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The Epidemiological Studies of Tuberculosis (TB) and (HIV) Patients in Some Parts of Southern Eastern Nigeria

[1]Ezekwesiri Cletus Okey, [2]Elendu C Onwuchekwa, [3]Nwachukwu N.C and Nnodim Johnkennedy[4*]

[1]Department of Public Health Madonna University, Nigeria Elele campus, Rivers State.

[2]Department of Public Health Abia State University Uturu, Nigeria.

[3]Department of Microbiology Abia State University Uturu, Nigeria

[4]Department of Medical Laboratory Science Imo State University Owerri.

Corresponding Author: [1]Ezekwesiri Cletus Okey, [1]Department of Public Health Madonna University, Nigeria Elele campus, Rivers State.

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Abstract

The epidemiological studies of tuberculosis (TB) and (HIV) patients in parts of Abia, Anambra and Imo States, were carried out using standard procedures. Two hospitals were chosen from each of the three States, namely: St. Charles Borromeo Specialist Hospital Onitsha and Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi, Federal Medical Centre (FMC) Umuahia and Abia State University Teaching Hospital (ABSUTH) Aba, and Federal Medical Centre (FMC) Owerri and Imo State University Teaching Hospital (IMSUTH) Orlu from January 2013 to December 2014. The epidemiological analyses of the data obtained from the six selected hospitals revealed that Abia State had the highest prevalence of HIV in 2013 (8.96%) as well as in 2014 (8.42%) compared to Anambra in 2013 (6.59%) and 2014 (3.82%) and Imo in 2013 (1.91% and 2014 (1.86%). On the other hand, Imo State had the highest prevalence of Pulmonary Tuberculosis (PTB) in 2013 (11.44%) compared to Anambra in 2013 (8.04%) and 2014 (7.14%) and Abia State in 2013 (6.84%) and 2014 (5.16%). Also revealed was the highest prevalence of TB – HIV co- infected patients in Abia State both in 2013 (43.7%) and 2014 (39.55%) compared to Anambra in 2013 (31.7%) and 2014 (36.05%), and Imo state in 2013 (16.95%) and 2014 (27.5%).

Keywords: Epidemiological, studies, tuberculosis, HIV, patients, Nigeria

Introduction

Epidemiology is a tool for improving public health. Epidemiological of Tuberculosis (TB) and Human Immunodeficiency Virus (HIV) have become necessary in parts of Abia, Anambra and Imo states due to the luming burden of health and economic hardship these diseases have placed on countries in sub-Saharan Africa like Nigeria that is already battling with dwindling health and economic situation public health, a collective action to improve the health of the members of a community [1].

TB-HIV co-infection which have worsened the situation of carriers and tremendously encouraged the spread of the disease which according to WHO has led to a sharp increase of TB infected patients in Nigeria [2].

Nigeria is ranking 4th in terms of incidence. It will interest you to know that from 1990 to 2011, 34 million people have been infected and are living with HIV worldwide. 23.5 million live in sub–Saharan Africa [3]. From the obvious points above, Nigeria and her citizens are not exempted from the attack of these dangerous and contagious diseases. Indeed, the epidemiological survey became necessary with a view to informing the NTBLCP and NACA the target areas that may need quick intervention both in strategy and process and to update the care givers of these patients on the necessary changes that may be occurring in their body which will guide them in their management decisions [4].

Tuberculosis (TB) and Human Immune Deficiency Virus (HIV) are diseases of public health emergency. Years back these two communicable diseases have been ravaging the whole world. Mycobacterium tuberculosis is actually the cause of tuberculosis disease. It is an acid-fast bacterium which is a major cause of morbidity and mortality worldwide. It should be noted that over one third of the world population is down with pulmonary tuberculosis (PTB) [5].

It is commonly a disease of the lungs (pulmonary tuberculosis). It spreads mostly and primarily through airborne, that is, moving in the air of droplets during coughing, talking or sneezing in a poorly ventilated closet and once it is inhaled into the lungs, it forms a localized

infection leading to unexplained cough that may persist for over three weeks, loss of appetite, weight loss and fatigue [6].

It was stated that pulmonary tuberculosis is influenced by economic and nutritional factors among other factors pointing out that developing countries have the highest prevalence due to poor economy and poverty. It could be recalled that in 2012, 8.6 million developed TB and 1.3million died from the disease [7].

More so, the mycobacterium is capable of activating the infected macrophages resulting to free radical burst and high serum level of these free radicals and high concentration of lipid peroxidation products are characterized by patients with advanced tuberculosis. The peroxidation however, could cause reduced concentration of serum lipids and tissue inflammation [8[. More so, tissue inflammation, oxidative stress and continuous production of free radicals in pulmonary tuberculosis patients may cause lower levels of antioxidants [9].

Despite all efforts by WHO, medical experts and donor agencies to contain tuberculosis disease, it is still raising its ugly head. Nigeria has the fourth highest burden of Tuberculosis because there is still resurgence of tuberculosis in the developing countries and problems of its control due to inadequate treatment, emergence of multi drug resistance tuberculosis, poverty, malnutrition, overcrowding and most importantly co-infection with HIV among others [10].

The human immunodeficiency virus (HIV), another deadly disease of global importance is the causative agent of acquired immunodeficiency syndrome (AIDS). It is a fatal illness that breaks down the body's immune system by infecting the CD4+ T- lymphocytes. This cellular CD4 immunodeficiency exposes HIV patients to several opportunistic infections because of depleted immune system function. The most hit of this pandemic is in most developing sub-Saharan countries like Nigeria. This in no small measure has reduced life expectancy and has overstressed already weak health system [11[. It has been documented that HIV is highly infectious and the major routes of transmission includes intimate sexual contact, contaminated blood, and mother-to-child. Others are by sharing of needles and by needle stick injuries. HIV disease has claimed many lives and still keeps many at the verge of death. It could be recalled that the number of people living with HIV/AIDS rose from around 8 million in 1990 to 34 million by the end of 2011 and out of the 34 million, 23.5 million live in sub-Saharan Africa and 1.8 million were newly infected with 1.2 million deaths [12]. This epidemiological Survey only indicates that HIV disease is still ravaging the global community especially the developing countries.

Human Immunodeficiency Virus (HIV) has been a leading cause of death among young adults with clinical presentation of Pneumonia, fever, cough, night sweat, and loss of vision, diarrhea, and weight loss, lymphadenopathy among others like slein rashes, anemia and hairy leukoplakia [13].

The determination of epidemiology of tuberculosis and HIV cases (patients) will help to generating pieces of information that will lead to the positive repositioning of the management and control of these two dangerous contagious diseases in parts of Abia, Anambra, and Imo States.

