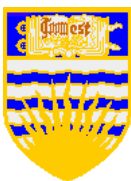


**Critical appraisal of submitted
cost-benefit models of 'Lovaas'
early intensive behavioural
intervention for autism**

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Critical appraisal of submitted cost-benefit models of ‘Lovaas’ early intensive behavioural intervention for autism

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*Report made in relation to proceedings before the Supreme Court of
British Columbia against the Government of British Columbia
regarding provision of services for treatment of children with autism*

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EXECUTIVE SUMMARY

This report provides a critical appraisal of two cost-benefit analyses filed with the Supreme Court of British Columbia by Harper Grey Easton in partial support of an action against the Government of British Columbia regarding provision of services for treatment of children with autism. The petitioners in the action claim that children with autism and autistic spectrum disorder (ASD) are being discriminated against by being denied their right to publicly-funded support for an effective treatment.

The Government of British Columbia asked the British Columbia Office of Health Technology Assessment (BCOHTA) to conduct a critical appraisal of the two cost-benefit analyses. BCOHTA is mandated to promote and encourage the use of assessment research in policy, planning and utilization decisions by government, health care executives, and practitioners. BCOHTA does not participate in policy development for a requesting agency, since its role is limited to appraisal of the scientific evidence.

The two cost-benefit analyses are:

- I. 'Cost-benefit analysis of Lovaas treatment for autism and autism spectrum disorder (ASD)' prepared by Douglas G Hildebrand of Columbia Pacific Consulting under contract to Harper Grey Easton.
- II. Jacobson JW, Mulick JA, Green G. Cost-benefit estimates for early intensive behavioral intervention for young children with autism: General model and single state case. *Behavioral Interventions* 1998;13:201-26. A briefing note based on this study was submitted.

Each cost-benefit analysis was critically appraised using widely accepted criteria developed by Drummond et al (1987, 1997).

It was found that both cost-benefit analyses are based on models biased in favour of Lovaas treatment. In neither instance do any children not receiving Lovaas children treatment appear in the functionally-normal category, despite research evidence showing that about 10-20% of a population of children with autism achieve employment, independent of specific treatment programs. At the same time, only 10% of the group receiving Lovaas treatment remained in the group having the highest service requirements.

Moreover, the assumption that only 10% of children receiving Lovaas therapy need the highest level of services is maintained, while the proportion of the population not receiving Lovaas treatment that need maximum services is varied between 40 and 80%. A similar range of effectiveness should have been applied to the group receiving Lovaas therapy.

Given the uncertain benefit from Lovaas treatment, there may be no proportional difference in the numbers that fall into the three service intensity categories. In that case, the cost-to-benefit ratio would favour not providing Lovaas treatment because of the relatively high costs of the Lovaas approach.

The public service requirements to provide Lovaas treatment or alternate treatment programs have not been measured, nor have the assumptions about service intensity been sufficiently supported.

This systematic review concludes that there is insufficient effectiveness evidence to conduct a cost-benefit analysis of early, intensive treatment programs in terms of ‘normalization’ of children diagnosed with autism.

It remains the case that without a soundly-based determination of the extent to which an intervention may result in benefit, and the degree of any such benefit, cost-benefit analyses have no basis on which to proceed. Cost estimates should be based on actual measurements of functioning autism treatment programs, not on economic modelling of current, weak effectiveness evidence.

1. INTRODUCTION

Request

Representatives of the Government of British Columbia requested the British Columbia Office of Health Technology Assessment (BCOHTA) to provide a critical appraisal of two cost-benefit analyses submitted as evidence in an action against the government regarding provision of services for treatment of children with autism.

The first of the analyses is a preliminary report entitled ‘Cost-benefit analysis of Lovaas treatment for autism and autism spectrum disorder (ASD)’ prepared by Columbia Pacific Consulting economist Douglas G. Hildebrand.¹ The report was commissioned by Harper Grey Easton, counsel for the petitioners. The second was prepared by Jacobson et al and taken from the US context.^{2,3}

The BC Office of Health Technology Assessment is mandated to promote assessment research for policy, planning and utilization decisions by government, health care executives, and practitioners. The Office does not participate in policy development for a requesting agency. Instead, its role is confined to appraisal of the scientific evidence. The BCOHTA method of review explicitly details the methodology used to produce its conclusions on the research evidence. An important objective of the review is to provide sufficient transparency to allow complete replication and subsequent critical analysis.

