Estimation of the burden of disease and costs of genital Chlamydia trachomatis infection in Canada

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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 aim was to examine the costs and health outcomes of normal versus enhanced screening, for genital Chlamydia trachomatis infection, in heterosexual Canadians, aged 10 to 39 years. The authors concluded that, compared with no change in screening, enhanced screening in asymptomatic individuals was highly cost-effective. The conclusions reached by the authors appear to be a reasonable assessment of the analysis and its findings.

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

Study objective
The aim was to examine the costs and health outcomes of normal versus enhanced screening, for genital Chlamydia trachomatis infection, in heterosexual Canadians, aged 10 to 39 years.

Interventions
Enhanced screening for asymptomatic chlamydia infections, in which the probability of being screened increased yearly from 0.002 to 0.1, was compared with normal screening, in which the probability remained at 0.002.

Location/setting
Canada/primary prevention.

Methods
Analytical approach:
A published mathematical model of chlamydia transmission (Fisman, et al. 2008, see 'Other Publications of Related Interest' below for bibliographic details) was used to synthesise the evidence. The model had five age groups: 10 to 14, 15 to 19, 20 to 24, 25 to 29, and 30 to 39 years. The time horizon was 18 years, from 1991 to 2009. The authors stated the study took a modified societal perspective, which excluded people's time and travel costs.

Effectiveness data:
The key outcomes were the probabilities of symptomatic infections, pelvic inflammatory disease with or without symptoms, and complicated chlamydia infections in men. The inputs for prevalence, transmission, complications and natural clearance of chlamydia infection were from epidemiological studies. The chlamydia testing volumes over time were from Ontario's public health laboratory system. The model was calibrated using the age-specific prevalence of chlamydia infections in Canada from 1991 to 2009.

Monetary benefit and utility valuations:
Pelvic inflammatory disease was assumed to result in a loss of about one quality-adjusted life-year (QALY), due to infertility and chronic pelvic pain, based on a published study of patients with the disease.

Measure of benefit:
The summary benefit measures were QALYs, symptomatic infections, cases of symptomatic pelvic inflammatory disease, and chronic sequelae averted. Future benefits were discounted at 3% per year.

Cost data:
The direct costs included those of the screening tests, treatments, and complications, such as epididymo-orchitis, tubal infertility, and ectopic pregnancy. The resource use for antimicrobial therapy, adverse drug reactions, and doctor visits was from published studies. Prices were adjusted for inflation to 2009 values, using the personal care component of the Canadian Consumer Price Index. All costs were reported in Canadian dollars (CAD) and future costs were discounted at 3% per year.

Analysis of uncertainty:
One-way, and probabilistic (using 1,000 simulations) sensitivity analyses were performed. The results were illustrated in a tornado graph, a scatter plot, and cost-effectiveness acceptability curves.

Results
The total QALYs lost were 310,505 with normal screening and 298,262 with enhanced screening; a gain of 12,243 QALYs with enhanced screening. The total costs were CAD 677.04 million with normal screening and CAD 712.62 million with enhanced screening; an incremental cost of CAD 35.58 million.

The incremental cost per QALY gained was $2,910 with enhanced screening.

One-way sensitivity analyses indicated that the results were very sensitive to the probability of pelvic inflammatory disease, the probability of symptomatic infections, and the QALY loss per pelvic inflammatory disease case. The probabilistic sensitivity analyses showed there was a 93% chance that the enhanced screening policy was cost-effective at a willingness-to-pay threshold of CAD 39,400 per QALY gained (the 2008 per capita gross domestic product in Canada).

Authors' conclusions
The authors concluded that, compared with no change in screening, enhanced screening for Chlamydia trachomatis in asymptomatic individuals was highly cost-effective.

CRD commentary
Interventions:
The scenarios were briefly described and justified. The baseline prevalence of chlamydia infections might be similar for other settings.

Effectiveness/benefits:
The predicted health outcomes were based on relevant national epidemiological studies, which were not fully described. The methods used to derive the utility losses were unclear, but a reference was given.

Costs:
The costing methods were well described and the unit costs were clearly presented. Productivity losses and other indirect costs were not included, but were relevant for a societal perspective and it seems that a health system perspective was reported.

Analysis and results:
The analytic approach was satisfactorily reported. The uncertainty was assessed, using appropriate methods, and the results were clearly reported. The findings were sensitive to variations in the key inputs. The authors acknowledged a number of limitations to their analysis, including the uncertainty in some influential parameters, such as the duration of infection, and the omission of the programme costs for screening. The authors discussed the fact that they used epidemiological data from Canada and costs from the USA, in the absence of Canadian costs.

Concluding remarks:
The methods, analyses and results were mostly clear and appear to have been comprehensive. Some types of costs were omitted, but the conclusions reached by the authors are a reasonable assessment of the study findings and the analysis undertaken.

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