Universal antenatal human immunodeficiency virus (HIV) testing programme is cost-effective despite a low HIV prevalence in Hong Kong

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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
The study evaluated the cost-effectiveness of universal antenatal human immunodeficiency virus testing (UAT) in Hong Kong for women who attended antenatal clinics. The authors concluded that the incremental benefits of the UAT programme were much greater than the incremental cost. The clinical estimates used in the model were not well reported and there is uncertainty in the results. Nevertheless, the authors’ conclusions are broadly appropriate.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The study evaluated the cost-effectiveness of universal antenatal human immunodeficiency virus (HIV) testing in Hong Kong for women who attended antenatal clinics.

Interventions
A universal antenatal testing (UAT) programme over a period of 3 years and 4 months was compared with no such programme. The programme included voluntary HIV antibody testing, the provision of information and counselling for pregnant women who attended antenatal clinics, and the offer of medical and obstetrical care to HIV-positive women.

Location/setting
Hong Kong. Outpatient/primary care.

Methods
Analytical approach:
The economic evaluation was based on national data from the UAT programme in Hong Kong. A model was used to combine screening, HIV-positive rates and transmission rates from this programme with prevalence data from elsewhere and with clinical estimates without the intervention, as estimated from the literature. The authors stated that they adopted a health care provider perspective. The health outcomes and costs were evaluated over the lifetimes of the mothers and infants.

Effectiveness data:
Clinical data related to the intervention were obtained from a national programme data and from the literature. Clinical data without the intervention, such as time to diagnosis and mother-to-child transmission rates, were estimated from the literature. Data were available for a period of 3 years and 4 months from the national programme. A total of 28 pregnant women tested HIV-positive during this period. Fifteen babies were born. The methods of identifying the literature and estimating the control clinical data from the literature were not reported. The main clinical estimate was the incidence of HIV transmission from mother to infant.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The measures of benefit were the number of HIV infections avoided during the 3 years and 4 months of the implementation of the programme and the number of life-years gained. The number of life-years gained was discounted
at an annual rate of 3.6%.

Cost data:
The cost analysis included the direct health service costs of screening, provision of information (including education resource materials), counselling, prevention of mother-to-child-transmission, and the lifetime cost of treating infected mothers and infected children. Resource use involved with the intervention was derived from the UAT programme. The unit costs of screening were also obtained from the UAT programme, while the cost of operations and prophylaxis were obtained from national sources and a pharmaceutical company, and the cost of treating persons living with HIV or acquired immunodeficiency syndrome (AIDS) was obtained from the literature. The price year was 2004/05. The cost data were discounted at an annual rate of 3.6%. The currency was Hong Kong dollars (HKD). The authors quoted an exchange rate of GBP 0.07048 to 1HKD.

Analysis of uncertainty:
Parameter uncertainty was investigated through one-way sensitivity analysis. Cost-effectiveness ratios were presented for the different parameter values entered in the model.

Results
The total incremental cost of the programme during the first 3 years of implementation was HKD 12,227,988.

The total number of transmitted infections avoided during the first 3 years was 6 infections.

A total of 154.59 discounted life-years were gained over the 3 years.

The average cost per HIV infection avoided was HKD 2,037,998 and the average cost per discounted life-year gained was HKD 79,099.

The cost-effectiveness ratios were sensitive to changes in the HIV prevalence in the antenatal population, the coverage of the programme for pregnant women and loss to follow-up.

Authors' conclusions
The authors concluded that the incremental benefits of the UAT programme were much greater than the incremental cost of its implementation.

CRD commentary
Interventions:
The intervention was well explained and the comparator was clear. The interventions compared were justified because the study retrospectively analysed the cost-effectiveness of the implementation of a health programme.

Effectiveness/benefits:
The total number of infants born to HIV-positive women was only 15. HIV was transmitted to one infant. The small sample size suggests the existence of uncertainty around the transmission rate estimate. The methods used to identify the literature used to estimate the clinical effectiveness estimates were not reported. The main clinical parameters of transmission rates were not well reported. Termination of pregnancy was listed as an intervention to reduce the risk of vertical transmission. This was not included in the calculation of the measure of benefit, without justification.

Life-years is an adequate measure of benefit when considering the mortality associated with HIV/AIDS. However, it does not fully capture the health benefits.

Costs:
All of the relevant costs consistent with the study perspective appear to have been included in the analysis. The sources of the resource use and the unit costs, and the data themselves, were well reported. The cost estimates were all relevant to the study population and setting. Discounting was appropriately conducted.

Analysis and results:
The cost results were well reported but the benefit results could have been clearer. A sensitivity analysis on antiretroviral effectiveness rates was conducted, but it was not explained how the therapy effectiveness rates fitted into the model. The uncertainty surrounding the HIV mother-to-child transmission rate was evaluated through varying the estimate in a sensitivity analysis. However, the small number of HIV-positive mothers and infants in the programme suggests that a greater range of the estimate could have been analysed. There was no indication that any analysis of uncertainty was conducted on the cost estimates in the model.

**Concluding remarks:**
The clinical estimates used in the model were not well reported and there is uncertainty in the results. Nevertheless, the authors' conclusions are broadly appropriate.

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