Navigator Pilot Project Evaluation

Alcohol and Drug Abuse Division

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Legislative Report

Minnesota Department of Human Services

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I. Executive summary

This report assesses outcomes from the Navigator Pilot Project, which operated from July 2010 through June 2013 in Washington County and 10 southeastern counties. We found that people in the pilot generally improved, although not all of the improvements were statistically significant or greater than observed in the comparison group. The report employs four types of measures: the National Outcomes Measures (NOMS) prescribed by the Substance Abuse and Mental Health Services Administration (SAMHSA); measures prescribed by the American Society of Addiction Medicine (ASAM), a measure of serious psychological distress (K6), and a measure tracking the change in use of detoxification from admission to the most recent measurement for clients of the project. Propensity score matching is used to create a group of similar people who received treatment as usual during this period; this group serves as a comparison group for the NOMS, ASAM and detoxification.

While the results of the pilots vary, there are a number of results that stand out. Pilot participants had greatly reduced psychological distress. They had a larger reduction in admissions to detox than did persons in the comparison group. The pilot yielded significant improvement in the measures of intoxication, psychological conditions, relapse potential, and recovery environment.

For NOMS, there is virtually no change in the pilot in the percentage showing problems, while the average reduction in the comparison group is 21 percentage points. The percentage of clients in the pilot who are either employed or students does increase significantly, but the percentage that lack a self-help group also increases significantly. Especially troubling is the finding that use of self-help groups declined significantly for those in the pilot.

The average change in the ASAM measures is 13 percentage points, which is slightly larger than the average change shown by the comparison group. The improvement in four dimensions; intoxication, psychological problems, potential relapse, and recovery environment, are significant. For intoxication, psychological conditions, and relapse potential, outcomes for the pilot and the comparison group do not differ significantly. For biomedical problems and the recovery environment, outcomes depend on whether clients exhibited a problem on those dimensions at admission. For clients who were coded as not having a problem at admission, the comparison group outperformed the pilot, yet for clients who were coded as having a problem at admission, the pilot provided superior outcomes. The model for readiness to change revealed that for clients who were coded as not having a problem at admission, the comparison group outperformed the pilot, but for clients who were coded as having a problem at admission, the two groups did not differ much.

The results for utilization of detoxification are unequivocal: the pilot, with a 30 percent reduction in detoxification, outperformed the comparison group.

There is a substantial reduction in the percentage of clients who met the criterion of serious psychological distress on the K6, with the admission rate of 32 percent declining to 15 percent. Unfortunately, the K6 is not measured in treatment as usual, so comparisons cannot be made.

The operation of the pilot in Washington County was quite different from its operation in the 10 southeastern counties. Clients in Washington County were provided navigators who worked for the county, and reimbursement was on a fee-for-service basis. The ten southeastern counties contracted with a vendor to provide navigator services, which were provided on a capitated basis. Clients in Washington County achieved significantly better outcomes on most NOMS, ASAM measures, and the K6. The reduction in utilization of detoxification was greater in the southeastern counties, but the difference was not significant. For most measures, Washington County achieved superior results, and they did so for less money. The mean cost of clients in Washington County was $4,640, and the mean cost in the southeastern counties was $15,701, a ratio of 3.4 to 1. Part of this difference is due to the fact that clients remained in the program longer in the southeastern counties; nevertheless, the average monthly costs were also substantially higher in the southeastern counties ($1,096 vs. $478 for a ratio of 2.3 to 1).

There was no single criteria measure which identified why Washington County achieved superior results for less money. The improvements in decreasing the use of alcohol, participation in self-help groups, readiness to change, relapse potential, and recovery environment suggest that Washington County may have provided a greater emphasis on sobriety. Participation in self-help groups, which increased in Washington County and decreased in the southeastern counties, may have played a pivotal role, given that such participation is known to bestow considerable benefits. It is also possible that contracting with a vendor who receives reimbursement on a capitated basis, as in the southeastern counties, leads to less positive results. What is clear is the pilot as operated in Washington County was successful and relatively inexpensive.

II. Legislation

The Department of Human Services is required to complete this evaluation and report under Minnesota Laws 2010, Chapter 376, Section 1, Subdivision 3, which reads as follows:

Subd. 3. **Program evaluation.** The commissioner shall evaluate pilot projects under this section and report the results of the evaluation to the chairs and ranking minority members of the legislative committees with jurisdiction over chemical health issues by January 15, 2013. Evaluation of the pilot projects must be based on outcome evaluation criteria negotiated with the pilot projects prior to implementation.

Since its original passage, slight modifications were made to the language as the projects progressed. The current statutory language is as follows:

254B.13 PILOT PROJECTS; CHEMICAL HEALTH CARE.

Subdivision 1. **Authorization for navigator pilot projects.** The commissioner may approve and implement navigator pilot projects developed under the planning process required under Laws 2009, chapter 79, article 7, section 26, to provide alternatives to and enhance coordination of the delivery of chemical health services required under section 254B.03.

Subd. 2. **Program design and implementation.** (a) The commissioner and counties participating in the navigator pilot projects shall continue to work in partnership to refine and implement the navigator pilot projects initiated under Laws 2009, chapter 79, article 7, section 26.

(b) The commissioner and counties participating in the navigator pilot projects shall complete the planning phase and, if approved by the commissioner for implementation, enter into agreements governing the operation of the navigator pilot projects.

Subd. 2a. **Eligibility for navigator pilot program.** (a) To be considered for participation in a navigator pilot program, an individual must:

(1) be a resident of a county with an approved navigator program;

(2) be eligible for consolidated chemical dependency treatment fund services;

(3) be a voluntary participant in the navigator program;

(4) satisfy one of the following items:

(i) have at least one severity rating of three or above in dimension four, five, or six in a comprehensive assessment under Minnesota Rules, part 9530.6422; or

(ii) have at least one severity rating of two or above in dimension four, five, or six in a comprehensive assessment under Minnesota Rules, part 9530.6422, and be currently participating in a Rule 31 treatment program under Minnesota Rules, parts 9530.6405 to 9530.6505, or be within 60 days following discharge after participation in a Rule 31 treatment program; and

(5) have had at least two treatment episodes in the past two years, not limited to episodes reimbursed by the consolidated chemical dependency treatment funds. An admission to an emergency room, a detoxification program, or a hospital may be substituted for one treatment episode if it resulted from the individual's substance use disorder.

(b) New eligibility criteria may be added as mutually agreed upon by the commissioner and participating navigator programs.

Subd. 3. **Program evaluation.** The commissioner shall evaluate navigator pilot projects under this section and report the results of the evaluation to the chairs and ranking minority members of the legislative committees with jurisdiction over chemical health issues by January15, 2014. Evaluation of the navigator pilot projects must be based on outcome evaluation criteria negotiated with the navigator pilot projects prior to implementation.

Subd. 4. **Notice of navigator pilot project discontinuation.** Each county's participation in the navigator pilot project may be discontinued for any reason by the county or the commissioner of human services after 30 days' written notice to the other party.

