

Activity Based Costing of Probation with and without Substance Abuse Treatment: A Case Study

Farrokh Alemi,^{1*} Faye Taxman,² Victoria Doyon,³ Meridith Thanner,⁴ Heibatollah Baghi¹

¹Ph.D., College of Nursing and Health Science, George Mason University, Fairfax, VA, USA

²Ph.D., Bureau of Governmental Research, University of Maryland College Park, College Park, MD, USA

³College of Nursing and Health Science, George Mason University, Fairfax, VA, USA

⁴Bureau of Governmental Research, University of Maryland College Park, College Park, MD, USA

Abstract

Background: Since many offenders have drug problems, investigators have proposed that drug testing and treatment should be an integral part of probation. In 1994, the Office of National Drug Control Policy (ONDCP) funded a demonstration project designed to integrate drug treatment with traditional supervision services. As part of this demonstration a new procedure called "seamless" probation was set up in which treatment providers were co-located with probation officers and probation officers coordinated offenders' participation in treatment.

Aims of the Study: This study examines the cost of providing substance abuse treatment coordination through probation agencies.

Methods: We used Activity Based Costing (ABC) to examine the cost of probation with and without treatment coordination in one probation agency. Agency budget was analyzed and allocated to various programs. A questionnaire was developed to assess probation officer's activities. The cost of coordinating treatment for one offender was calculated by dividing the total cost of the program by units of various activities done by the probation officers.

Results: Preliminary test of reliability of the instrument showed that it was accurately portraying the probation officers time allocation. Probation officers spent 6.9% of their time in seamless supervision and 83.3% time in traditional supervision (83.83%). The seamless probation officers had more group meetings and more phone contact with their offenders than traditional probation officers. The average cost per offender per day was \$12 for seamless probation and \$7 for traditional probation.

Discussion: This study is limited because it focuses on one agency at one point in time. Results may not be relevant to other agencies or to the same agency as it makes its operation more efficient. This study provides a method of allocating budget cost to per client costs using survey of probation officer's activities – a tool developed in this study. Comparison of seamless and traditional supervision activities showed major differences in terms of the probation officers' activities and costs.

Implications: There are significant costs associated with asking probation officers to coordinate treatment. Studies should be undertaken to examine the relative benefits that can be derived from this increased cost.

Received 27 May 2003; accepted 18 February 2004

Introduction

Since many offenders have drug problems, investigators have proposed drug testing and treatment should be made an integral part of probation.¹ One idea, known as seamless supervision, is to require the probation officer to closely monitor and supervise the participation of offenders in drug treatment programs. In 1994, the Office of National Drug Control Policy (ONDCP) funded a demonstration project designed to integrate drug treatment with traditional supervision services. As part of the project, substance-abusing offenders were required to participate in the following services:

- (i) A minimum of nine months of treatment in two different levels of care including an intensive treatment program requiring the probation agent and treatment provider to jointly run treatment groups for 3-5 hours a week;
- (ii) Graduated sanctions or responses to non-compliance such as positive drug tests or missed treatment or supervision appointments; and,
- (iii) Drug testing during the period of supervision at an accelerated rate of three times a month.

In contrast to traditional probation, seamless probation focuses primarily on face-to-face contacts between the agent, the treatment clinician and the offender. Seamless probation allows treatment and supervision to occur at the same location. Traditional probation offenders have to seek treatment at different sites. In seamless probation, drug testing is required; in traditional probation it is optional or at the discretion of each agency. We focus on measuring the cost of seamless and traditional probation in one agency.

* **Correspondence to:** Farrokh Alemi, Ph.D., Acting Assistant Dean of Graduate Health Science, George Mason University, College of Nursing and Health Science, 4400 University Drive, Fairfax, Virginia 22030-4444, USA
Tel.: +1-703-993 4226
Fax: +1-703-993 1953
E-mail: falemi@gmu.edu

Source of Funding: R01DA10705 National Institute on Drug Abuse, NIH.

