

## Original Article

# Outpatient Burden of Adult Respiratory Diseases in University of Ilorin Teaching Hospital, Nigeria

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### ABSTRACT

**Background:** Respiratory diseases constitute a significant cause of morbidity globally. There is limited information on the epidemiology of respiratory diseases in North Central Nigeria particularly with the changing trend in risk factors. **Aim:** This study aimed at evaluating the pattern and morbidity related to respiratory diseases among adult outpatients attending a chest clinic in a tertiary healthcare facility, especially with increasing environmental pollution and biomass exposure globally. **Patients And Methods:** This was a retrospective review of the case records of 338 newly referred patients seen in the chest clinic of the University of Ilorin Teaching Hospital (UITH) with respiratory illnesses over a 2-year period (January 2017–December 2018). **Results:** The mean age of the recruited patients was  $47.6 \pm 19.8$  years with a male to female ratio of 1.1:1. Microbiologically confirmed tuberculosis (30.2%), chronic obstructive pulmonary disease (COPD) (24.3%), and bronchial asthma (17.8%) were the commonest conditions managed in the clinic. Overall, noncommunicable respiratory diseases (61.2%) constituted a larger proportion of cases when compared to infective respiratory conditions. Almost 90% of the patients were never smokers. Systemic hypertension (15.1%) and human immunodeficiency virus infection (3.6%) were the commonest comorbid illnesses. **Conclusion:** Although tuberculosis constituted the most observed single condition, noncommunicable respiratory diseases predominated cumulatively among the new cases seen in the chest clinic of UITH, Ilorin. This raises the need for significant attention in terms of prevention and management of noncommunicable respiratory diseases, which appear to be on the uprising.

**KEYWORDS:** *Ilorin, Nigeria, outpatient, respiratory diseases*

## INTRODUCTION

Respiratory diseases constitute a significant cause of morbidity and mortality globally.<sup>[1]</sup> These conditions range from airway disease, lung infections, malignancies, interstitial diseases, pulmonary vascular diseases as well as pleural and sleep abnormalities.<sup>[1,2]</sup> Overall, approximately a sixth of the world's population suffers from acute or chronic respiratory conditions.<sup>[3,4]</sup> Also, respiratory illnesses make up a sixth of the thirty most common causes of mortality globally with chronic obstructive pulmonary disease (COPD) being the third and acute lower respiratory tract infections (LRTI) the fourth.<sup>[2]</sup> Furthermore, the impact of respiratory diseases accounts for over 10% of all disability-adjusted life

years, coming closely behind cardiovascular diseases including stroke.<sup>[5]</sup>

Sub-Saharan Africa also bears a significant burden from chronic respiratory diseases with very high age-standardized death rates in the region.<sup>[6,7]</sup> Respiratory diseases have accounted for between 8.7% and 12% of medical admissions from previous reports in Nigeria<sup>[8-11]</sup> with the predominant conditions being pulmonary

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tuberculosis, bacterial pneumonia, bronchial asthma, and COPD. However, there is a paucity of information regarding the demographics and pattern of these diseases in outpatient settings, particularly in North Central Nigeria.

There is also a need for more knowledge on the emerging trends of respiratory illness in outpatient low- and middle-income settings given the higher levels of urbanization and concomitant increase in exposure to environmental pollution, which has a substantial impact on the lungs.<sup>[12]</sup>

This study aims at evaluating the pattern and morbidity related to respiratory diseases among adult outpatients attending a chest clinic in a tertiary healthcare facility in Ilorin, North Central Nigeria. The information will help guide appropriate interventions towards reducing the burden of respiratory illnesses in the country as well as enabling appropriate planning and policy formulations to improve health systems.

## MATERIALS AND METHODS

### Study design

This was a 2-year retrospective review of adult patients referred to the chest clinic of the University of Ilorin Teaching Hospital, Ilorin between January 2017 and December 2018.

