Author's response to reviews

Title: Which practice characteristics are associated with the quality of cardiovascular disease prevention in European primary care?

Authors:

Sabine Ludt (sabine.ludt@med.uni-heidelberg.de)
Stephen M Campbell (stephen.campbell@manchester.ac.uk)
Davorina Petek (davorina.petek@gmail.com)
Justine Rochon (rochon@imbi.uni-heidelberg.de)
Joachim Szecsenyi (joachim.szescenyi@med.uni-heidelberg.de)
Jan van Lieshout (J.vanLieshout@iq.umcn.nl)
Michel Wensing (M.Wensing@iq.umcn.nl)
Dominik Ose (dominik.ose@med.uni-heidelberg.de)

Version: 4 Date: 7 February 2013

Author's response to reviews: see over
Re: Implementation Science: MS: 1474525847799830

Wednesday, February 06, 2013

Dear Sir, dear Madam,

Thank you very much for giving us the opportunity to submit a revised version of our manuscript:

‘Which practice characteristics are associated with the quality of cardiovascular prevention in European primary care?’

We would like to express our thanks to the reviewers for the helpful and precise comments. In the following letter, we address the issues raised by the reviewers and follow the reviewers’ comments (in italic) point by point.

We revised the paper very carefully and followed, in particular the methodological advice of Jonathan Benn. According to the reviewer’s comments, we tried to give more details on the meaning of single practice items and revised the factor analysis allowing more factors (4) to be extracted. Furthermore, we conducted single item regression analyses to separate the most important practice capacities.

We hope the revised manuscript is now acceptable for publication in Implementation Science. Please do not hesitate to contact us if further clarifications should be required.

Yours sincerely,

Sabine Ludt

For the authors
Reviewer 1:

**Reviewer's report**

**Title:** Which practice characteristics are associated with the quality of cardiovascular prevention in European primary care?

**Version:** 3  **Date:** 2 October 2012  
**Reviewer:** Nicholas Steel

**Reviewer's report:**

**Major comments**

Thank you for asking me to review this interesting paper which describes the relationship between practice characteristics and quality of preventive care for CVD for those at high risk, in an observational study of 267 practices in 9 European countries. The study was part of the European Practice assessment project.

1. The paper is clearly structured and generally well written. My main concern is with the reported association between practice ‘CVD-care’ score and ‘clinical performance’ score. If I have understood the paper correctly (and apologies if not), it seems to me that these measures would inevitably be statistically associated, as they measure very similar constructs. At the least, there is substantial overlap in their component measures. For example, CVD measure 4 (hypertension recall) is similar to QI 4 (hypertension record); CVD 7 (smoking cessation procedure) is similar to QI 7 (advice to quit smoking); CVD 8 (life style programme participation) is similar to QI 8 (advice for physical activity), and so on. Given this similarity I was not clear why the unsurprising statistical association had been tested for. If there was a hypothesis, that might have helped explain the purpose for the test.

The composite outcome measure is a composite score of 11 indicators, 9 process-indicators and 2 intermediate outcome indicators. The 9 outcome indicators are related to procedures that are recommended in clinical guidelines. Although some indicators and practice characteristics have similar issues (CVD-prevention), they differ from each other considerably in their practical and functional meaning:

- **QI 4:** A record of hypertension in the patient file does not automatically include a recall function. This is a special feature that has to be implemented and allowed for (e.g. in Germany it is not allowed!!). But the hypothesis is that practices that have recall-systems implemented are most likely to have a diagnosis of hypertension recorded that other practices.

In general, it was hypothesized that practices that are more active in CVD-prevention (e.g. participation in lifestyle programmes) and have more preventive services implemented (e.g. smoking cessation procedure) will have better outcomes related to the composite score, that also included 2 intermediate outcomes (RR-level and cholesterol-level). Looking at the results, this hypothesis was true for the UK, but not for Spain: Spain showed practice-scores above average but a poor result. On the other hand, Belgium had low practice scores but a composite quality score above average (see Tables 3 and 4).

The 55% overall achievement is interesting, as is the remarkable consistency between countries in the unadjusted scores in table 4. I would be much more interested in what this unique dataset can tell us about the factors driving the similarities and differences between European countries, rather than in the probably automatic correlation reported as the second finding, though obviously...
that interest may not be shared by the authors!

