

Editorial



India Needs a National COPD Prevention and Control Programme

Sundeep Salvi*, Anurag Agrawal†

Chronic Obstructive Pulmonary Disease (COPD) kills more than 3 million people every year, making it the 4th largest cause of death in the world.¹ It has been estimated that by the year 2030, COPD will become the third biggest cause of death. According to the World Health Organisation, COPD kills more people than HIV-AIDS, Malaria and Tuberculosis all put together in the South East Asian region. What is more worrying is the fact that mortality rates due to COPD are anticipated to increase by over 160% over the next 2 decades (Figure 1).² Half a million people die every year due to COPD in India, which is over 4 times the number of people who die due to COPD in USA and Europe (Figure 2).³ According to a report published by the Maharashtra State Health Resource Centre, COPD is the leading cause of death in Maharashtra, causing more deaths than those due to ischemic heart disease, stroke and diabetes all put together (Figure 3).⁴

Several epidemiological studies have investigated the

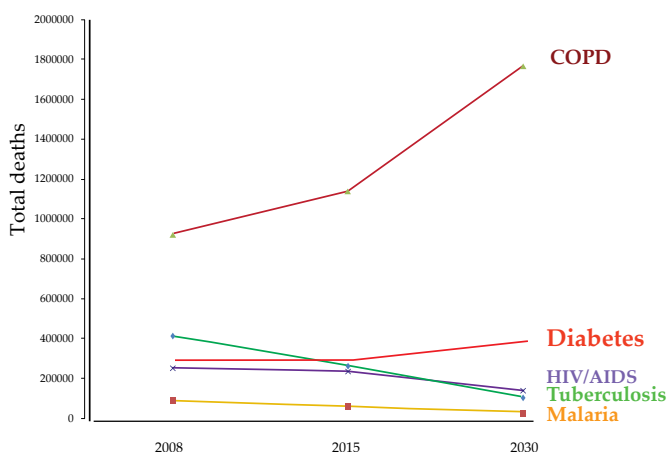


Fig. 1 : Estimated mortality rates due to different diseases in the South East Asian Region (WHO 2008)

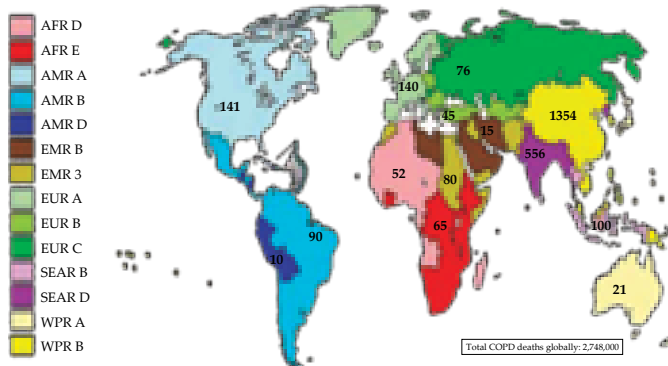


Fig. 2 : Mortality rates due to COPD in different parts of the world (Numbers in '000) (Ref. 3)

*Chest Research Foundation, Pune; †Institute of Genomics and Integrated Biology, Delhi

prevalence of COPD in India and most of these have used a respiratory health questionnaire and presence of symptoms to define the presence of COPD. Dr Jindal SK from the Postgraduate Institute of Medical Education and Research in Chandigarh has given an overview of the burden of COPD in India in Chapter 2, and has highlighted the growing prevalence and epidemic proportion of COPD in India. There seems to be a wide discrepancy in the prevalence of COPD across different studies, ranging from 2%-22% in men and 1.2%-19% in women.⁵ However, almost all of these studies have used respiratory health questionnaires, which have not been validated, and therefore cannot be relied for any national assessment. The Indian Council of Medical Research undertook a nationwide asthma and COPD prevalence studies in 16 centres across India in a sample of 242,575, and reported a prevalence of 3.49% (4.29% in males and 2.7% in females).⁶ Although this study used a validated respiratory questionnaire, epidemiological estimates of the prevalence of COPD are method dependent, since poorly reversible expiratory flow limitation, the hallmark of COPD, can be associated with few or no symptoms. Thus estimates based on symptoms may be substantially lower than those based on spirometric measurements. We conducted a large COPD prevalence study in a rural population in India using both the respiratory symptom questionnaire as well as post bronchodilator FEV1/FVC ratio of <70% to define COPD. There was an almost 2-fold higher prevalence of COPD if spirometry was used to define COPD, indicating that the true burden of COPD as determined in most epidemiological studies in India that used respiratory symptom questionnaires probably underestimated the burden of COPD by around half.⁷ A recent study from Mumbai using post-bronchodilator spirometry to define COPD reported a prevalence of 8% (personal communication). According to crude estimates, there are over 30 million COPD sufferers in India.

