

University of California, Davis
Behavioral Health Center of Excellence
California State Evaluation and Learning Support (Cal SEALS) for
SB-82 Triage Grants

Summary: Draft Summative Evaluation Plan for Adult/TAY Programs

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Background

In collaboration with the Mental Health Services Oversight and Accountability Commission (MHSOAC) and the University of California, Los Angeles (ULCA), UC Davis is conducting a program evaluation of county mental health triage services. Through the Mental Health Services Act of 2013 (SB-82), 15 counties were awarded \$20 million in triage grant funds. The 15 programs funded by the SB-82 triage grants to serve Adult/TAY individuals are designed to fulfill several roles along the continuum of crisis care, including providing crisis intervention, crisis stabilization, mobile crisis support, intensive case management, and linkage to services across care sectors. They may include Medi-Cal reimbursable targeted case management, peer support, and crisis services. Crisis services may be delivered through mobile programs and located at various settings in the community, including hospitals, emergency departments (EDs), schools, emergency placement shelters, foster homes, community clinics, jails, juvenile justice settings, homeless shelters, crisis intervention centers, law enforcement settings, nursing homes, and Veterans offices. The goal of these programs is to provide timely assessment and immediate support, referrals, and access to settings that support stabilization and are least restrictive.

The MHSOAC's specified outcomes for the Adult/TAY grants are to: (1) expand crisis prevention and treatment services; (2) improve client/family experience and recovery outcomes, and reduce costs; (3) reduce hospitalizations and inpatient days; (4) reduce recidivism and law enforcement expenditures; and (5) expand crisis-recovery early intervention and treatment options.

In this document we describe the plans for conducting the impact evaluation of the adult and transitional age youth (TAY) programs being implemented in the 15 counties across the state. The goal of the program evaluation is to assess the feasibility, effectiveness, and generalizability of mental health triage services in those counties.

UC Davis values the professional and lived experiences of persons working either with or affected by these mental health triage programs. We have assembled a Stakeholder Committee, including a client, a family advocate, direct service providers (physician, mental health administrator, and a nonprofit representative),

a law enforcement representative and involved community members to provide us feedback in developing the evaluation and understanding our findings. The funded county programs are also collaborating in this evaluation.

Introduction: SB-82 Evaluation Project

This document outlines the Summative Evaluation Plan for the adult/TAY programs being implemented in 15 counties across the state. The plan uses a mixed methods approach including quantitative and qualitative components.

The quantitative evaluation aims to address five key evaluation questions (described in detail below) using client and service data, along with additional SB-82 program-specific data, obtained directly from SB-82 grantees. The Crisis Continuum (Appendix 1) - a conceptual framework describing the treatment stages of mental health crises - provides the organizational structure for the analysis. Counties will be aggregated according to the Crisis Continuum stage targeted by their SB-82 programs. The impact of these programs will be measured using a range of analytic approaches described in detail below, integrating critical contextual factors based on stakeholder feedback into analyses. Options for linkage of these data with other local and state-wide data will be explored.

The aim of the qualitative component of the evaluation will be hypothesis generating, rather than hypothesis testing. The aim is to explore how the different crisis programs impact individual clients' path to recovery and well-being from the perspectives of the clients, their family members, providers, community partners, and other community stakeholders.

Our overall goal is to provide an understanding of how county SB-82 expansions changed the client experience/outcomes and will produce critical knowledge that can be used to continue improving community-based behavioral health services throughout California in the future.

Quantitative Evaluation

To conduct a rigorous quantitative analysis that addresses stakeholder needs and can be implemented with available data, our framework specifies four key elements: 1) population, 2) exposure/intervention, 3) comparator, and 4) outcome. Each of the five evaluation questions summarized below identifies all four key elements.

The evaluation team used the information gathered in county interviews to identify the stage(s) of the crisis continuum targeted by each SB-82 program, and clustered counties into overlapping sets of priority clusters. Clustering allows us to compare groups of counties in a meaningful way and permits the construction of larger samples to improve statistical power and provide more variation in outcome variables.

We propose three priority clusters based on the mapping of county SB-82 programs onto the crisis continuum: First Responder, Crisis, and Linkage. The First Responder cluster consists of Butte, Humboldt, Los Angeles, San Francisco, Sonoma, and Yolo counties. The Crisis cluster consists of the city of Berkeley, Los Angeles, Merced, Sacramento, San Francisco, Stanislaus, and Tuolumne counties. The Linkage cluster consists of Alameda, Butte, Calaveras, Humboldt, Merced, Placer, Sacramento, San Francisco, Tuolumne, and Ventura counties, along with the city of Berkeley.

Analysis Plans for Key Evaluation Questions

Question 1: Among behavioral health clients, do SB-82 programs for Adults/TAY reduce the rate of psychiatric hospitalizations?

