Reviewer's report

Title: Description and validation of a Markov model of survival that uses Framingham risk factors and smoking status.

Version: 1 Date: 17 February 2004

Reviewer: Steven A Grover

Reviewer's report:

General

This is an interesting and original manuscript that provides useful insights into the shortcomings of current risk assessment models and suggests a useful alternative approach backed up by a serious attempt at model validation. It should be published.

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

The authors have made a serious attempt to validate their model on an data set that is independent of the data used to develop the model. This is a major improvement over most other papers in this area. However, I do note some difficulties with the validation given the limited time horizon of 20 years where it appears that approximately 50% of patients enjoy a survival rate of 80% or more. Accordingly, the Whickham cohort data tend to cluster in the right hand corner of figure 2 limiting the usefulness of the validation exercise where a high correlation is inevitable given the restricted time horizon. It would be interesting to see how ranking individuals by only age would correlate with the observed results. It also follows that the estimates of error presented on page 8 are probably overly optimistic given the forced data clustering in figure 2. The authors should consider this in their evaluation of model validation and at very least present the results discussed in the opening paragraph of the discussion section in a transparent fashion... a table or figure would be useful providing more detail than simple p values. If they can identify alternative validation exercises using the Whickham data this would greatly improve their paper.

The authors should also compare their estimates of survival benefit in figure 3 with those published by others... it appears that eliminating CVD results in approximately an additional 3 years of life expectancy which is small compared to other published estimates.

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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)

All results presented in the abstract should be presented in the body of the manuscript. Greater detail in presenting the results would be helpful to the reader. A reference for the framingham model that was used in page 5 is essential. A summary table describing the risk factors of the Whickham cohort would useful.

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Discretionary Revisions (which the author can choose to ignore)

I would include the supplemental tables in the manuscript. I would also clarify in the first sentence of
page 4 whether the model they refer to is that cited in reference 10 or refers to the model that is presented in the present paper.

**What next?:** Accept after minor essential revisions

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

**Quality of written English:** Acceptable

**Statistical review:** No

**Declaration of competing interests:**
None