Apart from COPD being a disease associated with suffering and poor quality of life, it is an expensive disease to treat.

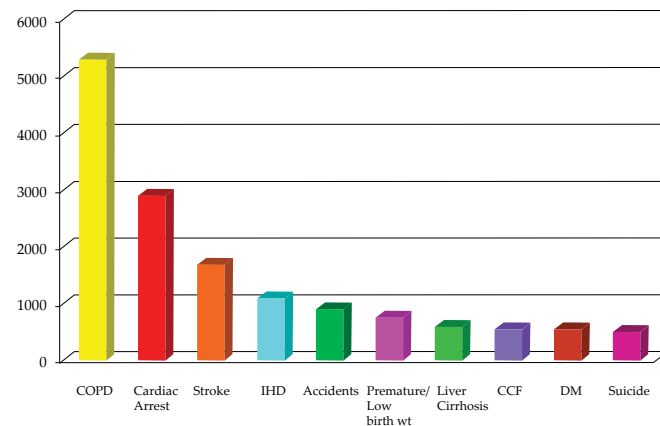


Fig. 3 : Top 10 leading causes of deaths in Maharashtra (Ref. 4)

According to a report published by the National Centre for Macroeconomics and Health, the estimated economic loss due to COPD in India is around Rs 35,000 crores.⁸ This is even higher than the total budget of the Ministry of Health and Family Welfare of India, which during 2010-2011 was 25,154 crores. Up to 84% of the direct costs associated with COPD are due to patient hospitalisations. Lost productivity due to COPD accounts for between 40% to 67% of the overall costs across the world.¹ COPD therefore drains the economy of the country.

In a resource-poor country like India, it is a challenge to curb the growing burden of COPD. Preventing the development of COPD therefore becomes the most economically viable option to reduce the burden of COPD. For this, we need to understand the risk factors that drive the development of COPD. Traditionally, it has been believed that tobacco smoking is the only major risk factor associated with the development of COPD, and rightly so, because of several landmark observational studies reported from the west.⁹ Because we Indians largely import knowledge from the west, we have been led to believe that tobacco smoking is indeed the most important risk factor for COPD in India too. And it may indeed be true to a certain extent because the use of tobacco smoking is increasing steadily in India. Apart from cigarettes, people from India smoke tobacco using bidis, hookahs and chillums among several other forms of smoking. It is important to note that the harmful effects of each of these are different. Bidis are more harmful than cigarettes (although they contain only one fourth the amount of nicotine, they produce four to five times more tar than cigarettes, making one bidi as harmful as one cigarette), hookahs are more harmful than bidis and the chillum is the most harmful of the lot.¹⁰

It has been recently argued that exposure to high levels of indoor air pollution due to the burning of biomass fuel (animal dung, crop residues, wood) seems to be a greater risk factor for COPD than tobacco smoking not only in the Indian sub-continent, but across the world.¹¹ This is because compared to 1.1 billion smokers in the world, 3 billion people are exposed to very high levels of indoor air pollution due to the burning of biomass fuel, usually in poorly ventilated homes.¹² In India, 70% of the homes use biomass fuel for cooking and heating purposes in poorly ventilated kitchens, and the amount of particulate matter pollution generated by the burning of biomass fuel are extremely high. During her lifetime, every woman who spends between 2-3 hours for cooking every day inhales a volume of 25 million litres of highly polluted air, thereby exposing her to extremely high levels of particulate matter and gaseous air pollutants.¹¹ Exposure to biomass smoke therefore becomes a major risk factor for COPD in India. The other common indoor air pollutant is the burning of mosquito coils at homes to get rid of mosquitoes. Burning one mosquito coil in the night emits as much particulate matter pollution, as that which is equivalent to around 100 cigarettes.¹³ A previous history of pulmonary tuberculosis has also been shown to be an independent and strong risk factor for the development of Obstructive Airways Disease, which is more of the COPD phenotype.¹⁴ In countries like Africa, Asia and South East Asia, where tuberculosis is highly prevalent, the burden of COPD due to a prior history of pulmonary tuberculosis is expected to be very high. In fact, a history of tuberculosis has been shown to be a bigger risk factor for COPD than tobacco smoking in studies from Africa and Asia.¹⁵ Chronic poorly treated persistent asthma has also been identified as an important risk factor for COPD, and its contribution to the overall prevalence of COPD is expected to be high in developing countries, where asthma still remains poorly diagnosed and treated.¹² The other risk factors

for COPD that have been identified are: occupational causes and poor socioeconomic status.¹²

