Cost effectiveness of human papillomavirus test of cure after treatment for cervical intraepithelial neoplasia in England: economic analysis from NHS Sentinel Sites Study


Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The study assessed the cost-effectiveness of human papillomavirus testing for women following treatment for precancerous changes of the cervix (cervical intraepithelial neoplasia) in England. The authors concluded that human papillomavirus testing following the sentinel sites protocol (testing and cytology six months after treatment) was cost saving and more effective in finding women at risk than an annual cytology-only follow-up over 10 years. The study methods seemed appropriate and were clearly and transparently reported. The authors’ conclusions appear appropriate.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The study assessed the cost-effectiveness of human papillomavirus testing for women following treatment for cervical intraepithelial neoplasia in England.

Interventions
Three different management pathways after cervical intraepithelial neoplasia treatment were compared: cytology-only based follow-up annually over 10 years; post-treatment follow-up with human papillomavirus testing and cytology at six months (NHS sentinel site protocol); and extended follow-up with human papillomavirus testing and cytology at six and 12 months and cytology alone at 24 months (extended follow-up protocol).

Location/setting
UK/Secondary care.

Methods
Analytical approach:
The authors developed a Markov model to synthesise epidemiological and cost data collected from the NHS Sentinel Sites (Bristol, Norwich, Liverpool, Manchester, Northwick Park, and Sheffield) with a range of estimates from studies in the published literature. The time horizon was 10 years. The authors stated that a health services perspective was adopted.

Effectiveness data:
The effectiveness evidence came from a range of sources including observational data from the NHS Sentinel Sites Study (available in an online appendix), a published systematic review, a review conducted by the authors, a meta-analysis, and a selection of known recent relevant studies. The main clinical estimates were test accuracy and compliance, treatment success, and risk of recurrent disease (which culminated in cases of cervical intraepithelial neoplasia 3+ averted).

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The primary measure of benefit was the cost per case of cervical intraepithelial neoplasia 3+ averted.
Cost data:
The costs included: the direct costs of consumables and capital equipment for human papillomavirus testing; staff time; consultation; treatment; and costs per event of cancer. The sources of resource use and prices were the NHS Sentinel Study Sites, manufacturer’s prices, and estimates from the published literature. The price year was 2009. Future costs were discounted at a rate of 3.5%. Costs were adjusted to 2009 prices using the Hospital and Community Health Services Index.

Analysis of uncertainty:
One-way and partial multi-way sensitivity analyses were conducted. The results were presented in graphs and fully described in the text.

Results
Cytology-only follow-up was associated with 29 residual cases of cervical intraepithelial neoplasia (3+) in 1,000 women treated by 10 years compared with 21 cases for human papillomavirus testing based on the sentinel sites protocol, and 22 cases for the human papillomavirus testing based on the extended follow-up protocol.

Cytology only follow-up was expected to cost £358,222 over 10 years per 1,000 women treated compared with £348,834 for human papillomavirus testing based on the sentinel sites protocol, and £407,274 for human papillomavirus testing based on the extended follow-up protocol.

Human papillomavirus testing based on the sentinel sites protocol was expected to be cost saving (-£1,120) compared with cytology-only follow-up. Human papillomavirus testing based on the extended follow-up protocol was expected to cost an additional £6,474 per case of cervical intraepithelial neoplasia (3+) averted compared with cytology-only follow-up.

Authors’ conclusions
The authors concluded that human papillomavirus testing following the sentinel sites protocol was cost saving and more effective in finding women at risk than a cytology-only follow-up protocol over 10 years.

CRD commentary
Interventions:
The interventions were described in full and were relevant to the study setting (England). It was likely that these interventions may be generalisable to other settings.

Effectiveness/benefits:
The data were came from a range of sources including observational data and reviews of the literature. The identification of the data were well described and appeared to be exhaustive. It appeared that attempts were made to ensure the best available evidence was incorporated into the model. The sources of data were relevant to the study setting (England).

Costs:
The included costs were relevant to the stated perspective; the sources of cost data were adequately reported. Cost estimates were provided in a table for clarity. The authors stated the price year and made adjustments to the costs using appropriate methods.

Analysis and results:
The Markov modelling approach was appropriate; a detailed description and diagram of the model was reported in an appendix. The use of an incremental approach was appropriate to allow the assessment of the relative cost-effectiveness of the alternative treatment pathways available. The authors used appropriate methods to assess uncertainty in the model results and subsequent conclusions. The results and sensitivity analyses were reported in full.

Concluding remarks:
The study methods seemed appropriate and were clearly and transparently reported. The authors’ conclusions appear appropriate.
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