CASE STUDY

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DISCOVERY

Assessment of tuberculosis prevalence in Enugu State – A 5-year case study (2014 – 2018)

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ABSTRACT

Tuberculosis (TB) remains a major global public health problem, as it is an infectious disease and a leading cause of death globally. The issue of missing TB cases has attracted so much attention globally; the same is the case in Enugu state as the primary drivers of TB transmission vary considerably from Local government to another. Community sensitization led to increasing in presumptive tested for TB (from 10230 in 2014 to 13260 in 2018). To ascertain Tuberculosis prevalence in Enugu state using5-year data. This current retrospective study was conducted on patients' record who reported at the TB directly observed treatment short course (DOTS) clinic from 2014 to 2018 in Enugu state. The study population consists of all documented data found in the TB Presumptive

and Treatment registers within the study duration. Data collected were subjected to statistical analysis, using One-way ANOVA and descriptive statistics. A total of 51,292 presumptive were tested for TB within the year under review, out of which 6371 were diagnosed bacteriologically to have TB, hence, a prevalence of 12%. Bacteriologically diagnosed cases of 98% (6250) were linked to treatment within the year 2014-2018. Statistical analysis revealed that generally across the period, male patients had a higher prevalence than the female patients. The treatment success rate (TSR) has gradually increased from 2014 to 2018 as TSR for 2014 was 79%, 2015 was 80%, 2016 was 81%, while 2017 and 2018 had 80% respectively. The number of presumptive cases increases yearly as a result of intervention going on in the state. A need for stakeholders to intensify the campaign in rural and urban areas to enhance community awareness will go a long way in reducing the burden of TB.

Keywords: Primary drivers, Presumptive, Directly Observed Treatment Short course clinic, bacteriologically, Community sensitization, intervention, Prevalence, Tuberculosis.

1. INTRODUCTION

Tuberculosis is the most infectious, contagious and single bacterial leading, killer disease in the world today caused by *Mycobacterium tuberculosis*. According to [11], it has been categorized as paediatric-TB in children (<10 years) or pulmonary tuberculosis (PTB) caused 84% of the fatalities reported while Extra Pulmonary Tuberculosis (EPTB) 16%. It is opportunistic in immunocompromised and suppressed patients. Sadly, high prevalence rate have been recorded in low socio-economic locations, overcrowding, and some other research have also identified in patient co-infected with HIV. Africa and Indeed Nigeria have been associated with a record high disease burden with states like Lagos, Kano and Oyo states with a huge population density. Nigeria has been reported to have 10.4 million incident and about 4% multi drug-related cases [12]. Sub-Sahara nations occupies a top spot in Africa, having a burden of 460,000 cases reported annually [7]. According to Sani, Garba, Oyeleke and Abalaka [13] the tubercule produce lesion rich in mycolylarabinogalactan, lipoarabinomannan, and mycolic acids. Although the pharmacological and antimicrobial therapiesare yet to be fully elucidated. Treatment and management strategies have recorded an improved level of success in recent times. According to WHO, (2014) 9.0 million new cases of tuberculosis globally, with continents like Asia (55%) and Africa (28.9%) and have accounted for 1.5 million deaths in 2013 alone and Over 4,105 deaths daily. It is widely reported that the co-infections by this causative agent have mortality and fatality cases. Failure of the health care facilities and poor diagnosis and detection have worsened the trend, use of better molecular and modern genomic tools have been identified to produce rapid detection [7]. In a related study Nwanta *et al.,* [10] reported 37.9% prevalence in MTB in Enugu State while [7] reported a prevalence of 24.8% with Efik tribe having the highest prevalence rate.

This discrepancy in the reports with those reported in other states could be attributed to the failure of the health management system in Enugu State. Here Uzochukwu *et al.* [15] had opined that

'*Health sector was ineffective, inefficient and inequitable in Enugu State prior to the onset of the new democratic government in 1999, as was also the case in other parts of Nigeria. The Enugu state healthcare system was centralized with minimal local or community level input into decision-making processes. The referral system was poor or non-existent in some cases, and the number of skilled staff was highly inadequate, resulting in inefficient service provision. Health infrastructure, especially in the Primary Healthcare centres, was in a state of neglect and dilapidation. This meant that those in more remote locations, especially the poor, had to travel long distances to access good quality healthcare services, thus increasing costs of healthcare. Hence, there was both financial and geographical inaccessibility of healthcare to most citizens, especially the poor that reside in these remote areas*'.