Supervision costs vary proportional to the intensity of services. Given more drug testing, more coordination with treatment and more monitoring of client's compliance, seamless probation might increase cost of supervision. This study provides an estimate of what funding is necessary if probation agencies are expected to work closely with treatment personnel. Thus, the study provides a mechanism for policy makers not only to mandate a change in probation procedures but also to fund the additional burden of delivering new services.

A number of authors describe how cost of health care programs can be calculated.²⁻⁷ In addition, many authors have described how cost of substance abuse programs should be assessed.⁸⁻¹⁷ Little is known about cost of probation. States often conduct reviews of their operating expenditures. For example, South Dakota Research Council¹⁸ reports cost of community corrections in 1997 was \$6,275 per year per client. They report average cost of parole services as \$1,891 per year per client. Schuman reports probation costs that range from low of \$275 for traditional probation to \$1,595 for more intensive probation.¹⁹ Wayson and Funke provide a step-by-step accounting allocation scheme for estimating cost of criminal justice programs.²⁰ The current study provides more information regarding cost of supervision, in particular cost of probation when it is co-located with substance abuse treatment.

By cost of supervision we are referring to the cost paid by the probation agency, at the state and local levels. We do not include cost to the society or cost to the victims.²¹ The societal cost of not treating substance abuse has been discussed elsewhere.²² We do not address costs to other agencies including cost for vocational training, welfare, foster care, police or the courts. We do not estimate the cost of the treatment agency. Nor do we address any future cost savings that may follow because supervision was able to reduce crime or reduce health care costs due to substance use.²³ A paper that addresses cost of treatment²⁴ and another paper that addresses the cost effectiveness of combining probation and treatment²⁵ are available through the first author.

Methods

This study examines one jurisdiction that is part of a randomized block experimental design to assess comprehensive treatment for substance abusing offenders on supervision. The jurisdiction provides both seamless and traditional supervision as part of a demonstration project sponsored by Office of National Drug Control Policy. The jurisdiction maybe different from other efforts in combining treatment and probation with respect to organizational and structural contexts. The jurisdiction was relatively small in both population (about 130,000) and area. In this case, the probation clients received outpatient group therapy. Both, supervision and treatment services were offered at one location, within the premises of the criminal justice agency. This allowed for ease of communication between probation officers and treatment counselor as well closer coordination

in delivery of services. Often the probation officers met with clients following the treatment meeting.

We estimated cost of the supervision at the Probation and Parole Agency from the budget of the agency. Current methods of estimating cost of a service rely on two sources of information: program budgets and program activities. While existing instruments are reasonable for obtaining and allocating program budgets to various program activities,²⁶ there is no standardized instrument in either the criminal justice or drug treatment literature regarding accurate measurement of program activities. The instruments that do exist²⁷ miss important components of supervision. To address this shortcoming, we developed a questionnaire for surveying program personnel regarding their activities. The questionnaire asks probation officers to list both what they did in a recent typical day as well as what they do in less typical days. This information is then used in conjunction with budget information to calculate cost of supervision. The survey form is available through the first author.

Calculation of Cost of Supervision

The calculation of cost of supervision followed four steps.

Budget Expenditures and Budget Adjustments

We obtained the operating budget of the agency from public records. A number of studies have explored hidden costs typically not included in agency budgets.²⁸ French *et al.* argue for the inclusion of economic costs in addition to accounting costs for estimating the costs of substance abuse treatment.^{26,29,30} This is especially important in examining building costs. Typical buildings are donated to agencies or are paid for in prior years and their costs are not reflected in current operating budgets. In the case of our agency, the building was leased; thus, the fair-market value was obtained directly from the agency's budget. The agency did rely on volunteer services for a number of services provided. These services were reported by the agency and a market value was assigned for the time of the volunteers.

Supervision officers rely heavily on information services provided by the State and City agencies. These information services are not paid for by the probation agency but used by the probation officers. It is important to estimate the cost of these services and add it into the budget. Information system costs were calculated from allocating the budget of State agencies responsible for production of online services to agencies utilizing the service. In addition, we calculated the cost of information systems provided by the city to the Probation and Parole agency.

