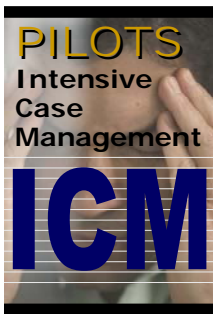




# DSHS | Preliminary ICM Pilot Outcomes

REPORT 4.70 | Changes in Medical Costs, Risk of Arrest, and Likelihood of Engaging in Alcohol or Other Drug (AOD) Treatment



## Intensive Case Management within a Supportive Housing Facility Preliminary Findings from the King County Pilot

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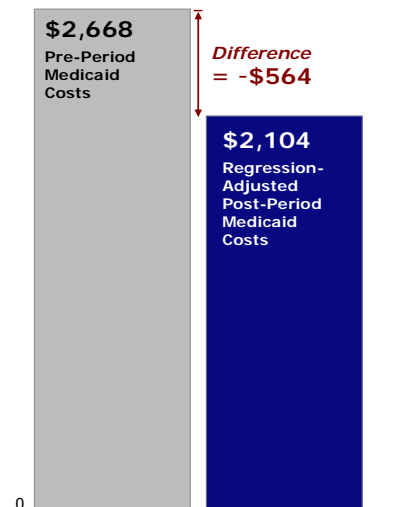
**T**HE INTENSIVE CASE MANAGEMENT (ICM) Pilot Program aims to improve outcomes for individuals with co-occurring chemical dependency and mental health conditions. This report provides a preliminary examination of the impact of the ICM pilot program in King County, where it is nested within a supportive housing unit. The housing facility provides a range of services and support to individuals who were targeted for participation due to their high utilization of crisis services (such as, emergency departments, detoxification centers, and jails). The King County pilot has been in operation since late fall of 2005. We examine the impact of ICM on Medicaid-reimbursed medical expenses, risk of arrest, and likelihood of engagement in alcohol or other drug (AOD) treatment in the year following the initial service encounter. We limit the analysis to individuals who met with a state-funded ICM case manager, but we cannot isolate the effect of ICM from what we assume are the more substantial effects of providing housing and on-site services. A team of University of Washington researchers is currently conducting an evaluation that will examine the impacts of the housing program as a whole.

### Key Findings

The findings show significant increases in the likelihood of engaging in AOD treatment. They also show promising declines in Medicaid costs. This is not surprising given that the site targets the highest intensity users of crisis services in the county, which is likely to be a high-opportunity population from a cost-containment perspective. Counter to expectations, the risk of arrest appears to go up for ICM participants, though this is not statistically significant. Together, the findings point to the importance of understanding how the program is being implemented on the ground so we can better understand the mechanisms through which various outcomes are affected. The findings also underscore the importance of looking at a broader set of outcomes (including mental health services) over a longer follow-up period. Both an implementation study and a final impact analysis will be presented as part of our final report in 2009.

#### Changes in Medicaid Costs Among Fee-For-Service (FFS) ICM Participants

- Overall Medicaid costs for ICM participants **declined by \$564 per member per month (pmpm)** based on a comparison with changes in costs for a matched group of non-participants ( $p=0.45$ ).
- While substantial in size, the cost declines do not reach standard levels of statistical significance due to a small sample size and highly variable medical costs in the study population.



## About the Intensive Case Management (ICM) Pilot Program

### What is the ICM pilot program?

- The intensive case management (ICM) pilot program targets individuals with primary chemical dependency diagnoses or dual chemical dependency and mental health diagnoses. Program participants are assigned to chemical dependency case managers who screen and assess them using instruments designed to identify co-occurring conditions. As appropriate, case managers then link clients to treatment and services and work to ensure that participants' basic needs are met (such as by linking them to medical coverage or economic assistance programs).

### What is the timeline for the ICM pilots?

- The ICM pilot programs took effect in July 2005, when Engrossed Second Substitute Senate Bill (E2SSB) 5763 became effective, though the programs did not become operational until late fall of 2005. In 2007, the state legislature passed Engrossed Substitute Senate Bill (ESSB) 6665, which extended funding for the pilot programs through June of 2009. Analyses presented in this report focus on ICM participants who first received services sometime between January 1, 2006 and June 30, 2007.

