

## COPD Trend in Slum Population of Dhaka City and Social Awareness to Combat Its Effect

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### Abstract

**Background:** A major cause of illness worldwide is chronic respiratory disorders. There is a strong upward trend towards the global incidence of these diseases. An additional 500 million people are affected by it. **Objective:** The research aimed to quantify chronic obstructive pulmonary disease (COPD) incidence in the slum of Dhaka City. **Materials and method:** A population-based survey was conducted using a well designed questionnaire. The research included all persons older than 20 years who live and intend to engage in the analysis in the identified slums in Dhaka City. Total 584 samples were calculated using a minimum prevalence of 4.7% at 95% confidence intervals with an allowable error of 20%. **Results:** The prevalence of COPD was found to be 3.25%. This study also found that there were high rates of illiteracy and low levels of education which tended to accompany limited awareness of COPD and hygiene. Therefore, slum dwellers in Dhaka city live with high health risks and at the same time they have limited knowledge about how to alleviate these risks. **Conclusion:** Slum population in Dhaka city is expected to continue to have COPD-related respiratory symptoms. When health problems arise, they have limited knowledge about first aid, what treatments and services are available, and where they are available.

**Keywords:** COPD; Chronic respiratory disorders; Social awareness; Slum area.

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### Introduction

For most citizens in the world still live in urban environments, the transformation of the global urban environment is one of the biggest problems of public health in the 21st century.<sup>1-3</sup> The world urban population will rise by nearly 1000 billion

by 2030, with rural populations staying relatively unchanged according to latest estimates from the United Nations.<sup>4</sup> This transition represents a rapid phase of global urbanization, which is particularly evident in the global South for more than two

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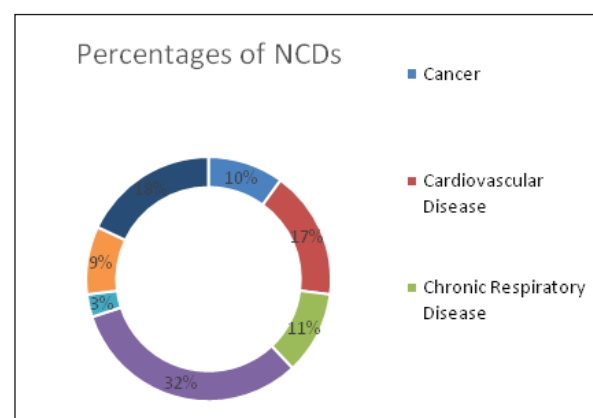
decades. In 2030, in African and Asian low- and middle-income nations, more than 90 percent of the global urban population increase will occur.

Before the early 1970s Bangladesh had been mostly agricultural, and urban population development has slowly risen to more than 30% by 2014, bringing about 83 million residents in metropolitan centers from about 50 million in 2014.<sup>4</sup> In the middle of the century, Bangladesh is often projected to be urban rather than agricultural.

A slum is one cluster of small housing communities composed of 5 or more households that are placed typically rather unsystematic and haphazardly, and is vulnerable to environmental threats and hazards from the state and private vacancies. The slums contain primarily the working age community, with 31.6% of them under 15, and only 2.6% of the age group 65 years and over. For adult (15 years of age or older), 36.2% of males and 42.3% of women do not go to school; 14.1% of boys and 8.9% of girls do not go to school.<sup>5</sup> Living in the slum is unstable. The bulk of neighbourhoods claim state property (90%), while approximately 70% of households are renters. Most of the households use pipe water to drink and 90% have sanitary latrines in the kitchen, but just 30% have septic tanks in house.<sup>5</sup> The World Health Organization acknowledges slum communities with overcrowded houses that are not properly constructed, with proper ventilation, drainage and waste management facilities.<sup>6</sup>

Non communicable diseases (NCDs) are chronic diseases that gradually evolve, impact functional health over time, and need continuous health care. The main NCDs include infectious disorders, diabetes, obesity, and persistent respiratory obstructive disorders (e.g., recurrent bronchitis and bronchial asthma). Accidents and deaths, psychiatric disorders, and contamination of the atmosphere (air, water and soil) are of smaller

occurrence. Many of these NCDs include specific risk factors linked to lifestyle such as intake of cigarettes and alcohol, poor diet (less vegetables and fruits and more salt, sugar and fat), and insufficient physical activity. Non communicable diseases (NCDs) reportedly account for 59% of Bangladesh's overall deaths (17% cardiovascular and 11% chronic respiratory disorders, 10% tumors, 9% accidents, 3% diabetes and 10% other NCDs).<sup>7,8</sup>