Materials and Methods:

A total of 600 confirmed TB (M-30, F-20) and HIV (M-20, F-30) positive subjects/Patients 18 years and above and 50 apparently normal (controls) subjects (M-30, F-20) were randomly selected from six hospitals (IMSUTH Orlu, FMC Owerri, NAUTH Nnewi, St Charles Borromeo Hospital Onitsha, FMC Umuahia and ABSUTH Aba) to participate in the study. i.e., 50 subjects/patients from each of the six selected hospitals in the three states respectively. All of them were dully informed of the details of the research work and consent was obtained prior to the study Participation was voluntary and questionnaire was issued to obtain demographic information of the participants such as age, sex, marital status and occupation.

Ethical approval for the study Participation was voluntary and questionnaire was issued to obtain demographic information of the participants such as age, sex, marital status and occupation was obtained from the ethical committees of the hospitals.

Statistical analysis

Data generated from this study were analyzed using simple percentages, frequency tables, student's t-test and analysis of variance (ANOVA). Each result was expressed as mean +/- SD. Each of the parameters analyzed was compared with control. Significance of mean differences were determined using SPSS Version 20 and was accepted at $p < 0.05$. Pearson's correlation coefficient was determined at 5% level of significance.

Results:

ST. CHARLES BORROMEO SPECIALIST HOSPITAL ONITSHA HIV PATIENTS IN LGAS JAN-DEC 2013.

	LGAs	Frequency	Percentage
1.	Aguata	5	0.77%
2.	Awka south	5	0.77%

3.	Awka North	5	0.77% Total HIV patients in 2013 = 643(2.78%) Total patients screened for HIV in 2013 =23095 161 males = 33% 482 females = 67% See Appendices 1 and 2
4.	Anambra East	11	1.71%
5.	Anambra West	4	0.62%
6.	Anaocha	4	0.62%
7.	Anyamelu	0	0%
8.	Dunukofia	8	1.24%
9.	Ekwusigo	6	0.93%
10.	Idemili North	355	39.7%
11.	Idemili South	11	1.71%
12.	Ihiala	2	0.31%
13.	Njikoka	6	0.93%
14.	Nnewi North	6	0.93%
15.	Nnewi South	3	0.47%
16.	Ogbaru	116	18.04 %
17.	Onitsha North	118	18.35 %
18.	Onitsha South	54	8.39.0%
19.	Orumba North	3	0.47%
20.	Orumba South	2	0.31%
21.	Oyi	19	2.96%

ST. CHARLES BORROMEO SPECIALIST HOSPITAL ONITSHA HIV PATIENTS IN LGAS JAN – DEC 2014

	L GAs	Frequency	Percentages
1.	Aguata	3	0.65%
2.	Awka South	4	0.88%
3.	Awka North	1	0.21%
4.	Anambra East	7	1.53% TOTAL HIV patients in 2014 = 456(1.3%) Total patients screened for HIV in 2014 = 34,865 Male = 198 (43.4%) Females = 258 (56.6%) (1.48% decrease from 2013) See appendices 3 and 4.
5.	Anambra West	0	0%
6.	Anaocha	3	0.65%
7.	Anyamelu	2	0.44%
8.	Dunukofia	7	1.53%
9.	Ekwusigo	1	0.21%
10.	Idemili North	171	37.5%
11.	Idemili South	10	2.20%
12.	Ihiala	7	1.53%
13.	Njikoka	6	1.32%
14.	Nnewi North	4	0.88%
15.	Nnewi South	3	0.65%
16.	Ogbaru	77	16.9%
17.	Onitsha North	72	15.8%
18.	Onitsha South	63	13.82%
19.	Orumba North	1	0.21%
20.	Orumba South	0	0%
21.	Oyi	14	3.1%

Table 12
ST. CHARLES BORROMEO SPECIALIST HOSPITAL ONITSHA HIV PATIENTS IN LGAS JAN – DEC 2014

	L GAs	Frequency	Percentages
1.	Aguata	3	0.65%
2.	Awka South	4	0.88%
3.	Awka North	1	0.21%
4.	Anambra East	7	1.53% TOTAL HIV patients in 2014 = 456(1.3%) Total patients screened for HIV in 2014 = 34,865 Male = 198 (43.4%) Females = 258 (56.6%) (1.48% decrease from 2013) See appendices 3 and 4.
5.	Anambra West	0	0%
6.	Anaocha	3	0.65%
7.	Anyamelu	2	0.44%
8.	Dunukofia	7	1.53%
9.	Ekwusigo	1	0.21%
10.	Idemili North	171	37.5%
11.	Idemili South	10	2.20%
12.	Ihiala	7	1.53%
13.	Njikoka	6	1.32%
14.	Nnewi North	4	0.88%
15.	Nnewi South	3	0.65%
16.	Ogbaru	77	16.9%
17.	Onitsha North	72	15.8%
18.	Onitsha South	63	13.82%
19.	Orumba North	1	0.21%
20.	Orumba South	0	0%
21.	Oyi	14	3.1%

Table 13: ST. CHARLES BORROMEO SPECIALIST HOSPITAL ONITSHA PTB PATIENTS IN LGAS JAN – DEC 2013

	LGAs	Frequency	Percentages
1	Aguata	1	0.88%
2.	Awka south	0	0%
3.	Awka North	0	0%
4.	Anambra East	0	0%
5.	Anambra West	2	1.75%
6.	Anaocha	1	0.88% Total PTB patients in 2013 = 114 (11.1%)

			Total patients screened for PTB in 2013 = 1,023 Total number of co-infection = 30 (26.5%) *See appendices 5 and 6 Male: 68 (59.7%) Females: 46 (40.3%)
7.	Anyamelu	0	0%
8.	Dunukofia	0	0%
9.	Ekwusigo	2	1.75%
10.	Idemili North	52	45.6%
11.	Idemili South	2	1.75%
12.	Ihiala	3	2.63%
13.	Njikoka	0	0%
14.	Nnewi North	0	0%
15.	Nnewi South	1	0.88%
16.	Ogbaru	11	9.65%
17.	Onitsha North	18	15.80%
18.	Onitsha South	18	15.80%
19.	Orumba North	1	0.88%
20.	Orumba South	0	0%
21.	Oyi	2	1.75%

Table 14: ST, CHARLES BORROMEO SPECIALIST HOSPITAL ONITSHA PTB PATIENTS IN LGAS JAN-DEC 2014.

S/N	Local Government Area	Frequency	Percentage occurrence
1.	Aguata	0	0%
2.	Awka south	0	0%
3.	Awka North	0	0%
4.	Anambra East	6	5.6%
5.	Anambra West	0	0% Total PTB patients in 2014 = 107 (11.8%) Total patients screened for PTB in 2014 = 887 Males: 74 (69.2%) Females: 33 (30.8%) Total number of TB-HIV co-infection =20 (19%) (0.7% increase from 2013) *See appendices 7 and 8
6.	Anaocha	1	0.94%
7.	Anyamelu	1	0.94%
8.	Dunukofia	1	0.94%
9.	Ekwusigo	1	0.94%
10.	Idemili North	39	36.45%
11.	Idemili South	3	2.80%
12.	Ihiala	2	1.87%
13.	Njikoka	1	0.94%
14.	Nnewi North	0	0%
15.	Nnewi South	0	0%
16.	Ogbaru	20	18.69%
17.	Onitsha North	10	9.34%
18.	Onitsha South	15	14.0%
19.	Orumba North	2	1.87%
20.	Orumba South	1	0.94%
21.	Oyi	4	

FMC OWERRI HIV PATIENTS IN LGAS JAN-DEC 2013.

