Cost-Benefit Studies in Vocational Services

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In this era of cost containment and managed care, the benefits and costs of vocational interventions for persons with psychiatric disability are receiving increased scrutiny. In response to this scrutiny, evaluators, providers, and agencies are turning to cost-benefit studies. The purpose of this article is, first, to examine the basic steps involved in cost-benefit studies in a way that will be understandable to program administrators, policy makers, and practitioners. Second, a review of cost-benefit studies on vocational programs for persons with psychiatric disability will be undertaken and the results summarized.

Introduction

In this era of cost containment and managed care, the benefits and costs of vocational interventions for persons with psychiatric disability are receiving increased scrutiny. In response to this scrutiny, evaluators, providers, and agencies are turning to cost-benefit studies as a means of demonstrating their impact. Some programs providing services to persons with psychiatric disability are informally testing their own cost effectiveness. For example, vocational programs may examine the number of clients they serve, vis-à-vis the costs associated with serving them. Cost-benefit studies take this process one step further by comprehensively examining whether programs are "worth" their cost, that is, whether the benefits that accrue to the clients, to taxpayers, or to society in general exceed the expenditure. Unlike studies of cost-effectiveness, cost-benefit studies must specify the perspective from which one is determining both costs and benefits. For example, what might be considered a benefit to a program participant (e.g., the receipt of entitlements) is reflected as a cost to society in the way of expenditures for entitlement monies. Cost-benefit studies are complex and based upon many fiscal and programmatic assumptions. According to at least one author, cost-benefit studies are "as much art as science" (Weisbrod, 1983). The purpose of this article is, first, to examine the basic steps involved in cost-benefit studies in a way that will be

understandable to program administrators, policy makers, and practitioners. Second, a review of cost-benefit studies of vocational programs for persons with psychiatric disability will be undertaken and the results summarized.

Steps in Cost-Benefit Analysis

Several authors (Johnson, Lewis & Bruininks, 1993; Sav, 1989) have described the basic steps needed to perform a cost-benefit analysis. They include:

1. Defining the program to be studied;
2. Defining the alternatives to the program being studied;
3. Determining the accounting framework;
4. Quantification and monetization of benefits and costs;
5. Analyzing the benefits vis-à-vis the costs.

These steps will be described in greater detail keeping in mind the perspective of a program administrator who wishes to conduct a cost-benefit study within a vocational program.

Step 1. Defining the Program to Be Studied

Defining the program to be studied may appear to be a straightforward first step in conducting a cost-benefit study, but for certain programs it may prove difficult and ambiguous. The first question to be answered is whether the program on which the cost-benefit study is to be conducted is a distinct entity, or whether it is embedded in a larger organization with overlapping accounting, finance, and personnel systems. To the extent that the program's finances cannot be disentangled from a larger organization, a cost-benefit study will prove more difficult, but generally not impossible.

To conduct a cost-benefit study, it is necessary to calculate both the direct and the indirect costs of that program entity. For example, if a freestanding supported employment (SE) agency is staffed by 3 full-time coaches and one clerical person, the direct costs of providing the supported employment services would be straightforward and could be calculated fairly easily. Administrative costs (overhead) such as rent, utilities, and the like would also be calculable. If embedded within a larger agency that provides a variety of other services, the direct and indirect costs associated with the supported employment program and personnel would have to be accurately apportioned to the SE program. Furthermore, most cost-benefit studies are conducted within a distinct timeframe of fiscal or calendar years. This would mean having both fiscal and client outcome information available for a parallel timeframe.

It is generally not wise to begin conducting a cost-benefit study if a program is in flux, if the interventions provided are undergoing a shift, if there is a great deal of turnover in the staff, or if the kind of client being served is changing dramatically. For example, if during a cost-benefit study, your program begins to serve persons who are significantly more disabled than in the past and the costs associated with serving such individuals are substantially greater, interpretation of the study will be confounded by this change and it will not be possible to disentangle the costs and benefits of serving a more disabled versus a less disabled client. If the program models or interventions within an agency are undergoing change, it might also be wise to postpone a cost-benefit study until the new interventions are fully embedded. Furthermore, any cost-benefit study should be accompanied by a full description of the interventions so that policy makers and administrators can make judgments about the cost-benefit data with a complete understanding of the program model being evaluated.