Subd. 5. **Duties of commissioner.** (a) Notwithstanding any other provisions in this chapter, the commissioner may authorize navigator pilot projects to use chemical dependency treatment funds to pay for nontreatment navigator pilot services:

(1) in addition to those authorized under section 254B.03, subdivision 2, paragraph (a); and

(2) by vendors in addition to those authorized under section 254B.05 when not providing chemical dependency treatment services.

(b) For purposes of this section, "nontreatment navigator pilot services" include navigator services, peer support, family engagement and support, housing support, rent subsidies, supported employment, and independent living skills.

(c) State expenditures for chemical dependency services and nontreatment navigator pilot services provided by or through the navigator pilot projects must not be greater than the chemical dependency treatment fund expected share of forecasted expenditures in the absence of the navigator pilot projects. The commissioner may restructure the schedule of payments between the state and participating counties under the local agency share and division of cost provisions under section 254B.03, subdivisions 3 and 4, as necessary to facilitate the operation of the navigator pilot projects.

(d) The commissioner may waive administrative rule requirements that are incompatible with the implementation of the navigator pilot project, except that any chemical dependency treatment funded under this section must continue to be provided by a licensed treatment provider.

(e) The commissioner shall not approve or enter into any agreement related to navigator pilot projects authorized under this section that puts current or future federal funding at risk.

(f) The commissioner shall provide participating navigator pilot projects with transactional data, reports, provider data, and other data generated by county activity to assess and measure outcomes. This information must be transmitted or made available in an acceptable form to participating navigator pilot projects at least once every six months or within a reasonable time following the commissioner's receipt of information from the counties needed to comply with this paragraph.

Subd. 6. **Duties of county board.** The county board, or other county entity that is approved to administer a navigator pilot project, shall:

(1) administer the navigator pilot project in a manner consistent with the objectives described in subdivision 2 and the planning process in subdivision 5;

(2) ensure that no one is denied chemical dependency treatment services for which they would otherwise be eligible under section 254A.03, subdivision 3; and

(3) provide the commissioner with timely and pertinent information as negotiated in agreements governing operation of the navigator pilot projects.

Subd. 7. **Managed care.** An individual who is eligible for the navigator pilot program under subdivision 2a is excluded from mandatory enrollment in managed care until these services are included in the health plan's benefit set.

Subd. 8. **Authorization for continuation of navigator pilots.** The navigator pilot projects implemented pursuant to subdivision 1 are authorized to continue operation after July 1, 2013, under existing agreements governing operation of the pilot projects.

History: *2010 c 376 s 1; 1Sp2010 c 1 art 19 s 16; 2011 c 86 s 10; 2013 c 108 art 4 s 12*

III. Introduction

Ten southeastern counties in Minnesota (Dodge, Fillmore, Goodhue, Houston, Mower, Olmstead, Steele, Wabasha, Waseca, and Winona), Washington County, and the state of Minnesota agreed to participate in a pilot project to address the needs of some of the residents of those counties who were not succeeding in traditional substance abuse treatment programs. Despite having been in treatment for their addictions multiple times, these individuals continued to abuse substances and often spent time in detoxification facilities. The goal of the project was to address needs of these complex clients more holistically; rather than just focusing on issues of chemical dependency, the project attempted to deal with unmet needs in various domains of the clients' lives.

Each participant was assigned a navigator, or care/case manager, who helped the client with issues such as housing, medical care, and employment, as well as addiction to substances. The project was funded with money that the counties would otherwise have contributed for the treatment of residents to the Consolidated Chemical Dependency Treatment Fund (CCDTF). At the time of the project's initiation, counties were responsible for about 15 percent of the cost for CCDTF clients. Under the pilot, the state initially paid all of the costs of treatment for residents of these counties funded by the CCDTF, and the counties used their usual contribution to fund the pilot. The State drew down the applicable federal financial participation for treatment costs on behalf of Medicaid recipients. In effect, the state funded the project by waiving the counties' maintenance of effort.

The Minnesota Legislature had first authorized the project in 2009, when it established the State-County Chemical Health Care Home Pilot Project. That project was a joint effort between counties and the Minnesota Department of Human Services to design modifications to the services available to some chemical dependency treatment clients. The State-County Chemical Health Care Home Pilot was authorized in Minnesota Laws 2009, Chapter 79, Section 26, and was the project from which the navigator Pilot was designed.

IV. Final report on outcomes from the Navigator Pilot Project

To participate in the navigator project, individuals must have had at least two episodes of treatment in the previous two years and met certain diagnostic criteria that indicate a serious addiction.

The program began admitting clients in July 2010, but only a few clients were admitted before December 2010, when enrollment substantially increased. Clients in Washington County were provided navigators who worked for the county, and reimbursement was on a fee-for-service basis. The 10 southeastern counties contracted with a vendor to provide navigator services, which were provided on a capitated basis.

A committee of representatives of the Minnesota Department of Human Services (DHS) and the counties met to design a plan for evaluating the project. The ideal way to evaluate such a project is to randomly assign eligible clients to either the pilot or a control group that receives treatment as usual, and then to measure the same outcomes at the same points in time for clients in both groups. Any significant differences in outcomes that emerge between the two groups can fairly confidently be attributed to the difference in treatment. A majority of members of the committee argued that this design would deprive too many clients of the benefits of the pilot and that funding data collection for members of the control group would be difficult. Instead of a randomized control trial, the committee determined that a form should be created to collect data from pilot participants and that a comparison group would be created from those who received treatment as usual. Measures for the comparison group would be obtained from the Drug and Alcohol Abuse Normative Evaluation System (DAANES), which collects data at admission and discharge on almost everyone who receives treatment in Minnesota.

Measurements for those in the navigator program were obtained from the Pilot Outcomes Monitoring Outcomes System (POMS), which involve paper forms submitted to DHS by navigators. The navigator completes a POMS form at admission, every six months, at discharge, and six months after discharge for every individual who participates in the program. The form contains various demographic information as well as federally mandated measures known as National Outcome Measures (NOMS), six dimensions of addiction that are similar to measures proposed by the American Society of Addiction Medicine (ASAM) and that are prescribed by Minnesota as the essential component of a chemical health assessment, and six questions on psychological distress known as K6. Navigators were also instructed to hand the client a satisfaction survey every six months and at discharge, which the client was to complete, place in a sealed envelope, and give back to the navigator, who would mail the survey to DHS.

This report relies on POMS data submitted by the counties to the Minnesota Department of Human Services (DHS) by July 1, 2013. The navigators reported 106 admissions, 65 six month updates, 40 twelve month updates, 25 eighteen month updates, 17 twenty-four month updates, 2 thirty month updates, 70 discharges, and 4 follow-ups. In general, the rate of submission of forms was excellent while clients were in the program but the rate of submission of follow-up forms was too low to be useful. DHS received 94.3 percent of the expected forms for pre-discharge updates but only seven percent of expected post-discharge updates. Because of this, we do not analyze post-discharge updates. Unfortunately, the rate of submission of satisfaction

surveys was very low. DHS received no post-discharge surveys and only 21 percent of the expected number of surveys from all other updates. The low number of returned surveys and the poor response rate suggests that the surveys as they were administered will not be a very useful source of information going forward.

