

The Economic and Health Burden of COPD in North America: Forecasting Through 2050

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Rationale: Chronic obstructive pulmonary disease (COPD) is a leading cause of death in North America and worldwide, and is growing in importance with the aging of the population and the increasing recognition of various risk factors including household air pollution. In order to inform and strengthen health systems, here we report results from a dynamic open cohort Markov model whereby we forecast the future economic and health burden of COPD through 2050 in North America. **Methods:** Using country-specific data for the United States (US) and Canada, derived from publicly available datasets, an open cohort Markov model was developed to simulate population dynamics from 2019 to 2050. Population growth was modeled across different subgroups of age, sex, and smoking status. COPD costs were calibrated for these different subgroups, and distributions of COPD severity grades (using GOLD criteria) were modeled based on smoking status and exposure to household air pollution. Direct healthcare costs, indirect absenteeism costs, and numbers of exacerbations associated with COPD were projected to 2050. Costs were adjusted for currency exchange rate and Consumer Price Index to match the US dollar in 2019. **Results:** We estimated that by 2050, the total cumulative direct health care cost of COPD across North America would be \$2.5T (\$81B annually), including \$2.4T in the US and \$84B in Canada. For total cumulative indirect costs (from absenteeism and loss of work productivity), we estimated \$1.7T (\$53B annually) including \$1.5T in the US and \$174B in Canada. The total cumulative number of COPD exacerbations was projected to be 815M (27M annually), including 732M in the US and 83M in Canada. **Conclusion:** The economic burden of COPD in North America is substantial and is likely to continue to grow in the coming years. These data may help to inform efforts with advocacy and/or help to prioritize expenditures strategically. Efforts to prevent and/or mitigate these health care and societal costs will be imperative.

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