

# Outpatient Treatment on Demand

## *Interim Evaluation*

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Carolina Johnson, PhD | October, 2019 – Reviewed and approved by HMA, November 26, 2019

### Executive summary

#### *Background*

The King County Behavioral Health Outpatient Treatment-on-Demand (OTOD) initiative, implemented by the King County Behavioral Health and Recovery Division (BHRD), aimed to increase timely access to outpatient behavioral health treatment in the publicly funded King County mental health and substance abuse treatment system. The initiative started in October 2017 and is scheduled to run through September 2020. BHRD designed performance-based incentive payments to encourage agency process improvements toward providing timely access to care.

This interim evaluation examined whether performance-based incentive payments were associated with reductions in client wait times, and whether changes in wait times were associated with client outcomes, using administrative data through the first full year following the start of the initiative (through 12/31/2018). Results of qualitative evaluation activities describing agency-reported facilitators and barriers to reducing wait times are also provided. The final evaluation will provide updated statistical analyses including data for the entire three-year initiative as well as updates to the qualitative evaluation based on conversations with participating agencies during the final year of the initiative.

#### *Methods*

Of 28 behavioral health agencies contracted to provide outpatient care at the time the OTOD initiative started, 23 participated in the initiative.

Participating agencies received incentive payments for performance on three metrics associated with rapid access to care:

1. Days to Offered Intake: percentage of clients offered an intake appointment within one day<sup>1</sup> of their initial request for service.
2. Days to Actual Intake: percentage of clients whose first intake service occurred within four days of their initial request for service.
3. Days to First Routine Service: percentage of clients who attended a follow-up “routine” appointment within seven days of their first intake service.

Agencies were also offered technical support, consulting services, and monthly tracking reports of performance relative to the OTOD metrics.

#### *Results*

Agencies felt positively about making process improvements toward rapid access to care, and believed the incentives helped them prioritize this work. Strategies agencies most frequently described to increase rapid access to care included:

- walk-in access

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<sup>1</sup> More specifically, business days excluding King County holidays.

- processes to schedule same-day appointments
- reductions in clinician documentation burden.

Common barriers to rapid access were special population service needs, client schedule preferences, and the challenges balancing service provision to both new and ongoing clients.

Overall, the OTOD initiative was associated with significantly reduced wait times for all three metrics. During the initiative, the average wait time for an offered intake for clients at participating agencies was 2 days, compared to 3.7 for clients requesting services at other agencies or before the initiative. Average days waited declined from 8.5 to 4.9 and 11.9 to 9.9 days for days to actual intake and days to routine service, respectively. All bivariate differences were statistically significant and the association between OTOD and reduced wait times was validated by multivariate regression models that accounted for many other authorization, client, and agency factors related to wait times.

Regression models suggest that while agency transitions to walk-in care had the greatest impact on reducing wait times, the OTOD initiative was associated with a statistically significant and substantively meaningful reduction in time waited for both an offer and actual intake, independent of whether an agency began walk-in models during OTOD participation.

Regression models also demonstrated that declines in wait times for routine service developed gradually over time. Mean wait times to first routine service showed significant declines over time for new clients at OTOD participating agencies, but not for those at other agencies, suggesting gradual, incremental improvement among OTOD participating agencies.

Rapid access to care was statistically significantly associated with the following client outcomes:

- Fewer days waited for the first routine service is associated with higher engagement with ongoing treatment.
- Contrary to expectations, those waiting fewer days for an intake had higher rates of ED utilization. While statistically significant, the magnitude is small (0.1 additional ED visits in the first 6 months, on average) and the relationship is likely due to issues jointly related to both rapid intake and ED utilization, such as clinical acuity.

### *Conclusion*

Agency enthusiasm for OTOD was high, and agencies made notable related process improvements, most commonly shifting from appointment-based intakes to walk-in and same-day intakes.

The introduction of the OTOD initiative was associated with significantly decreased wait time to offered and actual intake as well as a gradual decline over time in the wait time from intake to routine care. Shorter wait times were, in turn, related to greater subsequent treatment engagement, but not to crisis service or hospital utilization.

The OTOD initiative is scheduled to end in October 2020. As such, it will be important to determine how to sustain gains and continue to describe the successes and challenges associated with creating true treatment-on-demand.

## Introduction

The King County Outpatient Treatment on Demand (OTOD) initiative, implemented by the King County Behavioral Health and Recovery Division (BHRD) is an ongoing 3-year project (Oct 2017-Sept 2020) that seeks to increase rapid access to publicly-funded outpatient behavioral health care for individuals in King County through performance-based payment incentives. Increasing rapid access to care was hypothesized to result in increased treatment engagement and reduced hospitalizations, emergency department (ED) visits, and crisis services. The county imposed no requirements on agencies except that they participate in evaluation activities and agree to implement changes to improve timely access to care.<sup>2</sup> Of 28 eligible behavioral health agencies, 23 organizations agreed to participate.<sup>3</sup> Together, these participating agencies represent over 90% of new client authorizations for publicly funded behavioral health care in King County.

Bonus payments to participating agencies were based on the following three metrics associated with rapid access to care:

4. Days to Offered Intake: percentage of clients offered an intake appointment within one day<sup>4</sup> of their initial request for service.
5. Days to Actual Intake: percentage of clients whose first intake service occurred within four days of their initial request for service.
6. Days to First Routine Service: percentage of clients who attended a follow-up “routine” appointment within seven days of their first intake service.

The number of business days calculated for each of these measures for each new care authorization will be referenced repeatedly throughout this evaluation and may also be referred to as “wait times” or “rapid access to care performance.” Fewer days waited is considered better performance than a longer wait. When a client is said to “meet the OTOD target” for a measure, that client received that service within the number of days specified in the metric targets above.

The OTOD Evaluation Plan had five main aims:

1. To calculate targets and assess the performance of agencies participating in the OTOD incentive program to determine whether they qualify for bonus payments.
2. To examine whether and how performance-based incentive payments are associated with reductions in client wait times.
3. To examine whether and how changes in wait times are associated with changes in client outcomes.
4. To examine whether walk-in access is associated with changes in both wait times and client outcomes, independent of the effects of incentive payments and changing wait times, respectively.

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<sup>2</sup> 21 of 23 agencies also participated in a client satisfaction survey regarding access to care to check whether process changes adversely impacted client experiences. Survey responses suggest high levels of client satisfaction with access to care generally, and no declines in satisfaction were found since OTOD initiation.

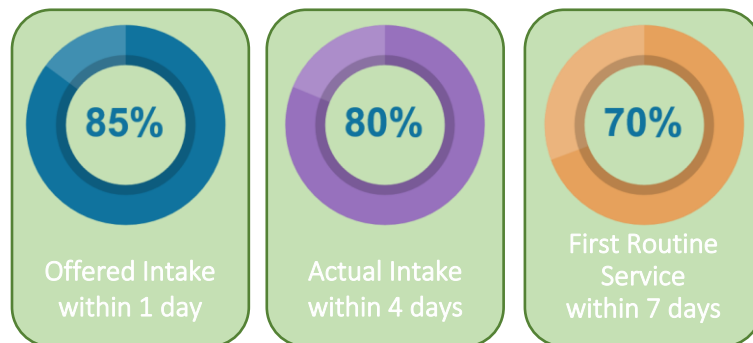
<sup>3</sup> One additional agency joined the initiative in mid-2019, bringing the total to 24.

<sup>4</sup> More specifically, business days excluding King County holidays.

5. To contextualize the quantitative performance evaluation with descriptive accounts of agencies' experiences with the initiative, including facilitators and barriers to change and effects on agency workflow and client satisfaction.

Aim 1 was implemented early in the project and is ongoing. County-wide targets for rapid access performance are represented graphically in **Figure 1**. Agency-specific performance goals are dynamic: targets are set twice a year based on agency performance relative to county-wide targets.

*Figure 1: King County Outpatient Treatment on Demand System-wide targets for days until intakes offered, actual intake completed, and first routine service following the intake.*



In addition to payment incentives, the County:

- Facilitated virtual learning community meetings in which participating agencies asked questions, shared challenges, and discussed solutions and best practices for providing rapid access to care;
- Sponsored National Council for Behavioral Health consultation (from MTM Services) to provide structured external review and advice for process improvements, especially the implementation of open (walk-in) access to care;
- Produced agency-specific monthly reports to track progress towards performance goals during the period;
- Provided technical assistance to fix data issues and improve overall data quality.

This report is an interim assessment of Aims 2-5 specified in the OTOD Evaluation Plan and should be interpreted within the context of the Program Guidelines (**Appendix A**) and the Evaluation Plan (**Appendix B**). The Program Guidelines provide detailed descriptions of agency expectations, performance measurement, and timelines for assessment and payment. The Evaluation Plan provides the theoretical justification for the research questions this interim evaluation aims to answer and the detailed technical specification of the models and measures used. The Evaluation Plan will frequently be referenced, and only deviations from this plan will be described in detail as needed.

In this report, a narrative of agency implementation, facilitation, and barriers (Aim 5) is presented first. Next, statistical model estimates are used to assess whether OTOD participation was associated with shorter wait times (Aim 2) and, if so, whether differences are explained better by OTOD participation generally or by the move to walk-in models of access to care (Aim 4). Finally, results of statistical model estimates are used to assess whether reductions in wait times were associated with key clinical outcomes (Aim 3).

## Implementation: What changes did agencies implement for OTOD? What are facilitators and barriers to rapid access to care (Aim 5)?

King County BHRD staff conducted in-person 30-90 minute interviews with one to three key informants from all 23 participating agencies during the first year of implementation. Data were analyzed qualitatively to elevate general themes. Analysis was completed in the first year of the program and learnings were circulated through the network and used to identify opportunities for process improvements. Principal takeaways are summarized below:

*Agency participation is motivated by a high degree of alignment between the initiative and agency goals.*

Agencies reported that OTOD's goals aligned with their internal service quality and patient engagement goals. Agencies felt OTOD was an opportunity to gain experience in value-based purchasing models, which was of growing importance to their work. Thus, agencies were highly motivated to make changes for OTOD, including changes whose costs were not fully covered by incentive payments.