COPD remains poorly diagnosed or wrongly diagnosed by health care providers. Apart from the lack of awareness of the risk factors associated with COPD, spirometry which is the gold standard diagnostic test, remains poorly utilised in clinical practice. Clinicians are not aware that relying on history and clinical examination only to diagnose COPD under-estimates the disease in over 50% of cases. In this modern era where diagnostic tools dominate clinical practice in other disease conditions, spirometry is an often badly neglected diagnostic tool. There are several reasons for this: apart from the fact that spirometry is poorly taught in the medical curriculum, there is a general perception that spirometry is not useful, it is expensive, it is difficult to perform and it is difficult to interpret. These are all myths. Clinicians need to accept the fact that spirometry is the most important diagnostic test for COPD. While there is some critique regarding the clinical significance of asymptomatic spirometric impairment, it is important to remember that this exemplifies success, not failure, of spirometry. By any logic, it is much better to diagnose disease before symptoms, particularly when the disease is poorly reversible like COPD. Smoking cessation, the most important intervention, is likely to be most effective at this stage. Whether knowledge of an abnormal spirometric test would motivate the patient to quit smoking is highly dependent on the manner in which this is presented, and the passion with which smoking cessation is pursued.

COPD is now a much better understood disease than before. Most COPD patients do not die because of the lung disease, but because of the other co-morbid conditions that accompany COPD.¹⁶ These include ischemic heart disease, hypertension, skeletal muscle dysfunction, osteoporosis, depression, diabetes and more recently renal involvement. It is important to look for the presence of these co-morbid conditions during each visit and treat them appropriately. In Chapter 7, Dr Murali Mohan gives an overview of the co-morbid conditions associated with COPD and the importance of early diagnosis and treatment.

Unlike in the past, there is a lot we can offer to our COPD patients. We can help improve their quality of life, reduce their symptoms, prevent exacerbations and hospitalisations and even improve survival. The current pharmacotherapy that is available can help reduce symptoms significantly and improve quality of life. Long-acting bronchodilators are the main stay of pharmacotherapy for COPD. They should be given by the inhaled route, and inhaled steroids should be added if the FEV1 values are <50% of predicted, or they have more than 2 episodes of exacerbations every year. Dr Sujeet Rajan discusses the pharmacotherapy of COPD in Chapter 5 and also highlights the fact that treating COPD is not only writing a prescription, but also involves counselling. Dr Virendra Singh discusses the importance of Pulmonary Rehabilitation in Chapter 9 and Dr Raj Kumar discusses the importance and methods of Smoking Cessation Programs in Chapter 10.

Why does India need a National COPD Prevention and Control Program?

For the last 5-6 decades, India has been battling the ravages caused by different communicable diseases, such as tuberculosis, malaria, HIV-AIDS, Leprosy, Filariasis and Dengue. More people died due to communicable diseases than non-communicable

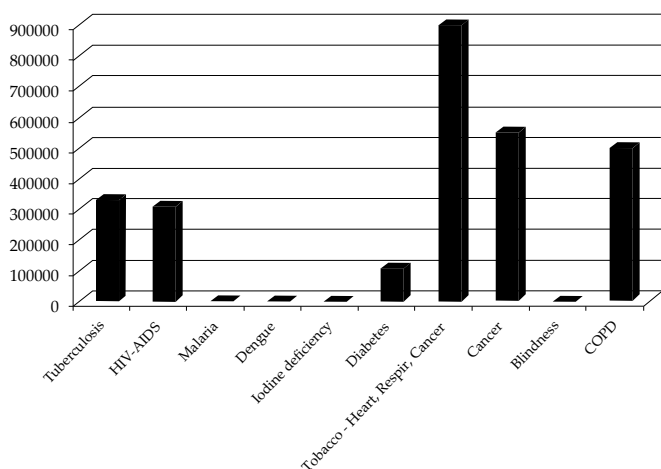


Fig. 4 : Mortality figures due to diseases currently covered under the National Health Program

diseases. However, deaths due to communicable diseases have declined sharply over the last couple of decades. This is largely a reflection of the tremendous success of the different national health programs introduced by the Government of India. This situation has changed. More people in India now die due to non-communicable diseases and chronic respiratory diseases tops this list.¹⁷ COPD kills half a million people in India every year, more than those who die due to tuberculosis, malaria or HIV-AIDS. Moreover, these numbers are expected to grow by 160% over the next 2 decades, in contrast to the decline in the number of deaths anticipated due to malaria, TB or HIV-AIDS.² COPD kills more people in India, than those due to Tuberculosis, HIV-AIDS, Malaria, Dengue, Iodine deficiency, Cancer and Blindness, diseases which are all covered under the National Health Programs (Figure 4).

According to crude estimates, 30 million people suffer with COPD in India, and these numbers are only going to increase in the forthcoming years.