We also were interested in differences between European countries and addressed the comparison of countries concerning the quality of preventive care already in previous analyses and papers [1, 2]. The EPA Cardio project was also designed to identify best practice examples [3], to identify effective organisational and functional preventive services of general practices independent of health care systems (this study) [4] and to report on patient related outcomes [5-7]. In this part of the study, and in this paper, we were particularly interested in preventive services of practices and their impact on a composite outcome measure that does not only include process measures but also outcome measures, independent of different health care systems. As described in the background and the discussion sections of the manuscript, practice characteristics that represent good organisation of care and quality of care are not automatically correlated.

Minor comments
Abstract:
1. The conclusions state that quality is ‘improvable’ by certain characteristics. Given that this is a cross-sectional observational study, it would be better to state that there was an association, as clearly causation cannot be assumed.

We agree entirely with this comment and have revised the paragraph accordingly.

Background:
2. I became lost in the last sentence on page 5, which starts: ‘although some practice capacities….’ Could this be rephrased to be easier to understand?

We have rephrased this sentence.

3. The last sentence of the background and also of the discussion states that the international nature of the study provided some protection against confounders. This is not self-evident, and so could the reasons for this protection be explained?

We see your point. The word ‘confounder’ is unclear and maybe wrong in this context. We wanted to express that the inclusion of countries with different health care systems may increase the external validity of our results. We used a 3-level model with country as random factor (i.e. third level) to take into account the variation at country level.

The sentence has been removed in the background section and revised in the discussion.

Methods:
4. Figure 1 is referred to but not labelled. Box 1 is missing in my version.
There was some trouble with the uploading of some files. We will check the correct upload in the revised version of the manuscript.

5. Could the sample sizes of 36 practices and 30 patients per country be discussed more, particularly as most countries had less than 36 practices?

Details of the power calculation were described in the study protocol [8]: Based on a power = 0.80 and alpha = 0.05, and a 95% confidence interval of 60 to 70% (with an estimated average score of 65%), we calculated 493 patients per country. Due to practical reasons we assumed 36 practices per country as the maximum feasible number (n = 14 per practice). We discussed the difficulties of enrolling 36 practices in the limitations section.

6. On page 7, please explain which questions were asked by questionnaire and which by interview.

We have revised the paragraph accordingly.

7. On page 8, please explain how the seven explanatory variables for the final model were chosen.

At the patient level, there were only two variables available in the medical record (age and gender).
At the practice level, we included variables to characterize the practice (location and size) and calculated scores using all other practice items (factor analysis). During the revision we adapted the factor analysis according the comments of J.Benn and included 4 practice scores (PrevServ, EMR, CCM and QM) instead of 2 (CVD-Care and QM).

8. On page 9, I think the non-responder analysis refers to responders with missing data, rather than non-responders, please clarify?

We have clarified that we compared included patients in comparison to excluded patients due to missing data.

Results:
9. Please see my major comment above about the expected correlation between organisational processes (CVD care) and clinical processes (QIs).

Please see the answer to the major comment 1.

Discussion:
10. ref 18 refers to a US study, and it might be helpful to also refer to a UK or European study of QI achievement.
We have added a further reference.

11. Bottom of page 12, what is a ‘multisided’ practice?

We meant multi-site practice. We have corrected the word (see also our answer to the “Additional material submitted by the reviewers”.

Conclusions:
12. Please see first ‘minor comment’ about association rather than causation, as improvement has not been found.

We agree with your comment and rephrased this sentence.

13. I was not sure for the reason for giving the list of practice characteristics here, as I understood that they were not individually significant, but only in composite?

We tried to describe the practice elements that were aggregated into the relevant score. We have revised the conclusion section to clarify our statement.

14. Please could the final sentence be re-phrased as I did not understand it?

We have rephrased the final sentence.

Level of interest: An article of importance in its field
Quality of written English: Acceptable
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’
Reviewer 2:

**Reviewer's report**

**Title:** Which practice characteristics are associated with the quality of cardiovascular prevention in European primary care?

