

A snapshot of chronic obstructive pulmonary disease in British Columbia and Canada

Greater utilization of spirometry and pulmonary rehabilitation could relieve some of the health care burden caused by a rise in COPD prevalence and mortality rates.

ABSTRACT: Chronic obstructive pulmonary disease (COPD) is a highly prevalent condition worldwide; Canadian and BC prevalence estimates vary but range from approximately 5% to 15% of the population aged 45 years and older. COPD is a leading cause of mortality and is expected to be the third leading cause of death worldwide by the year 2020, with much of this increase resulting from an exponential rise in COPD mortality among women. Despite the potential for spirometry and pulmonary rehabilitation to reduce the enormous burden of this disease, spirometry utilization in BC is low and there is limited access to pulmonary rehabilitation programs. Improvement in these areas could aid in early diagnosis and more effective management of COPD patients, with the potential for improving quality of life and other health outcomes.

Chronic obstructive pulmonary disease (COPD) is a highly prevalent disorder in British Columbia and is expected to be the third leading cause of death worldwide by 2020. Despite this there is a lack of awareness of the condition among medical professionals and the general public. A better understanding of the benefits provided by spirometry and pulmonary rehabilitation could lead to improved care strategies and a reduction in the prevalence and mortality rates for COPD in BC and Canada.

Prevalence

COPD is both underreported and underdiagnosed.^{1,2} Obtaining an accurate estimate of the true burden of COPD for BC and Canada is challenging, as the symptoms of COPD may not be present until airflow obstruction, a key feature of this disease, is already moderately to severely advanced. It is worrisome that the utilization of spirometry in individuals at risk has been extremely low, even though the Canadian Thoracic Society² and BC guidelines³ for COPD recommend that COPD be diagnosed based on a combination of clinical presentation and lung function testing. This has meant

that the bulk of information concerning COPD prevalence is based on surveys. In British Columbia, prevalence estimates from three data sources are strikingly different, probably due in part to differences in survey methodology.

Data source 1

National and provincial prevalence estimates of COPD are available from Statistics Canada via the Canadian Community Health Survey (CCHS).⁴ This self-report survey includes the question “Do you have chronic bronchitis or emphysema, as diagnosed by a health professional?” Based on data from the 2003 CCHS,⁴ the prevalence of chronic bronchitis and/or emphyse-

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ma in British Columbia is 4.7% for men and 5.9% for women aged 40 years or older. These estimates are far below the prevalence estimates for COPD in the Maritime provinces, but still higher than estimates in the Prairie provinces (Figure 1). The lower prevalence of COPD in British Columbia may be due to smoking rates that are lower than in other provinces in Canada.⁵ However, it should be noted that these and other estimates may also mask important differences in prevalence in high-risk groups or regions. High-risk groups may include First Nations and other Aboriginal populations, whose reserve members are routinely excluded from population health surveys or are not captured in administrative health data.

Data source 2

The prevalence estimates obtained from the British Columbia Ministry of Health administrative databases are similar to those available from CCHS. Using a COPD case definition of two physician visits or one hospitalization for COPD per year, physician claims and hospital discharge data were searched for COPD cases.⁶ The 2003–2004 prevalence estimate for COPD in BC was 4.4% for men and 4.0% for women, representing 73 747 British Columbians aged 45 years and older, with the prevalence increasing to 16% for individuals aged 85 years and older. Interestingly, the male-female ratio for prevalence seems to be dependent on the methodology used; men appear to have a higher prevalence based on administrative health data, while women appear to have a higher prevalence based on self-report data.