To address this question, we will assemble client-level data for a cohort of approximately 9,000 individuals from each priority cluster for a calendar period of at least 2 years prior to SB-82-funded program expansions and at least 2 years post-expansion. We will use statistical (log linear Poisson) models and an event history analysis framework for recurrent events to estimate and compare adjusted age-specific hospitalization rates before and after program expansions, with statistical adjustment for potential confounding variation such as client demographics, client mental health history, and county-level contextual factors identified by our stakeholder committee. This approach allows us to account for time-varying indicators of program exposure as well as between-client variation in time at-risk for hospitalization arising from different entry and exit dates of clients from the cohort. We will implement this approach by dividing each person's follow-up time into nonoverlapping person-periods, updating time-varying independent and dependent variables accordingly, and entering the natural log of the person-period length into the model as an offset. In secondary analysis, we will use quantitative data on program implementation, which we will collect as part of our Formative Evaluation Plan, to develop time-varying quantitative measures of program implementation, quantifying how variation in program implementation is associated with changes in age-specific hospitalization rates.

Additionally, we will evaluate the specific effects of different program types on clients using variables that encode the priority cluster classifications to form subgroups of interest and/or to fit interaction terms involving the cluster classifications and the intervention term. These strategies allow us to assess whether intervention effects vary according to the stage of the crisis continuum programs each county are designed to target.

The primary outcome variable will be based on the client-service level "service function" variable collected by counties for reporting to the Client & Service Information (CSI) database. This variable records whether a client received services at a hospital. We will code an indicator variable that takes the value 1

when, for the given person-period, a client receives hospital-based services for a given encounter and a zero otherwise. Regression of this outcome variable on the post-SB-82 indicator and age, along with a set of client and county-level covariates, in a multiple Poisson regression analysis with robust standard errors will allow us to estimate a treatment effect of SB-82 on the age-specific rate of hospitalization.

Question 2: Among counties receiving SB-82 grants, did SB-82 expansions reduce the rate of mental health emergency department encounters?

To address this question, we will obtain ED encounter data linked to hospital admission from California's Office of Statewide Health Planning and Development's (OSHPD) database for all counties. This dataset will contain longitudinal data for all clients with at least one ED encounter for a primary mental health diagnosis at least one year prior to, and one year after the SB-82 expansion, and will include those discharged from the ED and those requiring hospital admission. We will model mental health ED encounters as the realization of a multi-stage model wherein a person begins as "not at risk" (0 ED encounters). After their first emergent mental health crisis within the timeframe of the data, the client becomes "at risk" of repeated ED encounters (1 ED encounter). Finally, an "at risk" client could return to the ED for treatment of an emergent mental health crisis, in which they become a "repeated ED crisis" client (2+ ED encounters). An effective countywide crisis intervention should reduce the rate at which an "at risk" client transitions to the "repeated ED crisis" state. Using count data regression models, such as the Poisson models described above, we will compare the rate of repeated ED encounters over time between counties with and without expanded crisis services under SB-82 with statistical adjustments for client-specific controls, county-level demographic and economic characteristics, and stakeholder contextual factors, such as differences in Medi-Cal managed care plans across counties. In addition, we will repeat the analysis on the subset of EDs at hospitals most likely to be utilized by county mental health clients (as identified by the county programs). Focusing on rates of utilization in these targeted hospitals will be most likely to reveal impacts of the SB-82 programs on ED utilization for mental health crises.

Question 3: Among clients seeking county mental health crisis services, do SB-82 programs reduce the time law enforcement officers spend with crisis clients?

This evaluation will focus on the First Responder priority cluster and the approximately 9,700 individuals these counties expect to serve during the study period. Evaluating this question will depend crucially on the quality of data collected by counties in the SB-82 supplemental dataset. Thus, we have identified two methods that rely on different types of data to maximize our ability to credibly answer this evaluation question. The first method uses baseline time tracking data from counties tracking the amount of time a law enforcement officer spends in the

field with an individual in mental health crisis. This baseline sample will consist of all the available encounters from the initial period of data collection in the early stages of program implementation. Using baseline data together with post-baseline data, we will estimate the effect of full program implementation on law enforcement time-in-the-field by regression using a generalized linear model framework appropriate for nonnegative outcomes. Model selection will depend on the distribution of the client-level cumulative time-in-field outcome. This method is susceptible to bias introduced by confounding client- and county-level variation, which we will address by controlling for client characteristics and mental health history, as well as controls for county characteristics and local access to care. This analysis will provide estimates of the effect of the mobile response teams on the average amount of time a law enforcement officer spends in the field with an individual experiencing a mental health crisis.