**Version:** 3  **Date:** 17 November 2012  
**Reviewer:** Jonathan Benn

**Reviewer's report:**

The question posed by the research reported in this manuscript: “which practice characteristics are associated with quality of cardiovascular prevention in European primary care?” is clearly defined and promises to deliver valuable knowledge concerning desirable structural and organisational practice characteristics. The manuscript is appropriately structured and well written, with clear use of language. The abstract accurately summarises the key findings and messages of the report.

The use of hierarchical linear modelling with random effects parameters to account for practice level variations is entirely appropriate for a data set of this structure and addresses several common risks associated with ignoring the inherent structure/clustering of observations (e.g. artificially deflated standard errors). The model additionally affords the possibility of estimating variance at different structural levels of a dataset by fitting an “empty” hierarchical model and reporting the associated variance partition or intraclass correlation coefficient, which is reported in the results.

The composite quality measures and their implementation in the fitted statistical models does raise certain issues, in my view, and potential opportunities for clarification. The composite scales are rather heterogeneous in terms of the range of different types of characteristics they encompass. Furthermore, there is considerable conceptual overlap in what may be regarded as CVD care scale items and Quality Management scale items, making the distinction (or at least the factor labelling) seem somewhat arbitrary. From an intuitive standpoint, the range of factors wouldn’t seem to cluster conceptually and it is difficult to see how these dimensions are both distinct and sufficiently specified so as to be meaningfully and usefully interpreted as predictors in a statistical model. In the discussion, the notion is introduced that the CVD care items are more specific and the quality mgmt items more generic. Much of the discussion of prior research focuses upon specific sub-factors within the composite scale scores, yet the analysis was not performed at this level and the findings do not indicate the relative importance of any of the specific areas covered by the scale items. The authors report that factor analysis was performed to arrive at the two latent factors. It would be useful to report details of the factor analysis including the proportion of variance explained by the 2 factor solution (or some overall index of model fit) and some indication of the relative weightings of individual items on the latent constructs, perhaps in Table 1.

Understanding the relative centrality of each item to the underlying construct would indicate the degree to which the definition assigned to the latent factor is valid. Additionally, from a practical point of view, if very general composite factors are found to be statistically important, it is difficult to determine where to address remedial/improvement actions, where similar scores on the composite measure may express variable profiles across a number of distinct items which comprise the measure. It may not be feasible to focus upon such a broad range of factors in an improvement initiative and this type of modelling does not illuminate specific areas to prioritise. This is a practical limitation of the current statistical approach.
which might be acknowledged in the paper. An alternative approach might have been to fit the individual CVD care and quality management items rather than composite scale scores in order to assess their relative predictive validity or to conduct more exploratory work using statistical criteria to identify a set of strong individual predictors.

We revised all statistical processes carefully focussing on the factors analysis. You will find detailed explanation of all the changes we have made in the following step by step answers.

**MAJOR COMPULSORY REVISIONS:**

1. **Consider refitting the statistical model to include the raw scale factors in order to identify their relative and specific predictive power, rather than the composite measures used. A statistical regression approach may be useful in this context.**

We revised the factor analysis of practice items according to the method (i.e. nonlinear principal components analysis with CATPCA) described by Linting and van der Kooij [9], a tutorial to perform a principal component analysis with nominal variables, and extracted 4 factors according to their Eigenvalues. The factor analysis explained 54% of the variance.

2. **It would be useful to report details of the factor analysis including the proportion of variance explained by the 2 factor solution (or some overall index of model fit) and some indication of the relative weightings of individual items on the latent constructs, perhaps in Table 1.**

We included the factor loadings in table 1 and marked the items that were significantly associated with the outcome not only as a composite score but also as single items. For detailed information we provide the rotated factor solution results in this point by point answer (see also Table 1):