S/N	Local Government Area	Frequency	Percentage occurrence	
1.	Ideato North	1	0.79%	
2.	Ideato South	1	0.79%	

3.	Owerri municipal	13	10.24%	
4.	Owerri North	19	14.96%	
5.	Owerri West	29	22.84%	
6.	Nwangelle	2	1.58%	Total HIV patients = 127(0.815%) Total patients screened for HIV in 2013 = 15,696 *See appendices 9 and 10
7.	Ahiazu	1	0.79%	
8.	Aboh	4	3.15%	Males:51 (40.2%) Females:76 (59.8%)
9.	Ezinihite	2	1.58%	
10.	Onuimo	1	0.79%	
11.	Orlu	5	3.93%	
12.	Orsu	0	0%	
13.	Obowo	2	1.58%	
14.	Ihiteuboma	0	0%	
15.	Ikeduru	9	7.08%	
16.	Mbaitoli	10	7.87%	
17.	Njaba	3	2.36%	
18.	Oguta	2	1.58%	
19.	Oru East	1	0.79%	
20.	Oru West	1	0.79%	
21.	Isiala Mbano	1	0.79%	
22.	Ehime Mbano	5	3.93%	

FMC OWERRI HIV PATIENTS IN LGAS JAN-DEC 2014.

S/N	**Local Government Area**	**Frequency**	**Percentage occurrence**	
1.	Ideato North	0	0%	
2.	Ideato South	2	1.31%	
3.	Owerri municipal	27	17.80%	
4.	Owerri North	24	15.79%	Total HIV patients in 2014 = 152 (1.3%) Total patients screened for HIV in 2014 = 11,538 *See appendices 11 and 12
5.	Owerri West	28	18.42%	
6.	Nwangelle	0	0%	Males: 51 (34%) Females: 101 (66%) (0.5% increase from 2013)
7.	Ahiazu	3	1.97%	
8.	Aboh	1	0.66%	
9.	Ezinihite	1	0.66%	
10.	Onuimo	1	0.66%	
11.	Orlu	1	0.66%	
12.	Orsu	1	0.66%	
13.	Obowo	1	0.66%	
14.	Ihiteuboma	1	0.66%	
15.	Ikeduru	15	9.87%	
16.	Mbaitoli	19	12.5%	
17.	Njaba	6	3.95%	
18.	Oguta	2	1.31%	
19.	Oru East	2	1.31%	
20.	Oru West	0	0%	
21.	Isiala Mbano	1	0.66%	
22.	Ehime Mbano	1	0.66%	
23.	Nkwerre	1	0.66%	
24.	Ngookpala	4	2.63%	
25.	Isu	3	1.97%	
26.	Ohaji Egbema	7	4.60%	
27.	Okigwe	0	0%	

FMC OWERRI PTB PATIENTS IN LGAS JAN-DEC 2013.

S/N	Local Government Area	Frequency	Percentage occurrence	
1.	Ideato North	0	0%	
2.	Ideato South	3	1.04%	
3.	Owerri municipal	27	9.31%	
4.	Owerri North	26	8.97%	Total PTB positive in 2013 = 290(12.2%) Total patients screened for PTB = 2,382 Total number of TB-HIVco-infection patients = 36(12.4%)
5.	Owerri West	35	12.10%	
6.	Nwangelle	1	0.35%	
7.	Ahiazu	13	4.50%	
8.	Aboh	6	2.07%	Males: 194 (66.9%) Females: 96 (33.1%) *See appendices 13 and 14
9.	Ezinihite	4	1.38%	
10.	Onuimo	0	0%	
11.	Orlu	4	1.38%	
12.	Orsu	3	1.04%	
13.	Obowo	1	0.35%	
14.	Ihiteuboma	1	0.35%	
15.	Ikeduru	24	8.3%	
16.	Mbaitoli	47	16.21%	
17.	Njaba	10	3.45%	
18.	Oru East	2	0.69%	
19.	Oru West	1	0.35%	
20.	Oguta	9	3.10%	
21.	Isiala Mbano	11	3.79%	
22.	Ehime Mbano	7	2.41%	
23.	Nkwerre	5	1.72%	
24.	Ngookpala	7	2.41%	
25.	Isu	19	6.55%	
26.	Ohaji Egbema	21	7.24%	
27.	Okigwe	3	1.04%	

Table 18: FMC OWERRI PTB PATIENTS IN LGAS JAN-DEC2014

S/N	Local Government Area	Frequency	Percentage occurrence	
1.	Ideato North	0	0%	
2.	Ideato South	0	0%	
3.	Owerri municipal	7	4.51%	
4.	Owerri North	24	15.48%	
5.	Owerri West	27	17.42%	Total PTB positive patients in 2014 = 155 (6.1%) Total number of patients screened for PTB in 2014 = 2, 525 Total number of TB-HIV co-infection patients = 31 (20%)
6.	Nwangelle	0	0%	
7.	Ahiazu	8	5.16%	
8.	Aboh	3	1.94%	
9.	Ezinihite	3	1.94%	
10.	Onuimo	2	1.29%	Males: 104 (67.19%) Females: 51 (32.9%) (6.1 decrease from 2014) *See appendices 15 and 16.
11.	Orlu	3	1.94%	
12.	Orsu	0	0%	
13.	Obowo	0	0%	
14.	Ihiteuboma	2	1.29%	
15.	Ikeduru	10	6.45%	

16.	Mbaitoli	26	16.77%	
17.	Njaba	2	1.29%	
18.	Oguta	1	0.65%	
19.	Oru East	1	0.65%	
20.	Oru West	4	2.58%	
21.	Isiala Mbano	2	1.29%	
22.	Ehime Mbano	0	0%	
23.	Nkwerre	2	1.29%	
24.	Ngookpala	7	4.51%	
25.	Isu	5	3.22%	
26.	Ohaji Egbema	16	10.32%	
27.	Okigwe	0	0	

