Reviewer's report

Title: Body Composition and Arsenic Metabolism in the Strong Heart Study

Version: 1 Date: 19 August 2013

Reviewer: Rachel Grashow

Reviewer's report:

Review of manuscript, "Body Composition and Arsenic Metabolism in the Strong Heart Study", submitted to Environmental Health.

Authors present a clearly written paper describing the association between arsenic metabolites and measures of body composition such as BMI, %lean mass, % body fat and waist circumference. This paper fills a gap in current knowledge about arsenic exposure and body size, and underscores the need for future arsenic studies to consider how models should adjust for BMI and other body composition variables. Strengths of this paper include specific urine arsenic metabolite analysis, large sample size, and well-established measures of body composition. I found no major compulsory revisions necessary, although the paper would be strengthened if the following were addressed:

Minor essential revisions:

1) In the Background and/or Discussion sections, it would be helpful to outline for the reader which of the arsenic species measured in this study is more toxic, and what the implications of that changed toxicity would be for people with high versus low BMI.

2) Were any analyses run comparing the demographic characteristics of individuals missing iAs or MMA or % body fat? Could any bias have resulted from excluding these participants?

3) In the Discussion, I believe the sentence in the third paragraph that begins with "In the process" should conclude with "...in methylation processes".

4) There is an article by Su et al. entitled "The relationship between obesity, insulin and arsenic methylation capability in Taiwan adolescents". This paper also explored the relationship between BMI and arsenic metabolites in urine, with an additional examination of insulin resistance. It should be included in the Introduction or Discussion section to provide more context.

Discretionary revisions:

1) Were any other exposures measured in the Strong Heart Study that should be considered here? Could any other exposures serve as potential confounders?

2) In the Results portion of the Abstract, it would be helpful to include at least one parameter estimate and either a 95% CI or p-value. Similarly, in the Results section, it would be helpful if the relevant parameter estimates and confidence
intervals/p-values were mentioned in the text.

Level of interest: An article of importance in its field

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.