COPD is a chronic, progressive, expensive and difficult disease to treat. As of now, there is no cure for this disease. Primary (as well as secondary) prevention is therefore going to be the key to reduce the growing burden of COPD. We need more knowledge about the risk factors associated with COPD and the relative contribution of each of these in the Indian scenario before any interventional measures can be recommended. Good quality research studies from different regions of the country will be required to generate this new knowledge, and this will ultimately help make policy decisions.

A large number of COPD patients remain undiagnosed or wrongly diagnosed in clinical practice due to several reasons: (a) belief that COPD is only caused by tobacco smoking, which leads to under-diagnosis of COPD in never smokers who contribute to around half of all COPD cases (b) under-utilization of Spirometry as a diagnostic tool mainly due to lack of knowledge and availability of spirometers, and (c) difficulty in differentiating it from asthma. Under-diagnosis leads to more suffering and a further worsening of the disease state. Tackling this needs creating awareness amongst clinicians, educating them about spirometry and making spirometers available in hospitals and clinics. The curriculum of both undergraduate and postgraduate medical education will need to be strengthened to empower doctors with the knowledge required to manage COPD better. This will need to be followed by regular CME

Programs thereafter, where further updates on diagnosis and management can be provided. Inhalation therapy will need to be made available to all patients suffering with COPD. Pulmonary Rehabilitation Centres will need to be set up across the country to cater to the needs of patients with COPD. Physicians and scientists will need to be encouraged to conduct research that will help develop newer, easier and better diagnostic methods and develop newer drugs and inhalation devices, that will not only help further improve symptoms and quality of life, but will also halt, and if possible, revert the progression of the disease. This is only possible through a concerted nationwide effort and appropriate policy decisions in the form of a National COPD Prevention and Control Program. If we really want to curb the growing burden of COPD India, we need nothing short of a respiratory revolution.

References

- Salvi S. COPD: The neglected epidemic. Textbook of Pulmonary and Critical Care Med Vol 2, Ed: Jindal SK, Jaypee Publications, 2011;971-974.
- The Global Burden of Disease, WHO 2008 Oct, www.who.int/healthinfo/global_burden_disease/projections/en/index.html. Accessed on 22nd Dec 2011.
- Lopez A, Shibuya K, Rao C et al. Chronic obstructive pulmonary disease: current burden and future projections. *Eur Respir J* 2006;27:397-412
- Health Status Maharashtra 2009: A report by the State Health Systems Resource Centre. 2010;20-21.
- Jindal SK, Aggarwal AN, Gupta D. A review of population studies from India to estimate national burden of chronic obstructive pulmonary disease and its association with smoking. *Indian J Chest Dis Allied Sci* 2001;43:139-147.
- Jindal SK et al. Indian multi-centric study on epidemiology of asthma and chronic bronchitis in adults (INSEARCH) Study, ICMR Report, 2010.
- Salvi S, Juvekar S, Londhe J, Brashier B, Madas S, Barnes PJ. Prevalence of COPD in a rural population in India. *Eur Respir J* 2011;pA2954
- Murthy KJR, Sastry JG. Economic burden of chronic obstructive pulmonary disease: NCMH Background Papers- *Burden of Disease in India* 2005.
- Anderson D, Ferris BG Jr. Role of tobacco smoking in the causation of chronic respiratory disease. *N Engl J Med* 1962;267:787-94.
- Singh S, Soumya M, Saini A, Mittal V, Singh UV, Singh V. Breath carbon monoxide levels in different forms of smoking. *Indian J Chest Dis Allied Sci* 2011;53:25-28.
- Salvi S, Barnes PJ. Is exposure to biomass smoke the biggest risk factor for COPD globally? *Chest* 2010;138:3-6.
- Salvi SS, Barnes PJ. Chronic obstructive pulmonary disease in non-smokers. *Lancet* 2009;374:733-743.
- Liu W, Zhang J, Hashim JH, Jalaludin J, Hashim Z, Goldstein BD. Mosquito coil emissions and health implications. *Environ Health Perspect* 2003;111:1454-1460.
- Snider GL, Doctor L, Demas TA, Shaw AR. Obstructive airway disease in patients with treated pulmonary tuberculosis. *Am Rev Respir Dis* 1971;103:625-640.
- Limaye S, Salvi S. Risk factors for COPD. Textbook of Pulmonary and Critical Care Med Vo 2, Ed: Jindal SK, Jaypee Publications, 2011;987-992.
- Nussbaumer-Ochsner Y, Rabe KF. Systemic manifestations of COPD. *Chest* 2011;139:165-173.
- Nongkynrih B, Patro B, Pandav C. Current status of communicable and Non-communicable Diseases in India. *JAPI* 2004;52:118-123.