2. METHODOLOGY

A retrospective studywas employedin the determination of the prevalence of TB among patients attending directly observed treatment short (DOTS) course clinic from 2014 to 2018 in Enugu state. The study population consisted of all documented data found in the TB Presumptive and Treatment registers within the period of the study. The information used in the studywasextracted from registers using summary and biodata forms. Data collected were subjected to statistical analysis, using One-way ANOVA and descriptive statistics.

3. RESULT

Fifty one thousand two hundred and two(51,292) presumptive cases were tested out of which 6371 cases were diagnosed to have TB; hence, the prevalence rate for TB from the year 2014-2018 is 12%. In 2014, presumptive cases tested were 10230 patients, out of

which 1083 (11% prevalence rate) were bacteriologically confirmed. In 2015, 7136 presumptive cases were tested while 1129 (16% prevalence rate) were confirmed bacteriologically. In 2016, 9027 cases were tested while 1349 (15% prevalence rate) cases were bacteriologically confirmed. In 2017 and 2018, a total of 11639 and 13260 cases were tested, 1536 and 1274 cases were confirmed bacteriologically hence a prevalence rate of 13% and 10% respectively (Table1).

Table 1 Presumptive cases of TB identified

Year	2014	2015	2016	2017	2018	Total
Total Presumptive Tested	10230	7136	9027	11639	13260	51292
Bacteriologically confirmed	1083	1129	1349	1536	1274	6371
% Non-bacteriologically confirmed	89	84	85	87	90	88
% Prevalence rate	11	16	15	13	10	12%

The result presented in Table 2 shows the sample population of 8124 (55% male and 45% female) TB cases were placed on treatment from the year 2014-2018. In the year 2014 and 2015, there was a slight decrease (from 1542 cases to 1515 cases) in the number of cases. The year 2015 and 2016 experienced a steady increase (1515 and 1711 respectively), this peaked in the year 2017 with 1733 number of cases, this increase began to plunge down in the year 2018 with 1623 number of cases. Statistical analysis revealed that generally across the duration, male patients had the highest prevalence, unlike the female patients. Table 2 also shows a gradual rise in reported cases from ages 0-4 (1%), 5-14 (3%), 15-24 (11%) and 25-34 (21%). This rise in the number of cases peaked at ages 35-34 at 22%. After which it began to show a gradual decrease from ages 45-54, 55-64, and ≥65 with at percentages 17%, 13% and 12% respectively.

Table 2 The Number of Cases Treated Disaggregated by Age

Year	Gender	0-4	5-14	15–24	25–34	35–44	45–54	55–64	≥ 65	Total
2014	Male	7	22	80	166	219	192	98	77	861
	Female	9	18	96	173	143	116	75	51	681
2015	Male	5	22	78	162	181	156	134	92	830
	Female	9	22	85	162	129	116	98	64	685
2016	Male	7	16	87	217	207	158	131	146	969
	Female	4	23	106	178	143	122	81	85	742
2017	Male	11	29	78	185	242	172	121	119	957
	Female	9	26	109	158	145	115	124	90	776
2018	Male	4	25	82	179	208	161	102	130	891
	Female	11	22	100	157	147	110	100	85	732
Total		76	225	901	1737	1763	1418	1064	939	8124

NB: Statistical analysis using Two-way ANOVA on Microsoft excel was employed In the Interpretation of the data. p-value< 0.05 was employed In the Interpretation of the data. A-Age; G-Gender.

The average number of TB cases placed on treatment within the years under review is 1625. Bacteriologically diagnosed Pulmonary tuberculosis New Cases are 71%, Clinically diagnosed Pulmonary tuberculosis New cases 16%, Extra-Pulmonary tuberculosis Cases 6%, bacteriologically diagnosed Pulmonary tuberculosis retreatment cases 6% and Clinically diagnosed Pulmonary tuberculosis retreatment cases 2%. The difference in presumptive (6390) and treatment cases (6250) all bacteriologically diagnosed TB cases 2% (140) (Table 3).