### What is the intent of the ICM program?

- The goal of SB 5763 was to more fully integrate treatment for mental health and chemical dependency conditions and in the process improve treatment for patients with co-occurring conditions. The ICM pilots play an important role in this integration by: (1) targeting those with co-occurring conditions, (2) using screening and assessment instruments specifically designed for the co-occurring population, and (3) employing case managers who have familiarity with the target population.

### What is the difference between the two pilot sites?

- There are two DASA-selected sites, one in Thurston and Mason counties and one in King County. While the legislation clearly delineates the specific outcomes to be achieved through the ICM pilot program, it is much less clear about the type, modality, and intensity of services or even the context in which they are to be provided. As a result, the two pilot programs have important differences in terms of the context in which services are offered. For example, the Thurston/Mason county pilot is essentially a community-based, stand-alone service offered through a somewhat rural hospital chemical dependency center. By contrast, the King County pilot is nested within a supportive housing facility offering comprehensive on-site services (such as, meals and help with medication) in a very urban environment. This latter site employs a novel "housing first" harm reduction approach in which participants are allowed to drink alcohol on-site. Given the different ways in which the program is likely being implemented in the two sites, a forthcoming process evaluation will be essential for not only assessing whether the program's objectives are being achieved but also for understanding the different processes through which this may (or may not be) happening at the two sites.

### What research is available so far?

- Two earlier reports are available from analyses of ICM participants' baseline characteristics conducted in 2007. These reports highlight the extent to which ICM participants were more at-risk and more costly than their counterparts at baseline. These reports also suggest that the two pilot sites have successfully targeted the particularly vulnerable population ICM was designed to serve.

### Baseline ICM pilot reports available at:

THURSTON | MASON COUNTY  
<http://publications.rda.dshs.wa.gov/1351/>

KING COUNTY  
<http://publications.rda.dshs.wa.gov/1362/>



## Constructing the Comparison Group

An earlier report on the baseline characteristics of ICM participants in King County suggests they are quite distinct from non-participants who receive DASA-funded alcohol or other drug (AOD) treatment.<sup>1</sup> That report revealed that King County ICM participants had much higher per member per month (pmpm) medical costs than similar individuals who had engaged in DASA-funded AOD treatment in the same time period. In general, those findings suggest that the pilot program has been successfully targeting individuals with some of the greatest need. Yet it also means that caution must be taken in constructing an appropriate comparison group for the impact analysis so that any differences in outcomes may be more readily attributed to the program itself rather than to pre-existing differences between the treatment and comparison groups.

To address the issue of pre-existing differences, we estimated propensity scores for individuals in both the treatment and comparison group.<sup>2</sup> The technical notes at the end of this report provide more detail about this technique. This method leverages observable patient-level information to estimate the probability that someone would be an ICM participant. Propensity scores are then used to match each ICM participant with the person in the comparison group sampling frame who is most similar to them on a variety of baseline measures. Table 1 below shows the outcomes of this matching process in terms of demographic and other individual-level characteristics of both participants and non-participants.

TABLE 1  
Individual Averages Following 1:1 Match

| Descriptive Summary                                    | King County<br><i>n</i> = 98      |                                   |
|--|-----------------------------------|-----------------------------------|
|  | Non-Participants<br><i>n</i> = 49 | ICM Participants<br><i>n</i> = 49 |
| <b>DEMOGRAPHICS</b>                                    |                                   |                                   |
| Average Age  | 48                                | 48                                |
| Female   | 16%                               | 8%                                |
| Male   | 84%                               | 92%                               |
| <b>HEALTH AND RISK INDICATORS</b>                      |                                   |                                   |
| Chronic Illness Risk Score                             | 2.25                              | 1.90                              |
| Schizophrenia/ Bipolar affective disorder              | 18%                               | 10%                               |
| Other depression, panic disorder, phobic disorder      | 39%                               | 29%                               |
| Prior Detox  | 39%                               | 59%                               |
| Prior AOD Treatment                                    | 57%                               | 55%                               |
| Prior Indication of Need for AOD Treatment             | 98%                               | 98%                               |
| <b>MONTHS OF MEDICAID ELIGIBILITY</b>                  |                                   |                                   |
| Prior FFS non-dual Medicaid eligibility                | 10                                | 9                                 |
| Post FFS non-dual Medicaid eligibility                 | 10                                | 9                                 |
| <b>PRE AND POST MEDICAL COSTS</b> Per member per month |                                   |                                   |
| Prior ED costs   | \$138                             | \$223                             |
| Post ED costs  | \$148                             | \$147                             |
| Prior inpatient costs originating in ED                | \$2,116                           | \$1,531                           |
| Post inpatient costs originating in ED                 | \$1,081                           | \$473                             |
| Prior inpatient costs not originating in ED            | \$498                             | \$442                             |
| Post inpatient costs not originating in ED             | \$197                             | \$69                              |
| Prior Total Medicaid costs                             | \$3,532                           | \$2,668                           |
| Post Total Medicaid costs                              | \$2,212                           | \$1,111                           |

<sup>1</sup> Mancuso, et al. (2007) "About the King County ICM Pilot Participants," Olympia, WA: WA DSHS, Research and Data Analysis Division.

<sup>2</sup> In addition to the comparisons discussed here, we present findings for comparisons between King County ICM participants and comparison group members from Pierce and Snohomish counties. This provides alternative estimates given that some comparison group members from King County may be participating in other "housing first" programs comparable to the King County site.



## Preliminary Outcomes: Engagement in Alcohol or Other Drug (AOD) Treatment

One of the main objectives of ICM is to improve treatment for individuals with primary chemical dependency diagnoses or co-occurring chemical dependency and mental health conditions. A commonly used indicator of success with this population is the likelihood of engaging in alcohol or other drug (AOD) treatment following intervention. This is important because engagement in treatment has been shown to improve other outcomes, such as subsequent employment and earnings, substance use, and criminal activity.

The findings presented here reflect the outcomes of logistic regressions estimating the probability that an ICM participant would engage in AOD treatment in the 12 months following the first ICM service encounter relative to non-participants. There was no need to restrict the analyses to individuals who were eligible for FFS Medicaid, so the sample size grows to 114 (n=57 in each group). The regressions control for prior AOD treatment since individuals who were engaged in treatment in the past are more likely to engage again in the future.

In King County, when ICM participants are compared to non-participants who are also from King County, the **odds of engaging in AOD treatment are 14.0 times higher** relative to the matched comparison group (OR=14.0; p<0.0001). When ICM participants in King County are compared to non-participants from Pierce and Snohomish counties, the odds of engaging in treatment are 5.1 times higher for ICM participants (OR=5.1; p=0.002).

## Preliminary Outcomes: Arrests

Another objective of ICM spelled out in the legislation is to reduce the number of criminal justice interventions, including arrests. Accordingly, we ran logistic regression models estimating the probability of an arrest occurring in the post-period. As with the AOD treatment regressions, we did not restrict the analyses to those who had FFS Medicaid eligibility. We controlled for prior arrests, since people who were arrested in the past may be more likely to engage in criminal activities in the future.

Although the results do not achieve statistical significance, when ICM participants are compared to non-participants in King County, the **odds of arrest are about 60% higher** for participants (OR=1.6, p=0.27). Similarly, when compared to non-participants in Pierce and Snohomish counties, the odds of arrests for ICM participants appear to be 60% higher (OR=1.6; p=0.26).

One possible explanation for this counterintuitive finding is that there may be some unmeasured characteristics of ICM participants that make them both more likely to become participants and more likely to be arrested. For example, the ICM pilot in King County targets “chronic public inebriates,” individuals who are “known quantities” to health care and crisis service providers, as well as to law enforcement officials in the county. It is possible that the very same characteristics that led them to be put on a special list of the county’s highest utilizers of crisis services are also characteristics that tend to attract the attention of law enforcement. If our models fail to adequately measure these characteristics, the arrest outcomes could simply be spurious.

Table 3 below shows the results of the logistic regressions on arrest and AOD treatment engagement discussed above.

