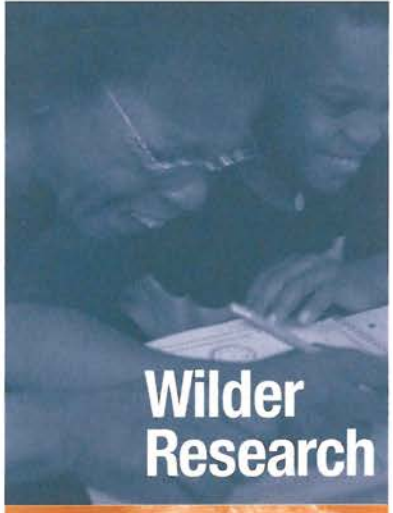

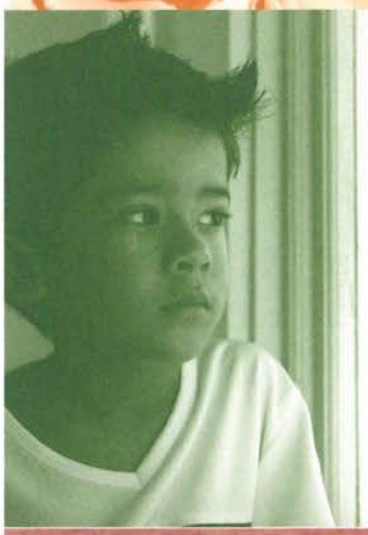

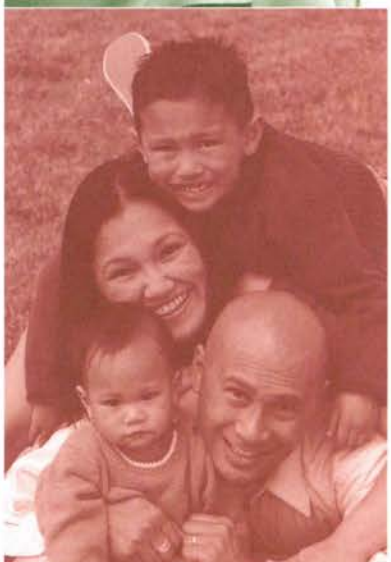

Economic analysis of programs that could qualify for a human capital performance bond pilot –part two

Examination of addiction treatment services, adult day health programs, and extended employment for persons with disabilities

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Contents

Figures

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Summary and conclusions

Addiction treatment services

Approximately 350 providers throughout the state provide addiction treatment services to about 27,000 adults per year at a cost of over $94 million in state funding. On average, the estimated potential first-year cash flow of increasing tax revenues and saving the health care and crime-related costs associated with alcohol and drug disorders is $5,513 per treated person. By year 10, the potential average cash flow is $6,123. At these cash flow levels, which likely do not account for all the potential benefits of alleviating alcohol and drug addictions, a $1 million bond could be repaid with the cash flows generated by an additional 106 persons in treatment for addictions – of which 64 persons (60%) are successfully treated and, by year 5, 40 of them do not require treatment again. These numbers do not take into account the traits of the persons in treatment.

Adult day health care

The average cost per year for adult day health care ranges from $12,800 for basic care to $29,000 for a full range of services. The annual per adult cost of skilled nursing home care in Minnesota ranges from $36,000 for the lowest-priced semi-private room to $91,250 for the highest-priced private room. The average cost per year of nursing home care paid for by Medicaid is about $48,800. Assuming average annual costs, the savings due to using adult day health care as a way to avoid nursing home care amounts to $36,000, split evenly between state and federal. The savings fall to about $20,000 for higher cost adult day health care. In sum, state savings range from $10,000 to $18,000 per year per avoidance of nursing home care.

However, several issues, including the use of Medicaid waivers and the limited number of years seniors use adult day health care, complicate the participation of adult day health care services in the bond pilot and require further investigation.