A. Characteristics of clients

Characteristics of clients

The timeliness of client enrollment varied over the course of the program. Close to half (46 percent) enrolled in the four months between December 2010 through March 2011, for an average of 12.3 enrollees per month. Enrollment in all other months averaged 2.2 enrollees per month.

Residence in a participating county may have also influenced enrollment. Enrollees were not uniformly distributed across counties. Table 1 shows the percentages of enrollees who lived in the counties that participated in the program. Nearly three-fourths of enrollees lived in the three most populous counties in the pilot, Olmstead, Washington, and Winona; while only about 10 percent lived in the six counties presented in the last row of the table.

Table 1. Percentage Distribution of County of Residence.

County	Percent
Olmsted	32.1
Washington	25.5
Winona	15.1
Steele	9.4
Mower	6.6
Dodge, Fillmore, Goodhue, Houston, Wabasha, Waseca	11.3

Table 2 shows the distributions of participants in the pilot for several demographic variables. For comparison, the last column in the table shows the distributions of these variables for all clients who received treatment for chemical dependency in Minnesota in 2011. The distribution of gender was similar in the two groups with about two-thirds being male. Those in the pilot were considerably older than those in treatment, with a much lower percentage being under age 25 and a much larger percentage being over 44. Participants in the pilot were disproportionately white;

in fact, so few participants were American Indian, African American, or Asian American that these categories had to be combined to preserve confidentiality. Similar percentages of participants in the pilot and treatment were single, but those in the pilot were considerably more likely to have been married previously (largely separated or divorced), while those in treatment were more likely to be currently married. Finally, those in the pilot were slightly better educated than those in treatment. Since older people, whites, and more highly educated people tend to have better outcomes in treatment (McRae, 2009, 2010), their over-representation in the pilot should increase the likelihood of favorable outcomes for those in the pilot. However, the over-representation in the pilot of the previously married, who tend to have less favorable outcomes, could decrease the likelihood of favorable outcomes of the group.Table 2. Percentage Distributions of Demographic Variables for Enrollees in the Pilot Program and for Patients in Treatment in Minnesota in 2011.

Variable	Value	Pilot	Treatment[a]
Gender	Male	63.2	66.2
	Female	36.8	33.8
Age	< 25	13.2	30.0
	25-44	50.0	46.4
	> 44	36.8	23.6
Race/ethnicity	White	88.7	73.9
	Hispanic	6.6	3.8
	Other	4.7	22.3
Marital status	Single	60.4	63.7
	Previously married	34.9	19.0
	Married	4.7	17.3
Education	< H.S. grad	18.1	25.3
	H.S. grad	38.1	36.2
	Some advanced	32.4	28.1
	College degree	11.4	10.4

[a] Data pertain to all admissions to treatment in MN in 2011. Source: DAANES, PMQI, MN DHS.

However, the data presented in Table 3 on criminal behavior illustrate the difficult challenges faced by those in the pilot. Whereas only 8 percent of those in the pilot have never been arrested, 24% of those in treatment have never been arrested. At the other extreme, 20 percent of those in the pilot have been arrested more than ten times, whereas about half of that percentage have been arrested that often among those in treatment. The next panel of the table shows that those in the pilot are much more likely to have their driver's license revoked; in fact, only 16 percent of those in the pilot have never had a revocation, whereas twice that percentage of people in treatment have never faced a revocation.

Table 3. Percentage Distributions of Lifetime Arrests and Driver's License Revocations for Enrollees in the Pilot Program and for Patients in Treatment in Minnesota in 2011.

Variable	Value	Pilot	Treatment[a]
Lifetime arrests	0	7.8	23.5
	1-5	46.6	53.0
	6-10	25.2	12.9
	11+	20.4	10.6
Driver's license revoked	Currently	39.8	27.8
	Ever	27.2	21.3
	Never	15.5	32.6
	Not applicable	17.5	18.3

[a] Data pertain to all admissions to treatment in MN in 2011. Source: DAANES, PMQI, MN DHS.

Table 4 shows that those in the pilot also have much more extensive histories of admission to detoxification and treatment facilities. Whereas only one in five participants in the pilot have no admissions to detoxification, over half of those in treatment have never been in detoxification. Over a quarter of those in the pilot have been in detoxification over ten times, while only three percent of those in treatment have been in detoxification that frequently. Similarly, no participants in the pilot have ever been in treatment, whereas one-fourth of those in treatment are in their first episode.

Table 4. Percentage Distributions of Lifetime Admissions to Detoxification and Treatment Facilities for Enrollees in the Pilot Program and for Patients in Treatment in Minnesota in 2011.

Type of Facility	Number	Pilot	Treatment[a]
Detoxification	0	20.0	56.6
	1-5	42.0	37.1
	6-10	12.0	3.1
	11+	26.0	3.2
Treatment	0	0.0	25.1
	1-5	51.5	64.2
	6-10	33.0	8.1
	11+	15.5	2.6

[a] Data pertain to all admissions to treatment in MN in 2011. Source: DAANES, PMQI, MN DHS.

Whereas histories of detoxification and treatment differ substantially between the two groups, Table 5 shows that about half of both groups have alcohol as a primary substance. Those in treatment are about three times more likely to have a primary substance of marijuana, while those in the pilot are about twice as likely to have methamphetamine as a primary substance.

Table 5. Percentage Distributions of Primary Substance for Enrollees in the Pilot Program and for Patients in Treatment in Minnesota in 2011.

Primary substance	Pilot	Treatment[a]
Alcohol	52.8	50.8
Marijuana	6.6	17.9
Opiates	13.2	16.3
Methamphetamine	19.8	8.3
Other	7.5	6.7

[a] Data pertain to all admissions to treatment in MN in 2011. Source: DAANES, PMQI, MN DHS.

B. Forming a comparison group

The results above make clear that all clients receiving treatment would form a poor comparison group. Any differences in outcomes between those in the pilot and those who received treatment as usual could be due to the fact that the two groups differed prior to treatment. In other words, various background factors affect the likelihood of being in the pilot and these factors could also affect outcomes.

The Department created a comparison group that best resembled the pilot participants. Using DAANES and POMS, the Department selected a comparison group and made certain the comparison group did not include anyone who was a pilot participant.

We then calculated the odds on being in the pilot on three types of factors: demographic, legal, and substance. Demographic factors include marital status, education, gender, age, and race/ethnicity (African American, Asian or Pacific Islander, Hispanic, and white). There were no Native Americans in the pilot, so they were removed from the comparison group. Legal factors include lifetime arrests, and revocation of driver's license (past year, lifetime, and never). Factors related to substances include primary substance (alcohol, cocaine, marijuana, heroin, other opiates, methamphetamine, and other), number of lifetime treatment episodes, and number of lifetime detoxification episodes. Variables that did not significantly affect the likelihood of being in the pilot were dropped from the model. The preferred model includes effects of being male, being African American, being married, number of arrests, never having had a license revoked, number of detoxification admissions, number of treatment admissions, using methamphetamines, and using opiates. The effects of age and education were not significant after allowing the other effects into the model, so they are not included.

We had hoped to draw the sample from the counties that participated in the pilot, but there was not sufficient representation in most categories. Instead, we restricted attention to admissions funded by the CCDTF from greater MN and the suburban metropolitan area, excluding Hennepin and Ramsey counties.

C. Outcomes

Discharge Status of Clients

Unfortunately, categories of discharge for DAANES and POMS use criteria so different that comparisons are meaningless. Therefore, we focus on POMS alone. Seventy clients were discharged from the project. Table 6 shows the reasons that clients were discharged. Only 15 percent were discharged because they met the goals of the project. The most common reason for discharge was that the client was incarcerated (23 percent), but data do not reveal whether incarceration resulted from crimes committed prior to or after enrollment.

The second most common reason for discharge resulted from the fact that clients who enrolled in managed care organizations became ineligible for the program. To be eligible for the navigator program, clients must be eligible for the CCDTF. Once they enroll, the navigator's job is to help them with diverse aspects of their lives. Many, if not all, clients would be without health insurance but eligible for Minnesota Health Care Programs (MHCP), so it would be clearly irresponsible for navigators to not get clients enrolled in MHCP. The first month in MHCP is on a fee-for-service basis, but most clients are moved to a managed care organization in the second month. Once in a managed care organization, the clients became ineligible for the pilot program. In response to this issue, the Alcohol and Drug Abuse Division eventually obtained a waiver from mandatory enrollment in managed care in the second and subsequent months of enrollment in MHCP.

Table 6. Percentage Distributions of Discharge Status

for Enrollees in the Pilot Program.

Discharge status	Percent
Met goals	14.5
Incarcerated	23.2
Ineligible, enrolled in managed care	17.4
Ineligible, moved	15.9
Terminated	10.1
Other	18.8

The third and fourth reasons for discharge are moving out of the area (16 percent) and termination by staff or clients (10 percent). Other reasons include death and becoming ineligible for reasons such as increased income.

Table 7 shows the length time that people who were eventually discharged spent in the program. Over half were discharged in the first six months, and most of these were discharged in the fourth month (not shown in the table). Those who met the goals of the program were likely to be in the program longer than those who did not do so; none of those who met the goals were in the program for less than seven months, whereas 63 percent of those who did not meet the goals were discharged in fewer than 7 months.

Table 7. Percentage Distributions of Months in the Program for Enrollees in the Pilot.

Months in Program	Percent
1-6	54.3
7-12	18.6
13-18	15.7
19-30	11.4

Satisfaction

As noted above, the response rate for the satisfaction surveys was very low, and this limits their utility. Furthermore, these questions were not asked as part of DAANES, so there is no comparison group. Nevertheless, among those who responded, clients in the navigator project expressed great satisfaction with the project. The survey asked, “How satisfied are you with the services that you received in this program?” (general), and “How satisfied are you with the time that it took to get these services?” (timeliness), with five response options ranging from very satisfied to very dissatisfied. The next questions asked respondents to express their level of agreement with “It was easy to contact my navigator when I had a problem” (contact), “Staff believe that I can grow, change and recover” (recover), and “Staff encouraged me to take responsibility for how I live my life” (responsibility). The final two questions asked, “As a direct result of services I received, I do things that are more meaningful to me” (meaningful), and “I am better able to do things that I want to do” (fulfill), with response options ranging from strongly agree to strongly disagree. Table 8 provides the percentage distributions of responses, added over events (6, 12, 18, 24, and 30 month updates and discharges) of the 48 submitted surveys. There is no discernible trend to responses over time.

Table 8. Percentage Distributions of Responses to the Satisfaction Survey.

Satisfaction	Very Satisfied	Somewhat Satisfied	Neutral	Somewhat or Very Dissatisfied
General	91.7	8.3	0.0	0.0
Timely	87.5	12.5	0.0	0.0
	Strongly Agree	Agree	Neutral	Disagree or Strongly Disagree
Contact	83.3	12.5	2.1	2.1
Recover	87.5	8.3	4.2	0.0
Responsibility	89.6	6.3	4.2	0.0
Meaningful	79.2	16.7	2.1	2.1
Fulfill	77.1	16.7	2.1	4.2

Over 90 percent of responses fall into the two most positive categories for all items, and fewer than 5 percent of responses to any item are negative. Indeed, four items received no negative responses. There is a slight tendency in the data for clients to provide less agreement with the last two statements, which assess the impact of the program, than with the previous statements, which assess the performance of the navigators, but the sample is much too small to be confident of these differences. In general, client response was overwhelmingly positive.

National Outcomes Measures

We report outcomes for people who have at least one post-admission record. We analyzed each transition (e.g., from admission to six months to 12 months, etc.), but the size of the sample was not sufficient for this analysis. Therefore, for individuals with two or more post-admission records, we report the most recent. In other words, we compare individual's responses to the various questions at admission to their responses at the most recent measurement. Only those with measurements at both criteria points were included in the analysis. Similarly, only those with measurements at admission and discharge were included in the comparison group.

The Substance Abuse and Mental Health Services Administration (SAMHSA) has developed six National Outcomes Measures (NOMS) to be administered at admission to and discharge from treatment in order to determine functioning in six critical domains. According to SAMHSA

(2010), NOMS "are designed to embody meaningful, real life outcomes for people who are striving to attain and sustain recovery; build resilience; and work, learn, live, and participate fully in their communities."

The first three columns of Table 9 show the percentages of pilot participants who exhibited problems in each dimension at admission and at the most recent measurement, as well as the percentage point improvement on each dimension. The dimensions are being homeless, being neither employed nor a student, being arrested in the previous thirty days, using alcohol in the previous thirty days, using illicit drugs in the previous thirty days, and not attending a self-help program in the previous thirty days. Providers are supposed to enter responses after discussing the questions with clients. All variables are coded so that the percentage indicates the percentage with a problem. Using the first row as an example, 16 percent reported being homeless at admission, 13 percent reported being homeless at the most recent measurement, so the improvement is 16-13=3. For four of the first five dimensions, the percentages reporting problems decline from admission to the most recent measurement, but the declines are fairly modest. The decline in the percentage of people who are neither employed nor students is more substantial. For the final dimension, the percentage reporting not attending self-help programs actually increases substantially. The last row of the table shows the averages over the six measures and indicates almost no change from admission to discharge, although this is due to the large increase in the percentage who lack a self-help group and the smaller declines on the other measures.

Table 9. Percentage of Patients Who Exhibited Problems on NOMS at Admission and at Most Recent Measurement for Pilot and Comparison Group.

	Pilot			Propensity-scored comparison group		
Measure	Admission	Recent	Improve	Admission	Discharge	Improve
Homeless	16.0	12.8	3.2	8.0	1.4	6.6
Not employed	85.7	74.7	11.0	83.1	77.9	5.2
Arrested	13.5	9.0	4.5	15.5	8.5	7.0
Alcohol	32.5	28.9	3.6	40.4	9.2	31.2
Drugs	14.1	12.9	1.2	40.4	12.1	28.3
No self-help	19.8	47.7	-27.9	60.3	15.3	45.0
Average	30.3	31.0	-0.7	41.3	20.7	20.6

Are these changes in the pilot statistically significant? With repeated measures such as these, the appropriate test of significance is the McNemar test, which focuses on the percentages that change from admission to the most recent measurement. In effect, McNemar tests whether, among those who change the percentage who improve differs from the percentage that decline.

This analysis indicates that change was not significantly different in the two groups for being neither employed nor a student, arrests, and using drugs. However, for being homeless, using alcohol, and lacking a self-help group, improvement was significantly greater in the comparison group than in the pilot group.

Outcomes using dimensions of American Society of Addiction Medicine (ASAM)

The second set of outcome measures are the Minnesota six dimensions of addiction similar to those proposed by the American Society of Addiction Medicine (Mee-Lee 2013). Minnesota's six dimensions were created in consultation with David Mee-Lee, MD, and though not identical, share titles and other characteristics with the ASAM six dimensions. Table 10 presents the percentage of patients at admission and the most recent measurement who were coded as having a moderate, serious or extreme problem, as well as the improvement from admission to the most recent measurement. We separate problem levels in this way because this is the critical distinction for most dimensions in determining whether and what type of treatment is needed (MN DHS 2011). These items form a critical component of both admission to treatment and admission to the pilot project as they are a required component of the eligibility assessment. The six dimensions are: 1) acute intoxication/withdrawal potential, 2) biomedical conditions and complications, 3) emotional/behavioral/cognitive conditions and complications, 4) readiness to change, 5) relapse/continued use/continued problem potential, and 6) recovery environment.

Table 10. Percentage of Patients Who Exhibited Problems on ASAM at Admission and at Most Recent Measurement for Pilot and Comparison Group.

	Pilot			Propensity-scored comparison group		
Measure	Admission	Recent	Improve	Admission	Discharge	Improve
Intoxication	26.8	9.8	17.0	5.1	2.9	2.2
Biomedical	32.5	25.0	7.5	9.4	7.9	1.5
Psychological	82.9	65.9	17.0	73.4	64.0	9.4
Readiness	67.9	59.3	8.6	71.0	50.0	21.0
Relapse	87.8	75.6	12.2	96.4	82.6	13.8
Environment	86.6	70.7	15.9	92.0	79.6	12.4
Average	64.1	51.1	13.0	57.9	47.8	10.1

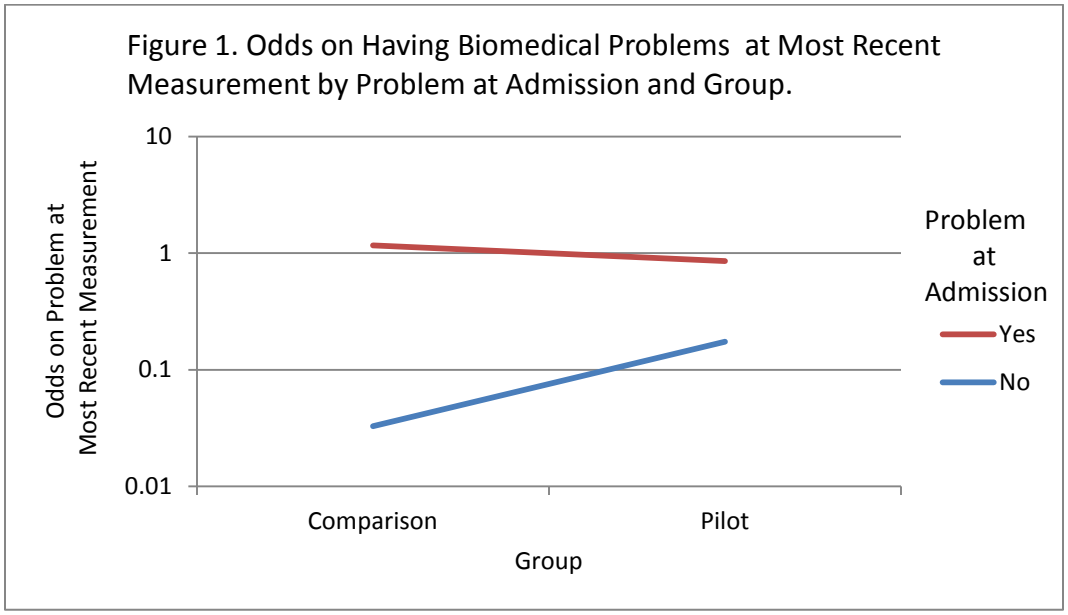
Participants in the pilot show improvement on all dimensions. Furthermore, tests indicate that the change is significant ($p < .05$) for four dimensions; intoxication, psychological problems, potential relapse, and recovery environment. Interestingly, three of these are areas in which people are especially likely to show problems at admission. So the program seems to be working best in the areas most commonly problematic for pilot participants.

For the NOMS measures, the average percentage with problems at admission was higher among those who entered treatment than it was among those who entered the pilot. This is not true for the ASAM measures. In the pilot, the average percentage with problems at admission is 64 percent; for treatment as usual, the average percentage with problems is 58 percent. These averages mask differences on the individual dimensions. Problems with intoxication, biomedical and psychological conditions are more prevalent in the pilot, but problems with relapse potential and the recovery environment are more prevalent in the comparison group.

As with the NOMS, we address the issue of how change in ASAM measures in the pilot compares to the change in the comparison group with log-linear models. For intoxication, psychological conditions, and relapse potential, outcomes for the two groups do not differ significantly.

The preferred models for the other three dimensions, biomedical, readiness, and recovery environment, specify that the effect of group depends on the level of the problem at admission. Figure 1 shows how the odds on exhibiting a biomedical problem at the most recent measurement depend on whether a biomedical problem exists at admission and whether one is in

the pilot or the comparison group. (An odds of 1.0 indicates that equal proportions have and do not have the problem, so the percentage equals 50.) The line for those who did not have a problem at admission shows, those in the pilot have considerably higher odds on exhibiting a problem at the most recent measurement (top line in figure 1). In fact, the ratio of the odds is 5.3, indicating that those in the pilot are 5.3 times more likely to exhibit a problem. On this dimension, the pilot did not perform well for those who did not have biomedical problems at admission. But the line for those who did have a problem at admission shows a very different pattern: those in the pilot exhibit lower odds on the problem by a factor of 0.73 (bottom line in Figure 1). Therefore, for biomedical problems, there is no simple answer to the question of whether the pilot or treatment as usual achieved better results.



Readiness to change exhibits a similar pattern but, among those who were ready to change at admission, being in the pilot raises the odds on not being ready to change at the most recent measurement by a smaller factor, 3.6. Among those who were not ready to change at admission, the odds on not being ready to change are very similar for those in the pilot and comparison groups. In effect, the pilot participants who were ready to change at admission didn't do as well as those in the comparison group, suggesting treatment as usual may work better for motivated people, but there was no difference between the groups among those not ready to change at admission.

Recovery environment also shows this type of interactive effect. Among those with a positive recovery environment at admission, being in the pilot raises the odds on a problematic

environment at the most recent measurement by a factor of 4.7. However, among those with a problematic recovery environment at admission, being in the pilot lowers the odds on a problematic recovery environment at the most recent measurement by about half.

The ASAM measures, then, show a mixed bag of results. Analysis of pilot participants shows significant improvement on intoxication, psychological conditions, relapse potential, and recovery environment. For three of these measures, intoxication, psychological conditions, and relapse potential, outcomes in the pilot and the comparison group are statistically indistinguishable. For biomedical conditions and the recovery environment, being in the comparison group led to better outcomes among those without the problem at admission, and the pilot led to better outcomes among those with the problem at admission. Readiness for change showed a similar but not identical pattern: the comparison group led to better outcomes for those who were ready to change at admission, but the two groups performed equally well among those who were not ready to change at admission.

Outcomes using the K6 distress scale

The K6, was developed to "discriminate cases of serious mental illness (SMI) from non-cases (Harvard Medical School 2005)." Kessler et al. (2003) discuss the derivation of the scale. SAMHSA (2008) considers the K6 to be a measure of non-specific psychological distress. The constituent questions of the K6 ask about the frequency of feeling nervous, hopeless, restless or fidgety, depressed, that everything was an effort, and worthless. At admission, 32 percent of the population provided responses that national standards suggest are indicative of serious distress; this declines by 17 percentage points, or about half the initial percentage with serious distress, by the most recent measurement. On this measure, then, the pilot performed very well. Unfortunately, these questions were not asked of those in treatment, so we lack a comparison group.

Detoxification

The assessment of use of detoxification depends upon linking POMS and DAANES records with data on detoxification episodes maintained by DHS. The rule that licenses detoxification facilities requires them to submit data on every client to DHS. We then calculated the number of detoxification admissions per month in the period from July 1, 2008 to the date of admission and the number of detoxification admissions per month in the period from the date of admission to October 31, 2013.

Table 11 presents the mean number of detoxification admissions per month prior to admission to the pilot or treatment, the mean number of detoxification admissions per month after admission

to the pilot or treatment, and the change for those in the pilot and the comparison group. Although the propensity score matching resulted in two groups that did not differ significantly on lifetime detoxification admissions, the two groups do differ significantly on both pre- and post-admission detoxification episodes. In the pre-admission period, those in the pilot averaged 0.111 episodes per month, whereas those in the comparison group averaged 0.029 episodes per month. In the post-admission period, those in the pilot averaged 0.078 episodes per month, and those in treatment averaged 0.025 episodes per month. So, in both periods, those in the pilot were more likely to have detoxification episodes. However, the decline in episodes per month in the pilot was significant, while the decline in the comparison group was not. Specifically testing whether the change in the two groups differs reveals that the decline was significantly greater in the pilot than in the comparison group.

Table 11. Number of Detoxification Episodes per Month before and after

Entering the Pilot or Treatment.

Group	Pre-Entry	Post-Entry	Change
Pilot	0.111	0.078	0.033*
Comparison	0.029	0.025	0.004
Difference	0.082*	0.053*	0.029*

* $p < 0.05$.

Comparison between Washington County and the southeastern counties

Reimbursement in Washington County was for services delivered, while reimbursement in the ten southeastern counties was on a capitated basis, each model of reimbursement designed by the participant counties. Services were delivered based on individual need. According to administrative data, the mean cost of clients in Washington County was $4,640, and the mean cost in the southeastern counties was $15,701, a significant difference. However, clients in the southeastern counties tended to be in the program for longer periods: according to administrative data, the mean number of months in Washington County was 9.8, and the mean in the southeastern counties was 14.8. The average monthly costs were $478 in Washington County and $1,096 in the southeastern counties. Regardless of whether the measure is total costs or monthly costs, the capitated services in the southeastern counties were significantly more expensive than the services in Washington County.

Table 12 shows the percentage distributions of the NOMS at admission and the most recent measurement for Washington County and the southeastern counties. Although the two groups

differ on some measures at admission, the averages are very similar. Washington County shows greater improvement on five measures: homelessness, employment, arrests, use of alcohol, and having a self-help group. Log-linear analysis reveals that the changes differ significantly for all measures but arrests. It is worth noting that only the southeastern counties showed an increase in the percentage lacking a self-help group.

Table 12. Percentage of Patients Who Exhibited Problems on NOMS at Admission and at Most Recent Measurement for Washington County and Southeastern Counties.

	Washington			Southeast		
Measure	Admission	Recent	Improve	Admission	Recent	Improve
Homeless	4.3	0.0	4.3	19.7	16.9	2.8
Not employed	91.3	60.9	30.4	83.8	79.4	4.4
Arrested	26.1	8.7	17.4	9.1	9.1	0.0
Alcohol	23.8	9.5	14.3	35.5	35.5	0.0
Drugs	9.1	13.6	-4.5	15.9	12.7	3.2
No self-help	26.1	17.4	8.7	17.5	58.7	-41.2
Average	30.1	18.4	11.8	30.3	35.4	-5.1

The results for the ASAM measures, shown in Table 13, are similar. The average percentage at admission are close to equal, but the average masks several large differences. In particular, a smaller percentage of clients in Washington County at admission manifest acute intoxication while larger percentages are coded as having problems with readiness to change, relapse potential, and the recovery environment. Improvements appear to be larger in Washington County for all dimensions other than intoxication. Log-linear analysis reveals that the difference for intoxication is not statistically significant, but all other differences are. Controlling for differences at admission, clients in Washington County exhibit significantly better functioning at discharge on all dimensions other than intoxication. The improvement on readiness to change, relapse potential, and recovery environment in Washington County are notable.

Table 13. Percentage of Patients Who Exhibited Problems on ASAM at Admission and at Most Recent Measurement for Washington County and Southeastern Counties.

	Washington			Southeast		
Measure	Admission	Recent	Improve	Admission	Discharge	Improve
Intoxication	4.8	4.8	0.0	34.4	11.5	22.9
Biomedical	19.0	4.8	14.2	37.3	32.2	5.1
Psychological	71.4	33.3	38.1	86.9	77.0	9.9
Readiness	85.7	4.8	80.9	61.7	78.3	-16.6
Relapse	100.0	28.6	71.4	83.6	91.8	-8.2
Environment	100.0	19.0	81.0	82.0	88.5	-6.5
Average	63.5	15.9	47.6	64.3	63.2	1.1

Change in K6, the measure of psychological distress, is also greater in Washington County. While 48.1percent of clients in Washington County exhibit serious distress at admission, none do so at the most recent measurement. In contrast, the percentage of clients in southeastern counties who exhibit serious distress declines from 29.3 percent at admission to 20.6 percent at the most recent measurement. Log-linear analysis reveals that the improvement is significantly greater in Washington County.