Economic modelling in health care

In conducting economic evaluation in the field of health care, investigators need to distinguish between assessments based on actual measurements of costs and benefits, and those based on models. Actual measurements represent verifiable primary data. Models, by contrast, are constructs, and as such, prone to bias in design, conduct and interpretation. Accordingly their use should be limited to instances when actual patient outcome is unknown.

In such circumstances, it is important to develop models that reflect a range of assumed benefits. Sheldon⁴ explains the potential for modelling bias if a representative range of assumed benefits is not included:

[T]here is a temptation for models to be used to obscure ignorance or uncertainty, to include values which are not based on the evidence and in this way are susceptible to being manipulated in order to produce the desired results.

It is within the particular regulatory and commercial context in which economic evaluations of health care take place that questions about the proper role and practice of modelling arise. Here, the results of models have an influence over real world private and public decisions.

Modelling can therefore, become the arena in which the various actors in the supply and demand for health care play out their battles. The pressure towards bias which naturally exists in a competitive marketplace for health technologies and where policy makers are seeking to contain costs will influence the results of modelling through its effect of the structure of the model and the assumptions used.⁴

Is the model appropriate?

From the perspective of Drummond et al,⁵ the hallmark of cost-benefit study is that both costs and consequences may be valued in monetary terms. This means valuing health benefits themselves, as distinct from their impact on service utilization or income. In addition, costs and consequences are valued separately and then compared.

In the present instance, the two models under review would not fit the definition of a cost-benefit analysis using Drummond et al methodology. In both cases, the authors restrict their analysis to treatment benefits from cost-aversion, that is, the financial costs to society avoided (mainly due to avoiding the provision of public services) through Lovaas therapy.

The Columbia Pacific Consulting, for example, chose a model based on a 1977 document ‘Guidelines for benefit-cost analysis’ published by the Environment and Land Use Committee Secretariat of the BC Government.⁶ These guidelines were developed in response to ‘the perceived need for consistency among benefit-cost studies performed both by government departments and private consultants’.

Neither the text nor bibliography of this document explain whether these guidelines were intended for application to the health or education sectors. The specific methodology suggested in these guidelines is based on the following premise:

The increasing presence of government in economic affairs through government’s several policy instruments (e.g., taxes, subsidies, legislative regulations and public enterprise) must be justified on the basis of the improved performance of the economy resulting from this activity. Properly conducted project evaluations through application of benefit-cost techniques are one means of insuring that economic performance is improved.⁶

These 1977 guidelines assume that the only relevant government objectives are economic growth, social well-being, natural environmental quality and income distribution/regional development. Thus, government funding decisions regarding services for children with autism would hinge on the child’s ability to achieve a normal functional status, generate a lifelong income stream, and thereby reduce their consumption of public expenditures. Alleviation of suffering does not feature prominently; nor are services that fail to achieve savings considered good investments.

Government guidelines such as these are generally considered more appropriate to transportation, mining or hydro-electric projects. The ethical problems that arise if such an approach is applied to the economic evaluation of health interventions have led Canadian government bodies to adopt different guidelines, for example, the guidelines for pharmacoeconomic evaluation by the Canadian Coordinating Office of Health Technology Assessment.⁷

The model adopted in the analysis by Jacobson et al shares the ethical and practical problems which arise with the approach used by Columbia Pacific Consulting model. The paper by Barnett et al⁸ on economic evaluation of early intervention programs is cited as support for the Jacobson et al's current model. The methodology used by Barnett et al is, however, of much higher calibre, and in point of fact was not the model adopted by Jacobson et al.

2. APPRAISAL METHODOLOGY

Both cost-benefit models were subjected to the same critical appraisal process. The standards for judging the methodological quality of the cost-benefit analyses were taken from a standard text on economic evaluation of health care programmes.^{5,9} The criteria are given in **Table 1**.

