Cost Research on Alcoholism Treatment

Although relatively little research has been conducted on the cost of services for alcohol treatment, this field has witnessed important developments in recent years. Some of these developments have grown from enduring interest in certain research questions. One central question has been whether individuals who undergo alcoholism treatment have lower health care expenditures afterwards. Another is whether some treatment settings deliver better outcomes for comparable costs—or comparable outcomes for lower costs—and thus are more cost-effective.

Other developments have arisen as questions not previously addressed have begun to receive attention. One line of inquiry is whether shorter or longer periods of inpatient treatment are more cost-effective. Another is whether treatment cost savings in the short term might lead to a higher probability of relapse, greater readmission to later treatment, and, consequently, greater long-term treatment costs. Above all, the last few years have brought improvements in the methodological tools for analyzing the costs of alcoholism treatment. These improvements hold considerable promise for the further development of the field.

Past Research

Earlier studies on the cost of alcoholism treatment have been summarized by Jones and Vischi (1979), Annis (1986), Holder (1987), Holder et al. (1991), and Finney et al. (1996). The National Institute on Alcohol Abuse and Alcoholism's (NIAAA) national plan for health services research also contains a review of this literature, along with a consensus statement reflecting the future research priorities of the National Advisory Council on Alcohol Abuse and Alcoholism (1997). This literature contains several general themes. One of the oldest is whether treatment for alcoholism leads to reductions in general health care costs, and, if so, whether such reductions would be sufficient to cover the costs of the alcoholism treatment. A net reduction in total health care costs, that is, a decrease in total costs after adjustment for alcohol treatment costs, is referred to as a cost offset. Early studies showed that cost offsets following alcoholism treatment could be demonstrated (Jones and Vischi 1979). Later literature (Holder 1987) continued to support this finding, while also showing that (1) cost offsets can be better studied if longer periods (greater than 1 year) of pretreatment health care costs are examined; (2) people with alcoholism (and their family members) are heavier users of health care services than are nonalcoholic people of the same age and gender; and (3) prior to entering treatment, general medical care costs for those who eventually seek treatment tend to rise (the "ramp-up" effect).

Another early concern raised in the literature on treatment cost was whether there are more effective and cost-effective alternatives to inpatient alcoholism treatment. A review of this literature published in 1986 concluded that (1) inpatient alcoholism programs lasting 4 weeks to a few months showed no higher success rates than did periods of brief hospitalization for a few days; (2) some patients could be safely detoxified without pharmacotherapy and in non-hospital-based environments; (3) partial hospitalization programs ("day hospitalization" with no overnight stays) had results equal or superior to inpatient hospitalization, at one-half to one-third the cost; and (4) in some populations, outpatient programs produced results comparable to those of inpatient programs (Annis 1986).

A recent analysis reviewed 14 additional studies comparing inpatient with outpatient treatment (Finney et al. 1996). Of these, seven studies found no significant differences in treatment outcomes between inpatient and outpatient regimens, five found effects favoring inpatient treatment, and two found effects favoring outpatient treatment. In both of the studies

favoring outpatient treatment, the regimen was a day hospitalization program, an intensive form of outpatient treatment. When the researchers investigated the intensity of therapy across programs, they found that the most intensive therapy almost always produced better treatment results. Because outpatient treatment is substantially less expensive than inpatient treatment, the authors offered the following policy recommendations: "(a) Encourage outpatient treatment for most individuals with sufficient social resources and no serious medical/psychiatric impairment and (b) promote the development and availability of less costly nonmedical residential and intensive outpatient treatment options" (Finney et al. 1996, p. 1793).

Although outpatient settings may be cost-effective for many patients, they may not be appropriate for all patients. The investigators in the study just described (Finney et al. 1996), along with other commentators (Schuckit 1998), have strongly recommended that inpatient treatment be retained as an option available for some patients, particularly those whose conditions are highly resistant to treatment, those with few financial resources, those whose environments may not be conducive to recovery, and those with serious, coexisting medical or psychiatric conditions.

Alcoholism treatment involves a diverse set of services. Researchers have identified some 43 current modalities, or therapeutic approaches, that have been discussed in the alcoholism research literature (Miller et al. 1995). Examples include motivational counseling, marital and family therapy, cognitive-behavioral therapy, skills training, aversion therapy, and psychotherapy. (It should be noted that treatment for alcoholism often entails application of several such modalities within a single treatment program.)

