Executive Summary

- There is a large body of evidence suggesting that exposure to air pollution, even at very minor levels, leads to adverse health effects. In particular, exposure to pollutants such as particulate matter has been found to be associated with increases in hospital admissions for cardiovascular and respiratory disease and mortality in many countries.

- Increasingly sensitive epidemiological studies in several countries under the auspices of WHO have identified adverse effects from air pollution at increasingly lower levels. It is found that the threshold value for a particular air pollutant like PM is a function of the endpoint (death, diminished pulmonary function, etc.), the nature of the responding population (from the most healthy to the most ill), as well as the time at which the response is measured (immediate vs. delayed or accumulated).

- The present study examines the mortality patterns of coal miners i.e. whether there is an excess mortality generally or for some diseases among the coal miners or whether the open cast mining contributes towards the increase in mortality rates of the coal miners.

- North Eastern Coalfields, Coal India Limited in Tinsukia district of Assam was selected as the study location.

- The potential sources of air pollution in the area are Drilling and blasting,Loading and unloading of coal and overburden (OB),The movement of heavy vehicles on haul roads, Dragline operations,Crushing of coal in feeder breakers, Wind erosion, Presence of fire and Exhaust of heavy earthmover machinery (HEMM).

- Total suspended particulate matter (SPM) concentration was found to be as high as 1035 μg/m3 and respirable particulate matter (PM_{10}) 265.85 μg/m3. During the monsoon for the month of September and October and when there was no coal mining activities the SPM concentration was found to be the lowest and consequently PM_{10} values also.

- The concentration of PM_{10} exceeded the permissible limit (150 μg/m3) during the winter and during that time coal mining was operated actively. Karl Pearson's co-efficient of correlation was conducted to test the correlation between SPM and PM_{10}. T-test was conducted to test the significance of the correlations. It was observed during the study that the variations of 24-h simultaneous SPM and PM10 concentrations data were most highly correlated during March, 2012 ($r=0.94$, $t=7.29$, $P<0.0002$).

- More than 8000 patients records maintained by the hospital authority were collected from the three hospitals Viz. ESIC Hospital, Mergherita Civil Hospital and Health centre of Margherita Coal mining area of Assam. Confounding Factors were patients with minor diseases like Cough, cold, dysentery etc.Patients having major diseases like Brain Tumour, Gold Bladder Stone, Eye disorders etc were considered along with the Lung diseases and skin diseases

- Out of the total patients suffering from lung disease the highest percentage was found in health centre(43%) whereas out of the total patients suffering from skin disease the highest percentage was reported from in ESIC(47.47%).

- Results indicate that PM10 and associated metals are one of the major causes for deterioration of ambient air quality

- The present study suggests that it is necessary to monitor the air quality as well as the health effects at regular intervals at strategic locations.

- Awareness programme for open cast coal mining activities must be conducted.

- Considering the severe non response from the respondents, a well planned strategy must be prepared for collection of effective primary data.