Step 2. Defining the Alternatives to the Program to Be Studied

There are two important considerations under this rubric of defining alternative programs. First, many participants of supported employment programs would be participating in another type of vocational or pre-vocational program were they not enrolled in your program. When figuring the costs and benefits of your program, you must take this fact into account, since the alternative program may be more or less expensive than your program to operate, and this will be figured into the cost-benefit analysis. If a client comes to your program from a sheltered workshop, you must figure the wages that person would have earned in that alternative program as well as the costs of participating in that program. For example, one cannot argue that a supported employment program is cost-efficient because participants earn $5.00 per hour, an increase over a baseline of no earnings. Many participants would have been earning money in the alternative program and those "opportunity costs" (that is, lost opportunities to earn money in another program), as they are sometimes referred to, must be subtracted from current earnings to accurately reflect the benefit of participating in the current program. In some studies, the alternative program to the one under study is assumed to be the place where the client was receiving services prior to receiving them in the supported employment program (Rogers, Sciarappa, MacDonald, Wilson & Danley, 1995; Rusch, Conley & McCaughrin, 1993). In another cost-benefit study, clients were assumed to have been in the next most restrictive vocational option than they were in at the time of the study (Lewis, Johnson, Bruiniks, Kallsen & Guillery, 1992). In

either case, if you wish to compare your supported employment program to another vocational program, the benefits and costs of participation in that other program must be calculated, as described later in Step 4. In order to do this, the alternative programs must first be specified, as in Step 2.

Second, under this step, you can often expect that participation in your program will lead to a decrease or an increase of other mental health, community, or support services. For example, in one study, participation in a supported employment program was accompanied by a rather dramatic decrease in the use of expensive mental health services such as hospitalization and psychotherapy (Rogers et. al., 1995). It is important to track the use of these alternative programs and services so that they may be monetized and figured into the analysis in terms of both costs and benefits (as described in Step 4).

Step 3. Determining the Accounting Framework

Several authors have developed accounting frameworks for conducting cost-benefit analyses (Noble & Conley, 1987; Thornton & Maynard, 1989). According to Johnson and his colleagues (1993), an accounting framework "provides a structured taxonomy for identifying, measuring, valuing, and evaluating the full range of costs and benefits" (p. 77) of vocational services. All assumptions underlying this framework must be made explicit. For example, determining which benefits, costs, and alternative programs to track, determining how to cost out the services, determining how to estimate "foregone productivity" (i. e., lost wages due to program participation) or "opportunity costs" must all be made explicit by the evaluator.

The use of one accounting framework versus another is intimately tied to the quality and comprehensiveness of data available upon which the cost-benefit study will be based. Obviously, the best scenario is one where client data (i. e., wages earned, fringe benefits received, and taxes paid) are tracked individually rather than estimated, and where costs and benefits from alternative programs are tracked on an individual client basis and not estimated. Program costs should be calculated accurately and comprehensively and assumptions regarding those costs made explicit. According to Thornton (1992), differences in evaluation methods or accounting frameworks used from study to study create a major source of uncertainty when interpreting cost-benefit studies. The final benefit-to-cost ratios reflect "hundreds of calculations and assumptions" (p.68), which make it difficult to conduct cross-study comparisons and meta-analyses. Several authors cited below describe their accounting frameworks in more detail.

Step 4. Quantification and Monetization of Costs and Benefits

As described earlier, several variables must be quantified when conducting a cost-benefit study; each is worthy of a separate discussion.

- Participant wages and fringe benefits
- Use and costs of alternative mental health programs
- Benefits received by recipients (e. g., SSI, SSDI)
- Calculating program costs in the program under study
- Intangible benefits

Participant wages and fringe benefits. Most cost-benefit studies track the actual dollars earned by participants in the program under study. In addition, attempts are generally made to put a dollar figure on the fringe benefits received, such as an employer's contribution to medical or life insurance, an employer's contribution to Social Security (FICA), and so forth. This can prove to be a difficult step and therefore many evaluators simply estimate the cost of fringe benefits using government figures. For example, Rogers et al. (1995) estimated the amount of fringe benefits at 15% of the participant's earnings, a figure provided by the federal government for lower-wage earners.