An obvious question is whether any of these modalities can be shown to be more cost-effective than the others. One research team opened up this line of inquiry with a review of 33 treatment modalities for which there had been at least one published clinical trial (Holder et al. 1991). In the review, each modality was rated for the degree of evidence of success, the strength of that evidence, and the cost of each treatment. The general finding was that the modalities with the most evidence of effectiveness were not the most expensive; meanwhile, some of the modalities with the least evidence of effectiveness also had the highest costs. This discomfitting conclusion was accompanied by the observation that the range of treatment costs across settings was enormous, with a high of $585 per day for hospital-based care and a low of $6 per visit at social model, nonresidential programs.

In reviewing these findings, it is important to note the surrounding context of cost studies in health care generally. As one investigative group noted, the number of such studies across all health care fields increased significantly between 1979 and 1990 (Elixhauser et al. 1993). However, the methodological standards for conducting either cost-effectiveness analyses or cost-benefit analyses varied so much from study to study that meaningful comparisons among the costs or benefits documented could not be made (Elixhauser et al. 1993). Hence, progress toward increased knowledge was inhibited by a lack of standardized techniques for measuring health treatment costs. Recent developments, discussed later in this section, have been aimed at reducing this problem.

Recent Studies

Recent studies of alcoholism treatment costs can be divided into two general categories: those that continue the study of issues raised in the earlier literature, and those that examine new research questions that have emerged from earlier work. For convenience, in the next sections the research is divided into studies of "continued issues" and studies of "new issues."

Continued Issues: Cost-Effectiveness of Different Treatment Modalities

A good example of the study of a continued issue is a 1996 reanalysis of the cost-effectiveness literature (Finney and Monahan 1996), a contribution explicitly labeled as a "second approximation" in response to the "first approximation" literature review offered in 1991 (Holder et al.

1991). For the later study, investigators reanalyzed 142 of the 177 studies from the original study, excluding only those studies that were not available in English, were duplicate reports, had unclear treatment modalities, or did not include a comparison group. They added 3 treatment modalities to the original classification scheme, bringing the total to 36, and revised the procedure for assessing outcomes by developing a mathematical formula, or "effectiveness index," that rated the strength of each study's findings on the basis of the research methods used.

Using this refined procedure, the authors of the 1996 review confirmed some of the findings of the original review. In both, some treatment modalities appeared to be effective, such as social skills training, the community reinforcement approach, behavioral marital therapy, and stress management training, whereas others did not, such as residential milieu treatment and general counseling. On the other hand, several treatment modalities received effectiveness ratings under the revised index that were quite different from those received in the original analysis. Brief motivational counseling, self-control training, and use of oral disulfiram (a drug that creates an aversive reaction to alcohol), for example, were rated significantly lower by the newer index.

Overall, the range of effectiveness ratings across all 36 modalities studied was reduced in the newer review. In its main finding, the reanalysis did not show a relationship between effectiveness and cost. When only those 26 modalities that had been documented by three or more studies were included, greater cost was related to lower effectiveness, but this relationship was not statistically significant.

Later research took the next logical step, which was to examine the costs of specific treatment modalities. In one recent study, investigators calculated the costs for each of the three treatments compared in a project called Matching Alcohol Treatments To Client Heterogeneity (Project MATCH) (Cisler et al. 1998). Project MATCH was an 8-year, multisite clinical trial sponsored by NIAAA. The trial tested the hypothesis that patients who were appropriately matched to treatments, based on characteristics of both the patient and the therapy, would have better outcomes than those who were unmatched or mismatched. Specifically, Project MATCH investigated three behavioral treatments: cognitive-behavioral therapy, motivational enhancement therapy, and 12-step facilitation (Project MATCH Research Group 1997).

As it turned out, each of the therapies produced generally comparable treatment outcomes in the Project MATCH trial. Therefore, the question was raised as to whether any of these equally effective treatments could be offered for a lower cost. Findings showed that average per-patient costs for motivational enhancement therapy were the lowest, at $537, compared with $904 for cognitive-behavioral therapy and $956 for 12-step facilitation. It is important to note, however, that the number of patient contact hours differed across therapies: only 4 hours for motivational enhancement therapy, compared with 12 hours for both 12-step facilitation and cognitive-behavioral therapy. When costs were computed per hour of patient contact rather than per patient, motivational enhancement therapy was actually more expensive ($134 per contact hour) than either cognitive-behavioral therapy ($75 per contact hour) or 12-step facilitation ($80 per contact hour). Thus, the therapy that appeared most expensive—12-step facilitation—was actually least expensive per contact hour, and the therapy that appeared least expensive—motivational enhancement therapy—was actually the most expensive per contact hour.

Another study compared treatment costs over a 3-year period for people with alcoholism who chose to attend Alcoholics Anonymous (AA) with costs for those who sought help from a professional outpatient alcoholism treatment provider (Humphreys and Moos 1996). As expected, treatment costs were lower for the AA group over the course of the study. However, outcomes were similar for both groups, indicating that voluntary AA participation may significantly reduce treatment costs without compromising outcomes. The authors cautioned that AA is not a substitute for outpatient treatment in all cases, but it can be effective for many individuals who

choose it. One limitation of this study is that patients selected their own treatment option rather than being randomly assigned. This "self-selection" creates the possibility of bias in the findings because the subjects who are more likely to achieve successful treatment outcomes, such as those with more motivation or less severe conditions, might be more likely to choose one treatment alternative over another.

Continued Issues: Cost Offsets

Recent studies have also continued to investigate cost offsets, or net reductions in health care costs attributable to alcoholism treatment. For example, one research group analyzed health insurance claims from 10 large firms, as generated by some 15,000 employees and dependents who received alcoholism treatment between 1989 and 1991 (Goodman et al. 1997). Results indicated that after the initiation of treatment, health care costs incurred by alcoholics declined, but that differences in these costs from pretreatment levels were relatively modest. The researchers found that cost offsets were greater for clients who initially received inpatient rather than outpatient treatment. Cost offsets were also greater within 6 months of the initiation of treatment than they were later. The authors emphasized that although the estimated cost offset effects were modest, "substance abuse treatment should not depend on whether it 'pays for itself' by offsetting other treatments" (Goodman et al. 1997, p. 938). They noted that substance abuse treatments, like other medical treatments, should instead be justified by the health benefits they provide.

Another research group examined the additional question of whether legal costs would drop, along with health care costs, after alcoholism treatment for patients who had behavioral marital therapy (O'Farrell et al. 1996*a*,*b*). The results can only be taken as suggestive, however, because of the small number of subjects included in the study's two components, a cost offset analysis (36 subjects) and a cost-effectiveness analysis (59 subjects). The cost offset analysis indicated that behavioral marital therapy decreased both health care and legal costs and that the savings exceeded the cost of delivering the therapy. Behavioral marital therapy was not found to be more cost-effective in terms of prolonging abstinence from drinking than was simple individual counseling, which was given to the control group. The two therapies had similar effectiveness in prolonging abstinence, but behavioral marital therapy was substantially more expensive. Behavioral therapy was just as cost-effective as individual counseling in terms of promoting marital adjustment, however. In addition, when special sessions to prevent relapse were added to behavioral marital therapy, improvements occurred in abstinence from drinking and marital adjustment outcomes. The additional relapse prevention therapy did not, however, lead to greater savings in health care or legal costs (O'Farrell et al. 1996*b*).

New Issues: Length of Treatment

Although the relative merits of inpatient versus outpatient treatment continue to receive occasional study (Long et al. 1998), most observers seem to have accepted the conclusions of the study by Finney and colleagues (1996); that is, outpatient treatment should be encouraged for most patients, but access to inpatient treatment should be retained for those patients who need it. The focus of cost-effectiveness research has accordingly shifted from the issue of inpatient versus outpatient care toward consideration of other treatment program dimensions. Prime among these are comparisons of shorter versus longer periods of treatment.

