

## Health Fact Sheets

# Chronic obstructive pulmonary disease under-diagnosed in Canadian adults: Results from cycles 3 and 4 (2012 to 2015) of the Canadian Health Measures Survey



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- . not available for any reference period
- .. not available for a specific reference period
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- 0 true zero or a value rounded to zero
- 0<sup>s</sup> value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- <sup>P</sup> preliminary
- <sup>r</sup> revised
- X suppressed to meet the confidentiality requirements of the *Statistics Act*
- <sup>E</sup> use with caution
- F too unreliable to be published
- \* significantly different from reference category ( $p < 0.05$ )

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Results from cycles 3 and 4 (2012 to 2015) of the Canadian Health Measures Survey (CHMS) suggest that chronic obstructive pulmonary disease (COPD) is under-diagnosed in Canadian adults. This is based on the disparity between the proportion of Canadian adults who reported having been diagnosed with COPD and the proportion of Canadian adults who had a measured airflow obstruction consistent with COPD.

COPD is a condition characterized by a progressive and chronic airflow obstruction, shortness of breath, persistent wheezing and coughing, and sputum production that occurs primarily in adults over the age of 35. Chronic bronchitis and emphysema are the two most common forms of COPD and cigarette smoking is responsible for 80% to 90% of all COPD cases,<sup>1</sup> suggesting that the majority of cases can be prevented. Other contributing factors may include outdoor, indoor and occupational air pollution.<sup>1</sup> Although airflow obstruction is not fully reversible, COPD can be treated and the symptoms controlled with proper medication and exercise programs.<sup>2,3</sup>

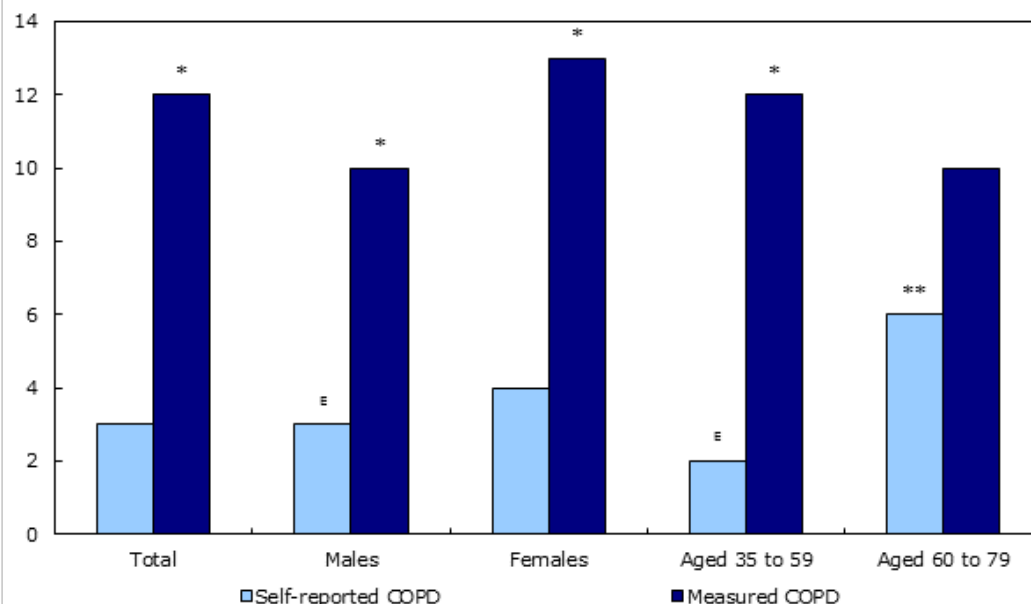
The CHMS used a health questionnaire to determine whether or not respondents were previously diagnosed with COPD.<sup>4</sup> Respondents considered to have diagnosed COPD were those who reported having been diagnosed with COPD, chronic bronchitis or emphysema by a health care professional. Combined data from cycles 3 and 4 (2012 to 2015) of the CHMS showed that 3% of Canadians aged 35 to 79 years reported a diagnosis of COPD (Chart 1). The prevalence of self-reported COPD diagnosis was not significantly different for men (3%) and women (4%). COPD diagnosis reporting was significantly greater in older adults aged 60 to 79 years (6%) than younger adults aged 35 to 59 years (2%).