*The most common strategy that agencies implemented to increase rapid access to intakes was to replace intake appointments with on-demand intakes*

The most common strategy implemented to increase rapid access to intakes was a shift to on-demand services, either through walk-in intakes or scheduling intakes on a same or next day basis. Agencies found that shifting to on-demand services reduced no-shows and increased the number of new clients they were able to serve. On-demand services require client and staff education and support during the shift in procedure. Agencies varied in the extent to which they accommodated client preferences for advance scheduling rather than walk-in or same-day appointments. Multiple agencies also reported implementing centralized scheduling to increase efficiency. Finally, many agencies reported changes to policies and procedures for data entry and documentation to reduce the burden of documentation on clinicians. These changes included collaborative documentation or restructuring workflows to move non-diagnostic components of the intake process to administrative staff.

*Specialized initial treatment sessions can start ongoing care quickly even when ongoing care providers require advance scheduling*

Agencies implemented several strategies for quickly engaging clients in post-intake, ongoing treatment. Some agencies assigned an ongoing case manager/clinician and scheduled the first routine service at the time of intake. Others provided an orientation or treatment planning session within a few days of the intake either with the client's case-manager, clinician, or another staff member. Patient preferences were frequently cited as a barrier to meeting the days to routine service targets. For example, patients may desire an appointment more than seven days after the intake to meet their scheduling needs.

*Diverse population-specific issues present multiple challenges to rapid access and engagement in care*

Client and population-specific issues beyond the control of an agency that were barriers to rapid access fell into three major categories: 1) requirements to coordinate with external parties other than the client and clinical staff, for example, assigning interpreters, meeting youth in school settings, receiving state approval to work with those in foster care; 2) client logistics, including transportation barriers or work and childcare obligations; and 3) low client motivation and the need for extensive outreach and follow-up before successfully entering treatment.

*On-demand intakes can produce challenges for prioritizing scheduling between established and new clients*

While shifts to walk-in and same day access increased agency capacity to respond to community demand for intake appointments, this also produced additional ongoing scheduling pressures. Several agencies reported challenges in timely client connections to clinicians for ongoing routine care due to staffing and treatment space limitations. In order for the expanded access enabled during the OTOD initiative to be sustainable in the long term, agencies may require additional support to strengthen other aspects of operations to handle high demand for services.

## Performance Evaluation: Do performance-based financial incentives reduce wait times (Aims 2 & 4)?

As described above, the qualitative evaluation clearly demonstrated that agencies implemented extensive changes as a result of participating in this initiative. What these qualitative accounts do not provide is an assessment of how effective the initiative has been in reducing observed wait times. The remainder of this evaluation uses administrative data on the more than 40,000 new authorizations for outpatient care reported from agencies during 2017-2018.

Simple descriptive statistics suggested that participation in the OTOD initiative was associated with shorter wait times on all three metrics. The mean number of days between a person's request for service and the first date offered for an intake at participating agencies during the initiative was 2 days, compared to 3.7 for clients requesting services at other agencies or before the initiative. The mean number of days between a person's request for service and the first date offered for an intake declined from 3.7 to 2 days, while the mean wait time for an actual intake was reduced from 8.5 to 4.9 days. Differences in wait times for routine care for clients seeking care from agencies participating in the OTOD initiative were smaller, with a modest decline from 11.9 to 9.9 days. These differences were statistically significant for all three metrics.

To test the hypothesis that the OTOD initiative had an independent effect on wait times (controlling for other factors that could affect wait times), we estimated multi-level regression models to predict the number of days waited for each of the three rapid access to care outcomes. We followed the framework laid out in the evaluation plan, including measures indicating OTOD status, walk-in availability, time trends, and client and agency characteristics as follows<sup>5</sup>:

- Indicator for whether the agency was participating in the OTOD initiative at the time of a client's request for service
- Indicator for whether the agency was offering walk-in access to care at the time of a client's request for service (to assess whether changes in rapid-access performance were due to this specific change in practice or the OTOD initiative more generally)
- Linear time trend and day of week indicators (to differentiate OTOD effects from any background time trends in wait times or client outcomes)
- Client-level factors at the time of the authorization for service
  - Demographics (gender, race/ethnicity, age)

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<sup>5</sup> While all covariates from the Evaluation Plan were included originally, some variables were removed to allow model convergence or to improve model fit (evaluated by information criterion comparisons and in-sample predictive accuracy).

- Behavioral health diagnoses (e.g., bipolar or schizophrenia spectrum disorders)
- Housing status at time of the initial request for service (i.e., housed, homeless, temporarily housed, in residential care, foster care)
- Past outpatient mental health, substance use, or medication-assisted treatment (MAT)
- Past psychiatric hospitalizations
- Agency characteristics at the time of the authorization for service
  - Caseload: total clients per active provider (a provider is ‘active’ if any services are reported as provided by that individual at that agency during the week of the request for service)
  - Intake caseload: intake clients per active intake/assessment-qualified provider (active provider defined as above, limited to providers with credentials required to conduct intakes)
  - Percent of agency staff qualified to conduct intakes/assessments

### Time to Intake Offered and Actual Intake

**Figure 2** shows the estimates for the association between OTOD participation and the availability of walk-in appointments on the days waited for an *offered* intake, controlling for other model variables<sup>6</sup>. Similarly, **Figure 3** shows the estimated relationships between the days waited for an *actual* intake and OTOD participation, walk-in availability, and the date of the request for service. The slope of the line represents the size of the overall effect. Controlling for other factors, an agency’s participation in OTOD is associated with an average of 1.6 days to an offered intake for a typical client, compared to 2.4 days for a typical client at agencies not participating in OTOD. Similarly, a typical client at OTOD participant agencies received their actual intake an average of 4.4 days following the request for service, compared to 6.7 days for typical clients at non-OTOD participant agencies. Note that client time to service was highly variable. The confidence intervals surrounding the point estimates (the shaded bands) reflect the magnitude of our certainty in these estimates.

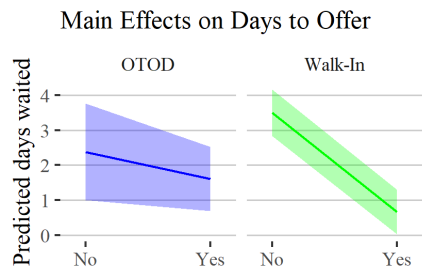
Measured independently of the overall OTOD initiative, implementation of walk-in access led to predicted wait times for an offered intake of less than one day for a typical client, a decrease of 2.8 days from the predicted wait time for a similar client and agency without walk in access. An agency changing from an appointment-only model to at least partial walk-in access availability was associated with a decrease in typical clients’ wait times of 2.8 and 3.8 days for the time to offered and time to actual intake, respectively. The magnitude of this change is not surprising, given that a move to walk-in access means that a new client’s request for services (and often their actual intake) is usually on the same day that they come into the clinic.

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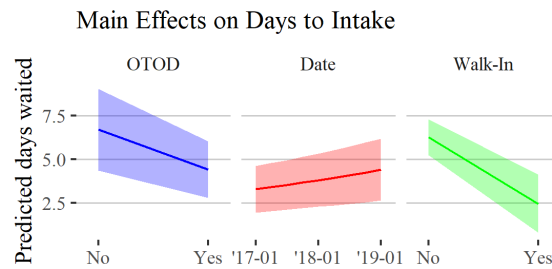
<sup>6</sup> Predictions from regression estimates represent the expected mean value of the outcome of interest, given fixed levels of all the contributing explanatory variables. Predictions were computed with the request for service date fixed at 12/31/2018 (unless date is the variable of interest) and all control variables were set to the median value. Thus, the predicted days waited in figures or text represents the average days a ‘typical’ client waited for services at the end of the evaluation period, under different hypothetical conditions (OTOD, walk-in, homeless, etc.). The phrase “controlling for other factors” or similar language indicates that we are describing outcomes for “typical” clients. The reader can assume any estimates of counts (i.e., expected number of days waited) were calculated this way.



**Figure 2:** Predicted days waited for an offered intake/assessment: effects of OTOD and walk-in availability with 95% confidence intervals



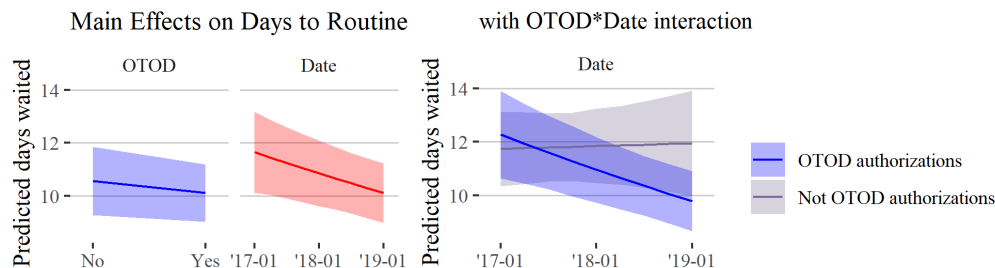
**Figure 3:** Predicted days waited for an actual intake/assessment: effects of OTOD, date, and walk-in availability with 95% confidence intervals



### Time to Routine Service

Estimates of the association between days waited for routine service and the OTOD initiative are shown in **Figure 4**. Walk-in availability did not have a statistically significant effect on the wait for routine service and is not shown. Initial regression models, represented in the left-hand panel of **Figure 4**, did not find a statistically significant drop in days to first routine service for clients served by OTOD participant agencies as compared to clients of non-participant agencies.

**Figure 4:** Predicted days waited for routine service: effects of OTOD and date, with and without the OTOD and date interaction.



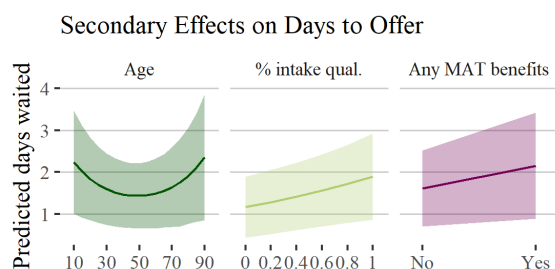
However, these initial regression models indicated that the expected days to first routine service decreased over time. Further descriptive exploration of the data indicated the downward trend began at the start of the OTOD initiative. To test whether the overall time trend may be attributable to gradual improvement in time to routine service among agencies participating in OTOD, regression models were refitted to test the interaction between date and active OTOD participation. Updating the models to allow this interaction both improves the model fit and provides empirical support for the descriptive intuition. The interaction term is large and significantly negative, supporting the conclusion that the gradual trend of decreasing days waited for routine service depended on the introduction of the OTOD initiative. It is worth noting that with the interaction, the change in predicted days waited attributed to the introduction of OTOD was a decrease of only two days, a smaller magnitude effect than we saw with the time to intake measures. This modest effect, especially in the context of a gradual trend rather than a clearly delineated change with the start of the OTOD program, aligns with the narrative accounts of providers. In interviews and learning community meetings, agency staff reported greater challenges in making substantial improvements to the time to routine service, with fewer simple process changes available to help agencies improve performance.



