# Population-based case-finding to identify airflow obstruction in symptomatic adults at high risk for asthma and COPD

*Reply to J.L. Perret and co-workers*:

We appreciate the interest of the correspondents in our article and their thoughtful comments about methodological considerations that affect the interpretation of our results [1]. We are pleased to have this opportunity to reply to the questions posed by J.L. Perret and colleagues.

In brief, our study investigated a representative sample of Canadian adults who had two distinct characteristics: 1) self-reported breathing problems; and 2) no previous physician diagnosis of asthma, COPD, cystic fibrosis, bronchiectasis, pulmonary fibrosis or lung cancer. Random digit dialling was used to reach contacts who reported breathing problems in the past 6 months and met other eligibility requirements. To ensure reported symptoms were significant, each qualified contact completed the Asthma Screening Questionnaire (ASQ) and COPD-Diagnostic Questionnaire (COPD-DQ) in a telephone interview. Our article gives the precise thresholds used in this screening step. Individuals exceeding the requisite thresholds were invited to join the study, where they were given spirometry to establish if they met conventional criteria for a diagnosis of obstructive lung disease, namely either asthma or COPD.

To speak to the concerns of the correspondents, we note that our study population is not the whole Canadian adult population but rather a subpopulation that we anticipate is enriched for cases of obstructive lung disease. We specifically designed our study as a case–finding study, to detect undiagnosed obstructive lung disease in subjects with significant respiratory symptoms, rather than as a screening study of asymptomatic individuals from the general population. Our study therefore can make no comment on the extent of undiagnosed obstructive lung disease that may be present among Canadian adults who do not have symptom scores that exceed our enrolment thresholds. Our selected thresholds for ASQ and COPD-DQ scores were chosen in order to define and set a minimum threshold for the degree of breathing difficulty that would characterise our study population. Validating the ASQ and COPD-DQ questionnaires was not an objective of our study and, indeed, we acknowledge that these questionnaires are being used outside their intended scope of application. We report receiver operating characteristic results for the ASC and COPD-DQ questionnaires, but these results are necessarily applicable only to the truncated score ranges for these instruments encountered in our study population.

We agree with J.L. Perret and colleagues, and we acknowledged in our paper, that a potential limitation of our study is that we did not continue testing subjects who had normal pre- and post-bronchodilator spirometry with bronchial challenge tests. It is thus possible that some cases of mild asthma were missed by our study, and we acknowledge that this may have affected the performance of the ASQ.

Our study population is intended to be a fair facsimile of an adult population with significant breathing problems that might be encountered in a community-based case-finding campaign. The eight-item questionnaire in our report is a demonstration case-finding instrument, which was constructed from questions administered in our study. Items in the questionnaire were selected using stepwise logistic regression procedures with the aim of achieving adequate predictive power for detection of obstructive lung disease. The correspondents reasonably note that more advanced model selection methods (machine learning with a larger array of predictors formed by non-linear transformations, interactions, and the like), and use of the TRIPOD checklist for diagnostic prediction models, might have yielded a more powerful instrument. We did not validate our 8-item questionnaire with new data; however, our study continues its

recruitment within a much broader mandate. Our ongoing study will offer new opportunities for rigorous prospective validation of an improved case-finding questionnaire that may find application in community-based case-finding campaigns.

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## References
1    Preteroti M, Whitmore GA, Vandemheen KL, *et al*. Population-based case-finding to identify subjects with undiagnosed asthma or COPD. *Eur Respir J* 2020; 55: 2000024.