An alternative strategy will estimate and compare the probability a law enforcement response to mental health crisis results in an arrest or jailing. This method is derived from the hypothesis that a mobile response team should divert crisis clients from being arrested or jailed. We will assemble a sample of all mobile response team encounters, logged calls, and law enforcement responses available from SB-82 counties in the supplemental dataset. In counties where mobile response teams are only available within specific hours of operation, we will compare the likelihood a law enforcement response results in an arrest just before and just after mobile response services become available. This quasi-experimental design, called regression discontinuity, assumes the probability an individual experience's a mental health crisis is independent of the mobile response team's hours of operation (Thistlethwaite and Campbell, 1960). That is, as long as the occurrence of mental health crises are randomly assigned within small windows of time around opening and closing of mobile response services during a given day, we will be able to directly observe the causal effect of mobile response teams on the probability an individual in mental health crisis is arrested or jailed. While assignment of clients to either side of opening/closing is likely to be approximately random, clients are not randomly distributed across counties, so we will need to account for potential county-level confounders, such as socioeconomic factors and access to care. This alternative method relies on more detailed data, but data that may be available from counties based on Triage round 1 data collection reports provided by the MHSOAC.

Question 4: Among SB-82 programs linking behavioral health clients to follow-up mental health services, were clients more likely to utilize post-crisis behavioral health services?

The evaluation team will assemble a cohort of approximately 9,000 county behavioral health clients seen in the Linkage priority cluster from at least 1 year prior to and at least 1 year after implementation of the SB-82 service expansion to estimate the effect of service expansions on the utilization of post-crisis services.

The outcome of interest is whether clients were more likely to utilize follow-up behavioral health services in the 6 weeks following a mental health crisis encounter as measured by the probability a client is observed receiving post-crisis services. We will use electronic health record (EHR) data provided by SB-82 linkage counties to observe whether a client received post-crisis community-based services. Moreover, we will observe when a client receives linkage services within the county behavioral health system and whether the client subsequently utilizes those services within a 6-week period. An indicator variable will be coded "1" when we observe utilization of post-crisis services and zero otherwise. We will analyze this outcome variable using fixed effects multiple logistic regression to estimate the probability a client utilizes follow-up behavioral health services. We will estimate the effect of the SB-82 expansion of linkage services on this outcome by comparing the change in probability due to the expansion of linkage services within the linkage priority cluster. Optionally, we could also compare the outcome variable across linkage and non-linkage SB-82 grantee counties.

A simple pre-post or between-county analysis, however, will not account for selection due to client-specific confounders. A credible estimate of the effect of expanded linkage services must account for selection bias. We can adjust for this problem by using client-level data from the county mental health EHRs to predict the probability a client would receive linkage services in an SB-82 linkage county in the post-period, a dependent variable to be constructed from the "service function" variable in county EHR data and SB-82 supplemental service data. Using the estimated conditional probability of receiving linkage services, we will match clients from the pre-SB-82 period, or from SB-82 grantee counties not focused on service linkage, to clients in linkage counties after the SB-82 expansion using the coarsened exact matching algorithm. This method constructs credible treatment and control groups assuming the distribution of pretreatment characteristics is the same for individuals with the same conditional probability of receiving SB-82 linkage services. Eliminating selection bias in this way allows us to estimate the average effect of the treatment on the treated, or the difference between an individual's outcome when she is treated and her counterfactual outcome in a world in which she was not treated (Dehejia and Wabha, 1999).

Question 5: Among counties receiving SB-82 grants, do SB-82 expansions reduce recidivism among behavioral health clients?

This evaluation question is relevant to all SB-82 grantees; we will assess this evaluation question for all priority clusters. As part of the data collected by the counties, we will obtain conviction data for all behavioral health clients in the 18 months prior to SB-82 program implementation up to the date of data collection (see Data Sources for more details). We will assemble a cohort of approximately 9,000 or more individuals per priority cluster who were county mental health system clients (extracted from the county mental health EHRs) during a calendar period that includes at least 18 months prior to SB-82-funded program expansions

and at least 18 months post-expansion. We will use log-linear Poisson models and an event history analysis framework for recurrent events to estimate and compare adjusted age-specific recidivism rates before and after program expansions, with statistical adjustment for potential confounding variation such as client demographics, mental health history, and county-level contextual factors identified by our stakeholder committee. This approach allows us to account for time-varying indicators of program exposure as well as between-client variation in time at-risk for recidivism arising from different entry and exit dates from the cohort. We will implement this by dividing each person's follow-up time into non-overlapping person-periods, updating the time-varying independent and dependent variables accordingly, and entering the natural log of the person-period length into the model as an offset. In secondary analysis, we will use quantitative data on program implementation to quantify how variation in program implementation is associated with reductions in age-specific recidivism rates.