The final adjustment to the budget concerned equipment costs. The agencies operating budget did not include the cost of equipment purchased in previous years. To estimate these costs we obtained the official agency's inventory list and used the age of the equipment to calculate market lease values. An exception to this was the cost of drug-testing equipment. The drug-testing machine was donated but the agency had to pay for supplies. Since this was the pattern at a number of other locations, the supply cost was assumed to include the lease value of the equipment.

Measuring Probation Officers' Activities

We asked supervision officers to report their daily workload and time distribution. The survey instrument was designed to capture two types of information: the distribution of time during a typical week and the distribution of atypical activities in 30-day period. We asked for distribution of time in five broad categories:

- (i) Contact with clients or collaterals (family members, employers, etc);
- (ii) Provider contacts;
- (iii) Court-related activities;
- (iv) Other (e.g., drug testing, duty officer, security); and
- (v) Administration activities.

These broad categories were further subdivided as in **Table 1**. (See also the Probation and Parole Officer Survey available through the first author).

Table 1. Classification of Supervision Procedures

Client or Collateral Contacts
Client intake
Face to face meeting
Group meeting
Field meeting & travel time
No show
Phone contact
Provider Contacts
Face to face meeting
Phone contact
Three way contact
Court Related
Report preparation
Court presence
Pre-sentence reports
Post sentence reports
Administration and Other Activities
Case log and documentation
Staff meetings
Drug testing supervision
Management of other officers
Training

Some agencies may be engaged in activities not listed above. Others may want to divide the activities in different fashion. At least in theory, the approach works with any set of mutually exclusive and exhaustive set of activities. However, finding such a set of activities is often difficult. It is, for example, possible to think of probation activities as a series of functions, e.g. assessment, referral, monitoring, graduated sanction, etc. These functional activities do not map directly to physical activities listed in **Table 1**. They include many different physical activities. For example, assessment may involve information gathering from the client through a face-to-face meeting, phone contact with treatment provider to examine their views, drug testing, and case log entry. Similarly, graduated sanction may include a number of face-to-face meetings with clients. We encourage agencies to

design their own set of activities but we caution that the procedure will not be meaningful unless the activities are mutually exclusive and exhaustive set.

Allocation of Budget

Probation officers do more than supervision. Many prepare pre- and post sentence reports that are not related to their supervision activities. To further complicate the matter, not all officers do the same type of supervision. Some focus on seamless supervision, others use more traditional supervision. Finally some do neither and focus on drug testing or management or community services. In step three, the agency's overall budget was allocated proportional to the hours probation officers spend in various investigative reporting, seamless supervision or traditional supervision.

Calculation of Cost Per Client and Per Day

The yearly supervision costs were divided by the number of supervision days to obtain a cost per client per day. The number of supervision days was estimated by multiplying twelve times the probation officers' monthly caseload by 23.5 days (the number of working days in a month). The cost of various components of supervision was calculated by allocating the cost per day of supervision proportional to time spent in each activity.

Reliability of Survey Instrument

We surveyed 18 probation officers working at the agency. Probation officers were provided a \$50 honorarium to participate in the survey. When responses were incomplete, we interviewed the officers in person. The response rate was 100%.

To test the reliability of the survey instrument, we used factor analysis (Promax rotation, Principle Component analysis with Kaiser Normalization and Promax rotations). The principal component analysis of 19 activities extracted five components. Three activities (pre-sentence report preparation, drug testing, and management of officers) did not load strongly on any of the five components; and were dropped from further analysis. The remaining activities were classified into five components that accounted for 70% of the variance in survey responses.

The reduction in components suggested that activities are highly correlated, meaning that officers who do much of one activity do a lot of the other activities in the same component. The first component with factor loads ranging from 0.50 to 0.83 was named "Bureaucratic Services" because the activities included written referrals to providers, request for warrants, post-sentence report preparation, activities related to no show clients, and continuing education. A subject with a high score on this component would focus on documentation and paperwork with little or no field activity or contact with client.