Table 1: Criteria for assessing economic evaluations - Drummond et al⁵

1. Was a well-defined question posed in answerable form?
<ul style="list-style-type: none"> 1.1 Did the study examine both costs and effects of the service(s) or programmes(s)? 1.2 Did the study involve a comparison of alternatives? 1.3 Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?
2. Was a comprehensive description of the competing alternatives given (i.e. can you tell who did what to whom, where, and how often)?
<ul style="list-style-type: none"> 2.1 Were any important alternatives omitted? 2.2 Was (Should) a do-nothing alternative (be) considered?
3. Was the effectiveness of the programmes or services established?
<ul style="list-style-type: none"> 3.1 Was this done through a randomized, controlled clinical trial? If so, did the trial protocol reflect what would happen in regular practice? 3.2 Was effectiveness established through an overview of clinical studies? 3.3 Were observational data or assumptions used to establish effectiveness? If so, what are the potential biases in results?
4. Were all the important and relevant costs and consequences for each alternative identified?
<ul style="list-style-type: none"> 4.1 Was the range wide enough for the research question at hand? 4.2 Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoints, and those of patients and third-party payers. Other viewpoints may also be relevant depending upon the particular analysis.) 4.3 Were capital costs, as well as operating costs, included?.
5. Were costs and consequences measured accurately in appropriate physical units (e.g. hours of nursing time, number of physician visits, lost work-days, gained life-years) ?
<ul style="list-style-type: none"> 5.1 Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis? 5.2 Were there any special circumstances (e.g. joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?

Table 1 (continued)

6.	Were costs and consequences valued credibly?
6.1	Were the sources of all values clearly identified? (Possible sources include market values, patient or client preferences and views, policy-makers' views, and health professionals' judgements.)
6.2	Were market values employed for changes involving resources gained or depleted?
6.3	Where market values were absent (e.g. volunteer labour), or market values did not reflect actual values (such as clinic space donated at a reduced rate), were adjustments made to approximate market values?
6.4	Was the valuation of consequences appropriate for the question posed (i.e. has the appropriate type or types of analysis - cost-effectiveness, cost-benefit, cost-utility - been selected)?
7.	Were costs and consequences adjusted for differential timing?
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?
7.2	Was any justification given for the discount rate used?
8.	Was an incremental analysis of costs and consequences of alternatives performed?
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits, or utilities generated?
9.	Was allowance made for uncertainty in the estimates of costs and consequences?
9.1	If data on costs or consequences were stochastic, were appropriate statistical analyses performed?
9.2	If a sensitivity analysis was employed, was justification provided for the ranges of values (for key study parameters)?
9.3	Were study results sensitive to changes in the values (within the assumed range for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?
10.	Did the presentation and discussion of study results include all issues of concern to users?
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (e.g. cost-effectiveness ratio)? If so, was the index interpreted intelligently, or in a mechanistic fashion?
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential differences in study methodology?
10.3	Did the study discuss the generalizability of the results to other setting and patient/client groups?
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (e.g. distribution of costs and consequences, or relevant ethical issues)?
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be redeployed to other worthwhile programmes?

3. APPRAISAL RESULTS

I. *Columbia Pacific Consulting*. 'Cost benefit analysis of Lovaas treatment for autism and autism spectrum disorder (ASD)'

Was a well-defined question posed in answerable form?

A question was posed, but it was not for the BC context. The Columbia Pacific report states that the primary objective of the study 'was to determine if the Lovaas treatment represents an efficient allocation of government health care expenditures.' To answer the question, the researchers would require to consider the Lovaas therapy versus alternate therapy, and each of these treatment alternatives versus no therapy.

A well-defined question, answerable in the BC context and relevant to current policy making processes would have been:

What are the comparative costs and benefits of the current standards of care available in British Columbia and a Lovaas treatment approach in the management of autistic/ASD children?

Was a comprehensive description of the competing alternatives given?

