Reviewer's report

Title: General practice variation in spirometry testing among patients receiving first-time prescriptions for medication targeting obstructive lung disease in Denmark: A population-based observational study

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Reviewer: Tjard Schermer

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In this paper Koefoed and colleagues report a data linkage study on practice variation in spirometry testing in Danish general practices. The study contributes some relevant new data to what is currently known on the issue of spirometry uptake and implementation in primary care. My comments are as follows.

Major Compulsory Revisions

1. In the paper the authors do not describe how spirometry is organized in Danish general practices. I can imagine that, like in other countries, healthcare professionals other than GPs (also) perform the spirometry tests. This could mean that some essential practice characteristics (for instance, presence of a (spirometry trained) practice nurse in the practice) that could explain part of the variation between practices are not included in the study.

2. The definition of the primary outcome (Methods, last sentence before ‘Statistical analysis’) does not seem to match with the aim of the study. Shouldn’t ‘….. patients within practice who had spirometry performed ….’ read ‘….. adult patients receiving a first-time prescription for respiratory medication within practices who had spirometry performed ….’?

3. I would like to see a graph (e.g., histogram or scatter plot) in which the primary outcome for each individual practice is shown, in order to gain insight in the actual distribution of the outcome and the variation between practices.

4. The Odds Ratios are statistically significant, which is not surprising given the large number of data points. The authors should define in the Methods section what they consider a relevant association between characteristics and the outcome. In other words, which minimum value should the OR have in order for it to express a relevant association?

5. A limitation of the results as reported is that the authors do not further distinguish between certain characteristics of the patients in their analysis. For instance, more in-depth analyses of whether or not spirometry is performed in a patient in relation to the type of respiratory medication prescribed (i.e., inhaled corticosteroids, non-steroid anti-inflammatory drugs, short-acting bronchodilators, long-acting bronchodilators; in the current analysis the authors pooled all R03 codes). Same for type of diagnostic label (i.e. COPD, asthma, if available in the data), gender, etc. Adding results from such analyses would make the paper more valuable.
6. Are all spirometry tests that are performed in Danish general practices recorded in the National Health Service Register, or could it be that some practices are using stand-alone spirometers and perform tests that are not entered in this system? If this is the case, this could introduce information bias in the results.

7. What do the authors consider to be the primary analysis: the crude/unadjusted analysis, the analysis adjusted for patient characteristics, or the analysis adjusted for patient characteristics and practice characteristics? This should be stated in the statistical analysis paragraph in the Methods section.

8. What do the authors mean with ‘observed variation is clinically meaningful or a possible quality gap’ on the final page of the Discussion section? Both ‘clinically meaningful’ and ‘possible quality gap’ require further clarification.

9. It seems to me that the authors have not identified all relevant previous studies related to the topic, for instance:

Minor Essential Revisions

10. The analyzed data were from the year 2008, now 5 years ago. Is there any reason to expect that in 2013 the findings would have been different? (For instance, by introduction of new guidelines for GPs regarding COPD or asthma) in the subsequent years.) The authors could add a sentence or two to Discussion section to address this.

11. English needs some editing: for instance ‘low age’ should be ‘young age’

Discretionary Revisions

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests.