Reviewer's report

**Title:** Insulin Resistance and its Association with the Components of Metabolic Syndrome among Obese Children and Adolescents.

**Version:** 2 **Date:** 24 February 2010

**Reviewer:** Sophie Hawkesworth

**Reviewer's report:**

**Major compulsory revisions:**

1. I have some concerns about the appropriateness of the analysis conducted in this paper. Both the independent variable, which in this case is insulin resistance (IR), and the dependent variable (the metabolic syndrome: MS) contain a measure of fasting glucose and are therefore interrelated. I would question whether it is thus correct to investigate the risk of developing MS depending on the IR status of the obese children studied? Instead, the paper could be restructured to look only at the association between IR and the other components of the metabolic syndrome in these children (removing fasting glucose) if this was felt to remain a valid research question.

2. If this new approach was taken I would suggest that Table 4 and Figure 1 were no longer necessary and that the analysis presented in Table 3 could be improved. For example, what is the rationale for categorising the HOMA-IR variable into percentiles? It may be more informative to conduct a linear regression analysis investigating the relationship between (in turn) HOMA-IR and waist circumference, HDL-C, Triglycerides, Systolic and Diastolic blood pressure. These analyses could be conducted both as simple regression and adjusted for appropriate confounders such as age, sex and BMI.

3. The paper would also be improved by greater clarity of the study design. For example, how were the schools selected for the first stage of the study and how were the 466 children selected for the second stage of the study from the 1475 eligible to participate? The discussion would also benefit from acknowledgement of the limitations of this type of cross-sectional analysis.

**Minor essential revisions:**

1. There are some problems with the language and grammar used in the paper which will require careful editing. For example: ‘overweightness’ should be replaced by ‘overweight’ throughout.

2. Page 4, line 7. You state that obesity increased by 1.1% annually amongst school children from 1999-2006. Is this based on just the two surveys mentioned (1999 and 2006)? If so, it is not possible to conclude if this was a 1.1% annual increase or if the rate varied between years. The 1999 survey should also be referenced here.

3. Page 5, line 7. You state that the prevalence of MS in children is unknown. Do
you mean in Mexico? If so, this should be clarified.

4. Did trained research personnel conduct the measurements of blood pressure and waist circumference? How many different personnel took these measurements and is there any data on the variation in their measurements?

5. Please explain the rationale for the 3.4 cut-off for IR in the text on page 7. Does this reflect to the distribution of HOMA in this population?

6. Page 7, line 10. I am unclear as to what 'measures of central tendency and dispersion' refers to. Please clarify.

7. Page 7, line 12. Please remove the 'y' before '#75th'

8. Page 8. Please be consistent when you report the differences between boys and girls in the components of the MS studied. For example, please include in brackets the percentages for hypercholesterolemia and LDL as well as the p-values.

9. Please use the specific p-values throughout the text rather than cut-offs of P<0.001 etc.

10. Page 9, line 14. Please explain what you mean by the fact that a higher pubertal stage could explain the fact that girls have higher insulin levels and lower glucose than boys.

11. Page 11, line 16. You state that the high prevalence of 'metabolically healthy, but obese individuals' suggests a protective genetic feature but your data may just reveal that other metabolic disorders develop later than obesity, which is a more likely explanation and one that should be emphasised.

12. Table 1. The ‘&’ sign after HOMA-IR should be superscript.

13. Table 2. The reference you give for the HOMA-IR cut-off does not contain this information and is different from the one provided previously in the text. Please amend.

**Level of interest:** An article of limited interest

**Quality of written English:** Needs some language corrections before being published.

**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.