Also tracked and figured into the cost benefit equation are the taxes paid by the participant because, although these monies paid represent a loss to the participant, they represent a gain to the taxpayer and are calculated as such in the final cost-benefit analysis. Sometimes evaluators estimate taxes paid by using tax bracket information provided by the Internal Revenue Services, rather than by tracking actual taxes paid on an individual participant basis. In planning a cost-benefit study, the more accurately actual costs, wages, fringe benefits, and taxes can be tracked, the more credible the results will be.

Tracking alternative services. It is important to track the costs of the alternative programs in which the client may be participating concurrently or prior to entering your SE program, as well as the units of other services received. This is especially important if you wish to examine whether service utilization and the associated costs of those services increase or decrease as a result of participating in the SE program. The most likely services to be tracked include treatment services, rehabilitation services, case management services, and other vocational services. However, utilization of services that can be affected by participation in a vocational program can vary by the population served, the specifics of the service

system, and the locale. For example, in a vocational program serving young adults with a high rate of substance abuse problems, you may want to track use of substance abuse treatment facilities, and perhaps other community services such as crisis hospitalization or protective custody. You could then test the hypothesis that participation in your vocational program decreased the use of substance abuse treatment or crisis services.

After tracking units of service received by clients from agencies outside your program over the time period of the study, the analyst must, using available rate information, calculate the costs of services per unit. Often Departments of Mental Health, Social Services, or Vocational Rehabilitation can provide per-unit rate information, which can be used for these calculations.

Transfer payments. Social Security benefits, veterans benefits, welfare payments, and other such benefits are considered in cost-benefit studies to be "transfer payments" because they represent monies being transferred from the taxpayer to the participant. As we shall see in Step 5, they do not represent a cost to society, but simply a transferring of monies from one group to another. It is important to track the receipt of such transfer payments before, during, and after program participation to determine whether such payments increase or decrease. The typical payments tracked include SSI and SSDI; however, depending on the participants of the program, any of the following benefits might be tracked: general relief, veterans benefits, housing subsidies, food subsidies, Worker's Compensation, private insurance payments, or other public monies received.

Calculating program costs in the program under study. Generally, cost-benefit studies arrive at a per-participant cost for the study period, for example, the cost of serving a participant for the fiscal year being studied. This can be done by tracking the number of hours or days of service each client receives and multiplying those hours or days of service by a per-hour or per-diem direct cost. To arrive at a per-hour or per-diem cost of providing services, personnel costs must be calculated by examining the salary and fringe costs per full-time equivalent staff persons. Generally, the more difficult task is to monetize the cost of overhead, administration, and supervision of direct services for the same period. Some studies simply use their entire program budget in conjunction with attendance records as the basis for calculating per-hour or per-diem costs, which is acceptable if the total program cost is genuinely reflective of the monies needed to run the program.

A major source of confusion in cost-benefit studies is whether to include the costs of start-up in the analysis for newer programs. One major study did include start-up costs (Noble, Conley, Banerjee & Goodman, 1991); however, others do not necessarily do so (Rogers et al., 1995). Not including start-up costs can lead to an underestimate of program costs, but including all costs in a one-year study can make the program appear very expensive. Amortizing the start-up costs over some reasonable period seems the most logical approach.

Intangible benefits. Several studies have attempted to examine the "intangible" benefits that accrue from participation in their vocational programs (Noble, Conley, Banerjee & Goodman, 1991; Rogers et al., 1995). Whereas the costs of items such as services received or wages and taxes can be monetized fairly easily, most program administrators would argue that it is the intangible benefits of increased self-esteem, increased community integration, and independence that are the most welcome by-products of program participation. Intangible benefits that have been studied include self-esteem, symptomatology, leisure time, job satisfaction, and work integration. Generally, authors of cost-benefit studies report these benefits in a narrative form, or represent them as a "+" or a "-" (depending on whether they were positively or negatively affected during program participation) in the final cost-benefit table (Johnson et al., 1993). No studies examined in this review have attempted to quantify intangible benefits in such a way that they can be figured into the final benefit-to-cost ratio.

