**Reviewer’s report**

**Title:** Determinants of the range of drugs prescribed in general practice: a cross-sectional analysis

**Version: 1 Date:** 19 January 2007

**Reviewer:** Petra Denig

**Reviewer’s report:**

**General**

This study shows that the range of drugs prescribed varies between GPs and therapeutic groups. An attempt is made to link various GP and practice characteristics to this range. The factors included appear to be driven more by the availability of the data than by theoretical considerations. Several hypotheses state that the direction of the relationship can be either positive or negative. The foundation for some others is not clear. The findings that the range of drugs prescribed is larger for GPs with larger patient lists and higher prescribing volumes, and for GPs who frequently receive representatives from the pharmaceutical industry confirm what was already known. It would be interesting to link the ranges observed within therapeutic (sub)groups to ranges that are considered sufficient for general practice.

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**Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)**

1. The definition of variation in drug prescribing is confusing. In the introduction it is stated that little is known about the variation in drug prescribing containing the same active substance but this study focuses on variation within therapeutic groups of drugs. This is not the same as the number of drugs containing the same active substance.
2. The choice of determinants included at practice and GP level in the model is not clear. Why is prescriptions per patients (only?) included at practice level, whereas it is linked to the GP in according to what is stated in the methods.
3. Percentage of prescriptions per patients could be a proxy for having more patients with more morbidity, and having more prescriptions included from specialists. The pearson correlations appear to point in that direction (0.29 with elderly, 0.43 with dispensing). Little attention is paid to this problem in the discussion. Moreover, the authors state that the correlations between the explanatory variables are moderate at most (table 3), while many are much higher than the bivariate correlations with overall range (table 2).
4. Some interpretations and conclusions made do not appear to be based on the results nor on what is known from previous studies, e.g.:
   - ‘The material shows this (i.e. the range) to be a useful addition (to usual measures).’
   - In my opinion, the finding that there are clear variations between (sub)groups does not tell anything about quality. Also, the finding that GPs with larger patients lists and higher prescribing volumes may be indicative of a higher need for more different drugs and casemix differences. As others have shown, when you correct for practice size, theoretically interpretable relationships may disappear (Dybdahl e.a. 2005).
   - ‘That a broader drug repertory could increase the inclination to prescribe’. Are there studies to support this explanation?
   - When information from the industry comes into a practice through one GP in a group practice, why would this be quicker in comparison to information that comes directly to a GP working single handed?
   - Is there literature to support the statement that working in a group practice is often associated with a stronger orientation to esteem by colleagues?

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**Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)**

5. This manuscript appears to be not carefully prepared. The first paragraph of the introduction is repeated almost literally in the second paragraph. The numbering of the references is not in sequence. In the discussion, no references are provided at all.
6. Why is reference 8 (Bjerrum 1999) mentioned but not a more relevant study of Bjerrum e.a. in the Scan J Prim Health Care 2000?
7. It is not really clear which literature or theoretical consideration form the bases for the hypotheses. Based on previous studies (2,5,8) one would expect some hypotheses, and also references 9-11 are mentioned as
providing relevant determinants, but most of the hypotheses are not referring to these studies.
8. ‘GPs’ pharmaceutical knowledge and information sources’ should be changed in ‘GPs’ information sources’ since knowledge is not measured.
9. I am not sure what is meant by the sentence in Methods that factor analysis showed that the scores for the subgroups were unidimensional.
10. Can you explain that there was no significant variation at practice level in the empty model, but a strong clustering within practices (and sufficient variation in overall range)?

Discretionary Revisions (which the author can choose to ignore)

11. It would be interesting to say it bit more about the ranges within therapeutic groups in relation to how many of such drugs should be sufficient for a general practitioner. This could be done, for instance, by linking the ranges to the average number of different drugs recommended per group in several formularies in the Netherlands. In this way, more light is shed on the quality issue.
12. The selection of some ATC3 and some ATC4 groups is a bit arbitrary, and leads to possible artifacts when looking at the range as a % of drugs on the market. Especially in subgroups with few drugs (10 or less), this range is likely (and indeed found) to be higher. In the Results, I do not understand what the authors want to say with the statement that ‘...the percentage of available drugs used was low in both antibacterials and antipsychotics shows that a low percentage of available drugs used does not imply little variation.’ Just selecting two examples does not ‘show’ much.
13. It seems strange to choose for a one-tailed testing when some hypotheses are not in one direction.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory 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: Yes, but I do not feel adequately qualified to assess the statistics.

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