### Study setting

The University of Ilorin Teaching Hospital (UITH) is a 600-bed tertiary health facility located in Ilorin, the capital of Kwara State in the North-Central geopolitical zone of Nigeria and serves as a referral center for patients in the state as well as other adjoining states of Osun, Oyo, Ekiti, Kogi, and Niger.

The chest clinic in UITH is a referral clinic that runs weekly with an average number of three–five new referred cases in a week as well as an estimated 15–20 patients on follow-up. The clinic is led by three respiratory consultants who evaluate and manage the patients alongside their specialty resident doctors. The clinic manages patients with noncommunicable respiratory conditions like bronchial asthma and COPD as well as respiratory infections such as tuberculosis and community-acquired pneumonia (CAP).

### Data collection

The medical records of the consecutive new patients seen in the chest clinic of UITH for the 2-year period were reviewed. The information extracted from the records included the sociodemographic characteristics, presenting symptoms and duration, confirmed respiratory diagnosis, comorbidities, cigarette smoking history,

and exposure to biomass. The diagnosis of respiratory disease was documented based on a conclusive diagnosis arrived at following the completion of clinical review, appropriate investigations, and confirmation by chest consultants in the unit.

### Operational definition of diseases

**Pulmonary tuberculosis (PTB):** A diagnosis of TB was made in patients with clinical and microbiological (positive GeneXpert *Mycobacterium tuberculosis* (MTB)/resistance to rifampicin (RIF) or sputum positivity for acid-fast bacilli)/histologic evidence of the disease.<sup>[13]</sup>

**COPD:** A diagnosis of COPD was considered in any patient with exertional shortness of breath, chronic cough or sputum production, and a history of exposure to risk factors for the disease. The diagnosis was confirmed by the presence of an airflow limitation that is not fully reversible (postbronchodilator forced expiratory volume in one second/forced vital capacity (FEV1/FVC) <0.70 and FEV1 <80% predicted).<sup>[14]</sup>

**Asthma:** A diagnosis of bronchial asthma was made in patients with episodic obstructive airway symptoms such as cough, breathlessness, chest tightness, and wheezing in combination with reversible airflow limitation on spirometry or peak expiratory flow.<sup>[15]</sup>

**Lung cancer:** A diagnosis was made based on clinical-radiologic findings and confirmed by tissue histology.<sup>[16]</sup>

**Interstitial lung disease:** A diagnosis was made based on history, laboratory, and radiological evidence suggestive of interstitial lung disease (reticular/nodular opacities, ground-glass opacities).<sup>[17]</sup>

### Case selection

The sample of cases for the study were patients with a diagnosis of respiratory disorder seen at the chest clinic of UITH, Ilorin from 2017 to 2018.

### Exclusion criteria

All patients with a diagnosis of respiratory disease during the study period whose medical case file was missing or patients with incomplete information.

### Data analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 24.0 (SPSS Inc., Chicago, IL, USA). Descriptive and frequency statistics were obtained for the variables studied. Variables with much missing information were excluded from the analysis to avoid bias. The Chi-square test was used to evaluate associations between the categorical variables, and *P* value of < 0.05 was considered statistically significant.

## Ethical consideration

Ethical approval for the study was obtained from the Ethical Review Board of the University of Ilorin Teaching Hospital, Ilorin (Ethical Review Committee Protocol Number: ERC/PIN/2021/03/0972).

## RESULTS

### Sociodemographic characteristics of patients

A total of 417 new patients were seen in the pulmonology outpatient clinic over the 2 year study period. However, following the exclusion of patients without core respiratory disease and those with incomplete data, 338 patients were recruited for the study [Figure 1]. The age range of the patients was from 15 to 96 years with a mean age of  $47.6 \pm 19.8$  years [Table 1]. The largest proportions of patients were within the age range of 21– 40 years (122; 36.1%). There was a slight male preponderance with a male to female ratio of 1.1:1. Most of the subjects were married (251; 74.3%) and of the Yoruba tribe (308; 91.1%).