Competing alternatives were not well developed. The two alternatives considered were Lovaas treatment and no Lovaas treatment. Description of the Lovaas treatment group was limited to stating that it is 'early intensive intervention' which is applied from age 3 to 6. Details are not provided as to professionals, institutions, therapies or duration. Presumably, an attempt would be made to replicate the services described in the Lovaas study (1987).¹⁰ However, treatment integrity was not examined in this, the only effectiveness study.

Current services for autistic/ASD children in BC were not described. Instead, the report refers to the current service categories as: 'respite services', 'behaviour support', 'supported childcare' and 'placement (after age 6)'. The report does not further describe or justify these categories.

The information provided is insufficient to justify dichotomous alternatives. For example, without additional details it is not possible to determine the overlap between current therapies and Lovaas treatment.¹¹

A 'do-nothing' alternative was not considered. The latter would have grounded the model in the natural history of the condition.

Was the effectiveness of the programmes or services established?

No. This key issue is virtually unaddressed. The Columbia Pacific report does not examine Lovaas treatment effectiveness beyond imprecise allusions to ‘U.S. research’, and it provides no discussion of the published debates regarding Lovaas effectiveness claims (See the BCOHTA systematic review and critical appraisal of the published primary data.¹²)

Were all the important and relevant costs and consequences for each alternative identified?

No attempt was made to itemize costs. As a result there is no way of knowing if important and relevant costs and consequences were adequately valued. No breakdown was given of the types of providers required to provide Lovaas treatment, their training or salary requirements. Furthermore, the outcome categories of ‘normal’ ‘semi-dependent’ and ‘very dependent’ are insufficiently described for the purposes of costing. The sources of the costs for these categories were not described.

Were costs and consequences measured accurately in appropriate physical units?

No. Costs were not actually measured and the sources of the cost estimates were not revealed. Therefore, the accuracy of costs estimates cannot be determined.

Costs and consequences were not measured in physical units considered appropriate to a health service, such as cost per quality adjusted life years. Instead, the Columbia Pacific Report primarily considered the annual costs for government services: Child Care (respite services, behaviour support, supported childcare and placement after age 6); Education (normal, low incidence/high cost, intensive special) and Adult Care (day program), residential (family home), residential (group home). Health costs only become represented indirectly in this model according to assumptions about their impact on public service provision and wage loss.

Assumptions about the impact of Lovaas treatment effectiveness on the use of public services and wage loss is prone to bias. For example, the base case model assumes that, with Lovaas treatment, 40% of children can be categorized as ‘normal’ in function, 50% ‘semi-dependent’ and 10% ‘very dependent’. The model assumes that without Lovaas treatment, 50% will be ‘semi-dependent’ and 50% ‘very dependent’. The sensitivity analysis did not include anyone without treatment achieving ‘normal’ status.

This assumption is contrary to the natural history evidence as summarized by Howlin.¹³ Across several decades, as many as 20% of children labelled ‘autistic’ achieved education and employment without the significant public expenditures that this model attributes to all children not receiving Lovaas treatment.

Were costs and consequences valued credibly?

Unknown. Independent verification of costs and consequences was not possible because the sources for values were not clearly identified. Details in the report are limited to: 'Estimates of the annual amount of these cost items were prepared by Columbia Pacific based on information from several sources. Data sources include information provided by Harper Grey Easton and reports prepared by various private and public sector organizations both in Canada and the United States.' As a result, there is no way of knowing if important cost items have been included. For example, for the service cost estimates, were market values used and how was volunteer labour valued?

Were costs and consequences adjusted for differential timing?

Yes. Future costs were discounted to present value. Various discount rates were used. For the base case, a 3.5% discount rate was used for lifetime costs of care and education. A rate of 2.5% was used for lifetime employment income. It is reported that this is the discount rate specified in the Law and Equity Act. This would be compatible with a social discount rate appropriate for public sector projects. The alternate discount rates result in more modest estimates of the purported 'savings' in the group receiving Lovaas treatment.

Was an incremental analysis of costs and consequences of alternatives performed?

