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Child and Adolescent
Mental Health Division

Annual Evaluation Report
Fiscal Year 2003

Prepared by
Eric L. Daleiden, Ph.D.

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Child and Adolescent Mental Health Division
Annual Evaluation Report Fiscal Year 2003
Executive Summary

This report summarizes the results of the annual internal evaluation for fiscal year 2003 conducted by the Child and Adolescent Mental Health Division (CAMHD). The purpose of this report is to provide detailed analysis and critical review of the information gathered during the annual evaluation process. Since the Interagency Performance Monitoring Report (http://www.state.hi.us/doh/camhd/index.html) now provides a regular summary of system performance measures, the goal of this annual evaluation was to analyze and describe changes to CAMHD over the past three fiscal years from July 1, 2000 to June 30, 2003. Key findings included:

1. Smaller Population. The overarching finding from this evaluation was that the overall population of youth registered to CAMHD declined by approximately 46% from fiscal year 2001 to fiscal year 2003. This decline was evident after accounting for major structural changes to the system by excluding youth receiving less intensive, outpatient services only, and excluding those youth with Pervasive Developmental Disorders.

2. Changing Population. Compared to earlier years, the CAMHD population in fiscal year 2003 tended to be younger, have a higher proportions of multiethnic, White, and Native Hawaiian or Pacific Islander youth, suffer more comorbid psychiatric diagnoses, be more involved with other child serving agencies, receive a high level of service intensity, and receive proportionately more out-of-home services. The annual populations were of parallel gender composition, scored similarly on standardized measures of functioning and service needs, were served at relatively uniform overall rates, and were discharged at proportionately similar rates with comparable improvements in child status.

3. Services Adjusted. Youth have tended to receive more services per year that were more likely to be out-of-home services received for shorter durations at any specific placement, except for therapeutic foster home. Community high risk residential, community residential, and multisystemic therapy services were proportionately expanded whereas out-of-state, partial hospitalization, day treatment, respite, and less intensive services were contracted. In accord with the overall population decline, the total number of youth served, amount of services provided, and total expenditures decreased during the study period.

4. Placement Predictors. Youth were more likely to receive out-of-home services if they were older, multiethnic, White, or Native Hawaiian or Pacific Islander, involved with other child serving agencies, registered at Hawaii or Leeward Oahu, or suffering from comorbid diagnoses, disruptive behavior disorders, substance-related disorders, or mood disorders, but not attentional disorders.

5. Results for Youth. The CAMHD service system effectively helped the majority of its youth to experience improved functioning and decreased service needs that prepared them for successful management in outpatient services within a 9 to 18 month service episode.

6. Child Improvement Predictors. Hospital residential, therapeutic group home, and multisystemic therapy services were settings most associated with reliable improvements in functioning, whereas intensive in-home services were associated with maintaining stability. Youth with mood or substance-related disorders were more likely to show child status improvements and youth with disruptive behavior were less likely to show improvements.

7. Competing Efficiencies. Service efficiencies were gained in the overall cost per hour of service, but these gains were offset by increases in the number of service hours provided per youth and resulted in higher average expenditures per youth. Thus, the system appears to have adjusted service intensity to maintain the historical level of treatment gains and generated cost savings per service hour that were insufficient to offset the higher intensity, so that average expenditures per youth increased.

Executive Summary: Key Results

Overall Population

1. Overall decline in population size (-1,177 registered youth per year; -698 youth with services procured per year), total services provided (-245,586 hours per year), and service expenditures (-$13 million per year) from fiscal year 2001 to 2003.
2. Youth most likely to terminate registration were receiving case management only, not involved with DHS, older, suffered from a single disorder, or belonged to a single ethnic group.
3. Relative declines in the population size were localized to the Honolulu Oahu, Big Island, and Maui Family Guidance Centers, with an absolute increase in size at Family Court Liaison Branch.
4. Increasing admission rates were related to the development of Family Court Liaison Branch and approximately ½ of youth are discharged at some point during the year, indicating a steady flow through the system with approximately 50% of youth discharged by 9 months and 75% discharged by 18 months.
5. Minimal change in gender composition but increased proportion of multiethnic, White, and Native Hawaiian or Pacific Islander youth, and the average age of registered youth decreased by approximately 1 year to 14.4 years.
6. Service eligibility remained predominantly IDEA and Rehabilitation Act Section 504, but QUEST youth accounted for an increasing proportion of youth with services procured.
7. Considerable stability in diagnostic categories was evident, but rate of comorbid diagnoses increased. Largest increases were for mood (+5%), disruptive behavior (+4%), anxiety (+3%), and substance-related (+3%) diagnoses.
8. Youth tended to enter CAMHD services with impaired functioning that required multiple intensive and integrated mental health services and were discharged with functioning that was appropriate for continued outpatient management.
9. Average functioning at intake and average rate of improved functioning have remained consistent despite the increased diagnostic and interagency complexity of the population.

Service Utilization

1. Despite overall population decline, the proportion of youth served (-2% of registered youth per year) declined relatively little.
2. A decrease in average cost per unit of service (-$2 per hour) was offset by an increase in average service intensity per youth (+66 hours per year) so an overall increase in average cost per youth (+$445 per registered youth per year; +$1,756 per youth with services procured per year) resulted.
3. High and low utilization groups were identified based on service hours received and expenditures.
4. Youth involved with DHS or Family Court were disproportionately represented in the high utilization group.
5. Youth with greater service volatility (i.e., experiencing more provider agency changes) were more common in the high utilization group.
6. Older age and the presence of comorbid diagnoses were associated with higher utilization during two of the three years studied.
7. Aside from the obvious finding that out-of-home services predicted higher utilization, no clear pattern of specific services discriminated high from low service utilization.

Out-of-Home Services

1. Overall declines in population (-61 youth per year), service intensity (-96,272 hours per year), and service expenditures (-$3 million per year).
2. Relative increase in number of youth served out-of-home (9% of youth with services procured per year) and in the average proportion of all services per youth that were provided out-of-home (+9% per year).
3. Decreased length of service at all out-of-home levels of care except for therapeutic foster homes.
4. Increase in average cost per unit of service (+$1 per hour per year) and relatively stable service intensity per youth (-5 hours per youth per year) yielded increased average cost per youth (+$2,032 per registered youth per year; +$4,498 per youth with services procured per year). These higher relative costs for out-of-home services were being predominantly driven by a larger relative proportion of youth accessing out-of-home services, whereas unit cost and service intensity made smaller contributions.
5. Youth most likely to receive out-of-home services were older, multiethnic, White, or Native Hawaiian or Pacific Islander, involved with other child serving agencies (DHS, Family Court, or Incarcerated/Detained), suffered from multiple disorders, disruptive behavior disorder, mood disorder, or substance-related disorder, and were registered with the Hawaii or Leeward Oahu family guidance centers.
6. Youth with a primary attentional disorder were less likely to receive service out of their home.
7. As increased placement in out-of-home services has coincided with continued improvement in child functioning and regular discharges, the overall increases in service intensity appear reasonable for promoting therapeutic change.

Specific Services

1. Community high-risk residential, community residential, multisystemic therapy increased in relative proportion of youth served and in total number of youth served.
2. Therapeutic group homes, therapeutic foster homes, intensive in-home, and flex services increased in proportion of youth served but decreased in total number of youth.
3. Intensive day stabilization and respite homes increased in total number of youth served but accounted for a negligible portion of the service population.
4. Hospital residential remained fairly stable in relative use but decreased in total number of youth served.
5. Out-of-state, partial hospitalization, day treatment, respite, and less intensive decreased in relative use and in total number of youth served.
6. The flow of youth through services showed mild increases for all services except flex services suggesting that some reductions in length of service were achieved within specific settings.

Introduction

The Hawaii Department of Health is organized into three administrations, Behavioral Health Services, Health Resources, and Environmental Health. The Child and Adolescent Mental Health Division (CAMHD) is a division of the Department of Health's Behavioral Health Services Administration, which also includes the Adult Mental Health Division and the Alcohol and Drug Abuse Division. The mission of CAMHD is to provide timely and effective mental health services to children and youth with emotional and behavioral challenges, and their families. These services are provided within a system of care that integrates Hawaii's Child and Adolescent Service System Program principles, evidence-based services, and continuous monitoring.

Background

Two federal lawsuits have played an important role in the development of children's services over the past decade. First, in 1991, the State of Hawaii settled a class action lawsuit with the U. S. Department of Justice for violations of the civil rights of individuals residing at Hawaii State Hospital. Because youth were residing at Hawaii State Hospital at that time, CAMHD participated in the lawsuit. Second, in 1994, due to a failure to provide necessary mental health and educational services as required by the Individuals with Disabilities in Education Act (IDEA) and Section 504 of the Rehabilitation Act, the Federal Courts enjoined the State of Hawaii Departments of Health and Education in the Felix Consent Decree. The State was charged with establishing a system of care to provide effective mental health and special education services for children and youth in need of such services to benefit from their education. As a result, the last decade has witnessed sweeping statewide systems reform.

The response to these lawsuits yielded large increases in the number of youth accessing services, the amount and type of services available, and the monitoring of system performance. Under the early design of the system, a comprehensive array of services from outpatient to residential placements was provided by through the Department of Health. Since 2000, the system of care has been evolving to a school-based behavioral health model in which educationally related outpatient and less intensive services are provided through the Department of Education. More intensive mental health services are still provided through the Child and Adolescent Mental Health Division (CAMHD) of the Department of Health and are accessed through an interagency peer review process at the school level. In the past year, the state was found to be in substantial compliance with the Felix consent decree and the Department of Justice Settlement. Accordingly, the system focus has evolved from widespread reform to sustainability and consolidation of gains.

In addition to providing mental health services to help children benefit from their education, CAMHD also provides mental health services to youth from any referral source who meet eligibility criteria for Medicaid, Severe Emotional and Behavioral Disturbance (SEBD), and elect to enroll in the CAMHD QUEST plan. In this capacity, CAMHD acts as a Pre-Paid Inpatient Health Plan for Medicaid-Eligible youth under the terms of the Balanced Budget Amendment of 1997. Youth enrolled in QUEST may be provided with a full array of mental health services including case management, outpatient, intensive community-based, and residential services through CAMHD's statewide network of private providers and its regionally distributed family guidance centers.

The transition to school-based services, the shift to sustainability of the reforms, and the continued development of QUEST services have presented interesting challenges to the CAMHD system. One primary issue has been the move from externally driven changes and monitoring by the Courts, to internal accountability and quality improvement processes, along with increased oversight and monitoring associated with the QUEST plan. Accordingly, CAMHD has been actively developing and refining systems for practice management and performance evaluation.

The Present Evaluation

As part of the internal evaluation system, CAMHD conducts an in-depth evaluation of its performance and functioning on an annual basis in addition to performing quarterly analyses. The purpose of the present report is to provide detailed analysis and critical review of the information gathered during the annual evaluation process. CAMHD gathers a wide variety of information about the performance of its operations. This information may be summarized into five major categories. First, population information is collected to understand the characteristics of the children, youth, and families that are served. Second, service information is compiled regarding the type and

amount of direct care services used by children, youth, and families. Third, financial information is gathered about the cost of services. Fourth, system information is collected about the quality and operations of the statewide infrastructure needed to support children, youth, and families. Finally, outcome information is examined to determine the extent to which services provided lead to improvements in the functioning and satisfaction of children, youth, and families.

During fiscal year 2003 (July 1, 2002 through June 30, 2003), significant revisions were made to the CAMHD's routine administrative and clinical reporting infrastructure. This included the production of a quarterly performance report, known as the Integrated Performance Monitoring Report (http://www.state.hi.us/doh/camhd/index.html) or the Sustainability Report, which was modeled after the fiscal year 2002 annual evaluation report (Daleiden, 2002). Therefore, to minimize redundancy, a new analytic strategy was used for this year's annual evaluation report. Rather than presenting detail description and discussion of information from the past year, the goal of the fiscal year 2003 annual evaluation was to describe and analyze changes to CAMHD over the past three fiscal years from July 1, 2000 to June 30, 2003. Hopefully, this investigation of changes will help articulate the complex effects of shifting to school-based services, moving into the sustainability period of the consent decree, and developing the QUEST plan.

To achieve this goal, two strategies were considered. First, the total number of youth registered with CAMHD for services over the period could be examined. This strategy would have the strength of being comprehensive in its presentation, but had the weakness that information from the prior years might not be as relevant to the current functioning of the system. This weakness primarily emerged due to the transition of services for two major populations to other state agencies. Specifically, (a) less intensive, low-end services and (b) services for youth with Pervasive Developmental Disorders (PDD) were transferred out of the CAMHD array over the past few years. The second strategy was to adjust the yearly populations to include only those youth who would be expected to receive services in CAMHD's fiscal year 2003 array. This second strategy has the advantage of increasing comparability across years and therefore is expected to be more relevant to the current decision-making environment (e.g., average expenditures per youth in the sample are more likely to reflect the current average cost per youth). It has the disadvantage that the final results do not comprehensively describe CAMHD's history (e.g., the total expenditures for all youth included in the sample will be less than CAMHD's total expenditures during the period). This second strategy was chosen.

A multistep procedure was used to define the final population of interest. First, the group of all youth registered to CAMHD between July 1, 2000 and June 30, 2003 were identified. Youth with a record of being transferred to the Department of Education were removed from the group. Next, any youth discharged during fiscal year 2001 prior to initiating DOE transfers and who only received less intensive services during that time were excluded. To adjust for "overtransfer," youth that were transferred to DOE and subsequently readmitted during the study period were "added back" into the population. Finally, youth with a primary or comorbid diagnosis of PDD were excluded. CAMHD continues to provide services to a small number of youth suffering from PDD, but a reliable way of identifying youth in comparable circumstance across the study period was not available. Therefore, youth in this category were removed throughout the sample, again preferring comparability to comprehensiveness. The detail characteristics of the final sample are described below.

