Chapter 6

Summary and Conclusion
Industrial workers are generally at the risk of constant exposure to different types of pollutants emitted from the industries. Inhalation of these substances can cause damage in the structural and mechanical, hence functional properties of the lungs, thus making them vulnerable to different types of respiratory diseases. Duration of exposure, ageing and smoking can together complicate respiratory functions. Several studies on health hazards to industrial exposure have indicated significant respiratory function impairment in industrial workers.

Since much information is not available on the respiratory status of industrial workers in Kerala, this work was undertaken with a view to study respiratory function of workers in 5 major industries in this state.

In the present study respiratory status of industrial workers was evaluated through the measurement of lung volumes and flow rates using spirometry. Total of 700 male workers, both smokers and non-smokers, having exposure to industrial environment ranging from one to more than 20 years were studied and compared with control classifying them according to age, exposure duration and smoking status.

Highly significant differences in lung volumes and flow rates among different industrial workers and control group were noticed. It suggests that exposure to different chemicals, noxious gases and particulate matter was injurious to the normal respiratory function. Significant decline in lung volumes (FVC, FEV\(_1\) and FEV\(_1\)/FVC\%) and flow rates (PEF, FEF\(_{25-75}\), FEF\(_{25}\), FEF\(_{50}\), FEF\(_{75}\), and FEF\(_{0.2-1.2}\)) among industrial workers than that of control was also observed.

To study the effect of duration of exposure to pollutants in the factory environment, correlation study was done. With increased duration of exposure to
industrial dusts, lung volumes and flow rates were significantly reduced in all industrial workers.

The respiratory status of the workers vary depending upon the type of chemicals or gaseous effluents that are released from each factory. FACT workers had significantly worse respiratory functions compared to others. This may be due to the variety of chemicals handled there and poor pollution-control measures adopted. Low level of different irritants or less duration of exposure may be the possibility for the better respiratory function in HNL workers.

Respiratory function was found to be significantly deteriorated both in smokers as well as non-smokers than control group. But the difference between smokers and non-smokers was insignificant though the smoker-averages are less than non-smoker averages. This indicates that industrial dust exposure had more impact in respiratory function than did smoking in the present study. The interaction between smoking and occupational exposure is complex and needs further development of techniques to study these interactions. Lung function deterioration starts early in smoker industrial workers than non-smoker industrial workers.

Significant decline in lung volumes and flow rates than control group with advancement of age was also observed in these workers. The trend of decrease was high after the age of 45 in most of the industrial workers. Thus ageing together with pollutants and smoking aggregates the respiratory dysfunction.

It was concluded that workers in these 5 industries are at a high risk for development of functional impairment of upper and lower airways especially on their chronic exposure to the factory environment beyond 20 years.

It is recommended that chronic industrial exposure in FACT-CD & UD, cotton mill, IRE and HNL workers may be considered as a risk factor and appropriate preventive measures may be taken to improve their respiratory status.