Reviewer's report

Title: Is the APLS formula used to calculate weight-for-age applicable to a Trinidadian population?

Version: 1 Date: 21 February 2012

Reviewer: Giles Cattermole

Reviewer's report:

This is an interesting paper, and should make a useful addition to the literature on weight estimation for children.

Major revisions:

1. The key problem with the paper is the lack of appreciation of the difference between accuracy (bias) and precision when evaluating the performance of weight estimation tools. Mean difference is a measure of accuracy. But precision measures the spread of the estimates. The 'percentage of estimates within 10% of the true weight' is one method of measuring precision. But the most commonly accepted method now is that of Bland Altman, as this gives a measure of both accuracy and precision. Bear in mind that a highly 'accurate' rule might be clinically useless (and therefore dangerous) if it is so imprecise that one could never trust its use for an individual patient; conversely, one could tolerate a small bias if the rule were highly precise.

2. Note that you also 'assume' that a 10% mis-estimation is clinically significant. This needs justification.

3. Another key issue is that there are no references to any paper beyond 2007. There has been quite a lot of published work on this topic since then (including from a few non-Western countries), and the authors need to discuss their results in the light of this. A simple PubMed search for 'age-based weight estimation' would be helpful. At least one of those papers from the last couple of years discusses accuracy and precision, and age-based versus other methods of weight estimation.

4. Importantly, the APLS course has now changed its recommended weight estimation to include the Luscombe formula for 6-12 year olds (retaining the old formula for 1-5 year olds). In other words, the new APLS guidance follows the same conclusion as you have reached: that 2a+4 is preferable to 3a+7 in 1-5 year olds! It also makes the comment in your discussion regarding the acceptability of the 2a+4 based on its use in 5-10 year olds, somewhat ironic.

5. The discussion (and especially the limitation section) is far too long. It would benefit from being halved.

Minor essential revisions:
6. Table 1 is referred to in the introduction, but this appears to be different from the Table 1 included in the paper.

7. I presume that 'age' means 'age last birthday'? If so, this should be made clear (otherwise, readers might think it means 'rounded to nearest whole year'). The difference is important in this age-group.

8. Sometimes the 3a+7 formula is described as 'Luscombe', sometimes as 'Luscombe and Owens'. Consistency is preferable.

9. The introduction describes 'a second study performed by...'. This suggests that this was only the second study to look at the question. I'm not sure this is true. It might be better to say 'another study...'.

10. I am very unconvinced by the sample size calculation method. Please could you check, and if the same result comes out, could you give a reference for the method used?

11. Table 1 is at marked variance from the text. Especially, the negative signs seem to be the wrong way round. Also, the Luscombe formula has been given different results in the text and in the table.

12. Lubitz is described as the largest Broselow tape study, with 937 patients. I don't know what the largest study is, but Resuscitation 2010;81:1105 is a study of 1370 children (admittedly, only 449 aged 1-5).

13. The final bar chart needs better labels (and may not be necessary at all).

Discretionary revisions:

14. There is too much repetition between introduction and discussion. I would reduce the details about other published work that is currently in the introduction.

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

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.