Should the UK government's deep cleaning of hospitals programme have been evaluated?

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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
This study examined the cost-effectiveness of deep cleaning in hospitals, with the aim of reducing the incidence and burden of hospital-acquired infections. The authors concluded that, from the perspective of the UK National Health Service, deep cleaning was unlikely to be cost-effective and a good use of public funds. The analytic approach was based on a number of hypotheses and assumptions, which might have affected the methodological quality of the study, but the authors’ conclusions appear to be robust.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to examine the cost-effectiveness of a programme of deep cleaning in hospitals, which aimed to reduce the incidence and burden of hospital-acquired infections.

Interventions
The deep cleaning programme consisted of manual cleaning by scrubbing all surfaces and equipment, and a decontamination process, using hydrogen peroxide vapour. This programme was implemented in the UK in 2007 and 2008. The deep cleaning was compared with no intervention.

Location/setting
UK/hospital.

Methods
Analytical approach:
The analysis used a cost-effectiveness framework with data from multiple sources. The time horizon was one year and the authors stated that the perspectives of the hospital and the National Health Service (NHS) were adopted.

Effectiveness data:
The clinical evidence was estimated using two approaches. In the first analysis, the evidence came from a selection of relevant studies, which were known to the authors. The details of these studies and their methods were not provided and a number of assumptions were required to simulate the efficacy of the programme over time. In the second analysis, the prior beliefs of a sample of 15 UK experts were elicited, using a questionnaire, based on a Bayesian approach. The key clinical endpoint was the annual reduction in the hospital-acquired infection rate due to the programme.

Monetary benefit and utility valuations:
The utility valuations were from a report of the CleanYourHands campaign, which assessed the impact of a reduction in hospital-acquired infections on quality of life and survival.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the summary benefit measure and were determined using the CleanYourHands report data.

Cost data:
The economic analysis included the cost of the programme and the opportunity cost of closing wards while the cleaning was carried out. The programme cost was derived from official reports on its implementation. The opportunity cost was...
calculated using transfers to the NHS under the Payment by Results scheme, on the basis of the assumed number of bed
days during which the wards were closed for cleaning. The cost savings that resulted from reduced infections were
included and were based on data from a previous cost analysis. All costs were in UK pounds sterling (£) for the fiscal
year 2007 to 2008.

Analysis of uncertainty:
Best- and worst-case scenarios were considered in the sensitivity analysis, using the most favourable and unfavourable
assumptions based on both the experts’ opinions and published evidence.

Results
The cost of the deep cleaning was £57.5 million and the opportunity cost was £54.8 million per day. The cost saving per
infection prevented was £4,112 and the QALYs gained per infection prevented were 0.007.

In the base case, the wards were closed for two days for cleaning and the incremental cost per QALY gained with the
programme was £534,000 in the first analysis, using literature-based data (annual reduction in infections of 0.87%) and
£1,464,000 in the second analysis, using the experts’ opinions (annual reduction in infections of 0.33%). The best-case
cost-utility ratio was £66,000 and the worst-case was £11,471,000.

All figures were well above the threshold of £30,000 per QALY for cost-effective health care interventions in the UK.
The annual reduction in hospital-acquired infections would need to be 7.8% for the programme to be cost-effective at
the £30,000 threshold.

Authors’ conclusions
The authors concluded that, from the perspective of the UK NHS, the deep cleaning programme was not likely to be
cost-effective nor a good use of public funds.

CRD commentary
Interventions:
The selection of the comparators was appropriate within the authors’ setting and reflected the objective.

Effectiveness/benefits:
The effectiveness analysis used two approaches, with data from published estimates and from a panel of experts, and
they provided similar findings. This approach was necessary because there were no alternative data on the impact of the
programme on the number of infections. The derivation of the clinical variables using a well-conducted systematic
review of the literature would have been the best approach, but the sensitivity analysis considered wide ranges for these
variables and this proved that the results were robust. Some key details on the derivation of utility values were provided.
These estimates were derived from another programme. QALYs are a valid measure not only for capturing the impact
of the programme on quality of life and survival, but also to allow cross-disease comparisons.

Costs:
The economic analysis reported macro-categories of costs, with no list of the cost items. The unit costs and quantities of
resources used were not provided. This approach reduces the transparency of the economic analysis and limits the
possibility of replicating the study in other settings. The economic analysis was conducted according to the study
objective.

Analysis and results:
The use of an incremental approach to synthesise the costs and benefits was appropriate, but the findings were
presented selectively, with only the incremental cost-utility ratios being clearly presented. Different scenarios were
considered in the sensitivity analyses and the results were robust to variations in the clinical and economic data.

Concluding remarks:
The analytic approach was based on a number of hypotheses and assumptions that might have affected the
methodological quality of the study, but the authors’ conclusions appear to be robust.
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