Employment for persons with disabilities

About 5,400 Minnesotans with disabilities receive ongoing employment supports necessary to maintain and advance their employment in center-based and supported employment programs. These employees potentially leave public assistance for employment, saving social service costs and increasing tax revenues for the state. However, the low average wage and limited number of hours worked by most of these employees amount to annual average incomes of between $2,000 and nearly $6,000.

Two out of 46 extended employment programs generate higher average cash flows than the other programs (about $2,500) and could pay off the bond by employing an additional 58 persons with disabilities.

Conclusions

The volume of persons treated for alcohol and drug addiction and the minimal long-term treatment success rates (38%) required to generate sufficient cash flows suggests that human capital performance (HUCAP) bonds are a feasible way to fund some addiction treatment programs. The state should be able to pay off the bonds based on decreased crime and health care costs and increased tax revenues. The programs would have to gauge their outcomes and decide if they have the capacity and right mix of participants to achieve or increase their initial success rates to at least 60 percent.

More investigation with state Medicaid experts about reimbursement assumptions and with nursing home pre-admission screening programs is needed before any decisions about including adult day health care programs in the pilot.

Most employment programs for persons with disabilities do not appear to produce high enough wages or sufficient incomes to generate sufficient cash flows to be a good fit for the pilot. A couple programs that have stand-out outcomes may be good candidates.

Finally, there may be other areas where the potential is high but the economic studies and data are too limited at this time to qualify for the bond pilot.

Introduction

Human capital performance bonds are predicated on the assumption that health, education, and social service programs produce social outcomes that have measurable economic value. A clear example is job training programs, which increase state income and sales tax revenues when they successfully achieve employment and wage gains for participants. Other types of programs may not increase tax revenues, but they might save money by reducing costly state spending, such as for repeat incarceration or chronic homelessness. This economic value is equivalent to cash and has the same financial value as cash flow in a business. Accordingly, just as businesses use projected cash flow to finance their current spending, state government could do the same to finance social programs based on their expected future payback.

Invest in Outcomes, led by founder Steve Rothschild, has proposed using state appropriation bonds in a pilot initiative to test this new model for funding programs by rewarding those that successfully meet set performance goals. For every million dollars in bond funding, programs in the pilot would have to generate cash flows of $140,000 per year for up to 10 years to cover the interest (4%), amortization (8%), and administrative costs (2%).

The purpose of this report is to examine in more depth the three service or program areas identified in the previous report that appear to have the best potential for big enough cost avoidance or income growth to produce sufficient cash flows to be suited for this performance-based funding pilot – addiction treatment services, adult day health programs, and extended employment for persons with disabilities.

A separate, third report details the management rules, procedures, and safeguards of the pay-for-performance process during the pilot and a rigorous evaluation plan that pertains to each type of service or program in the pilot.

Estimated economic contribution of addiction treatment services to Minnesota taxpayers

Profile of addiction treatment services

This analysis is based on data from the 2009 Consolidated Chemical Dependency Treatment Fund of Minnesota (CCDTF), the primary fee-for-service payment mechanism for chemical dependency treatment services for persons eligible to have treatment paid for by public dollars.

The CCDTF pays for low-income (100% of poverty) and chemically-dependent Minnesotans to receive chemical dependency treatment services.

Approximately 350 providers throughout the state provide treatment services. Eligibility for the CCDTF is determined by the counties and reservations according to the Rule 25 Assessment.

In 2009, 27,100 adults (duplicated) were placed for treatment across the 350 providers at a cost of $94.1 million.

About 61 percent successfully completed treatment (Minnesota Department of Human Services, 2009), potentially leading to reduced use of emergency and other health care, increased employment, and reduced crime.

