

# What are the practical implications of current data on the worldwide prevalence of COPD?

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The social and economic burden of cardiovascular diseases was recognized several decades ago and vigorous attempts were made to quantify the prevalence of these diseases, identify their risk factors, and introduce interventions aimed at reducing the burden of these common diseases. These efforts have been remarkably successful, to the extent that morbidity and mortality from cardiovascular diseases in developing countries have decreased markedly and it has been possible to apportion the decrease in deaths in the USA to better diagnosis, reduction in risk factors, and treatment [1]. We are a long way from this remarkable success in other chronic diseases such as diabetes and chronic obstructive pulmonary disease (COPD) [2].

Important first steps in mounting an effective public health program to control a disease are to quantify its social and economic burden and identify its risk factors. For COPD, we have known for over 40 years that smoking is the most important risk factor globally [2,3]. However, there have been a limited number of population-based surveys of COPD prevalence reported, and the results have shown wide variation [4]. It is likely that the variation is due to differences in population selection including the age of the population studied and response rate, different methods and varying quality control of the primary outcome, lung function, and the use of different definitions of COPD.

Data from the Burden of Obstructive Lung Disease (BOLD) Study site in Poland, reported in this issue [5], provide important new information about the prevalence of COPD in a sample of residents in the Małopolska region in the southern part of Poland. Nizankowska and colleagues from Krakow report that the prevalence of COPD, defined as GOLD Stage 1 and higher, was 22.1% overall in their sample of adults aged 40 years and older; 27.7% in men and 16.6% in women. This represents an appreciably higher burden of COPD than previously reported. Using a more stringent criterion for COPD, GOLD Stage 2 which is commonly thought of as clinically

significant disease, the prevalence is 10.9% overall; 13.3% in men and 8.6% in women.

The BOLD Study was started in response to the initiation of the Global Initiative for Chronic Obstructive Lung Disease (GOLD). The goals of GOLD were to raise awareness of COPD and decrease morbidity and mortality from the disease [2]. As the first GOLD Report was being written, it became apparent that the paucity of available prevalence data in most countries would limit the effectiveness of the GOLD program. The BOLD study was started to address this gap in knowledge [6]. The first step was to develop standardized methods for estimating COPD prevalence that could be used in countries at all stages of economic development [6]. The weaknesses of some of the earlier prevalence surveys were addressed by building in very strict quality control and careful oversight of all stages of the study by a central Operations Center. To date, 13 countries have completed the BOLD survey and the first cross-site analysis of data from the first 12 countries to finish was reported recently [7].

In the first cross-site paper from the BOLD Study [7], the focus was on the prevalence of GOLD Stage 2 and higher (clinically significant) COPD and its association with smoking and age, the two most important risk factors. In the paper from Nizankowska and colleagues reported in this issue [5], the investigators dig deeper into their extensive data set and report on the relationship of COPD and educational level, and provide more data about COPD in never-smokers in their sample. Socio-economic status has consistently been shown to be an important risk factor, although the reason why socio-economic status is a risk factor is unclear. We used educational level as a surrogate for socio-economic status and, as shown in Nizankowska's report, COPD is clearly more common in those with a lower educational background. Education remains an independent risk factor, even when smoking is taken into consideration, so there must be other risk factors that track with educational level. Possible examples might be greater exposure to occupational particulates, more frequent or severe lower respiratory infections in childhood and poorer nutrition. Cross-sectional data allow us to pose such hypotheses which must then be answered by studies specifically designed to address them.

Nizankowska's paper also highlights the importance of COPD in never-smokers. They report that 17.8 % of never-smokers (20.1% in women and 12.3 % in men) met the crite-

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ria for GOLD Stage 1 and higher COPD (post-bronchodilator forced expiratory volume in the 1st second/forced vital capacity ratio  $<0.7$ ). These data are remarkable and puzzling since smoking is considered to be by far the most important risk factor in developed countries. In some, the presence of irreversible airflow limitation may reflect long-standing asthma, although asthma is usually thought of as a disease characterized by reversible not irreversible airflow limitation. This is a fertile area for research and the results from Poland, and the other BOLD countries, will help to develop hypotheses that can be tested.

What are the practical implications of the BOLD data for Poland and for the rest of the world? First, and most important, the social and economic burden of COPD is appreciably higher than previously thought and, as predicted by WHO [3], is likely to increase steadily as the world suffers from the effects of the epidemic of tobacco use and the world's population ages. Although most believe that the startling prediction that COPD will be the third leading cause of death worldwide by 2020 is a direct result of worldwide smoking, in reality the most important factor that is driving the steady rise in COPD mortality is the changing global demographics with life expectancy increasing especially in developing countries.

Second, there is no escaping the fact that smoking is the most important preventable risk factor for COPD and every effort must be made to decrease smoking rates and discourage teenagers from starting to smoke. This is particularly important for girls as they are smoking in larger numbers than boys and there is increasing evidence that women may be at greater risk of COPD, given the same dose or exposure [2]. Legislation to limit smoking in all public places is proving to be a very effective way to reduce smoking rates in many countries.

We still have a long way to go to show a decline in COPD morbidity and mortality. In particular, we need health care professionals to do a better job of early diagnosis so that intervention can be started early, when it is most effective. We also need better drugs that can modify the course of COPD once it has become evident [8]. To date, the available armamentarium of drugs is effective in alleviating symptoms but not effective in modifying the natural history of COPD. To look on the positive side, however, studies such as BOLD are helping to raise awareness and are stimulating research so that we will have a better understanding of the distribution of and risk factors

for COPD. This in turn will lead to more effective strategies for intervention and eventually to a downturn in the upward trajectory of the social and economic burden of COPD.

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## From Editor

**Synopsis:** Buist AS, McBurnie MA, Vollmer WM, et al. International variation in the prevalence of COPD (The BOLD Study): a population-based prevalence study. *Lancet.* 2007; 370: 741–750.

This cross-sectional study assessed prevalence of COPD and its risk factors in 12 countries. Based on data from 9425 participants, prevalence of COPD overall and in individual stages was found to be different between countries (COPD overall: for men – from 15.2% in China to 28.7% in South Africa, 27.7% in Poland; for women – from 7.6% in China to 25.7% in Austria, 16.7% in Poland) and greater for men than for women. The risk of stage II or higher COPD increases with age – approx. 2-fold for every 10 years; and with exposure to tobacco smoke – approx. 1.2-fold for every 10 pack-years.

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