TABLE 3  
**Estimated Effect of ICM Participation on Odds of Arrest and Treatment Engagement**

| Outcome Variable         | King ICM Participants vs. King Non-Participants<br><i>n=114</i> |                  | King ICM Participants vs. Pierce/Snohomish Non-Participants<br><i>n=114</i> |                  |
|--------------------------|---|------------------|---|------------------|
|                          | Odds Ratio Point Estimate   (Standard Error)                    | p-value (*≤0.05) | Odds Ratio Point Estimate   (Standard Error)                                | p-value (*≤0.05) |
| Arrests                  | 1.6   (0.4)   | 0.27             | 1.6   (0.4)   | 0.26             |
| Engaged in AOD Treatment | 14.0   (0.7)  | <0.0001*         | 5.1   (0.5)   | 0.002*           |

## Discussion

Together, the findings reported here are promising and suggest that participants who receive ICM services within a supportive housing facility in King County may experience improved health and increased engagement in AOD treatment. To recap, among ICM participants compared to matched non-participants, we observe the following outcomes in the year after the initial ICM service encounter:

- **Medicaid-reimbursed medical costs declined.** On average, overall Medicaid costs declined by \$564 pmpm among ICM participants compared to non-participants. This estimate controls for the decline in costs we would have expected to see due to “regression to the mean” because ICM clients in King County were targeted to receive housing at the pilot site based on their extremely high baseline use of publicly-funded services.
- **ICM participants were much more likely to engage in Alcohol or Other Drug (AOD) treatment.** Compared to non-participants, ICM participants in King County had odds of engaging in AOD treatment that were 14 times higher ( $p < 0.0001$ ). This is important because treatment engagement can improve other key outcomes, such as subsequent employment and earnings, substance use, and criminal activity. These findings also suggest that ICM may be helping improve treatment for a particularly vulnerable set of individuals, many of whom have co-occurring chemical dependency and mental health conditions.
- **The odds of arrest appear to go up, though this is not statistically significant.** One possible explanation for this unexpected result is that there is some unmeasured “third factor” that relates both to the likelihood of ICM participation *and* to the likelihood of arrest but for which our models have not adequately accounted.

A process evaluation and more comprehensive impact analysis that will be completed as part of the final ICM report should provide more insight into the pathways through which ICM may affect outcomes of interest.

## Limitations and Future Directions

There are a few important limitations to the present analysis that the reader should bear in mind:

### 1. Constructing the comparison group was challenging.

In the absence of random assignment, it is always a challenge to identify appropriate comparison groups for quasi-experimental program evaluations. In the case of ICM, this challenge was compounded because it was especially difficult to identify individuals who were as extreme as ICM participants at baseline. This was particularly true in King County due to the method used to target individuals for participation in the supportive housing facility in which ICM was offered. In light of all this, our findings should be interpreted cautiously.

### 2. The characteristics of ICM participants and relatively small sample sizes impose important limitations on the precision of the impact estimates.

On their own, small sample sizes such as those used in the present analysis make it unlikely that one will be able to detect statistical significance even when such significance could be found with a larger sample size. In the case of the ICM analysis, this is compounded by the extreme variation we see in key variables of interest (such as medical costs). For example, the variation and small sample sizes in King County are such that the changes in medical costs would have to be implausibly large in order to achieve statistical significance. As a result, we caution the reader to focus more on the size of the coefficient and less on the *p*-value (the level of statistical significance). At the same time, it is important to keep in mind that the confidence intervals around the estimates are such that we often cannot be certain what the “true” direction of the effect really is.

### 3. It is not possible to isolate the effect of the ICM program at the King County site.

It is important to remember that in King County ICM is nested within a much larger and more comprehensive “housing first” program. Using the limited data at our disposal, we simply cannot know whether changes in outcomes may be due to ICM as opposed to other elements of the larger housing first program at that site.

**4. Little is known yet about the “dosage” or intensity of the ICM intervention.**

Given the severity of their chemical dependency and mental health conditions, ICM participants may be both hard-to-engage and hard-to-treat. It is entirely plausible, then, that an individual might see a case manager one time for a short period in the midst of a crisis and then never engage in ICM services again. Increasing our understanding of the nature of the intervention through the forthcoming process study will help us to better understand the extent to which the King County pilot has been successful in engaging and retaining participants. In turn, this will likely help us to further unpack the outcomes reported here.

**5. Other outcomes, such as engagement in mental health services, will be important to include in the final impact analysis.**

The ICM pilot programs are designed to improve treatment for individuals with co-occurring chemical dependency and mental health conditions. Yet this preliminary impact analysis has focused only on participants’ engagement in AOD treatment since data on mental health services is not yet available for the 12 month post-period. The final report will examine ICM participants’ mental health service utilization, as well as their use of other services. If ICM has successfully achieved the goals set out in the legislation, participants will have reduced their use of crisis services and increased enrollment and engagement in services and treatment programs that will help them move towards recovery and achieve some semblance of stability in their lives.

