Prevalence and Spatial Epidemiology of Chronic Obstructive Pulmonary Diseases in an Industrial Town of India: An Interim Analysis

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Overview

- Chronic Obstructive Pulmonary Diseases (COPD) is the fourth leading cause of death worldwide.
- COPD is a major public health problem in India also.
- McKay et al recommended that accurate estimates of current/future disease prevalence are required
Overview

• From 1964 to 1995, studies conducted in male population of northern India showed prevalence between 2.12 to 9.4%

• Murthy & Sastry, based on these studies, in 1995, in their background paper for NCMH projected 147 lakh male and 75.1 lakh female patients of COPD in 2016.

• But where are these patients located?
Objectives

- To identify locations of COPD cases
- To determine the prevalence at local levels
- To determine the hotspots of COPD
Methodology

- A cross sectional community based survey was conducted
- So far survey has been completed in industrial area and partially in urban residential area
- All suspected cases were confirmed by spirometry and prescriptions, if available
- All cases were geocoded using Trimble Juno SA
- ESRI Arc GIS 10.2 and SPSS v20.0 were used for data management and analysis
Results

- 1999 households were surveyed covering a total population of 9509 and in industrial area
- 1900 households were surveyed covering a total population of 8128 and in residential area
Map 1: Map of Ludhiana showing surveyed area and location of cases
Results

- 56 confirmed cases of COPD were identified, of which 40 were in industrial area and 16 in urban residential areas.
- The overall prevalence was 3.17/1000 population.
- Respective prevalence rates in industrial and non-industrial area were 4.20/1000 and 1.96/1000.
Map 2: Colony wise prevalence of COPD in Ludhiana
Map 3
Density Mapping

Density of cases

- 0 - 215,850.6129
- 215,850.613 - 714,076.5061
- 714,076.5062 - 1,186,129.806
- 1,186,129.807 - 1,672,141.956
- 1,672,141.957 - 2,369,075.75
Map 5: PM$_{2.5}$ interpolation and location of cases
Conclusion

• High concentration of cases of COPD found in residential neighborhoods of air polluting industries
• Mapping helps in identifying location of cases
• Will help in planning health care services for such cases
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