## Other client and agency characteristics

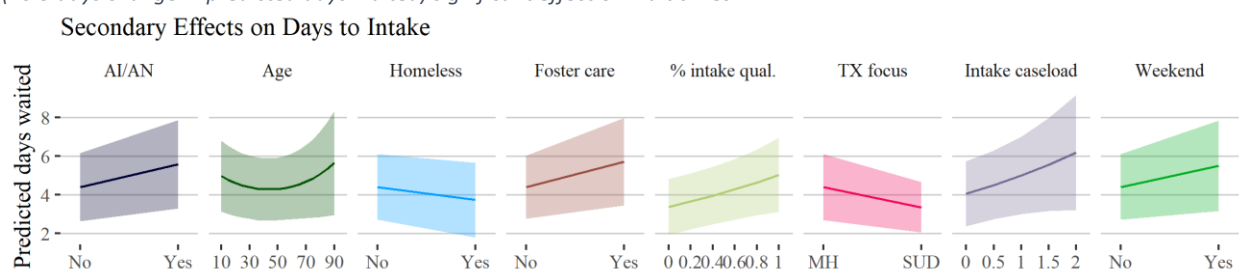
Fitting regression models that included a comprehensive array of agency and client control variables allowed us to identify other notable associations with rapid access to care. Any model variables that were associated with a statistically significant change of at least 0.5 days in the expected days waited for each wait time measure are highlighted below. Summaries of all modeled effects are found in **Appendix C**. **Figure 5** illustrates those agency and client characteristics that were associated with a large and statistically significant difference in days to intake offers. Age, whether a client received MAT in the past, and the percent of staff qualified to perform intakes were all significantly associated with the time to intake offered. No other model covariates produced statistically significant differences greater than 0.5 days. Age showed a curvilinear (U-shaped) relationship, aligning with agency reports of specific challenges in the youth and elderly (who may receive more care in the community or at schools, settings where agencies identified more barriers to rapid access). A client's previous MAT treatment was associated with increased days waited for the offered intake. The average days to an offered intake increased as the percentage of staff qualified to conduct intakes increases, controlling for other factors. While this observed relationship may seem counter-intuitive, a possible explanation may be that a higher percentage of intake-qualified staff implies a less specialized staff (many agencies, especially larger agencies may have a more diversified staff, with staff members unqualified for intakes available to provide ongoing care and/or case management). It could be possible that a more specialized staff mix leads to greater efficiency and responsiveness to changing demand for services. Further research could be useful to develop and test this hypothesis.

**Figure 5:** Additional variables that demonstrate a statistically significant and substantive (>0.5 days) effect on change in predicted days waited

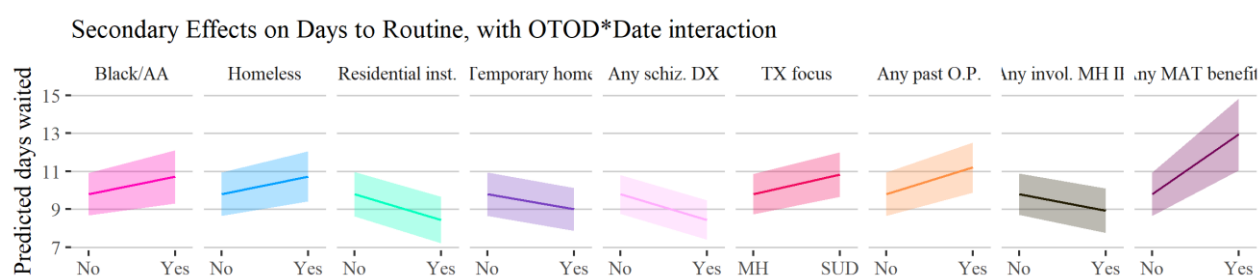


Compared to models of days to offered intake, a wider range of client and agency characteristics were substantively and significantly associated with the days waited for an actual intake (**Figure 6**). Clients who were homeless and clients seeking care for substance use disorders had shorter waits for actual intake than other clients. Foster care youth, American Indian/Alaska Native clients, and clients seeking care at agencies with a higher intake caseload showed significantly increased time to actual intake. Requests that come in on the weekend were also associated with longer waits for the actual intake.

**Figure 6:** Predicted days waited for an actual intake: effects of covariates that demonstrate a statistically and substantively (>0.5 days change in predicted days waited) significant effect on wait times



**Figure 7:** Predicted days waited for a first routine service: effects of covariates that demonstrate a statistically and substantively (>0.5 days change in predicted days waited) significant effects on wait times



Results for days waited for the first routine service contrast with those of days waited for intakes reported above. Clients who were homeless at time of request and clients seeking care for substance use disorders were associated with increased days to first routine service. Black/African American clients and clients with previous outpatient or MAT treatment also experienced longer waits to first routine service. Those who were living in residential care institutions or in temporary housing, had a schizophrenia spectrum diagnosis, or past involuntary mental health commitments waited, on average, fewer days for first routine service than persons without these factors.

### Additional modeling details

All models were estimated as multi-level models with agency-level intercepts to account for agencies' baseline practices related to rapid access. About 11% of all service authorizations (e.g., outpatient service authorization, MAT authorization, etc.) were for clients with more than one authorization during the evaluation period, including <1% who had 3 or more separate authorizations. To reduce bias, for clients with multiple new authorizations, one authorization was randomly selected for model estimation.

Counts of days waited were modeled using zero-inflated negative binomial models (ZINB), which are commonly used when both variability and the number of 'zero' counts are high. ZINB models model both the expected count (zero to infinity) and the probability that an observation is a "structural" zero, or an observation where zero is the only possible outcome<sup>7</sup>. This makes sense in wait times models: clients at clinics with walk-in appointment model would almost universally have no days between the request for service and intake. Meanwhile, a client at a clinic with a scheduled service model would be served at the next available time that is available to the client, which may or may not be the same day.

<sup>7</sup> For example, the number of cigarettes smoked in the past month by a non-smoker.

While ZINB models were chosen for the analysis, multi-level binary logistic models were also fit, with the outcomes dichotomized by whether the days to service was at or below the initiative's target thresholds (intake offered within 1 day, actual intake within 4 days, and routine service within 7 days of intake). While point estimates and statistical tests for significance varied slightly, the size and direction of main effects were consistent with ZINB models. **Figure 11** in **Appendix C** provides model summaries that can be compared with the results from the zero-inflated count models presented above.

## Policy Evaluation: Are reduced wait times associated with improved client outcomes (Aim 3)?

The OTOD initiative was motivated by the expectation that a shorter wait to initiate treatment would improve outcomes for clients. The evaluation plan hypothesized that rapid access to care would be associated with an increased level of subsequent treatment engagement and decreased utilization of ED, SUD residential services, crisis services, and involuntary hospitalizations. After a review of data availability, models were estimated to evaluate whether the days waited for the actual intake and first routine service were associated with the following clinical outcomes<sup>8</sup>:

1. Treatment engagement: whether a client had one or more additional services within 30 days of first routine service (binary outcome)
2. ED visits in the six months following the start of the authorization
  - a. Whether a client had any ED visits during the six months following (binary outcome)
  - b. The number of client ED visits during the six months following (count outcome)
3. Crisis events recorded in the six months after the start of the authorization
  - a. Whether a client had any crisis events during the six months following (binary outcome)
  - b. For clients with any crisis events in the preceding three years, the number of crisis episodes during the six months following authorization start (count outcome)
4. Involuntary psychiatric hospitalization in the six months after the start of the authorization
  - a. Whether a client had any involuntary psychiatric hospitalizations (binary outcome)
  - b. For clients with any involuntary psychiatric hospitalization events in the preceding three years, the number of involuntary hospitalization episodes during the six months following authorization start (count outcome)

For each outcome, two models were estimated, implementing two different ways of measuring wait times: one that included the number of days waited until actual intake and first routine service, and a second that included instead a dichotomous indicator of whether the authorization met the OTOD targets for days waited for actual intake and first routine service. Both sets of models included the same agency and client controls used in the performance evaluation above. Fitting these two different types of models provides an important check on the reliability of these results: using a dichotomous measure of whether the authorization met the OTOD wait time targets means that we can include a larger sample of clients in

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<sup>8</sup> This list of outcomes is revised from the Evaluation Plan. Crisis, commitment, and mobile crisis services were collapsed into a single outcome due to small numbers of events. Crisis respite services were excluded due to a suspension of the program contract. SUD residential treatment is also excluded as King County stopped receiving complete information on SUD residential treatment in 2019. Finally, only involuntary psychiatric hospitalizations are analyzed, as King County stopped receiving information on voluntary psychiatric hospitalizations in 2019.

our analysis, because we can include clients who had an intake session that demonstrated a need for care, but who never returned for a first routine service.

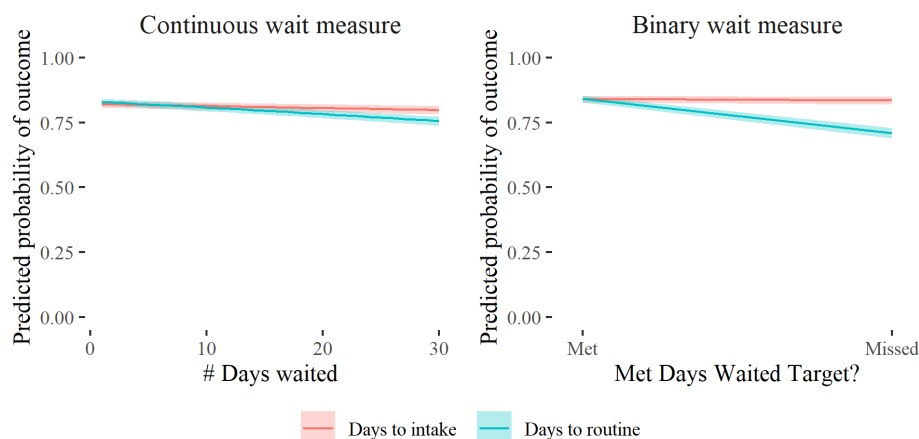
All outcomes were estimated with binary logistic regressions, assessing the extent to which wait times were associated with the presence or absence of key client outcomes. For the three system utilization outcomes (2, 3, and 4), we fit additional count models designed to provide further detail about the magnitude of any relationship between wait time and utilization outcomes. For the number of involuntary psychiatric hospitalizations and crisis events, analyses were limited to clients with a prior history of these events to better handle such rare events. Full model summaries are shown in **Figure 12** and **Figure 13** in **Appendix C**, and an overview of statistically significant results are presented below.