Table 3 Number on Treatment By Case Definition

Year	BDPTBNC	CDPTBNC	EPTB	BDPTBRC	CDPTBRC
2014	958	355	90	92	47
2015	1063	259	100	77	16
2016	1302	233	80	81	15
2017	1282	211	82	125	33
2018	1168	218	110	102	25
Total	5773	1276	462	477	136
%	71%	16%	6%	6%	2%
The Difference in presumptive (6390) and treatment (6250) all bacteriologically diagnosed.					140 (2%)
Average cases on treatment annually					1625

Key: NBDPTB-Bacteriologically diagnosed Pulmonary tuberculosis New Cases; NCDPTB- Clinically diagnosed Pulmonary tuberculosis New cases; EPTB- Extra-Pulmonary tuberculosis Cases; BDPTBRC-bacteriologically diagnosed Pulmonary tuberculosis retreatment cases; CDPTBRC-Clinically diagnosed Pulmonary tuberculosis retreatment cases

4. DISCUSSION

Tuberculosis is a leading cause of death in the world today. These have sparked a level of research within the scientific community. In this study, 52040 presumptive cases were identified from the year 2014-2019, with a progressive increase from the year 2015 this agrees with Anih *et al.,* [1] and Dokubo *et al.,* [3] who suggest that Nigeria has the fourth highest annual number of TB cases among countries. Subbaraman *et al.,* (2019) reported that most presumptive pulmonary TB patients fail reach a health facility and access TB tests or individuals TB might be diagnosed empirically, This gap may reveal patient losses from use of suboptimal diagnostic tests.Most individuals who have negative sputum smears have conditions other than TB this agrees with the low number of 12% were diagnosed bacteriologically. The result obtained revealed that prevalence between 2015-2018 reduced from 15.53 % to 14.59%, 12.9% and 9.52% respectively. In a similar study, Sani *et al.* [14] reported a prevalence rate of over 25.5%. The result obtained in this study also agrees with the study of Islam *et al.,* [5]. Onyedum *et al.,* [12] in a related study reported 32% in Nigeria;the result was also in agreement with the report of [7] in whose report documented a prevalence 24.8% between 2005-2015 while it was 17.6% in Itu, L.G.A of Cross River state. Furthermore, Edike [4], reported a prevalence of 37.8% of maternal tuberculosis as of the major crises of the infection of patients, these corroborates the findings of this work and the reports of [7] that fluctuations in the number of cases reported for TB is strongly linked to the incidence of HIV. The fraction of the sampled population that remained unconfirmed bacteriologically represent a number of patients that presented symptoms obvious advanced stages of infections, fatalities of patients have been linked with the incidence of co-infection or as an opportunistic infection of immunosuppressed patients. Subbaraman *et al.* [14] identified the discrepancies in linking diagnosed patients prior to treatment registration is a major point for attention in TB programs as was 140(2%) patients lost in this study. Patients within the age of 35-44 years were the most frequent for treatment and retreatment in Enugu State from the data obtained between 2014-2015. This corroborates the report of [8] in a similar study conducted in Arba Minch, Southern-Ethiopia and reported the same age bracket had a high prevalence rate with patients within 31-40 years. The report of Mama *et al.* [8] suggested that female unmarried patients were red-alert patients. This study deferred from our report that the male patients had the highest number of patients that reported for treatment but agrees with Kooffreh *et al.,* [7] and Itah and Udofia, [6] that reported a higher prevalence in the male than female. The numbers of patients on retreatment are a clear indication of MDR-TB. In the year 2017 and 2018 had 125 and 102 patients. This trend is worrisome compared to other factors leading to a series ofchanges in the patient immunity and defence system. This corroborates with the finding of Islam *et al.* [5] whose report suggested that the trend in the MDR-TB could be an emerging cause of death of patients. Kooffreh *et al.,* [7] reported that the trend of MDR-TB, in Cameroun to be 79% which some these invasive strains have been reported in some parts of Cross River State, has reported that Efiks had a higher prevalence of the MDRTB.

5. CONCLUSION

Prevalence and treatment of TB-patients in Enugu State have taken a different turn between 2014-2015. There has been a decline in prevalence of TB in recent time as seen in the figure and tables presented in this work. The incidence of TB in 2017 and the

application of kits in the diagnosis and detection of the disease have also been in the decline of the prevalence. The number of presumptive cases reported in Enugusuggests the presence of other invasive bacterial and fungal agents in their air droplets. The cases of retreatment observed in 2017 and 2018 were higher with a decline in the prevalence within Enugu State. Routine assessment and of TB treatment strategies and management of cases and diseases, burden.

Recommendations

1. There is a need for the government to intensify the end-TB the campaigns in the rural and urban areas to enhance enlightenment of the public in both print and mass media.
2. Molecular and easy- to- use, cheap and readily available kits must be developed to assist a first contact-diagnosis and detection of TB- in patients in record time specially in rural communities.
3. Use of indigenous languages in mass media in the spread of messages to promote accessibility to treatment facilities and resources must be encouraged.

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