### Clinical characteristics

The predominant presenting symptom was cough (315; 93.2%), which was followed by shortness of breath (282; 83.4%), wheeze (85; 21.5%), and chest pain (36;10.7%). [Table 1]

**Table 1: Socio-demographic and clinical characteristics of patients**

Parameter	Frequency (%)
Age (in years)	
<=20	25 (7.4)
21-40	122 (36.1)
41-60	96 (28.4)
61-80	84 (24.6)
>80	11 (3.3)
Mean Age (in years)	47.6±19.8
Sex	
Male	179 (53.0)
Female	159 (47.0)
Presenting Symptom	
Cough	315 (93.2)
Shortness of breath	282 (83.4)
Chest pain	36 (10.7)
Wheezing	85 (25.1)
Hemoptysis	19 (5.6)
Smoking History	
Current smoker	8 (2.4)
Past smoker	33 (9.8)
Passive smoker	1 (0.3)
Never smoker	296 (87.6)
Biomass Exposure	
Yes	144 (42.6)
No	194 (57.4)

Almost 90% of the patients were never smokers, and 144 persons (42.6%) reported previous exposure to some form of biomass fuel. [Table 1] The main comorbid illness was systemic hypertension (51;15.1%), HIV infection (12; 3.6%), and diabetes mellitus (7;2.1%). Seventy-eight percent of the recruited patients had no documented comorbid illnesses.

**Table 2: Frequency of respiratory cases**

Cases managed at Chest Clinic in the study period (n=338)	Frequency (%)
Communicable respiratory diseases	131 (38.8)
Noncommunicable respiratory diseases	207 (61.2)
Tuberculosis	102 (30.2)
Pulmonary Tuberculosis - new cases	86 (23.8)
Relapsed PTB	8 (2.3)
PTB - treatment failure	1 (0.3)
RR - TB	2 (0.6)
Disseminated TB	5 (1.4)
Chronic obstructive pulmonary disease (COPD)	82 (24.3)
Asthma	60 (17.8)
Bronchial asthma	54 (15.9)
Occupational asthma	3 (0.9)
Cough variant asthma	3 (0.9)
Community-Acquired Pneumonia	32 (9.5)
Asthma/COPD Overlap Syndrome (ACOS)	2 (0.6)
Lung Abscess	2 (0.6)
Interstitial Lung Disease	20 (5.9)
Idiopathic pulmonary fibrosis	7 (2.1)
Scleroderma-related ILD	1 (0.3)
Posttuberculosis lung fibrosis	10 (3.0)
Sarcoidosis	2 (0.6)
Chronic Hypersensitivity Pneumonitis (Bird Fanciers Lung)	1 (0.3)
Intrathoracic malignancies	14 (4.1)
Primary lung cancer	11 (3.3)
Secondary lung cancer (renal cell carcinoma)	2 (0.6)
Mesothelioma	1 (0.3)
Pleural effusion	5 (1.5)
Malignant pleural effusion	2 (0.6)
Parapneumonic effusion	1 (0.3)
Tuberculous pleural effusion	2 (0.6)
Pulmonary Aspergilloma	1 (0.3)
Bronchiectasis	8 (2.4)
Posttuberculous bronchiectasis	7 (2.1)
Recurrent pneumonia	1 (0.3)
Upper airway cough syndrome	1 (0.3)
Eosinophilic bronchitis	1 (0.3)
Gastroesophageal reflux disease (GERD)-induced chronic cough	2 (0.6)
Costochondritis/Musculoskeletal-related chest pain	3 (0.9)
Chronic Pulmonary Embolism	1 (0.3)
Primary spontaneous pneumothorax	1 (0.3)

