Reviewer's report

Title: Blood pressure and associated factors in a North African adolescent population. A national cross-sectional study in Tunisia

Version: 2 Date: 8 November 2011

Reviewer: Pascal Bovet

Reviewer's report:

The authors have taken good care of remarks by the reviewers and the text is much improved. I would like to suggest just a few further remarks on the following issues:

1) Page 7: when using word such as « larger » the term compared should be specified, e.g. pre-HT was more frequent among boys (41.8%) “vs. girls (28.2%)” of preferably “than girls (28.2%)”. The same appers in the next line in the same fist paragraph on page 7 and in the alt line on page 7, as well as first line and 7th line on page 8 “3rd tertile vs 1st tertile” not “3rd tertile vs 1st”.

2) Page 9, line 8: the significance of the association with WC was higher than with BMI. Clearly table 2 shows that the association (univariate) tends to be larger with BMI than WC.

3) For table 3 are BMI and WC adjusted tighter? If this is the case, the interpretation is the effect of waist conditional on knowing BMI (or inversely the significance of BMI conditional of knowing WC). Often the association of one or another adiposity marker would disappear when one adjust for two similar adiposity markers that strongly correlate (e.g. BMI and waist). It would be useful to state in the text that it is interesting to see that both markers, despite being strongly correlated, remain significantly associated with elevated BP, hence bring addition independent information. Related to this, in results, it would be useful to mention the correlation coefficients between BMI and waist (separately in males and females).

4) In table 3, an asterisk is given only for the hypertension column, and it seems that the column for elevated BP is not adjusted to all variables. Is this the case? It seems to me that all models should be adjusted to all factors. However it would be useful to mention what are the OR for BMI and OR for waist estimated in models adjusted for all variables appearing in the table but with only one adiposity marker included in the multivariate model at a time (e.g. i) all variables + BMI but not waist and ii) all variables + waist but not BMI, separately in males and females) in view of high correlation of BMI and waist, and the fact that BMI and waist essentially convey the same information. This would allow to directly compare the association of BMI with BP vs the association of waist with BP in multivariate analysis.

5) Page 10, line 11, replace “not very related” with “not strongly associated with”
6) Page 10, line 3. Please complete the sentence “Despite the strong relationship between obesity and elevated BP at individual level in this same study” (and remove reference 63 in this context). Indeed, the issue is that there was a strong relationship between BMI and BP in this very same study of Chiolero et al (in an African country) but, despite this association between BMI and BP, there were downward trends of BP over time in this population, raising issues that other factors may have lowered BP. This issue is important as downward trends in BP are found in most countries, particularly in high income countries and middle income countries, despite marked upward secular trends in BMI (in adults: e.g. Danaei G et al. National, regional, and global trends in systolic blood pressure since 1980: systematic analysis of health examination surveys and epidemiological studies with 786 country-years and 5•4 million participants. Lancet. 2011 Feb 12;377(9765):568-77; in children: a review by Chiolero A et al. Has blood pressure increased in children in response to the obesity epidemic? Pediatrics. 2007 Mar;119(3):544-53, and other recent papers, e.g. Smpokos EA et al. Secular changes in anthropometric measurements and blood pressure in children of Crete, Greece, Prev Med. 2011 52(3-4):213-7. This issue is important as if we knew why BP is decreasing despite the main risk factor of BP being increasing (BMI) we would know an important factor that is lowering BP in many populations and we could possibly be able to act upon this (yet unknown) factor (less salt? more fruits/vegetables? other? etc).

**Level of interest:** An article of importance in its field

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

**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