The analytic framework described by Aday, Begley, Lairson, and Slater (1998) and discussed in the context of system of care research by Rosenblatt and Woodbridge (2003) was used to organize the evaluation. This framework identifies the three key components of heath services research as equity, efficiency, and effectiveness. In the present application, equity analysis involved examination of disparities across demographic groups (i.e., age, gender, ethnic, geographic region, and diagnostic) in services and expenditures. Efficiency analysis involved comparing input to output ratios for services (e.g., cost per youth, cost per service hour, service hours per youth). Effectiveness included analysis of the benefits of services in terms of child functioning and service needs.

Method

Data Sources

Data for this report were gathered from a wide variety of sources. The primary source of information is the Child and Adolescent Mental Health Management Information System (CAMHMIS), which supports registration of child and youth with CAMHD, authorization of services, electronic billing for services, and child status monitoring functions. System information was collected from independent databases maintained by numerous offices and committees within CAMHD. The CAMHD Administrative Services Office maintains the databases for QUEST enrollment and manual billing information for intensive in-home services. The Clinical Services Office maintains a database of youth placed in out-of-home settings based on weekly provider census reports. The Performance Management Office maintains a database of sentinel events based on incident reports submitted by providers. The consumer satisfaction database is maintained through the cooperation of Hawaii Families as Allies (HFAA) and the CAMHD research and evaluation section (RES). The CAMHD RES was responsible for merging and validating information from this multitude of databases, and is responsible for any errors in data or analysis reported here.

Child and Adolescent Mental Health Information System (CAMHMIS) Fields. Information was gathered and entered into CAMHMIS through the standard operating procedures of the regional Family Guidance Centers. Generally, care coordinators are responsible for gathering data from families and professionals and for organizing completion of child status measures on a quarterly basis. Detailed information about the structure of the CAMHMIS database is beyond the scope of the present report.

Population Variables

Admissions were defined to include both new registrations and repeated registrations without a discharge within the preceding one-month period. New registrations were counted when a new record is created for a youth previously unknown to CAMHD with a registration start date within the reporting period. Repeated registrations were identified whenever a previously known youth had at least one registration record during the reporting period indicating a change in registration status from a discharged status to a registered status.

Age in Years was defined as the difference between a youth's date of birth and the final day of each fiscal year (i.e., June 30 of 2001, 2002, and 2003, respectively).

Agency Involvement data (i.e., Department of Human Services (DHS), court, and incarcerated/detained) were entered into CAMHMIS in the form of a start date and end date of involvement with each agency. A youth was defined as involved with a specific agency if they had an active record with that agency that included a start date prior to the final day of the reporting period (e.g., June 30, 2003) without an end date prior to the period end.

Diagnostic Status was defined based on Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994) codes entered into CAMHMIS. Youth registered with CAMHD receive annual diagnostic evaluations from the Department of Education, DOE providers, or occasionally CAMHD staff. Children and youth may receive multiple diagnoses on the first two axes of the DSM system. Diagnoses on either axis whether primary, secondary, or tertiary were included in analysis of comorbid diagnoses.

Discharges were recorded when a youth had at least one registration record during the reporting period indicating a change in registration status from registered status to discharged status.

Ethnicity was based on client self-presentation and was coded directly in CAMHMIS as African-American, African Other, American Indian, Asian Other, Caucasian Other, Chamorro, Chinese, Filipino, Hawaiian, Hispanic Other, Japanese, Korean, Micronesian, Mixed Ethnicity, Pacific Islander Other, Portuguese, Puerto Rican, or Samoan. For some analysis, these categories are aggregated into the following groups: American Indian or Alaska Native, Asian, Black or African American, Hispanic, Multiethnic, Native Hawaiian or Pacific Islander, and White.

Family Guidance Center (FGC) was defined as the most recent center to which youth were registered as of the final day of the reporting period.

Gender was based on client self-presentation and was coded as either female or male.

Mental Health Status described the source of the youth's eligibility for CAMHD services as either Individuals with Disabilities Education Act (IDEA), Rehabilitation Act Section 504, Mental Health Only (not related to special education), or Pending determination, and was coded directly in CAMHMIS.

Service Variables

Intensive Mental Health Services (also referred to as High-End services) were defined to include psychosexual assessments, intensive home and community based services (including multisystemic therapy), day treatment, partial hospitalization, intensive day stabilization, therapeutic foster homes, therapeutic group homes, respite home, community-based residential, community high-risk residential, hospital-based residential, acute inpatient, out-of-state, and respite services. Intensive services also included flex funded services for any of these levels of care.

Out-of-home Placement was an indicator variable identifying if a youth received any out-of-home service during the period. Out-of-home services included out-of-state, acute inpatient, hospital residential, community high risk residential, community residential, therapeutic group home, and therapeutic foster home services. When specifically noted, some analysis may include services provided while youth were detained or incarcerated as out-of-home services.

Out-of-home Service Intensity was calculated as the proportion of hours recorded for out-of-home services during the period divided by the total service hours during the period (for details see service intensity definition below).

Quest Involvement was determined through a daily transaction that examines the list of Quest eligible youth published by Med-Quest Division and identifies those youth actively registered in CAMHMIS on that day. A youth was defined as Quest involved if the youth was recorded in the CAMHD Quest Eligibility database as eligible for Quest on one or more days during the reporting period.

Receipt of Services was calculated based on records that were accepted as payable during billing adjudication for the hospital residential, community residential, therapeutic group home, therapeutic foster home, respite home, intensive day stabilization, intensive in-home, and less intensive levels of care. Service information for the out-of-state, community high risk, multisystemic therapy, flex, and respite is based on the CAMHMIS service authorization database augmented by information based on manual billings collected by the Fiscal Office and weekly provider census data collected by the Clinical Services Office. A youth is identified as receiving a service if there was a record of payment for the service on at least one day during the quarter. Thus, the service receipt counts are unduplicated within a level of care, but are duplicated across levels of care. For example a youth who received one month of hospital residential and two months of intensive in-home services would be recorded as receiving both of these levels during the period.

Service Intensity was defined as the number of service hours per reporting period. Service units are recorded in CAMHMIS as 15-minute units for home and community services and daily units for out-of-home services. To create a relatively comparable metric across levels of care, daily out-of-home services were converted to hours at a rate of 6.5 hours per day. Because daily utilization of multisystemic therapy was not recorded for fiscal years 2001 to 2002, hours of service were allocated based on the practice standard formula of 80 hours during the first month of service, 40 hours during the second month, and 20 hours for subsequent months.

Service Volatility was calculated the number of provider agency changes per period. For example, a youth who moved from community residential to multisystemic therapy during a period would record one provider change, whereas a youth moving from community residential to hospital residential and back to community residential services during the period would record two changes. This variable was selected to provide a gross indicator of the frequency with which youth experience major service transition, but it does not capture the frequency of changes to individual therapists within a provider agency.

Fiscal Variables

Cost per Level of Care (LOC) was calculated as the total cost (US$) of services for a given level of care divided by the unduplicated count of youth receiving services at that level of care. Therefore, these expenditures are unduplicated across levels of care and when summed across all levels of care will equal the total expenditures during the period for the study sample.

Cost per Youth per Level of Care (LOC) represented the average cost (US$) for services received by youth at the specified during the period. This variable describes the average cost of providing the specific service to youth. If a youth received any other service during the period, this value will be less than the total cost of providing services to that youth.

Total Cost of Services was the sum of all service expenditures (US$) recorded during the period. When presented by level of care, the total cost of services was allocated to level of care based on youth counts that were duplicated across levels of care, but unduplicated within a level of care. Therefore, these expenditures are duplicated across levels of care and will sum to a value greater than the total real expenditures during the period.

Total Cost per Youth represented the average cost (US$) for all services received by youth during the period. For example, the total out-of-state cost per youth includes total expenditures for youth who received any out-of-state service. If a youth receive two weeks of out-of-state services and two months of multisystemic therapy for a total quarterly expenditure of $20,000, this amount would be included in calculating the averages for both the out-of-state services and multisystemic therapy levels of care. This variable describes the total cost during the period of providing services to a youth receiving one or more days of service at a specified level of care.

Outcome Variables

ASEBA Child Behavior Checklist (CBCL; Achenbach, 1991a; Achenbach & Rescorla, 2001). The CBCL is a 113-item child behavior problem checklist completed by parents, parent-surrogates, or others who know the children in family-like settings. Respondents are asked to rate items on a three point scale from not true to very true or very often that describe a youth "now or within the past 6 months." It provides total, broadband, syndrome, and competence scales. The broadband problem scales measure an internalizing factor and an externalizing factor. The syndrome scales measure withdrawn behavior, somatic complaints, anxious/depressed behavior, delinquent behavior, aggressive behavior, social problems, thought problems, and attention problems. The competence scales assess school, activity, and social competence. Raw scores and T-scores (Mean = 50, SD = 10) based on gender and age groups from the standardization sample are available. Achenbach (1991a) reported acceptable internal consistency (α = .90 internalizing, α = .93 externalizing) and test-retest reliability (one-week r = .89, .93; one-year r = .79, .87; two-year r = .70, .86) for the CBCL. Achenbach (1991a) also reviewed numerous studies supporting the validity of the CBCL relative to other parent-report behavior checklists, clinic-referral status, and categorical psychiatric diagnosis. T-scores were used in all analyses. Achenbach & Rescorla (2001) reported internal consistency (α = .90 - .92 broadband, α = .82 - .92 syndrome, α = .82 - .93 competence), parent agreement (r = .72 - .85 broadband, r = .65 - .85 syndrome, r = .57 - .76 competence), 8-day test-retest reliability (r = .91 - .92 broadband, r = .67 - .88 syndrome, r = .83 - .91 competence), 12-month stability (r = .80 - .82 broadband, r = .64 - .82 syndrome, r = .62 - .76 competence), and 24-month stability (r = .70 - .82 broadband, r = .56 - .81 syndrome, r = .43 - .73 competence) for the CBCL. The ASEBA information is collected on optical

scan forms that are sent via state courier to the CAMHD Management Information System (MIS) office for processing and uploading to CAMHMIS.

ASEBA Teacher Report Form (TRF; Achenbach, 1991b; Achenbach & Rescorla, 2001). The TRF is a 113-item behavior problem checklist that is completed by teachers or school personnel who know the child in school-like settings. Respondents are asked to rate items on a three point scale from not true to very true or very often that describe a pupil "now or within the past 2 months." It provides total, broadband, syndrome, and competence scales. The broadband problem scales measure an internalizing factor and an externalizing factor. The syndrome scales measure withdrawn behavior, somatic complaints, anxious/depressed behavior, delinquent behavior, aggressive behavior, social problems, thought problems, and attention problems. The TRF competence (a.k.a. adaptive functioning) assessment differ from the other ASEBA forms and yields the following scales: academic performance, working hard, behaving appropriately, learning, and happy. Raw scores and T-scores (Mean = 50, SD = 10) based on gender and age groups from the standardization sample are available. Achenbach & Rescorla (2001) reported internal consistency (α = .90 - .95 broadband, α = .72 - .95 syndrome, α = .90 total adaptive functioning), teacher agreement (r = .58 - .69 broadband, r = .28 - .69 syndrome, r = .37 - .58 competence), 16-day test-retest reliability (r = .86 - .89 broadband, r = .60 - .96 syndrome, r = .78 - .93 competence), 4-month stability (r = .48 - .69 broadband, r = .38 - .84 syndrome) for the TRF. The ASEBA information is collected on optical scan forms that are sent via state courier to the CAMHD Management Information System (MIS) office for processing and uploading to CAMHMIS.

ASEBA Youth Self-Report (YSR; Achenbach, 1991c; Achenbach & Rescorla, 2001). The YSR is a 112-item behavior problem checklist that is completed by youth between 11 and 18 years of age. Respondents are asked to rate items on a three point scale from not true to very true or very often that describe themselves "now or within the past 6 months." It provides total, broadband, syndrome, and competence scales. The broadband problem scales measure an internalizing factor and an externalizing factor. The narrowband problem scales measure the following dimensions: withdrawn behavior, somatic complaints, anxious/depressed behavior, delinquent behavior, aggressive behavior, social problems, thought problems, and attention problems. Raw scores and T-scores (Mean = 50, SD = 10) based on gender and age groups from the standardization sample are available. The YSR competence scales measure activity and social competence, but not school competence. Achenbach & Rescorla (2001) reported internal consistency (α = .90 broadband, α = .71 - .90 syndrome, α = .55 - .75 competence), 8-day test-retest reliability (r = .80 - .89 broadband, r = .67 - .88 syndrome, r = .83 - .91 competence), and 7-month stability (r = .53 - .59 broadband, r = .36 - .63 syndrome, r = .43 - .59 competence) for the YSR. The ASEBA information is collected on optical scan forms that are sent via state courier to the CAMHD Management Information System (MIS) office for processing and uploading to CAMHMIS.