IMSUTH ORLU HIV PATIENTS IN LGAS JAN-DEC 2013

S/N	Local Government Area	Frequency	Percentage occurrence	
1.	Ideato North	15	6.47%	
2.	Ideato South	12	5.17%	
3.	Owerri municipal	1	0.43%	
4.	Owerri North	5	2.16%	Males: 93 (40.1%) Females: 139 (59.9%) *See appendices 17 and 18
5.	Owerri West	2	0.86%	
6.	Nwangelle	9	3.88%	
7.	Ahiazu	1	0.43%	Total HIV positive patients in 2013 = 232 (7.42%) Total patients screened for HIV in 2013 = 3, 129
8.	Aboh	2	0.86%	
9.	Ezinihite	3	1.29%	
10.	Onuimo	2	0.86%	
11.	Orlu	50	21.55%	
12.	Orsu	28	12.07%	
13.	Obowo	0	0%	
14.	Ihiteuboma	0	0%	
15.	Ikeduru	1	0.43%	
16.	Mbaitoli	12	5.17%	
17.	Njaba	38	16.40%	
18.	Oru East	12	5.17%	
19.	Oru West	4	1.72%	
20.	Oguta	1	0.43%	
21.	Isiala Mbano	7	3.02%	
22.	Ehime Mbano	4	1.72%	
23.	Nkwerre	6	2.59%	
24.	Ngookpala	0	0%	
25.	Isu	16	6.89%	
26.	Ohaji Egbema	0	0%	
27.	Okigwe	1	0.43%	

IMSUTH ORLU HIV PATIENTS in LGAS JAN-DEC 2014

S/N	Local Government Area	Frequency	Percentage occurrence	
1.	Ideato North	3	2.41%	
2.	Ideato South	7	5.64%	
3.	Owerri municipal	0	0%	
4.	Owerri North	0	0%	Total HIVpatients in 2014 = 124 (3.70%) Total patients screened in 2014=3,313
5.	Owerri West	0	0%	
6.	Nwangelle	3	2.41%	

7.	Ahiazu	0	0%	
8.	Aboh	1	0.806%	Males: 43 (35%) Females: 81 (65%) (3.75% decrease in 2014) *See appendices 19 and 20.
9.	Ezinihite	0	0%	
10.	Onuimo	3	2.41%	
11.	Orlu	34	27.41%	
12.	Orsu	11	8.87%	
13.	Obowo	0	0%	
14.	Ihiteuboma	1	0.806%	
15.	Ikeduru	4	3.22%	
16.	Mbaitoli	11	8.87%	
17.	Njaba	12	9.67%	
18.	Oru East	4	3.22%	
19.	Oru West	1	0.806%	
20.	Oguta	4	3.22%	
21.	Isiala Mbano	2	1.61%	
22.	Ehime Mbano	1	0.806%	

IMSUTH ORLU PTB PATIENTS in LGAS JAN-DEC 2013.

S/N	Local Government Area	Frequency	Percentage occurrence	
1.	Ideato North	0	0%	
2.	Ideato South	7	12.08%	
3.	Owerri municipal	0	0%	Total PTB positive patients in 2013 = 58 (8.8%) Total patients screened for PTB in 2013 = 659 Total number of TB-HIV co-infection = 23(39.7%)
4.	Owerri North	0	0%	
5.	Owerri West	0	0%	Males: 39 (67.2%) Females:19(32.8%) *See appendices 21 and 22.
6.	Nwangelle	0	0%	
7.	Ahiazu	0	0%	
8.	Aboh	0	0%	
9.	Ezinihite	0	0%	
10.	Onuimo	0	0%	
11.	Orlu	29	50.0%	
12.	Orsu	6	10.35%	
13.	Obowo	0	0%	
14.	Ihiteuboma	0	0%	
15.	Ikeduru	1	1.72%	
16.	Mbaitoli	2	3.50%	
17.	Njaba	3	5.17%	
18.	Oru East	3	5.17%	
19.	Oru West	1	1.72%	
20.	Oguta	1	1.72%	
21.	Isiala Mbano	3	5.17%	
22.	Ehime Mbano	0	0%	
23.	Nkwerre	1	1.72%	
24.	Ngookpala	0	0%	
25.	Isu	1	1.72%	
26.	Ohaji Egbema	0	0%	
27.	Okigwe	0	0%	

IMSUTH ORLU PTB PATIENTS in LGAS JAN-DEC2014

S/N	Local Government Area	Frequency	Percentage occurrence	

1.	Ideato North	3	5.77%	
2.	Ideato South	1	1.92%	
3.	Owerri municipal	0	0%	Males: 37 (71.2%) Females: 15 (28.8%) (1.2% decrease from 2014) *See appendices 22 and 23.
4.	Owerri North	0	0%	
5.	Owerri West	2	3.85%	
6.	Nwangelle	1	1.92%	
7.	Ahiazu	0	0%	Total PTB patients in 2014 = 52 (7.6%) Total patients screened for PTB in 2014 = 680 Total number of TB-HIVco-infection = 26 (50%)
8.	Aboh	0	0%	
9.	Ezinihite	0	0%	
10.	Onuimo	0	0%	
11.	Orlu	19	36.54%	
12.	Orsu	7	13.50%	
13.	Obowo	0	0%	
14.	Ihiteuboma	0	0%	
15.	Ikeduru	1	1.92%	
16.	Mbaitoli	1	1.92%	
17.	Njaba	4	7.69%	
18.	Oru East	1	1.92%	
19.	Oru West	0	0%	
20.	Oguta	2	3.85%	
21.	Isiala Mbano	1	1.92%	
22.	Ehime Mbano	1	1.92%	
23.	Nkwerre	3	5.77%	
24.	Ngookpala	1	1.92%	
25.	Isu	4	7.69%	
26.	Ohaji Egbema	0	0%	
27.	Okigwe	0	0%	

Discussion:

Epidemiological survey of TB and HIV in Abia, Anambra and Imo States showed varied percentages of prevalence indicating various levels of successes recorded by the implementation of TB and HIV interventions and also where intervention implementation should be reviewed through the assessment of the level of impact on the population under study [14].

Epidemiology has been a wonderful tool that can be used to study the type and history of the health of the population for example, the types of problems that affect the society and humanity over time.

You would see that there are certain infectious diseases that predominate this time for example Tuberculosis and human Immunodeficiency Virus (HIV). Epidemiology can be used to diagnose the health of the community by trying to make a picture of the characteristics of the community with respect to its demographic makeup in terms of particular health problem that exist in the community and from the information derived can be used to propose specific plans and programs to intervene in order to optimize the health of the community having determined the cause of factors leading to the disease occurrence and spread [15].

Therefore, Epidemiology is the basic science of public health, because it is the science that describes the relationship of health or disease with other health related factors in human populations. For instance, in this study, the epidemiological study of Tuberculosis (TB) and Human Immunodeficiency Virus (HIV) in the 3 states of the southeast under review which are Abia, Anambra and Imo states reveals some major and strategic information that can be used to propose specific plans and programs that will bring about interventions that will optimize the health of the community.

Worldwide, HIV is one of the most serious health and development challenges. The first case was reported in 1981 and today, there are approximately 36.9 million people currently living with HIV and tens of millions of people have died of AIDS related causes since the beginning of the epidemic. While new cases have been

reported in all regions of the world, approximately 70% are in sub-Saharan Africa [16]

Now looking at the results here for instance, in Anambra state, two tertiary hospitals selected were St. Charles Borromeo Specialist Hospital Onitsha and Nnamdi Azikiwe University Teaching Hospital Nnewi (NAUTH). In Abia state two tertiary hospitals selected were Federal Medical Centre (FMC) Umuahia and Abia State University Teaching Hospital (ABSUTH) Aba. While in Imo State the tertiary hospital selected were Federal Medical Centre (FMC) Owerri and Imo State University Teaching Hospital (IMSUTH) Orlu.