The second component with factor loads ranging from 0.88 to 0.95 was labeled "Direct Client Services" because it included meeting clients in the field, face-to-face meeting with providers, phone contact with providers, and court appearance. A probation officer with a high score on this

Table 2. Total Hours Spent by 18 Officers in Various Activities Per Day

Activities	Agency	Standard Deviation	Pre and Post Sentence	Seamless Supervision	Traditional Supervision
Client or Collateral Contacts					
Client intake	4.60	0.51		0.10	4.50
Face to face	16.81	0.79		0.57	16.25
Group meeting	2.29	0.61		1.33	0.96
Field meeting	6.99	0.51		0.26	6.73
No show	0.34	0.07		0.03	0.30
Phone contact	11.79	0.68		2.85	8.95
Provider Contacts					
Face to face	2.26	0.39		0.07	2.18
Phone contact	2.94	0.19		0.13	2.81
Written referral	0.70	0.05		0.04	0.67
Three-way	0.03			0.00	0.03
Court or Criminal Justice Related					
Court appearance	7.23	0.54		0.36	6.87
Report preparation	7.06	0.47		0.07	6.99
Pre-sentence	15.33	2.69	15.33		
Post-sentence	1.22	0.13	1.22		
Other					
Request for warrants	1.18	0.12		0.05	1.13
Case documentation	24.43	1.61		0.52	23.92
Staff case reviews	0.70	0.12		0.00	0.70
Drug testing	14.91	1.71		0.62	14.29
Administration					
Management of officers	2.74	0.80	0.37	0.00	2.36
Continuing education	4.23	0.52	0.58	0.11	3.53
Training of others	2.85	0.78	0.39	0.02	2.43
Breaks, conferences	13.39	0.81	1.83	2.47	9.09
Total	144		19.72	9.59	114.69
Percent of Total	100%		13.70%	6.66%	79.64%

component would spend most of his/her time providing traditional supervision services to individual clients.

The third component with factor loads ranging from 0.90 to 0.96 was named "Group Supervision Services" because it included group meeting with clients, phone contact with clients, and participation in conferences/training sessions. Probation officers with a high score on this component were prototypical of how seamless supervision was delivered in this agency. They would meet with their clients following or during the group therapy session and maintain close phone contact in between group sessions.

The fourth component with factor loadings ranging from 0.36 to 0.96 was named "Client Intake" because it included initial client intake, three way telephone contact with provider and clients, case documentation and face-to-face meeting with clients. Probation officers with a high score on this factor were involved in getting the clients into the agency and assigning them to new officers.

The fifth component with factor loads ranging from 0.70 to 0.80 was named "Training Services" because it included case reviews with probation officers, training of other probation officers and report preparation. An officer with a

high score on this factor would typically have a management position as well as supervising a limited number of clients.

The Cronbach's alpha coefficient provides an estimate of the degree to which each activity measures the same characteristics as other items within the same component. The Cronbach alphas for the five components were 0.65, 0.80, 0.89, 0.64 and 0.66 respectively. The results showed that the survey components had moderate to high reliability.

Results

Table 2 shows the cumulative distribution of activities of 18 probation officers across different types of supervision cases. In a single day, they spent a total of 144 hours. This effort was distributed across various activities. About 13% of their time was spent in preparing pre and post sentence reports. The remainder of their effort was put into seamless supervision (7% of the time) or in traditional supervision (80%).

Of particular interest is the contrast between seamless and traditional supervision. For the seamless supervision,

Table 3. Number of Cases Supervised

	Total cases per month*	Average length of probation (days)	Number of supervision days in a year
Pre-sentence reports	21		
Post-sentence reports	35		
Seamless supervision	34	294.03	9,588
Traditional supervision	732	361.84	102,039

* Assuming 23.5 working days per month

Table 4. Cost of Probation Per Day and Per Client (June 30 2000 to July 1st 2001 Costs)