Data source 3

A randomly sampled, population-based study currently underway is designed to measure the burden of lung

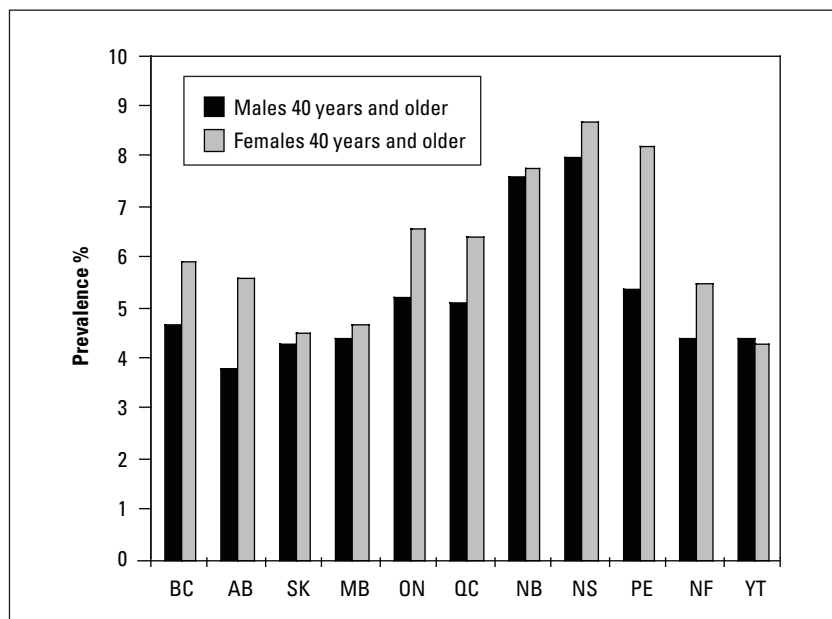


Figure 1. Estimates of COPD prevalence, based on self-report data from the Canadian Community Health Survey, 2003.⁴

disease (BOLD study). Based on questionnaires plus spirometry, this study will estimate the prevalence of COPD in Vancouver⁷ and other Canadian cities. Preliminary results from this study suggest that the CCHS self-report data and the BC government's administrative health data both grossly underestimate prevalence by as much as 70%. It is important to note that this estimate is based on the Vancouver population only. It is not known how this compares with other regions in British Columbia, especially in the Northern Health Authority where smoking rates are high. Nevertheless, these data do match findings from other studies that have explored the issue of underdiagnosis. In the United States, data from the National Health and Nutrition Examination Survey suggest that at least 63% of those with COPD are not diagnosed.⁸

Hospitalizations

Although the majority of COPD patients are not hospitalized with their

disease, hospital admissions for COPD or COPD-related conditions place an enormous burden on Canada's health care system. In Canada, the 1996 to 1999 COPD hospitalization rate was 853 hospitalizations for COPD per 100 000 population aged 55 years and older.⁵ In comparison with other provinces, British Columbia fares well. British Columbia had the lowest 3-year (1996 to 1999) average hospitalization rate for COPD (555 hospitalizations per 100 000 in the 55 years and older population).⁵ In contrast, the Northwest Territories had the highest rate (3083 hospitalizations per 100 000).

Although British Columbia may have lower hospitalization rates for COPD than other parts of the country, the burden of illness is still very large. A recent Canadian study on resource use in COPD found that in a sample of 524 COPD patients followed for one year, 14% were admitted to hospital with an average length of stay of 13.2 days.⁹ Using the estimate of 73 747