Child and Adolescent Functional Assessment Scale (CAFAS; Hodges, 1998). The CAFAS is a 200-item clinician report scale that measures youth's level of functional impairment. Based on their knowledge and experience with the child, raters review behavioral descriptions ordered by level of impairment within eight domains of functioning. The subscales of School Role Performance, Home Role Performance, Community Role Performance, Behavior Toward Others, Mood/Emotions, Mood/Self-Harmful Behavior, Substance Use, and Thinking are calculated by scoring the highest level of impairment (i.e., severe = 30, moderate = 20, mild = 10, no/minimal = 0) endorsed within the respective domain of items. An eight-scale total score is calculated by summing across the eight subscales, whereas a five-scale total is calculate by summing the raw scores from behavior, substance use, and thinking scales with the maximum score from the school, home, and community role performance scales and with the maximum score from the emotions and self-harm. The CAFAS has been found to have acceptable internal consistency across items, inter-rater reliability across sites, and stability across time (Hodges, 1995; Hodges & Wong, 1996). Studies of concurrent validity have found that CAFAS scores are related to severity of psychiatric diagnosis, intensity of care provided, restrictiveness of living settings, juvenile justice involvement, social relationship difficulties, school-related problems, and risk factors. Studies of predictive validity have found that CAFAS scores from intake assessments predict service utilization and cost for services. Care coordinators serve as the

primary raters for the CAFAS and results are entered directly into a networked computer scoring program by care coordinators or statistics clerks.

Child and Adolescent Level of Care Utilization System (American Academy of Child and Adolescent Psychiatry, 1999). The CALOCUS is a clinician rating form. Clinicians make dimensional ratings on a five-point scale in the domains of risk of harm, functional status, comorbidity, environmental stress, environmental support, resiliency and treatment history, child treatment acceptance and engagement, and parent treatment acceptance and engagement. These ratings may be summed to yield a total score, but are also combined through a detailed algorithm into a level of care judgment into one of seven categories: basic services (Level 0), recovery maintenance and health management (Level 1), outpatient services (Level 2), intensive outpatient services (Level 3), intensive integrated service without 24-hour medical monitoring (Level 4), non-secure, 24-hour, medically monitored services (Level 5), and secure, 24-hour, medically managed services. Preliminary reliability (Ted Fallon, 2002, personal communication) indicated that intrajudge agreement based on clinical vignettes ranged from ICC (2,2) = .57 - .95 across scales with all scale above .70 except for environmental stress and child treatment acceptance and engagement. Preliminary validity analysis found that the CALOCUS total score correlated -.33 with the Child Global Assessment of Scale (CGAS) and .62 with the CAFAS eight-scale total score. Care coordinators serve as the primary raters for the CALOCUS and results are entered directly into a networked computer scoring program by care coordinators or statistics clerks.

Results

Population Characteristics

The final population of youth selected for this evaluation represented youth registered to CAMHD during the period from July 1, 2000 to June 30, 2003 who would be expected to qualify for services in CAMHD's fiscal year 2003 service array. As previously noted, youth receiving low-end services only and youth with Pervasive Developmental Disorders were excluded from the final population. CAMHD provided case management services for 4,878 children, youth, and families during FY 2001, 3,111 during FY 2002, and 2,525 during FY 2003. This represents population declines of 36% between FY 2001 and FY 2002, 20% between FY 2002 and FY 2003, and 48% over the three-year period.

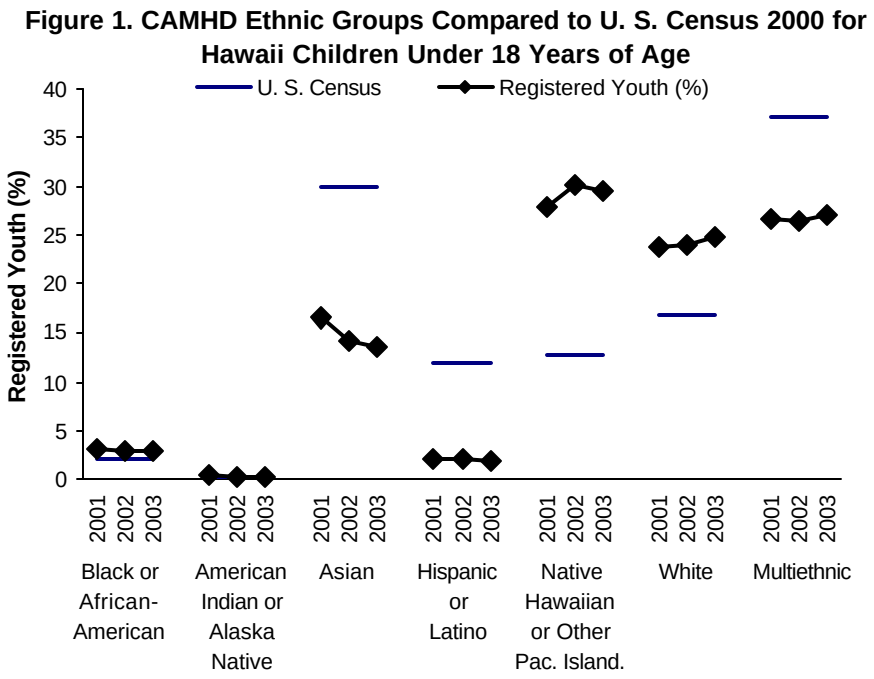
Both new admission rates (17%, 23%, and 39%) and repeat admission rates (5%, 7%, and 21%) have increased over the study period. An important factor accounting for this increase is the continued development of the Family Court Liaison Branch (FCLB), which provides assessment and treatment for youth at the Detention Home on Oahu and the Hawaii Youth Correctional Facility. Discharge rates have fluctuated but demonstrate a relatively stable trend (46%, 52%, 48%), with approximately one-half of youth being discharged at some point during the year. These high admission and discharge rates provide an indication that many youth are completing service episodes during the year and that the number of youth registered at any given point in time is expected to be considerably less than the annual count.

With the exception of age, the demographic composition of the study population remained relatively stable across the period. Females accounted for 30% to 32% of the population and males for 68% to 70%. The five most prevalent ethnic groups in all three years were Multiethnic (26 – 27%), Native Hawaiian (23 – 25%), Caucasian (21 – 22%), Filipino (7 – 8%), and Japanese (5%). The average age of youth decreased by approximately one year over the study period (15.6, 15.2, and 14.4 years) but the distributions remained relatively similar (e.g., SD = 3.7, 3.5, and 3.4) with a mild negative skew (-0.5 to -0.8).

When CAMHD population demographics were examined in comparison to results from the 2000 US Census (see Figure 1), several interesting patterns emerged that tended to parallel national trends. First, although the proportion of females and males are roughly balanced in the general population, males were much more likely to receive services from CAMHD. Examination of ethnicity revealed that youth of Asian (-15% to -17%), Hispanic or Latino (-10%), or multiple (-10% to –11%) ethnicities were underrepresented in the CAMHD population compared to the population of youth in Hawaii under age 18 years. Native Hawaiian or Pacific Islander (+15 to +17%) and White (+7 to +8%) youth were disproportionately over-represented. Black or African-American (+0.8% to +1.1%) youth were also somewhat over-represented but accounted for a small portion of both the CAMHD and general populations. Because CAMHD does not use the same procedure for gathering ethnic

Table 1. Percent of CAMHD population by ethnic group.

	Fiscal Year		
	2001 %	2002 %	2003 %
Black or African American	**3.0**	**2.8**	**2.8**
American Indian and Alaska Native	**0.4**	**0.2**	**0.3**
Asian	**16.5**	**14.3**	**13.7**
Chinese	1.3	0.8	0.7
Filipino	8.1	7.5	7.1
Japanese	5.2	4.5	4.5
Korean	0.7	0.5	0.4
Other Asian	1.3	1.0	0.9
Hispanic or Latino	**2.1**	**2.1**	**1.9**
Puerto Rican	0.9	0.9	0.9
Other Hispanic	1.1	1.1	1.1
Native Hawaiian or Pacific Islander	**27.9**	**30.2**	**29.4**
Native Hawaiian	23.2	24.9	24.5
Micronesian	0.4	0.3	0.4
Samoan	3.0	3.3	2.8
Other Pacific Islander	1.3	1.6	1.8
White	**23.7**	**24.0**	**24.7**
Portuguese	2.9	2.7	2.8
Other Caucasian	20.9	21.4	21.9
Multiethnic	**26.5**	**26.4**	**27.1**
Not Available	46.1	35.3	36.8



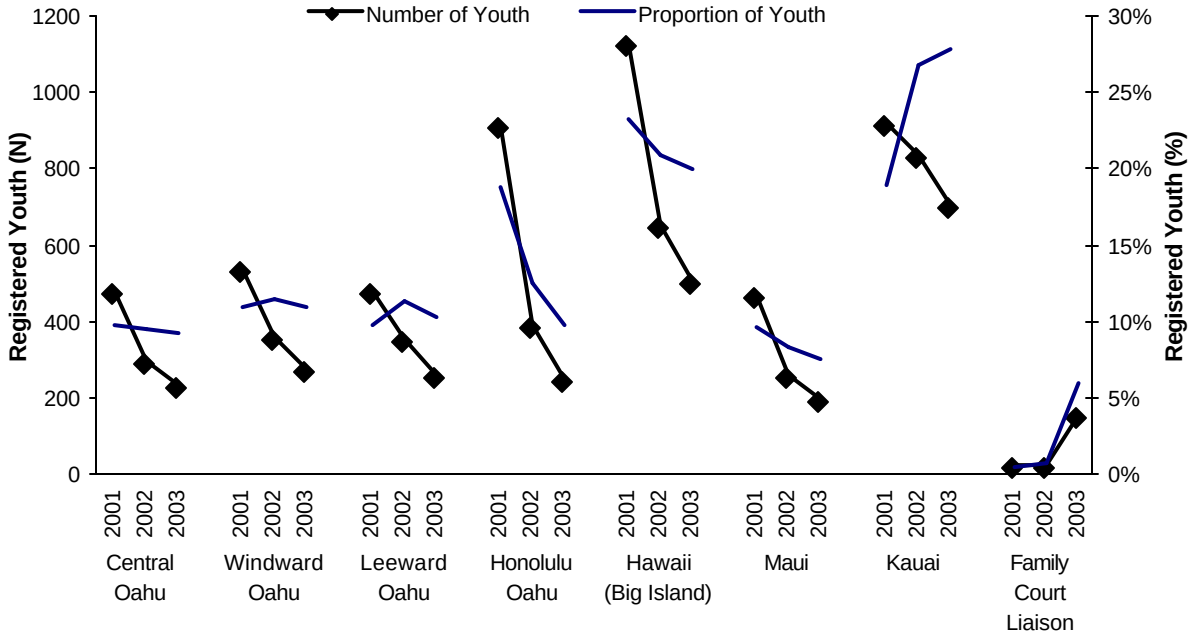
information as the U. S. census, these results must be interpreted with caution. Specifically, CAMHD does not allow individuals to endorse multiple specific ethnic groups, nor does CAMHD use a separate national origin question regarding Hispanic or Latino heritage. Therefore the observed percentages are likely an understimate of the true Hispanic representation and are expected to be lower than the census estimates as many youth of Hispanic or Latino origin would be expected to endorse the multiethnic alternative in the CAMHD assessment. Similarly, some youth with multiple ethnic backgrounds may select the single category that they feel best describes the ethnic identification. Because CAMHD can not determine exactly which ethnicities are represented in the multiethnic group, the source of the under-representation is unclear.

Across the study period, IDEA (63%, 74%, and 69%) remained the most common mental health status, followed by Section 504 (18%, 19%, and 21%), and Mental Health Only (1%, 2%, and 6%). The increases in Section 504 and Mental Health only were associated with a decline in the pending status from 18% to 4%. The proportion of registered youth eligible for the QUEST health plan was 21% for FY 2002 and 23% for FY 2003. When examined as the proportion of youth with services procured, to adjust for youth registered to the Mokihana Project on Kauai and FCLB, QUEST eligible youth accounted for 27% and 38% of the FY 2002 and FY 2003 populations.

The proportion of youth recorded as involved with other agencies increased across the study period. The effect was evident for DHS (6%, 10%, and 11%), Court (4%, 14%, and 21%), and Incarceration/Detention (1%, 4%, and 6%). These patterns were also evident when the proportions of youth with procured services were examined for DHS (9%, 14%, and 15%), Court (8%, 19%, and 31%), and Incarceration/Detention (2%, 6%, and 9%). Although these trends may represent a real increase in the “interagency complexity” of the CAMHD population, anecdotal reports also indicate that the operational and management practices at the family guidance centers have matured and allowed for better capture of this information as they have with child status measure completion (c.f., Daleiden, Brogan, & Arensdorf, 2003). Further, relative to the other data available, the validity of interagency data remains more questionable due a lack of clear statewide standards and procedures for capturing and recording these data.

Although all regions showed a decline in the number of youth registered for services, the geographic distribution of the population demonstrated several changes over the study period. The Honolulu Oahu Family Guidance Center (HOFGC: 19%, 12%, and 10%), Hawaii Family Guidance Center (HFGC: 23%, 21%, and 20%), and Maui Family Guidance Center (MFGC: 9%, 8%, and 7%) accounted for a relatively lower proportion of the total population over the years, with the HOFGC showing the largest decline. The Mokihana Project on Kauai (KFGC: 19%, 27%, and 28%) and Family Court Liaison Branch (FCLB: 0%, 1%, and 6%) accounted for a larger proportion of the total population. The Central (9 – 10%), Leeward (10 – 11%), and Windward (11%) Oahu populations were relatively unchanged as a proportion of the total population. Reanalysis of these distributions after excluding KFGC and FCLB, revealed that the decline at HOFGC (23%, 17%, and 14%) persisted, whereas the HFGC (28%, 28%, and 30%), and MFGC (12%, 11%, and 11%) were stable in this restricted context.

