The cost-effectiveness of HIV testing of physicians and dentists in the United States


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.

Health technology
Human immunodeficiency testing (HIV) testing of physicians and dentists.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis and cost-benefits analysis.

Study population
Hypothetical cohort of physicians and dentists.

Setting
Hospital or diagnostic centres. The economic study was carried out in the USA.

Dates to which data relate
Effectiveness and resource data were mainly derived from studies published during the period 1989-1993. Price date was 1992.

Source of effectiveness data
Data were derived from the literature.

Modelling
A decision analysis model was used to assess costs and benefits.

Outcomes assessed in review
Main clinical data related to: percentage of HAWs tested; HIV seroprevalence in HAWs; sensitivity and specificity of the testing sequence; risk of transmission from HAWs to patients.

Study designs and other criteria for inclusion in the review
National surveys, reports and other not specified studies.

Sources searched to identify primary studies
Not stated.
Criteria used to ensure the validity of primary studies
Data quality ranking was derived from the US Preventive Services Task Force.

Methods used to judge relevance and validity, and for extracting data
Not specified.

Number of primary studies included
A large unspecified number of studies was considered.

Methods of combining primary studies
Where it would have been applicable, the method used was not specified.

Investigation of differences between primary studies
Not investigated.

Results of the review
The main baseline effectiveness data used were: 41% of physicians and dentists underwent voluntary testing; HIV seroprevalence in HAWS was 0.4%; test sensitivity and specificity were estimated to be 99% and 99.9% respectively. The estimated risk of the transmission to patients was calculated to be 0.00002 from surgeons, and 0.000002 from dentists.

Measure of benefits used in the economic analysis
HIV infections averted and monetary benefits, calculated converting into dollars the value of patient cases averted using a valuation of life approach.

Direct costs
A societal perspective was used. Estimates of costs were derived from the literature. Costs included laboratory and counselling costs (test kit, personnel, fringe benefits, overhead); medical care costs averted due to the patients’ infections avoided. Costs were reflated to 1992 using the medical consumer price index. A decision analysis model was used to calculate final costs. A 5% discount rate was used.

Indirect Costs
HCW’s lost productivity due to mandatory practice changes. No other details were given.

Currency
US dollars ($).

Sensitivity analysis
A sensitivity analysis was carried out on costs and other relevant model data input. The methods used was not specified, but it seems that the analysis of extremes was applied.

Estimated benefits used in the economic analysis
Under a medium seroprevalence and transmission risk scenario for surgeons, the number of patient infections averted
would be 9.6, 20.8, 25 and 26.1 for increased voluntary testing, mandatory testing with informed patients, mandatory with restriction of practice, mandatory testing of all physicians with exclusion. For the same options, the results for dentists were 6.6, 13.3, 17.7, 18.4 respectively.

Cost results
For surgeons, at baseline conditions, the total costs (in millions) for increased voluntary testing, mandatory testing with informed patients, mandatory with restriction of practice, mandatory testing of all physicians with exclusion were $28.1, $28.4, $27.9 and $27.8 respectively. If the same options were costed for dentists, the results would have been $12.9, $13.8, $13.3 and $13.2 respectively.

Synthesis of costs and benefits
At baseline conditions, for surgeons, the cost per infection averted (in parenthesis the incremental cost per infection averted compared with current testing) for increased voluntary testing, mandatory testing with informed patients, mandatory testing with restriction of practice, and mandatory testing of all physicians with exclusion were $2,931,000 ($1,208,000), $1,361,000 ($395,000), $1,115,000 ($291,000), and $1,065,000 ($271,000) respectively. At baseline conditions, if the same options were costed for dentists, the results would have been $1,957,000 ($1,957,000), $1,040,000 ($768,000), $750,000 ($500,000), and $716,000 ($471,000) respectively. The cost-benefit analysis showed that the benefits of mandatory testing of surgeons exceeded the costs when the value of one patient infection averted was greater than $271,000. This threshold increased to $471,000 for dentists. When the lost productivity value due to exclusion of surgeons from practice was considered, the value of one patient averted would have to exceed $43 million for the benefits of testing to exceed the costs. For dentists, this threshold value dropped to $28 million. Results were very sensitive to seroprevalence and transmission risk: the incremental cost-effectiveness ratio ranged from a saving of $81,000 under a scenario of high prevalence and high transmission risk for surgeons, to a maximum of $447,062,000 under a scenario of low prevalence and low transmission risk for dentists. Moreover, sensitivity analysis on various parameters, showed that mandatory testing is more cost-effective if specificity rate is high, the decrease in patient exposures following mandatory restriction is high, the cost of a negative test is low, treatment costs for HIV-positive HAWS are low.

Authors' conclusions
The authors stated that on the basis of their analysis, in which there is uncertainty and incomplete data about the main variables of the model, it was not possible to reach any definitive conclusions regarding the cost-effectiveness of mandatory testing policies.

CRD Commentary
This is a good and very detailed exercise. As the authors themselves recognise, it represents a good start to informing debate about the evaluation of policy options for preventing transmission of HIV infections from physicians to patients. The model used in this study was reported in a very clear way and an extensive sensitivity analysis was carried out.

Implications of the study
Further research should be conducted for the collection of primary data.

Source of funding
National Institute of Mental Health; Agency for Health Care Policy and Research.

Bibliographic details