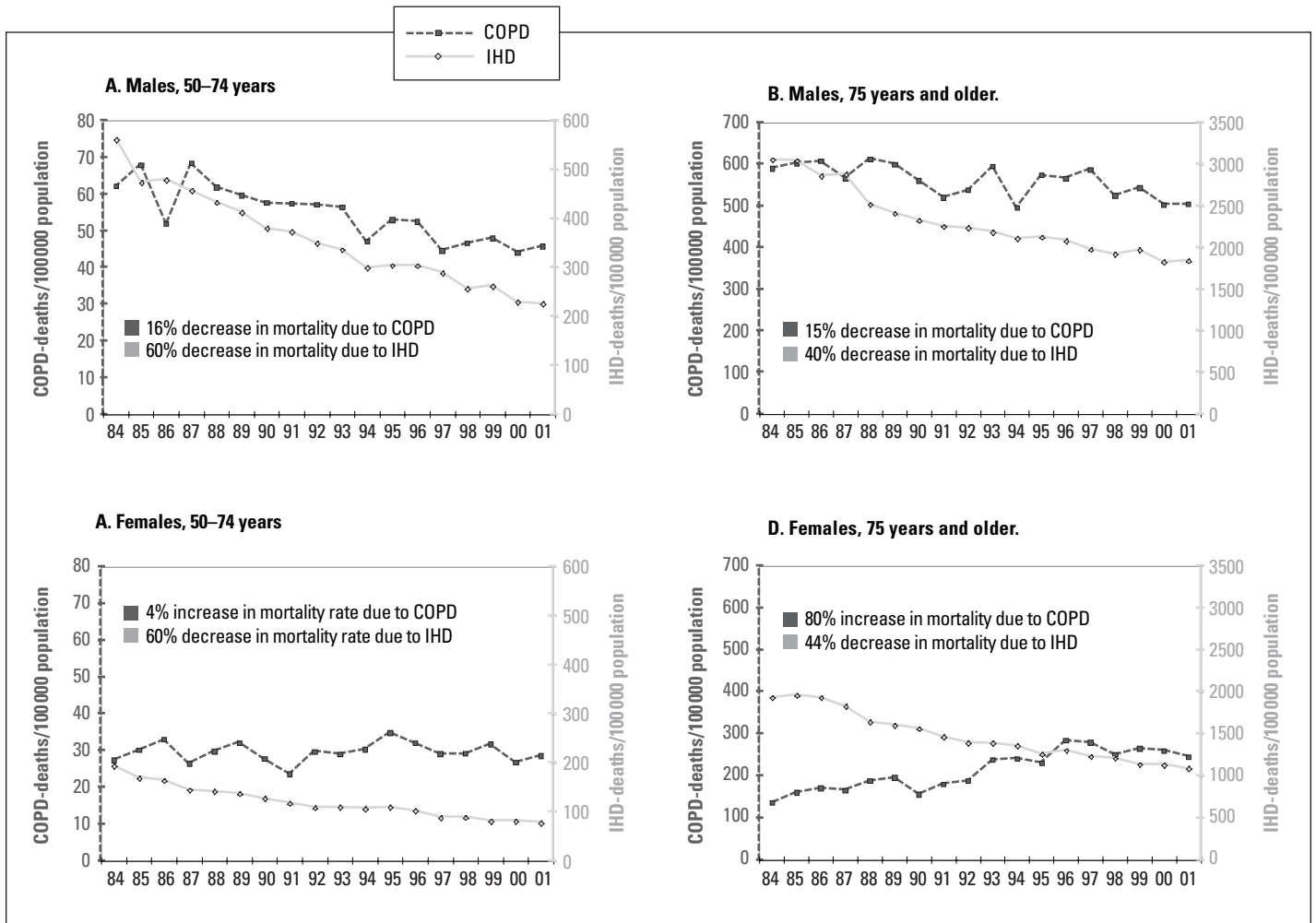


Figure 2. Age-standardized mortality due to chronic obstructive pulmonary disease (COPD) or ischemic heart disease (IHD) in BC, 1984–2001.

British Columbians with COPD,⁵ this translates to approximately 136 000 inpatient days per year. Perhaps an even more alarming statistic is that 9% of those BC COPD patients discharged from hospital after an acute exacerbation are readmitted to hospital *within 15 days*.⁶ This suggests a gap in care, since these readmissions are likely related to the initial exacerbation of COPD and subsequent hospitalization. Better discharge transition to home and follow-up using community health services or telehealth initiatives may reduce this readmission rate.