**Table 3: Distribution of cases based on age, sex, smoking status, and biomass exposure**

	TB n=102 (30.2%)	COPD n=82 (24.3%)	Bronchial Asthma n=60 (17.8%)	CAP n=32 (9.5%)	ILD n=20 (5.9%)	Cancers n=14 (4.1%)	P*
Age group (in years)							<0.001
≤20	9 (8.8)	0 (0)	10 (16.7)	4 (12.5)	0 (0)	0 (0.0)	
21-40	54 (52.9)	1 (1.2)	42 (70.0)	12 (37.5)	6 (30.0)	2 (14.3)	
41-60	27 (26.5)	31 (37.8)	7 (11.7)	5 (15.6)	9 (45.0)	4 (26.8)	
61-80	10 (9.8)	39 (47.6)	1 (1.7)	8 (25.0)	3 (15.0)	6 (42.9)	
>80	2 (2.0)	11 (13.4)	0 (0)	3 (9.4)	2 (10.0)	2 (14.3)	
Sex							0.033
Male	65 (60.7)	47 (63.7)	23 (38.3)	12 (37.5)	10 (50.0)	7 (50.0)	
Female	37 (39.3)	35 (36.3)	37 (61.7)	20 (62.5)	10 (50.0)	7 (50.0)	
Smoking status							<0.001
Never Smoker	96 (94.1)	59 (72.0)	59 (98.3)	29 (90.6)	19 (95.0)	10 (71.4)	
Current smoker	2 (2.0)	3 (3.7)	1 (1.7)	1 (3.1)	1 (5.0)	0 (0.0)	
Past smoker	4 (3.9)	20 (24.4)	0 (0.0)	2 (6.3)	0 (0)	4 (28.6)	
Passive smoker	0 (0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0)	0 (0.0)	
Biomass exposure							<0.001
Exposure to biomass	24 (23.5)	77 (93.9)	6 (10.0)	9 (28.1)	12 (60.0)	6 (42.9)	
No exposure to biomass	78 (76.5)	5 (6.1)	54 (90.0)	23 (71.9)	8 (40.0)	8 (57.1)	
HIV status							<0.001
Positive	11 (10.8)	0 (0)	0 (0)	1 (3.1)	0 (0)	0 (0)	
Negative	86 (84.3)	31 (37.8)	21 (37.8)	13 (40.6)	15 (75.0)	16 (57.1)	
Unknown	5 (4.9)	51 (62.2)	39 (65.0)	18 (56.2)	5 (25.0)	12 (42.9)	

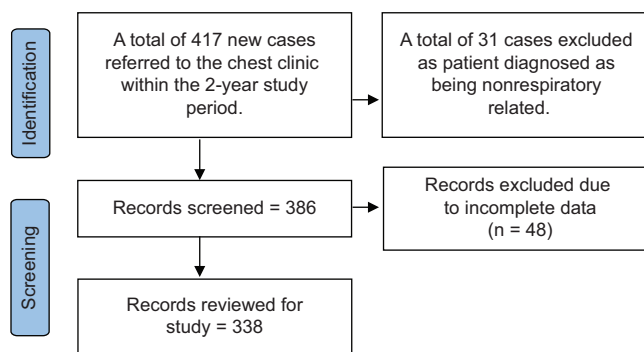
\*Chi square. TB - tuberculosis; CAP - community-acquired pneumonia; ILD - interstitial lung disease

### Pattern of respiratory diseases

Noncommunicable respiratory diseases including COPD, bronchial asthma, interstitial lung disease, and thoracic malignancies constituted 61.2% of the respiratory cases seen in the chest clinic, whereas the communicable diseases were responsible for 38.8% of the cases seen. [Table 2] Patients with microbiologically confirmed tuberculosis constituted the largest proportion of cases, accounting for about a third (102; 30.2%) of all the cases seen in the 2-year period. This was followed by COPD (82; 24.3%), bronchial asthma (60; 17.8%), and CAP (32; 9.5%).

