

## A RETROSPECTIVE STUDY ON THE MORTALITY RATE OF HUMAN IMMUNODEFICIENCY VIRUS (HIV) AND PULMONARY TUBERCULOSIS (PTB) CO-INFECTED INDIVIDUALS IN NASARAWA STATE, NIGERIA

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### ABSTRACT

Tuberculosis (TB) co-infection with HIV is becoming a global emergency especially in the sub-Saharan Africa. Its diagnosis is notoriously challenging in countries with poor resource settings with limited diagnostic facilities. The purpose of this study is to investigate the mortality rate of HIV/TB co-infection among the seropositive HIV individuals in Nasarawa state, Nigeria. A five year retrospective study from January 2007 to December 2011 was carried out using profiles of seropositive HIV individuals. A total of 3,470 case records of subjects were retrieved and pre-designed case record forms (CRF) were used to record vital information in demographic data, social and medical history, laboratory results, treatment access and mortality data. 841 (24.2%) individuals had HIV/TB co-infection. The age group 20-29 years had the highest prevalence rate (30.3%) with HIV/TB co-infection while females had higher prevalence rate (56.7%) throughout the five year period of study. Individuals with formal education had the least prevalence rate (21.9%) in all the years under review except in 2009 (35.9%) while individuals “not educated” had the highest prevalence rate (41.1%) except in 2010 (36.0%). The married individuals had the highest prevalence rate (46.0%) followed by the single adults (26.0%). The unemployed individuals had the higher prevalence rate (52.6%) in four years while the employed rated 50.3% in 2009. There was a rise in the number of individuals who had access to ATTB treatment from 2009-2011, while there was a decline in the number of individuals who had access to ART treatment from 2007-2011. Females had higher mortality rate (54.5%) from 2008-2011 while the mortality rate of males in 2007 was 50.5%. Women were greatly affected by HIV/TB co-infection as a result of poor socio-economic status. There was no significant difference ( $P>0.05$ ) for all demographic indices except for educational status ( $p<0.05$ ). Greater intervention programs and services should be provided especially for women.

**KEY WORD.** Pulmonary, Tuberculosis, Antiretroviral, Treatment, Socio-economical.

### INTRODUCTION.

Tuberculosis (TB) is the commonest opportunistic infection in people living with Human Immunodeficiency Virus (HIV) worldwide but commonly in developing countries (Pape, 2004); it is the most common cause of death in HIV-positive adults living in developing countries, despite being a preventable and treatable disease (Corbett, 2003). TB and HIV have been closely linked since the emergence of Acquired Immunodeficiency Syndrome (AIDS), (Raviglione et al, 2000). About 22% to 65% of people living with HIV/AIDS have tuberculosis of any organ and tuberculosis accounts for about 13% of all HIV related death worldwide (Arora, 2000). While tuberculosis prevalence has declined by more than 20% worldwide, the rates in Africa have tripled since 1990 in countries with high HIV prevalence and are still rising across the continent at 3 – 4% per year (WHO, 2005). These diseases are among the ten leading causes of death in Nigeria and indeed Africa (WHO, 2008); Nigeria currently ranking fourth among the 22 high burden countries in the world and second in Africa where approximately eleven million people worldwide are now co-infected with HIV-TB (Sharma et al, 2005; Corbett et al, 2003). The Social stigma associated with TB further compounded the problem; between 1998 and 1999, a 20% increase of tuberculosis cases was reported in countries severely affected by HIV/AIDS in Africa (Hino et al, 2005). The economic impact of this pathogenic synergy is particularly great because HIV disproportionately affects persons during the most productive years of their lives.

### MATERIALS AND METHODS.

#### STUDY AREA

Nasarawa State was created from the current Plateau State on October 1, 1996 with her state capital at Lafia. Nasarawa State is located at the centre of Nigeria with coordinates of 8°32'N and 8°18'E and has a land mass of 27117km<sup>2</sup> was Population number at the census of 2006 was 2,040,097. The state is made of three (3) senatorial

districts (South, North and West) with thirteen (13) Local Government Areas namely: Akwanga, Wamba, Nasarawa Eggon (Northern senatorial District), Lafia, Keana, Obi, Doma and Awe (Southern Senatorial District), and Keffi, Nasarawa, Kokona and Toto (Western senatorial District). The state shares boundary with five states and the Federal Capital Territory, to the North, with kaduan state, to the North-East, with Plateau state, to the North-west, with Abuja, to the South with Benue State, to the South-West; with Kogi State and to the South-East with Taraba State.