![Screeplot](image)
### Rotated Component-Matrix

<table>
<thead>
<tr>
<th>Component</th>
<th>1 (Prev Serv)</th>
<th>2 (EMR)</th>
<th>3 (CCM)</th>
<th>4 (QM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVD risk tool integrated medical record system</td>
<td>0.770</td>
<td>0.102</td>
<td>0.132</td>
<td>0.067</td>
</tr>
<tr>
<td>CVD risk advice integrated medical record system</td>
<td>0.706</td>
<td>0.161</td>
<td>-0.180</td>
<td>0.242</td>
</tr>
<tr>
<td>Nurses take part in campaigns on CVD risk prevention</td>
<td>0.654</td>
<td>-0.129</td>
<td>0.180</td>
<td>-0.118</td>
</tr>
<tr>
<td>System recalling patients risk CVD</td>
<td>0.601</td>
<td>0.109</td>
<td>0.503</td>
<td>0.209</td>
</tr>
<tr>
<td>Record CVD risk tool has been offered</td>
<td>0.577</td>
<td>0.259</td>
<td>0.264</td>
<td>0.187</td>
</tr>
<tr>
<td>Consultations lifestyle Quantifikation</td>
<td>0.564</td>
<td>0.017</td>
<td>0.452</td>
<td>0.172</td>
</tr>
<tr>
<td>Case finding methods Quantifikation</td>
<td>0.559</td>
<td>0.247</td>
<td>0.130</td>
<td>0.054</td>
</tr>
<tr>
<td>Participation lifestyle programmes Quantifikation</td>
<td>0.553</td>
<td>0.003</td>
<td>0.169</td>
<td>0.329</td>
</tr>
<tr>
<td>CVD standardized risk assessment tool Quantifikation</td>
<td>0.549</td>
<td>0.139</td>
<td>0.252</td>
<td>0.148</td>
</tr>
<tr>
<td>Directory of local prevention activities Quantifikation</td>
<td>0.514</td>
<td>0.026</td>
<td>0.227</td>
<td>0.265</td>
</tr>
<tr>
<td>All nurses attend training on CVD last 5 years</td>
<td>0.488</td>
<td>0.061</td>
<td>0.429</td>
<td>0.050</td>
</tr>
<tr>
<td>Project concerning cardiovascular risk management last 2 years</td>
<td>0.445</td>
<td>0.149</td>
<td>0.146</td>
<td>0.356</td>
</tr>
<tr>
<td>Quantifikation</td>
<td>0.410</td>
<td>0.344</td>
<td>0.090</td>
<td>0.030</td>
</tr>
<tr>
<td>Procedure smoking cessation Quantifikation</td>
<td>0.017</td>
<td>0.831</td>
<td>0.201</td>
<td>0.015</td>
</tr>
<tr>
<td>Patient file system Quantifikation</td>
<td>0.190</td>
<td>0.809</td>
<td>0.202</td>
<td>0.096</td>
</tr>
<tr>
<td>Medication prescriptions Quantifikation</td>
<td>0.139</td>
<td>0.666</td>
<td>0.067</td>
<td>0.089</td>
</tr>
<tr>
<td>Direct access to medical guidelines Quantifikation</td>
<td>0.012</td>
<td>0.633</td>
<td>0.112</td>
<td>0.369</td>
</tr>
<tr>
<td>Review of examination results Quantifikation</td>
<td>0.022</td>
<td>0.610</td>
<td>0.041</td>
<td>0.426</td>
</tr>
<tr>
<td>Examination results and measures Quantifikation</td>
<td>0.058</td>
<td>0.362</td>
<td>0.752</td>
<td>0.232</td>
</tr>
<tr>
<td>System recalling patients Diabetes Quantifikation</td>
<td>0.330</td>
<td>0.275</td>
<td>0.705</td>
<td>0.221</td>
</tr>
<tr>
<td>System recalling patients CVD Quantifikation</td>
<td>0.271</td>
<td>0.317</td>
<td>0.642</td>
<td>0.297</td>
</tr>
<tr>
<td>System recalling patients Hypertension Quantifikation</td>
<td>0.332</td>
<td>-0.123</td>
<td>0.504</td>
<td>0.001</td>
</tr>
<tr>
<td>Cardiovascular quality improvement projects Quantifikation</td>
<td>0.302</td>
<td>0.491</td>
<td>0.499</td>
<td>0.121</td>
</tr>
<tr>
<td>System recalling patients risk influenza Quantifikation</td>
<td>0.081</td>
<td>0.185</td>
<td>0.480</td>
<td>0.394</td>
</tr>
<tr>
<td>Team meeting quality improvement CVD Quantifikation</td>
<td>0.320</td>
<td>0.076</td>
<td>0.177</td>
<td>0.711</td>
</tr>
<tr>
<td>Critical incident register Quantifikation</td>
<td>0.004</td>
<td>0.016</td>
<td>0.251</td>
<td>0.703</td>
</tr>
<tr>
<td>Quality report Quantifikation</td>
<td>0.286</td>
<td>0.214</td>
<td>0.165</td>
<td>0.569</td>
</tr>
<tr>
<td>Clinical audit in last 12 months Quantifikation</td>
<td>0.004</td>
<td>0.016</td>
<td>0.251</td>
<td>0.703</td>
</tr>
</tbody>
</table>