### Treatment Engagement

Models of treatment engagement support the hypothesis that shorter wait times are associated with higher rates of subsequent treatment engagement. There is strong positive support for a relationship with days to routine service and weak positive support for a relationship with days to actual intake.

Overall rates of treatment engagement are high, with 78% of all new clients receiving a second routine appointment within a month of their first routine service. Whether a client showed this type of treatment engagement was related to OTOD wait times. Specifically, among OTOD participating agencies regression models predicted that 83% of typical clients whose first routine service was within two days of their intake appointment would have a follow-up appointment in the following 30 days, compared to 78% for otherwise similar clients who waited 20 days for their first routine service. This relationship of treatment engagement with wait times is more pronounced when using the dichotomous measure of whether wait times met the OTOD target of 7 days. Models predicted that 84% of typical clients who met the 7-day target would have follow-up appointments in the next 30 days, compared to only 70% of similar clients who did not meet the OTOD target. Modeled effects for days to actual intake were statistically significant and in the same direction as the days to first routine service, but substantially smaller in size (as illustrated in **Figure 8**).

*Figure 8: Predicted probability of treatment engagement for different measures of wait times*

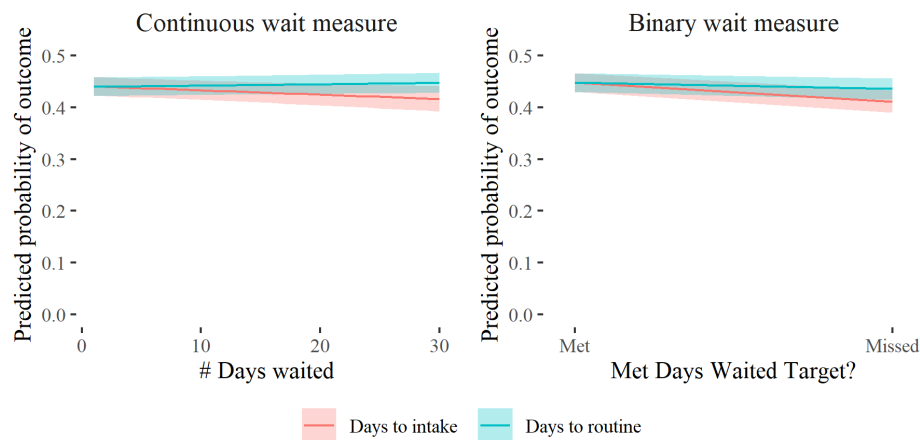


### Emergency Department (ED) visits

The Evaluation Plan hypothesized that fewer days waited for treatment would be associated with decreased likelihood of ED visits. Regression models did not generally support this hypothesis. Controlling

for other client characteristics, those who waited fewer days for an initial intake appointment were more likely to have one or more ED visits in the six months following their initial authorization. This relationship is the opposite of what was expected and may be due to unmeasured client characteristics associated jointly with both rapid intake and future ED utilization (such as greater clinical acuity). This negative association between wait time and ED visits was seen in models using both the exact number of days waited and simply whether or not the OTOD target was met. While statistically significant, the magnitude of this association is small, as illustrated in **Figure 9**. For typical clients, the probability of a future ED visit among those with an intake one day after request was estimated as 1.2% higher than those who waited 30 days for an intake. The days waited for the first routine service did not demonstrate a statistically significant (or substantively meaningful) relationship with the probability of one or more ED visits being reported in their Medicaid claim records.

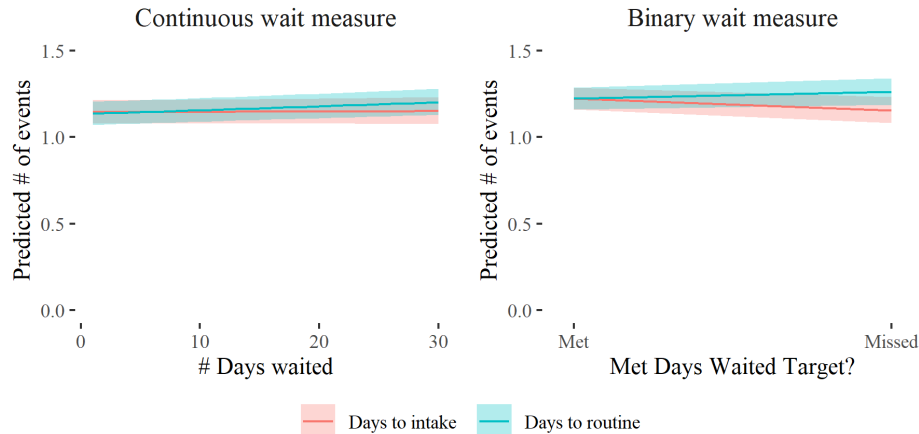
*Figure 9: Predicted probability of an ED visit for different wait time measures*



As illustrated in **Figure 10**, modeling the number of ED visits as a count<sup>9</sup> does not produce substantially different results to the binary models of whether clients had any ED visits. While the exact number of days waited for intake was not significantly associated with the number of ED visits, a typical client who met the OTOD target for days waited for an intake had a slightly higher predicted number of ED visits (0.1 additional visits) compared to similar clients who did not meet the OTOD target for days to intake.

<sup>9</sup> Specifically, with negative binomial models.

**Figure 10:** Predicted number of ED visits for different measures of wait times



However, the count models did produce one result that diverges from the general trend of shorter wait times either having no relationship or being associated with increased ED visits: The number of days waited to the first routine service was significantly positively associated with the number of client ED visits in the following 6 months. The association was very small, however: the average number of ED visits among those who waited 30 days for their first service was <0.1 visits greater than those who waited one day. When clients were categorized by whether they met the OTOD target for days to first service (rather than using the count of days waited), no statistically significant effect was observed.

#### Involuntary hospitalizations and crisis events

All regression models were estimated for involuntary hospitalizations and crisis events (outcomes 3a, 3b, 4a, and 4b of the Evaluation Plan). No significant associations were found between days waited for intake or routine care and either involuntary hospitalizations or crisis events.

## Conclusions

Agency enthusiasm for OTOD was high. Sites reported a variety of strategies to increase rapid access to an offer for an intake appointment as well as the actual intake appointment, including walk-in access, processes to schedule same-day appointments, and reductions in clinician documentation burden. Special population needs or service settings, client preferences, and balancing service needs of new and ongoing clients were frequently cited challenges to meeting OTOD service targets. Analysis demonstrated that the introduction of the OTOD initiative was associated with significant decreases in time to an intake offer and time to actual intake. Statistical models also demonstrated a gradual declining trend over time in the time to first routine service that was limited to OTOD agencies after the start of the initiative.

The evaluation plan outlined several hypotheses for how reduced wait times would be associated with improved client outcomes. This evaluation provided statistical support for the first hypothesis that wait times would be associated with treatment engagement, but analysis did not support the other hypotheses about the relationship of wait time to reduced acute care utilization measures. Specifically, clients who met OTOD targets were more likely to show subsequent treatment engagement as indicated by having additional follow-up appointments within 30 days of their first routine appointment (supporting the research hypothesis). ED utilization was shown to be associated with wait times, but the direction of the relationship contradicted expectations: clients with shorter wait times for a first intake appointment were

slightly more likely to have future ED visits. Days waited for routine services were largely unrelated to subsequent ED utilization. There was no statistically significant relationship between wait times and the number of subsequent involuntary psychiatric hospitalizations or crisis service utilization. Thus, while decreased wait times were associated with indicators of continued treatment engagement, there was no clear evidence for an association of decreased wait times with improvement in other clinical outcomes.

The OTOD initiative is set to end in October 2020, after which a final evaluation will be delivered. It is important to continue to monitor the successes and challenges of this initiative for emerging trends. As the project nears its end, King County and its partners will need to determine how to sustain gains in client service outcomes as the initiative matures and incentives are discontinued.



## Appendix A: Evaluation Plan

### Evaluation Plan

#### King County Behavioral Health Outpatient Treatment-on-Demand Initiative

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### 1. Evaluation Background and Aims

The demand for behavioral health treatment has been growing and behavioral healthcare systems must adapt to meet this increased demand. As with cardiovascular disease or other medical conditions, early assessment and treatment of behavioral health concerns is critical and starts with access to care. To avoid waitlists and improve efficiency, providers must be able to offer appointments when needed, understanding that while 90% of same-day appointments are kept, up to 50% of individuals with later appointments have been reported to no-show or cancel.<sup>10</sup>

The King County Behavioral Health and Recovery Division (BHRD) is responsible for administering the publicly-funded mental health and substance abuse treatment system in King County. This system includes outpatient, residential, and inpatient behavioral health services. Currently, only a handful of community behavioral health centers (CBHCs, hereafter agencies) contracted with King County BHRD offer same day access or treatment on demand. To increase timely access to outpatient behavioral health treatment, BHRD embarked on two strategies in mid-2016:

1. Working with Third Sector Capital Partners to design performance-based payments (i.e., bonuses) to incentivize agencies to meet performance targets for shorter delays between requests for appointments and receiving services. The performance metrics and targets were determined through negotiations between BHRD and agencies.
2. Contracting with MTM Services to provide consultation to agencies interested in implementing open access to care, defined as having appointments available on a walk in basis.

It has been hypothesized that addressing behavioral health needs quickly will have several positive effects:

- Improve treatment engagement by capitalizing on client motivation.
- Reduce no-shows and cancelled appointments.
- Reduce the likelihood of symptom escalation.
- Reduce the use of emergency and crisis services and hospitalization.
- Increase client satisfaction with access to care.

