The costs and impacts of testing for hepatitis C virus antibody in public STD clinics

Honeycutt A A, Harris J L, Khavjou O, Buffington J, Jones T S, Rein D B

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
The study investigated the use of testing for hepatitis C virus (HCV) antibody in public, sexually transmitted disease (STD) clinics for different sub-groups of patients:

- drug-injecting individuals;
- men aged 40 years or older with a history of 100 or more sexual partners;
- men aged 40 years or older with fewer than 100 lifetime sexual partners; and
- women aged 40 years or older.

Type of intervention
Screening.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised individuals, regardless of age, identified in the National Health and Nutrition Examination Survey (NHANES) as being injection drug users (IDUs). Also identified in the NHANES were three groups of patients aged 40 years old or older. These were men who reported having 100 or more lifetime sexual partners, men who reported having fewer than 100 lifetime sexual partners, and women.

Setting
The study setting was primary care. The economic analysis was carried out in the USA.

Dates to which data relate
The effectiveness data were derived from the NHANES (which included information on patients for the years 1999 to 2002) and from studies published between 2003 and 2005. The price year was 2006.

Source of effectiveness data
The clinical and epidemiological data used in the economic evaluation included:

- the prevalence of HCV in the different sub-groups;
- the sensitivity and specificity of HCV testing protocols; and
- the proportion of patients returning for their test results.
Modelling
No decision analytic model was used. The costs and outcomes were derived by combining parameters using a multiplicative formula.

Sources searched to identify primary studies
The prevalence of HCV for each sub-group was derived from the NHANES survey. The percentages of patients returning for their results were obtained from primary data from one STD clinic. The sensitivity and specificity of the testing protocol were derived from two published studies.

Methods used to judge relevance and validity, and for extracting data
The authors did not report how the two studies used to derive the sensitivity and specificity were identified, nor did they report their reasons for choosing these two studies.

Measure of benefits used in the economic analysis
The measure of benefits used was the number of STD clinic patients in each sub-group with a true-positive HCV test result, who returned to receive their results.

Direct costs
The direct costs to the STD clinic providing the service were included in the analysis. These comprised the costs of screening, pre-test counselling, risk assessment, performing a blood test, laboratory analysis for HCV antibodies and post-test counselling. Resource use was derived from two STD clinics, one in San Diego and another one in Denver. Labour costs were derived from the hourly compensation rates, whilst test costs were derived from laboratory fee schedules. The authors reported that the costs of the STD clinic facilities were not included as they were fixed and would be incurred regardless of whether anti-HCV testing was offered. Since the costs were incurred over a short time, discounting was not relevant and was therefore, not performed. The average costs were reported. The price year was 2006.

Statistical analysis of costs
Mean costs were reported alongside a range of costs.

Indirect Costs
Productivity costs were not included.

Currency
US dollars ($).

Sensitivity analysis
A series of one-way sensitivity analyses were performed by varying the prevalence rate of HCV and the costs of testing. A scenario analysis was also performed by evaluating the impact of a rapid test on the costs and outcomes.

Estimated benefits used in the economic analysis
The percentage of patients with a true-positive test outcome who returned for their results was:

45.51% for IDUs;
12.95% for males aged 40 years or older with more than 100 lifetime sexual partners;
1.63% for males aged 40 years or older with fewer than 100 lifetime sexual partners; and
0.76% for females aged 40 years or older.

**Cost results**
The average costs of HCV counselling, testing and referral were:

- $24.76 for IDUs;
- $23.19 for males aged 40 years or older with more than 100 lifetime sexual partners;
- $22.65 for males aged 40 years or older with fewer than 100 lifetime sexual partners; and
- $22.61 for females aged 40 years or older.

**Synthesis of costs and benefits**
The costs and benefits were combined using an average cost-effectiveness ratio (i.e. the cost per client with a true-positive test who returned to receive their results). By sub-group, the average cost-effectiveness ratio was:

- $54.40 for IDUs;
- $179.10 for men with more than 100 lifetime sexual partners;
- $1,385.70 for men with fewer than 100 lifetime sexual partners; and
- $2,986.10 for women.

The results of the sensitivity analyses showed that, for IDUs, the results were relatively insensitive to uncertainty in the prevalence and costs. For other sub-groups, however, changes in prevalence of HCV had a bigger impact on the average cost-effectiveness ratio. Not surprisingly, screening tests that provided the results immediately lowered the average cost-effectiveness ratios for all four sub-groups.

**Authors' conclusions**
Testing injection drug users (IDUs) in sexually transmitted disease (STD) clinic settings was highly cost-effective. Some clinics might find it cost-effective to expand testing to men aged 40 years or older who have had more than 100 lifetime sexual partners.

**CRD COMMENTARY - Selection of comparators**
The authors compared HCV screening in STD clinics for different sub-groups of at-risk patients. The authors reported that, in the USA, few STD clinics currently provide HCV testing. You should assess if the strategies assessed are currently being provided in your own setting.

**Validity of estimate of measure of effectiveness**
Estimates of effectiveness were derived from a variety of sources. Such sources included survey data (NHANES), the authors' own setting, and two published studies. No synthesis of the data appears to have taken place. The authors reported the sources used to derive the model parameters in full. However, they did not report how the two studies used to derive the sensitivity and specificity were identified, nor did they report their reasons for choosing these particular studies.

**Validity of estimate of measure of benefit**
The estimation of health benefit (number of STD clinic patients with a true-positive HCV test result who returned to receive their results) was derived appropriately. The formulae used to derive health benefit were reported in full in the article. However, the measure of benefit used will make comparisons with other health care interventions and diseases difficult, and may not fully capture the health benefits of the interventions under study.

Validity of estimate of costs
The analysis of the costs was performed from the perspective of the STD clinic providing the service. Given this perspective, it appears that all the relevant cost categories have been included. All major relevant costs also appear to have been included in the analysis, although the authors reported that the costs of the STD clinic facilities were not included as they were fixed and would be incurred regardless of whether anti-HCV testing was offered. The sources of the unit costs and resource use were appropriately reported. Resource use was derived from the authors' settings, while the unit costs were derived from the hourly compensation rates and laboratory fee schedules. Since the costs were incurred immediately, discounting was not relevant and was therefore not performed. The price year was reported, which will aid any future inflation exercises.

Other issues
The authors did not compare their findings with those from other studies. The issue of generalisability to other settings was partly addressed in the sensitivity analyses. The authors do not appear to have reported their results selectively and their conclusions reflected the scope of the analysis.

The authors reported a number of further limitations to their study. First, the measure of benefit used did not take the additional costs or benefits of the intervention into account. Second, the authors were unable to limit their analysis of anti-HCV prevalence to include only those patients without known anti-HCV positive status, because the NHANES did not ask respondents whether they had ever been told by a doctor they had HCV antibodies. Third, the NHANES excluded groups at especially high risk of HCV infection (e.g. homeless or incarcerated patients). Fourth, the study did not consider females older than 40 years with more than 100 sexual partners as the NHANES sample for this group was too small. Fifth, it was assumed that the probability of returning for test results was the same across sub-groups. Sixth, the sensitivity analyses undertaken were limited. Finally, estimates of the costs and return rate were based on data from only two STD clinics.

Implications of the study
The authors stated that results from their study also suggest that expanding testing to non-IDU men older than 40 years who have had more than 100 lifetime sexual partners may be cost-effective for some STD clinics.

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Other publications of related interest
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