Step 5. Analyzing the Benefits vis-à-vis the Costs

Table 1 contains a mock cost-benefit analysis for a theoretical supported employment program. On the column to the far left are the components of the analysis: separate and total benefits, separate and total costs, and the final benefit-to-cost ratio. The second column represents the sources of benefits and costs: net wages and benefits (in this case, wages and benefits after program participation less wages and benefits from before program participation), taxes paid, reduced use of other services, reduced transfer payments, direct and indirect program costs. Across the top of the page on the far right is the analytical perspective of society, the program participant, and the taxpayer. Society can be thought of as the combined perspectives of the taxpayer and the program participant, and thus the items in the columns for the "program participant" and the "taxpayer" add up to the figures in the "society" column. Benefits are represented as straight dollar figures while costs are stated in parentheses. (Not all cost-benefit analyses will employ a table identical to the one used here, but the reader would recognize all the common elements.)

Once again it is noteworthy to mention that what may be a cost from one perspective is a benefit from another. In this

Table 1 — Final Cost-Benefit Analysis

		Analytical Perspective				
Analysis	Sources of Benefits/Costs	Society	=	Participant	+	Taxpayer
Benefits:	a. Wages and fringe benefits	$2,000		$2,000		$0
	b. Taxes paid	$0		($400)		$400
	c. Reduced use of alternative services	$2,000		$0		$2,000
	d. Reduced transfer payments	$0		($1,000)		$1,000
Total Benefits:	**e. Total benefits (a+b+c+d)**	**$4,000**		**$600**		**$3,400**
Costs:	f. Direct program costs	($5,000)		$0		($5,000)
	g. Indirect program costs	($2,000)		$0		($2,000)
Total Costs:	**h. Total program costs (f+g)**	**($7,000)**		**$0**		**($7,000)**
Net Benefits:	i. Total program benefits less total program costs (h−e)	($3,000)		$600		($3,600)
Benefit/Cost Ratio:	**j. Total benefit divided by total cost (e÷h)**	**.57**				
		($4,000 ÷ $7,000)				

example, the average net participant wages and fringe benefits over the year are $2,000 (line a), which benefit the participant and society, but not the taxpayer directly. Taxes paid (line b) are represented in parentheses in the participant column because they represent a loss for the participant but are represented in the taxpayer column as $400 because they are a benefit for the taxpayer; that is, the taxes represent money going into the tax coffers. Taxes are represented as $0.0 in the society column because from the transfer perspective they represent monies simply moved around. Benefits do accrue to society and to the taxpayer from the reduced use of other services, however. In this example, the average reduction in alternative services for the participants of this supported employment program is $2,000 per year (line c), perhaps resulting from decreased use of partial hospitalization or clubhouse programs. Both society and the taxpayer benefit from this reduction, and the taxpayer benefits from reduced transfer payments such as SSI or SSDI (line d), while it is a loss to clients. Thus, the sum of the benefits (line e) is $4,000 for society as a whole, $600 on average for the participants (because, while they have earned $2,000 on average, they have lost SSI or some other transfer payment, as represented by the $1,000 in parentheses, and lost $400 in taxes paid). The taxpayer benefits to the tune of $3,400, due to less monies spent for alternative services, reduced SSI or other transfer payments, and taxes paid into the tax coffers. The direct costs ($5,000; line f) and indirect costs ($2,000; line g) of the supported employment program add up to $7,000 on average per participant, per year—a cost to society as a whole, and the taxpayer, but not a cost to the participant. When these costs are taken into account for society and the taxpayer, the amount of benefit is reduced. In this example there is a net cost to society because the total benefit to society was $4,000; however, the cost of delivering the program is $7,000 (line h). Thus, the net cost of providing this service from the societal perspective is $3,000 per participant, per year (line i). The participant benefits remain the same, at $600 per year, and the taxpayer's benefits, when weighed against the costs, also decline. The benefits to the taxpayer were $3,400, but the program costs the taxpayer $7,000. Therefore, the net cost of the program to the taxpayer is $3,600.

In the final analysis, the cost-benefit ratio that is generally calculated at the end of such an analysis is done from the perspective of society as a whole, though it is possible to generate such ratios from the other two perspectives. In this case, the benefit-to-cost ratio is .57 ($4,000 in benefits accrued to society as a whole, divided by $7,000 in costs; line j). This means that the benefits that accrued to society did not exceed the costs. Generally, a ratio approaching 1.0 is desired; the ratio can also exceed 1.0. The interpretation of a program that has a benefit-to-cost ratio of 2.0, for example, would be: "The program returns two dollars to society for every dollar expended."