However, there does not appear to be extant research that has evaluated these hypotheses.

King County's initiatives to increase timely access to outpatient behavioral health treatment provide an opportunity to examine several of the above hypotheses, in addition to assessing the role of incentive payments and open access in reducing client wait times. The performance monitoring and evaluation of the OTOD program, thus, has five distinct aims:

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<sup>10</sup> Hixon AL, Chapman RW, Nuovo J. Failure to keep clinic appointments: implications for residency education and productivity. *Fam Med* 1999;31(9):627-30; Williams ME, Latta J, Conversano P. Eliminating the wait for mental health services. *J Behav Health Serv Res*. 2008 Jan;35(1):107-14

1. To calculate targets and assess the performance of agencies participating in the OTOD incentive program to determine whether they qualify for bonus payments (see program guidelines in the Appendix for definition of bonus payment criteria).
2. To examine the whether and how performance-based incentive payments are associated with reductions in client wait times.
3. To examine whether and how changes in wait times are associated with changes in client outcomes.
4. To examine whether open access is associated with changes in both wait times and client outcomes, independent of the effects of incentive payments and changing wait times, respectively.
5. To contextualize the quantitative performance evaluation with descriptive accounts of agencies' experiences with the initiative, including facilitators and barriers to change and effects on agency workflow and client satisfaction.

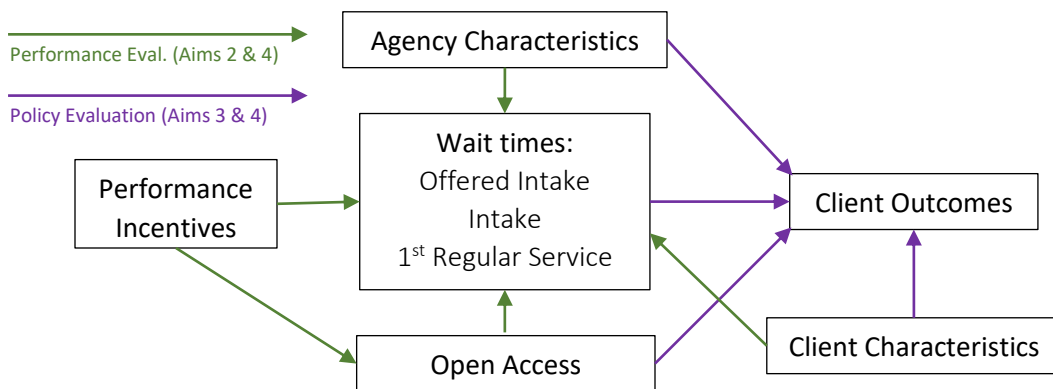
Aims 1-4 will be will be addressed with a quantitative evaluation using data on clients and key dates of services at each of the agencies that have signed on to participate in the Outpatient Treatment-on-Demand Initiative. The quantitative evaluation will use both agency-level and individual client-level measures based on agency service and Medicaid claims data available to the King County Department of Community and Human Services Performance, Measurement, and Evaluation staff. Aim 5 will be a separate qualitative evaluation, working with the agencies to identify areas of challenge and success, providing descriptive insights that may inform future discussions about treatment on demand strategies or building effective incentive programs within the county more generally.

## 2. Definition of the Treatment on Demand Intervention

The King County initiative to use performance-based bonus payments increase access to outpatient behavioral health treatment on demand is described in detail in the program guidelines in Appendix A. King County BHRD is not requiring agencies who participate in OTOD to implement a specific intervention. Instead, each agency will determine how to meet negotiated performance payment targets. For example, changes might include the development of open access hours to provide intakes on a walk-in basis or the development of streamlined documentation to improve the efficiency of the intake process. Agencies are given autonomy over the process changes they think will improve their wait times, and are encouraged to revise their plans as needed to improve performance. The only change implemented by King County is the conditional provision of bonus payments to participating agencies that meet their required targets.

## 3. Key Concepts and Measures

Defining several key concepts, and the expected relationships between them, is necessary to achieve the four evaluation objectives outlined above. The figure below illustrates key concepts and the relationships to be assessed to address Aims 2 - 4.



In brief, the availability of incentive payments for reduced wait times is expected to decrease the number of days clients must wait for intake and regular service visits, as well as increase the likelihood of an agency adopting open access, which itself is expected to decrease the number of days clients wait to receive an intake. Addressing client needs quickly has been hypothesized to improve client outcomes by increasing the likelihood of treatment engagement, which is expected to avert symptom escalation and reduce the use of crisis and emergency services and hospitalizations. Agency wait times and client outcomes are also expected to depend on individual agency and client characteristics, which will be included as control variables in analyses. Detailed definitions of these concepts follow.

### Definitions and Data Sources

**Clients:** Clients included in this evaluation are new clients who are authorized to receive an outpatient behavioral health benefit at an agency participating in the OTOD initiative.<sup>11</sup> A new client is defined as any patient requesting outpatient services at an agency who has not received outpatient or long-term carve-out services at that agency within the last 90 days. In the second half of 2016, agencies enrolled 13,109 new clients and during the first half of 2017 they enrolled 14,478 new clients. It is expected that similar numbers of new clients will be enrolled during the OTOD initiative.

**Authorization:** An authorization, for the purposes of this study, is a data transaction indicating a request by a contracting agency to provide a year-long outpatient benefit for a client that is granted by the BHO. Authorizations included in this evaluation are limited to those for ‘new’ clients: in which a ‘request for service’ transaction is paired with an ‘Initial authorization’ code (that is, there was neither a ‘vendor change’ nor a ‘continuation of benefit’ AND the authorization did not have an open outpatient benefit with the same ‘treatment focus’ within 90 days prior to the new authorization). A client may thus have multiple “new” authorizations during the program study period.

<sup>11</sup> Almost all the eligible agencies have opted to participate in the initiative. During the six-month Jan-June 2017 baseline period, these participating agencies accounted for over 93% of new authorizations. Given the small scale and idiosyncratic characteristics of the non-participating agencies, they will not be included in this evaluation.

**Incentive Eligibility:** Participation in OTOD will be measured as a binary indicator at the agency level (1= an agency submitted a Letter of Intent indicating their participation in the initiative; 0 otherwise).<sup>12</sup>

**Treatment on Demand:** Treatment on demand will be measured as the number of days a client must wait for services. Three different measures of wait times will be tracked for evaluation:

1. Time to Intake Offer: Business days between request for service and first offered intake.
2. Time to Actual Intake: Business days between request for service and first actual intake.
3. Time to Routine Service: Business days between first actual intake and first routine service.

Each of the measures is captured through existing, automated processes. Specifically, agencies use secure data transactions to submit data elements daily to King County BHRD, where they are integrated into a database nightly. Data elements include clients' unique BHRD IDs, agency IDs, outpatient benefit, and key dates.

**Open Access:** Open Access, having treatment available on a walk-in basis, will be indicated as present if an agency self-reports implementing open access policies, absent if it does not. The date when an agency began implementing Open Access will also be recorded. Agencies are asked in the Letter of Intent to indicate whether they currently have open access policies. Agencies that have already implemented Open Access are asked when they first implemented the policy. All agencies are asked to describe what changes they plan to make to increase Treatment on Demand. Agencies without existing Open Access policies will indicate in the Letter of Intent whether they will start implementing Open Access.

**Client Outcomes:** Client outcomes include measures of treatment engagement and service utilization as defined below:

<i>Outcome Measure</i>	<i>Expected Change</i>
1. Treatment Engagement: At least one additional outpatient service within 30 days of the first routine service. <sup>13</sup>	Higher
2. Utilization: Any voluntary psychiatric hospital admission (and #)	Lower
3. Utilization: Number of days in voluntary psychiatric hospital	Lower
4. Utilization: Any involuntary psychiatric hospital admission (and #)	Lower
5. Utilization: Number of days in involuntary psychiatric hospital	Lower
6. Utilization: Any contact with crisis and commitment services (and #)	Lower
7. Utilization: Any contact with mobile crisis services (and #)	Lower

<sup>12</sup> As part of the sign-up process, participating agencies will submit by the end of November a brief description of the changes they plan to implement. These action plans will be reviewed by the evaluation team. If a clear cluster of approaches to reducing wait times emerges, additional indicators may be included in the quantitative analyses classifying agencies by the type of change they will implement.

<sup>13</sup> This definition of treatment engagement, here applied to both mental health and substance use disorder services, is simplified from the statewide definition of SUD treatment engagement defined here: <https://www.dshs.wa.gov/sites/default/files/SESA/rda/documents/cross-system/SUD-Treatment-Initiation-and-Engagemen.pdf>

- |  |       |
|--|-------|
| 8. Utilization: Any contact with crisis respite services (and #) | Lower |
| 9. Utilization: Any emergency department visits (and #)          | Lower |

Each of these measures can be derived from data transmitted by agencies via secure network connections to the King County BHRD php96 management information system. As with service date information, data are uploaded and integrated nightly. Emergency department utilization, for Medicaid clients, is available in the King County ProviderOne Medicaid claims data extract.

**Client Characteristics:** Unique client characteristics, such as diagnosis category, are important confounders to any analysis of client wait times and individual outcomes. All individual- and authorization-level analyses will include measures controlling for individual client characteristics at the time of their request for service. These control variables include:

<i>Client-level Controls</i>	<i>Data Source</i>
Gender/Race/Ethnicity/Age	BHO php96 database
# of outpatient tier benefits over previous 3 years*	BHO php96 database
# of intensive outpatient benefits (3B) or carve outs (e.g., PACT, FISH, FACT, SSH) over previous 3 years*	BHO php96 database
# of voluntary hospitalizations over previous 3 years*	BHO php96 database
# of involuntary hospitalizations over previous 3 years*	BHO php96 database
# of crisis services over previous 3 years*	BHO php96 database
Diagnosis category (i.e., major depression, bipolar, anxiety, schizophrenia spectrum disorders, substance use (SUD), any other)	BHO php96 database
Homeless at time of service request or in past 3 years*	BHO php96 database
Incarcerated within King County in past 3 years*	BHO php96 database
# of outpatient SUD treatment admissions in past 3 years*	BHO php96 and Target databases
# of Methadone admissions in past 3 years*	Target and BHO php96 databases
# of detox admissions in past 3 years*	Target and BHO php96 databases
# of sobering contacts in past 3 years*	Sobering Center database

\* Data for this measure will be censored for individuals who moved into King County during the 3 years previous to the request for service.