Tuberculosis was largely found in patients between the ages of 21 and 40 (54; 52.9%), whereas the majority of the patients with COPD were aged between 61 and 80 years (39; 47.6%). The patients with bronchial asthma were mostly in the age range of 21—40 years (42; 70%), whereas those with intrathoracic malignancy were mainly in the age range of 61 and 80 years (6; 42.9%). [Table 3]

All the patients with asthma were never smokers, whereas 72% of the patients with COPD were also never smokers. In addition, only 28.4% of the cohort with intrathoracic malignancies were either current or past smokers. The majority of the patients with COPD had exposure to biomass fuel (77; 93.9%). Only 10.8% of the patients with tuberculosis had HIV coinfection. [Table 3]



**Figure 1: Flowchart indicating patient recruitment**

### DISCUSSION

Our study is novel in evaluating the pattern of respiratory disease in an outpatient setting in the North-Central region of Nigeria. The predominant diseases identified were tuberculosis, COPD, asthma, and pneumonia, a pattern in tandem with global trends<sup>[1]</sup> as well as previous studies in outpatient and inpatient settings in the various regions of the country.<sup>[8-12]</sup> Cumulative evaluation of cases also revealed noncommunicable respiratory diseases dominated, a finding which is consistent with a similar report by Alasia *et al.*<sup>[12]</sup> in Port Harcourt, Southern Nigeria. This further emphasizes the need to focus strategies on combating the continued growing trend of noncommunicable respiratory diseases in low- and middle-income countries.<sup>[6,18]</sup> This has been

linked to increasing exposure to outdoor and indoor air pollutants as well as occupational exposure to dust and fumes.<sup>[19]</sup> Our finding is contrary to previous reports in the southwestern<sup>[8,9]</sup> and southeastern regions of the country<sup>[11]</sup> where communicable respiratory diseases dominated. These studies were however carried out among admitted patients, which could potentially explain the difference in observations.

Generally, the bulk of the patients reviewed were in their youthful ages in line with previous observations from similar studies<sup>[8-12]</sup> in the country. This is a potential source of concern given that this is the productive age range of individuals, calling for more efforts at enforcing preventive strategies. Tuberculosis and asthma were common in the productive age group, whereas COPD and cancers were commoner in patients above 60 years old. The fact that tuberculosis was found to be more in individuals less than 40 years of age is in keeping with historic findings that the risk of tuberculous infection is greatest during adolescence and early adulthood.<sup>[20]</sup> In addition, it is established that although asthma can occur at any age, its incidence and prevalence are more in children and young adults. As observed in this survey, adult females with asthma were more than their male counterparts; a known trend following the reversal from the male predominance that occurs at puberty, indicating the potential role of reproductive hormones.<sup>[21]</sup> However, TB and COPD were identified in more males than females, which corroborates the observations from previous reports.<sup>[11,12]</sup>

Most of the patients with COPD were never smokers, which further highlights the increasing role of nonsmoking causes of COPD, especially biomass fuel exposure as reported in an earlier study<sup>[22]</sup> in the same site. However, an audit of COPD cases that attended the same hospital 5 years earlier reported that almost 70% had a history of cigarette smoking,<sup>[23]</sup> which was in tandem with a previous report from Ile-Ife.<sup>[24]</sup> This change in trend highlighting the predominance of nonsmoking risk factors for COPD in our setting can be attributed to a reduction in the prevalence of smoking in the country emerging from increasing campaigns worldwide against tobacco smoking as well as the increasing awareness of physicians to probe exposure of patients to biomass smoke.

Our study was limited by the fact that the data gathered were from a referral center and hence may not entirely represent findings in the general population. However, the study still provides very cardinal information about the pattern and morbidity of respiratory disease in the North-Central region of the country where there is relatively limited information. Further periodic

evaluation will also be useful for evaluating the trend of respiratory diseases in the area as well as evaluating the success of intervention strategies.

## CONCLUSION

Noncommunicable respiratory diseases constitute a larger proportion of respiratory cases seen in the chest clinic in UITH, Ilorin, Nigeria. There is a need to further focus on preventive strategies to halt the increasing progress of noninfective respiratory diseases in our setting.

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## Conflicts of interest

There are no conflicts of interest.

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