	Agency costs	Investigative reporting***	Seamless supervision***	Traditional supervision***
Personnel services	\$1,191,362	\$163,182	\$79,320	\$948,859
Contractual services	\$11,984	\$1,641	\$798	\$9,544
Supplies & materials	\$9,436	\$1,293	\$628	\$7,516
Building rental	\$206,144	\$28,236	\$13,725	\$164,183
Equipment rentals*	\$122,083	\$16,722	\$8,128	\$97,233
Information services**	\$148,621	\$20,357	\$9,895	\$118,369
Economic cost of volunteers	\$5,013	\$687	\$334	\$3,993
Total	\$1,694,643	\$232,117	\$112,828	\$1,349,697
Cost per work day	\$6,009	\$823	\$400	\$4,786
Number of client-days		15,792	9,588	206,424
Cost per day per client		\$15	\$12	\$7

Note: * Estimated from market lease value.

** Estimated from State and City operating budgets.

*** Personnel, Contractual, Supplies, Building, Equipment, Information services, and volunteer costs were allocated proportional to activities of probation officers involved in investigative reporting, seamless and traditional supervision.

because treatment was provided in a group setting, probation officers met their clients mostly in groups. Therefore, they were able to take advantage of treatment setting to more efficiently work with their clients. In contrast, probation officers using the method of supervision rarely utilized the group setting.

Table 3 represents the number of cases managed by the probation officers. There were fewer seamless clients. The majority of effort and clients were concentrated on the traditional supervision. We asked the officers to provide dates of intake and discharge. From this information we calculated the average length of probation for the clients. The seamless clients stayed in probation for a shorter time, allowing officers to focus on new cases.

Table 4 shows the budget of the agency divided into seamless supervision, traditional supervision and investigative reporting. We first divided the expenditures proportional to activities in **Table 2**. **Table 4** presents the supervision costs for both traditional and seamless interventions. Note that for an average offender, seamless supervision costs were higher than traditional supervision.

The average cost of a day of supervision was divided across activities involved during a day. **Table 5** summarizes the findings.

Sensitivity Analysis

In our analysis of cost, we made a number of assumptions. To investigate the sensitivity of the conclusions to specific assumptions, we change key variables in the analysis by 1% and report the percent change in difference of seamless supervision cost more than traditional supervision. **Table 6** summarizes the sensitivity analysis. Among the variables studied, the difference between seamless and traditional supervision was most sensitive to changes in caseload of probation officers delivering seamless supervision. Accurate calculation of hours spent per case is integral to accurate measurement of the difference of seamless and traditional supervision costs.

Discussion

This study was limited by its focus on one agency. The experience of other agencies may be different. Furthermore, the study reflects costs at one point in time. The agency may become more efficient as it continues to implement the seamless program.

This study provides a method of allocating budget cost to per client costs using survey of probation officer's activities.

Table 5. Cost of Components of Supervision

	Percent of day	Cost per day	Cost per client	Cost per occasion
Client or Collateral Contacts				
Client intake	3.19%	\$166	\$33	\$70
Face to face	11.68%	\$606	\$20	
Group meeting	1.59%	\$82	\$20	\$80
Field meeting	4.85%	\$252	\$16	\$20
No show	0.23%	\$12	\$5	
Phone contact	8.19%	\$425	\$9	
Provider Contacts				
Face to face	1.57%	\$81	\$12	\$12
Phone contact	2.04%	\$106	\$7	\$12
Written referral	0.49%	\$25	\$14	
Three-way	0.02%	\$1	\$24	\$48
Court or Criminal Justice Related				
Court appearance	5.02%	\$260	\$47	\$149
Report preparation	4.90%	\$254	\$20	\$45
Pre-sentence	10.64%	\$552	\$300	
Post-sentence	0.85%	\$44	\$30	
Request for warrants	0.82%	\$42	\$27	
Other				
Case documentation	16.97%	\$880	\$15	\$18
Staff case reviews	0.49%	\$25	\$8	\$14
Drug testing	10.35%	\$537	\$4	\$39
Administration				
Management of officers	1.90%	\$99		\$67
Continuing education	2.94%	\$152		\$161
Training of others	1.98%	\$102		\$68
Conferences vacations	9.30%	\$482		\$42
Total	100.00%	\$5,453		

Typically, Activity Based Costing allocates budgets to program units through assumptions regarding utilization of accounts by different activities; in contrast, we used a survey of employees to understand the distribution of activities. Thus, we provide a structured method for allocating costs. We presented data, albeit preliminary and limited in number of cases, showing that the survey instrument was reliable and was performing as expected.