Although Washington County showed superior performance on almost all NOMS and ASAM dimensions, utilization of treatment and detoxification after admission did not differ significantly in the two groups. Clients in Washington County had an average of 0.7 treatment episodes after admission to the pilot, and clients in southeastern counties had an average of 0.8 episodes, but this difference was not significant.

Table 14 shows utilization of detoxification before and after treatment in the two regions. Although clients in the Southeast had more detoxification episodes per month prior to treatment, the two regions did not differ significantly in episodes per month after admission to the pilot or in the decline in episodes per month.

Table 14. Number of Detoxification Episodes per Month before and after

Entering the Pilot by Region.

Group	Pre-Entry	Post-Entry	Pre-Post
Washington	.058	.045	.013
Southeast	.130	.090	.040*
SE-Washington	.072*	.046	.027

* $p < 0.05$.

D. Conclusions

This report examines outcomes from a pilot project in Washington County and ten southeastern counties which provided a navigator or care coordinator to participants in efforts to assist with augmented living services such as such as housing, employment, and medical care, as well as addiction. Services in Washington County were provided on a fee-for-service basis, and services in the southeastern outies were provided on a capitated basis.

From July 1, 2010, to June 30, 2013, 106 clients entered the program and 70 were discharged. Of the 70 who were discharged, only 14 percent were deemed by pilot navigators to have met the goals of the program. By this measure, the project did not reach its intended goals. On the other hand, 36 clients continued in the program and were able to receive program services. The clients who were discharged without meeting the goals may have benefitted from their limited participation as well.

Participants in the pilot were more likely than those in treatment as usual to be older, white, more highly educated, previously married, have extensive criminal histories, have driver's license revocations, and to have experienced multiple episodes of both detoxification and treatment. These differences make participants in treatment a poor choice for a comparison group. Propensity score matching was used to create a comparison group from people receiving treatment that eliminated these differences. Unfortunately, we have measures on the comparison group only at admission and discharge; the time frame covers a much shorter period than the exposure of people to the pilot. Furthermore, we do not know if, for example, sobriety attained by someone in treatment is maintained at a later time. By contrast, measures in the pilot cover a period as long as 30 months.

To assess the functioning of the program, we analyzed four types of measures, NOMS, ASAM, the K6, and utilization of detoxification at admission and the most recent measurement. The analysis includes only clients who have measures at admission and a more recent time.

For NOMS, there is little difference in the average percentage with problems at admission and discharge, this is largely due to the fact that participation in self-help groups declines significantly. The other measures show improvement but only the improvement in being employed or a student is statistically significant. By contrast, the average improvement in the

comparison group is 21 percentage points. Improvement in the comparison group was significantly greater for being homeless, using alcohol, and lacking a self-help group. The two groups did not differ significantly in being neither employed nor a student, arrests, and using drugs.

The increase in the percentage of people in the pilot who did not participate in a self-help group is concerning, since such participation is known to be an important tool for maintaining sobriety (Humphreys et al. 2004; O'Brien and 1996; Timko and DeBenedetti 2007). It may be that the navigator functioned as an alternative source of support or that the more multi-dimensional approach of the navigator pilot deemphasized sobriety and made participation in such groups difficult.

The average pilot participant change in the ASAM measures is 13 percentage points, which is a bit larger than the average change shown by those in the comparison group. Furthermore, the improvement in four dimensions; intoxication, psychological problems, potential relapse, and recovery environment, are significant. For intoxication, psychological conditions, and relapse potential, outcomes for the pilot and the comparison group do not differ significantly. For biomedical problems and the recovery environment, outcomes depend on whether clients exhibited a problem on those dimensions at admission. For clients who were coded as not having a problem at admission, the comparison group outperformed the pilot, but for clients who were coded as having a problem at admission, the pilot provided superior outcomes. The model for readiness to change was both similar and different: for clients who were coded as not having a problem at admission, the comparison group outperformed the pilot, but for clients who were coded as having a problem at admission, the two groups did not differ much.

The pilot performed very well at reducing serious psychological distress. The percentage of clients with scores indicative of serious distress declined substantially from 32 to 15 percent. Unfortunately, we do not measure the K6 in licensed substance abuse treatment.

Changes in detoxification also reflect positively on the pilot. The decline from 0.111 episodes per month prior to admission to 0.078 episodes per month after admission was significant and significantly greater than the decline in the comparison group. While a change of 0.033 episodes per month may seem trivial, this translates to a decline in utilization of detoxification of 30 percent.

In general, clients in the pilot were very satisfied with services received, although the response rate for the survey was so low that we cannot be confident in this result; clients in the pilot improved a bit on most NOMS, but less than those in the comparison group; clients in the pilot improved a bit more on the ASAM measures, with change that was similar to change in the comparison group and even better for some clients on some measures; clients in the pilot improved a lot on the measure of serious psychological distress; and clients in the pilot decreased utilization of detoxification more than those in the comparison group. These results suggest rather lukewarm support for the pilot.

However, comparing outcomes in Washington County and the southeastern counties reveals that there was considerably more success in Washington County. Improvement on most NOMS,

ASAM measures, and K6 was substantially greater in Washington County. Improvement on most measures was also substantially greater in Washington County than in the comparison group. In fact, improvement on three ASAM measures that the Alcohol and Drug Abuse Division views as critical in an assessment, readiness to change, relapse potential, and recovery environment, was remarkable: the percentages with problems on these dimensions declined by over 70 percentage points. Results for three of the NOMS are informative. Clients in Washington County improved their employment status, and employment is an important source of well-being (Veroff, Douvan, and Kulka 1981); they reduced consumption of alcohol, and this surely improves the quality of life (Foster 1999); and they increased participation in self-help groups, which is important to maintaining sobriety (Humphreys et al. 2004; O'Brien and 1996; Timko and DeBenedetti 2007).

Not only did the project in Washington County achieve superior results, it did so for less money. The mean cost of clients in Washington County was $4,640, and the mean cost in the southeastern counties was $15,701, a ratio of 3.4 to 1. Part of this difference is due to the fact that clients remained in the program longer in the southeastern counties; nevertheless, the average monthly costs were also substantially higher in the southeastern counties ($1,096 vs. $478 for a ratio of 2.3 to 1).