One research group abstracted medical records and surveyed program administrators at 98 U.S. Department of Veterans Affairs (VA) inpatient treatment programs in an attempt to identify the characteristics of the most cost-effective clinics (Barnett and Swindle 1997). Their principal measure of program outcome was whether patients were readmitted to treatment at any VA hospital in the United States within 180 days of discharge. They found that both treatment cost and outcome were related to program size, intended length of stay, ratio of staff to patients, and client treatment histories. In addition, they found that 28-day programs were much more costly and only slightly more effective than 21-day programs. Whereas the average 21-day

treatment costs were $3,754 per patient and had a 75.0-percent chance of successful outcome (within the 180-day window), the longer 28-day treatment programs added $860 to per-patient costs but only improved success rates to 78.3 percent. On this basis, the authors concluded that 21-day programs were more cost-effective than 28-day programs.

Similar findings on length of stay were produced by a 1998 study of 12 inpatient alcoholism treatment facilities for U.S. Navy personnel (Trent 1998). A planned reduction from a 6-week to a 4-week treatment program created an opportunity to conduct a natural experiment of treatment outcomes under the two plans. Results indicated that patients treated in the shorter, 4-week program achieved outcomes similar to those treated by the longer 6-week program in terms of alcohol use, number of negative incidents, retention on active duty status, job performance, and recommendation for reenlistment or advancement. The researchers also noted that participation in aftercare (principally attendance at AA) was the best predictor of treatment outcomes at 1-year follow-up. Although the study did not estimate the costs of the competing programs, clearly, shortening program length by about one-third could generate significant cost savings.

New Issues: Long-Term Costs

Alcoholism is, of course, a chronic disease. It is therefore reasonable to expect that any given individual with alcoholism may experience several episodes of treatment, separated by periods of sobriety, over the course of a lifetime. Thus, it is important that treatment cost research examine the long-term, or lifetime, costs for affected individuals. Such research is valuable for examining whether focusing on potential treatment cost savings in the near term might be shortsighted because such savings lead to greater costs over the long run. For example, while inpatient treatment may not seem cost-effective in the short term, if it reduces episodes of later care, it may compare more favorably with other treatment strategies when viewed from a long-term perspective.

Fortunately, cost researchers are taking the first steps in this direction. One research group has made the distinction between the alcohol treatment costs incurred during the first 6 months of treatment and the costs incurred later (Goodman et al. 1996). One of their studies, involving 879 insured employees and retirees who underwent alcoholism treatment, analyzed whether the patients required additional alcoholism treatment between 6 and 90 months after the initial treatment episode, and estimated the cost of such treatment (Goodman et al. 1996). The researchers examined such variables as the intensity of initial treatment; inpatient versus outpatient setting of the initial treatment; severity of diagnosis (dependence vs. abuse); presence of drug abuse, liver disease, or coexisting psychiatric disorders; and demographic characteristics.

The results indicated that the treatment setting (inpatient vs. outpatient) during the first 6 months had no bearing on either the need for or the total costs of later treatment. Moreover, the intensity of treatment during the first 6 months had no effect on later treatment costs for patients diagnosed as alcohol abusers, although more intense treatments in the initial 6 months slightly reduced later treatment costs among patients diagnosed as alcohol dependent. The patient's diagnosis, however, did influence the probability that treatment would occur after the 6-month mark. Later treatment was more common among alcohol-dependent individuals (as opposed to alcohol abusers) and those who also abused other drugs. Treatment costs beyond the first 6 months were greater for those with drug abuse problems, liver disease, or coexisting psychiatric disorders, largely because these factors increased the likelihood that long-term treatment would occur in an inpatient rather than an outpatient setting.

While these results seem to indicate that near-term savings can be achieved without triggering greater costs in the long run, they run counter to an earlier finding that a return to treatment (over a 2-year window) was less likely among patients initially treated in an inpatient hospital setting than among those attending AA (a less intensive

and less costly option) (Walsh et al. 1991). The tradeoff between near-term and later treatment costs clearly requires continued research attention.

New Developments in Measuring Costs

Perhaps most important of all the new directions that recent studies have taken is the development of improved methodological tools for conducting cost research. Heretofore, treatment cost studies, whether in the alcohol treatment field or in other health care fields, have generally not been based on recognized economic principles for assessing cost. They also have been so idiosyncratic as to preclude judicious comparison of results across studies. Steps toward remedying these conditions hold considerable promise for the advancement of knowledge in the field.