Having "walked through" the process of constructing a cost-benefit study, we can turn our attention to the results of such studies for persons with psychiatric disability. In reviewing these studies, I will point out some of the five steps of a cost-benefit analysis, which were described above.

Studies Examining the Cost-Benefit of Supported Employment

Lewis and his colleagues (1992) performed a cost-benefit analysis for vocational programs in the state of Minnesota. They were able to gain the cooperation of 11 service providers, across 13 service sites, involving 41 vocational program options and approximately 1,800 clients (Step 1). This represented about 9% of all the programs in the state, and included vocational services of many types. They specified the alternative vocational program (Step 2) as the next most restrictive program from the one the client was in at the time of the study. (For example, for the sheltered workshop option, the next least restrictive option was the "Day Activity" option). In terms of their accounting framework (Step 3), the authors did not collect data individually on each client, but rather examined program records, budgets, and expenditure records, and interviewed key personnel to explicate the costs associated with each program option (Step 4).They examined only SSI in terms of transfer payments, and used the Targeted Job Tax Credit (a cost to Society and the Taxpayer) in their analysis (Step 3). In the final benefit-cost (BC) analysis (Step 5) the authors reported variable results, but overall positive outcomes. They concluded that all forms of supported employment were cost-effective when compared to habilitation training, sheltered workshop interventions, and vocational training when examined from the societal perspective. When SE was compared to habilitation training, the return to society was $2 for every $1 invested. When SE was compared to on-site employment (sheltered workshops), the majority of agencies reported favorable BC ratios, averaging $1.30 to $4.00 for each dollar invested. Even where there were unfavorable outcomes in terms of the cost-benefit analysis, from the participant perspective, there were increased wages and "intangible benefits."

Another large-scale study of supported employment was conducted by Noble and his colleagues in the state of New York (1991). The service of interest was the job coach model (Step 1) provided to clients with all disabilities, including persons with psychiatric disabilities, within the state vocational rehabilitation agency. Noble and his colleagues developed a sophisticated program evaluation tool (SEMIS; Supported Employment Management Information System) to track individual client data. A total of 45 service providers and 1,250 clients (316 with psychiatric disability) were included in this study, which spanned 1988–1990. The accounting framework used by Noble (Step 3) included examination of unaudited reports from provider agencies and calculations of increased productivity (i. e., more hours worked by clients), estimates of foregone productivity (what clients lost by giving up participation in another vocational program), estimates of current earnings, employers' contribution to Social Security, projected savings from the reduced use of alternative programs, and projected earnings if the client had stayed in the alternative program. Taxpayer benefits were estimated by examining the increase in taxes paid, the decreases in SSDI and SSI, and the cost savings from alternative programs. Two methods were used to estimate the costs (Step 4) of the vocational programs being studied: one using the SEMIS data, the other using data provided by the state vocational rehabilitation agency itself. Staff wages and administrative costs were included, as were vocational rehabilitation agency start-up costs, and the Targeted Job Tax Credit. The results suggested that supported employment programs in the state of New York yielded $5.7 million in societal benefits (Step 5), but that 75% of those benefits accrued from decreased use of alternative programs. Client earnings in the supported employment programs were 2.15 times higher than in the alternative vocational programs; however, the cost of running supported employment programs was 83–91% higher than those associated with running alternative programs. The final cost-benefit ratios were .67–.69; not very favorable from a societal perspective. However, Noble and his colleagues did find differences in societal benefits by disability group. He concluded that persons with severe mental illness were less expensive and more "cost-effective" to serve when compared with the other disability groups studied. He analyzed several intangible benefits and found a decrease in available leisure time, no significant change in symptomatology, and greater integration in the work force than was the case for clients in alternative vocational programs. Noble and his colleagues concluded that supported employment programs must increase client earnings and lower program costs to increase overall cost-efficiency and thus obtain more favorable benefit-to-cost ratios.