Potential cash flows generated from outcomes of addiction treatment programs in Minnesota

To estimate the potential cash flows per treated case, we adapted a cost-benefit model developed by the Washington State Institute of Public Policy (WSIPP) for addiction treatments (see: http://www.wsipp.wa.gov/pub.asp?docid=06-06-3901 and the technical appendix for a detailed explanation of the model), using the following steps:

1. We estimated the annual impact of the addiction treatment services on the prevalence and magnitude of alcohol and drug disorders during a period of 10 years. This impact is computed by deducting the estimated time of recovery of participants from the natural rate of recovery of non-participants. The rate of recovery of participants is computed using parameters produced by the WSIPP based on a meta-analysis of evidence-based addiction programs. These impacts are called the annual marginal treatment effects of the program (MTE).

2. We estimated a series of annual costs due to the disorders in three areas: tax revenues, health care use, and crime. The per person annual costs are estimated using parameters from Minnesota and from the meta-analysis computed by the WSIPP. (See Appendix for details.)

3. We then multiplied the per-person annual costs of each disorder by the MTEs to obtain the potential benefits generated by addiction treatment, as shown in Figure 1. We converted the resulting potential benefits to present values for each year using a standard discount rate.

4. As shown in the last column of Figure 1, we then generated the per-person annual potential benefits of the program by estimating the weighted average of the benefits from each disorder. The average is weighted using the estimated number of people in Minnesota with the disorder in a given year and who are likely to complete the treatment covered by the CCDTF.

1. Gross potential benefits to state per person treated (before netting out program costs)

Year	Potential savings in health care costs per treated case	Potential additional tax revenues per treated case	Potential crime savings per treated case	Weighted average total potential benefit per treated case
1	$68	$104	$5,341	$5,513
2	75	112	5,686	5,874
3	82	119	5,952	6,154
4	87	126	6,144	6,357
5	92	130	6,264	6,487
6	96	134	6,316	6,547
7	99	136	6,302	6,538
8	102	137	6,225	6,463
9	103	137	6,085	6,324
10	$102	$135	$5,885	$6,123

5. We then estimated the annual present-value program costs per treated person using the total appropriation for CCDTF for 2009 and total treated individuals (duplicated), as shown in Figure 2 (column 3), and then calculated the potential net annual cash flows per treated case by subtracting the average annual cost per treated case from the average annual benefit per treated case (column 4).

6. Finally, the number of new, successfully treated cases required to cover the costs of the Human Capital Bond are estimated, assuming an annual cost of $140,000 associated with a $1 million bond (Figure 2, column 5).

2. Net potential cash flow to state per person successfully treated and number of success cases required to cover bond costs

Year	Weighted average potential benefit per treated case	Average cost per treated case	Net potential cash flow per treated case	Number of participants required to successfully complete treatment and stay sober each year to cover bond cost
1	$5,513	$3,319	$2,193	64
2	5,874	3,224	2,650	53
3	6,154	3,132	3,021	46
4	6,357	3,043	3,314	42
5	6,487	2,956	3,531	40
6	6,547	2,871	3,675	38
7	6,538	2,789	3,749	37
8	6,463	2,710	3,754	37
9	6,324	2,632	3,692	38
10	$6,123	$2,557	$3,566	39

Discussion of potential cash flows of addiction treatment programs

In this analysis, the estimated average potential first-year cash flow is $5,513 -- due to increasing tax revenues and saving the health care and crime-related costs associated with alcohol and drug disorders. By year 10, the potential average cash flow is $6,123.

The alleviation of alcohol and drug addictions would likely produce other benefits; however, we included only outcomes for which sufficient information was available. Moreover, these potential cash flows are based on an average across programs and persons treated for addictions. Success rates, and therefore cash flows, would likely vary by program and by demographic traits.

For perspective, the cash flows required to pay the $140,000 each year for 10 years to cover the interest (4%), amortization (8%), and administrative costs (2%) on a $1 million bond could be generated with an additional 106 persons in treatment for addictions – of which 64 persons (60%) are successfully treated and, by year 5, 40 of them (38% overall success rate) do not require treatment again. This number of additional cases does not take into account the traits of the persons in treatment.

