namely:-

X₁ - - - Illiteracy
X₂ - - - Unemployment
X₃ - - - Health facility
X₄ - - - Poverty

The dependent variable Y’ was defined in terms of the HIV&AIDS pattern. Essentially the regression equation proposed for modeling HIV&AIDS pattern was given as:

\[ Y = a + b₁X₁ + b₂X₂ + b₃X₃ + b₄X₄ + e \]

Where y=HIV & AIDS pattern

a=intercepts of the regression equation

b=regression co efficient (i.e. beta weight) for X₁, X₂, X₃, and X₄

The model, summary and the regression co efficient /t – values are presented in table 2 and 3[see the appendix for details].

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>Std. error</th>
<th>F</th>
<th>Sig</th>
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</thead>
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<tr>
<td>1</td>
<td>.825</td>
<td>.681</td>
<td>.626</td>
<td>78.738</td>
<td>12.279</td>
<td>0.00</td>
</tr>
</tbody>
</table>

a. Predictors: (constant), poverty, health facilities, unemployment, illiteracy

b. Dependent variable: HIV&AIDS Pattern

Data in table 2 presents the multiple correlation co-efficient ‘R’ and the co-efficient of determination ‘R²’. A close examination of the ‘R’ and ‘R²’ values reveal that the four independent variables (Illiteracy, Unemployment, Health facility and Poverty) jointly correlated strongly with the pattern of HIV&AIDS distribution (R= .825). However, the four factors jointly explain 68.1% of variance in the HIV & AIDS distributional pattern. The F – values of 12 .279 (Table 2) reveals that the joint relationship between the independent variable and HIV & AIDS pattern is significant (P=0.00) at 0.05 significant level. This implies that the relationship is not attributable to chance. In terms of the individual contribution of the independent variables to the HIV&AIDS model (i.e. distribution pattern) table 3 contains the standardized co –efficient (beta weights) which is used to assert the relative importance of each factor in the model.

**Table 3: Model Co-Efficient**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized co-efficient</th>
<th>standardized co-efficient</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
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<tr>
<td>B</td>
<td>Std. error</td>
<td>beta</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1(constant)</td>
<td>-295.289</td>
<td>150.705</td>
<td>.959</td>
<td>.062</td>
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<td>Illiteracy</td>
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<td>.088</td>
<td>.263</td>
<td>1.839</td>
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<tr>
<td>Unemployment</td>
<td>.452</td>
<td>.119</td>
<td>.540</td>
<td>3.818</td>
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<td>Health facility</td>
<td>1.406</td>
<td>.967</td>
<td>.194</td>
<td>1.454</td>
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<tr>
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<td>1.912</td>
<td>.092</td>
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</tbody>
</table>
As data in table 3 indicates, the standardized regression co-efficient (indicating the relative importance) of the four factors and their levels of significance are as follows: illiteracy (Beta =.263, sig. = 0.07) unemployment (.540, sig. = 0.00) health facility (.194, sig. = 0.16) and poverty .092, sig. =0.45). Going by the above data, it is clear that unemployment is the most significant factor responsible for the observed pattern of HIV&AIDS in the study area. Other factors such as illiteracy and availability of health facility have made considerable contribution to the observed pattern of HIV&AIDS but not significant at 0.05 significant level. Poverty made the lowest contribution (to the pattern of HIV&AIDS) which is not significant statistically. Essentially the model for predicting the pattern of HIV&AIDS using unemployment as the most important would be: Y =2952 – 1540 x 2. What this means is that a unit decrease in unemployment would yield 0.540 unit reduction in HIV&AIDS. In other words, the pattern of HIV&AIDS distribution in the state can be altered using the factor of unemployment. In the practical sense, the model appears relative owing to the fact that jobless people are pre-occupied with risky sexual activities just to past time. Among the female folk, joblessness would encourage prostitution thereby increasing the risk of HIV&AIDS.

5. Discussion

From the maps produced and spatial analysis carried out in this study, it is obvious that the areas with high incidence of HIV&AIDS is randomly distributed. The implication of this distribution pattern is that the entire population of the state is at risks because these high incidence locations are far apart thereby making the coordination of control programmes difficult and more expensive. A clustered pattern would have made it easy to restrict movement in and out of high incidence areas among other things. Furthermore, the high incidence of HIV&AIDS in three urban centres of Uyo, Eket and Oron raises questions about the activities that might be responsible for the distribution of the epidemic in these urban centres. This study revealed that unemployment was the most singular factor that was responsible for the pattern of HIV&AIDS distribution at 0.001 significance level. Other factors analyzed contributed to the distribution pattern but, were not significant statistically. This was an indication that with improvement in employment (i.e. creation of job opportunities), the spread of the epidemic can be significantly contained. The urban areas with high incidence of HIV&AIDS are very important locations which attract people from different parts of the world. This means that, since HIV&AIDS knows no boundary, there is the need to sensitize communities that are close to these urban centers. This is to safe guide youths who migrate on daily basis to these areas in search of jobs among other things. There is also the need to channel prevention programme to the rural population in order to reduce the risk of HIV&AIDS. Attention should be shifted away from the urban centres where there is evidence of clustering of HIV&AIDS. Most of the HIV&AIDS intervention and prevention programme, are presently based on the epicenter of the diseases, while the rural areas are left out. It is clear from available population statistics that a large number of people in the state live in the rural areas. For this reason, there is need to educate the rural inhabitants as well as economically empower individuals in the rural communities especially women.

5.1 Conclusions

This study shows that, the areas with high incidence of HIV&AIDS are randomly distributed. One of the implications of this is that, the disease can easily spread to other parts of the State. Four socio
economic factors namely- unemployment, illiteracy, poverty and locations of health establishments have profound effect on the pattern of HIV&AIDS distribution in the area. However, this study revealed that, unemployment is the most significant factor that is responsible for the pattern of HIV&AIDS distribution in Akwa Ibom State. Therefore, this study recommends job creation as a means of reducing, if not eradicating the spread of the disease in the study area. Also, since HIV&AIDS is a very devastating ailment, it requires frequent monitoring and emergency response. For this to be cost-effective, we need to include the demographics of those that are tested/screened for the disease in the data collection procedure. If such data is collected on settlement basis, then, we are most likely to have a more realistic and dependable distribution pattern. This will in turn make our efforts/programmes for fighting the disease cost-effective.

6. References