Table 6. Sensitivity to Assumptions

1% increase in this variable leads to:	Change in difference of seamless and traditional supervision costs
Caseload of officers in seamless probation	-2.06%
Percent time spent on investigative reports	0.00%
Clients served in traditional probation	1.07%
Cost of personnel (agency wide)	0.70%
Cost of building	0.12%
Equipment	0.07%
Information system costs	0.09%
Hours spent on seamless supervision	2.25%
Hours spent on traditional supervision	-1.25%

We completed the survey of the officers over a three-month period with relative ease. Probation officers were paid \$50 to complete the survey and completed the survey during work time. Most completed the survey in 20 minutes. There was strong support from both the management and the union to complete the survey. The process was also facilitated by the presence of study staff during one of the administrative days, in which the entire probation officers were in office. We called back officers who did not complete the form or whose form was incorrectly completed. While probation agencies may not be able to duplicate our 100% completion rate, the ease with which the survey was conducted suggests that completion rates will be high if the survey is accompanied by similar steps to boost the response rate. In our view, the key to high response rate was our ability to be physically present in the agency and remind busy probation officers of the need to complete the survey.

Comparison of seamless and traditional supervision activities showed major differences in terms of the probation officers' activities. The seamless probation officers were more likely to meet in groups, perhaps as a function of how substance abuse treatment was organized. Probation officers spent more time on phone calls to clients than officers conducting traditional supervision. They also had to attend more training conferences than the traditional supervision

officers. In contrast, after the initial intake where many hours were spent in face to face meeting with clients, the traditional supervision officers were more likely to spend time in case documentation. Overall, the cost per client per day for the seamless probation was 77% more than traditional supervision. Our data suggest that coordinating treatment and supervision may lead to increased probation costs.

Policy makers should keep in mind that the current paper reports only cost to probation agency and none of benefits. The benefit data are available in a separate paper through the first author. From the perspective of program planners and policymakers it is important to know how costs vary with the type of client. For example, cost may vary by age, employment, severity of offense, criminal history, treatment history, co-morbid conditions, or program staffing arrangements. The current study does not address these important issues. Future research can focus on how cost of probation may change with client and delivery characteristics.

The present study provides an instrument for measurement of probation activities and applies it to one agency and shows that it can be used to allocate the budget of the agency to various program activities.

Acknowledgement

We appreciate the enthusiastic support we received from Linda Eichenbaum and Probation Officers in completing the survey forms. This work was supported by grant R01DA10705 National Institute on Drug Abuse, NIH. The principal investigator was Taxman F and the grant title was: Evaluation of the HDTA Seamless System for Offenders. The survey form, available through the first author is in public domain and can be used without written permission from its authors. Please cite this paper when using the form.