In these six hospitals, epidemiological data of pulmonary tuberculosis (PTB) and Human Immunodeficiency Virus (HIV) cases from January 2013 to December 2014 were collected and analyzed at state levels and were possible with the information gathered were analyzed down to Local government Areas (LGAs).

However, in St. Charles Borromeo Hospital in 2013, out of 23,095 patients screened for HIV, 643 representing 2.78% was HIV positive. 161 representing 33% of the HIV positive patients were males while 482 representing 67% of the positive patients were females. This is consistent with the previous studies (UNAIDS 2015). Previous studies however stated that women represent approximately half (51%) of all adults living with HIV and accounts for 63% of young people living with HIV (WHO Global tuberculosis report and Global HIV/AIDS epidemic 2014). People within the age range of 18 – 47 were most affected by HIV [17].

Down to Local Government Areas, it was observed that Idemili North LGA was most affected having 355 HIV positive patients representing 39.7% of all the HIV positive patients in the hospital followed by Onitsha North LGA with 118 representing 18.35% and Ogbaru with 116 representing 18.04% respectively.

In Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi still in Anambra state, out of 9,196 patients screened for HIV, 1482 patients representing 16.1% was HIV positive. 40.2% (596) of the HIV positive patients were males while 59.8% (850) were females.

Also, the age range of 18-47were found to be most affected and this is consistent with the previous studies (The Global HIV/AIDS Epidemic 2015).

So, pulling together the HIV data of St Charles Borromeo Specialist Hospital Onitsha and Nnamdi Azikiwe University Teaching Hospital Nnewi, a total of 2,125 representing 6.58% out of 32,291 patients screened for HIV were positive. 757 representing 35.6% were males while 1,368 representing 64.4% were females. This is consistent with the previous studies and the reason could be due to gender inequalities, differential access to service, sexual violence increases and women being biologically more susceptible to HIV [18]

In 2014, 456 patients out of 34,865 patients screened for HIV in St. Charles Borromeo Specialist Hospital Onitsha representing 1.3% were HIV positive. 198 representing 43.4% of the HIV positive patients were males while 258 representing 56.6% of the HIV positive patients were females. This shows that females were more affected than males and age ranges of 18-47 were most affected showing that those in reproductive ages are mostly at risk of contracting HIV. These are consistent with the previous studies as stated earlier and reasons are same as above. At the local government level, it was observed that Idemili North again had 171 HIV patients representing 37.5% of the overall HIV positive patients while Ogbaru, Onitsha North and Onitsha South had 77 (16.9%), 72 (15.8%) and 63 (13.82%) respectively among others. Besides, when the result of 2013 of St. Charles Borromeo Specialist hospital was compared to that of 2014, it was observed that the number of patients infected with HIV in 2014 decreased from 643 in 2013 to 456 in 2014 representing 1.48% decrease. This is consistent with the recent UNAIDS study which observed that the number of people newly infected with and the number of AIDS-related deaths have declined. This is attributed to the fact that there are new global efforts that have been mounted to address the epidemic particularly in the last decade and again the number of people with HIV receiving treatment with anti-retroviral drugs has increased to 15 million as of March 2015 showing a 1.4 million increase since June 2014 [19].

Recent research has shown that HIV treatment to people with HIV significantly reduces the risk of transmission to their negative partners. The reduction is also attributed to a more effective prevention strategies going on including behavior change programs, condom use, HIV testing, blood supply safety, harm reduction efforts for injecting drug users and male circumcision.

In Nnamdi Azikiwe University Teaching Hospital Nnewi, a total of 1,167 patients out of 7,578 patients screened for HIV in 2014 were HIV positive representing 15.4%. 467 representing 40% were males while 700 representing 60% were females. When 2013 result was compared to 2014, the numbers of HIV positive patients dropped from 1,482 to 1,167 representing 0.7% decrease, the reasons are as stated above.

Pooling the 2014 results of St. Charles Borromeo Specialist Hospital Onitsha and Nnamdi Azikiwe University Teaching Hospital Nnewi together, it showed a total of 1623 HI V positive patients out of 42,443 patients screened which represents 3.82%. 665 out of 1623 HIV positive patients representing 41% were males while 958 representing 59% were females. The result shows that females are affected more than males and also both prevalence and incidence of HIV declined from 2013 to 2014 in Anambra State.

In FMC Umuahia in 2013, a total of 385 out of 4,350 patients screened from January to December were HIV positive representing 8.85%. 175 HIV positive patients

out of 385 HIV patients were males representing 45.5% while 210 representing 54.5% were females with the age range of 18-47 being mostly affected.
This shows that females are most affected and also those in their productive years.
In Abia State University Teaching Hospital (ABSUTH) Aba, a total of 112 patients out of 1195 patients screened for HIV representing 9.4% were HIV positive. 38 out of 112 HIV positive patients representing 33.9% were males while 74 representing 66.1% were females with age range of 18-47 years being most affected. It shows once more that females were most affected and individuals at their reproductive years were worst hit.

In 2014 in FMC Umuahia, a total of 3,727 patients were screened for HIV and 305 patients out of which representing 8.2% were HIV positive. 105 out of 305 representing 34.4% were males whereas 200 representing 65.6% were females. The age ranges of 18-47 year were most affected. When 2013 HIV positive result was however compared to 2014 HIV positive, the number dropped from 385 in 2013 to 305 in 2014 representing 0.65% decrease.
In ABSUTH in 2014, a total of 106 patients out of 1,151 screened for HIV were positive representing 9.2%. 48 patients out of 106 HIV positive patients representing 45.3% were males while 58 patients out of 106 HIV positive were females. When this result was compared with the 2013 result, the number of HIV positive patients dropped from 112 in 2013 to 106 in 2014 representing 0.2% decrease. When pooled together the 2013 epidemiological results of HIV cases in Abia State i.e. the FMC Umuahia and ABSUTH Aba, we then have 497 HIV positive patients out of 5,545 patients screened representing 8.96%. 213 out of 497 HIV positive patients representing 42.9% were males while 284 representing 57.1% were females. In the same vein, when 2014 epidemiological results of FMC Umuahia and ABSUTH Aba were pooled together, 411 patients out of 4,878 patients screened for HIV representing 8.42% were HIV positive and out of 411 HIV positive patients, 153 representing 37.2% were males while 258 representing 62.8% were females. Comparing the 2013 epidemiological result of HIV with that of 2014 in Abia State, it was observed that there was a drop in the number of HIV positive patients from 497 in 2013 to 411 in 2014 representing a 0.54% decrease. This is consistent with the previous studies as explained above.