Extraktionsmethode: Hauptkomponentenanalyse.
Rotationsmethode: Varimax mit Kaiser-Normalisierung.
a. Die Rotation ist in 6 Iterationen konvergiert.

### 3. It is too strong to say that quality of cardiovascular risk management is improvable by the presence of certain practice characteristics and I don’t believe that the analysis presented fully supports this assertion (made also in the abstract). The Beta coefficients derived from the linear models fitted allow estimation of the degree to which a statistically adjusted dependent variable is sensitive to incremental change in the predictor, but this is still covariate analysis and whilst implementing certain practice characteristics may be necessary to improve care, we cannot conclude they alone are sufficient. Only evaluation of an interventional design might reasonably be expected to support this statement. Furthermore, aggregated practice characteristic items were fitted as a single predictor, making identification of the specific necessary practice characteristic changes difficult beyond a rather broad set of factors classified as “CVD care”.

As a guide for quality improvement work, the findings from this analysis suggest an intervention which is rather underspecified in its scope and this should be acknowledged as a limitation of the study and in the conclusions.

We agree with this comment. We have revised the manuscript text accordingly and have used the word ‘association’ between practice capabilities and quality of care throughout the manuscript.

Furthermore, in order to identify quality-relevant practice characteristics more precisely, we separated the 13 single items of the ‘PrevServ’ score (Table 1) and calculated the association with the outcome for each single item of this score. By this
step we identified 5 items in the multilevel analysis (items No. 2, 7, 10, 11 and 13 – Table 1) that were positively associated with the outcome:
the ‘PrevServ’-item 2 (Table 1) – ‘integration of lifestyle advice in the electronic medical record’ (regression coefficient \( r = 8.33; p = 0.0006 \)),
the ‘PrevServ’-item 7 (Table 1) – ‘use of case-finding methods to identify patients at risk’ (\( r = 6.74; p < 0.0001 \)),
the ‘PrevServ’-item 10 (Table 1) – ‘the availability of a register of preventive prospects provided by local organisations’ (\( r = 4.79; p = 0.0009 \)),
the ‘PrevServ’-item 11 (Table 1) – ‘continuous medical education for nurses’ (\( r = 6.40; p < 0.0001 \)) and
the ‘PrevServ’-item 13 (Table 1) – ‘implementation of a minimal intervention strategy for stop smoking advice’ (\( r = 3.78; p = 0.0322 \)).
A score of these 5 items (PrevServ_5) resulted in a positive association with the CVRM-performance (\( r = 4.28; p < 0.0001 \)) (Table 6) and led to the final model (M6) with the best model fit.

MINOR ESSENTIAL REVISIONS:
4. Please clarify that items 9-12 in the quality management scale (table 1) are dependent upon a positive response to item 8 and how these items were treated in aggregation for the overall scale score.

We see your point. As we found out, these items (9-12) were dependent from a positive answer to item 8, we excluded these items from the factor analysis. We also excluded item 6 of the quality management scale as the recall items (2-6) in the CVD-care scale were correlated to this item. The final factor analysis included therefore 27 items.

5. Clarify the research rationale for prior statistical adjustment of covariates in the model. Why should these effects be controlled/partialled prior to modelling the effects of practice characteristics upon the dependent variable?