**Agency Characteristics:** Agency characteristics such as client case mix, provider to patient ratio, size, or location may also constitute important control variables impacting wait times and client outcomes. Most

agency characteristics, such as size or location, remain constant over time and will be accounted for in multi-level regression modelling choices as described below. Two potentially time-varying characteristics, case mix and provider-to-patient ratios, will be calculated from case data submitted through existing automated data processes integrated daily into the DCHS database systems.

## 4. Evaluation Methodology

The evaluation methodology is designed to address each of the aims outlined in Section 1. Aims 1 – 3 will be addressed with three distinct quantitative research components, while Aim 4 (the role of Open Access specifically) will be folded into analyses that address Aims 2 and 3. Aim 5, contextualizing the agency and client experience of the Treatment on Demand initiative, will be addressed with qualitative engagement with agencies through interviews and group discussions, described in Section 4.4 below.

### 4.1 Aim 1 (Performance Monitoring)

This first evaluation component consists of performance measurement necessary to implement the incentive program, that is, a semi-annual assessment of whether each agency has met performance targets. The unit of analysis for Aim 1 is thus the individual participating agency (N = 23)

For this assessment, actual performance will be compared with established targets for each of the three metrics of client wait times. Agencies will be evaluated in terms of the percentage of new clients meeting target wait times for each time metric. See Appendix A for a detailed discussion of the methodology for defining targets, relevant time periods, and calculation of agency's performance with respect to those targets. In addition, DCHS evaluation staff will provide each agency with a monthly report of their progress towards the semi-annual targets.

### 4.2 Aims 2 & 4 (Performance Evaluation)

The performance evaluation is designed to estimate the relationship between an agency's participation in the OTOD incentive program, agency implementation of open access, and each of the three metrics for new client wait times. The unit of analysis for this evaluation is new client authorizations at participating agencies during the three years prior to the start of the program and the three years of program implementation (10/1/2014 – 9/30/2020).

#### 4.2.1 Estimation Strategy

The core question of Aim 2 is “does participation in the incentive program improve client access to treatment on demand?” – that is, do participating agencies see a reduction in wait times. This analysis is based on an implied counterfactual: that a participating agency's wait times would be higher were they not part of the Initiative. As agency participation in the initiative was not randomly assigned (which could provide an experimental test of this counterfactual claim), the evaluation team will use regression methods designed for use with observational data. As almost all eligible agencies chose to participate in the program, opportunities to compare wait times by participating and non-participating agencies are limited. Thus, the best available comparison is to contrast results before and after agencies' entrance into the incentive program.

This analysis will use multi-level time series regression models to separately model each wait time metric as predicted by agency participation in the performance payment initiative at the time of a request for service, agency implementation of open access policies at the time of the request for service, relevant time trend indicators (to improve comparability of authorizations over a six-year period), as well as client

and agency characteristics at the time of the new authorization. As each wait time metric is itself a count of numbers of days, we will use regression models appropriate for count distributions (such as Poisson or negative binomial).

The unit of analysis will be the authorization for service by a “new” client at an agency. Authorizations over time are not independent because they are clustered by agency and because a client can be a ‘new’ client more than once within the six year study period. Multi-level modelling methods will be used, specifically the lme4 package in the statistical software R. Models for this analysis will take the form:

$$(1) \quad W_{im} = \beta_P P_{at} + \beta_O O_{at} + \beta_X X_{cit} + \beta_A A_{at} + \beta_T T + \alpha_a + \eta_c + \varepsilon_i$$

where  $W_{im}$  is the number of days waited for each Treatment on Demand metric  $M$ ,  $i$  is an individual request for service,  $P_{at}$  is the indicator of whether the agency participated in OTOD at the time of the request for service ( $t$ ),  $X_{cit}$  is the vector of client characteristics at time  $t$ ,  $A_{at}$  is the vector of time-varying agency characteristics at time  $t$ ,  $T$  is the time trend,  $\alpha_a$  is the unique intercept (fixed effect) associated with each agency, (capturing time-invariant agency characteristics),  $\eta_c$  is the random error term associated with the individual client  $c$ , and  $\varepsilon_i$  is the random error term of the individual request for service itself. Time trends will be modelled following exploratory data analysis to establish the functional form of observed trends.

In addition, Aim 4 asks whether open access has its own a unique effect on improving treatment on demand. To address Aim 4, we will estimate versions of Equation (1) that include interactions between presence of open access ( $O_{at}$ ) and incentive participation ( $P_{at}$ ). These interactions allow us to examine the relative importance and interdependence of open access polices and bonus payments. Estimating these models separately for each wait time metric will allow us to differentiate impacts of both OTOD incentives and Open Access at different phases in clients’ engagement with agencies.

#### 4.3 Aims 3 & 4 (Policy Evaluation)

The policy evaluation is designed to assess whether and to what extent wait times are related to client outcomes (Aim 3). This evaluation will also examine any additional direct effect of Open Access on client outcomes beyond the effect of changes in client wait times (Aim 4). The evaluation will take as its unit of analysis each individual client who made a request for service at one of the 23 participating agencies during the three-year study period. Analyses will focus on treatment engagement in the month following the request for service and will track clients for six months after their request for service to estimate the extent to which decreased wait times are associated with decreases in “negative” client events. Some clients may have multiple new authorizations within the study period. For clients with multiple new authorizations during the overlapping six-month evaluation period one request for service will be selected at random and the other overlapping authorizations will be dropped from analysis.

#### Estimation Strategy

The evaluation will use three different estimation strategies to assess the relationship between wait time and client outcomes. The first strategy examines the association between wait times and clients’ engagement with treatment in the month following the request for service, while the second two examine the relationship between wait times and adverse outcomes over the six months following the request for service. The first model of adverse outcomes will treat client outcomes over the six months period as cumulative, for example using the total number of days in involuntary psychiatric hospital over that entire



period. The second will instead model the time to event for each category of event, for example the number of days from request for service to the first involuntary psychiatric hospitalization.

All models will also include indicators for the presence of open access policies at the time of request for service as well as client and agency characteristics as control variables. Exploratory data analysis will identify any important time trend or seasonality effects that will be included in the models as appropriate. As with the performance evaluation, , we will estimate versions of both Equations (2) and (3) that include interactions between wait times and open access policies, to assess the extent to which open access policies mediate the effect of wait time on outcomes, jointly addressing Aims 3 and 4.

#### *Logistic Models of Treatment Engagement*

One expectation of the treatment on demand initiative is that more responsive service will lead to better treatment engagement. The model of the association between wait times and treatment engagement will take the form:

$$(2) \quad Y_{ect_1} = \beta_I I_{ct_0} + \beta_S S_{ct_0} + \beta_O O_{at_0} + \beta_X X_{ct_0} + \beta_A A_{at_0} + \beta_T T + \alpha_a + \eta_c + \varepsilon_i$$

where  $Y_{ect_1}$  is a binary indicator of whether client  $c$  engaged in a second service within 30 days of their initial request for service,  $I_{ct_0}$  is the number of days the client waited for actual intake, and  $S_{ct_0}$  is the number of days the client waited for routine service after intake.<sup>14</sup> All other terms are defined as in Equation (1). As the outcome and observations in this analysis continue to be clustered in individuals and agencies, models will be estimated with multi-level logistic regression, using the lme4 package in R.

#### *Count Models of Adverse Outcomes*

Decreased wait times are also hypothesized to decrease the number of adverse events such as involuntary hospitalizations, use of crisis services, or appointment cancellation/no shows. These will be modelled both as cumulative counts and with a time-to-event analysis. The models of the association between wait time and the first, cumulative, treatment of patient outcomes will take the form:

$$(3) \quad Y_{kct_6} = \beta_I I_{ct_0} + \beta_S S_{ct_0} + \beta_O O_{at_0} + \beta_X X_{ct_0} + \beta_A A_{at_0} + \beta_T T + \alpha_a + \eta_c$$

where  $Y_{kct_6}$  is a count of instances of outcome  $k$  (from  $K$ , the set of all outcomes of interest) at time  $t_6$ , six months after the client  $c$ 's request for service. All other terms are defined as in Equation (2), although with only one observation per client. This is now a two-level model with no error term for the authorization. As the outcomes to be modelled are counts, we will implement regression methods based on appropriate distributions for count data (such as Poisson or negative binomial). Tests for overdispersion and structural zeros will be conducted and final model choice adapted accordingly. Models will continue to address the multi-level structure of the data (with clients nested in agencies), and will be fit using the Poisson family of estimators within the lme4 package in R.

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<sup>14</sup> The third wait time metric, days to offered intake, is excluded from these models because it is expected to be highly correlated with days to actual intake. The wait time to the actual intake has a stronger conceptual link with the goal of treatment on demand and thus is the metric included in the policy evaluation models.

#### *Time-to-Event Models of Adverse Outcomes*

Survival models of the relationship between wait times and time to event will be estimated via a Cox proportional hazard regression (which can use both categorical and continuous predictors) via the survival package in R. The general model will take the form:

$$(4) \quad h_{kc}(t) = h_0(t) \cdot \exp(\beta_I I_{ct_0} + \beta_S S_{ct_0} + \beta_O O_{at_0} + \beta_X X_{ct_0} + \beta_A A_{at_0})$$

where  $h_{kc}(t)$  is the hazard function for outcome  $k$  for client  $c$  (which is derived from the days to first event for that client) and  $h_0(t)$  is the baseline hazard function which is allowed to vary as a function of time. The covariate terms (which increase or decrease the hazard for each client) are defined as for Equation (2). To account for the clustered structure of the data, clustered standard errors by agency will be included in these models.

#### 4.4 Aim 5 (Qualitative Contextualization)

The quantitative performance evaluation was designed to understand, at an aggregate level, to what extent the incentive program is associated with improvements in the time clients wait for services. This high level impact evaluation is of central importance to assessing the value of the initiative overall. The three year period of the initiative also offers an excellent opportunity to build a descriptive context of the agency and client experience during this period of innovation and change. The proposed qualitative engagement with agencies is intended not to formally condition our analyses in the performance evaluation. Instead, this work has two broad goals. The first goal is to provide information supporting continued learning and improvement during the initiative, for example, helping to identify possible concerns with respect to client or provider experience as they emerge. The second goal is to describe perceived barriers and facilitators to change within the agencies that could serve as background information for the planning of future treatment on demand or pay for performance initiatives.

This qualitative engagement is expected to have three main components:

- 1) Engagement with providers to identify possible approaches to assessing client experience, to identify if and when practice changes in pursuit of decreased wait times have adverse effects on client satisfaction with services. Further evaluation activities may follow depending on the approach to assessing client experience that is agreed on within the agencies.
- 2) Interviews with at least one staff person at each agency participating in the OTOD initiative in the first and last six months of the three years of the initiative. This person will either be the individual identified by the agency as the primary contact for communication about the program, or another person they identify. These interviews will focus on developing an account of perceived barriers and facilitators to achieving shorter wait times. By conducting interviews toward the beginning and end of the initiative, it will be possible to capture changes over time in the agency experience of the initiative. For instance, barriers to the initial transformation of practices' intake and scheduling processes may differ from than the challenges agencies face as they approach the final performance targets. These interviews will also provide the opportunity to build in avenues for agency feedback to the county on the design and implementation of this pay for success process.
- 3) Regular "community of practice" calls or meetings, in which agencies can share their experiences, ask for help, and learn from and support each other during this period of organizational change.

## Appendix B: Program Guidelines

### **OUTPATIENT TREATMENT ON DEMAND (OTOD) Program Guidelines**

#### **A. Definitions**

1. Outpatient Treatment on Demand (OTOD): an initiative that aims to improve timely access to outpatient behavioral health care and follow-up for individuals seeking such care utilizing case rates, to pay the Contractor bonuses for high performance for delivering timely intake assessments and connection to routine care while maintaining high levels of patient satisfaction.
2. Bonus Payments: an incentive for Contractors to meet performance targets detailed in program-specific requirements below.
3. Baseline Period: a six-month period used to calculate Contractor performance targets.
4. Assessment Period: a six-month period in which Contractor improvement is compared to performance targets to determine bonus payments.
5. Payment Period: a six-month period in which Contractor receives bonus payments if performance targets are met in corresponding assessment period.
6. Key Dates Transaction: data transaction that includes Request for Service and First Intake Appointment Offered (see King County Behavioral Health Organization (BHO) Policy and Procedures).
7. Request for Service Date: as defined in the key dates data transaction.
8. First Intake Appointment Offered Date: as defined in key dates data transaction.
9. New Client: client requesting outpatient services from a Contractor who has not received outpatient or long-term carve-out services at that Contractor within the last 90 days.
10. Actual Intake: date that corresponds to the submission of an intake service encounter with an intake evaluation code as specified in the Division of Behavioral Health and Recovery (DHBR) Service Encounter Reporting Instructions for BHOs (SERI).
11. First Routine Service: date corresponding to the submission of the first non-intake, non-crisis service encounter after an outpatient benefit authorization for a New Client.
12. Medical Necessity Criteria: individuals who qualify for King County behavioral health services as defined by the Mental Health Medical Necessity Criteria and the Substance Use Disorder Medical Necessity Criteria (see King County BHO Policy and Procedures).

## B. Program-Specific Requirements

To receive bonus payments for providing OTOD, Contractors shall meet the following requirements:

1. Document, by November 30, 2017, planned and active processes to support Treatment on Demand. The County will not require the Contractor to deploy specific strategies, such as Open Access, but will require the Contractor to report what strategies are chosen and how they are implemented. Please indicate in your document whether your agency is currently, or will be, implementing Open (walk-in) Access to outpatient care and the extent to which it is/will be implemented (e.g., all mental health and substance use disorder, partial, etc.). If your agency already provides walk-in access, please indicate when this form of access to outpatient care was initiated.
2. Participate in the evaluation of OTOD, including collection of patient satisfaction data.
3. Performance incentive requirements:
  - a. The County will establish Contractor-specific growth targets toward a county goal for each performance metric. Contractors that meet their growth target or exceed the county goal during an assessment period will receive the full bonus for that metric in the corresponding payment period. An overview of these terms is below. To facilitate Contractors' ongoing understanding of performance, the County will provide Contractors with monthly performance data over the trailing six-month period.

### Contractor growth target Calculation Methodology

Component	Description
<b>A Performance Metric</b>	Definitions for the Time to Intake Offer, Time to Actual Intake, and Time to Routine Services
<b>B County Goal</b>	Ideal level of performance provided by contractors for each performance metric
<b>C Growth Percentage</b>	Fixed % change needed in each Assessment Period to reach County Goal within three years
<b>D Contractor Growth Target</b>	Contractor-specific growth target to earn bonus payment

### Sample Contractor Specific Performance Targets

Contractor	<b>A</b> Performance Metric	Baseline Period Performance	<b>B</b> County Goal	<b>C</b> Growth Percentage	<b>D</b> Contractor Growth Target	Perf. Required in Assessment Period
Contractor A	Offered Intake within 1 day	65% w/in 1 day	85% w/in	25%	$(85-65) * .25 = 5\%$	<b>70%</b>
Contractor B		45% w/in 1 day	1 day		$(85-45) * .25 = 10\%$	<b>55%</b>

b. Performance Metrics: the assessed time between two dates<sup>15</sup> shall be:

i. Time to Intake Offer:

$$\frac{\text{\# of New Clients with First Intake Appt Offered on same or next day of Request for Service}}{\text{\# of Authorizations for New Clients with Request for Service}}$$

ii. Time to Actual Intake:

$$\frac{\text{\# of New Clients receiving First Actual Intake within 4 days of Request for Service}}{\text{\# of Authorizations for New Clients with Request for Service}}$$

iii. Time to Routine Service:

$$\frac{\text{\# of New Clients receiving First Routine Service within 7 days of First Actual Intake}}{\text{\# of New Clients meeting Medical Necessity Criteria during Actual Intake}}$$

c. Growth Target Calculation: A Contractor's per period growth target is calculated as follows:

$$\text{Contractor Growth Target} =$$

$$(\text{County Goal} - \text{Contractor performance in Baseline Period}) * \text{Growth Percentage}$$

It is understood that Contractor performance may decline in certain assessment periods. If this occurs, the County will use the prior assessment period's required performance level to determine bonus payment instead of recalculating a lower target.

d. County Goals for each Performance Metric:

i. Time to Intake Offer: shall be 85 percent of clients receiving first intake appointment offered within the same or next day of request for service;

ii. Time to Actual Intake: shall be 80 percent of clients receiving first actual intake within four days of request for service; and

iii. Time to Routine Service: shall be 70 percent of clients receiving first routine service within seven days of first actual intake.

e. Growth Percentages for each Performance Metric: (shown below) the consistent percentage of the difference between the county goal and any Contractor's baseline period performance that must be achieved over any semi-annual assessment period to receive bonus payment in the corresponding payment period. A Contractor performing above the county goal will receive the full bonus for that metric.

i. Time to Intake Offer – 25 percent of difference each Assessment Period

ii. Time to Actual Intake – 35 percent of difference each Assessment Period

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<sup>15</sup> Each of these calculations are exclusive of weekends (i.e., Saturday / Sunday/ [King County Holidays](http://www.kingcounty.gov/courts/district-court/court-dates-and-fees/holiday-closures.aspx) (<http://www.kingcounty.gov/courts/district-court/court-dates-and-fees/holiday-closures.aspx>))

- iii. Time to Routine Service – 35 percent of difference each Assessment Period
- f. Incentive Size and Performance Metric Weighting:
- i. If the Contractor meets performance targets in a given assessment period, the Contractor shall earn a two percent bonus on their uniform benefit on all outpatient benefits during the corresponding payment period.<sup>16</sup>
  - ii. For each performance metric, Contractor performance is judged on an all-or-nothing basis (i.e., met the Contractor growth target or county goal – or did not). If a Contractor does not meet their growth target/county goal for a specific performance metric, they are not eligible for a bonus payment for that metric.
  - iii. The Contractor shall receive payment based on the following weights:

Performance Metric	Case rate bonus	% of total bonus pool
Time to Intake Offer	0.5 %	25%
Time to Actual Intake	0.5 %	25%
Time to Routine Service	1.0 %	50%

Example: The Contractor meets Time to Actual Intake (25%) and Time to Routine Service (50%) goals during an assessment period but does not meet Time to Intake Offer (25%) goal. That Contractor would receive 75 percent of the maximum bonus payment, or 1.5 percent bonus on outpatient benefits during the corresponding payment period.

g. Managing Missing Data

Each of the proposed performance metrics is calculated as the difference between two date elements submitted by the Contractor. When calculating performance levels, the County will exclude authorization records in which the first date is missing and treat instances in which the second date is missing as a non-success. The table below lays out how each data element is treated for each performance metric.

Performance Metric	First Date	Second Date
Time to Intake Offer	Request for Service	First Offered Intake
Time to Actual Intake	Request for Service	Actual Intake
Time to Routine Service	Actual Intake	First Routine Service

<sup>16</sup> Intake-only authorizations are included in calculation of Time to Intake Offer and Time to Actual Intake metrics; however these authorizations are not included in Outpatient Benefits eligible for receiving bonuses.

If the County notices a substantial change in data quality or completeness for data elements involved in this initiative, the County will initiate a discussion with the Contractor. If the issue cannot be resolved, it will be forwarded to the contract monitor to determine whether it may impact incentive payments.

h. Patient Satisfaction Qualifier Metric: *will be defined with participating agencies.*

i. Payment Timing

i. October, 2017-March, 2018: Full bonus payment (2% of Outpatient Benefits) will be made on the 15th of each month for the given month (e.g., December 15, 2017 for December, 2017, etc.) regardless of actual performance.

ii. April, 2018-September, 2018: The County will calculate earned bonuses during March, 2018 to begin payment in April, 2018, in order to take into account data submission lags. The monthly payments for this period will be based on the Contractors' performance during the period August, 2017-January, 2018 to allow for a 30-day data submission lag and a month for analysis and reporting. Recognizing that this includes some months prior to the initiation of the incentive program, the County will require only **half** of the expected growth percentage (relative to section 3.e. above):

Time to Intake Offer – 12.5%

Time to Actual Intake – 17.5%

Time to Routine Service – 17.5%

iii. October 2018-March 2019 and beyond. The County will calculate earned bonuses during September 2018 to begin payment in October 2018. The monthly payments for this period will be based on the Contractor's performance during the period February 2018-July 2018 to allow for a 30-day data submission lag and a month for analysis and reporting. Performance calculation will occur as defined in section 3a-h.

#### **Timeline for Baseline, Assessment, and Payment Periods<sup>17</sup>**

	2017												2018												2019												2020											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S			
Payment																																																
Assessment																																																
Baseline																																																

<sup>17</sup> Since the first Payment Period (October, 2017 – March, 2018) is not contingent on performance, there is no Baseline or Assessment.



## Appendix C: Model summaries

### Models of days waited: count models and logistic models

**Figure 21:** Summary of regression results for days waited/wait targets met on OTOD status, Walk-in availability, and other covariates. “Increase” means the variable increases the expected number of days waited, “decrease” means the variable decreases the expected days waited. Models included random intercepts for agencies and omitted variables that reduced model fit or convergence without substantively changing estimates of key variables: OTOD, walk-In, and date. Sample size decreases between outcomes: the study population with data on each metric is a subset of the population with data on the preceding metric, from 37,185 unique clients for days to offer to 29,135 unique clients for days to routine.

	Days to offer		Days to intake		Days to routine			
OTOD	decrease	decrease	decrease	decrease	not sig.	decrease	not sig.	not sig.
OTOD: zero-infl.			decrease					
Date	increase	decrease	increase	not sig.	decrease	decrease	not sig.	not sig.
OTOD*Date						decrease	decrease	
Walk-in	decrease	decrease	not sig.	decrease				
Walk-in: zero-infl.	decrease		decrease					
Weekend	not sig.	not sig.	increase	increase				
Female	decrease	not sig.	not sig.	not sig.	not sig.	increase	not sig.	increase
Age	decrease		decrease					
Age-squared	increase		increase					
Age group: youth		increase		increase	not sig.	decrease	not sig.	decrease
Age group: older		increase		increase	increase	not sig.	increase	not sig.
AI/AN	increase	decrease	increase	increase	not sig.	not sig.	not sig.	not sig.
Asian	decrease	not sig.	not sig.	not sig.	not sig.	not sig.	not sig.	not sig.
Black/AA	not sig.	not sig.	increase	not sig.	increase	not sig.	increase	not sig.
NH/PI	decrease	not sig.	not sig.	not sig.	not sig.	not sig.	not sig.	not sig.
Other race	decrease	decrease	not sig.	decrease	not sig.	not sig.	not sig.	not sig.
White	not sig.	not sig.	not sig.	not sig.	not sig.	not sig.	not sig.	not sig.
Hispanic	not sig.	not sig.	not sig.	decrease	not sig.	not sig.	not sig.	not sig.
Multiple Race	not sig.	increase	not sig.	not sig.	not sig.	not sig.	not sig.	not sig.
Interpreter required	increase	increase	not sig.	increase	not sig.	decrease	not sig.	decrease
Homeless	not sig.	decrease	increase	decrease	increase	increase	increase	increase
Homeless: zero-infl.	decrease		decrease		increase		increase	
Foster care	not sig.	increase	increase	increase	not sig.	not sig.	not sig.	not sig.
Residential inst.	decrease	increase	decrease	not sig.	decrease	not sig.	decrease	not sig.
Residential inst.: zero-infl.	increase		increase		increase		increase	
Temporary home	not sig.	decrease	increase	decrease	decrease	not sig.	decrease	not sig.
Minimum distance	not sig.	increase	not sig.	increase	not sig.	increase	not sig.	increase
TX focus: SUD	decrease	decrease	decrease	decrease	increase	increase	increase	increase
Diagnosis: schiz.	not sig.	decrease	increase	increase	decrease	decrease	decrease	decrease
Diagnosis: bipolar	decrease	decrease	decrease	not sig.	not sig.	not sig.	not sig.	not sig.
N bookings	not sig.	decrease						
N MAT benefits	increase	not sig.			increase	increase	increase	increase
N Sobering	not sig.	not sig.						
N invol. MH	increase	increase			decrease	decrease	decrease	decrease
N vol. MH	not sig.	not sig.						
N OP benefits					increase	increase	increase	increase
N SUD resid.					not sig.	decrease	not sig.	decrease
Caseload					not sig.	not sig.	not sig.	not sig.
Intake caseload	not sig.	not sig.	increase	increase				
% qualified	increase	decrease	increase	not sig.	not sig.	not sig.	not sig.	not sig.
	ZINB	Logit	ZINB	Logit	ZINB	Logit	ZINB interact.	Logit interact.

## Binary client outcomes:

**Figure 3:** Summary of regressions results of binary client outcomes (did the event happen in the 6-month follow up) on days waited and client/agency/time controls. Outcomes are summarized in columns; direction of significant estimates for a given outcome was constant across model specifications using count or binary measures of wait times and so are collapsed for simplicity. Note that count and binary waits were never included in the same model. “Negative” means that the given variable decreases the probability of the client reporting a specific outcome in the six-month follow up period. “Positive” means that the variable increases the probability of seeing the specific outcome. Note that interpretation of “# of days” and “met target” results are the inverse of each other: a positive effect of “# of days” indicates that the outcome becomes more likely as the number of days increases, while a positive effect of “met target” indicates that the outcome becomes more likely when the wait time target is met (i.e., when the wait time is low). All models estimated fixed effects (unique intercepts) for agencies. To improve model performance with unbalanced data, specific client or agency controls were omitted when they adversely affected model fit or convergence without substantively changing estimates for key predictors of interest: days to routine service and days to intake.

	Crisis	ED	Invol Psych.	Treat. engage.
# days to intake -	not sig.	negative	not sig.	negative
# days to routine -	not sig.	not sig.	not sig.	negative
Met intake target -	not sig.	positive	not sig.	not sig.
Met routine target -	not sig.	not sig.	not sig.	positive
Walk-in -	negative	positive	not sig.	not sig.
Date -				negative
Female -	not sig.	positive	not sig.	not sig.
Age -	positive	positive	positive	negative
Age-squared -	negative	negative	negative	positive
AI/AN -	not sig.	positive	not sig.	negative
Asian -	not sig.	negative	not sig.	not sig.
Black/AA -	not sig.	positive	not sig.	negative
NH/PI -	not sig.	not sig.	not sig.	not sig.
Other race -	negative	not sig.	not sig.	not sig.
White -	not sig.	not sig.	not sig.	not sig.
Hispanic -	not sig.	not sig.	not sig.	not sig.
Multiple Race -	not sig.	positive	not sig.	not sig.
Interpreter required -	not sig.	positive	not sig.	not sig.
Homeless -	positive	positive	positive	negative
Foster care -		not sig.	not sig.	not sig.
Residential inst. -	not sig.	not sig.	not sig.	negative
Temporary home -	positive	positive	positive	not sig.
Any schiz. DX -	positive	positive	positive	positive
Any bipolar DX -	positive	positive	positive	not sig.
Any SUD DX -	not sig.	positive	not sig.	not sig.
Any depres. DX -		positive		not sig.
Any other DX -		positive		not sig.
Past crisis -	positive			
Past MH invol. -			positive	
% qualified -				positive
	Crisis	ED	Invol Psych.	Treat. engage.

## Count client outcomes

**Figure 43:** Summary of count model regression results of the number of instances of specific client outcomes during the six-month follow-up period on days waited and client/agency/time controls. Outcomes are summarized in columns; direction of significant estimates for a given outcome was constant across model specifications using count or binary measures of wait times and so are collapsed for simplicity. Note that count and binary waits were never included in the same model. “Negative” means that the given variable decreases the probability of the client reporting a specific outcome in the six-month follow-up period. “Positive” means that variable increases the probability of seeing the specific outcome. Note that interpretation of “# of days” and “met target” results are the inverse of each other: a positive effect of “# of days” indicates that the outcome becomes more likely as the number of days increases, while a positive effect of “met target” indicates that the outcome becomes more likely when the wait time target is met (i.e., when the wait time is low). All models estimated fixed effects (unique intercepts) for agencies. To improve model performance with unbalanced data, specific client or agency controls were omitted when they adversely affected model fit or convergence without substantively changing estimates for key predictors of interest: days to routine and days to intake.

	Crisis	ED	Invol Psych.
# days to intake -	not sig.	not sig.	not sig.
# days to routine -	not sig.	positive	positive
Met intake target -	not sig.	positive	not sig.
Met routine target -	not sig.	not sig.	not sig.
Walk-in -	not sig.	positive	not sig.
Date -		positive	
Female -	not sig.	positive	not sig.
Age -	not sig.	positive	not sig.
Age-squared -		negative	not sig.
AI/AN -		positive	not sig.
Asian -	not sig.	negative	not sig.
Black/AA -	not sig.	positive	not sig.
NH/PI -	not sig.	not sig.	not sig.
Other race -	not sig.	not sig.	not sig.
White -	not sig.	not sig.	not sig.
Hispanic -		not sig.	not sig.
Multiple Race -	not sig.	not sig.	not sig.
Interpreter required -	not sig.	positive	not sig.
Homeless -	not sig.	positive	positive
Foster care -		not sig.	not sig.
Residential inst. -		not sig.	negative
Temporary home -	not sig.	positive	not sig.
Any schiz. DX -	positive	positive	positive
Any bipolar DX -		positive	not sig.
Any SUD DX -	not sig.	positive	not sig.
Any depres. DX -		positive	
Any other DX -		positive	
# past int. benefits -			positive
	Crisis	ED	Invol Psych.

## Appendix D: Comparison of client characteristics for OTOD and non-OTOD authorizations

**Figure 54:** This figure summarizes the difference in means of client characteristics for non-OTOD and OTOD authorizations. Points in the plot show the difference between the mean of each characteristic within non-OTOD authorizations used in regression models minus the mean for all OTOD authorizations used in regression models. For continuous variables (indicated with \*) the difference in standardized means is reported (adjusting for very different ranges in the variables). For binary variables (all other) the difference between raw means is reported: this represents the difference in proportion of the population with the indicated characteristic in each group. A negative value indicates that the characteristic is less common or smaller in the non-OTOD population. While there is some variation in how similar the OTOD/non-OTOD authorizations are for different characteristics, the key thing to note in this plot is how small the differences are, with many characteristics having a difference close to zero and most having differences less than 0.05. For example, any depression diagnosis (diagnosis\_depress) is reported for 35% of OTOD clients and 23% of non-OTOD clients, producing a mean difference of 0.03.