Figure 2. Absolute and Relative Size of CAMHD Family Guidance Center Populations



Geographic distribution was also examined as a proportion of the general population of youth between the ages of 3 and 21 years identified by the US census. The counties of Honolulu (i.e., Central, Leeward, Windward, and Honolulu FGCs) and Maui had the lowest penetration rates and registered approximately one-half of one percent of their respective general populations. Hawaii served more than one percent and Kauai served over four percent. Throughout all analysis of Kauai, it is important to keep in mind that unlike the other centers, all youth served by the Mokihana Project are registered with CAMHD, not just youth receiving intensive mental health services. When registration rate changes were examined, the Big Island (-1.5%) and Kauai (-1.3%) demonstrated the largest proportional declines followed by Maui (0.8%) and Honolulu (0.6%). This yielded a statewide decline of three-quarters of a percent (0.75%) in penetration rate over the study period.

Table 2: Percent of youth aged 3 – 21 years by county registered with CAMHD.

	Percent of 2000 Census Population		
County	2001	2002	2003
Hawaii (BI)	2.73	1.57	1.22
Honolulu	1.06	0.61	0.44
Kauai	5.74	5.21	4.39
Maui	1.38	0.76	0.56
State	1.55	0.99	0.80

Source: U.S. Census 2000 website

Examination of primary diagnostic trends suggested a fair degree of stability across the study period. The five most common primary diagnostic categories across the three-year period were attentional disorders (26 – 27%), disruptive behavior disorders (23 – 24%), mood disorders (18 – 22%), adjustment disorders (9 – 12%), and anxiety disorders (9%). The prevalence of primary mood disorders increased by 4% during the study period whereas the prevalence of adjustment disorders declined by 3%. Prevalence rates for all other primary diagnostic categories remained stable (< 1.5% change).

Over the study period, the proportion of registered youth with one or more comorbid diagnoses increased from 57% to 65%, as did the proportion of youth with services procured (65% to 71%) and the average number of diagnoses (M = 1.5 to M = 1.8). The diagnostic categories showing increases were mood disorders (5%), disruptive behavior disorders (4%), anxiety disorders (3%), and substance-related disorders (3%). The rate of adjustment disorders

decreased over the period, so that anxiety disorders surpassed adjustment disorders as the fifth most common comorbid condition.

These findings illustrate a variety of transformations to the CAMHD population. The most striking of these is the dramatic decline in population size. This decline was evident across geographic regions, including Kauai, which has always provided services through the integrated, school-based Mokihana Project. To seek greater understanding of factors associated with this decline, more in-depth analysis of youth transitioning in and out of the system was performed.

What Predicted Population Decline?

To further investigate factors related to the overall decrease in population size, discriminant function analyses were used to predict which youth remained registered from year-to-year, and which youth were discharged. These analyses were first performed using demographic information only and then repeated with service information added. Demographic variables included youth age in years, seven category ethnic grouping, primary diagnosis, whether the youth had one or more comorbid diagnosis, geographic region at end of the period, and interagency involvement. Service variables included whether any service was procured, whether any out-of-home service was procured, and whether services were procured at each level of care excluding flex services, and the number of provider agency changes during the year. Child status variables were not included in these analyses due to the large amounts of missing data in earlier years.

When registration changes from FY 2001 to 2002, the discriminant function based on demographics correctly classified 74% of youth in terms of their retention versus termination status, whereas the combined demographic and services function correctly classified 83% of youth. In the demographic only analysis, 13 predictors emerged as significant following Bonferroni correction. These predictors of retention were the presence of any comorbid diagnosis, DHS involvement, Native Hawaiian or Pacific Islander ethnicity, registered to Kauai FGC, not registered at Honolulu Oahu FGC, Court involvement, Mixed ethnicity, White ethnicity, primary diagnosis of disruptive behavior, any incarceration, registered to Leeward Oahu FGC, younger age in years, and primary diagnosis of anxiety disorder. Adding service variables to the discriminant function yielded the same patterns as the demographic only, with the additional finding that youth who had any service procured, regardless of type of service, and changed provider agencies more often were more likely to remain registered from year to year.

A somewhat different pattern of results emerged when predicting registration changes from FY 2002 to 2003. The discriminant functions were not quite as accurate with the demographics only analysis correctly classifying 64% of youth and the combined demographic and services function correctly classifying 66% of youth. The demographic only analysis yielded four significant univariate predictors of retention – younger age in years, DHS involvement, presence of a primary diagnosis of an attentional disorder, and presence of a primary diagnosis that was not substance-related. Although not statistically significant when

Table 3. Summary of factors discriminating year-to-year registration changes.

	Termination of Registration
Replicated	Case Management Only
	No DHS Involvement
	Older Age in Years
	Only One Primary Diagnosis*
	Single Ethnic Group Reported*
2001- 2002 Only	Not Hawaiian or Pacific Islander
	Not White
	No Court Involvement
	Not Incarcerated During Year
	Not Registered to Kauai FGC
	Honolulu Oahu FGC Registration
	Not Registered to Leeward Oahu FGC
	Not Primary Disruptive Behavior Disorder
	Not Primary Anxiety Disorder Diagnosis
2002- 2003 Only	Not Primary Attentional Disorder
	Primary Substance-Related Disorder

Note: * Was not statistically significant when Bonferroni corrected in 2002 – 2003 analysis.

Bonferroni corrected, the next two best predictors of retention were being of mixed ethnicity and having one or more comorbid diagnoses. The addition of service information yielded a similar pattern in that youth with any service procured, regardless of level of care, and who had more provider changes were more likely to remain registered in the following year.

Population Summary

In summary, the overall size of the CAMHD population decreased by 48% over the study period. Absolute size decreases were evident statewide, but the largest regional decreases were in Honolulu, the Big Island, and Maui. This population decrease was offset by considerable growth at the Family Court Liaison Branch, which helped account for an increase in admission rates across the period. Discharge rates of approximately 50% per year suggest that CAMHD is not a "dead-end" service stop for youth, but rather that a sizable percent of children who receive intensive services return to less intensive services following a time-limited registration episode. The CAMHD population consisted predominantly of youth receiving services through IDEA and 504, with some indication that the proportions of Mental Health Only and QUEST youth are on the rise. The average age of the CAMHD population has decreased by approximately one year and the population has a higher proportion of multiethnic, Caucasian, and Native Hawaiian or Pacific Islander youth, but the gender distribution has remained fairly stable. The primary diagnostic composition has also remained generally stable with evidence of increased rates of comorbidity of mood disorders, disruptive behavior disorders, anxiety disorders, and substance-related disorders with a concurrent decrease in the prevalence of adjustment disorders.

Several hypotheses may be offered to account for the overall population decline. First, despite efforts to balance the population across fiscal years, some major unanticipated factor(s) may have been missed. The most significant factor that was not controlled was the growth of FCLB, but this effect would tend to increase overall population size, an effect opposite to the observed trend. Second, the provision of high quality low-end services would be expected to decrease the need for intensive services and therefore a high-end population decline may have resulted from effective low-end service. The rapid emergence of high-end population reductions following the transition of low-end services would tend not to support this hypothesis. Third, the introduction of an additional referral procedure (i.e., peer review) between the Department of Education and Department of Health may have created new inefficiencies or hesitancy to refer that would be expected to decrease the high-end population. Fourth, widespread marketing about the change from a "clinical" to an "educational" model may have affected decision-making of IEP teams and promoted less preference for "clinical services." Fifth, the relative shift of training to emphasize best practices beyond service planning, wrap-around, and engagement may have "diluted" the frontline focus on increasing access to underserved populations. Finally, more youth and families may be receiving private rather than publicly funded services.

Examination of the various population characteristics identified several factors that predicted which youth were no longer accessing services. Across both annual transitions studied, youth were less likely to remain registered with CAMHD if they received case management services only, were not involved with DHS, were older, were diagnosed with a single disorder, or belonged to a single ethnic group. Several other ethnic, diagnostic, geographic, and interagency involvement variables predicted registration changes during one of the transitions studied, but were not replicated across years. For example, Honolulu Oahu displayed the highest termination rates, whereas Kauai and Leeward Oahu had the highest retentions.

Many of these factors are expected to predict discharge rates in a well-functioning system. For example, providing a period of case management services following completion of more intensive services is common to support monitoring of treatment gains prior to final system discharge. Similarly, youth with single diagnostic problems and youth uninvolved with other child serving agencies may represent less complicated life situations that are more readily treated and discharged. However, these effects may also describe a change in the complexity of problems expected for the provision of intensive mental health services. The findings that multiethnic group membership and interagency involvement predict retention may indicate that youth "belonging" to multiple social groups may be more likely to have an advocate that identifies with the youth and promotes receipt of more intensive services. These comments are speculative and the analyses cannot help discriminate among these possibilities. Finally, when taken together, these effects accurately predicted roughly two-thirds to three-quarters of youth who changed registration status, so a large demographically unbiased decline in the number of youth accessing high-end mental health services remained unexplained.

Service Characteristics

Several major structural changes were made to the CAMHD service array during the study period. Community high-risk residential services were initiated during the second half of FY 2001, and day treatment and partial hospitalization services were phased out. Beginning in FY 2002, intensive day stabilization and respite home services began to be offered.

Service Population

In addition to these qualitative changes, several changes to utilization patterns were evident during analysis. The number of youth receiving each service during the study period was examined in terms of the proportion of the unduplicated count of all youth receiving service, the total number of youth receiving service during the period, and the monthly average of the number of youth receiving service. The proportion describes the relative pattern of service utilization and adjusts for the decreasing population size over the three-year period. The total number provides an absolute indicator of the size of the service, and the monthly average provides a better estimate of the service population size at any given point in time. The degree of population flow through the service is indicated by the extent to which the monthly average is lower than the total number of youth receiving service (e.g., if all youth received service for the entire period, the monthly average would be equal to the total number served). Therefore, programs with longer lengths of service will have less discrepancy between the unduplicated counts and the average.

Figure 3. Absolute and Relative Size of Out-of-Home Services

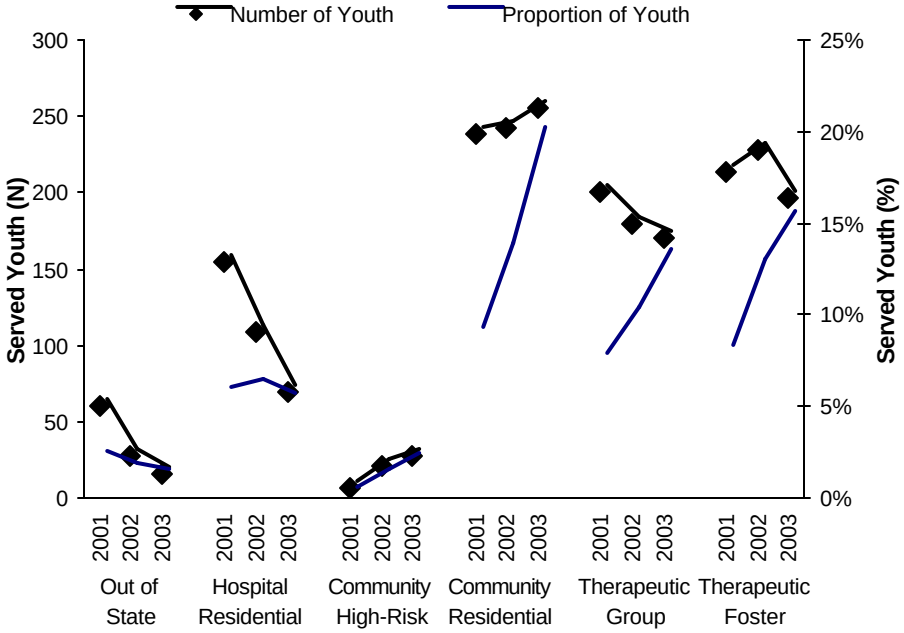
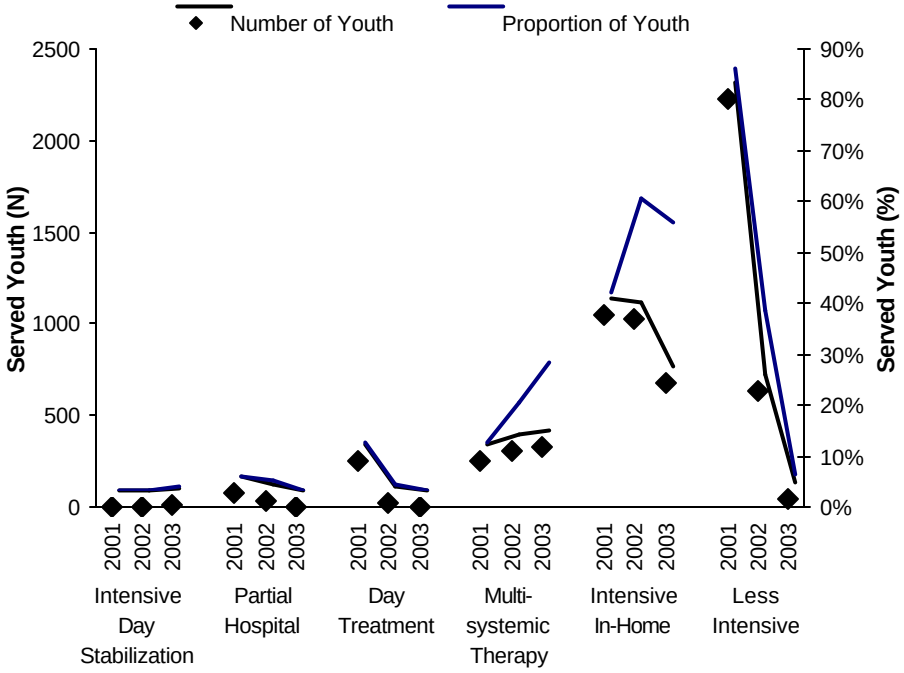


Figure 4. Absolute and Relative Size of In-Home Services



The total number of youth with services procured during the period declined, but accounted for a relatively stable portion of the total registered population (see Table 4). Thus, within the CAMHD system, there was little reduction (-2% of registered youth per year) in the procurement of services beyond the general decline of the population of youth accessing the CAMHD system. Out-of-home services accounted for an increasing proportion of all services procured (+ 9% per year) although the total yearly and average monthly census of these services decreased (-61 youth yearly, -35 youth monthly per year).