No incremental analysis of costs and consequences was performed. In other words, the additional (incremental) costs generated by one alternative over another was not compared to relative benefits generated. However, while usually important for meaningful comparisons of alternative health care interventions, omitting this incremental cost and consequences analysis may be appropriate in this instance where the effectiveness and relative effectiveness has not been adequately established.

Was allowance made for uncertainty in the estimates of costs and consequences?

The allowances made were insufficient given the uncertainties in the current state of knowledge regarding both treatment effectiveness and the history of autism. For example, Table 7 of the Columbia Pacific report presents an analysis of cost by effectiveness level. 'Outcome 1' is defined as normal for the purposes of public service provision and achieving employment. However, the authors did not allow this outcome as possible for the group not receiving Lovaas treatment. This overlooks evidence on the natural history of autism which acknowledges a range of outcomes, including the attainment of sufficient function without Lovaas therapy to achieve employment.

Did the presentation and discussion of study results include all issues of concern to users?

No. This model simply asserts a truism, namely, if an effective treatment for autism were available that achieved its effect at an early age, it would reduce public service costs over the lifetime of a person with autism.

II. *Jacobson et al.* 'Cost benefit estimates for early intensive behavioral intervention for young children with autism'

The Jacobson model appears in the journal 'Behavioural Interventions' which was available to BCOHTA librarians from one US source.² This publication may or may have not been subjected to rigorous peer review from within either clinical or economic disciplines before publication.

The Jacobson et al model resembles the Columbia Pacific in structure and assumptions.

Was a well-defined question posed in answerable form?

Yes. A reasonably well-defined question was posed:

This report presents a cost-benefit analysis of EIBI [early intensive behavioural intervention] for children with autism or PDD [pervasive developmental disorder]. We estimate costs and benefits of services for children with autism or PDD who receive EIBI relative to those of children without disabilities in general and children with autism or PDD who do not receive effective intervention or who otherwise continue to need intensive supports. The analysis provides a projection of cost-aversion, that is, the financial costs to society avoided through provision of EIBI services.²

However, the question is narrowly focused on comparing Lovaas treatment alone to a collection of unknown alternatives. Again, an alternative question that appropriately reflected actual treatment options in BC would have been:

What are the comparative costs and benefits of current care models available in British Columbia and a Lovaas treatment approach in the management of children with autistic/ASD?

Was a comprehensive description of the competing alternatives given?

No comprehensive description of the competing alternatives is given. No details are provided regarding Lovaas therapists, their training or their professional activities. Critical assumptions about the comparison treatments are omitted from summary tables.

The alternative to Lovaas treatment is simply described as children who ‘do not receive effective intervention or who otherwise continue to need intensive supports’.

Table 2 shows the assumptions that have been made about effectiveness (*Brief: Schedules 2, 6, 7, 8 and 9*). The model assumes that children who receive Lovaas treatment will achieve a state of normal functioning (20-60% effectiveness assumptions, in shaded columns) while the comparison group which does not receive Lovaas treatment does not achieve this level (0% throughout). The Lovaas treatment group is given an additional advantage by fixing the percentage that achieve the worst outcome (fall in the highest intensity service category) at 10% while varying the proportion who fall in this category in the comparison group between 40 to 80%.

Table 2 also demonstrates an unusual feature of the Jacobson model. The model varies the assumed outcomes in the comparison group across a spectrum of Lovaas treatment effectiveness levels. When conducting sensitivity analysis, it is customary to vary one parameter at a time. No justification is given for concurrently varying the baseline comparison group.

The cost of publicly-funded services in each service category are provided in the left-hand column. The public services include special and intensive educational support, supplemental security income/aid to dependent children and family support services from age 6 to 22; and community-based services, intensive community services, wage loss as well as supplemental security income/aid to dependent children and family support services from age 22 to 55.

Jacobson et al do not consider the problem of treatment integrity, addressed most cogently by Gresham and McMillan 1997.^{14,15} At issue is the actual treatment provided by Lovaas (1987)¹⁰ and McEachin, Smith, & Lovaas (1993)¹⁶. It is impossible to determine, for example, whether Lovaas treatment is the same as what Jacobson et al term ‘early intensive behavioral intervention (EIBI)’.