Three significant recent developments in the improvement of cost measurement methodologies have been (1) the guidelines contained in the U.S. Public Health Service's (PHS) *Cost-Effectiveness in Health and Medicine* (Gold et al. 1996; see also Russell et al. 1996; Siegel et al. 1996; Weinstein et al. 1996); (2) the Drug Abuse Treatment Cost Analysis Program (DATCAP) developed by French and colleagues (French and McGeary 1997; French et al. 1997); and (3) the Uniform Accounting System and Cost Reporting for Substance Abuse Treatment Providers, a contract product developed for the Center for Substance Abuse Treatment by Capital Consulting Corporation (Caliber Associates 1998*a,b*).

The PHS guidelines contain a set of recommendations for conducting cost-effectiveness studies (Gold et al. 1996; see also Russell et al. 1996; Siegel et al. 1996; Weinstein et al. 1996). They were developed to promote consistency in economic evaluations of health care programs. To create these guidelines, the PHS commissioned a group of leading experts to reach consensus on a set of standard procedures for conducting cost-effectiveness studies. Among the many guidelines are recommendations to measure costs to the entire society rather than from the perspective of a given treatment-delivering organization; to include a "reference case" in research reports or an analysis conducted according to a common, standard set of economic assumptions to facilitate comparison with other studies; and to identify ethical problems that may arise in the course of analysis. The complexity of the guidelines indicate that considerable expertise in the mathematics of economics would be required to use them. The guidelines were not developed to apply specifically to alcoholism or substance abuse treatment costs, and have yet to be used to study such costs. However, they should be fully appropriate for such analyses.

The DATCAP takes quite a different approach (French and McGeary 1997; French et al. 1997). Its intent is to provide a procedure for measuring substance abuse treatment costs that could be administered without placing a substantial burden on the staff of a typical treatment center. The procedure measures economic costs, that is, the market value of all goods and services expended in providing treatment. Costs are estimated from the perspective of the provider organization rather than from the perspective of the client, of third-party payers (such as insurance companies), or of the society at large. These cost-estimating procedures have been applied to employee assistance programs (Bray et al. 1996; French et al. in press) and to a wide variety of drug abuse treatment programs (French et al. 1996, 1997), but applications specific to alcoholism treatment have not yet appeared in the literature.

The Uniform Accounting System and Cost Reporting for Substance Abuse Treatment Providers was also developed more as a tool for treatment providers than for academic researchers (Caliber 1998*a,b*). Like DATCAP, it measures costs from the perspective of the provider organization. The Uniform System differs from DATCAP by focusing on accounting costs rather than on economic costs. Accounting costs are based on a treatment program's actual expenditures for goods and services used in providing treatment. These can differ from economic costs (market value costs) whenever the treatment provider has access to free or subsidized resources, such as volunteer labor, the use of free or subsidized space, or donated food (Dunlap and

French 1998). In such cases, the accounting costs (actual expenditures for resources) will be lower than the economic costs (market values of resources). Which of the two systems is more desirable depends on the purpose of a study and the perspective of its authors. Most treatment providers would probably be more comfortable with accounting costs, as these most closely resemble the budgets that will be needed to provide the services. Researchers, on the other hand, are more likely to prefer economic costs, since conclusions based on the comparison of costs between programs should not be confounded by uneven access to free or subsidized resources.

By providing templates for the measurement of treatment costs, the above three systems promise to facilitate future research in two ways. First, they will make any cost study easier to conduct by providing model cost-measurement systems built on underlying assumptions that do not need to be reformulated de novo by each researcher who addresses the subject. Second, the standardization they provide should enable and encourage comparison between studies, thereby offering a richer field of evidence from which to draw conclusions, insights, and hypotheses. Given both advantages, these three cost measurement systems hold substantial promise for the near-term development of the field.

In Closing

Research in the field of treatment costs has seen some interesting developments in recent years. Some of these have been based on continued study of earlier research questions, while others have emerged as new themes in the literature. Research on the cost-effectiveness of different treatment modalities has continued to find that the more expensive modalities do not necessarily produce better treatment outcomes. Other research has continued to show that cost offsets are achieved following treatment; that is, reductions in general health care costs for those who have been treated for alcoholism are large enough to compensate for the expense of that treatment. Researchers have continued to conclude that outpatient therapy may be a more cost-effective option than inpatient therapy for many patients (although some patients will require inpatient therapy). Having generally resolved these points, research attention has begun to shift to related topics, such as the relative cost-effectiveness of shorter versus longer inpatient treatment programs, and whether the short-term savings from outpatient treatment are balanced against treatment costs that might be realized in the long term. While probably less interesting to most readers, developments in the standardization of methods for measuring treatment costs should be recognized as significant. These promise to improve future cost research considerably.