## TECHNICAL NOTES

### Data Sources

This report provides a preliminary impact analysis for the Intensive Case Management (ICM) pilot program funded through the Division of Alcohol and Substance Abuse (DASA). The analyses presented used data from the following sources:

- RDA's Client Services Database provided client demographics, Mental Health Division service data, and a common identifier for linking client information from multiple data sources.
- DASA's TARGET data system provided information on ICM participation, alcohol/drug treatment, detoxification, and assessment services.
- Medical claims from the Medicaid Management Information System provided: diagnoses of chronic physical conditions and mental illness; information from pharmacy claims; and medical service cost and utilization data. Claims-based reimbursement amounts for acute medical inpatient admissions at hospitals in the Certified Public Expenditure (CPE) program were adjusted to reflect the full cost of the inpatient stay.
- OFM Eligibility data provided information on clients' medical coverage.
- Mental illnesses were identified using the psychiatric diagnosis categories from the Chronic Illness and Disability Payment System (CDPS). A chronic illness risk indicator combined diagnoses from CDPS with pharmacy claim information from the Medicaid-Rx pharmacy-based risk adjustment tool.

### Case Selection

The treatment group was composed of individuals who received DASA-funded ICM services between January 1, 2006 and June 30, 2007. The comparison group was constructed from DSHS administrative data and initially consisted of all individuals statewide who were eligible for DSHS Medical Assistance at least one month between FY 1998 and FY 2008 and who were at least 18 years-old by June 30, 2007. For both pilot sites, the core analysis confined the comparison group to individuals residing in the same county as the pilot site. However, given the potential for members of the comparison group in King County to be residing in other Housing First programs similar to the pilot site, results for King County are also presented based on a comparison group drawn from Snohomish and Pierce counties. The analyses on medical costs further restricted both treatment and comparison groups to those individuals who were eligible for fee-for-service Medicaid (but not dually eligible for Medicare) at least one month in both the pre- and post-period.

### Time Frame for Analysis

For the treatment group, the "index month" was defined as the month between January 1, 2006 and June 30, 2007 in which the patient received their initial ICM service. For the comparison group, individuals were randomly assigned an "index month" between January 1, 2006 and June 30, 2007 through a process that ensured that the distribution of index months was the same for this group as it was for the treatment group. For both groups, the pre-period is the 12 months prior to the index month and the post-period is the 12 months following the index month.

### Constructing the Comparison Group

To estimate the impact of the ICM pilot program, we constructed a matched comparison group to provide a counterfactual projection of the experience ICM clients would have had if they did not participate in the pilot program. We performed a 1:1 match on the following characteristics:

- Demographics: age, gender
- Prior chronic illness risk score based on diagnoses and prescriptions in the Medicaid record
- Prior mental illness diagnoses
- Prior total Medicaid pmpm costs
- Prior alcohol or other drug (AOD) treatment
- Prior detoxification services

In general, the regression models on arrests and engagement in AOD treatment included the same variables in the propensity score model except that they did not include prior detoxification services or prior Medicaid costs and they added months of prior FFS Medicaid (non-dual Medicare) eligibility and prior arrests. The propensity score was estimated separately at each site and ICM participants were matched with a single individual in the comparison group sampling frame who was most like them based on their propensity score.

### Regression Analyses

Once each ICM participant had been matched to a non-participant who looked similar on a variety of baseline characteristics, a series of regressions were run on medical costs in the post-period, controlling for chronic illness risk scores. Medicaid cost outcomes are based on a difference-in-differences approach. Changes in Medicaid costs before and after the initial ICM encounter are compared to changes in Medicaid costs before and after the randomly selected index month for the comparison group. Regressions on arrests and AOD treatment engagement estimated the odds of these events occurring for ICM participants relative to non-participants in the post-period.

Additional copies of this paper may be obtained from: <http://www1.dshs.wa.gov/RDA/> or <http://www1.dshs.wa.gov/dasa/> or through the Washington State Alcohol|Drug Clearinghouse by calling 1-800-662-9111 or 206-725-9696 (within Seattle or outside Washington State), by e-mailing [clearinghouse@adhl.org](mailto:clearinghouse@adhl.org), or by writing to 6535 Fifth Place South, Seattle, Washington 98108-0243.