Despite the general population decline, community high-risk residential and multisystemic therapy displayed both absolute and relative growth (see Figure 3 & Figure 4). Community residential services also demonstrated both absolute and relative growth, but a small decline in monthly average suggested that more youth may be using this level of care for shorter durations. Therapeutic group homes, therapeutic foster homes, intensive in-home, and flex services accounted for an increasing proportion of services over the study period, but demonstrated a lower absolute size. Hospital residential services displayed an absolute decrease in size and average census but accounted for a relatively stable proportion of the service population, suggesting that placements rates have not decreased within the CAMHD system beyond the general population decline, but length of service has decreased considerably. Out-of-state, partial hospitalization, day treatment, respite and less intensive displayed both absolute and relative decreases over the three-year study period. Respite homes and intensive day stabilization showed obvious absolute increases when they were first offered during fiscal year 2003, but had negligible monthly averages and accounted for a miniscule portion of all services.

Table 4. Percent, total number, and monthly average of youth receiving one or more days of service by level of care.

Any Services Procured	Fiscal Year			Fiscal Year			Fiscal Year		
	2001	2002	2003	2001	2002	2003	2001	2002	2003
	%	%	%	Total	Total	Total	Ave.	Ave.	Ave.
Out-of-State	2.2%	1.5%	1.2%	60	27	16	41	15	8
Acute Inpatient	0.0%	0.1%	0.0%	1	1	0	0	0	0
Hospital Residential	5.7%	6.1%	5.4%	154	109	69	42	33	17
Community High Risk	0.2%	1.2%	2.1%	6	21	27	5	17	17
Community Residential	8.9%	13.5%	19.9%	239	242	256	106	107	99
Therapeutic Group Home	7.5%	10.0%	13.2%	200	179	170	84	78	62
Therapeutic Foster Home	8.0%	12.7%	15.3%	213	228	197	120	129	107
Respite Home	0.0%	0.0%	0.3%	0	0	4	0	0	0
Intensive Day Stabilization	0.0%	0.0%	0.9%	0	0	11	0	0	1
Partial Hospitalization	2.7%	1.8%	0.1%	71	32	1	22	9	0
Day Treatment	9.3%	1.1%	0.0%	249	19	0	135	6	0
Multisystemic Therapy	9.4%	17.3%	25.2%	253	310	323	86	108	107
Intensive In-Home	38.9%	57.4%	52.8%	1,043	1,030	678	522	593	273
Flex	18.4%	19.3%	21.9%	494	346	281	138	92	82
Respite	6.7%	7.9%	3.8%	180	141	49	102	75	20
Less Intensive	83.0%	35.3%	3.3%	2,223	633	42	1,158	281	7
Out-of-Home Total	27.7%	38.5%	47.2%	742	690	606	402	402	333
Unduplicated Total (% of Registered)	54.9%	57.6%	50.9%	2,679	1,793	1,284			

Note: Acute inpatient was not a standard CAMHD service, but was purchased for youth in unique circumstances; partial hospitalization and day treatment were transferred to the Department of Education during this period.

Service Intensity

The intensity of services was examined through analysis of the numbers of hours of service procured. To provide a single indicator across in-home (i.e., home and community) and out-of-home services, one out-of-home service day was assumed to reflect 6.5 service hours. It is important to note that small changes to this conversion value would be expected to have a material effect on the estimated proportion of services that were provided in-home versus out-of-home. Therefore, it is recommended that the actual percent of in-home and out-of-home services should not serve as a basis for decision-making. Nevertheless, the use of a standard conversion value across fiscal years supports interpretation of changes in the relative pattern of services over the course of the study period.

Again, consistent with the general population decline, the total number of hours of service purchased statewide declined during the study period (-245,586 hours per year). Overall declines in the total number of hours purchased were evident for both in-home (-149,314 hours per year) and out-of-home services (-96,272 hours per year), but the more rapid decline of in-home service hours resulted in a sizable relative increase (+10% per year) in the proportion of all service hours that were procured in out-of-home settings. The relative proportion of out-of-home to total service hours per youth increased (+9% per year), and in-home services accounted for a smaller proportion of all services received by youth placed out-of-home (-3% per year). For those youth receiving any in-home services, the proportion of their service hours that were provided in their home or community remained relatively stable during the period (-1% per year).

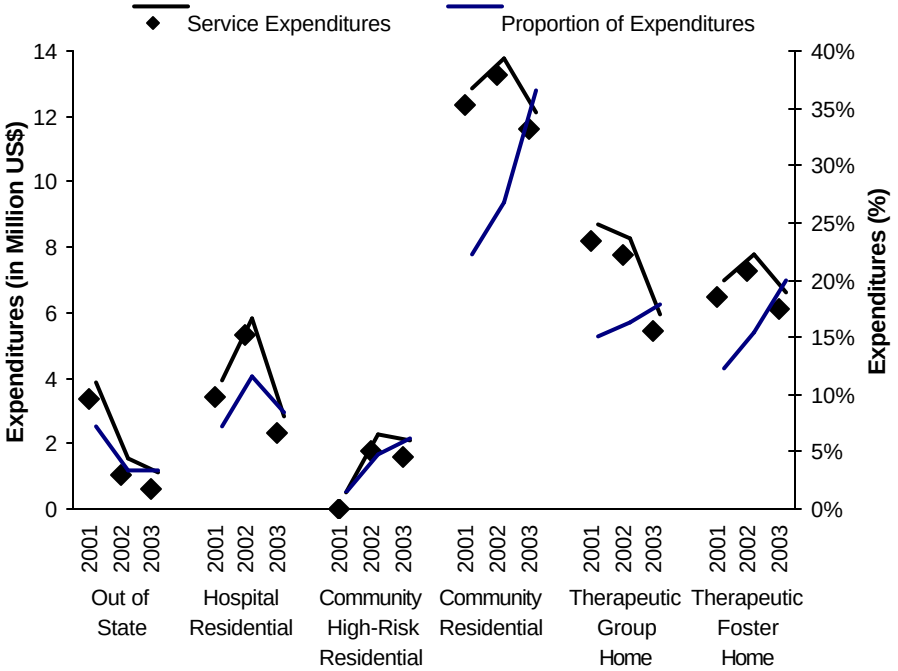
All specific levels of care showed decreasing total hours except for the developing services (i.e., community high-risk residential, intensive day stabilization, respite homes, and multisystemic therapy). Out-of-state, hospital residential, and less intensive services accounted for a decreasing proportion of all services procured, whereas community high-risk residential, community residential, therapeutic group home, therapeutic foster home, and multisystemic therapy accounted for an increasing proportion of all services.

Service Expenditures

Service expenditures may serve as a proxy variable for service utilization to the extent that total costs are affected by the number of youth served, the intensity and duration of services provided, and the restrictiveness of the service setting. Therefore, total expenditures and expenditures per level of care were analyzed to describe service patterns. Consistent with the declining population, total service expenditures showed a decreasing trend ($59.7 million, $52.4 million, $33.2 million). Total out-of-home service expenditures showed a second year increase, but decreased below initial levels in FY 2003 ($33.8 million, $36.4 million, $27.7 million). However, out-of-home services accounted for an increasing proportion of the total service expenditures (57%, 70%, 84%).

All specific levels of care showed decreasing total costs except for the developing services (i.e., community high-risk residential, intensive day stabilization, respite homes, and multisystemic therapy). However, the costs for therapeutic foster homes and flex services were only slightly lower in 2003 than 2001 and fluctuated across years (see Table 5). When

Figure 5. Out-of-Home Service Expenditures



the relative proportion of costs was examined, the levels of care showing decreases were out-of-state, partial hospitalization, day treatment, intensive in-home, respite, and less intensive services. Multisystemic therapy, therapeutic foster home, therapeutic group home, and community residential were relatively increasing. Hospital residential remained fairly stable. Respite home and intensive day stabilization accounted for a negligible portion of service expenditures.

Figure 6. In-Home Service Expenditures

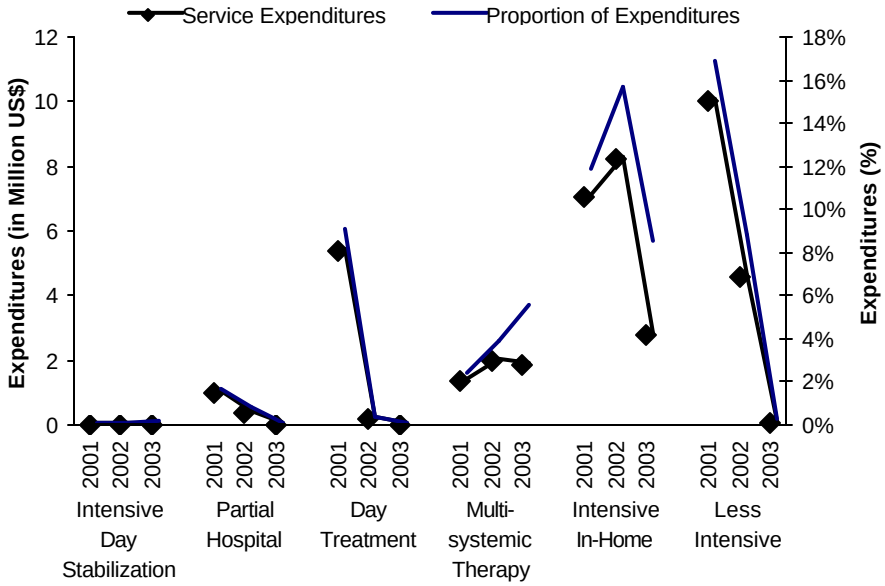


Table 5. Expenditures (US$) per level of care and percent of total expenditures.

	Fiscal Year			Fiscal Year		
For Youth with Services Procured	2001 per LOC	2002 per LOC	2003 per LOC	2001 %	2002 %	2003 %
Out-of-State	3,379,853	1,038,035	639,585	5.7%	2.0%	1.9%
Acute Inpatient	270	1,037	0	0.0%	0.0%	0.0%
Hospital Residential	3,422,558	5,309,375	2,335,000	5.7%	10.1%	7.0%
Community High Risk	0	1,787,940	1,577,565	0.0%	3.4%	4.8%
Community Residential	12,372,387	13,241,826	11,643,307	20.7%	25.3%	35.1%
Therapeutic Group Home	8,192,340	7,742,834	5,445,838	13.7%	14.8%	16.4%
Therapeutic Foster Home	6,453,979	7,297,919	6,127,659	10.8%	13.9%	18.5%
Respite Home	0	0	2,080	0.0%	0.0%	0.0%
Intensive Day Stabilization	0	0	23,000	0.0%	0.0%	0.1%
Partial Hospitalization	984,750	368,000	5,026	1.6%	0.7%	0.0%
Day Treatment	5,394,290	179,973	0	9.0%	0.3%	0.0%
Multisystemic Therapy	1,382,780	1,987,538	1,832,154	2.3%	3.8%	5.5%
Intensive In-Home	7,053,293	8,204,245	2,787,366	11.8%	15.6%	8.4%
Flex	643,294	435,921	603,220	1.1%	0.8%	1.8%
Respite	388,309	253,355	60,478	0.7%	0.5%	0.2%
Less Intensive	10,032,916	4,580,675	68,959	16.8%	8.7%	0.2%
Out-of-Home Services	33,821,386	36,418,966	27,768,953	56.7%	69.5%	83.8%

Note: Acute inpatient was not a standard CAMHD service, but was purchased for youth in unique circumstances; partial hospitalization and day treatment were transferred to the Department of Education during this period.

Service Stability

Stability of services was investigated by examining the number of provider agencies changes that youth experienced per year. Consistent with the overall population reduction, the total number of provider changes statewide decreased during the study (-397 per year), but the average number of changes per youth remained stable. On average, youth with services procured experienced less than one provider agency change per year (Mean = 0.6 – 0.7 changes). Across years, the typical youth did not tend to step through multiple service providers and levels of care during the year, but a small proportion of youth accounted for many changes. Approximately one-fifth to one-third of youth served changed provider agencies at least once during the year (19% in FY 2001, 21% in FY 2002, 33% in FY 2003). The 5% of youth with the most agency changes accounted for approximately 65% of all agency changes during FY 2001 and FY 2002, but only about 40% of all agency changes during FY 2003. Thus, there is some evidence that in FY 2003 provider changes are more broadly distributed across those youth receiving services.

Service Equity

A series of discriminant function analyses were conducted to identify demographic factors related to procurement of any services provision, out-of-home placement, and amount of services used. As with the prior analysis of population decline, demographic variables included youth age in years, seven category ethnic grouping, primary diagnosis, whether the youth had one or more comorbid diagnosis, geographic region at end of the period, and interagency involvement. Service variables included in analysis of utilization amounts were whether any service was procured, whether any out-of-home service was procured, and whether services were procured at each level of care excluding flex services, and the number of provider agency changes during the year. Child status variables were not included in these analyses due to the large amounts of missing data in earlier years. Separate discriminant functions were calculated for each study year and the final univariate results described here were classified as unanimous (i.e., significant in all models) or replicated (i.e., significant in two study years). Due to the large number of analyses, Bonferroni correction was used to control for family-wise error rates. This correction in conjunction with the requirement for replication yielded highly conservative significance tests.