References

- Visher CA. Incorporating drug treatment in criminal sanctions. *National Institute of Justice Reports* 1990; **221**: 2-7.
- Tolley G, Kenkel D, Fabian R. *Valuing health for policy: An economic approach*. Chicago: The University of Chicago Press, 1994.
- Sloan FA. *Valuing health care*. New York: Cambridge University Press, 1996.
- Kenkel D. On valuing morbidity, cost effectiveness analysis and being rude. *J Health Econ* 1997; **16**: 749-757.
- Johannesson M. *Theory and methods of economic evaluation of health care*. Dordrecht: Kluwer Academic Publishers, 1996.
- Hargreaves WA, Shumway M, Hu TW, Cuffel B. *Cost-outcome methods for mental health*. San Diego: Academic Press, 1998.
- Drummond MF, O'Brian JO, Stoddart GL, Torrance GW. *Methods for the economic evaluation of health care programs*. Second edition. Oxford: Oxford University Press, 1997.
- French MT, Salome HJ, Sindelar JL, McLellan AT. Benefit-cost analysis of addiction treatment: methodological guidelines and empirical application using the DATCAP and ASI. *Health Serv Res* 2002; **37**(2): 433-455.
- Zarkin GA, Galinis DN, French MT, Fountain DL, Ingram PW, Guyett JA. Financing strategies for drug abuse treatment programs. *J Subst Abuse Treat* 1995; **12**(6): 385-399.
- French MT, McGeary KA. Estimating the economic cost of substance abuse treatment. *Health Econ* 1997; **6**(5): 539-544.
- French MT. Economic evaluation of drug abuse treatment programs: methodology and findings. *Am J Drug Alcohol Abuse* 1995; **21**(1): 111-135.
- French MT. Economic evaluation of alcohol treatment services. *Recent Dev Alcohol* 2001; **15**: 209-228.
- Roebuck MC, French MT, McLellan AT. DATStats: results from 85 studies using the Drug Abuse Treatment Cost Analysis Program. *J Subst Abuse Treat* 2003; **25**(1): 51-57.
- Alexandre PK, Roebuck MC, French MT, Chitwood DD, McCoy CB. Problem drinking, health services utilization, and the cost of medical care. *Recent Dev Alcohol* 2001; **15**: 285-298.
- Alexandre PK, Roebuck MC, French MT, Barry M. The cost of residential addiction treatment in public housing. *J Subst Abuse Treat* 2003; **24**(4): 285-290.
- Bradley CJ, French MT, Rachal JV. Financing and cost of standard and enhanced methadone treatment. *J Subst Abuse Treat* 1994; **11**(5): 433-442.
- French MT, McGeary KA. Estimating the economic cost of substance abuse treatment. *Health Econ* 1997; **6**(5): 539-544.
- Bertsch D, Mertz A. *Correction costs: issues and difficulties*. South Dakota Legislative Research Council Issue memorandum 97-27, May 1998, 1-7.
- Schuman AM. The cost of correctional services: Exploring a portly charted terrain. *Research in Corrections* 1989; **2** (1): 27-34.
- Wayson BL, Funke GS. *What price justice?* The Jefferson Institute of Washington DC, 1989.
- Cohen MA, Miller TR. The cost of mental health care for victims of crime. *Journal of Interpersonal Violence* 1998; **13**(1): 93-110.
- Jerrell JM, Hu T, Ridgely MS. Cost-effectiveness of substance disorder intervention for people with severe mental illness. *J Mental Health Administration* 1994; **21**: 3.
- Pearson FS, Lipton DS. A meta analytical review of the effectiveness of corrections based treatments for drug abuse. *The Prison Journal* 1999; **79** (4): 384-410.
- Alemi F, Sullivan T. *A Standardized Survey of Program Activities through Time-in-Between Discharges*. George Mason University, 2004.
- Alemi F, Taxman F, Doyon V, Thanner M. *Cost and benefit of combining probation and treatment*. Interim report to National Institute of Drug Abuse, 2001.
- French MT, Dunlap LJ, Zarkin GA, McGeary KA, McLellan AT. A structured instrument for estimating the economic cost of drug abuse treatment. The Drug Abuse Treatment Cost Analysis Program (DATCAP). *J Subst Abuse Treat* 1997; **14**(5): 445-455.
- Callahan R, Kaune M, Slavings R. *Statewide time study of supervision and parole officers*. Virginia Department of Corrections, April 2000.
- McDonald D, Fournier E, Russell-Einhorn M, Crawford S. *Private Prisons in the United States. An Assessment of Current Practice*. Report of Abt Associates Inc. Bethesda MD, July 16, 1998.
- Bradley CJ, French MT, Rachal JV. Financing and cost of standard and enhanced methadone treatment. *J Subst Abuse Treat* 1994; **11**(5): 433-442.
- French MT, McGeary KA. Estimating the economic cost of substance abuse treatment *Health Econ* 1997; **6**(5): 539-544.