**Fig. 1: Prevalence of NCDs**

Chronic respiratory disease (COPD) is a chronic and increasingly worsening lung condition marked by gradual restriction of the supply of air. The global burden of these diseases is showing a discernible upward trend, and an estimated 500 million people suffer from them.<sup>7</sup> Chronic respiratory disease (COPD) is the 4th-largest cause of death and the 13th-largest cause of disease incidence in the world with a rise in the next decade predicted.<sup>8</sup> The restriction of the lungs to noxious particles or gasses is typically slow and related to an irregular inflammatory reaction.<sup>9</sup> Persistent respiratory disorders are among the most severe forms of such diseases in airways and other lung systems including chronic obstructive pulmonary diseases (COPD) and bronchial asthma.<sup>10</sup>

Research also has shown that the centers of various contagious epidemics across the globe. High incidence of non-infectious diseases is also

apparent in slum regions. High incidence of noninfectious diseases in slums has evolving facts as well. Dynamics in the slum community are often susceptible to obstructive airway diseases.<sup>11,12</sup> Chronic respiratory disease (COPD) remain an important cause of disability and health care burden in Bangladesh. Information on COPD is scarce in Bangladesh, very few studies recorded COPD prevalence in Bangladesh. It is estimated to affect 10 to 13 percent of adults over the age of 40 in Bangladesh. Most patients stay undiagnosed until the disease is too serious to induce respiratory discomfort and requires prompt response.

## Materials and method

This was a cross-sectional descriptive study and used survey questionnaire. The research included all persons older than 20 years who live and intend to engage in the analysis in the identified slums of Dhaka city. Persons who did not contribute to the analysis were disqualified. A minimum sample size of 584 was calculated using a minimum prevalence of 4.7% at 95% confidence intervals with an allowable error of 5%. For this analysis, each household picked all individuals meeting the inclusion requirements. Since informed consent has been given to engage in the test, a two-step test was undertaken. In the first phase, simple demographic data from respondents were collected. The above were all respondents treated with persistent bronchitis and bronchial asthma with the implementation of the updated British Medical Research Council with their colloquial terms. Excel and SPSS software were used for statistical analysis. An individual was recognized as a typical case of COPD if the airflow constraint was not entirely reversible. The obstruction of ventilation is typically incremental and is attributed largely to an inflammation of the lung in addition to toxic contaminants and gasses produced by smoke.

## Results

A total of 584 rural people were included in this sample for both sexes aged 20 years. There were 316 men and 268 women in the community who were affected (Table I).

**Table I: Distribution of the study population on the basis of age and sex (N=584)**

Age (in years)	Male	Percentage (%)	Female	Percentage (%)	Total
>20-29	125	27.78	93	20.67	218
30-39	50	11.11	59	13.11	109
40-49	20	4.44	18	4.00	38
50-59	36	8.00	42	9.33	78
60-69	60	13.33	36	8.00	96
70 and above	25	5.56	20	4.44	45
Total	316		268		584

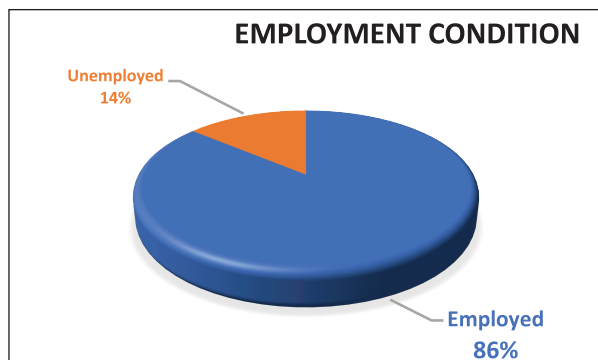
**Table II: Age and sex-wise prevalence of chronic obstructive pulmonary disease in study population (N=584)**

Age (in years)	Male	Percentage (%)	Female	Percentage (%)
20-49	18	3.08	16	2.74
50 and above	25	4.28	19	3.25
Total	43		35	

**Table III: Educational status of respondents (N=584)**

Educational Status	Percentage of Female	Percentage of Male
Above high school pass	2%	4%
High school level	11%	13%
No formal education	55%	45%
Primary level	32%	38%
Grand Total	100%	100%

Above table shows that majority people are slum belong with no formal education. And the second majority people have primary education.



**Fig. 2: Percentage of Employment**

Above pie chart (Fig. 2) displays the employment condition. Most of the respondents (86%) were working at various sectors. Distribution of their occupation is showed in Table IV. Each slum people lead their life through hard job. Some occupations are quite directly connected with COPD.

**Table IV: Distribution of their occupation**

Occupation	Number of Male	Number of Female
Construction labor	24	28
Garments worker	35	104
Hawker	44	18
House Servant	2	75
Industry worker	32	22
Labor	56	16
Others	8	5
Rickshaw puller	115	0
<b>Grand Total</b>	<b>316</b>	<b>268</b>

As most of the respondents could not have proper food, they were weak in immunity. Table V shows their nutritional status.

