Reviewer's report

Title: Swimming pool attendance is related to asthma among atopic school children: A population-based study

Version: 1 Date: 12 January 2015

Reviewer: Laia Font

Reviewer's report:

General comment.

The study “Swimming pool attendance is related to asthma among atopic school children: A population-based study” aims to assess the link between current indoor swimming and asthma among 1,866 11-12 years old children in Sweden, and the effect modification of atopy. This is a relevant topic for public health that has been discussed in the last decade with inconsistent results. Although this study has limitations already identified in previous studies (such as the lack of trichloramine measurements in pools or the cross-sectional design), it is of interest since it entails other strengths (large sample with very high response rate and skin prick test measurements) and is among the firsts in Nordic countries. Some aspects of the manuscript, specially the presentation of the results, should be improved before accepting for publication.

Specific comments:

Major Compulsory Revisions

Introduction.

Methods.
2. What measure of socioeconomic status was used as potential confounder (maternal education, social class...)?

Results.
3. Table 1. Why is the descriptive stratified by sex? It would be more useful to show results stratified by atopy and, if any, report relevant differences by sex in the text.
4. What is the prevalence for the original 4 category question on pool attendance? Could you do three categories to see if there is a dose-response relationship?
5. Was there a statistical interaction between swimming and sensitization on asthma?
6. Was there an association between swimming and sensitization?
7. I understand that the OR reported in paragraph 2 and 3 are unadjusted, while the adjusted models are only shown in the figures. It would be more informative if a table showing the adjusted OR for the different outcomes and for the overall population and stratifying for sensitization status was added.

Discussion.
8. Second paragraph. The reference “Jacobs 2012” is missing at the end of the second sentence as well. The study in reference 13 (Font-Ribera 2009) did have measurements on trichloramine in air.
9. The no association detected between swimming and asthma in the overall population is also of relevance and should be mentioned in the conclusion.

Minor Essential Revisions

Abstract.
10. Specify that is “current” swimming in the methods and results.

Methods.
11. Specify that the question is on “current” swimming
12. Second sentence page 6: a parenthesis “)" is missing at the end of the sentence.

Discretionary Revisions

Results.
13. What are the covariables associated with swimming pool attendance? A sentence with this information could be added.
14. Was socioeconomic status a confounder?
15. As this is the second follow-up of the study, could it be possible to stratify the results according to previous respiratory health such as ever asthma or ever wheezed in the first follow-up?

Discussion.
16. When talking about biomarker studies (3rd and 4th paragraph), it should be distinguished between those comparing usual swimming pool attendance and basal levels of the biomarker and those assessing short-term changes in biomarkers after swimming in a pool. These are two different topics and results can not be compared directly. The former (basal levels) are more relevant for this study. Inconsistent results have been found in lung epithelium biomarkers after swimming both for atopic and non atopic (Font-Ribera L, Kogevinas M, Zock JP, Gómez FP, Barreiro E, Nieuwenhuijsen MJ, Fernandez P, Lourencetti C, Pérez-Olabarria M, Bustamante M, Marcos R, Grimalt JO, Villanueva CM. Short-term changes in respiratory biomarkers after swimming in a chlorinated pool. Environ Health Perspect. 2010 Nov;118(11):1538-44).
17. Not only the association between swimming and asthma, but also the effect
modification of atopy, is inconsistent among epidemiological studies. Larger and population-based studies have not found this interaction (Font-Ribera 2009, Font-Ribera 2011, Jacobs 2012). A further discussion on this would be helpful.

**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.