Reviewer's report

Title: The Reliability of the Ankle-Brachial Index in the Atherosclerosis Risk in Communities (ARIC) Study and the NHLBI Family Heart Study (FHS)

Version: 2 Date: 20 September 2005

Reviewer: Ryan Lennon

Reviewer's report:

General

This paper estimates the reliability coefficient of ABI measures in the ARIC/FHS subjects. The paper is heavy with statistical details and appears to pave the way for future work in regression modelling such that regression parameter estimates may be adjusted for ABI measurement error.

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

none

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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)

1) Page 10, para 2 – “than those with different ankles measured (R=0.486)”. Should it be “R=0.706”?
2) Page 10, para 3 – “the difference between the first and second measure increased with increasing ABI level.” Should it be “decreased” instead of “increased”?  
3) Page 11, para 3 – “computed as the average of” should be “computed as the ratio of the average of”?
4) Table 1 – In my copy, statistics are sometimes offset from the appropriate row label due to wrapping within columns. This is also true for tables 2 and 3.

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Discretionary Revisions (which the author can choose to ignore)

1) The authors interest in estimating the reliability of the ABI appears to be for the purpose of adjusting parameter estimates (away from the null) for regression models in which ABI is an independent variable. Such a parameter estimate is only unbiased for the unobserved “true” value. While the “true” value may be estimated using James-Stein estimates (reference 56), this fact is not mentioned until a cursory reference in the second sentence of the conclusions section. It doesn’t really belong there, since it isn’t a true conclusion of the authors’ efforts, but rather the details needed to put their findings into practice. I think the allusion to reference 56 and its implications
would be better placed in the second paragraph of the Background.

2) Page 4, para 2 - “ARIC participants were examined every 3 years beginning in 1987-1989.” Does this mean for all patients that the first examination was in 1987 and the last in 1989, or that for some patients the first examination was in 1987 and for others it was in 1989?

3) Page 6, last para – “assumed to represent the sum of the true measure…” Consider replacing “measure” with “value”.

4) Page 8, para 2 – “for those whose ABI was at or below with those…” Which ABI? Do you mean the average ABI?

5) Page 10, para 2 – May the authors speculate why different ankle measures resulted in increased reliability? This would seem counterintuitive – “ankle error” would be introduced and thus ought to decrease reliability.

6) Page 12, para 3 – The reliability estimate for the ratio of within visit means (0.704) would seem to be most relevant for regression parameter adjustments in future work. Perhaps it should be reported in the abstract and/or conclusions.

7) Page 15, para 2 – If the authors intend to adjust regression parameter estimates in future analyses of the ARIC/FHS subjects, do they intend to use the one overall estimate of reliability, or should separate estimates be used for separate sites, since the reliability was significantly different between sites?

What next?: Accept after minor essential revisions

Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests:

I declare that I have no competing interests.