Cost-effectiveness of voluntary HIV screening in Russia
Tole SP, Sanders GD, Bayoumi AM, Galvin CM, Vinichenko TN, Brandeau ML, Owens DK

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 evaluated the cost-effectiveness of potential voluntary human immunodeficiency virus (HIV) screening and counselling programmes in Russia. The authors concluded that the early identification of HIV infection through screening was cost-effective in all except the lowest prevalence groups. The methods appear to have been satisfactory, but the limited reporting makes it unclear if the authors' conclusions are appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
To evaluate the cost-effectiveness of potential voluntary human immunodeficiency virus (HIV) screening and counselling programmes for the general population.

Interventions
No HIV screening was compared with screening for HIV once in a lifetime, and repeat screening. Each month people could undergo HIV testing through symptom-based case finding, a screening programme, or both. For repeat screening, intervals of every one to five years were considered.

Location/setting
Russia/primary care.

Methods
Analytical approach:
A Markov model was developed to estimate the costs and benefits for each of the HIV screening programmes, in a cohort of people aged 15 to 49 years, over their lifetime. The data were from published studies and expert opinion. The authors did not report the study perspective.

Effectiveness data:
The effectiveness data for screening and counselling were based on published studies. The effectiveness of counselling in reducing risky behaviours was based on evaluations of counselling and testing effectiveness in the USA. The authors used their judgement in assuming that counselling did not alter the risk of transmission via injection drug use, and that 50% of patients had access to antiretroviral therapy, which reduces infection. Epidemiological data were from the Joint United Nations Programme on HIV/acquired immune deficiency syndrome (AIDS; UNAIDS), the World Health Organization (WHO), and Russia's Federal AIDS Center. The key clinical parameters included the incidence and prevalence of HIV, screening sensitivity, effectiveness of testing and counselling, disease progression probabilities, and survival.

Monetary benefit and utility valuations:
The utility estimates for individuals with HIV were derived from published studies set in countries other than Russia.

Measure of benefit:
The primary benefit measure was the number of quality-adjusted life-years (QALYs) gained and these were discounted at an annual rate of 3%.

Cost data:
The analysis included the direct costs of: medical visits, laboratory tests, testing and counselling, follow-up, treatment, and support services while on treatment. Russian data were obtained from the Russian Bulletins of Laboratory Services, Russian Regional AIDS Center directors, and non-governmental organisations. The cost of antiretroviral therapy was based on the year 2006, and the authors stated that this price was expected to decrease significantly over the next few years. The price year and adjustments for inflation were not reported. All costs were in US dollars ($) and an annual discount rate of 3% was applied.

Analysis of uncertainty:
One-way and multi-way sensitivity analyses were performed varying the reduction in risky behaviour following screening and counselling, quality of life decrement associated with HIV, cost of antiretroviral therapy, and proportion of patients receiving antiretroviral therapy. These results were obtained for the scenario of index cases only as well as for index cases and their sexual partners. One-way sensitivity analyses were performed and graphs presented to demonstrate the point at which screening was not cost-effective as defined by the WHO. The parameters varied were the prevalence for once-a-lifetime screening and the incidence for screening every one to five years.

Results
For index cases only, the expected QALYs were 23.813 for no screening, 23.817 for screening once-a-lifetime, and 23.822 for screening every five years. The cost per patient screened was $3,121 for no screening, $3,177 for screening once-a-lifetime, and $3,282 for screening every five years.

The incremental cost-effectiveness ratio (ICER) of screening once-a-lifetime compared with no screening was $13,396 per QALY gained. The ICER for screening every five years compared with once-a-lifetime screening was $25,388 per QALY gained. The ICER for screening every two years compared with every three years was $27,696 per QALY gained.

The sensitivity analyses showed that these results were sensitive to the inclusion of sexual partners with index cases, which improved the ICERs. They were insensitive to changes in prevalence and only sensitive to changes in incidence when considering more frequent screening intervals. They were generally insensitive to the other parameters varied.

Authors' conclusions
The authors concluded that the early identification of HIV infection through screening was cost-effective in all except the lowest prevalence groups. Voluntary HIV screening of 15 to 49 year olds every two years was cost-effective by WHO guidelines.

CRD commentary
Interventions:
The interventions were well described and relevant in the authors’ setting. Screening for HIV in Russia was widespread since the 1980s, but the cost-effectiveness remained unclear.

Effectiveness/benefits:
There was no indication that the authors conducted a systematic review to obtain the clinical effectiveness estimates, so it is not clear if the best available evidence was used. The reporting of the methods used to identify the sources was limited, but these details were published elsewhere (Sanders, et al. 2005, see ‘Other Publications of Related Interest’ below for bibliographic details). These data appeared to be from good studies. The epidemiological data was modified to account for the underestimation of prevalence and incidence due to undiagnosed cases. Given the uncertainty around this estimate, the authors conducted sensitivity analysis across a range of incidences, which were reported. It was not clear if the lowest estimate of incidence was as low as the estimate from the Federal AIDS Center. The utilities were from studies conducted outside Russia and therefore may not reflect the study population and no information was given on the instruments used to derive these utilities. QALYs were an appropriate benefit measure, given the impact that HIV has on both quality of life and survival.

Costs:
The authors did not report the study perspective, so it is unclear if the appropriate cost categories were included. The sources used to derive the cost data were satisfactorily reported, but the year in which data was obtained from the
Russian Bulletin of Laboratory Services, Russian Regional AIDS Center directors and non-governmental organisations was not reported. The price year was also not reported, so the results cannot be re-valued in future years. No adjustments for inflation were reported and the cost of antiretroviral therapy was based on a 2006 value. The reporting of the cost data and methodology was limited, but more details were published elsewhere (Sanders, et al. 2005).

Analysis and results:
The description of the model structure and assumptions was limited, but more details were published elsewhere (Sanders, et al. 2005). The results were partially reported, with the complete results, including incremental costs and QALYs, only for some screening strategies. The issue of uncertainty was addressed with one-way and multi-way sensitivity analyses, but no probabilistic sensitivity analysis was performed. The impact of changing the proportion of individuals receiving antiretroviral therapy, when assuming ineffective counselling, was not reported and, since the base value for this variable was uncertain, this should have been reported. The authors noted a number of limitations in their analysis.

Concluding remarks:
The methods appear to have been satisfactory, but limited reporting makes it unclear if the authors' conclusions are appropriate.

Funding
Supported by the National Institute on Drug Abuse; the Agency for Healthcare Research and Quality; and the Department of Veterans Affairs.

Bibliographic details

PubMedID
19103893

DOI
10.1258/ijsa.2008.008128

Original Paper URL
http://ijsa.rsmjournals.com/cgi/content/abstract/20/1/46

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
AIDS Serodiagnosis /economics; Adolescent; Adult; Cost-Benefit Analysis; HIV Antibodies /blood; HIV Infections /diagnosis /epidemiology /prevention & control /transmission; Humans; Markov Chains; Mass Screening /economics /methods; Middle Aged; Prevalence; Quality of Life; Russia /epidemiology; Voluntary Programs /economics /statistics & numerical data; Young Adult

AccessionNumber
22009100639

Date bibliographic record published
09/09/2009
Date abstract record published
17/03/2010