In addition, we will evaluate the specific effects of different program types on clients served by these programs, using variables that encode the priority cluster classifications to form subgroups of interest and to fit interaction terms involving the cluster classifications and the intervention term. These strategies allow us to assess whether intervention effects vary according to the stage of the crisis continuum programs in each county are designed to target.

Data Sources

The primary data to support our evaluation of costs and outcomes will be obtained directly from counties and will consist of county-delivered service and client data based on information counties already report to California's CSI system. The counties providing this data can flag clients receiving SB-82 funded services. Such data includes hospitalizations and services targeted for reduction through expansion of crisis intervention services. In addition, the data will allow the evaluation team to estimate the cost of services delivered. We are also exploring linking our county data to state data sets, including data available from OSHPD and the Department of Justice (DOJ).

Contextual Factors Data Based on Stakeholder Feedback: Stakeholders identified two particularly important contextual factors we should include in our quantitative evaluation plan: differences in access to public transportation between counties and differences in Medi-Cal managed care plans between counties. To account for potential confounding variation related to access to public transportation, we will include county-level information on public transportation infrastructure from the California Transit Association. To account for potential confounding variation related to differences in the quality and level of service across Medi-Cal managed care plans across counties, we will include county-level information on client experience and overall quality collected annually at the county-level for each managed care plan by the California Department of Health Care Services.

County Characteristics: The evaluation team will need to account for differences in socioeconomic characteristics across counties. We will utilize county-level data from the American Community Survey (ACS) for the relevant years of the evaluation period. The ACS is a monthly household survey conducted by the Census Bureau to collect detailed personal and household characteristics from across the United States. The Census Bureau uses the ACS to produce annualized, detailed household and population characteristics for every county in California, including socioeconomic information that covers topics such as employment, income, and housing. The evaluation team will use this detailed county-level data to inform the quantitative analysis method and to control for important county characteristics correlated with the outcomes of interest.

Qualitative Evaluation

A qualitative evaluation of the SB-82 programs will also be conducted. These analyses will evaluate the programs in relation to the MHSOAC's goals, including the ability to: improve client experience of care and recovery outcomes, reduce recidivism and law enforcement expenditure, and expand recovery-oriented treatment options. Each of these goals will be explored with a range of stakeholders using semi-structured interviews focusing on the aims described below.

Method: In order to address the aforementioned MHSOAC goals above, qualitative semi-structured interviews with clients, family members, mental health crisis service providers and law enforcement officers will be conducted. Each interview will be audio-recorded and transcribed with any identifiers removed. The data will consist of the deidentified transcripts of the interviews, conducted via a secure videoconference.

Prior to recruitment, interview guides will be developed by the evaluation team to address each study goal. These interview guides will be reviewed by the UC Davis Stakeholder Committee and SB-82 providers, clients, and family members prior to the interviews being conducted, and will be amended based on stakeholder feedback.

Participants: We will aim to purposively recruit approximately 55 participants in total: 15 clients, 15 family members, 10 law enforcement partners, and 15 providers. It is anticipated that saturation of the main themes should be met with this many participants. However, if saturation is not met, then additional participants will be recruited. Due to high prevalence of Spanish speakers across the state of California, qualitative interviews for clients and family members will be offered in both English and Spanish.

Participant Incentives: Participants will be compensated \$30 in gift cards to take part in the qualitative interview, which in addition to the consent process should

take approximately 90 minutes. Outside of the financial incentives of taking part, there are not expected to be any direct benefits to the participants. However, participants will be informed that their involvement may provide indirect benefits, namely providing significant insights into best practices for triage services as they are implemented in the future.

Data Analysis: The transcripts will be hand-coded by at least two qualitative researchers and analyzed utilizing an inductive approach to thematic analysis. Stakeholders will be involved in both the development of the interview guide, and in the interpretation of the findings by way of reviewing the coding framework, to ensure that their perspectives were accurately reflected in the work.

Finally, we will adopt a mixed-methods approach and integrate the findings from the quantitative analysis with those of the qualitative analysis to provide context and integration of findings. This will integrate input provided by county program staff, county SB-82 clients, client family members, and local law enforcement agencies.

References

Dehejia, R. H., & Wabha, S. (1999). Causal effects in nonexperimental studies: Reevaluating the evaluation of training programs. *Journal of the American Statistical Association*, 94, 1053-62.

Thistlethwaite, D., & Campbell, D. (1960). Regression–Discontinuity analysis: An alternative to the ex post facto experiment. *Journal of Educational Psychology*, 51: 309–317.

Appendix 1. Crisis Continuum

The Crisis Continuum is a conceptual framework that maps mental health care services into the three stages of mental health crisis: the pre-crisis/preventive stage, the acute crisis stage, and the post-crisis referral/follow-up stage. It is used to understand which mental health care services a patient in crisis needs on their path toward recovery.

CONTINUUM OF ADULT/TAY CRISIS INTERVENTIONS

