Model Types Submitted to NICE: What Is Considered Appropriate by Evidence Review Groups?

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Objective
- A review of Evidence Review Group critiques of models in recent NICE submissions was conducted to determine any associations between model type and Evidence Review Group criticisms.

Background
- Novel and complex model types are being used more regularly in economic evaluations. However, it is not yet clear how these are received by Evidence Review Groups (ERGs).
- Knowledge of common criticisms relating to specific types of model could be invaluable to those involved in developing economic models for Health Technology Assessment (HTA) submissions.

Methods
- All National Institute of Health and Care Excellence (NICE) single technology appraisals published between May 2016 and May 2017 were reviewed.
- Data extracted included indication, model type, the program used for model development, whether the ERG considered the model type appropriate, and details of the ERG critique.
- When faced with ERG critiques of model type, the group attempted to consider whether the type was appropriate for the decision problem, as suggested by the ERG. If the ERG was satisfied with the model type, the model was included in the review. This also applied to any model types other than those submitted in the current review, but which were not included in the previous review.

Results
- The 48 submissions reviewed included 43 cohort state-transition models (Markov, partitioned survival, semi-Markov and decision tree/Markov models), 1 Markov model run as both a cohort and microsimulation model, 3 Monte Carlo individual patient simulations (IPS) and 1 DICE model.

Conclusions
- In the majority of cases, ERGs include an explicit review of model type in their critique.
- Other model types are more common in disease areas with fewer submissions, and are generally considered appropriate if their implementation is transparent and user-friendly.
- Practical implementation with reasonable model run times is an important factor when considering new model types such as DICE and DES.

References
1. NICE TA404: Ixekizumab for treating moderate to severe plaque psoriasis
2. NICE TA413: Chronic hepatitis C
3. NICE TA423: Eribulin for treating locally advanced or metastatic breast cancer
4. NICE TA434: Hepatic pulmonary thromboembolism
5. NICE TA437: Pirfenidone for treating idiopathic pulmonary fibrosis
6. NICE TA442: Ixekizumab for treating moderate to severe plaque psoriasis
7. NICE TA454: Deglucagon for treating advanced hormone-dependent prostate cancer
8. NICE TA460: Levobuvastatin for treating moderate to severe plaque psoriasis
9. NICE TA467: Naltrexone-bupropion (prolonged release) for managing weight and obesity

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