Cost-effectiveness analysis of partner notification program for human immunodeficiency virus infection in Japan

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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
Partner Notification Program (PNP) for Human Immunodeficiency Virus Infection (HIV).

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Male and female HIV-positive individuals (excluding haemophiliacs).

Setting
Hospital. The economic study was carried out in Kyoto, Japan.

Dates to which data relate
The main effectiveness data were obtained from a single study conducted in 1997, a review of previously published studies conducted between 1990-1996 and authors' assumptions. Resource and cost data were taken from 1990-1996 sources. The price year was 1997.

Source of effectiveness data
The estimate of the number of HIV preventable cases was obtained from a single study.

Link between effectiveness and cost data
The costing was undertaken retrospectively on the same patient sample as that used in the effectiveness study.

Study sample
A cohort of 277 HIV carriers was included in the analysis. The male to female ratio of HIV carriers was 2.3. Power calculations to determine the sample size were not reported.

Study design
Cohort study. The duration of the follow-up was not stated. There was no loss to follow-up.
Analysis of effectiveness
The analysis of effectiveness was based on intention to treat. The primary health outcome was the number of HIV preventable cases.

Effectiveness results
The number of HIV preventable cases was 55 (47 HIV carriers with an average new HIV per HIV infected individual of 0.17. From this 47 HIV positive partners, another 8 could be traced).

Modelling
Not considered.

Outcomes assessed in the review
Effectiveness estimates derived from a review were the average new HIV per HIV infected individual, initial T4 cell distribution of the carrier and life expectancy of the HIV infected individuals according to the T4 cell distribution.

Study designs and other criteria for inclusion in the review
No specific study designs were stipulated by the authors as inclusion/exclusion criteria.

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
10 studies were included in the review.

Methods of combining primary studies
Narrative method.

Investigation of differences between primary studies
Not undertaken.

Results of the review
The average new HIV per HIV infected individual was 0.17. The initial T4 cell distribution of the carrier was T4 > 500 cells/mm?3, 59%; T4 = 201-500 cells/mm?3, 36.4%; and T4 < 200 cells/mm?3, 4.6%. Life expectancy of the HIV infected individuals according to the T4 cell distribution was 10.75 years, 9 years and 2 years, respectively.

Methods used to derive estimates of effectiveness
Estimates of effectiveness were also derived from authors’ assumptions.
Estimates of effectiveness and key assumptions
The initial T4 cell distribution among the HIV carrier was assumed to be similar to that found among 1,665 asymptomatic persons in the Multicentre Cohort Study: T4>500 cells/mm³, 59%; T4=201-500 cells/mm³, 36.4%; T4<200 cells/mm³, 4.6%. The mean time to develop AIDS was 10.75 years, 9 years and 2 years in the T4>500 cells/mm³, T4=201-500 cells/mm³ and T4<200 cells/mm³ groups, respectively. All partners notified were assumed to test ELISA and those with positive result to have additional ELISA and western blot test for confirmatory purposes. Ancillary costs were assumed to be 25% of the medical care cost.

Measure of benefits used in the economic analysis
The outcome measure was the number of years gained being the sum of the life expectancy of the HIV prevented individuals discounted at standard rate.

Direct costs
Costs of counselling of the index cases, locating partners, counselling and testing of the partners, initial check-up, follow-up and treatment of the newly found HIV carriers among the partners, treatment of AIDS and treatment of individuals during their life years gained were included in the analysis. Resource and cost data were reported separately. An annual discount rate of 5% was applied. The quantity/cost boundary adopted was the hospital. The price year was 1997.

Statistical analysis of costs
Not undertaken.

Indirect Costs
Not considered.

Currency
US dollars ($). An exchange value was set at 115 Yen = US$1.00.

Sensitivity analysis
A one-way sensitivity analysis was undertaken on the number of newly found HIV positive individuals per index case, acceptance of HIV testing among the notified partners, average number of partners per index case, costs for counselling, physician visits costs, laboratory tests costs, drugs and locating partners costs and ancillary costs.

Estimated benefits used in the economic analysis
The net life years gained by the PNP was 181.

Cost results
The costs for follow-up and antiviral treatment of newly found HIV carriers were $1.8 million (39%), costs for the treatment of AIDS till death were $0.69 million (36%), costs for medical care during the gained life years were $0.48 million (10%), costs for ancillary care were $0.49 million (11%) and costs for locating, counselling and testing of the partners were $0.18 million (4%). An annual discount rate of 5% was applied.

Synthesis of costs and benefits
The incremental cost-effectiveness ratio was $4,930 per life year gained over "no PNP strategy". Sensitivity results indicated that PNP was cost-effective over a wide range of assumptions. Compared with other medical interventions.
(Fecal Occult Blood Test, Total Colonoscopy, Screening for gastric cancer in male/female and HIV screening for the population with 1% prevalence), the PNP strategy was far more cost-effective. The sensitivity analysis results were again favourable for the PNP strategy.

Authors’ conclusions
This study strongly support the implementation of PNP as a part of HIV prevention strategies in Japan.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator is clear. PNP was demonstrated to be effective in containing the spread of HIV. You, as a user of this database, should consider whether these are widely used health technologies in your own setting.

Validity of estimate of measure of benefit
The estimate of measure of benefit used in the economic analysis is likely to be internally valid. The data have not been used selectively, although as a 100% acceptance rate was assumed, the PNP effectiveness may have been slightly overestimated. The robustness of the results was examined using a one-way sensitivity analysis. However, the review description lacked details, in particular descriptions of study designs, sources searched, inclusion/exclusion criteria and differences between primary studies were not stated.

Validity of estimate of costs
Resources were reported separately from the prices and adequate details of methods of quantity/cost estimation were given. Important cost items do not appear to have been omitted. However, no statistical analysis was conducted. As the study was retrospective, the costs need to be treated with a degree of caution.

Other issues
The authors’ conclusions are likely to be justified given the uncertainties in the data. The issue of generalisability to other settings or countries was addressed and appropriate comparisons with other studies were made in terms of cost-effectiveness results. The results do not appear to have been presented selectively.

Implications of the study
Further research is needed regarding life years gained by antiviral treatment for HIV carriers, the probability of false-positivity of laboratory test and cost data for counselling.

Source of funding
None stated.

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