The required cash flows could also be generated by improving successful outcomes by less than one percent overall.

Savings for federal taxpayers

The main calculations in this report are based on assumptions and statistics that are valid for Minnesota taxpayers; however, it is reasonable to assume that a reduction in the incidence and magnitude of these disorders would also generate economic benefits for the federal government. Figure 3 summarizes the potential estimated cash flow for federal taxpayers due to decreased health care costs and increased tax revenue generated by addiction treatment programs. Note that we do not include savings from crime reduction since we do not have sufficient information on the parameters required to produce such estimates for the federal government.

On average, participants who successfully complete their treatment would contribute to the federal government nearly $1,300 per year more than if they would not have received treatment. If 61 percent of the 27,000 participants in a single year successfully complete their treatment, the annual average potential benefits for federal taxpayers would be close to $23 million and reach a total $256 million during a 10 year period.

3. Federal cash flows of the addiction treatment program outcomes

Year	Savings in health care costs for federal taxpayers per successfully treated case	Additional federal tax revenues per successfully treated case	Federal cash flow per successfully treated case
1	$68	$1,216	$1,284
2	75	1,240	1,315
3	82	1,265	1,346
4	87	1,290	1,377
5	92	1,316	1,408
6	96	1,342	1,438
7	99	1,369	1,468
8	102	1,396	1,498
9	103	1,424	1,527
10	$102	$1,453	$1,555

Estimated economic contribution of adult day health programs to Minnesota taxpayers

Introduction

Adult day health care services provide daytime care and activities outside of the home as both an alternative to private caregiving and to nursing home care. The core services include supervision, activities, and socialization. For adults with more health care needs, programs offer enhanced services such as nurse monitoring, therapy, and moderate assistance with daily activities. A third level offers intensive services, including nurse monitoring and intervention, rehabilitation, staff assistance with daily activities and transfer to chair, toilet or bed. Specialized programs provide support and care for adults with dementia.

Medicaid pays for these services under special Medicaid programs or under Medicaid waiver programs for home care that shift long-term care for the aged and disabled from institutions to the community (Wenzlow, *et al*. 2008) because non-institutional care is less costly and can reduce people's need for more expensive nursing homes (Kitchener, *et al*. 2006; Sergeant *et al*. 2010).

This section of the report estimates the potential cost avoidance of using adult day health programs as an alternative to skilled nursing home care.

Scope of use

According to the Minnesota Adult Day Services Association, Minnesota has 50 adult day centers at various levels throughout the state. These centers are usually open during working hours and may stand alone or be located in senior centers, nursing facilities, churches or synagogues, hospitals, or schools.

In Minnesota, 99,000 seniors use some form of long-term care paid for by Medicaid. About 32 percent of these seniors use adult day health programs (Wenzlow *et al*. 2008).

Costs of care

Daily fees for adult day health care range from $32–$145. The fees vary, depending on the location of the center and the range of services the center provides. The average cost per year at $64 per day for 200 days (4 days per week for 50 weeks) amounts to $12,800

annually. Assuming use requiring a full range of services at $145 per day for 200 days (4 days per week for 50 weeks), the costs would rise to $29,000 annually.

4. Costs of adult day health care in Minnesota

	Low	High	Average
Twin Cities	$35	$117	$74
Rochester Area	$43	$59	$50
Rest of State	$32	$145	$63
Minnesota	$32	$145	$64

Source: Metlife Market Survey of Long-Term Care Costs (2010)

The annual per adult cost of skilled nursing home care in Minnesota ranges from $36,000 for the lowest-priced semi-private room to $91,250 for the highest-priced private room. Medicaid by policy pays for semi-private rooms with exceptions due to medical or behavior issues. Assuming 90 percent semi-private use and average prices, the annual costs amount to about $48,800.