Mortality

COPD is the fourth leading cause of death in Canada and is expected to be the third leading cause of death worldwide by 2020. In the United States, it is the only leading cause of death where the mortality rate *increased* between 1965 and 1998.¹

Mortality data for COPD are available at the national and provincial levels from the Public Health Agency of Canada and Statistics Canada. Using the codes for COPD (J40-44) from the *International Statistical Classification of Diseases, 10th revision*, the British Columbia mortality

rate for 1997 was 27.1 per 100 000, lower than the Canadian rate of 30.4 per 100 000.⁵ This rate likely underestimates the true burden of COPD-related mortality, as pneumonia or another respiratory tract infection may be listed as the primary cause of death in COPD patients.

Trends in mortality due to COPD and other leading causes of death have changed over time in British Columbia (**Figure 2**). Based on data available from the Public Health Agency Major Chronic Diseases online surveillance (http://dsol-smed.phac-aspc.gc.ca/dsol-smed/mcd-smcm/index_e

.html), men 50 years and older have experienced a large decrease in mortality due to ischemic heart disease (IHD) and a much smaller decrease in mortality due to COPD from 1984 to 2001. In contrast, women 50 years and older have experienced a similar decrease in mortality due to IHD, but have experienced an increase in COPD-related mortality. This is most striking in the 75 years and older age group, with an 80% increase in COPD-related mortality for women from 1984 to 2001. Again, these mortality rates likely underestimate the impact of COPD mortality on high-risk groups. When looking at Canadian data, the highest rates for COPD mortality were in the Northwest Territories, with rates almost three times higher than those in British Columbia.⁵ The large Aboriginal population in northern communities may be bearing a much larger burden of mortality than is indicated in our provincial data.

Spirometry use and pulmonary rehabilitation

By definition, COPD is a disease state characterized by chronic expiratory airflow limitation. In order to accurately diagnose COPD and distinguish it from other diseases that cause shortness of breath, such as asthma, pulmonary fibrosis, and congestive heart failure, spirometry must be performed. Yet this important diagnostic tool is underutilized in Canada and British Columbia. In one study in which medical records from Toronto's Gender, Asthma and COPD Clinic were studied, only 20% of the women who were candidates for spirometry had undergone this diagnostic test. This percentage increased to just 37% after specific interventions designed to reinforce COPD guidelines and improve access to spirometry services were implemented.¹⁰

Similar results have been reported in British Columbia. In 2002–2003, only 37% of newly diagnosed COPD patients had undergone spirometry in either the year before or the year after diagnosis. The reasons for this underutilization are not clear, but may include physician discomfort with test interpretation, lack of accessibility to testing facilities, and a general perception of a lack of need for spirometry in making a COPD diagnosis.

rehabilitation program.¹³ Anecdotally, in BC most of these programs are located in the Lower Mainland, and even these see only a fraction of COPD patients in their communities. Patients living in remote communities have higher COPD prevalence but fewer options when it comes to exercise programs with qualified staff experienced in prescribing exercise for respiratory patients.

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Pulmonary rehabilitation is a key component in the management of COPD patients. Increased quality of life, improved exercise capacity, and reduced hospitalizations after pulmonary rehabilitation have all been reported.^{11,12} However, the number of pulmonary rehabilitation programs available falls far short of demand. Despite the recommendations from national² and provincial COPD guidelines³ that clinically stable COPD patients with activity limitations be referred to formal exercise programs, recent Canadian data show that only 1.2% of the Canadian COPD population has participated in a pulmonary

Conclusions

Although current data sources probably substantially underestimate the numbers, COPD is clearly a highly prevalent chronic condition in BC and Canada. Discordance in reported prevalence of COPD is likely due to differences in survey methodology, as well as actual differences from province to province. The disease results in a tremendous burden in terms of morbidity, mortality, and health care utilization. Increased utilization of spirometry by primary care physicians would be extremely helpful for earlier and more precise identification of COPD in patients at risk, which could

translate into more active intervention strategies targeting prevention and optimal management strategies. There is strong evidence supporting the benefits of interdisciplinary pulmonary rehabilitation. Increased access to such programs would help improve function and quality of life for our COPD patients while reducing health care expenditures in BC.

Competing interests

None declared.

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