Cost effectiveness of targeted HIV prevention interventions for female sex workers in India

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 assessed the cost-effectiveness of targeted interventions for female sex workers to reduce risky sexual behaviour and to prevent HIV infection. The authors concluded that targeted interventions were very cost-effective from the perspective of the health care system. The methods were valid and extensively reported, with more details in a web appendix. The authors’ conclusions appear to be robust.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
This study assessed the cost-effectiveness of targeted interventions for female sex workers to reduce risky sexual behaviour and to prevent HIV infection.

Interventions
The targeted interventions included peer-led counselling to encourage behaviour change towards safer sex practices, the promotion of condoms, quarterly referrals for health check-ups and sexually transmitted infection (STI) treatment, and referral and support for accessing antiretroviral therapy (ART) after self-disclosure of HIV-positive status by the female sex worker to an outreach peer worker.

The aim of the programmes was to increase safer sexual behaviour by reducing the number of sex partners and increasing the use of condoms in commercial sex encounters. The interventions were part of the National AIDS Control Organization (NACO) programme, in India. They were compared with a mass media campaign to encourage condom use in the general population.

Location/setting
India/primary care and community.

Methods
Analytical approach:
The analysis was based on a compartmental dynamic Markov model, with a 20-year time horizon. The authors stated that the analysis was carried out from the perspective of the health system.

Effectiveness data:
The clinical data were from a selection of relevant studies. The epidemiological inputs were mainly from Indian sources; some were from studies conducted in other countries. A key input for the model was the efficacy of the interventions in increasing condom use, treating STIs and reducing their prevalence, reducing the number of sex acts, and reducing the number of sex partners. These data were from two national behavioural surveys, and Integrated Biological and Behavioural Surveillance (IBBA) information. The effectiveness of a mass media campaign in enhancing condom use was from a South African study. Other data were from published reviews of the literature.

Monetary benefit and utility valuations:
The disability weights were published Global Burden of Disease estimates for HIV and AIDS.

Measure of benefit:
Disability-adjusted life-years (DALYs) and HIV infections averted were the summary benefit measures. A 3% annual discount rate was applied.

Cost data:
The economic analysis included two main cost categories: the programme costs and the costs of ART. The programme costs were from implementation plans and annual reports. The costs of ART were from published Indian studies and international funds, including NACO. All costs were reported in US dollars ($) and Indian rupees (INR) and were discounted at an annual rate of 3%. The price year was 2008.

Analysis of uncertainty:
One-way sensitivity analyses were carried out to identify the influential inputs. The ranges of values were from the literature or authors’ opinions. A probabilistic sensitivity analysis was carried out and cost-effectiveness acceptability curves were constructed.

Results
In the simulated population, the costs were $1,085 million with mass media and $1,371 million with the interventions. The HIV infections were 7.4 million with mass media, and 4.7 million with the interventions. The DALYs were and 91.7 million with mass media, and 65.1 million with the interventions.

The incremental cost per HIV infection averted with the targeted interventions over mass media alone was $105.5 (INR 4,748). The incremental cost per DALY averted was $10.9 (INR 490).

The most influential inputs were the risk of HIV and STI transmission per sex act, the STI cofactor effect, the number of clients, the unit cost of implementing targeted interventions, and the female sex worker's condom use.

There was nearly a 70% chance that the targeted interventions were cost-effective at a willingness-to-pay threshold equal to the per capita gross domestic product of India (INR 25,393).

Authors' conclusions
The authors concluded that targeted interventions were very cost-effective from the perspective of the health care system.

CRD commentary
Interventions:
The rationale for the selection of the comparators was clear as the proposed targeted interventions were compared against a general intervention to prevent STI. The key elements of the interventions were described.

Effectiveness/benefits:
The clinical data appear to have been from valid sources that generally reflected the epidemiology and behaviour of the Indian population. Other data were from reviews of the literature and published reports. There was high uncertainty around some key parameters, which was investigated in the extensive sensitivity analysis. Both benefit measures appear to have been valid for assessing the impact of the interventions on the patients’ health. DALYs were particularly relevant for a developing country as they capture the burden of disease and allow cross-disease comparisons to be made. The sources for the disutility weights were given, but no other details were reported.

Costs:
The economic analysis included those costs relevant to the public payer. They were presented as category totals and were not broken down into individual items. The key data sources were given, and appear to have been appropriate for India. The impact of alternative cost estimates was tested in the sensitivity analyses. Currency conversions were performed and the price year was reported.

Analysis and results:
The results were clearly presented. An incremental approach was used to synthesise the costs and benefits of the two interventions. The uncertainty was satisfactorily investigated and the key results were presented and discussed. The
authors compared their results with those of other published studies and highlighted the advantages and limitations of this study. The dynamic model was a good design and was mainly populated with Indian data. The transferability of the results was not investigated and the findings appear to be specific to the authors' setting or other settings with similar economic development.

Concluding remarks:
The methods were valid and extensively reported, with more details in a web appendix. The authors' conclusions appear to be robust.

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