Demonstrating a positive return on investment for a prenatal program at a managed care organization: an economic analysis

Sackett K, Pope R K, Erdley W S

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 a prenatal programme, Right Start, at a managed care organisation (MCO) was investigated. All members identified as being at risk for low birth weights, whether single or multiple births, received the intervention components of the Right Start programme. The intervention components of the programme included provider participation, prenatal education and case management.

Provider participation included the completion of a prenatal risk assessment form during the initial visit, with subsequent referral of the pregnant member to the programme. Case manager visits to physicians’ offices, follow-up phone calls by nursing students, and monetary incentives for providers facilitated compliance with the referral process. Prenatal education included clinical assessments and specific, targeted member education. Pregnant members received a pack of health education materials and were encouraged to attend prenatal classes. They were also asked to answer a health risk questionnaire to identify areas requiring attention. Case management was provided by a baccalaureate prepared registered nurse. The Right Start programme was compared with current practice for pregnant women.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised managed care members (infants) whose mothers were in the Right Start programme and infants whose mothers were not in the Right Start programme.

Setting
The study setting was primary care. The study was conducted in the state of New York, USA.

Dates to which data relate
The effectiveness and resource use data were obtained from the years 1999 and 2000. The price year was 1999 and 2000.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was undertaken retrospectively on the same patient sample as that used in the effectiveness study.
**Study sample**
No sample size appears to have been determined in the planning phase of the study. In addition, no retrospective power calculations were reported. The participants were identified from two years' worth of MCO claims from pregnant members either assigned or not assigned to the Right Start programme. For the two years of the study there were 2,338 births (2,252 single births and 86 multiple births) in the Right Start group and 3,753 (3,629 single births and 124 multiple births) in the non-Right Start group. The authors did not provide any more baseline characteristics of the mothers.

**Study design**
This was a retrospective cohort study that was undertaken in a single MCO. The groups were followed-up until the birth of the infant(s). Hence, there was no loss to follow-up.

**Analysis of effectiveness**
All the participants included in the study appear to have been accounted for in the analysis. The primary health outcome was the proportion of low birth weight infants in each group. For the purpose of the analysis, low birth weight included infants with very low birth weight (<750 g to <2,500 g) as one population, and no differentiation was made between these two groups. Numbers of low birth weights were as defined by Medicare Diagnosis Related Groups (DRG) codes. The DRG codes used for low birth weight were 602 - 621 (for very low birth weight the codes were 602 - 608).

The authors did not report any baseline characteristics, nor did they report whether the patient groups were similar. However, they reported that pregnant members at higher risk for delivering low birth weight infants were identified for participation in the Right Start programme entirely at the discretion of their provider. Therefore, the authors concluded that members of the Right Start programme were selectively at higher risk for low birth weight deliveries, per the judgement of the provider.

**Effectiveness results**
In the years 1999 and 2000, of the total 2,338 births in the Right Start group, 72 (3%) infants were considered to be of low birth weight, compared with 230 (6%) of the 3,753 total births in the non-Right Start group.

**Clinical conclusions**
The Right Start programme was more effective than current practice in the MCO at preventing low birth weight, even though members of the Right Start programme were selectively at higher risk for low birth weight deliveries, per the judgement of the provider.

**Measure of benefits used in the economic analysis**
The authors did not derive a summary measure of health benefit. The analysis was, in effect, a cost-consequences study.

**Direct costs**
The direct costs included were those of the MCO. These comprised the costs of the first year of life for low birth weight and normal weight infants, and the investment costs of the project. The latter (investment costs) covered personnel allocation, mailing costs, provider reimbursement and other miscellaneous costs such as non-mailing media, programme marketing-related travel and expenses. Using these two costs the authors also calculated the ROI of the Right Start Programme. ROI was calculated as the net savings associated with the programme divided by the net costs of the programme. The costs associated with the first year of life for infants were derived from the Return on Investment Right Start Program Executive Summary. The costs and the quantities were not reported separately. Discounting was unnecessary, as the costs were incurred during one year, and was not performed. The price years were 1999 and 2000. The study reported the incremental costs.
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 not performed.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The estimated gross savings associated with the prevention of low birth weight due to the Right Start programme were $315,390 in 1999 and $474,231 in 2000. Therefore, the total saving due to the Right Start programme during these two years was $789,621.

The estimated investment costs associated with the Right Start programme were $251,555 in 1999 and $321,800 in 2000. Therefore, the total investment cost for these two years was $573,355.

The net savings of the programme were therefore $63,835 for 1999 and $152,431 for 2000. Hence, the total saving for these two years was $216,266.

The ROI for 1999 was 25%, which increased to 47% in 2000. Therefore, the ROI during 1999 through to 2000 was 37%.

Synthesis of costs and benefits
The costs and benefits were not combined.

Authors' conclusions
Right Start was a programme that could provide significant cost returns to managed care organisations (MCOs) long after the yearly costs were incurred.

CRD COMMENTARY - Selection of comparators
The authors compared the Right Start programme with a non-Right Start programme, which represented current practice in the MCO. The authors did not provide any details of the services provided by the latter.

Validity of estimate of measure of effectiveness
The analysis was based on a retrospective cohort study. This was appropriate for the study question since the authors could quickly determine the outcomes of women assigned to Right Start and those assigned to non-Right Start. However, a randomised controlled trial would have been a more preferable study design, as the authors reported that there were important selection biases: the members of the Right Start programme were selectively at higher risk for low birth weight deliveries than those in the non-Right Start group, as judged by the provider. The authors also reported that
without ‘gold’ standard, randomised double-blind studies it was difficult to prove if success was due to the case management interventions alone used for the Right Start programme. However, the assignment would appear to have biased against the Right Start programme, as patients in this group were considered to be at higher risk of having a low birth weight. The authors did not use any statistical tests to examine whether differences in low birth weights between the two groups were statistically significant.

Validity of estimate of measure of benefit
The authors did not derive a summary measure of health benefit. The analysis was therefore categorised as a cost-consequences study. The comments in the ‘Validity of estimate of measure of effectiveness’ therefore apply.

Validity of estimate of costs
All the categories of cost relevant to the perspective adopted (i.e. MCO) were included in the analysis. All the costs related to the set up and running of the Right Start programme were appropriately reported by category of cost. However, the authors did not report the costs included when estimating the costs of low birth weight infants and normal weight infants during their first year of life. It is therefore not possible to say if any major costs in this category were omitted from the analysis. The costs and the quantities were not reported separately, which will limit the generalisability of the authors' results. The costs were derived from the authors’ settings. No sensitivity or statistical analyses of the costs were performed to test for uncertainty, or to examine if the costs were significantly different between the two groups. Discounting was unnecessary, as all the costs were incurred during one year, and was not performed. The price year was reported, which will aid any future inflation exercises.

Other issues
In terms of comparisons with other studies, the authors reported that preliminary work had suggested that education and nursing interventions targeting prenatal enrollees decreased the incidence of low birth weight infants and improved birth outcomes. The issue of generalisability to other settings was not addressed. The authors do not appear to have presented their results selectively and their conclusions reflected the scope of the analysis. The authors reported the main limitation of their study was that, without the ‘gold’ standard of randomised double-blind trials, it was difficult to prove if the Right Start programme alone was successful.

Implications of the study
The authors suggested that extrapolation of their results reveals a potential 24 to 46% return on future years’ investments, and that the Right Start Programme should continue to be monitored for savings. In terms of future research, a randomised controlled trial would help in the validation, or otherwise, of these findings.

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None stated.

Bibliographic details

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Other publications of related interest


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Subject indexing assigned by NLM

MeSH
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