Reviewer’s report

Title: A PCR-based diagnostic testing strategy to identify carbapenemase-producing Enterobacteriaceae carriers upon admission to UK hospitals: early economic modelling to assess costs and consequences

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Reviewer: Jennifer Hirst

Reviewer’s report:

This is an interesting and important analysis presenting results from a decision-analytic model on the costs and consequences of using PCR to detect CPE compared with culture-based testing. The authors clearly describe the models used and how costs were estimated. The finding that PCR testing would save costs to the NHS compared with culture testing to detect CPE remained robust for all sensitivity analyses.

I only have a few comments on this paper. Firstly, how widely is PCR testing available in UK hospitals? If this were to be widely adopted, how many hospitals would need to invest in new instrumentation and what would the costs of this be?

There needs to be more background on MALDI-TOF MS and its role in the diagnostic pathway. Is this the gold standard for detection of CPE? It is unclear whether this is part of the usual care pathway for following-up positive samples.

In the review of sensitivity and specificity of culture tests and PCR, which analytical methods were used as the reference standard? Were these gold standard methods and were they pre-specified before combining data in meta-analysis? If more than one method was used then please discuss the risk of bias in accurately determining the sensitivity and specificity.

Please provide a reference for the following sentence on page 16, line 345:

"However, with each consecutive culture test, patients with CPE who test positive have characteristics that are different from patients with CPE who test negative, and performing subsequent culture tests on patients who test negative is expected to decrease culture test performance."

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