Table 2: Jacobson model comparison of ‘early intensive behavioral intervention (EIBI)’ with unspecified alternative assumptions about proportionate public service intensity requirements

	Analysis 1		Analysis 2		Analysis 3		Analysis 4		Analysis 5	
	EIBI	No EIBI	EIBI	No EIBI	EIBI	No EIBI	EIBI	No EIBI	EIBI	No EIBI
Costs Allocation: Governmental										
Normal range										
3 yrs family social services										
13 yrs regular education										
3 yrs SSI/ADC	20%	0%	30%	0%	40%	0%	50%	0%	60%	0%
51 yrs SSI/ADC (10%) [33 yrs wage/income subtracted from public expenditure total]										
Partial effect										
15 yrs family social services										
15 yrs of intensive special education	70%	20%	60%	30%	50%	40%	40%	50%	30%	60%
51 yrs SSI/ADC										
28 yrs of waiver services										
25 yrs of supported work										
Minimal effect										
15 yrs family social services										
15 yrs of intensive special education	10%	80%	10%	70%	10%	60%	10%	50%	10%	40%
51 yrs SSI/ADC										
33 yrs of waiver services										
33 yrs of intensive community services										
25 yrs of supported work										
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

SSI/ADC = supplemental security income/aid to dependent children

Was the effectiveness of the programmes or services established?

No. Jacobson et al do not consider the strengths or limitations of current effectiveness evidence. Instead they uncritically make the following assumptions:

“The proportion of children who achieve normal functioning in all areas is probably somewhat lower than the proportion reported in the literature to data (just under 50%).

In any group of children with autism or PDD who receive competently delivered EIBI, between 20 and 50% will achieve normal functioning; about 40% will achieve meaningful but moderate gains; and about 10% will continue to require intensive special education and adult services.

Without EIBI the majority of children with autism or PDD will manifest enduring dependency on special education and adult developmental disability services.”²

These assumptions are based on an uncritical acceptance of the research results. (See BCOHTA report on the primary data from Lovaas/EIBI.¹²)

Were all the important and relevant costs and consequences for each alternative identified?

Unknown. The authors provide too few details to make this determination. Instead of providing detailed costing information which would permit the identification of unwarranted expenditures, the Jacobson et al model uses the following categories based on estimated ‘Commonwealth of Pennsylvania costs for the following types of services: 1) early intervention, 2) family support services, 3) intensive early intervention, 4) regular education; 5) special education, 6) intensive special education, 7) home and community based services, 8) intensive community services, 9) institutional services, 10) supplemental security income/aid to dependent children, 11) median household income and 12) supported wages.’ The authors then assign costs associated with these services to children, in proportion to the assumed number that achieve maximal, partial or minimal treatment effect. Alternative treatment to EIBI is identified by little more than the differential assignment of costs or cost savings (in terms of public expenditures) based on estimates of the number of children who achieve normal function.

Were costs and consequences measured accurately in appropriate physical units?

No. Costs and consequences were not measured in physical units (such as cost per quality-adjusted life year) appropriate to the economic evaluation of a health intervention. Instead both benefits and costs were reduced to the costs of government services provided or avoided. Other perspectives, such as that of the patient, society as a whole, or third-party payers, were excluded.

Were costs and consequences valued credibly?

No. The valuation of costs and consequences were not valued credibly for the purposes of making a health funding decision in British Columbia. Jacobson et al used expenditure estimates based on aggregated costs for public services in Pennsylvania and US costs for EIBI. These are unlikely to be comparable to Canadian costs.

Were costs and consequences adjusted for differential timing?

No. This oversight is the most indefensible aspect of the analysis. The relevant economic principle is that financial benefits occurring in the future are to be valued less than those in the present. Instead of appropriately adjusting for differential timing Jacobson et al have done quite the opposite. They have not discounted future costs to present value, in accordance with Canadian government standards. Future costs have been inflated at a rate of from 1.5 to 3% using the rationale that service costs will increase due to inflation.

Was an incremental analysis of costs and consequences of alternatives performed?