In Imo State in Federal Medical Centre (FMC) Owerri in 2013, 127 patients out of a total of 15,696 patients screened for HIV representing 0.815% were HIV positive and 51 out of a total of 127 HIV positive were males while 76 HIV positive were females showing that females were most affected and mostly affected were within the age ranges of 18-47 years showing that individuals at their reproductive ages were mostly affected. Down to Local government Areas, 29 out of 127 positive individuals representing 22.84% were from Owerri West, 19 representing 14.96% were from Owerri North and 13 representing 10.24% were from Owerri Municipal LGAs among others.

In Imo State University Teaching Hospital (IMSUTH) Orlu, in 2013, 232 out of a total of 3,129 patients screened for HIV were positive representing 7.42%. 93 out of 232 HIV positive patients representing 40.1% were males while 139 were females representing 59.9%. Age ranges of 18-47 years were mostly affected.
In the Local Governments Areas, Orlu has 50 out of 232 positive patients representing 21.55%, Njaba has 38 representing 16.4%, Orsu has 28 representing 12.1%, Isu, Ideato North, Ideato South and Oru East have 16 (6.89%), 15 (6.47%) and 12 (5.17%) respectively among others.

In 2014 in FMC Owerri, 152(1.3%) out of a total 11, 538 patients screened for HIV were HIV positive out of which 51 representing 34% were males while 101 representing 66% were females showing females as being the mostly affected and the age ranges of 18 – 47 were mostly affected. Owerri West Local Government Area had the highest number 28 representing 18.42% out of the 152 HIV positive patients, followed by Owerri Municipal with 27 representing 17.8%, the next is Owerri North Local Government having 24 representing 15.79%. Mbaitoli and Ikeduru had 19 (12.5%) and 15 (9.87%) respectively among others.

Contrary to the trend of results above, when the results of 2013 and 2014 of FMC Owerri were compared, there was a slight increase of HIV positive patients screened in 2014 i.e. from 127 HIV positive patients in 2013 to 152 HIV positive patients in 2014 representing 0.5% increase.

This increase is not out of place because according to UNAIDS 2015 the increase can be attributed to continuing new infections, people living longer with HIV and general population growth. The UNAIDS study 2015 also said that there were 36.9 million people living with HIV in 2014 up from 29.8 million in 2001 and 2 million new infections in 2015 or about 5,600 new infection per day.

In 2014 in IMSUTH Orlu, 124 out of a total of 3,313 screened for HIV were HIV positive representing 3.7%. 43 out of 124 HIV positive patients were males representing 35% while 81 HIV positive patients were females representing 65%. This shows that females were mostly affected. Also, age ranges of 18-47 years were mostly affected. In terms of local government Areas, Orlu had 34 out of 124 HIV positive representing 27.41%, Njaba had 12 HIV positive individuals representing 9.67% while Mbaitoli and Isu had 11 (8.87%) and 10 (8.06%)

respectively among others.

Comparing IMSUTH Orlu 2013 result to 2014 showed that there was a significant drop from the number of HIV positive patients in 2013 from 232 to 124 in 2014 representing 3.75% decrease. Then pooling all the HIV epidemiological results of FMC Owerri and IMSUTH Orlu together in 2013 shows that 359 out of a total of 18,825 patients screened for HIV were HIV positive representing 1.91%. 144 out of 359 HIV positive patients were males representing 40.1% while 215 of them were females representing 59.9% in Imo State.

Also, pooling all the HIV epidemiological results of FMC Owerri and IMSUTH Orlu together in 2014 shows that 276 out of a total of 14851 patients screened for HIV were HIV positive representing 1.86%. 94 out of a total of 276 HIV positive patients were males representing 34.1% whereas 182 HIV positive patients representing 65.9% were females Then comparing the epidemiological HIV results of 2013 to 2014 in Imo state shows a slight decrease of the number of HIV positive patients from 2013 to 2014 representing 0.047% the reason is same as been explained above. Occupations most affected among HIV patients are Traders 38.33%, Artisans 25%, Students 10%, and Civil servants 8.33% among others. More so, 40.66% among HIV patients were married while 53.33% were not married as shown by the questionnaire.

HIV has led to a resurgence of tuberculosis (TB), particularly in Africa, and TB is a leading cause of death for people living with HIV [20]. Epidemiological analysis of pulmonary tuberculosis (PTB) in St. Charles Borromeo Specialist Hospital Onitsha in 2013 shows that 114 out of a total of 1023 patients investigated for TB were TB positive representing 11.1%. 68 TB positive patients out of a total of 114 TB patients representing 59.7% were males while 46 of them representing 40.3% were females. Down to the Local Government Areas, Idemili North LGA was affected much more than other LGAS having 52 TB positive patients out of the 114 representing 45.6% while Onitsha North and Onitsha South had equal number of 18 TB positive patients each representing 15.8% respectively among others.

In this hospital, however, 30 TB positive patients out of 114 TB positive patients representing 26.5% are co-infected with HIV. This analysis shows that males are more affected than females which mean that the male susceptibility to TB infection is higher than that of females and the most affected age group was between 18 and 47 years. This is consistent with the previous studies (Itah and Udofia 2005 and Nwachukwu et al 2009). The susceptibility of TB infection to males more than females was attributed to the fact that there may be under notification of females due to cultural and socio-economic factors leading to barriers in accessing health care [20].

It could also be due to the effect of sex steroid hormones on the immune response to infection as explained by Bouman et al (2005) whereby the interplay between the endocrine and the immune systems are widely documented in humans and animal models. For example, it has been reported that androgen deprivation due to the castration of male mice leads to an increase in the absolute number of T lymphocytes in the peripheral lymph nodes and an increase in the proliferation of the cells following antigen recognition. It could also be due to sex specific genetic architecture. Fortin et al (2007) reported that it is now widely accepted that host genetic factors play a major role in determining differential susceptibility to infection and disease outcome in humans. They said that most studies in the context of TB have investigated the role of specific candidate genes, chosen on the basis of the effects of their murine orthology on the response to experimental mycobacterium infections or the known biology of the disease. However, genetic variations in an increasing number of genes e.g., NRAMPI, HLA Class II, VDR, MAL/TIRAP, DC-SIGN, MCP-1, TLR8 has been found to be associated with complex susceptibility to pulmonary TB.

Again nutrition may also play a role in the susceptibility or resistance to M. Tuberculosis. Iron for instance, is a crucial component of several enzymes and redox systems in mycobacteria, as in all living organism. The extrusion of iron from the mycobacterial vacuole has long been recognized as an innate immune system mechanism, conserved throughout evolution, for host phagocyte control of various intracellular pathogens including mycobacterium [21]. Iron deficiency is common in women from developing and industrialized countries (Zimmermann and Hurrell 2007). But it remains unclear whether anemia is correlated with greater resistance to TB in humans.

However, experimental evidence from animals suggests that iron overload increases permissiveness to M. tuberculosis considerably, both in vivo and invitro [22].

