Reviewer’s report

Title: Identification of effective screening strategies for cardiovascular disease prevention in a developing country: using cardiovascular risk-estimation and risk-reduction tools for policy recommendations

Version: 2 Date: 19 August 2012

Reviewer: Parinya Chamnan

Reviewer’s report:

Major compulsory revisions:

This study examined the effectiveness and costs related to different screening strategies, both universal and targeted strategies, for detection and prevention of cardiovascular risk in a multi-ethnic Asian population in Malaysia. It is well-written and addresses an important issue related to approaches to screening individuals at high cardiovascular risk in the population. However, there are a few major issues needed to be addressed.

1. The authors used estimated cardiovascular risk instead of true cardiovascular rates to calculate the impact of screening and subsequent interventions. This might have altered the results, particularly incremental effectiveness and thus costs. Detecting individuals at high risk may not be the same as individuals who would develop actual cardiovascular events (estimated risk versus actual risk). The authors used the latest version of the Framingham risk scores which have not been validated in Asian populations. The Authors need to more comprehensively discuss how this may have affected the results, e.g. how this approach might have an impact on different age groups and sexes.

2. The authors did not take into account some uncertainties related to parameters used in their equations to calculate the impact of screening and interventions, e.g. different rates of uptake and adherence to intervention and relative risk. It would be grateful to see some sensitivity analysis on this.

3. It seems that the authors assumed 100% response to invitation for screening, which is unlikely to be feasible in a real world. It would be great to see a more feasible response rates to screening invitation. Importantly, responses to invitation to screening and preventive interventions are likely to differ by strategies considered in this study. For example, older males are less likely to turn up for risk screening and treatment than young females. This should be taken into account in the modelling or at least be discussed more clearly how this may impact the results.

Minor essential revisions (some are repeated to the major points above):

Abstract:

1. It is not clear how the authors mean by the term ‘general community screening’. Does it mean ‘universal screening in the population’ or ‘screening in
the population, both targeted and mass screening’. It would be better to clarify this and use a more widely used and standard term.

Methods:

2. In order to justify the validity of the study in terms of cardiovascular risk estimation, it would be great to see how the variables used to compute the risk were measured (e.g. blood pressure and body mass index).

3. As mentioned above, it seems that the authors assumed a perfect response rate to screening invitation. This should be clarified and if possible, results for more feasible response rates should be presented.

4. The authors did not take into account the uncertainties over the parameters related to preventive interventions. It would be great if the authors could include a sensitivity analysis in this paper, i.e. presenting results for different possible values of these parameters (rate of uptake and adherence to intervention and relative risk reduction). This would allow the audience to see how much impact the uncertainties related to these parameters may affect the study results.

Discussion:

5. According to the core concept of this paper, it would be better to use the term ‘cardiovascular risk screening’ rather than ‘cardiovascular risk factor screening’, as it stands in the first paragraph of the Discussion.

6. Using estimated cardiovascular risk (Framingham risk score) instead of actual cardiovascular rates in the population to calculate the impact and related costs of screening and interventions might have altered the results. This is related to how the risk scores developed in one population will perform in a different population with different back ground risk. Previous studies have shown that this predictive ability of a risk score also differ by levels of risk in a population to which the score is applied, e.g. in a population with low average background risk, Framingham risk score overestimates risk in a greater extent for those with higher actual risk than those with lower risk (Chamnan P, et al. BJGP 2010, Brindle P, et al. BMJ 2003). The reviewer is glad to see that the authors mention “The Framingham Risk Score has not been validated in... Therefore, it’s accuracy in prognostication of risk is unclear”

This should however be more comprehensively discussed.

7. Related to the previous point, before discussing how different screening would impact on cardiovascular prevention, it would be worthy discussing how well the risk score could be used to predict the risk in this multi-ethnic Malaysian population. This is because the impact of interventions seems to be proportional to how well the risk score can identify men and women at high risk in different strategies, provided the same formulae used to calculate the impact of intervention.

8. Tables

Table 1. The authors used the term ‘proportion’ but present the results as percentage. This should be made consistent.
Table 2. The decimal places should be consistent e.g. p-value in the right most column and the age values and its standard deviation. Tables 3-5. There is no consistency in decimal places presented.

**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