The aim of statistical modeling is to identify the main factors that explain variation in the outcome variable. In our study, we used the following explorative modelling strategy: We started with a random intercept model and continued with variables measured at the lowest level (i.e. patient level) and then worked upwards according to the hierarchical structure of our data. This analysis strategy was specified before any analysis was undertaken. In other studies and papers, we focused more on variables at the patient level. In this study, only age and gender were available in the medical record. At the practice level, we included all available practice variables, the 4 practice scores and 3 additional variables: location (urban) and size that were operationalized by full time equivalents (FTEs) of GPs and nurses. As the variables FTEs of GPs and nurses were correlated with each other, we excluded the FTEs-nurses variable.
Sensitivity analysis we also considered a model with practice characteristics only.
<table>
<thead>
<tr>
<th>Effect</th>
<th>Practice_size_2</th>
<th>Practice town &gt; 100.000</th>
<th>estimate</th>
<th>standard error</th>
<th>DF</th>
<th>t-Value</th>
<th>Pr &gt;</th>
<th>alpha</th>
<th>lower CI</th>
<th>upper CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>44.5856</td>
<td>6.3220</td>
<td>8</td>
<td>7.05</td>
<td>0.0001</td>
<td>0.05 30.0069</td>
<td>59.1642</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice_size_2 1</td>
<td>2.0356</td>
<td>1.9973</td>
<td>3504</td>
<td>1.02</td>
<td>0.3082</td>
<td>0.05 -1.8804</td>
<td>5.9517</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice_size_2 2</td>
<td>0</td>
<td>2.1939</td>
<td>3504</td>
<td>0.19</td>
<td>0.8501</td>
<td>0.05 -3.9318</td>
<td>4.7707</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban 1</td>
<td>0.4195</td>
<td>2.1939</td>
<td>3504</td>
<td>0.19</td>
<td>0.8501</td>
<td>0.05 -3.9318</td>
<td>4.7707</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban 2</td>
<td>0</td>
<td>2.1939</td>
<td>3504</td>
<td>0.19</td>
<td>0.8501</td>
<td>0.05 -3.9318</td>
<td>4.7707</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PrevServ_13</td>
<td>1.9474</td>
<td>0.6999</td>
<td>3504</td>
<td>2.78</td>
<td>0.0054</td>
<td>0.05 0.5752</td>
<td>3.3196</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMR_5</td>
<td>0.07630</td>
<td>1.2425</td>
<td>3504</td>
<td>0.06</td>
<td>0.9510</td>
<td>0.05 -2.3597</td>
<td>2.5123</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCM</td>
<td>-0.8295</td>
<td>0.6798</td>
<td>3504</td>
<td>-1.22</td>
<td>0.2225</td>
<td>0.05 -2.1624</td>
<td>0.5034</td>
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<tr>
<td>QM</td>
<td>-0.2635</td>
<td>0.9163</td>
<td>3504</td>
<td>-0.29</td>
<td>0.7737</td>
<td>0.05 -2.0600</td>
<td>1.5330</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Present and discuss statistical correlations between the covariates and the independent variables of interest in the study, particularly between the cvd-care and qual mngmt scores.

As we revised factor analysis, we now have 4 practice scores (PrevServ, EMR, CCM and QM, as described above. The factor analysis was performed at the practice level with 27 Variables. The 4 factors extracted were orthogonal to each other per definition.

In the multilevel analyses at the patient level, the 4 practice scores showed correlations between 0.2 and 0.6 (PrevServ and CCM). Therefore, we included the scores separately in the multilevel analyses. The only score that was significantly associated with the outcome was the PrevServ-Score. To separate single items of the PrevServ-Score we included each single item separately in the multilevel analysis (see point 3).

7. Provide statistical parameters associated with individual item loadings on latent constructs for the two scales carried forwards in the analysis.

See answers and tables above. We provided item loadings in this point-by point answer and also in the manuscript (Table 1)

8. Provide graphical depiction of variance in the key study variables at practice level. This might include comparison of CVD-care/qual mngmt scale items and/or the composite quality outcome measure (e.g. estimated residuals plot from the variance partition model (M1) with confidence intervals).

The variables included in the final model explained the variance partition at practice level by 21.1%. The following figure shows the residual plot at the practice level:

Residual plots +/- sd x rank (Level 2: Praxen)
9. If possible, report statistical significance parameters associated with the empty variance partition model (e.g. whether the multilevel model represents a significant improvement in goodness of fit over a unilevel model).

