Cost-effectiveness of a brief video-based HIV intervention for African American and Latino sexually transmitted disease clinic clients

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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.

Health technology
The technology studied was a video-based group intervention aimed at encouraging safe sex behaviours, namely, condom use. Called VOICES/VOCES, the video and group discussion were provided in a single session at sexually transmitted disease (STD) clinics when participants came to the clinic for testing or treatment. Two videos were used - one for the group of African Americans, and another in English and Spanish for Latinos.

Type of intervention
Primary prevention.

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

Study population
The study population comprised African-American and Latino clients of STD clinics.

Setting
The setting was urban sexually transmitted disease clinics. The economic study was carried out in New York City, USA.

Dates to which data relate
The intervention effectiveness data were collected in 1992 and 1994. Additional model parameter values were derived from studies published in 1994, 1997 and 1998. It was not clear when the resource use data were collected. The HIV treatment costs were inflated to 1999 dollars. No price year was given for the other costs.

Source of effectiveness data
The intervention effectiveness data were drawn from a single study with data for other parameters being derived from a synthesis of other studies and from assumptions.

Link between effectiveness and cost data
The cost data were collected at four replication sites, none of which were the site at which the effectiveness study was carried out. Although the authors did not describe it, the resource use data may have been collected after the effectiveness results were known.

Study sample
The sample was selected from all clients attending the Morrisania STD clinic in the South Bronx in 1992 and who gave written informed consent to participate in a randomised clinical trial. There were 2,004 male clients who participated in
the study (1,210 in the intervention group and 794 in the control group). Some female clients also participated though not all data items were collected for this group. All clients who attended the clinic during the study period were asked to participate in the study, and 99% agreed to do so. Thus, the sample would appear to have been appropriate for the study question. No power calculations are reported.

Study design
This was a single-centre randomised clinical trial. Participants were followed-up for an average of 17 months to determine the incidence of new STDs. The completion rate was 97%. The authors did not comment on those clients who did not complete the study. Additional information about the study design can be found in the first reference listed later (see "Other Publications of Related Interest").

Analysis of effectiveness
The authors did not report whether the analysis was performed on the basis of intention to treat or treatment completers only. The article provided no details of the baseline comparability of the two groups. The primary health outcomes were the number and frequency of sexual contacts and incident STDs, defined as an STD diagnosed at least 30 days after the intervention. These data were obtained for each participant through the New York City STD surveillance system.

Effectiveness results
Applying the results of the effectiveness study within the model (and including parameters values assessed in the literature review), it was estimated that 94.8% of the intervention group used condoms as compared with 86.2% in the control group.

Based on these estimates, an average of 27.69 (range: 4.79 - 202.78) HIV infections were averted by the use of the VOICES/VOCES intervention. This consisted of 14.0 (range: 3.18 - 126.87) HIV infections averted among 9,500 HIV-uninfected participants, and 13.35 (range: 3.37 - 101.61) among the 500 HIV-positive clients.

The effectiveness of the VOICES/VOCES interventions appears to be greater in the HIV-positive clients.

Clinical conclusions
This video-based intervention is one of the few interventions shown to be effective in male, heterosexual, non-injecting-drug-using populations in reducing the incidence of STDs.

Modelling
A previously published equation of HIV transmission dynamics was used to deduce the impact of the intervention on condom use via the observed impact on incident STDs. This was in turn used to estimate the number of HIV infections averted by the intervention. Probability distributions were assigned to some of the model parameters and probabilistic models were used to relate costs to two outcome measures (HIV infections averted and QALYs gained).

Outcomes assessed in the review
The outcomes assessed by a review were the prevalence of STDs and HIV in the study population, the effectiveness of condoms, and the transmissibility of HIV and STDs.

Study designs and other criteria for inclusion in the review
Data were derived from published studies and New York City Health Department Data.

Sources searched to identify primary studies
Not stated.
Criteria used to ensure the validity of primary studies
Not stated.

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

Number of primary studies included
Four primary studies were included.

Methods of combining primary studies
Not stated.

Investigation of differences between primary studies
Not reported.

Results of the review
The prevalence of HIV was 5% and the prevalence of STDs was 0.23 (range: 0.172 - 0.30).

The transmission probabilities for HIV and STDs in a single sexual contact were 0.0056 (95% CI: 0.0041 - 0.0075) and 0.150 (95% CI: 0.10 - 0.253), respectively.

Methods used to derive estimates of effectiveness
The authors make some assumptions in using their models.

Estimates of effectiveness and key assumptions
The prevalence of HIV among partners of non-HIV-infected participants was assumed to be equal to the overall prevalence of 5%.

Partners of HIV-positive participants were assumed to have a higher prevalence of 7%.

It was estimated that condoms were 90% effective.

Measure of benefits used in the economic analysis
The primary outcome measure was HIV infections averted. This benefit measure was translated to quality-adjusted life years (QALYs) gained using quality of life weights related to four stages of HIV/AIDS.

