Reviewer's report

Title: Quantification of the energy gap in young overweight children. The PIAMA birth cohort study

Version: 1 Date: 24 March 2011

Reviewer: Manfred Müller

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Major Compulsory Revisions

The authors have tried to provide a scientific basis for current recommendations to prevent childhood overweight. They are congratulated for addressing a vulnerable period of childhood development (i.e. between 2 and 5 years of age). This period has not been addressed in previous studies and is considered as a suitable phase for early health promotion and interventions by experts as well as many health authorities. The authors have tried to model the so-called energy gap from a greater longitudinal data set which was found to be between 69-77 kcal/d. These numbers should be addressed in future recommendations and measures of behavior changes in pre-school children.

Major revision needed.

The following points should be addressed in an revised version of the ms.

Modeling of energy gap differs between the different studies cited. This may add to between-studies-differences in results. The authors should use their own data to calculate energy gap using the different strategies. Specifically the percentile-based approach used in ref.8 should be compared with their own strategy.

Regarding their own approach a number of questions remained to be answered. Since weight and height were based on self reports from the parents and a number of BMI data were missing these methodological drawbacks should be addressed more systematically. I assume that theses problems may add a considerable error which should be at least quantified. A further question is that for my feeling energy gap was calculated by two different strategies (i.e. from NN to NO and from OO to ON). These data should compared with each other. The authors assumed a linear model. Faced with the normal percentiles of weight and height this cannot be really true. Thus I recommend to use a more sophisticated model taking into account changes in P50 (for NN) and P90 (for OO). This will give a more detailed view on age-dependent changes in energy gain. My major concern is on author's calculation of body composition from the weight data. First, the reference data base of FM used is outdated and is not population-specific (i.e. it cannot be used for Dutch children). There are more recent data bases for FM in European populations of children. Second, using the mean data of percentage FM per weight (or BMI) does not take into account the
considerable inter-individual variance in the weight-FM relationship. Third, percentiles of weight and FM should be compared with each other and the dynamics of changes in either FM or weight should be taken into account in the model used to calculate energy gap. Following Hill's approach (i.e. using BMI plus a mean energy equivalent of weight changes) may provide an alternative approach. A more systematic analysis of body composition at least in a subgroup of children is recommended.

Fig. 1 is missing in my ms.

In children at age 2 to 5 years there is high remission rate in overweight compared to children at age 6-10 years. This should be taken into account in any future recommendations on prevention of childhood overweight.

The authors refer to considerable differences in energy gaps published so far. Taking a lifelong view on the overweight issue the different numbers should be compared with each other and specific recommendations for specific life periods should be considered. My question is whether these differences reflect real life course specific problems in energy balance. Alternatively they may be more likely due to the differences in the methodological approaches used to calculate the energy gap in the different studies.

**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'