**Table V: Nutritional status of respondents**

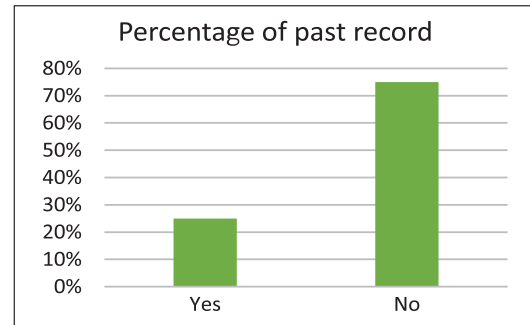
BMI (kg/m <sup>2</sup> )	Nutritional Status	Number of Male	Percentage of Male	Number of Female	Percentage of Female
Below 18.5	Underweight	150	47.47	166	61.94
18.5-24.9	Normal	122	38.61	86	32.09
25.0-29.9	Overweight	40	12.66	13	4.85
30.0 and above	Obese	4	1.27	3	1.12
<b>Grand Total</b>		<b>316</b>	<b>100.00</b>	<b>268</b>	<b>100.00</b>

None of the female respondents was smoker. Among the males, 20% were active smoker (Table VI).

**Table VI: Distribution of smokers among male respondents (n=316)**

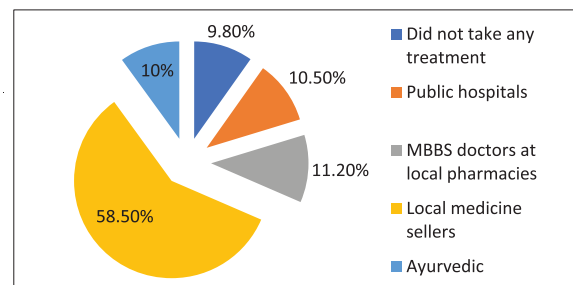
Smoking	Number of Population	Duration of smoking in year
Non-Smoker	5%	0
Active Smoker	20%	5 to 20
Occasional Smoker	15%	3 to 7

Most of the patients did not have any past record of chronic obstructive pulmonary disease (COPD).



**Fig. 3: Respondents' past record of COPD**

The following data shows the health seeking behavior of COPD affected family members in last 3 months. This data also indicate that the awareness level of the slum people is very poor.



**Fig. 4: Health seeking behavior of the COPD affected family members in last 3 months**

## Discussion

As far as our knowledge, it is the first research involving adult slum dwellers of Dhaka city to look at the incidence of respiratory problems in the day labourer and hard working people in the form of asthma and recurrent bronchitis. The following are the risk factors linked to asthma in the slum residents; female gender, elevated age, unemployment, and smoking background. In the past, the main contributing factors correlated with signs of recurrent bronchitis have been smoking and poor rates of schooling. Exposures of toxic fuel with asthma or bronchitis were not found in the slum community. The findings of this research show that the incidence of recurrent bronchitis and COPD increases with increased age. An investigation from Dhaka on COPD prevalence using postbronchodilator spirometry in addition to

the questionnaire reported a nearly 2-fold higher prevalence.<sup>13</sup> Studies have shown that prevalence of chronic bronchitis is positively related to age which has been attributed to changes in immune system and negative impact of age on lung physiology.<sup>14</sup> Opposite findings of some studies may be explained by sensitivity to detrimental environmental slum dynamics that result in a recurrent activation of immune processes in slum residents' lungs, which could impair lung growth during stage of development such as infancy. This in turn may contribute to reduced volumes of the lungs and underlying inflammation in early adulthood and hence to a decline in the age of illness including COPD and chronic bronchitis.<sup>14</sup>

The result of this research suggests that the slum population is likely to have asthma and COPD-related respiratory symptoms. Asthma and COPD are quickly growing to be the world's leading killers. The increasing slum population will potentially add to the burden of these diseases in the countries where urban slum habitats constitute sizeable population. There are several reasons of developing COPD among the people. Among them, slum environment, sanitation, improper dietary habit, aeration, and occupation share the most acute problem. Tobacco smoking even causes worsening of persistent obstructive pulmonary disorder (COPD). However, it has long been known that the chance of airflow interference is raised by a subgroup of active smokers. Patel et al.<sup>15</sup> checked the hypothesis that smokers of tobacco are usually prone to develop COPD and facial wrinkling. The growth of slums in countries with a high urban slum community would be costlier in a period of rising diseases such as COPD that contribute to the global killers.

## Conclusion

The finding of this research is that the slum dwellers are at higher risk to develop

COPD-related respiratory symptoms. This study also cues towards the need of conducting separate asthma and COPD prevalence studies in slums to reveal actual burden of these diseases in global community, which are assumedly tip of the iceberg. There is also an urgent need for regularization of urbanization and slum formations in the cities in order to control asthma and COPD morbidities globally. The epidemiological data thus generated can be useful in the design of new preventive strategies especially in the primary health care.

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