What Discriminated Intensive Case Management Only from Service Procurement?

The first set of analyses examined the full annual registered populations, and classified youth with respect to whether or not they had any service procured in addition to intensive case management. These discriminant functions correctly classified 73% to 77% of youth across years. The majority of the significant predictors were unanimous across models (see Table 6). Ethnicity, interagency involvement, geographic region, and diagnostic factors all significantly discriminated youth who had services procured from youth receiving case management only. Across years, Black or African-American youth were 2% more common, and Multiethnic, Native Hawaiian or Pacific Islander, and White youth were 7% to 11% more common in the group of youth with procured services. Higher proportions of youth with services procured were also involved with DHS (8% - 9%), Family Court (8% - 19%), or were incarcerated or detained (2% - 5%). Kauai FGC continued to register all youth served by the Mokihana project with CAMHD even though only high-end services are purchased for these youth through the CAMHD array. Therefore, as expected, Kauai FGC accounted for disproportionately more youth receiving case management only (19% - 38%) than having services procured through CAMHD. The percentage of youth

Table 6. Summary of factors discriminating procurement of any service.

	More Likely to Have Services Procured
Unanimous Findings	Black or African-American Ethnicity
	Multiple Ethnicity
	Native Hawaiian or Pacific Islander
	White Ethnicity
	Court Involvement
	DHS Involvement
	Incarcerated/Detained During Year
	Central Oahu FGC Registration
	Leeward Oahu FGC Registration
	Not Registered to Kauai FGC
	Windward Oahu FGC Registration
	Any Comorbid Diagnosis
	Primary Disruptive Behavior Disorder
	Primary Mood Disorder
Replicated Findings	Hawaii (Big Island) FGC Registration

registered to Central, Leeward, and Windward Oahu was 4% to 12% greater in the group of youth with services procured than the group with case management only. Youth registered to Hawaii FGC accounted for a larger proportion of youth with services procured during two years (6% - 10%) but the difference (3%) was not statistically significant in the third analysis. Youth with one or more comorbid diagnoses (20% - 28%), youth with primary disruptive behavior disorder (7% - 11%), and youth with mood disorders (4% - 7%) were more common in the group of youth with services procured. Child age and gender were not significantly related to service procurement.

What Predicted Out-of-home Placement?

Analysis of factors discriminating youth receiving out-of-home placement at any time during the year correctly classified 72% to 78% of youth across years. Child age, ethnicity, interagency involvement, and diagnostic factors significantly discriminant youth served out-of-home from youth exclusively served in their homes (see Table 7). On average, youth receiving out-of-home services were 1.2 to 1.9 years older than youth receiving in-home services only. Multiethnic, Native Hawaiian or Pacific Islander, and White youth were 6% to 9% more common in the group of youth placed out-of-home. Higher proportions of youth placed out-of-home were also involved with DHS (13% - 15%), Family Court (11% - 30%), or were incarcerated or detained (4% - 7%). Youth registered with Hawaii (8% - 16%) and Leeward Oahu (5% - 8%) were more prevalent and, as expected, youth registered with Kauai FGC (11% - 24%) were less prevalent in out-of-home placements. Youth with one or more comorbid diagnoses (16% - 26%), youth with primary disruptive behavior disorder (8% - 16%), and youth with substance-related disorders (2% - 4%) were more common and youth with a primary attentional disorder were 7% to 8% less common in the group of youth receiving out-of-home services. Youth with a primary mood disorder accounted for a larger proportion of youth placed out-of-home during two years (6.2% - 6.9%) but although similar in magnitude (5.9%) this difference was not significant in the third analysis. Gender was not related to receipt of out-of-home services.

Table 7. Summary of factors discriminating procurement of out-of-home services.

	More Likely to Be Placed Out-of-Home
Unanimous Findings	Older Age in Years
	Multiple Ethnicity Native Hawaiian or Pacific Islander White Ethnicity
	Court Involvement DHS Involvement Incarcerated/Detained During Year
	Hawaii (Big Island) FGC Registration Leeward Oahu FGC Registration Not Registered to Kauai FGC
	Any Comorbid Diagnosis Not Primary Attentional Disorder Primary Disruptive Behavior Disorder Primary Substance-Related Disorder
Replicated Findings	Primary Mood Disorder

What Accounted for More Intensive and Expensive Services?

Because both the service expenditure and service intensity variables were highly skewed, a new variable was created to identify groups of high and low service utilization. To create this variable, the total expenditures per year and the total number of hours per year were divided at their respective medians. The high utilization group was defined as being above the median in both total expenditures and total hours per year. Youth below the median on either total hours or total expenditures were assigned to the low utilization group. Youth who scored above the median on one variable, but not the other were included in the high utilization group if the scored more than two standard deviations above the median in the residual univariate distribution. This yielded the final high (n = 1,302, 49% FY 2001; n = 852, 48% FY 2002; n = 639, 50% FY 2003) and low (n = 1,374, 51% FY 2001; n = 929, 52% FY 2002; n = 644, 50% FY 2003) utilization groups. These analyses only included the population of youth with one or more services procured.

Discriminant analyses were conducted with demographic variables only and with a combination of demographic and service variables. The demographic analyses classified 61% to 65% of youth correctly into high and low utilization groups. The demographic analyses correctly classified 81% to 89% of youth. Youth involved with DHS (7% - 10%)

or Family Court (5% - 20%) were more prevalent in the high utilization group. In two analyses, the high utilization group was, on average, 0.7 to 1.1 years older than the low utilization group, whereas the age effect (0.4 years older) was not significant in the third analysis. Youth with one or more comorbid diagnoses were 7% to 15% more common in the high utilization group, although this effect was only statistically significant in two analyses.

When service variables were included in the analyses, three basic findings emerged. First, in addition to the demographic effects replicating, youth in the high utilization group changed provider agencies more frequently than the low utilization group (on average 0.7 to 0.8 more agency changes). Second, not surprisingly, out-of-home in its various forms accounted for high utilization. Third, the procurement of less intensive, multisystemic therapy, or intensive in-home services did not consistently predict low service utilization. In two years, youth who did not receive intensive in-home services were disproportionately represented in the high utilization group but this effect was reversed in the third year. Therefore, it seems that youth receiving any out-of-home services tend to use the most services and that these youth probably also received a distribution home or community-based services during the year. This analysis suggests that no single type of in-home service has consistently minimized overall service utilization.

Table 8. Summary of factors discriminating high from low utilization groups.

	More Likely to Be in High Utilization Group (Demographics Only)	More Likely to Be in High Utilization Group (Services Included)
Unanimous	DHS Involvement Court Involvement	DHS Involvement Court Involvement More Provider Changes Any Out-of-State Services Any Out-of-Home Services Any Hospital Residential Any Community High-Risk Residential Any Therapeutic Group Home Any Therapeutic Foster Home
Replicated	Older Age in Years Any Comorbid Diagnosis	Older Age in Years Any Community Residential Any Partial Hospitalization No Intensive In-Home Services Any Less Intensive Services

Service Efficiency

Prior analyses found that the total number of youth served, the total number of hours provided, and the total service expenditures decreased during the study period. Therefore, further analysis of the relative rates of decline for these measures is necessary to determine whether the decline in outputs (e.g., number of youth served, service hours provided) was associated with a comparable decline in inputs (i.e., dollars expended). The definition of which variables constitute inputs and outputs implicitly depends on one's perspective. The present analysis viewed the number of youth accessing services as the primary output, the number of hours provided as a mediating factor, and expenditures as the primary input. Accordingly, the efficiency analysis focused on whether the intensity of services (i.e., hours per youth), expenditures per youth, and expenditures per unit of service intensity changed during the study years.

Service Intensity

Despite the decline in the total number of hours, the average number of hours purchased per youth increased by 66 hours per year. Thus, the number of youth accessing services declined more rapidly than the number of hours of service provided. As a result, the typical youth in FY 2003 received 132 more hours of service during the year than youth served during FY 2001.

When examined by setting, the average number of in-home service hours per youth decreased (-28 hours per youth per year), whereas the average number of out-of-home service hours remained fairly stable across the years (-5 hours per youth per year). When interpreting these patterns, it is important to keep in mind that approximately 20% of youth received both in-home and out-of-home services in all years but in recent years, a higher proportion of total hours purchased were out-of-home hours. Examination of service patterns for individual youth revealed that average service intensity per youth decreased for most out-of-home levels of care (i.e., out-of-state, hospital residential, community high-risk residential, community residential, and therapeutic group home) but remained fairly stable or increased for therapeutic foster home, respite home, intensive day stabilization, and multisystemic therapy services.

Table 9. Service hours provided per youth per year and average percent of total hours received at each level of care.

	Fiscal Year			Fiscal Year		
For Youth with Services Procured	2001 Hours	2002 Hours	2003 Hours	2001 %	2002 %	2003 %
Out-of-State	1,558	1,294	1,133	87%	73%	65%
Acute Inpatient	-	-	-	-	-	-
Hospital Residential	530	528	393	63%	47%	46%
Community High Risk	1,648	1,835	1,344	41%	71%	63%
Community Residential	930	929	794	76%	77%	75%
Therapeutic Group Home	864	897	727	70%	68%	67%
Therapeutic Foster Home	1,209	1,233	1,182	73%	74%	76%
Respite Home	0	0	42	0%	0%	9%
Intensive Day Stabilization	0	0	2	0%	0%	11%
Partial Hospitalization	14	12	0	16%	15%	0%
Day Treatment	14	12	0	25%	1%	0%
Multisystemic Therapy	153	136	141	58%	60%	76%
Intensive In-Home	97	114	77	52%	65%	71%
Flex	-	-	-	-	-	-
Respite	-	-	-	-	-	-
Less Intensive	115	277	10	57%	59%	6%
Out-of-Home Services	1,168	1,245	1,158	88%	88%	93%
In-Home Services	159	207	102	80%	78%	77%

Analysis of the proportion of total services hours received at a specific level of care for youth receiving one or more services at that level of care provided an indication of the degree to which youth received additional services at other levels of care. Over the study period, the developing services (i.e., community high-risk residential, intensive day stabilization, respite homes, and multisystemic therapy) accounted for a larger proportion of all services received by

youth in these services, as was also the case for therapeutic foster homes and intensive in-home services. Out-of-state, hospital residential, therapeutic group home, and less intensive services accounted for a lower proportion of all services received by youth at these levels of care, suggesting that youth who received these services were increasingly provided with additional alternative services. Community residential services accounted for a stable proportion of all individual services received. As expected, partial hospitalization and day treatment service intensity per youth decreased as these services were eliminated from the CAMHD array.

Taken together, these analyses suggest that youth have tended to receive more services per year, but that these services are more likely to be out-of-home services, received for shorter durations at specific placements, which account for a smaller percentage of services received per youth. Thus, it appears likely that a subset of youth are receiving services in multiple out-of-home settings and staying for a shorter time in each setting except therapeutic foster homes. The fact that therapeutic foster homes are demonstrating a stable service intensity and accounting for a higher proportion of all services may suggest that youth placeed out-of-home may be more efficiently "stepping down" into therapeutic foster homes from more restrictive out-of-home levels of care.

Service Expenditures

Despite the reduction in total service expenditures, the average cost per youth with services procured increased during the study period ($22,326, $29,438, $25,839) whereas the average expenditure per unit of service decreased over the study period ($49, $48, $45). Thus, the number of youth receiving services declined more rapidly than the amount of dollars expended, which in turn declined more rapidly than the number of hours of service provided. In other words, efficiencies were gained over the period in the cost per hour of service, but these gains were more than offset by increases in the number of service provided per youth, resulting in an overall increase in cost per youth.

Table 10. Average expenditures (US$) per youth receiving service and per service hours by level of care.

	Fiscal Year			Fiscal Year		
For Youth with	2001	2002	2003	2001	2002	2003
Services Procured	$/Youth	$/Youth	$/Youth	$/Hour	$/Hour	$/Hour
Out-of-State	58,273	51,902	53,299	36	30	35
Acute Inpatient	270	1,037	-	-	-	-
Hospital Residential	38,028	50,088	37,661	42	92	86
Community High Risk	-	148,995	98,598	-	46	43
Community Residential	51,767	54,718	45,482	56	59	57
Therapeutic Group Home	40,962	43,256	32,034	47	49	44
Therapeutic Foster Home	30,300	32,008	31,105	26	26	26
Respite Home	-	-	520	-	-	12
Intensive Day Stabilization	-	-	2,091	-	-	322
Partial Hospitalization	13,870	11,500	5,026	-	-	-
Day Treatment	21,664	9,472	-	-	-	-
Multisystemic Therapy	6,523	6,974	5,725	38	59	46
Intensive In-Home	6,763	7,965	4,111	70	70	54
Flex	1,302	1,260	2,147	-	-	-
Respite	2,157	1,797	1,234	-	-	-
Less Intensive	4,513	7,236	1,642	41	31	130

Overall efficiency gains were primarily associated with in-home services, which demonstrated both decreasing expenditures per youth ($9,420, $8,686, $3,722) and per service unit ($66, $52, $52). Decreases in cost per youth were evident for across the in-home levels of care, whereas the cost per service hour reductions were mostly due to the intensive in-home level of care.