**STUDY POPULATION:** Individuals aged 10 to 59 years old and HIV seropositive attending Federal Medical Centre, Keffi, Nasarawa State, Nigeria.

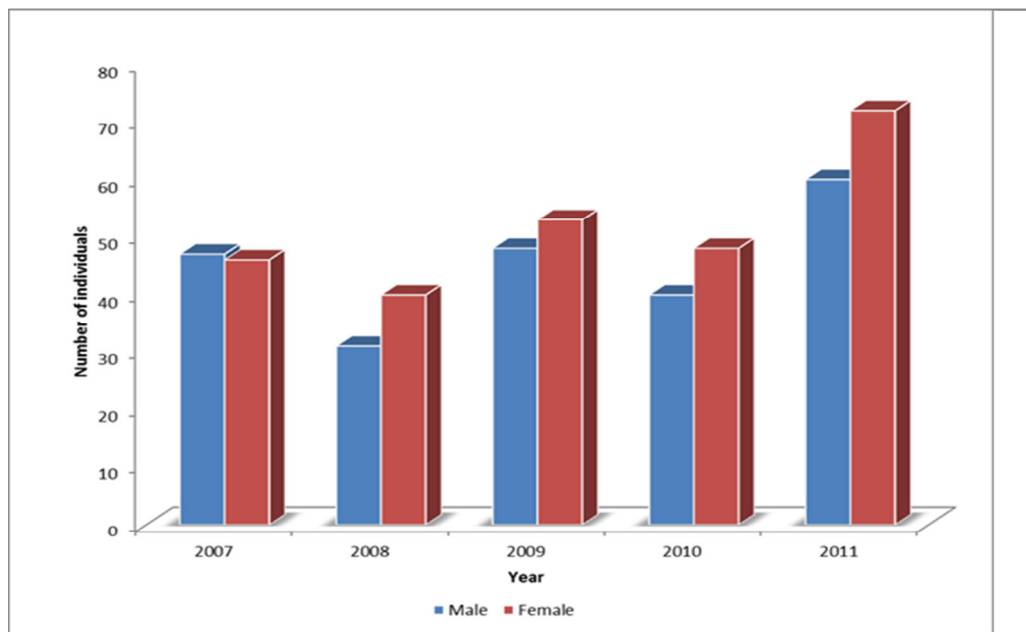
**STUDY DESIGN:** A five (5) year cohort retrospective study from January 2007 to December 2011 was carried out. The cohort facility based study was done at a tertiary healthcare centre. Federal Medical Centre, Keffi. Also, a six month prospective study from January to June 2012 was carried out.

**ETHICAL CONSIDERATION:** Ethical clearance (attached in appendix...) for the study was obtained from Nasarawa State Ministry of Health (SMOH) Lafia, and Federal Medical Centre (FMC) Keffi, Health Research Ethics Committee.