The data in POMS do not reveal the reason (s) to draw any conclusion as to why Washington County appeared to do more with less money. One possibility is a greater emphasis on sobriety. The results for use of alcohol, participation in self-help groups, readiness to change, relapse potential, and recovery environment suggest that this was the case. However, the fact that those in Washington County and the southeastern counties showed similar rates of treatment and declines in the use of detoxification is inconsistent with this explanation,

Another obvious possibility is that contracting to a vendor who receives reimbursement on a capitated basis leads to less positive results. It may be that navigators in Washington County felt more accountable because they had to "bill" for each service and, therefore, focused on services with a higher probability of success. Of course, generalizing from a sample of two (Washington County and the 10 southeastern counties) is risky. What we know is that the results of the pilot in Washington County were very positive.

Finally, a caveat is in order. The data in POMS rely on the reports of navigators who have an obvious interest in the results. However, providers in DAANES also know that they are being evaluated, so any bias that exists in POMS is also likely to exist in DAANES and comparisons between the two should cancel the bias. Analysis of DAANES data reveals that the reports of providers are fairly similar to the reports of assessors, who have no interest in biasing results, although the relatively small differences that do exist work in the interests of providers (McRae 2011). Furthermore, the one objective measure that we have, detoxification, shows substantial improvement for participants in the pilot. In short, we doubt that biased reporting is an important factor in these results but caution the reader that it is a possibility.

V. Report recommendations

The 2013 Legislature authorized, in Minnesota Statutes 254B.13, Subd. 8. the continuation of the Navigator Pilots. Under this authority, the participant pilot counties were allowed to continue operation, under the existing agreements, beyond their previous termination date of July 1, 2013. The Department has no additional recommendations for legislative action in this regard.

As outlined in this report, the Navigator Pilots demonstrated a number of successes in serving a number of persons identified as difficult to serve in the chemical dependency treatment system. Clients in the navigator project expressed great satisfaction with the project. Pilot participants showed significant improvement on measures of intoxication, psychological conditions, relapse potential, and recovery environment. Measures of serious psychological distress were greatly reduced. Finally, the pilots greatly outperformed the comparison group in the reduction of detoxification use.

In the 2013 session, the Minnesota Legislature authorized the Department of Human Services create new pilot projects. These pilot projects were authorized in Minnesota Statutes 254B.14 which, consistent with the design of the Navigator Pilot Project, are intended to "build on the effectiveness and efficiency of the service continuum for chemically dependent individuals in Minnesota…" The Continuum of Care Pilots' design will be consonant with some of the features of the Navigator Pilots, and are intended to build on the successes in reducing use of detoxification and improvements in other measures.

In an additional analysis of the data collection process, the Department employed a Six Sigma analysis of the Navigator Pilots. Six Sigma is a framework for continuous improvement. The review included input from representatives of the Department and the participating pilot counties. The Six Sigma team recommended a set of steps to improve collection and reporting of data, client satisfaction surveys and client follow-up. Recommended steps included providing early screening for participant eligibility for available health care and other benefits, improving collection of emergency contact information to benefit follow-up data collection, creating standardized training and online training materials for navigators and other pilot "staff."

The Department will use what has been learned from this analysis to benefit the Navigator and Continuum of Care pilots in future.

In closing, the Department has learned a great deal from the work of the navigator pilot. In these lessons learned, augmented services available for the treatment of substance use disorder gave more flexibility and options than one would experience in a traditional treatment episode, and for a longer period of time. Capacity building is a priority for the Chemical and Mental Health Administration. Engaging the legislature, stakeholders, and those in recovery to improve the identification of services which are most appropriate to each individual's needs are required in order to transform the systems now working with persons with substance use disorders.

VI. Appendix

REFERENCES

D'Agostino, Jr., Ralph B. 1998. "Tutorial in Biostatistics: Propensity Score Methods for Bias Reduction in the Comparison of a Treatment to a Non-Randomized Control Group." *Statistics in Medicine* 17: 2265-81.

Minnesota Department of Human Services. 2011. *Chemical Health Division Minnesota Matrix.* Downloaded from https://edocs.dhs.state.mn.us/lfserver/Public/DHS-5204B-ENG on 11-14-2013.

Foster, J.H., J.E. Powell, E.J. Marshall, and T.J. Peters. 1999. "Quality of Life in Alcohol-Dependent Subjects – a Review." *Quality of Life Research* 8:255-61.

Humphreys, Keith, Stephen Wing, Dennis McCarty, John Chappel, Lewi Gallant, Beverly Haberle, A.Thomas Horvath, Lee Ann Kaskutas, Daniel Kivlahan, Alexandre Laudet, Barbara S. McCrady, A.Thomas McLellan, Jon Morgenstern, Mike Townsend, and Roger Weiss. 2004. "Self-Help Organizations for Alcohol and Drug Problems: Toward Evidence-Based Practice and Policy." *Journal of Substance Abuse Treatment* 26(3): 151-8.

Kessler, R.C., Barker, P.R., Colpe, L.J., Epstein, J.F., Gfroerer, J.C., Hiripi, E., Howes, M.J, Normand, S-L.T., Manderscheid, R.W., Walters, E.E., Zaslavsky, A.M. 2003. "Screening for serious mental illness in the general population." *Archives of General Psychiatry*. 60(2): 184-189.

McRae, James A. 2010. Treatment for Chemical Dependence and Abuse in Minnesota: 2008. Minnesota Department of Human Services. Downloaded from https://edocs.dhs.state.mn.us/lfserver/Public/DHS-6154-ENG.

McRae, James A. 2009. Racial/Ethnic Differences in Treatment for Substance Abuse and Dependence in Minnesota. Minnesota Department of Human Services. Downloaded from http://edocs.dhs.state.mn.us/lfserver/Public/DHS-6064-ENG.

McRae, James A. 2011. "Similarities and Differences in Assessments of Severity of Addiction Provided by County Assessors and Treatment Providers." Minnesota Department of Human Services.

Mee-Lee, David. 2013. *The ASAM Criteria: Treatment Criteria for Addictive, Substance-Related, and Co-Occurring Conditions.* American Society of Addiction Medicine.

Harvard Medical School. 2005. National Comorbidity Survey. http://www.hcp.med.harvard.edu/ncs/k6_scales.php.

O'Brien, Charles P., and A. Thomas McLellan. 1996. "Myths about the treatment of addiction." *The Lancet* 347: 237-40.

Rosenbaum, Paul R., and Donald B. Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Causal Effects." *Biometrika* 70:41-55.

Substance Abuse and Mental Health Services Administration. *NOMs 101: National Outcome Measures*. Downloaded from http://www.samhsa.gov/co-occurring/topics/data/nom.aspx on April 24, 2010.

Substance Abuse and Mental Health Services Administration. 2008. "2004 State Estimates of Substance Use." Downloaded from http://www.samhsa.gov/data/2k4state/ch6.htm on 11-15-13.

Timko, Christine, and Anna DeBenedetti. 2007. "A Randomized Controlled Trial of Intensive Referral to 12-Step Self-Help Groups: One-Year Outcomes." *Drug and Alcohol Dependence* 90:270-9.

Veroff, Joseph, Elizabeth Douvan, and Richard Kulka. 1981. *The Inner American: A Self-Portrait from 1957 to 1976.* New York: Basic.