The CHMS also conducted a spirometry test to measure lung function (see “About spirometry and COPD” below). The results from cycles 3 and 4 (2012 to 2015) indicate that 12% of Canadians 35 to 79 years of age had a measured airflow obstruction consistent with COPD (Chart 1). The prevalence of measured COPD did not differ significantly between sexes nor between age groups.

There were, however, significant differences between the prevalence of self-reported and measured COPD (Chart 1).

**Chart 1**  
**Self-reported versus measured chronic obstructive pulmonary disease (COPD) in adults aged 35 to 79, by sex and age group, household population, Canada, 2012 to 2015**

percent



‡ use with caution (data with a coefficient of variation (CV) from 16.6% to 33.3%)

\* significantly different from self-reported COPD ( $p < 0.0001$ )

\*\* significantly different from estimate for age group 35 to 59 ( $p < 0.001$ )

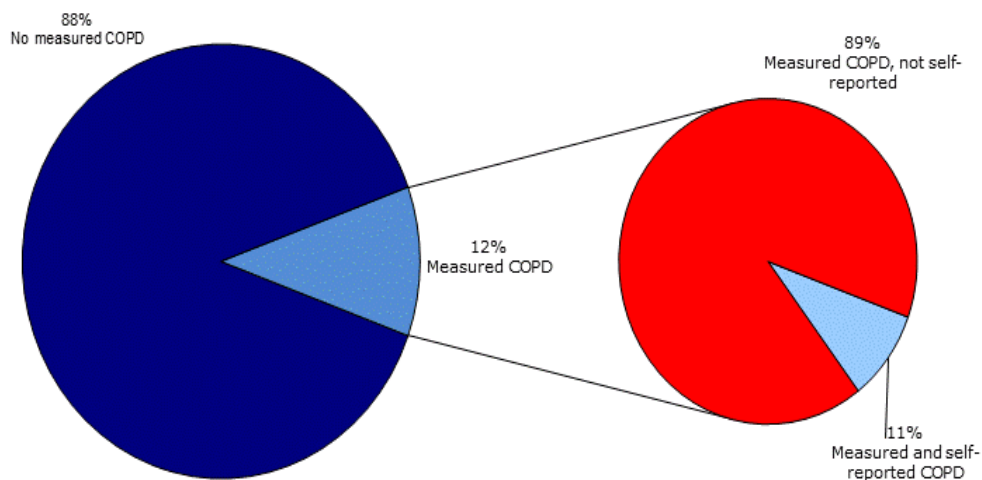
**Source:** Canadian Health Measures Survey, Cycle 3 (2012 and 2013) and Cycle 4 (2014 and 2015).

Among the 12% of 35- to 79-year old Canadians with measured airflow obstruction consistent with COPD, only 11% reported that they had previously been diagnosed by a health care professional (Chart 2). When asked, the vast majority (89%) reported that they had not previously been diagnosed by a health care professional.

Under-diagnosis was the least prevalent among older adults. Over 24% of the 60- to 79-year old population with measured airflow obstruction consistent with COPD reported a diagnosis whereas only 6% of the 35- to 59-year-olds were aware of their condition (data not shown).

On the other hand, 2% of the 35- to 79-year old population with normal lung function results reported that they had been diagnosed with COPD by a health care professional (data not shown). However, it could not be determined whether this was due to an over-diagnosis of COPD or to the use of medication to control airflow obstruction.

**Chart 2**  
Percentage of adults aged 35 to 79, by self-reported<sup>1</sup> and measured<sup>2</sup> chronic obstructive pulmonary disease (COPD), household population, Canada, 2012 to 2015



1. Self-reported COPD is based on a self-reported diagnosis of COPD, chronic bronchitis or emphysema by a health care professional.  
2. Measured COPD is defined as having a forced expiratory volume for one second to the forced vital capacity (FEV1/FVC) ratio less than the lower limit of normal (LLN).

**Source:** Canadian Health Measures Survey, Cycle 3 (2012 and 2013) and Cycle 4 (2014 and 2015).

Results from the cycles 3 and 4 (2012 to 2015) of the CHMS support the link between COPD and smoking noted in the literature.<sup>1</sup> Of the 12% of 35- to 79-year-olds with measured COPD, 74% of them reported that they were smokers or had a history of smoking (data not shown).