Direct costs
Direct costs included in the analysis were start-up costs (including the videos, other equipment and staff training), recurrent costs (primarily labour costs) and client-specific costs (including materials provided to each participant). The resource use quantities were obtained from a detailed study of four centres offering the intervention, though it was not clear when this was carried out or if the unit costs were also obtained from this source. Some resource use quantities were reported separately or can be deduced from the information presented. Capital expenditures (such as the purchase of the TV or VCR) were annuitised and distributed across the life of the project with a 5% discount rate being used in the annuity function. In the cost-utility analysis, the authors used HIV treatment costs derived from one particular study and inflated to 1999 dollars. A discount rate of 5% was used for costs (and outcomes). The authors stated that no
research-related costs were included in the analysis.

**Statistical analysis of costs**
No statistical analysis of costs was carried out.

**Indirect Costs**
Indirect costs are not included in this analysis.

**Currency**
US dollars ($).

**Sensitivity analysis**
Although not specifically stated, the authors appear to have used Monte Carlo analysis to investigate uncertainty surrounding some cost and epidemiological parameters. Although the analysis itself was not described, ranges were reported around some model parameters and outputs. The authors reported using a triangular probability distribution for some parameters. The ranges for the data items obtained in the literature review were derived from the studies themselves, other parameter ranges being dictated by the range of values that were consistent with the models used. The ranges around the intervention cost estimates may represent the range observed across the four centres.

**Estimated benefits used in the economic analysis**
The intervention resulted in an average of 27.69 HIV infections averted (range: 4.79 - 202.78) and an average of 387.61 QALYs gained (range: 65.44 - 3488.30).

**Cost results**
The total cost of the intervention was $447,005 (range: $340,162 - $557,174).
The intervention cost an average of $44.70 per client (range: $34.02 - $55.72).
The cost savings due to HIV infections averted averaged $5,544,408 (range: $429,000 - $45,400,000).

**Synthesis of costs and benefits**
The average cost of the intervention per HIV infection averted was $21,486 (range: $2,399 - $87,670).
The average cost of the intervention per QALY gained was $1,613 (range: $149 - $7,554).

When HIV treatment cost savings were included there was no positive cost per QALY gained (i.e. the intervention dominated).
The costs savings of HIV treatment avoided outweighed the cost of the intervention for intervention costs per client up to $599.

**Authors’ conclusions**
This intervention was found to be feasible and cost saving.

**CRD COMMENTARY - Selection of comparators**
The comparator was normal service provision at STD clinics and was thus an appropriate comparator for estimating the
effectiveness of the proposed additional intervention of VOICES/VOCES. It also provides a useful comparator for decision-makers in other settings.

**Validity of estimate of measure of effectiveness**
The effectiveness study appears to have been appropriately designed. It was of relatively high quality compared with other studies of HIV prevention programmes that are not randomised and are more reliant on self-reported and potentially biased data. Given that 99% of clients agreed to participate in the study, the sample appears to have been appropriate for the study question.

Some model parameters were derived from the literature, although a systematic review was not conducted. Many of the model parameters were varied in the sensitivity analysis, although results and details of this analysis were not reported.

**Validity of estimate of measure of benefit**
HIV infections averted were converted to QALYs using weights obtained from a previously published study of HIV. Possible differences between the patients in the two studies were not discussed.

**Validity of estimate of costs**
The analysis of the intervention costs was detailed and included all the relevant cost components. However, not all resource use quantities were reported separately and the source of the unit costs was not stated. The HIV treatment costs were derived from one American study and may not be applicable to other health care systems. It would appear that all costs were varied in the sensitivity analyses. Care was taken to exclude costs related to the research itself.

The authors noted some differences between the actual and simulated values of some inputs, although they did not provide an explanation for these differences. For example, the analysis suggested that the average cost per client is $43.30, but the simulated value was $44.70.

**Other issues**
The findings of this study were compared with other studies of HIV prevention programmes and in particular with two reviews of such studies. The authors stated that none of the previous studies related to this study population and that the cost-effectiveness of this study was about average when compared with prevention programmes aimed at homosexual men.

The authors assessed the generalisability of these results to other settings in so far as they noted that the cost of the intervention might vary depending on how and where it is implemented. Their threshold analysis indicated that this intervention would be cost saving even if the intervention cost were to increase several fold.

The details of the probabilistic sensitivity analyses were not entirely clear from the article. For example, the authors did not always explain how the ranges were derived, what probability distributions were used (and why) and which variables they included in the sensitivity analyses (and why). In analysing the sensitivity to the number of QALYs gained per infection averted, the authors used the 0% and 5% discounted values from the primary study as the low and high values. It is not clear why these were appropriate extreme values to test uncertainty about the discount rate. The ranges around the outcomes may have been unnecessarily wide, thus making the findings difficult to interpret.

**Implications of the study**
The authors recommended that a video-based intervention be included in HIV prevention programmes for this study population.

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**Other publications of related interest**


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