5. Nursing home costs in Minnesota

	Semi-private Room			Private Room		
	Low	High	Average	Low	High	Average
Twin Cities	$104	$212	$148	$104	$245	$172
Rochester Area	$99	$147	$121	$117	$157	$136
Rest of State	$105	$217	$130	$116	$250	$147
Minnesota	$99	$217	$132	$104	$250	$150

Source: Metlife Market Survey Of Long-Term Care Costs (2010)

Potential cost savings

Assuming average annual costs, the savings due to using adult day health care as a way to avoid nursing home care amounts to $36,000, split evenly between state and federal. The savings fall to about $20,000 for higher cost adult day health care.[1] In sum, state savings range from $10,000 to $18,000 per year per avoidance of nursing home care.

[1] The American Recovery and Reinvestment Act increased the federal match to 62 percent, but the usual match is 50 percent.

Discussion of potential cost savings of adult day health programs

Several issues complicate the participation of adult day health care services in the bond pilot and require further investigation.

The use of Medicaid waivers to pay for long-term care services makes these services a special case. The expected cost differential between nursing home care and adult day health care may already be built into the reimbursement formula. More investigation with state Medicaid experts about reimbursement assumptions and potential cash flows is needed.

Paying off the bonds over 10 years is not feasible because the cost avoidance due to adult day health care use is commonly two years or less. An appropriate amortization rate would have to be determined, if possible.

Finally, rigorous evaluation studies do not strongly link adult day health programs as the reason for delayed nursing home use and show that most of the benefits of adult day health care programs accrue to the individuals and their adult child caregivers, not to the state (Doty, 2000; Gaugler *et al*, 2003; Mason *et al*, 2007; Ramsay and Higginson, 1995; Schmitt *et al*, 2010; Shannon *et al*, 2006; Shapiro and Mitchell, 2001). For example:

- The primary outcomes associated with adult day health programs tend to be improved quality of life for participants and lower caregiver burden.
- Findings are mixed regarding the impact of adult day health programs on entry into residential nursing homes. Based on a 2007 review of literature, studies have shown no significant difference in nursing home entry between participants and nonparticipants of adult day health programs.
- Analysis of the cost-effectiveness of adult day health programs has also varied. Some studies have found that the monetary benefits of these programs outweigh the costs, while other studies have found the programs to be cost-neutral or cost-burdened.
- The areas in which monetary benefits have been found include: decreased nursing home expenses, increased caregiver employment productivity, and decreased health care expenses. However, in most cases, these benefits are only present when adult day health programs are embedded in a larger long-term health care system and are offset by high programming costs and increased use of services.

However, if the first two issues can be resolved, then adult day health care programs could participate in the pilot by adding reduction in hospitalizations and other health care costs as the key outcome variable, using nursing home pre-admission screening to identify matched pairs of seniors with similar demographic and health profiles, with one ending in adult day health care and the other moving to a nursing home.

Estimated economic contribution of extended employment for people with disabilities to Minnesota taxpayers

Introduction

In 2010, nearly 3,000 Minnesotans with severe disabilities received ongoing employment supports necessary to maintain and advance their employment in center-based employment programs, and about 2,400 were in supported employment programs, which placed and supported them in jobs in the private and public sectors. These employees potentially leave public assistance for employment, saving social service costs and increasing tax revenues for the state.

The extended employment program received $15.4 million in state appropriations in 2011 through Minnesota's Department of Employment and Economic Development.

Profile of earnings

As shown in Figure 6, on average, employees in center-based employment have annual incomes of less than $2,000 and earn about $3.50 per hour, and those in supported employment have annual incomes of nearly $6,000 and earn $9.80 per hour. On average, both groups work 10 or 11 hours per week.

Based on a cost-benefit study by Wilder Research, one center-based program stands out as having higher average annual earnings than other center-based programs, about $19,400, primarily because, on average, employees in that program work more hours per week (36 vs. 10) and earn higher hourly wages ($10.34 vs. $3.56) than the employees in the other programs.