Yes. Incremental analysis of costs and consequences was performed; that is, the additional (incremental) costs generated by one alternative over another was compared (presented in **Table 2**). However, due to the restrictions of the assumptions used in the model the information provided by this analysis is of doubtful value.

Was allowance made for uncertainty in the estimates of costs and consequences?

No. The allowances for uncertainty seemed inadequate given the current state of knowledge on the natural history of autism and alternate (to EIBI) treatment. For example, overlooked are children that achieve sufficient function to be employed and forego lifelong services, independent of specific treatment. Also overlooked are the benefits of alternate treatment programs. Similarly, provision of EIBI may in fact provide no additional benefit, despite additional costs, in a particular setting, depending on alternative treatment programs. These possibilities are not accounted for in this model.

Did the presentation and discussion of study results include all issues of concern to users?

This report, in contrast to the Columbia Pacific model does acknowledge the difficulty with the underlying research:

[F]or many clinicians and researchers, the question is not whether children with autism or PDD can achieve substantially improved functioning, but what practices lead to the best outcomes for these children and whether the methodology underpinning the research findings on EIBI is sound.²

Despite acknowledgment of uncertainty regarding effectiveness evidence in the body of the report, this uncertainty is ignored in drawing conclusions regarding cost-benefit of EIBI. For example, the report states:

At a rate of normal functioning achieved by 40-50% of children with autism or PDD who receive EIBE (see, e.g., Lovaas, 1987) compared to virtually ineffective intervention, cost savings per child served are estimated to be from \$274,709 to \$282,689 with inflation to age 22 and from \$2,439,710 to \$2,816, 535 with inflation to age 55.²

This type of conclusion is highly misleading for several reasons. No actual costs of EIBI have been measured, nor has its impact on the use of public services actually been studied. The assumed 45-50% normalcy rate following EIBE treatment has not been demonstrated using properly conducted and controlled clinical trials. The assumption that alternative treatments are virtually ineffective is not reasonable.

4. SUMMARY

I. Columbia Pacific Consulting model

The BCOHTA appraisal found that 9 of 10 criteria for a valid economic analysis were inadequately met by the Columbia Pacific model.

Five criteria were particularly problematic:

- 1) An inadequate formulation of alternative treatment categories for the purposes of evaluation in terms of both benefits and effects.
- 2) A failure to establish the state of effectiveness evidence and deal with the uncertainty in outcomes with Lovaas treatment;
- 3) The introduction of a substantial bias by failing to acknowledge the existence of a 'normal' category in the 'without' Lovaas group for the purposes of public service utilization and vocational achievement.
- 4) A failure adequately to detail costing items and provide sources for estimates.
- 5) Costs and consequences were not measured in appropriate physical units such as quality of life years gained or disability-free life years. Instead, benefit was represented by three public service / vocational categories termed 'normal', 'semi-dependent' and 'very dependent'.

II. Jacobson et al model

The BCOHTA appraisal found that 9 of 10 criteria for a valid economic analysis were inadequately met by the Columbia Pacific model.

Four criteria were particularly problematic:

- 1) No actual costs of early intensive behavioural intervention (EIBI) were measured.
- 2) Neither EIBI or alternative treatment programs were adequately described. Alternative treatment programs were barely visible in this analysis.
- 3) The authors unproblematically accepted a 45-50% normalcy rate following EIBE treatment. Variations of this 'normalcy' rate did not allow for the possibility of little difference between children receiving EIBI and those receiving a reasonable alternative approach.
- 4) Jacobson et al contravened a fundamental principle of economic evaluation by using inflation and not discount rates to estimate cost savings to public expenditures from age 6 to 55.

5. CONCLUSIONS

At best, these cost-benefit models demonstrate the obvious: if an effective treatment for autism were available that resulted in normally-functioning children starting at an early age, it would massively reduce public service costs (as well as human suffering) over the lifetime of a person with autism.

However, it is premature to draw conclusions regarding absolute or relative effectiveness of any treatment options, since until effectiveness is established, cost-benefit economic models are meaningless.

In these circumstances, research effort would be more appropriately directed to determine actual costs, both absolute and relative, of existing autism treatment programs.

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