In the same view, the epidemiological analysis of TB patients in Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi in 2013 reveals that 154 out of a total of 2,312 patients investigated for TB representing 6.7% were TB positive. 103 out of 154 TB positive representing 66.7% were males while 51 of them representing 33.1% were females. The age range of TB infected patients was between 18-47 years. It was observed that 55 out of the 154 TB positive patients were co-infected with HIV. Pooling the results of TB patients obtained from St. Charles Borromeo Specialist Hospital Onitsha and Nnamdi Azikiwe University Teaching Hospital Anambra together in 2013shows that Anambra State has a total of 268 patients infected with TB representing 8.04% out of 3,335 patients investigated for TB. It showed that 171 out

of 268 TB patients representing 63.8% were males whereas 97 of them representing 36.2% were females and the age range was still between 18-47 years. More so, out of 268 TB positive patients, 85 of them representing 31.7% were co-infected with HIV. The results are consistent with the previous studies as explained above.

In 2014 in St. Charles Borromeo Specialist Hospital Onitsha, the epidemiological data of TB was analyzed and showed that 107 out of 887 patients investigated for TB were TB positive representing 11.8%. Among the TB positive patients 74 representing 69.2% were males while 33 representing 30.8% were females. 20 TB positive patients were co-infected with HIV representing 19%. Idemili North LGA was most affected having 39 TB positive patients representing 36.45% followed by Ogbaru LGA with 20 TB patients representing 18.69%. Onitsha South and Onitsha North LGAS had 15 and 10 TB patients representing 14% and 9.34% respectively.

NAUTH Nnewi in the same 2014 on the TB epidemiological analysis showed that 2,026 patients were investigated for TB. 101 representing 4.9% were TB positive. 73 out of 101 representing 72.3% were males while 23 representing 27.7% were females. It was observed that there was a drop in the number of TB positive patients in NAUTH Nnewi from 154 in 2013 to 101 in 2014 representing 1.8 decreases. When the results of St. Charles Borromeo and NAUTH for 2014 were pooled together in Anambra State, it was observed that 208 representing 7.14% out of a total of 2,913 investigated for TB were TB positive. 147 out of 208 TB patients representing 70.7% were males while 101 representing 29.3% were females and 175 out 208 TB patients representing 36.05% were co-infected with HIV. Interestingly, the prevalence of PTB in Anambra State declined from 268 representing 8.04% in 2013 to 208 representing 7.14% in 2014 and the decrease was about 0.9%. This is consistent with the previous studies. According to Global tuberculosis report 2013, the rate of new TB cases has been falling worldwide for about a decade, achieving the MDG global target. TB incidence rates are also falling in all six WHO regions though the rate of decline 2% per year is slow.

In Federal Medical Centre Umuahia Abia State, the epidemiological data of TB analysed showed that in 2013, 53 patients out of a total of 1398 patients investigated were TB positive representing 3.79%. 38 out of the 53 positives were males representing 71.7% while 15 of them representing 28.3% were females. It was observed that 28 out of them representing 52.8% were co-infected with HIV. The age ranges of 18-47 were mostly affected. More so, the epidemiological data from Abia State University Teaching Hospital (ABSUTH) Aba Abia State in 2013 was analysed and the results showed that out of 1,043 patients investigated for TB, only 114 patients were TB positive representing 10.9%. 76 out of the 114 TB positive patients representing 66.7% were males whereas 38 representing 33.3% were females and 45 out of the 114 TB positive were co-infected with HIV representing 39.5%. Pooling the FMC Umuahia and ABSUTH Aba TB epidemiological results, it shows that in Abia State in 2013 167 out of a total number of 2,441 patients investigated for tuberculosis were TB positive representing 6.84%. A total of 114 TB positive patients were males representing 68.3% while 38 of them representing 31.7% were females. Then out of a total of 167 TB positive patients, 73 of them were co-infected with HIV representing 43.7%.

Then in 2014, the epidemiological data of TB in FMC Umuahia showed that 40 patients out of 1,374 patients investigated for TB were TB positive representing 2.9%. 28 out of the 40 positive TB patients were males representing 70% while 12 positive TB patients representing 30% were females and 23 out of the 40 TB patients were co-infected with HIV representing 57.5%. Comparing the FMC Umuahia of 2013 to that of 2014, it was observed that there was a drop of the number of positive TB patients from 53 (3.79%) in 2013 to 40 (2.9%) in 2014 reflecting 0.89% decline.

In ABSUTH Aba in 2014, the TB epidemiological data analysed showed that 94 out of 1,015 patients investigated for TB representing 9.26%. 64 out of 94 TB positive were males representing 68.1% while 30 of them representing 31.9% were females and 30 out of the 94 TB positive patients representing 31.9% patients were co-infected with HIV. The age ranges of 18-47 were mostly affected. Comparing the TB results of ABSUTH Aba of 2013 to that of 2014, it showed that the number of TB positive patients dropped from 114 in 2013 to 94 in 2014 representing a 1.6% decline.

Then, pooling the 2014 results of TB positive patients of FMC Umuahia and ABSUTH Aba, it showed that Abia state in 2014 had 134 TB positive patients out of 2,389 patients investigated for TB representing 5.61%. 92 TB positive patients representing 68.7% were males while 42 of them representing 31.3% were females and 53 TB positive representing 39.55% were co-infected with HIV. When the 2013 prevalence of TB in Abia State was compared to that of 2014 and a decline of 1.23% was observed which is consistent with the previous studies as explained earlier.

In FMC Owerri Imo state in 2013 the epidemiological data of TB was analysed. it showed that 290 patients out of a total of 2,382 patients investigated for TB were TB positive representing 12.18%. Out of the 290 PTB positive patients, 194 representing 66.9% were males while 96 representing 33.1% were females. Patients with the age ranges of 18 – 47 were mostly affected and 36 out of 290 TB positive patients were co-infected with HIV

representing 12.4%. In the Local government Areas, Mbaitoli LGA had 47 TB positive patients representing 16.2%, followed by Owerri west with 35 TB positive patients representing 12.1%. Owerri municipal, Owerri North, Ikeduru, Ohaji Egbema and Isu LGAs had 27 (9.31%), 26 (8.97%), 24 (8.3%), 21 (7.24%) and 19 (6.55%) respectively, among others.

Still in Imo State, the epidemiological data of TB in Imo State University Teaching Hospital (IMSUTH) Orlu was analysed and it showed that in 2013, 58 patients out of 659 patients investigated for TB were TB positive representing 8.8%. Out of the 58 TB positive patients, 39 of them were males representing 67.2% whereas 19 of them representing 32.8% were females. However, 23 out of the 58 positive patients were co-infected with HIV representing 39.7%. The results of the Local Government Areas showed that Orlu, Ideato South and Orsu had 29 (50%), 7 (12.08%) and 6 (10.35%) respectively among others. In 2014, the epidemiological data of PTB in FMC Owerri showed that out of a total of 2,525 patients investigated for TB, 155 patients were PTB positive representing 6.1%. Out of 155 PTB positive patients, 104 were males representing 67.1% while 51 of them representing 32.9% were females. The study showed that 31 PTB positive patients out of the 155 positive patients were co-infected with HIV representing 20%.

