What is the true burden of chronic obstructive pulmonary disease in India and what are its implications at a national level?

According to the global burden of disease (GBD) report, chronic obstructive pulmonary disease (COPD) is the 2nd leading cause of death and disability adjusted life years (DALY’s) in India.\(^1,2\) Based on sophisticated mathematical models developed from only well-designed and executed prevalence studies, mortality data and the burden of risk factors for COPD across India, the 2019 GBD report estimated the COPD prevalence to be 37.8 million. However, at the most, these are only estimates based on the limited amount of existing data. Understanding the true burden of COPD in India is necessary to inform our health-care policy makers and health-care providers to device COPD-specific preventive, promotive, and therapeutic health-care strategies. However, India is literally a nation within nations with a huge geographic, cultural, and economic diversity. Conducting well-designed and technically sound COPD epidemiological studies across India is a huge challenge.

Earlier epidemiological studies determined the prevalence of COPD using a questionnaire that captured demographic details, symptoms, and exposure to risk factors. However, they lacked adequate sensitivity and specificity to make any reliable estimates. Spirometry was found to have much greater sensitivity and specificity. In fact, the Global Initiative for Chronic Obstructive Lung Disease used spirometry to define COPD, which then became the gold standard.

Spirometry, however, is a difficult test to perform not only because it is an effort-dependent test and requires patient cooperation but also because it needs a well-trained and patient technician who performs good quality spirometry.\(^3\) To confirm the diagnosis of COPD, it is necessary to perform two spirometry tests, a prebronchodilator and a postbronchodilator test after giving an inhaled short-acting bronchodilator through a pressurized metered dose inhaler and spacer or a dry powder inhaler and waiting for at least 20 min between the two tests. Prebronchodilator forced expiratory volume in 1 s/forced vital capacity (FEV\(_1\)/FVC) only suggests the presence of obstructive airways diseases and cannot be used to define COPD. Furthermore, the correct way of interpreting spirometry to define COPD is still debated. Should a fixed value of <0.7 be used for the FEV\(_1\)/FVC ratio, or should the lower limit of normal (LLN) be used?\(^4\) Should COPD be defined based only on the spirometry report or should the symptoms be also taken into account?

This lack of clarity for defining COPD and the challenges encountered in performing spirometry have demotivated epidemiologists to conduct COPD prevalence studies. An earlier systematic review of previously published studies from India in 2012 revealed not a single study that met the quality standards.\(^5\) The authors, however, estimated a crude prevalence rate of chronic bronchitis based on the questionnaire only to be roughly between 6.5% and 7.7% in the rural areas only.

Since 2012, there have been several attempts to conduct good quality COPD prevalence studies in India. At least four sites across India took part in the burden of obstructive lung disease study, an international study using a robust design and standardized and validated questionnaires along with a postbronchodilator spirometry test. Over the last decade, several others have also used this methodology to study the burden and risk factors for COPD in India. In this issue of the journal, Daniel et al.\(^6\) report a systematic review and meta-analysis of eight such studies conducted in different parts of India (total sample size of 8659, 49.2% males). Among the eight studies, 4 were from northern India, 3 from southern India, and 1 from the eastern region. Five of the eight studies were conducted in rural areas, whereas three studies were conducted in urban cities. Using random effects pooled estimates, they reported the prevalence of COPD in India to be 7.4% (95% confidence intervals: 5%–9.8%). The COPD prevalence was 11% in urban areas, whereas in rural areas, it was 5.6%. Using these prevalence rates, and the fact that 34.9% of the India’s population (1.39 billion according to the 2021 United Nations data) live in the urban areas and 65.1% live in the rural areas, and that COPD occurs at a younger age in India (>35 years) like in other low- and middle-income countries,\(^7\) the estimated burden of spirometry-defined COPD in India is 37.6 million. This is surprisingly similar to the GBD 2019 estimates for COPD prevalence in India (37.8 million). Using the reported 95% confidence intervals by Daniel et al., the COPD burden in India will likely range from 25.1 million to 49.2 million.

It has been generally agreed upon that the postbronchodilator FEV\(_1\)/FVC ratio <0.7 or the LLN identifies all patients of COPD characterized by the two distinct structural processes, namely (a) emphysema due to alveolar wall destruction and poor elastic recoil of lungs and (b) small airways narrowing and remodelling. However, concerns have been raised about the sensitivity of spirometry to detect...
Despite the huge and growing burden of COPD in India, over 98% of people living in urban slums of Pune city and its surrounding rural villages have never heard the word COPD. A call for a National COPD Prevention and Control Program was made in the past, yet very little has changed at the health-care policy level.

India now needs to start taking COPD very seriously. A recent American Thoracic Society workshop made ten specific recommendations for a country like India to tackle COPD effectively, namely (1) national respiratory societies should provide country-specific COPD management guidelines; (2) patient and professional organizations must persuade policy-makers of the importance of lung function testing programs; (3) health-care education and training should emphasize the early-life origins of COPD; (4) urgent action is required by governments to reduce air borne exposures, including exposures to tobacco smoke and indoor and outdoor air pollution; (5) guidance for COPD should explicitly link across Essential Medicine Lists and the World Health Organization package of essential noncommunicable disease interventions for primary health care in low-resource settings and should consider availability, affordability, sustainability, and cost-effective use of medicines; (6) the pharmaceutical industry should work to make effective COPD and tobacco-dependence medicines globally accessible and affordable; (7) implementation of locally adapted, cost-effective pulmonary rehabilitation programs should be an international priority; (8) the World Health Organization Global Action Plan for the Prevention and Control of Noncommunicable Diseases should specify how improvements in respiratory health will be achieved; (9) research funders should increase the proportion of funding allocated to COPD; and (10) the respiratory community should leverage the skills and enthusiasm of earlier-career clinicians and researchers to improve global respiratory health. This blueprint suggested by the American Thoracic Society, if implemented, will contribute significantly to reducing the burden of COPD in India. It is now time to start taking COPD seriously before the burden of COPD overwhelms our health-care system and economy.

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