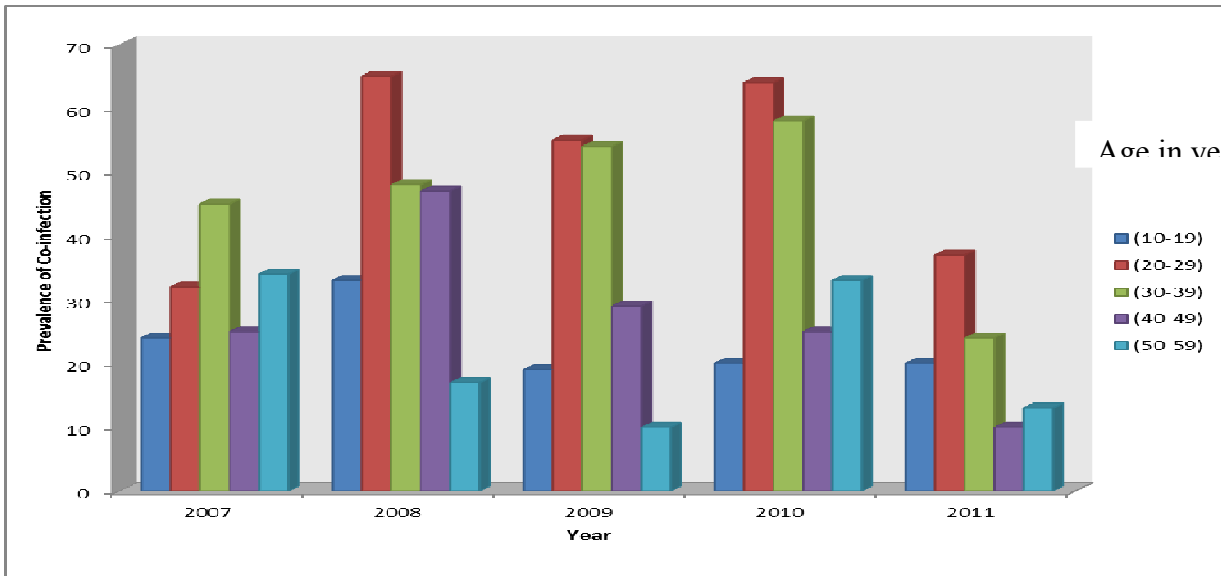
**DATA COLLECTION:** Random case records of subject were retrieved and pre-designed case form (CRF) were used to record vital information on demographic data/social and medical history, laboratory results including AFB, microscopy, and anti-retroviral therapy history. All information were treated with high confidentiality. For prospective study, sputum was obtained into labelled sterile from three hundred and fifty (350) diagnosed HIV patients attending FMC Keffi from January to June. As sputum was collected, demographic information (sex, age, occupation status) of each patient was recorded on designed forms.