Model fits:
Empty model (M0):

<table>
<thead>
<tr>
<th>Anpassungsstatistiken</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2 Res Log-Likelihood</td>
</tr>
<tr>
<td>AIC (kleiner ist besser)</td>
</tr>
<tr>
<td>AICC (kleiner ist besser)</td>
</tr>
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<td>BIC (kleiner ist besser)</td>
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Level 1: Age, gender (M1)

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<th>Anpassungsstatistiken</th>
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<td>-2 Res Log-Likelihood</td>
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Level 2: Practice scores: PrevServ, EMR, CCM, QM; location and size (M2.2)

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Fully adjusted model (M3)

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Sensivity analysis (M4)

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<td>AICC (kleiner ist besser)</td>
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<td>BIC (kleiner ist besser)</td>
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</table>
Level of interest: An article of importance in its field
Quality of written English: Acceptable
Statistical review: Yes, and I have assessed the statistics in my report.
Declaration of competing interests: I declare that I have no competing interests.
Reviewer 3:

**Reviewer's report**

**Title:** Which practice characteristics are associated with the quality of cardiovascular prevention in European primary care?

**Version:** 3  **Date:** 21 November 2012

**Reviewer:** Carl de Wet

**Reviewer's report:**

Attached

**Level of interest:** An article of importance in its field

**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.

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**Additional material submitted by the reviewers**

20th November 2012

Dear Editor,

Thank you for the invitation to review the manuscript: ‘Which practice characteristics are associated with the quality of cardiovascular prevention in European primary care?’

**General comments**

The study’s aim was well-defined and concerns a topic relevant and important to most health care systems. The methods were appropriate, described in sufficient detail and the presented data were relevant. The findings are important and the discussion section is likely to be of interest to a wide readership. My main feedback pertains to the writing style. While this is clearly a matter of personal preference, I think the manuscript could be made more accessible, clearer and succinct, especially for non-specialist readers. I have provided a number of specific examples below for the authors to consider.

However, the study seems to have been designed and executed to a high standard overall and I would certainly recommend it for publication.

**Major compulsory revisions**

The following title would more accurately reflect the study: ‘Which practice characteristics are associated with the quality of cardiovascular disease prevention in European primary care?’

The title of the manuscript has been changed accordingly.

**Minor compulsory revisions**

Page 4 ‘…functional use...’ Delete ‘functional’.

The word ‘functional’ has been deleted.

Page 6 ‘…aim of this study was to analyse the effect...’ In the abstract the aim is
‘...assess the relationship...’ Do they mean their aim was to ‘...determine the effect (if any) of...’

The word ‘analyse’ has been replaced by ‘determine’.

Page 6 The heading ‘setting’ fits better with the heading ‘sample’, where the geographical settings are described. The section under ‘setting’ provides contextual and background information and would benefit from a different heading.

We agree with the reviewer on this issue. We decided to start the method section with this introductory paragraph without a separate heading.

Page 9 ‘...the UK...’. The sample section lists ten European countries, of which ‘England’ is one. The authors should use either UK or England consistently throughout.

‘England’ has been replaced by ‘United Kingdom (UK) in the sample section and used throughout the manuscript’.

Page 10 The sentence beginning ‘Adjusted for all other...’ could be clearer

To explain the phrase ‘Adjusted for all other variables’ more clearly, two sentences have been phrased:
‘The estimates (regression coefficients) indicate the amount of composite quality-indicator scores changes in % with each increasing unit of continuous variables or in comparison to a reference category for categorical variables. Each regression coefficient is thereby adjusted for all remaining variables included in the model.’

Page 13 What does ‘...practices that were granted at the highest attainable level...’ mean?

The National Committee for Quality Assurance (NCQA) Patient-Centered Medical Home (PCMH) 2011 is a recognition program for improving primary care. In a set of standards that describe clear and specific criteria, the program gives practices information about organizing care around patients, working in teams and coordinating and tracking care over time. PCMH 2011.
http://www.medicalhomeinfo.org/national/recognition_programs.aspx
There is a scoring system for PCMH elements. Practices with 85 points of 100 (maximum) are categorized in the highest level:
http://www.ncqa.org/Portals/0/Programs/Recognition/RPtraining/PCMH%202011%20standards%201-3%20workshop_2.3.12.pdf

Page 15 The conclusion could be rewritten in a clearer manner.