Out-of-home services showed both an increasing trend in cost per youth ($12,648, $20,449, $21,644) and cost per out-of-home service unit ($41, $46, $43) throughout the period. Average costs per level of care were stable or declining for all out-of-home services except for therapeutic foster homes services. Average cost per unit of service increased considerably for hospital residential ($42 to $86) but this was offset by a reduction in the service intensity per youth to yield relative stable cost per youth. Due to decreased service intensity (i.e., shorter lengths of service), community residential services displayed a sizable efficiency in cost per youth despite stable cost per hour. Therapeutic group homes gained efficiencies on all dimensions. Therapeutic foster homes were fairly stable on all three efficiency indicators, but small increases in cost per hour ($25.5 to $26.4) were associated with increased cost per youth.

When interpreting the cost per service unit, it is important to keep in mind that the scaling of these estimates is arbitrary (i.e., they do not represent contracted costs per billable hour) so the actual values should not be interpreted. Instead, these estimates were constructed to compare relative efficiencies across study years. For example, the increased cost for less intensive services is likely due to the fact that psychosexual assessments, which are performed by high qualified and specialized personnel, accounted for almost all of the less intensive services purchased during FY 2003, whereas many other less specialized outpatient services were also purchased in prior years. Nevertheless, changes to contracted unit costs, such as those associated with the many new contracts that were negotiated as part of the service array reorganization for FY 2002, would affect these numbers accordingly.

Service Summary

Taken together, the utilization and cost patterns describe a consistent picture of the CAMHD service system during the study period. The overall reduction in population size was associated with absolute decreases in the number of youth accessing services, total hours of service procured, and the total expenditures for those services. Examination of relative changes indicated a fairly stable pattern in the overall proportion of youth served, increased service intensity, and an increased proportion of youth and hours provided out-of-home. Service expansion was evident for the community high-risk residential, community residential, and multisystemic therapy levels of care. Out-of-state, partial hospitalization, day treatment, respite, and less intensive services were contracted. Out-of-state and respite service reductions represent a transition or reduction of services within the CAMHD array. The reduction in partial hospitalization, day treatment, and less intensive services was consistent with the transition of these services to the Department of Education, who provides for these service needs through the school-based behavioral health array. Intensive in-home services were provided to a larger proportion of youth at a somewhat lower intensity across the study period.

The series of analyses describing which youth were most likely to receive services, be placed out-of-home, and to use sevices at a high level, yielded fairly similar results. In general, intensive services were more likely used by older youth with multiple agency involvement, comorbid diagnoses, or Native Hawaiian or Pacific Islander, White, or Multiethnic identification. Notably, youth with attentional disorders were more likely to be served in their community and less likely to be placed out-of-home, whereas youth with disruptive behavior disorders, substance-related disorders, and mood disorders experienced the opposite tendency.

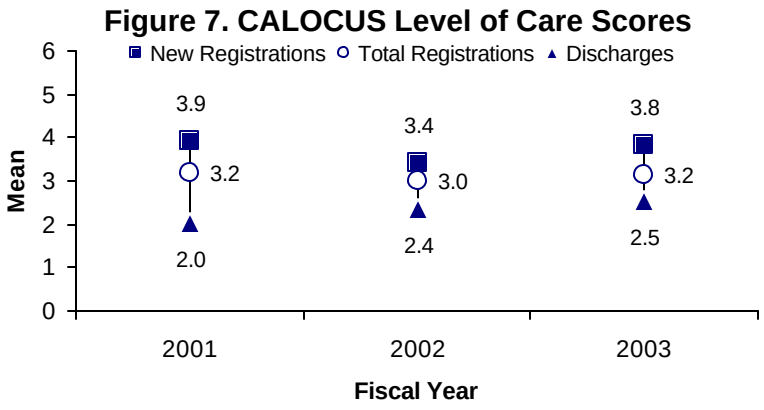
Overall efficiencies were gained in the cost per hour of service provided, which was largely due to in-home service adjustments. The increased service intensity offset gains in cost per hour and yielded higher costs per youth. The observed pattern of out-of-home service usage and costs suggests that the higher relative costs for out-of-home services were being predominantly driven by a larger relative proportion of youth accessing out-of-home services, whereas unit cost and service intensity made smaller contributions.

Child Status Characteristics

To examine child functioning and level of service needs, the eight-scale total score from the Child and Adolescent Functional Assessment Scale (CAFAS) and the level of care score from the Child and Adolescent Level of Care

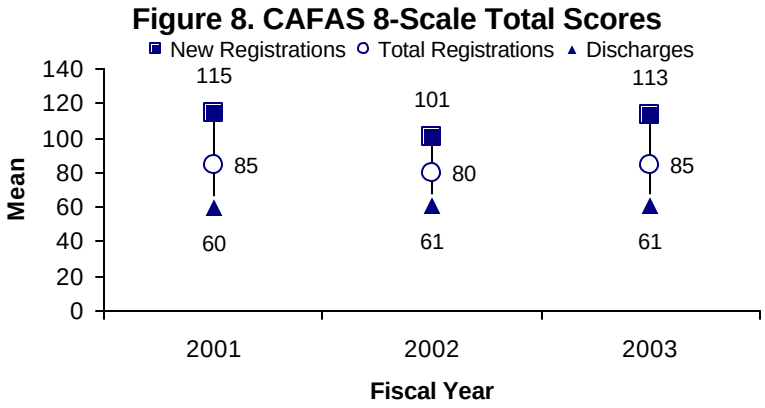
Utilization System (CALOCUS) were used as primary outcome measurements. CAMHD has also developed procedures for collecting the Achenbach System of Empirically Based Assessment (ASEBA) parent (CBCL), teacher (TRF), and youth (YSR) report forms, but due to large amounts of missing data during the study period, results from the ASEBA are only reported when sufficient data are available.

The first analysis examined the child status scores for the annual populations. For each year, three scores were calculated (a) the average score within three-months of admission for the group of youth admitted during the year, (b) the average score across all assessments conducted during the year for all youth with one or more assessments, and (c) the average score within three-months prior of discharge for the group of youth discharged during the year. These scores describe the average status for youth entering, active, and leaving the CAMHD system during the year, but they do not describe changes within an individual over time. Over the three years of the study period, the number of youth receiving assessments has consistently increased, so the associated sampling error has decreased, particularly for the admission and discharge estimates. Accordingly, the 95% confidence intervals have decreased across fiscal years. Because these population scores were fairly stable across the three years in the study so overall levels are described.



Analysis of average CAFAS scores indicated a stable pattern across study years. For all study years, intake scores were higher than average scores, which were in turn higher than discharge scores. The 95% confidence range of average CAFAS scores for youth newly admitted to the system were 101 – 129, 95 – 107, and 109 – 117 for FY 2001, 2002, and 2003 (N = 43, 179, & 334), respectively. The 95% confidence range for average functioning of all youth were 83 – 87, 78 – 82, and 83 – 87 for FY 2001, 2002, and 2003 (N = 1,300, 1,544, & 1,317), respectively. For discharged youth the confidence intervals were 49 – 72, 55 – 67, and 57 – 66 for FY 2001, 2002, and 2003 (N = 53, 221, & 323), respectively. As a guideline for interpreting the CAFAS, scores of 50 – 90 may indicate a need for services beyond outpatient care and scores of 100 – 130 indicate the need for intensive services with multiple supports. Further, a score of 80 on the CAFAS represents the point of functional impairment that qualifies a youth as severely emotionally or behaviorally disturbed (SEBD).

Analysis of average CALOCUS scores generally replicated the CAFAS findings and indicated a stable pattern across study years. For all study years, child needs at intake exceeded the needs of the average youth in the system, which in turn exceeded the needs of youth at discharge. The 95% confidence range of average CALOCUS scores for youth newly admitted to the system were 3.3 – 4.5, 3.1 – 3.7, and 3.7 – 4.0 for FY 2001, 2002, and 2003 (N = 33, 135, & 301), respectively. The 95% confidence range for average functioning of all youth were 3.1 – 3.3, 2.9 – 3.1, and 3.1 – 3.2 for FY 2001, 2002, and 2003 (N = 867, 1,202, & 1,200), respectively. For discharged youth the confidence intervals were 1.5 – 2.5, 2.1 – 2.6, and 2.4 – 2.7 for FY 2001, 2002, and 2003 (N = 42, 205, & 294), respectively. As a guideline for interpreting the CALOCUS, a score of 2 indicates a need for outpatient services, a score of 3 indicates a need for intensive services, and a score of 4 indicates a need for multiple intensive integrated services.



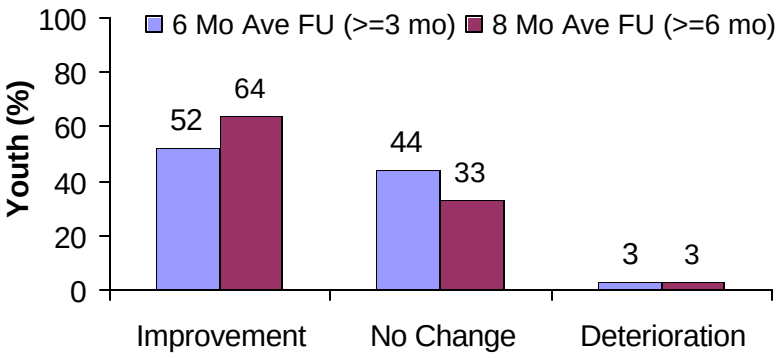
Taken together, the CAFAS and CALOCUS results show that the average youth entering the CAMHD system was in need of multiple integrated intensive services and supports. On average, all youth in the system were in need of intensive services and case management beyond basic outpatient care. Finally, youth discharged from the system remained in need of outpatient services, but did not generally require more intensive programming. Thus, the findings based on these standardized measures of child status, indicate that CAMHD is serving the population of youth in need of intensive mental health services and that the average youth discharged from CAMHD was not in need of intensive services. The relatively elevated scores at admission indicate that many youth accessed CAMHD services at a point of crisis, as is quite common. The present data do not describe whether these youth experienced fairly rapid increases in impairment or whether there was a gradual escalation to these higher levels of need. The observed pattern may indicate that school-based behavioral health services are successfully maintaining some youth at relatively high levels of functional impairment. Alternatively, youth may enter a crisis during the period of time between referral for CAMHD services and the date of initial assessment. It is also possible that youth whose service needs are gradually escalating are not being detected and provided rapid intervention at the point that their impairment begins to suggest a need for intensive services.

Analysis of average total problem scores on the parent-reported CBCL and teacher-reported TRF displayed similar patterns to the CAFAS and CALOCUS, but the elevation of scores was less pronounced. Fiscal year 2003 was the only year with valid data on more than 30 youth with admissions and discharges, so only these results are reported. The 95% confidence range of average CBCL and TRF scores for youth newly admitted to the system were 68 – 72 and 62 – 66 (N = 78 & 89, respectively), for all youth were 64 – 66 and 60 – 62 (N = 385 & 469, respectively), and for discharged youth were 58 – 67 and 57 – 62 (N = 36 & 77, respectively). On the ASEBA scores greater than 60 indicate clinically significant elevations, whereas scores from 65 – 70 are considered in the borderline clinical range. These results indicate that teachers described youth as experiencing fewer symptoms of psychopathology than parents, but both teachers and parents noted more symptoms in the group of new admissions than in the total population and discharged groups.

To the extent that population-based estimates of intake, average, and discharged scores describe a decreasing pattern that remains stable over time, it is likely that the functioning of individual youth is improving as they progress from intake to discharge. Nevertheless, population-based analyses do not directly describe changes within individuals across time. To examine intra-individual change, baseline and follow-up scores were identified for individual youth, and an indicator of reliable change using a 95% confidence level was calculated (Jacobson & Truax, 1991). For each youth the registration episode of interest was defined as the most recent period of registration with a six month or longer length of service. The baseline assessment was defined as the highest score received within three months of admission. The follow-up measure was defined as the most recent assessment that was completed three or more months after the baseline assessment (or six or more months after baseline).

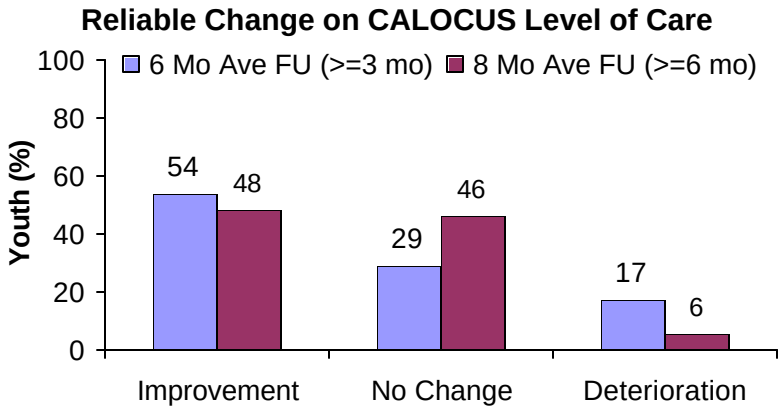
When a three-month minimum follow-up period was required, the average duration between baseline and follow-up assessment was 6.3 months for CAFAS (n = 124) and 6.2 months for CALOCUS (n = 87). When a six-month minimum follow-up period was required, the average duration between baseline and follow-up assessment was 8.4 months for both CAFAS (n = 69) and CALOCUS (n = 59). When CAFAS scores were analyzed for youth with a three-month or longer follow-up period 52.4% showed reliable improvement, 44.4% showed no change, and 3.2% showed deterioration. When a six-month or longer follow-up period was examined 63.8% showed reliable improvement, 33.3% showed no change, and 2.9% showed deterioration. Thus, approximately one-half to two-thirds

Figure 9. Reliable Change on CAFAS 8-Scale Total



of youth demonstrated improved functioning beyond that expected due to measurement error and chance fluctuations. Very few youth demonstrated deterioration in functioning once they received services from CAMHD.