**DATA ANALYSIS:** Data obtained were analysed using statistical software SPSS and EPI Info 3.5

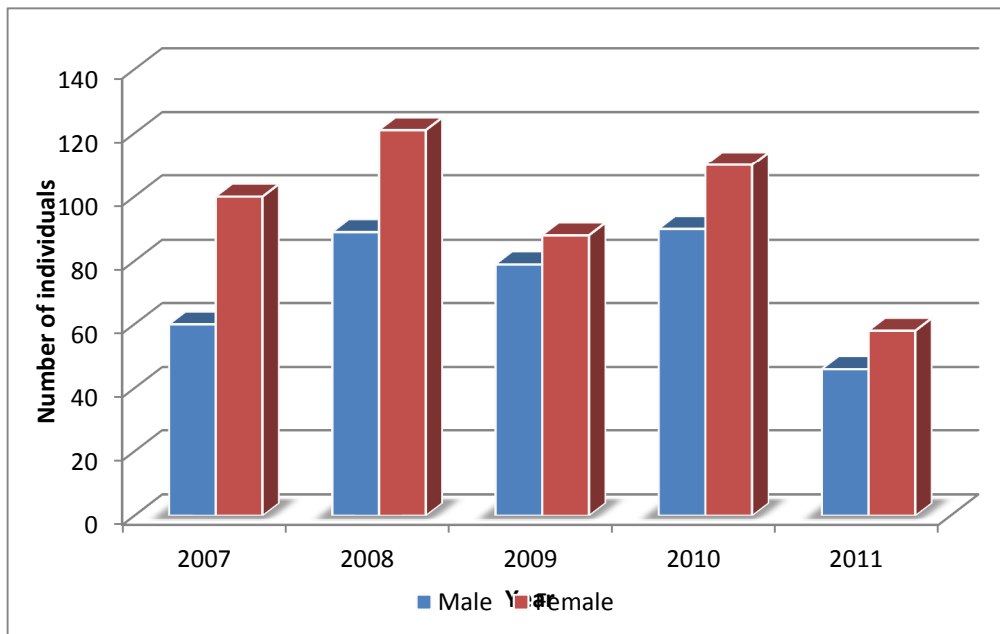
## Results



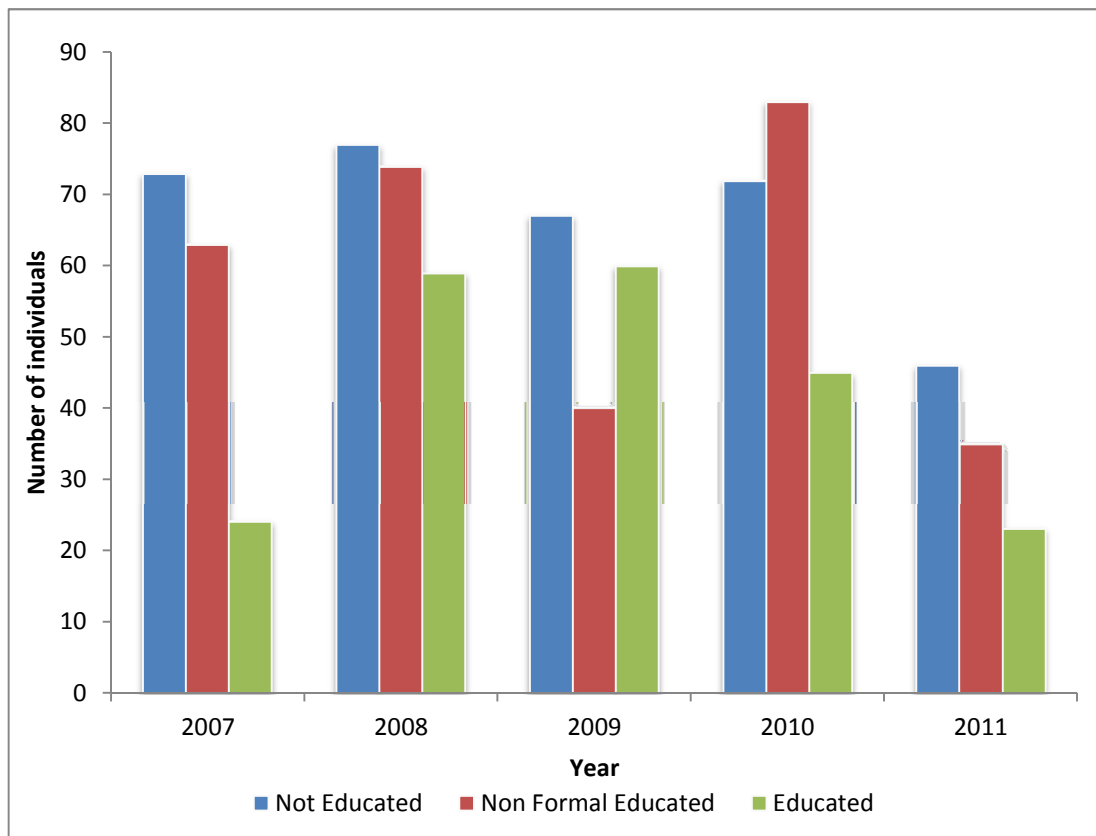
**Fig.1: Mortality rate of TB-HIV Co-infection distribution in Nasarawa State, from 2007 to 2011.**



**Fig.2: Age Distribution of individuals with HIV/TB co-infection in Nasarawa State, from 2007 to 2011**



**FIGURE 3: Sex Distribution of individuals with HIV/TB co-infection in Nasarawa State from 2007 to 2011.**



**FIGURE 4: Educational status of individuals with HIV/TB Co-infection in Nasarawa State from 2007 to 2011.**

**DISCUSSION:** Out of the 3,470 recorded cases of seropositive HIV individuals during the period of study (January, 2007 to December, 2011), it was observed that the highest prevalence rate of HIV infection; 22.7% (786) was in 2011 and the least prevalence rate; 18.3% (634) was in 2008 with p value of 0.220, which indicate no statistical; difference ( $p > 0.05$ ). This agrees with studies conducted by Mario et al, 2010 in Kenya and Onubogu et al 2010 in Lagos. Many reports showed that HIV infection was on the increase as there are new cases everyday despite the intervention being provided by WHO and do nor agencies for the fight against HIV/AIDS. Possible factors attributing to the decline in 2008 might be social stigmatization, forcing individuals to hide. The rise in 2011 might be attributed to health seeking behavior as a result of awareness. With more information and knowledge, it makes individuals to seek health.