Rusch and his colleagues (1993) studied supported employment programs in Illinois during the years 1986–1990. They were motivated to conduct this analysis by earlier studies indicating poor outcomes associated with supported employment and the need for a longer timeframe. The authors were able to gain cooperation from 30 programs, with a client pool of 729 (Step 1). Most of those individuals were diagnosed with developmental disabilities; however, a substantial proportion had psychiatric disabilities. The authors excluded clients in unsupported competitive employment from their analysis. The supported employment programs studied included individual placements, work crews, and enclaves. The authors

used a management information system to track data on clients and state agency data to track program costs. They found that the participants of supported employment programs had $4 million in gross earnings over the 4 years of the study. However, estimated probable earnings from the alternative vocational programs were $2 million dollars, and reduction in costs associated with the alternative programs was $6 million dollars (Step 2). From the societal perspective, the average ratio of benefits to costs (Step 5) for the 4-year period of the study ranged from .75 in Year 1 to 1.09 in Year 4, for an average across all 4 years of .91. From the taxpayer perspective only, ratios were .66 in Year 1 to .89 in Year 4. In their accounting framework (Step 3), they did not include fringe benefits, nor did they factor in Social Security benefits paid by the employer. Their findings were consistent with an earlier study conducted by Rusch, using a matched pairs design, which demonstrated the cost-effectiveness of supported employment comparing 20 clients receiving supported employment services to 20 not receiving such services.

One of the few cost-benefit studies of supported employment conducted on a program serving only persons with psychiatric disability was conducted by Rogers, Sciarappa, MacDonald-Wilson, and Danley (1995). They undertook a cost-benefit study of an innovative program for 19 persons with mental illness, on a university campus (Step 1). At entry into the program, clients were asked to provide information about their use of an array of mental health services, their use of alternative programs (Step 2), and their wages, benefits, and hospitalization days for the year prior to admission. Data were collected prospectively on the same variables. An attempt was also made to assess the effect upon intangibles, including work integration, symptoms, job satisfaction, and satisfaction with the intervention. The program achieved a cost-benefit ratio of .89 (Step 5), suggesting that it approached, but did not quite attain, cost-efficiency. The largest effect appeared to be in the reduced use of alternative programs: an average reduction of $4,500 during the study, mostly in reduced hospitalization. Unfortunately, the program costs were fairly high, offsetting the increased wages and reduced amount of transfer payments found in the study. In terms of the intangible benefits, work site integration and program satisfaction were high, job satisfaction was not high, and symptoms remained unchanged.

These studies are summarized in Table 2.

Table 2 — Summary of Cost-Benefit Studies of SE Programs for Persons with Mental Illness

AUTHOR	SITE	PROGRAMS	N	KEY FINDINGS
Lewis et al., 1992	Minnesota	41 vocational programs (e. g., day activity workshops, habilitation training, vocational training)	1800 including some clients with psychiatric disability	• All SE programs are cost-effective when compared to sheltered workshop, habilitation training, and vocational training.
Noble et al., 1991	New York	Job Coach model provided through state V.R. agencies	1250 (316 with psychiatric disability)	• SE programs yielded $5.7 million in benefits but most of that was accrued from decreased cost of alternative services. • Clients in SE programs earned 2.15 x higher than in alternative vocational programs, but SE programs cost more to run. • Final cost-benefit ratios from societal perspective about .67-.69.
Rusch et al., 1993	Illinois	30 SE programs including crews, enclaves, and individual placements	729 (some with psychiatric disability)	• Reduced use of alternative programs totaled $6 million; net earnings totaled $2 million. • Cost-benefit ratios ranged from .75 in first year to 1.09 in fourth year.
Rogers et al., 1995	Massachusetts	One experimental SE program for clients with psychiatric disability	19	• Largest single effect was reduced use of alternative services, particularly hospitalization costs. • Final cost-benefit ratio was .89.

Limitations in Cost-Benefit Studies on Vocational Outcomes

Thus far, the cost-benefit studies that have been conducted on vocational programs serving persons with psychiatric disabilities vary tremendously in scope and depth, from the small-scale but perhaps more tightly controlled studies to larger scale studies of statewide programs where many more assumptions were made in the course of conducting the analyses. As a result, it is difficult to look across all studies and arrive at a singular conclusion about the cost-benefits of vocational programs for persons with psychiatric disability. Thornton has expressed similar concerns about conducting cross-study comparisons among cost-benefit studies (1992).