6. Average annual income of persons with disabilities in extended employment programs

	Persons served	Average hours per week	Average hourly wage	Average annual income
Center-based programs	2,915	9.9	$3.56	$1,856
Supported employment	2,356	11.3	$9.80	$5,758

Potential cash flows generated from extended employment programs for persons with disabilities in Minnesota

Figure 7 shows that supported employment programs, on average, generate a first-year cash flow to the state due to tax revenues and reduced public assistance costs of $1,157, nearly double the average amount generated by center-based programs. The one stand-out center-based program, in comparison, generates an average first-year cash flow of $2,439.

7. Average first-year cash flow per person in center-based and supported employment service programs

Cash flow source	Center-based (16 programs)	Supported employment (29 programs)	Stand-out center-based program
Increased tax contribution	$260	$806	$1,921
Sales tax	$39	$121	$288
Reduction in Public Assistance use	$230	$230	$230
Total	$529	$1,157	$2,439

In order to determine if any other center-based or supported employment programs generate above average cash flows, we examined the cash flows for the 45 programs separately. Figure 8 shows the cash flows for the top five performers in each type of program, first for the top five supported work programs and then for the top five center-based programs.

The top supported employment program has a first-year cash flow of $2,554, slightly higher than the one-stand-out center-based program.

8. Average cash flow per person with disabilities employed in center-based or supported employment

Program	Income tax	Sales tax	Welfare	Cash flow
1	$2,021	$303	$230	$2,554
2	$1,525	$229	$230	$1,983
3	$1,348	$202	$230	$1,780
4	$1,345	$202	$230	$1,777
5	$1,288	$193	$230	$1,711
6	$1,921	$288	$230	$2,439
7	$775	$116	$230	$1,121
8	$400	$60	$230	$690
9	$333	$50	$230	$612
10	$325	$49	$230	$604
11	$272	$41	$230	$543

Note: Programs 1-5 are supported employment; programs 6-11 are center-based employment.

Discussion of first-year cash flows of employment for persons with disabilities

In this analysis, most employment programs for persons with disabilities do not appear to generate sufficient cash flows to be a good fit for the pilot; however, 3 to 5 programs are likely good fits. Moreover, employment for persons with disabilities would likely produce other benefits; however, we included only outcomes for which sufficient information was available. Moreover, these cash flows are based on an average across persons with disabilities. Hours worked, wages, and use of public assistance, and therefore cash flows, would likely vary by demographic and disability traits.

For perspective, among the top two performers, the cash flows required to pay the $140,000 in the first year to cover the interest (4%), amortization (8%), and administrative costs (2%) on a $1 million bond could be generated by employing an additional 56 persons with disabilities, or about 1 percent more persons with disabilities employed by all the center-based and supported employment programs combined in the past year.

Ten-year projected cash flows of extended employment programs

The proposed human capital performance bond would likely be amortized or paid back over 10 years. This section estimates the average net present values of the 10-year projected cash flows per employee with disabilities per program, accounting for the average per person investment by the state in the extended employment programs.

As shown in Figure 9, the projected cash flows of the two top performing programs are about $24,000 per person. The total projected cash flows must be at least $1,400,000 over 10 years to cover the interest, amortization, administrative costs on a $1 million bond. Assuming an equal number of employees per program, these two programs would require an additional 58 employees with disabilities to stay employed for at least 10 years. The average length of employment among these employees is not known at this time.