Coming to the Local Government Areas, it was observed that Owerri West LGA had the highest of PTB positive patients of 27 representing 17.42% followed by Mbaitoli LGA which had 26 representing 16.77%. Others were Owerri North having 24 representing 15.48%, Ohaji Egbema which had 16 representing 10.32% among others. Then comparing the results of FMC Owerri 2013 to 2014, it showed that the number of PTB positive dropped from 290 in 2013 to 155 in 2014 representing 6.1% decline.

More so, analyzing the PTB epidemiological data of IMSUTH Orlu in 2014 showed that out of 680 patients investigated for TB, 52 were TB positive representing 7.6%. 37 out of the 52 TB positive patients were males representing 71.2% while 13 of them were females representing 28.8%. Then 26 out of the 52 positive PTB patients were co-infected with HIV representing 50%. Comparing the results of 2013 to 2014, it showed that there was a decline in the number of PTB patients from 58 in 2013 to 52 in 2014 representing 1.2% decrease. Now, pooling all the results of TB together in 2013, that is FMC Owerri and IMSUTH Orlu PTB results, it then showed that in Imo state in 2013, 348 patients out of a total of 3,041 patients investigated for TB were TB positive representing 11.44% and out of the 348 PTB positive patients, 233 were males representing 67%, while 115 were females representing 33% and a total of 59 out of the 348 positive PTB patients were co-infected with HIV representing 16.95%. Comparing the results of 2014 together, that is results of PTB of FMC Owerri and IMSUTH Orlu showed that in Imo state in 2014, 207 patients out of a total of 3,205 patients investigated for TB were TB positive representing 6.46%. 141 patients out of 207 PTB positive patients were males representing 68.1% while 66 of them representing 31.9% were females and a total of 57 out of 207 positive PTB were co-infected with HIV representing 27.5%. Comparing the 2013 result with the 2014 result it showed that there was a decrease of the number of PTB positive patients from 348 in 2013 to 207 in 2014 representing 4.98% decline. It was also observed that the age ranges of 18-47 were mostly affected. Males were mostly infected with PTB more than females which is consistent with the previous studies as explained above [22].

However, the questionnaire revealed that the occupations most affected by TB were Traders 21.66%, Artisans 26.66%, Transporters 11.66%, and Farmers 18.33% among others. More so, it was discovered that 63.33% of TB positive patients were married while 36.66% were unmarried.

Histological study (sputum cytology) was done on the sputum specimens of the mycobacterium tuberculosis positive patients and also on the sputum specimens of normal (control) individuals to determine changes in the sputum cells dispositions and presentation that may indicate pulmonary tuberculosis. 36 out of 120 mycobacterium tuberculosis positive sputum specimens examined had epithelioid cells, Langhans type giant cells and uncharacteristic multinucleated giant cells in significant number (27%, 8%, and 17%) respectively. This is consistent with the previous studies [23].

Naseill et al 1972 stated that there is little to be found on sputum cytology in lung tuberculosis in the literature. Meanwhile, it has been disclosed that apart from pulmonary tuberculosis, other lung diseases such as chronic non-tuberculosis inflammatory lung disease and broncho genie carcinoma the number comparatively used to be very small. The presence of cells looking like epithelioid cells or Langhans type giant cells as well as border line Langhans types in sputum or bronchial secretions warrants a strong suspicion of pulmonary tuberculosis. As tuberculosis is often associated with necrosis and affection of the bronchial wall and or mucosa, it is comprehensible that epithelioid cells and Langhans cell would be found in sputum cytologic examination. Thus, it seems important to look carefully for these cell types in sputum/secretions as it would be of considerable importance in the differential diagnosis of various lung diseases, particularly of pulmonary tuberculosis and lung cancer using a simple test such as pulmonary cytology [24].

Besides, when sputum of normal (control) individuals were examined, there were neither epithelioid cells, Langhans type giant cells, uncharacteristic multinucleated giant cells nor border line Langhans types and bronchial secretions seen. This result when compared with that of the TB positive result informed that the patients were

actually having pulmonary tuberculosis. Besides, the chest radiography of the pulmonary tuberculosis patients showed opacity of the air ways and areas of cavitation's in bilateral parahilar location and diffuse nodular opacity in bilateral lung fields. Normal (control) cells showed fine granular cytoplasmic staining.

Conclusion

In the epidemiological survey of TB and HIV in Abia, Anambra and Imo States for instance the prevalence of HIV in Anambra State in 2013was 6.59% but in 2014 it declined to 3.82%. In Abia State, the prevalence of HIV in 2013 was 1.91% which declined to 1.86%. Arising from this research, the percentage decline per year per state was 2.77% in Anambra State, 0.54% in Abia State and 0.05% in Imo state. The analysis shows that there is decline in the prevalence rate but rather slow. Therefore, a more concerted effort should be made by all and sundry both government and individuals to step up interventions that will bring HIV spread to a halt in these states.

In another development, the prevalence of pulmonary tuberculosis (PTB) in the same three states Abia, Anambra and Imo States was studied and the findings are as follows: the prevalence of PTB in Anambra State in 2013 was 8.04% and declined to 7.14% in 2014.

In Abia State, the prevalence of PTB was 6.84% in 2013 and 5.61% in 2014. In Imo state, the prevalence of PTB was 11.44% in 2013 and 6.46% in 2014. The rate of decline per year in each state was 0.9% in Anambra State, 1.23% in Abia State and 4.98% in Imo State.

Generally, the rate of decline is also low. However, it was also observed that the TB-HIV co-infected patients in the three states were significantly high with minimal or no reduction at all in the subsequent year for instances the prevalence rate of TB-HIV co-infection in Anambra State in 2013 was 31.7% which increased to 36.05% in 2014. In Abia State, the TB-HIV co-infection in 2013 was 43.7% and 39.55% in 2014. In Imo State it was 16.95% in 2013 and 27.5% in 2014. This shows that there is a high burden of HIV in TB patients

It is therefore very imperative to reduce the burden of HIV in TB patients and the main interventions is HIV testing and provision of ART and cotrimoxazole preventive therapy to those found to be HIV positive. Again, effort should be made to also reduce TB among people living with HIV and the interventions should be regular screening for TB among people in HIV care and provision of Isoniazid preventive therapy to those without active TB who meet eligibility criteria. Based on the results obtained from the analysis of the epidemiological data of HIV and TB in this research as made available by the selected tertiary health institutions in the population under study, the prevalence of HIV was higher in Abia State both in 2013 and 2014 followed by Anambra State and then Imo state.

More so, the prevalence of TB was higher in Imo state in 2013 followed by Anambra State and then Abia State whereas in 2014, the prevalence of TB was higher in Anambra State followed by Imo state and then Abia State. Traders, Artisans, Civil servants, students, Farmers and transporters are among the population at risk of HIV and TB in Abia, Anammbra and Imo States.

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