The age distribution of HIV/TB co-infection in the study showed that most cases occurred among sexually active, productive/childbearing persons aged 20-30 years (25.3%) across the studied years with p value of 0.325, which indicate no statistical; difference ( $p > 0.05$ ). This agreed with Singhal et al, Zoll and Okonko et al, 2012 in Abeokuta. Individuals in this age group were more vulnerable to TB infection and comprised of young adults with peer pressure and adolescence. Females had higher prevalence rate in the sex distribution of HIV/TB co-infection throughout the period of study with a mean of 56.7%. This was similar to studies of Nwobu et al, 2004 in Edo and Onubogu et al, 2010 in Lagos but Contracts Taura et al, 2008 in Kano and Maori, 2012 in Gombe the difference in co-infection rate in males and females could be as a result of early exposure of females to sexual activity due to bad economic situations, high susceptibility to infection (Umeh et al, 2007), delay (i) care seeking due to stigma association with HIV infection, less access to fund for transportation and personal health care (Nsubuga et al, 2002). One third (33%) of married women in Nigeria are in polygamous union (NACA, 2011) and health seeking behavior attributing to its higher prevalence. (Uzoma *et al*, 2009). The education status of individual with HIV/TB co-infection showed that the individuals not educated had the highest prevalence rate in four years of the five years study; 2007 (45.6%), 2008 (36.7%), 2009 (40.1%) and 2011 (44.2%) with p value of 0.012, which indicate statistical; difference ( $p < 0.05$ ). Individuals who were educated had the least prevalence rate 34.8% across the five years study. This agreed with NACA, 2011 and Yitayih et al, 2012 in North West Ethiopia. Formal educated is power and the best vaccine to HIV/TB co-infection. Two thirds of the 110 millions

of children no in school are girls of the world's 875 million illiterate adults; two thirds are women who have the highest prevalence rate in HIV/TB co-infection (NACA, 2011).

While HIV is the most powerful risk factor for the progression of TB infection to TB disease (Yusuph et al, 2005 and Van Altena et al, 2007), it has been noted that HIV individuals are highly vulnerable to TB infection because of their immune suppressed system and the latter has become their number one killer (science Daily, 2009). Drug resistance, inadequate drug, lack of drug adherence is some causes of treatment failure (Vibrova et al, 2007). Men though are decision makers, have economic empower, have access to health programs and services, and are more educated, still died for lack of trust and acceptance.

The epidemiological trend of individuals with HIV/TB co-infection showed an undulating movement of polygon expression. This agreed with studies of Mahmood, 2010 in Banladesh, Onubogu *et al*, 2010 in Lagos and Okonko *et al*, 2012 in Abeokuta. The rise might be contributed to health seeking behavior as a result of health intervention programs, crisis discordant population and poor feeding habits because of poverty. The decline might be attributed to slackened health intervention programs. Female individuals had the higher prevalence of mortality rate from 2008 to 2011 (54.4%). This agreed with the studies of Zwang *et al*, 2007. Despite the fact that cure for TB has been discovered over five decades ago and much health intervention programmes on HIV/AIDS, HIV/TB co-infection and positive response of patients to standard short course chemotherapy, individuals in Nigeria and Africa still died of HIV/TB co-infection (Global Health, 2010). Factors attributing to women showing high mortality rate might be their lack of economic power, their vulnerability, their abuse, poor feeding habits, polygamous marital union, their barrier to accessing HIV/TB co-infection health intervention programs and services, household care-givers, etc (NACA, 2011).

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## CONCLUSION

From the study it was observed that HIV infection was in increase despite health programs and services to fight the infection. The pulmonary tuberculosis epidemic was a challenge to control and because of its synergy with HIV epidemic, created enormous problems that needed to be tackled with precision and collaboration. Overall, female individuals suffered more from the HIV/TB co-infection and poverty and illiteracy levels contributed to the high burden of HIV/Tb co-infection.

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