The conclusion section has been rewritten in the manuscript.

Discretionary revisions
Page 5 Replace ‘...countries worldwide contributing’ with ‘...countries worldwide and
contribute…’

The sentence has been changed in the manuscript accordingly.

Page 5 Replace the sentence beginning ‘Patients in primary care…’ with ‘…Patients should receive or be offered a range of appropriate services in primary care to address their acute and chronic conditions, including health promotion and targeted lifestyle advice…’

The sentence has been changed accordingly.

Page 5 The sentence beginning with ‘Lifestyle advice…’ could arguably be deleted or moved. The next sentence beginning with ‘…However, the delivery…’ would then follow on in a more logical manner in the same paragraph.

We see your point. However, we assume the sentence beginning with ‘Lifestyle advise…’ to be important to point out the important linkage between prevention delivered in general practices and community resources.

Page 5 Is ‘…behavioural counseling…’ an example of a preventive need or potential practice service?

‘Behavioural counselling’ was used as an example for a necessary preventive practice service? We have revised the sentence.

Page 5 ‘…delivered in primary care practices…’ Delete ‘practices’.

The word ‘practices’ have been deleted in this sentence.

Page 5 ‘…especially in preventive’ Consider replacing with ‘…especially as it relates to preventative care…’

We revised the sentence.

Page 5 ‘. . .practices capacities…’ Do the authors mean practice factors, infrastructure, components or something else with the word ‘capacities’?

Yes, we have used ‘capacities’ as a synonym for ‘characteristics’.

Page 6 ‘…on the quality of care for patients at high risk for…’ Consider replacing with ‘… on the quality of preventive care for patients at high risk of…’

We have considered your comment.
Page 6 The sentence beginning with ‘…the international character…’ could arguably be included in the ‘strengths and limitations’ section of the discussion or alternatively as justification for their choice of study design in the method section.

The sentence has been deleted in this paragraph as there is a similar phrase in the strengths and limitations section.

Page 6 The sentence ‘This study was part…project (2006-2010), focusing…’ should be in the past tense throughout ‘…which focused on…’

We have revised this sentence accordingly.

Page 6 ‘…before being used in the study…’ – consider replacing ‘the’ with ‘this’.

We have replaced ‘the’ by ‘this’.

Page 7 ‘…practice according to size, location or number…’ Should it be ‘…and number…’?

Yes, We have replaced ‘or’ by ‘and’.

Page 9 The sentence beginning ‘…32.6%...’ Could be rephrased as ‘…32.6% of the practices were located in large towns (e.g. more than 100 000 inhabitants) and xx% had two or more GP full time equivalents (FTE)...’

We have revised this sentence accordingly.

Page 9 ‘..was calculated to 9.2…’ replace with ‘...was 9.2 and the mean...’

We replaced accordingly.

Page 9 ‘...lowest scores...’ Was only one country the ‘lowest’?

We have replaced ‘highest’ and ‘lowest’ with ‘minimal’ and ‘maximal’.

Page 10 The heading ‘Performance on cardiovascular risk management’ could be ‘Cardiovascular risk management performance’

We have revised the heading.

Page 10 ‘...was calculated to be 55.9...’ replace with ‘...was 55.9%...’

We have replaced the phrase accordingly.
Page 10 ‘...twenty percent...’ Add a full stop.

We have added the full stop.

Page 12 In the sentence beginning ‘...As, the Chronic...’ replace with ‘...The Chronic...and elements of the CCM...’

We have revised the sentence accordingly.

Page 12 ‘...multisided...’ Does the authors mean ‘multi-site’?

Yes we have replaced the word.

Page 13 The sentence beginning with ‘...Only small variation...’ could be clearer

We have rephrased this sentence.

Page 14 The sentence ‘...Participants were male to a higher percentage...’ could be rewritten in a clearer manner.

We have revised the sentence.

Table 1. The title could be ‘...Practices’ structural...’ or ‘...Structural and organizational characteristics of practices...’

We have rephrased the title.

Table 4. The abbreviation ‘CVRM’ could be given in full again

We have included the full phrase.

Table 5. The title could be clearer.

We rephrased the title.
References: