Reviewer's report

Title: The cost-effectiveness of exercise referral schemes

Version: 1 Date: 4 August 2011

Reviewer: Nefyn Williams

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General comments

A decision analytic model is reported estimating the cost of exercise referral schemes from a UK NHS perspective. The model is clearly reported and the conclusions are justified, however the assumption that the exercise referral schemes have a lasting effect on physical activity has neither been justified nor tested in the sensitivity analysis. I have used a checklist based on the ISPOR Task Force Report (Weinstein et al Value in Health 2003;6:9-17) to assess the quality of the model.

Decision Context

(1) Is there a full description of the decision question, its context, and the process by which this was identified?
Yes

(2) Do the model structure & parameters adequately represent the key decision options and perspective?

The model is structured so that its inputs and outputs are relevant to the NHS and personal social service perspective of the economic evaluation.

(3) Do the treatment options cover those of immediate interest to the decision maker?
Yes

(4) Are there additional treatment options likely to be of interest in other decision and clinical contexts?
No

(5) Is the model structure easily adaptable to include future developments?
Yes

Health States and Clinical Outcomes

(1) Does the model structure fit (appropriate & relevant) with the clinical theory of the disease process?

The structure of the model is consistent with the theory that physical inactivity contributes to the development of CHD, stroke and diabetes. However the model does assume that changes in exercise behaviour persist and that improvements
in physical activity do not decay. This is acknowledged in the discussion but has not been tested in the sensitivity analysis. This deficiency in the sensitivity analysis needs to be acknowledged.

(2) Does the model appropriately capture the full impact and cost of treatments? Yes

(3) Does the model appropriately represent the patient population(s) of concern? Yes

(4) How has heterogeneity been included in the model? Sub-group analyses in individuals with obesity, hypertension & depression were used but I was unclear how these related to the population of sedentary 4-60 year olds, please clarify

(5) Were appropriate methods used to include patients’ treatment and disease history and effects on event rates? Yes, risks of developing health states associated with inactivity systematic review & known prevalence data

(6) Does the model clearly list and justify structural assumptions, and likely impacts on outcomes? Yes

(7) How were structural aspects tested by the modeller (e.g. clinical opinion, literature review, clinical guidelines)? Unclear, please clarify

(8) Was the modelling methodology fully justified (e.g. Markov, decision tree, discrete simulation)? No, please do so

Transparency
(1) Is the model structure transparent (structure, parameters and values)? Yes

(2) Is the physical model fully accessible to a non-modelling audience? I think so

Timing
(1) Are time horizons appropriate, given the disease, treatments and decision context (1-year, 10-year, lifetime)? Yes lifetime time horizon.

(2) Are the model’s cycle times appropriate to the disease and treatments of interest?
Unsure, please clarify

(3) Have appropriate methods been used to extrapolate data over extended time horizons?
The model assumed that changes in exercise behaviour persist and that improvements in physical activity do not decay. I am not convinced that this is justified.

Data values
(1) Is there a full description of a thorough review process identifying data values?
Yes

(2) Are the sources of data values fully described and appropriate?
Yes

(3) Are there clear criteria for data inclusion / exclusion?
Unsure, please clarify

(4) Are there appropriately documented value ranges for data parameters for sensitivity analysis?
Yes

(5) Is there clear identification of areas in the model populated with clinical opinion? Is the approach appropriate?
Yes, resource use & cost estimates of ERS assessed by expert advisory group.

Data preparation
(1) Are there full details on data preparation to generate parameter values (e.g. meta-analysis, relative risk rates, estimation of utility, calculation of transition rates)?
Yes

(2) Were transition rates correctly calculated from interval data?
I presume so although I haven't checked

(3) Were survival data appropriately extrapolated / modelled (e.g. weibull, exponential)?
Life expectancy derived from average age of onset for each condition

(4) Are sensitivity analysis adequately handled and classified (e.g. probabilistic, one way, multi-way)?
Yes.

Data incorporation
(1) Are data units, time intervals and patient characteristics consistent?
Yes

(2) Was uncertainty adequately incorporated in the model using appropriate sensitivity structures and analyses?
Further sensitivity analysis examining the lasting effect of physical activity should have been performed.

Internal validation
(1) Was there a thorough and adequate quality control / error checking test plan?
Yes, including peer review by a modeller

(2) Was the model replicated and compared using alternative software?
Unclear, please clarify

(3) Was there a clinical face-value reality check? How was this conducted (e.g. internal review, expert review)?
Yes expert peer review

(4) Was the model shown to accurately replicate data used in model construction?
Unclear, please clarify

Cross-model validation
(1) Was the model directly compared and contrasted with existing models in the same disease area?
No, please clarify

(2) Were differences between models appropriately discussed, categorized and acted on?

External validation
(1) Was the model validated against independent data?
No, please clarify

(2) Were data suitable in terms of its context for comparison (patient group, treatments, timelines, outcomes)? N/A

(3) Which interim outputs were matched? N/A

**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