Examining the direct costs and effectiveness of syphilis detection by selective screening and partner notification

Reynolds S L, Kapadia A S, Leonard L, Ross M W

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 use of selective screening (SS) versus partner notification (PN) for syphilis detection.

Type of intervention
Screening and primary or secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients at risk for syphilis. Specific inclusion criteria were not reported.

Setting
The setting was the community. The economic study was carried out in the city of Houston, Texas, USA.

Dates to which data relate
The effectiveness and resource use data were gathered in 1994 and 1995. The price year was 1996.

Source of effectiveness data
The effectiveness evidence was derived from a single study.

Link between effectiveness and cost data
The costing was not carried out on the same sample of patients as that used in the effectiveness analysis.

Study sample
Power calculations were not conducted. The study sample comprised 180,640 individuals who were tested for syphilis between 1994 and 1995 by the Bureau of Services and by the Harry County Jail Laboratory in Houston. The two approaches were used for case identification.

Study design
The design of the study was unclear, but it appears to have been a retrospective review of patient charts. No details of the follow-up (length and loss) were provided.
Analysis of effectiveness
The analysis of effectiveness excluded those individuals who were tested in private facilities. The primary health outcome used was the proportion of syphilis cases detected. The overall proportion of syphilis cases detected was also reported.

Effectiveness results
The overall proportion of syphilis cases detected was 1.6% (2,849 out of 180,640). Of these, 80.1% (2,282 cases) were detected with SS and 19.9% (567 cases) with PN.

The breakdown of cases detected was as follows:

for SS, 70.1% early latent disease, 19.5% secondary syphilis, 10.4% primary syphilis and 11.3% maternal syphilis;
for PN, 74.1% early latent disease, 15.7% secondary syphilis, 10.2% primary syphilis and 2.6% maternal syphilis.

Clinical conclusions
The effectiveness study showed the number of cases detected with each strategy.

Measure of benefits used in the economic analysis
The summary benefit measure was the number of primary and secondary syphilis cases detected with the two approaches. This measure was derived directly from the effectiveness study.

Direct costs
Discounting was irrelevant since the costs were incurred during a short time. The unit costs and the quantities of resources used were provided separately. The health services included in the cost analysis were serology, patient contacts and travel for SS, and serology, surveillance, case management and travel for PN. Some categories of costs, such as those required after a diagnosis of syphilis (medications and administration of drugs) and fixed costs, were not considered. The cost/resource boundary of the study was that of the Sexually Transmitted Diseases Prevention Program of the Houston City Health Department. Resource use was derived from time-motion studies and some surveys. Wages for personnel were derived from the City Of Houston pay scale (including fringe benefits). The source of the other costs was not reported. The price year was 1996.

Statistical analysis of costs
The costs were treated deterministically.

Indirect Costs
The indirect costs were not considered.

Currency
US dollars ($).

Sensitivity analysis
A sensitivity analysis was conducted to assess the robustness of the cost-effectiveness of the two strategies to variations in the contact indices and the direct cost of serology. The contact index is a common effectiveness measure, defined as the total number of individuals named as sexual partners from a given series of cases divided by the total number of index cases interviewed. The impact of considering the effectiveness of prophylactic treatment was also considered. Some ranges of estimates were derived from the literature.
Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The total costs were $579,101 in the SS group and $229,529 in the PN group. However, it should be noted that the two sample sizes were different.

Synthesis of costs and benefits
Average cost-effectiveness ratios were calculated to combine the costs and benefits of the interventions under evaluation. An incremental analysis was also conducted.

The cost per case of primary syphilis detected was $1,322 with SS and $1,561 with PN (incremental cost per case detected of $239).

The cost per case of secondary syphilis detected was $2,025 with SS and $2,578 with PN (incremental cost per case detected of $553).

The cost per case of early latent syphilis detected was $563 with SS and $546 with PN (incremental cost per case detected of -$17).

The cost per case of early syphilis detected was $395 with SS and $405 with PN (incremental cost per case detected of $10).

The sensitivity analysis showed that, with a contact index of 2.0 or higher (it was 1.71 in the base-case), PN was the most cost-effective strategy for primary syphilis. A value higher than 3.0 would be required for PN to be more cost-effective than SS for secondary syphilis.

When the costs were varied, $3.15 was the threshold value above which PN was more cost-effective than SS.

Finally, when considering the effectiveness of prophylactic treatment (even for low estimates), PN was more cost-effective. However, the inclusion of treatment costs made the cost-effectiveness ratio of PN slightly higher than that of SS.

Authors' conclusions
Selective screening (SS) was a cost-effective option for the identification of syphilis but, when prophylactic treatment was considered, partner notification (PN) represented the most cost-effective strategy. However, when the cost of treatment was included, SS remained the most cost-effective strategy.

CRD COMMENTARY - Selection of comparators
The selection of the comparators appears to have been appropriate, as both approaches represented routine strategies for the identification of syphilis. You should decide whether they are valid comparators in your own setting.

Validity of estimate of measure of effectiveness
The effectiveness evidence came presumably from a review of patient charts, which were derived from an administrative database that contained all relevant information on patients with syphilis. This represents a weak source of evidence. The effectiveness measure reflected only the proportion of disease that was detected using the two approaches and did not show the impact of the study intervention on patient health. No 'gold' standard was used to assess the diagnostic yield of the two approaches, and the analysis revealed only that more cases where identified with SS. The analysis of effectiveness appears to have been conducted as an intermediate step in the calculation of the costs.
Validity of estimate of measure of benefit
The summary benefit measure was derived from the effectiveness analysis. Hence, its validity is restricted by the limitations of the effectiveness study, as reported above. The use of a more generalisable benefit measure would have been useful.

Validity of estimate of costs
The authors explicitly stated the perspective adopted in the study. It appears that all the relevant categories of costs have been included in the analysis. The methods used to calculate the total costs were reported. Full details on the unit costs, quantities of resources used and price year were provided. This enhances the possibility of replicating the study in other settings and in other time periods. The authors justified the exclusion of some items. Clearly, the adoption of a wider perspective would have been interesting. The costs were treated deterministically and few sensitivity analyses were conducted. The source of the cost data was not reported for all items.

Other issues
The authors did not compare their findings with those from other studies. They also did not address the issue of the generalisability of their results to other settings. The authors stated only that caution is required when extrapolating the cost results to settings where programmes might be less well-established or comprehensive. All the estimates were specific to the study setting and only limited sensitivity analyses were carried out. This further reduces the external validity of the analysis. The study referred to individuals being tested for syphilis and this was reflected in the conclusions of the analysis.

Implications of the study
The study results suggested that a more innovative and more efficient approach would be to identify and target the "core" transmitters.

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Other publications of related interest

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