References

Annis, H.M. Is inpatient rehabilitation of the alcoholic cost-effective? Con position. In: Stimmel, B., ed. *Controversies in Alcoholism and Substance Abuse.* Advances in Alcohol and Substance Abuse Series. New York, NY: Haworth Press, Inc., 1986. pp. 175–190.

Barnett, P.G., and Swindle, R.W. Cost-effectiveness of inpatient substance abuse treatment. *Health Serv Res* 32(5):615–629, 1997.

Bray, J.W.; French, M.T.; Bowland, B.J.; and Dunlap, L.J. The cost of employee assistance programs (EAPs): Findings from seven case studies. *Employee Assistance Q* 11(4):1–19, 1996.

Caliber Associates. *Integrated Evaluation Methods: A Guide for Substance Abuse Treatment Knowledge Generating Activities.* Report prepared for the Center for Substance Abuse Treatment. Fairfax, VA: National Evaluation Data and Technical Assistance Center, 1998*a*.

Caliber Associates. *Minimum Evaluation Data Set: Core Data Lists.* Report prepared for the Center for Substance Abuse Treatment. Fairfax, VA: National Evaluation Data and Technical Assistance Center, 1998*b*.

Cisler, R.; Holder, H.D.; Longabaugh, R.; Stout, R.L.; and Zweben, A. Actual and estimated replication costs for alcohol treatment modalities: Case study from Project MATCH. *J Stud Alcohol* 59(5):503–512, 1998.

Dunlap, L.J., and French, M.A. A comparison of two methods for estimating the costs of drug abuse treatment. *J Maintenance Addict* 1(3):29–44, 1998.

Elixhauser, A.; Luce, B.R.; Taylor, W.R.; and Reblando, J. Health care CBA/CEA: An update on the growth and composition of the literature. *Med Care Suppl* 31(7):JS1–JS11, 1993.

Finney, J.W.; Hahn, A.C.; and Moos, R.H. The effectiveness of inpatient and outpatient treatment for alcohol abuse: The need to focus on mediators and moderators of setting effects. *Addiction* 91(12):1773–1796, 1996.

Finney, J.W., and Monahan, S.C. The cost-effectiveness of treatment for alcoholism: A second approximation. *J Stud Alcohol* 57(3):229–243, 1996.

French, M.T.; Dunlap, L.J.; Galinis, D.N.; Rachal, J.V.; and Zarkin, G.A. Health care reforms and managed care for substance abuse services: Findings from 11 case studies. *J Public Health Policy* 17(2):181–203, 1996.

French, M.T.; Dunlap, L.J.; Zarkin, G.A.; and Karuntzos, G.T. The costs of an enhanced employee assistance program (EAP) intervention. *Eval Program Plann*, in press.

French, M.T.; Dunlap, L.J.; Zarkin, G.A.; McGeary, K.A.; and McLellan, A.T. A structured instrument for estimating the economic cost of drug abuse treatment: The Drug Abuse Treatment Cost Analysis Program (DATCAP). *J Subst Abuse Treat* 14(5):445–455, 1997.

French, M.T., and McGeary, K.A. Estimating the economic cost of substance abuse treatment. *Health Econ* 6(5):539–544, 1997.

Gold, M.R.; Russell, L.B.; Siegel, J.; and Weinstein, M.C. *Cost-Effectiveness in Health and Medicine.* New York, NY: Oxford University Press, 1996.

Goodman, A.C.; Nishiura, E.; Hankin, J.R.; Holder, H.D.; and Tilford, J.M. Long-term alcoholism treatment costs. *Med Care Res Rev* 53(4):441–464, 1996.

Goodman, A.C.; Nishiura, E.; and Humphreys, R.S. Cost and usage impacts of treatment initiation: A comparison of alcoholism and drug abuse treatments. *Alcohol Clin Exp Res* 21(5):931–938, 1997.

