Costs and cost effectiveness of a health care provider-directed intervention to promote colorectal cancer screening among veterans


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 a health care provider-directed intervention offering quarterly feedback to physicians on their patients’ colorectal cancer (CRC) screening rates. This intervention was compared with current practice, where physicians did not receive quarterly feedback reports.

Type of intervention
Screening promotion.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised veterans who were aged 50 years or older, were of average risk for CRC, and had not returned a three-card faecal occult blood test within the last year or undergone a screening flexible sigmoidoscopy/colonoscopy procedure within the last 5 years.

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

Dates to which data relate
The effectiveness and resource use data were derived from a study published in 2005. The price year was not reported.

Source of effectiveness data
The effectiveness data were derived from a published study (Ferreira et al. 2005, see ‘Other Publications of Related Interest’ below for bibliographic details).

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

Study sample
The authors used a parent study for their clinical data, limited details of which are reported in the current study. For further details see Ferreira et al. (2005).

A total of 60 health care providers caring for 1,015 patients were included in the intervention group. Fifty-three health care providers and 963 eligible patients were included in the control group.
**Study design**
Health care providers were randomly assigned to each group. The duration of follow-up was 25 months. The method of randomisation and possible blinding, and losses to follow-up were not reported in the current study. The authors only reported limited information for this field, referring instead to the published clinical study (Ferreira et al. 2005).

**Analysis of effectiveness**
The health outcomes used in the analysis were the CRC screening rates and recommendation rates. It was not reported whether the patient groups were comparable at analysis. For relevant details see the clinical paper (Ferreira et al. 2005).

**Effectiveness results**
CRC screening was recommended for 76.0% of patients in the intervention group and for 69.4% of controls, (p=0.02).

The rate of CRC screening was 41.3% for the intervention group versus 32.4% for the control group, (p=0.003).

**Clinical conclusions**
An intervention based on quarterly feedbacks to physicians improved CRC screening rates at a Veterans Affairs medical centre.

**Measure of benefits used in the economic analysis**
The summary measure of benefits used in the economic analysis was additional person screened, which was derived using the difference in screening rates between the intervention and the comparator.

**Direct costs**
The direct costs included in the analysis were those to the health care provider when providing the health care provider-directed intervention for CRC. The authors identified and determined all inputs used for the intervention, based on the generation of feedback reports by manual review of electronic medical records. The cost categories included were data collection, data analyst, quality control, costs of conducting four sessions, compensation for 60 providers attending the feedback sessions, and cost to the provider. The specific resources included personnel and overheads. Personnel cost estimates were derived from actual salary and benefit data. Health care resources not related to implementing the intervention (e.g. screening) were excluded.

In a second analysis, the data included in the feedback reports for the intervention arm were assumed to be generated with information technology support, rather than by manual review of electronic medical records. Expert opinion from an information technology specialist, two health economics and two health services researchers resulted in an estimated 90% reduction in personnel time.

In their analyses, the authors made two assumptions. First, health care participation in the feedback sessions occurred at no cost to the provider because the sessions occurred at lunchtime. Second, provider-patient discussions were conducted at no cost because they were opportunistic and required minimal time.

The costs were incurred during a 25-month period. Consequently, discounting was not necessarily relevant and was not performed. The study reported the total costs of the intervention. The price year was not reported.

**Statistical analysis of costs**
The costs were treated as point estimates (i.e. the data were deterministic).

**Indirect Costs**
The indirect costs were not included.

**Currency**

US dollars ($).

**Sensitivity analysis**

Sensitivity analyses were performed. These investigated cost-effectiveness estimates by varying the source of patient data (derived by information technology review of the electronic medical record versus abstracted from the medical record by a research assistant), labour costs and the effectiveness of the intervention.

**Estimated benefits used in the economic analysis**

The rates of CRC for the intervention versus control arms were 41.3% (95% confidence interval, CI: 38.2 to 52.6) versus 32.4% (no 95% CI), (p=0.003).

**Cost results**

Over the 25-month intervention period, the total cost of the CRC screening promotional effort was $86,753. The mean cost per individual provider was $1,446.

When information technology systems were used to review medical records, the total cost of the CRC screening promotional effort was $17,431 and the mean cost per individual provider was $291.

No costs were reported for the control group.

**Synthesis of costs and benefits**

The costs and benefits were combined using an incremental cost-effectiveness ratio (i.e. the additional cost per additional veteran screened). The incremental cost-effectiveness ratio for the intervention using manual review of electronic medical records was $978 per additional veteran screened for CRC.

Sensitivity estimates based on 95% CIs around the screening rates indicated that the additional cost per additional veteran screened in the intervention group ranged from $767 to $3,213. Based on a variation of 10% around the point estimate for costs, the additional cost per additional veteran screened in the intervention group ranged from $78,078 to $95,428 for the 25-month period. The associated incremental cost-effectiveness ranged from $877 to $1,072 per additional veteran screened. When information technology systems were used to review medical records, the incremental cost-effectiveness ratio was estimated at $196 per additional person screened for CRC.

**Authors' conclusions**

The health care provider-directed intervention to promote colorectal cancer (CRC) screening among veterans would be cost-effective if relevant data could be generated by existing information technology systems.

**CRD Commentary**

Validity of estimate of costs:

All the categories of cost relevant to the perspective of the third-party payer were included in the analysis. The authors omitted several costs from their analysis, such as the costs of screening itself, and only included the actual costs of the health care provider-directed intervention. However, this was valid since their outcome was the additional cost per additional veteran screened with the intervention. The costs and the quantities were not reported separately, but the authors reported costs by category. The costs were derived from the authors' settings. Appropriate sensitivity analyses were performed. Discounting was not relevant as the costs were incurred over 2 years. The price year was not reported,
which will hamper any possible inflation exercises.

Other issues:

The authors made appropriate comparisons of their findings with those from other studies on the cost-effectiveness of CRC screening promotion that had also found that screening promotion was associated with additional costs per additional person screened. The issue of generalisability to other settings was partly addressed in the sensitivity analysis. The authors do not appear to have presented their results selectively. However, in order for the authors to report whether or not the intervention was cost-effective, they should have reported or estimated what the third-party payer’s willingness-to-pay threshold for an additional veteran being screened was. Further, as the outcome measure was not generic (i.e. life-years saved or quality-adjusted life-years gained), it may be difficult to make comparisons across other interventions.

The authors reported several further limitations to their study. First, the findings were based on an urban Veterans Affairs medical centre, thus additional studies are required in other settings to establish the generalisability of the intervention. Second, the use of different cost methodologies affected cost-effectiveness findings. Third, the costs to individual patients were not measured. Fourth, longer follow-up of changes in provider behaviour was not estimated. Finally, a large proportion of patients in the intervention group remained unscreened, thus additional efforts may be needed to achieve target goal screening rates.

Implications of the study

The authors reported that their findings may have broad applicability because a 2005 Medicare initiative will provide the Veterans Affairs electronic medical record system as a free benefit to all US physicians.

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Other publications of related interest


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