## About spirometry and COPD

Spirometry is a functional tool that measures the volume of air an individual inhales and exhales in addition to the speed at which the air is moved in or out of the lungs. In the same manner that blood pressure measurements provide important information about general cardiovascular health, spirometry is invaluable as a screening tool for general respiratory health. Used alongside other respiratory tests, spirometry allows medical practitioners to monitor respiratory health for conditions such as COPD. Spirometry results are interpreted by comparing measurements to the expected values for a normal healthy individual of the same sex and similar age with the same body dimensions and ethnic characteristics.<sup>5</sup>

The spirometry measurements of primary interest for COPD diagnosis are:

- Forced vital capacity (FVC): the total volume of air that can be forcibly exhaled after a maximum inspiration.
- Forced expiratory volume in one second (FEV<sub>1</sub>): the volume of air that can be forcibly exhaled in the first second of a FVC manoeuvre.
- The FEV<sub>1</sub> to FVC ratio (FEV<sub>1</sub>/FVC) is used as the value for diagnostic purposes.

Self-reported COPD was determined from the health questionnaire administered as part of the CHMS. Respondents were asked if they had ever been diagnosed with COPD, chronic bronchitis or emphysema by a health care professional.

An airflow obstruction consistent with COPD was based on measured spirometry results where the FEV<sub>1</sub>/FVC was below the lower limit of normal (LLN).<sup>6</sup> The LLN takes into account ethnicity, height, age and sex, and establishes a cut-off value for the FEV<sub>1</sub>/FVC. This value represents the highest FEV<sub>1</sub>/FVC ratio among the 5% of the population with the lowest FEV<sub>1</sub>/FVC results. In other words, 95% of the healthy population falls above this set value. This approach allows for a more appropriate and accurate measure and diagnosis of COPD.<sup>7,8</sup> However, it is important to note that asthma also causes a reduction in spirometry measurements and could not be separated for this report as a post-bronchodilator test was not administered.

## Data

Canadian Health Measures Survey data related to this fact sheet are available in CANSIM table 117-0011.

For more information on the Canadian Health Measures Survey, please contact Statistics Canada's Statistical Information Service (toll-free 1-800-263-1136; 514-283-8300; STATCAN.infostats-infostats.STATCAN@canada.ca).

Aussi disponible en français. ([www.statcan.gc.ca/cgi-bin/change.cgi](http://www.statcan.gc.ca/cgi-bin/change.cgi) )

## Notes

- 1 Public Health Agency of Canada. 2013. *Chronic Pulmonary Obstructive Disease (COPD)*. <http://www.phac-aspc.gc.ca/cd-mc/crd-mrc/copd-mpoc-eng.php>. (accessed: November 21, 2016).
- 2 Canadian Lung Association. 2013. *Chronic Obstructive Pulmonary Disease (COPD)*. <http://www.lung.ca/COPD>. (accessed: November 21, 2016).
- 3 Public Health Agency of Canada. 2008. *I Have COPD. Why is it Important for me to Exercise?* [http://www.phac-aspc.gc.ca/cd-mc/crd-mrc/copd\\_exercise-mpoc\\_exercice-eng.php](http://www.phac-aspc.gc.ca/cd-mc/crd-mrc/copd_exercise-mpoc_exercice-eng.php). (accessed: November 21, 2016).
- 4 Data from Cycle 3 (2012 and 2013) and Cycle 4 (2014 and 2015) of the Canadian Health Measures Survey were combined for this fact sheet.

- 5 Hankinson, J.L., Odencrantz, J., and K. Fedan. 1999. "Spirometric reference values from a sample of the general U.S. population." *American Journal of Respiratory and Critical Care Medicine*. Vol. 159.
- 6 Miller, M.R., Hankinson, J., Brusasco, V., et al. 2005. "Standardisation of spirometry." *European Respiratory Journal*. Vol. 26, no. 2.
- 7 Swanney, M.P., Ruppel, G., Enright, P., et al. 2008. "Using the lower limit of normal for the FEV<sub>1</sub>/FVC ratio reduces the misclassification of airway obstruction." *Thorax*. Vol. 63.
- 8 Aggarwal, A.N. 2008. "How appropriate is the gold standard for diagnosis of airway obstruction?" *Lung India: Official Organ of Indian Chest Society*. Vol. 25.