Reviewer’s report

Title: Temporal Trends in Sensitivity and Specificity of measured and self-report based body mass index - findings from three population surveys in Ireland

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Reviewer: Manfred Stommel

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This paper is puzzling. I agree with the authors that, despite numerous studies having investigated the measurement biases in self-reported height and weight and BMI values based on them, we lack evidence about if and how such biases may have changed over time. Thus, in principle, this paper could have made a valuable contribution. However the paper is marred by (a) weak data, and (b) an underdeveloped “theory,” or better: appeal to “social norms.” In addition, there are some analysis issues that should be addressed.

The main claim of the authors that “all three survey samples (from 1998, 2002, and 2007) are reasonably representative of the (Irish) population” seems farfetched, given the evidence presented: (1) the response rates of all three SLAN surveys are not exactly high (ranging from 53%-62%), when compared to national health surveys in many industrial countries. (This is not surprising given that the SLAN is a postal survey.)

Even more worrisome, however, are the extremely small sample sizes of the analytical samples: there are only 208 cases out of 586 with self-reported height and weight data in 1998, and 331 out of 411 in 2002. Not only are these unlikely to be “unbiased” samples of the Irish adult population, but the small sample sizes alone would lead to a serious lack of statistical power to test changes over time. For instance, testing the reported decline in sensitivity from 75.3% to 67.6% from the 1998 (n=208) to the 2002 (n=311) sample has a power of 0.42 according to my calculations (assuming a 5% significance level).

Even worse power problems occur in the comparison of male and female 1998 study participants in the analytical sample. The whole paragraph at the bottom of page 9 is unsupportable. For example, the statement “the sensitivity for overweight females was greater than for males indicating a higher rate of true positives for females is based on a comparison involving 38 out of 49 women compared to 23 out of 32 men. Among the women a shift of a single woman from overweight to normal would decrease sensitivity by 2%, among men such a shift would represent a decrease in sensitivity of 3%!

In sum, given the data, I find it hard to believe that the ‘trend’ discovered here is a reflection of true changes in the population, rather than artifacts of shifting sample selections.

Even if the decline in the sensitivity of self-reporting overweight and obesity turns out to be real, what accounts for it? The authors drop some hints about changing
“social norms” with respect to the acceptability of obesity in society and give two references (only one of these by Johnson, Cooke, Croker & Wardle appears relevant), but they don’t give a cogent explanation. For instance, here in the United States one could well argue that obesity, and certainly being overweight, has become MORE acceptable in society over the last decade (sociologists would argue that social norms tend to adjust to empirical average values): just witness the “big is beautiful” fashion shows, the movement to see social opprobrium of obesity as a discrimination problem, etc. Thus, one would expect a decline in the bias of reporting one’s true overweight. Just because public health officials warn about the health consequences of obesity, one should not automatically assume that that influences social norms. The main point is that the argument implied by the authors that, in Ireland, social norms are changing to the effect that overweight and obesity have become less acceptable over the last decade needs empirical evidence to back it up.

One additional methodological note: accepting the traditional BMI categories of “normal weight”, “overweight” and “obesity” and using sensitivity and specificity measures to show measurement bias is not the most efficient way to show such bias. This approach essentially discards all evidence about measurement biases within these broad weight classes. It would be much better to compare the DIFFERENCES between measured and self-report BMI values for the whole range of the BMI scale.