Hilton, M., and Huebner, R.B. *Improving the Delivery of Alcohol Treatment and Prevention Services: A National Plan for Alcohol Health Services Research.* NIH Pub. No. 97-4223. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism, 1997.

Holder, H.D. Alcoholism treatment and potential health care cost saving. *Med Care* 25(1):52–71, 1987.

Holder, H.; Longabaugh, R.; Miller, W.R.; and Rubonis, A.V. The cost-effectiveness of treatment for alcoholism: A first approximation. *J Stud Alcohol* 52(6):517–540, 1991.

Humphreys, K., and Moos, R.H. Reduced substance-abuse-related health care costs among voluntary participants in Alcoholics Anonymous. *Psychiatr Serv* 47(7):709–713, 1996.

Jones, K.R., and Vischi, T.R. Impact of alcohol, drug abuse and mental health treatment on medical care utilization: A review of the research literature. *Med Care* 17(12 supp. 2):1–82, 1979.

Long, C.G.; Williams, M.; and Hollin, C.R. Treating alcohol problems: A study of programme effectiveness and cost effectiveness according to length and delivery of treatment. *Addiction* 93(4):561–571, 1998.

Miller, W.R.; Brown, J.M.; Simpson, T.L.; Handmaker, N.S., Tbien, T.H.; Luckie, L.F.; Montgomery, H.A.; Hester, R.K.; and Tonigan, J.S. What works? A methodological analysis of the alcohol treatment outcome literature. In: Hester, R.K., and Miller, W.R., eds. *Handbook of Alcoholism Treatment Approaches: Effective Alternatives*, 2nd ed. Needham Heights, MA: Allyn & Bacon, 1995. pp. 1–45.

O'Farrell, T.J.; Choquette, K.A.; Cutter, H.S.; Brown, E.D.; Bayog; R., McCourt, W.; Lowe, J.; Chan, A.; and Deneault, P. Cost-benefit and cost-effectiveness analyses of behavioral marital therapy with and without relapse prevention sessions for alcoholics and their spouses. *Behav Ther* 27:7–24, 1996*b*.

O'Farrell, T.J.; Choquette, K.A.; Cutter, H.S.; Floyd, F.J.; Bayog, R.; Brown, E.D.; Lowe, J.; Chan, A.; and Deneault, P. Cost-benefit and cost-effectiveness analyses of behavioral marital therapy as an addition to outpatient alcoholism treatment. *J Subst Abuse* 8(2):145–166, 1996*a*.

Project MATCH Research Group. Matching alcoholism treatments to client heterogeneity: Project MATCH posttreatment drinking outcomes. *J Stud Alcohol* 58(1):7–29, 1997.

Russell, L.B.; Gold, M.R.; Siegel, J.E.; Daniels, N.; and Weinstein, M.C. The role of cost-effectiveness analysis in health and medicine. Panel on Cost-Effectiveness in Health and Medicine. *JAMA* 276(14):1172–1177, 1996.

Schuckit MA. Penny-wise, ton-foolish? The recent movement to abolish inpatient alcohol and drug treatment [Editorial]. *J Stud Alcohol* 59(1):5–7, 1998.

Siegel, J.E.; Weinstein, M.C.; Russell, L.B.; and Gold, M.R. Recommendations for reporting cost-effectiveness analyses. Panel on Cost-Effectiveness in Health and Medicine. *JAMA* 276(16): 1339–1341, 1996.

Trent, L.K. Evaluation of a four- versus six-week length of stay in the Navy's alcohol treatment program. *J Stud Alcohol* 59(3):270–279, 1998.

Walsh, D.C.; Hingson, R.W.; Merrigan, D.M.; Levenson, S.M.; Cupples, A.; Heeren, T.; Coffman, G.A.; Becker, C.A.; Barker, T.A.; Hamilton, S.K.; McGuire, T.G.; and Kelly, C.A. A randomized trial of treatment options for alcohol-abusing workers. *N Engl J Med* 325(11):775–782, 1991.

Weinstein, M.C.; Siegel, J.E.; Gold, M.R.; Kalet, M.S.; and Russell, L.B. Recommendations of the Panel on Cost-Effectiveness in Health and Medicine. *JAMA* 276(15):1253–1258, 1996.