9. Average net present values of 10-year projected cash flows per employee with disabilities per program

Program	Average Investment	Cash flow	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Net present value
1	$1,880	$2,554	$2,655	$2,760	$2,869	$2,982	$3,100	$3,222	$3,350	$3,482	$3,619	$3,762	$24,104
2	$1,880	$1,983	$2,061	$2,143	$2,227	$2,315	$2,407	$2,502	$2,601	$2,703	$2,810	$2,921	$18,311
3	$1,880	$1,780	$1,850	$1,923	$1,999	$2,078	$2,160	$2,246	$2,334	$2,427	$2,523	$2,622	$16,252
4	$1,880	$1,777	$1,847	$1,920	$1,996	$2,075	$2,157	$2,242	$2,331	$2,423	$2,518	$2,618	$16,221
5	$1,880	$1,711	$1,779	$1,849	$1,922	$1,998	$2,077	$2,159	$2,244	$2,333	$2,425	$2,521	$15,552
6	$837	$2,439	$2,535	$2,635	$2,740	$2,848	$2,960	$3,077	$3,199	$3,325	$3,456	$3,593	$23,941
7	$837	$1,121	$1,165	$1,211	$1,259	$1,309	$1,361	$1,414	$1,470	$1,528	$1,589	$1,651	$10,569
8	$837	$690	$717	$746	$775	$806	$837	$871	$905	$941	$978	$1,016	$6,196
9	$837	$612	$636	$661	$687	$715	$743	$772	$803	$834	$867	$902	$5,404
10	$837	$604	$628	$653	$678	$705	$733	$762	$792	$823	$856	$890	$5,323
11	$837	$543	$564	$587	$610	$634	$659	$685	$712	$740	$770	$800	$4,704

Note: Programs 1-5 are supported employment; programs 6-11 are center-based employment.

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Appendix

Summary of parameters

Using the following parameters, we estimated a series of per person annual costs caused by addiction disorders in three areas: tax revenues, health care use, and crime.

A1. Parameters from Minnesota data

Parameter	Description	Use	Value
MN Population	No of people in MN in the age groups selected to be eligible for treatment (2009)	Prevalence of disorders, weights for average costs and benefit.	3,927,756
No. of treated by program	Adults treated in MN in 2009 by program	Prevalence of disorders, weights for average costs and benefit	27,000
Program costs	Total annual appropriation	Weighted cost per treated	$94,100,000
Cost of incarceration	Annual Marginal Operating Cost of an additional individual incarcerated in MN. A cross section regression for fiscal year 2009 was estimated using DOC of MN institutions operating expenses and average daily populations of all institutions in the state.	Cost of crime (only incarceration costs)	47,751.51
Average Earnings (MN)	Data from Census Bureau	Cost from lost income due to disorders	37,865
Employment Rate (MN)	Proportion of labor force working (2009)	Cost from lost income due to disorders	62%

A2. Parameters from national data and the Washington State Institute of Public Policy

Parameter	Description	Use	Value
% change in average earnings due to alcohol	Impact of disorders. Calculated by the WSIPP using meta-analysis	Estimation of the change in income	-0.21
% change in average earnings due to drugs	Impact of disorders. Calculated by the WSIPP using meta-analysis		-0.21
Effect Size: alcohol	Impact of program on the prevalence and magnitude of disorders. Calculated by the WSIPP using meta-analysis	Estimation of the marginal treatment effect of the program	-0.26
Effect Size: drugs			-0.262
Assumed rate of growth of earnings	Calculated by the WSIPP using meta-analysis from Census data on income of the age groups treated.	Estimation of the change in income	0.02
Average cost of Health Care (national	Annual cost per current abuser (adjusted to base year for real growth in costs). Calculated by the WSIPP.	Estimation of the change in health care costs	Alcohol: $4,496.00 Drugs: $6,114.00
Percent of costs paid by taxpayer	Calculated by the WSIPP using national data set on health care costs.		Alcohol: 43% Drugs: 59%
Current Prevalence: Alcohol	Obtained by the WSIPP using national data set on health care costs.		5.6%
Current prevalence: Drugs	Obtained by the WSIPP using national data set on health care costs.		2.1%
Rate of decay			-0.062
Scale up	Assumption to account for the growth of small programs		0.75
Effect size: Alcohol	Calculated by the WSIPP using meta-analysis of evidence-based studies		-0.247
Effect size: Drugs			-0.355