Significant methodological problems remain in the conduct of cost-benefit studies (Bond, Clark & Drake, 1995). For example, some studies attempt to project future earnings as a means of demonstrating future benefits; others attempt to project the costs and lost opportunities from participating in alternative programs; others "discount" (that is, costs and benefits that may accrue in the future are "discounted" to their value in today's dollars). All of these methods require forecasting to some degree, much the same way that economists attempt to predict the rates of employment in future years. These estimates are not always accurate, and when one study relies upon numerous assumptions and projections, the error can be compounded.

As mentioned earlier, some cost-benefit studies fail to take into account the fact that client earnings would probably not be zero if their program did not exist (Hill et al., 1987). It is likely that at least some clients would have earnings, thus raising the baseline against which the cost-benefit is conducted. Making the assumption that baseline earnings are zero makes it easier to have a favorable cost-benefit ratio; using the actual baseline earnings obviously makes it more difficult to achieve a favorable cost-benefit ratio. In conducting or interpreting cost-benefit studies, it is important to be aware of this methodological pitfall.

Studies suggest that valid cost-benefit studies may not be possible on programs early in their life, making it difficult to examine the costs and benefits of new and innovative programs. Research suggests that approximately 3–4 years are needed for a program's costs to stabilize (Rusch et al., 1993). Conducting a cost-benefit analysis prior to such stabilization and drawing conclusions about the efficiency of that program could therefore be misleading. Furthermore, a program should be stable in terms of clients, staff, and programs before a cost-benefit analysis is attempted. A dramatically changing client base during the course of a cost-benefit study can obscure the differential costs associated with serving different types of clients, as noted earlier. However, if the evaluator has a reliable measure of severity of disability available for each client being studied, it is possible to calculate benefits and costs separately for subsets of clients, based upon this measure.

Researchers conducting cost-benefit studies appear to disagree about whether to include start-up costs, an issue of which accounting framework to use. Whether unique start-up costs should be included and how they should be amortized are important questions that can alter the bottom line of any cost-benefit study. In theory, the results of cost-benefit studies should inform program directors and policymakers about the efficiency of various types of services. Ignoring start-up costs entirely presents a problem because were another program administrator attempt to start up such a program, he or she would not achieve as favorable a cost-benefit ratio. On the other hand, there are types of start-up expenses that would not be a factor after the first few years of a program's life, for example, construction costs. Under these circumstances, a cost-benefit study that is more reflective of the program's costs and benefits would not include start-up costs or would amortize those costs over a reasonable period of time. Clearly, these assumptions and choices should be made explicit by the evaluator, and perhaps the cost analysis should be presented with and without start-up costs.

The issue of whether to include or not include start-up costs is not as significant when a cost-benefit study is examining two interventions and their relative efficiency. In that case, as long as the same accounting framework and assumptions are applied to both programs (e. g., start-up costs for both programs are used) and those assumptions are made explicit, the essential question will be answerable: that is, does program *x* have a more favorable cost-benefit ratio than program *y*. It goes without saying that differing accounting frameworks, vastly different assumptions, and different data collection methods make it difficult to compare across cost-benefit studies presently in existence.

Conclusions

An attempt was made to provide a primer on cost-benefit analyses for vocational services for persons with psychiatric disability. Cost-benefit studies are complex, and, of necessity, some of that complexity was lost in this presentation. Most program administrators would have difficulty conducting such a study without technical assistance. This primer was intended to help administrators become more familiar with the terminology, process, and components of cost-benefit studies. There are numerous resources cited in this article for program administrators to learn more about cost-benefit studies. Of particular note is a recent book chapter by Clark and Bond (1995), which fully explores important issues in cost-benefit studies.

Given the paucity of cost-benefit evaluations for persons with psychiatric disability, it is difficult to draw conclusions about their cost-efficiency. Studies conducted thus far are promising and suggest that participation in supported employment programs can boost participant wages and decrease the use of alternative services. Thus, when compared to day care types of interventions, SE programs appear cost-effective. The relatively high cost of delivering SE services is responsible in part for not achieving more favorable benefit-to-cost ratios. While most evaluations thus far have made intra-program comparisons (i. e., comparing different vocational services within one program), or longitudinal comparisons (comparing benefits and costs before and after participation), what is needed are more studies involving comparisons of vocational programs, ideally using a randomized design. Furthermore, it is important to note that the question of whether supported employment programs are valuable to persons with psychiatric disability rests on factors other than their cost-benefit ratio.

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