Reviewer's report

Title: The influence of measurement error on calibration, discrimination, and overall estimation of a risk prediction model

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Reviewer: Lisa Cadmus-Bertram

Reviewer's report:

This paper uses data from the National Population Health Survey and a population-based diabetes registry to examine who random and systematic error affect the calibration and discrimination of a diabetes risk model. Overall, the paper is interesting, well-written and easy to read. There are a few areas where minor smoothing of the language would be helpful but overall it’s quite polished.

Major compulsory revisions
None

Minor essential revisions
1. Would be helpful to define body mass index as kg/m^2 earlier (either in the abstract and/or in the last paragraph of the introduction.

2. Add a brief description of calibration and discrimination to methods section. Authors describe how these were defined from a mathematical standpoint, but do not provide a commonsense description of what the words “calibration” and “discrimination” mean. They may be known to most readers of this journal, but I think it is worth spelling it out.

Discretionary revisions
1. Among obese individuals, weight can be under-reported by quite a bit more than 3.0 kg (the maximum under-reporting tested in the analysis). I see many obese study participants who have not weighed themselves in months and when they come to the clinic, we find their self-report is off by 10-20 pounds or more. Might be useful to extend the simulation a bit farther? (I am not primarily a statistician, so I may be misunderstanding how the parameters of 0.0 kg – 3.0 kg of under-reporting function in the simulations.) Also, the heaviest people are likely to be subject to the greatest systematic error in reporting weight. How does it affect the risk model if the degree of under-reporting is associated with BMI?

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

Quality of written English: Acceptable

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.