When CALOCUS scores were analyzed for youth with a three-month or longer follow-up period 54.0% showed reliable improvement, 28.7% showed no change, and 17.3% showed deterioration. When a six-month or longer follow-up period was examined 48.1% showed reliable improvement, 46.3% showed no change, and 5.6% showed deterioration. Consistent with the CAFAS three-month follow-up analysis, approximately one-half of youth showed reliable improvement in their service needs. However, CALOCUS analyses revealed relatively higher rates of deterioration once youth enrolled for CAMHD services.



The major limitation of the reliable change analysis was the relatively small sample size. The basic demographic and service characteristics of the reliable change samples were compared with the characteristics of the full population to provide some indication of the similarity between these groups. The sample with completed outcome measures tended to be younger (-1.5 years), have more females (+7% to +8%), fewer Native Hawaiian or Pacific Islander (-9% to -11%) and Asian members (-4% to -6%), have fewer attentional disorders (-14% to -16%), fewer comorbid diagnoses (-20% to -20%), and fewer youth with court hearings. Hawaii (+13%) and Maui (+14% to +16%) youth were over-represented and Kauai (-23%) youth were under-represented in the reliable change sample. Youth receiving multisystemic therapy (+23% to +28%) services were relatively more common whereas youth receiving intensive in-home (-15 to -17%), community residential (-11% to -12%), therapeutic foster home (-6% to -8%) and therapeutic group home (-5% to -6%) services were relatively less common in the reliable change sample. Although the reliable change analyses addressed a diverse population, the samples differ in important ways from the total population.

System Effectiveness

Discriminant function analyses were conducted to identify factors associated with reliable improvements in functioning and reliable reductions in service needs. The primary challenge to these analyses was the small sample size on which reliable change could be calculated. Several steps were taken to adjust for the reduced sample. First, reliable change was classified into the two groups of improvement versus no improvement. Second, only the sample with three or more month follow-up assessment was analyzed. Third, a minimum youth to predictor variable ratio of 10 to 1 was maintained by reducing the number of predictor variables. The 10 most discriminating variables based on univariate comparisons were selected for inclusion in the CAFAS model regardless of their statistical significance. Eight variables were chosen for the CALOCUS analysis. Finally, a single analysis was conducted across all years of the study; so sample-to-sample replication was not possible. While these procedures promoted statistical power within the simplest possible model, they also increased the likelihood of finding spurious effects due to chance particularly considering the lack of replication analyses. Therefore, these analyses should be considered exploratory.

What Predicted Reliable Improvements in Functioning?

The multivariate discriminant function predicting reliable change on the CAFAS total scale was statistically significant, χ^2 (10, N = 124) = 21.2, p = .020, and correctly classified 63% of cases. Demographic factors predicting improved functioning were older age, not registered to Central Oahu FGC, and court hearing involvement (see Table 11). Diagnostically, youth without primary disruptive behavior disorders and with primary mood or substance-related disorders were most likely to show improved functioning. With respect to services, youth receiving

therapeutic group home, hospital residential, or multisystemic therapy were more likely to show improved functioning and youth receiving intensive in-home services were less likely to show reliable improvements in functioning.

When interpreting these results it is important to keep in mind that these analyses do not describe the overall level of functioning of youth but rather the change in functioning following registration with CAMHD. Similarly, these analyses do not adjust for the actual level of functioning at intake and youth with more elevated scores may be more likely to show improvement. Thus, youth served in hospital residential may be more likely to show improvements than youth receiving intensive in-home, but may still have more impaired functioning despite the improvement. Thus, these service results describe hospital, therapeutic group home, and multisystemic therapy as likely settings for positive therapeutic change and intensive in-home services as a setting for maintaining functioning level.

Table 11. Summary of factors discriminating reliable improvement in child functioning.

More Likely to Experience Reliable Improvement in Functioning
Older Age
Court Involvement
Not Registered to Central Oahu FGC
Primary Mood Disorder Primary Substance-Related Disorder Not Primary Disruptive Behavior Disorder
Hospital Residential Therapeutic Group Home Multisystemic Therapy

What Predicted Reliable Reductions in Service Needs?

The multivariate discriminant function predicting reliable change on the CALOCUS level of care scale was statistically significant, χ^2 (8, N = 87) = 17.0, p = .030, and correctly classified 70% of cases. Several geographic region effects were related with changes in service needs (see Table 12). Specifically, a higher proportion of youth demonstrating reliable reductions in service needs were registered to Honolulu Oahu and Maui FGCs and a lower proportion were registered with Central Oahu and Windward Oahu FGCs. Youth with disruptive behavior disorder were less likely to demonstrate reliable reductions in needs whereas youth with substance-related disorders were more likely to improve. Finally, youth receiving intensive in-home services and hospital residential services were less likely to show reduced service needs that youth not receiving these services.

Table 12. Summary of factors discriminating reliable improvement in service needs.

More Likely to Experience Reliable Improvement in Service Needs
Registered to Honolulu Oahu FGC Registered to Maui FGC Not Registered to Central Oahu FGC Not Registered to Windward Oahu FGC
Primary Substance-Related Disorder Not Primary Disruptive Behavior Disorder
Not Hospital Residential Not Intensive In-Home Services

Registration Episode Length and Readmission Rates

A study of typical registration episode length and readmission rates during fiscal years 2001 to 2003 was recently performed using a sample very similar to the current sample (Daleiden, 2003c), so analyses were not repeated here. However, the findings are directly relevant to interpreting the present results, so a brief summary is provided. For the total sample of youth who completed one or more treatment episodes during the period, the average length of the first completed registration episode was 7.2 months (SD = 4.6) and the median length was 6 months. Of those youth who completed an initial registration episode, 9.5% were readmitted for a second registration episode during the study period. The average period of discharge between first and second episodes was 10.7 months (SD = 6.8) and the median break in service was 9 months. The average length of second completed episodes (M = 7.4 months, SD = 4.3, Mdn = 7) was similar but slightly longer than the length of first episodes.

To provide an estimate of the typical treatment course for youth who enter the CAMHD system for the first time, a survival-type analysis was performed on the sample with initial registrations during the study period. Results

indicated that approximately 50% of youth completed registration episodes within nine months, 75% completed within 18 months, and approximately, 10 – 15% of eligible youth remained enrolled through the entire three-year period. At six-months following discharge, 95% of eligible youth remained discharged and at two to three years following discharge, approximately 90% of youth remained discharged. Most of the readmissions occurred within the first six to nine months after discharge followed by a relatively slow, stable continuing admission rate. Thus, throughout the entire study period there was a readmission rate of approximately 10% of eligible youth. As in the full sample analysis, the length of second episodes tended to be somewhat longer than first episodes. Approximately one-third of youth completed their second service episode by 12 months following readmission and at 18 months following readmission, approximately 60% of eligible youth had completed their second service episode.

Although discriminant function analyses were not performed, univariate analyses found that older youth, and youth registered to Windward Oahu FGC and Leeward Oahu FGC had longer registration episodes. Youth registered to Family Court Liaison Branch had shorter episodes on average, likely due to the provision many risk assessments at Detention Home. Maui FGC and Family Court Liaison Branch had the fewest youth with multiple episodes (i.e., readmissions), whereas Kauai FGC, Hawaii FGC, and Windward Oahu FGC had the highest proportion of youth with multiple episodes. Youth with comorbid disruptive behavior disorders and attentional disorders were more likely to be readmitted than those without these disorders. Gender and ethnicity were not significantly related to episode length or readmissions.

Child Status Summary

Both population-based and individual analyses found that youth entering CAMHD services show improved functioning. Youth tend to enter CAMHD with impairments that call for multiple intensive and integrated mental health services and the majority of youth show reliable improvements in functioning upon receipt of these services. Youth tend to leave the CAMHD system with functioning appropriate for management in outpatient services. Approximately, 90% of youth completed their first registration episode during the period within twelve months and approximately 10% of youth were readmitted for a second episode. Preliminary analysis of factors predicting change revealed that hospital residential, therapeutic group home, and multisystemic therapy provide the setting most associated with reliable improvements, whereas intensive in-home services were most associated with maintaining stability. Youth suffering from mood disorders or substance-related disorders were more likely to show reliable improvements, whereas youth with disruptive behavior disorders were less likely to show improvements. In sum, the CAMHD service system appears to effectively help the majority of youth with intensive mental health problems return to better functioning appropriate for outpatient management within a 9 to 18 month treatment episode.

Summary and Conclusions

Overall Trends

The overarching finding from this evaluation that must serve as a context for all other effects was that the overall population of youth registered to CAMHD declined by approximately 46% from fiscal year 2001 to fiscal year 2003. This decline was evident after accounting for major structural changes to the system by excluding youth receiving less intensive, outpatient services only and those youth suffering from Pervasive Developmental Disorders. Compared to earlier years, the CAMHD population in fiscal year 2003 tended to be younger, have a higher proportions of multiethnic, White, or Native Hawaiian or Pacific Islander youth, suffer more comorbid psychiatric diagnoses, be more involved with other child serving agencies, receive a high level of service intensity, and receive proportionately more out-of-home services. On the other hand, the annual populations were of parallel gender composition, scored similarly on standardized measures of functioning and service needs, were served at relatively uniform overall rates, and were discharged at proportionately similar rates with comparable improvements in child status.

Services

In accord with the overall population decline, the total number of youth served, amount of services provided, and total expenditures decreased during the study period. Community high risk residential, community residential, and multisystemic therapy were proportionately expanded whereas out-of-state, partial hospitalization, day treatment, respite, and less intensive services were contracted. Youth have tended to receive more services per year that are more likely to be out-of-home services received for shorter durations at any specific placement exc ept therapeutic foster home. Youth were more likely to receive out-of-home services if they were older, multiethnic, White or Native Hawaiian or Pacific Islander, involved with other child serving agencies, registered at Hawaii FGC or Leeward Oahu FGC, and suffered from comorbid diagnoses, disruptive behavior disorders, substance-related disorders, or mood disorders, but not attentional disorders.

Child Functioning

The majority of youth entering CAMHD experience improvements in their functioning and decreased service needs that prepare them for successful management in outpatient services following a 9 to 18 month service episode. Hospital residential, therapeutic group home, and multisystemic therapy services were settings most associated with improvements in functioning, whereas intensive in-home services were most associated with maintaining stability. Youth with mood or substance-related disorders were more likely to show child status improvements and youth with disruptive behavior were less likely to show improvements.

Efficiency

Service efficiencies were gained in the overall cost per hour of service, but these gains were offset by increases in the number of services provided and resulted in higher average expenditures per youth. Service efficiency analyses did not directly account for cost per unit of child status improvement nor adjust for the child problem severity. However, the changes to service efficiency occurred in the context of a population that had higher levels of interagency involvement, comorbidity, and showed relatively stable pattern of child improvement. Therefore, the increases in service intensity per youth appeared sufficient to promote comparable treatment gains in the more complex population of fiscal year 2003. The system appears to have adjusted service intensity to maintain the historical level of treatment gains and generated cost savings per service hour that were insufficient to offset the higher intensity, so that average expenditures per youth increased.

CAMHD in Context

The evidence of population decline after adjusting for service needs indicates that relatively fewer youth are receiving intensive mental health services. This means that the interagency DOE-DOH system is functioning differently than the previous DOH-only single agency system with respect to service access. If the goal of the interagency system was to provide similar services to similar youth through a different organizational structure, then that goal was not achieved. However, if the goal was to reorganize services and structures to provide effective

intensive mental health services to youth with the most complex problems and life situations through CAMHD, then that goal was achieved. Youth in the current CAMHD population are more complex in terms of diagnosis and interagency involvement. However, the lack of increase in child status scores suggests that less complex youth who used to be served experienced similar levels of impairment and had comparable service needs. Therefore, it seems that the complexity but not the severity of the CAMHD population has increased. The decreasing population size and increasing complexity does not mean that the system is functioning more poorly or that many service gaps have emerged. Although one reasonable hypothesis is that the CAMHD population has decreased due to referral inefficiencies or systemic obstacles to accessing intensive mental health services, other alternatives exist. For example, more youth may be effectively served through school-based services or more youth may be accessing mental health services through private sources, while CAMHD continues to serve youth in complex circumstances. The CAMHD data are insufficient to test these alternatives, which require analysis of multiagency, public, and private information.

During fiscal year 2001, when CAMHD provided less intensive services as part of its array, almost all (92%) youth with more intensive services procured also received some form of less intensive services. The designers of the interagency system expected such less intensive services to be "wrapped" with many of the more intensive services. This concept underlies that notion that youth needing intensive mental health services to benefit from their education are a "shared" responsibility between DOE and DOH. If one assumes the interagency system was mostly implemented as designed, then estimating the number of youth receiving public mental health services statewide by adding the DOE population with the DOH population would tend to overestimate the true number of youth served. A more accurate estimate might be obtained by adding a portion (e.g., 20%) of the CAMHD registered population to the DOE population. More generally, it would probably be preferable if DOE registered all CAMHD youth in need of mental health services to benefit from their education, so that the DOE registered count be used as the statewide estimate of the Felix class size. CAMHD and Med-QUEST could supplement this estimate with the number of youth receiving services through the QUEST health plans to estimate all public mental health services. Although these steps would help understand public mental health services, youth receiving private services would remain an important but unmeasured population for understanding the epidemiology of all mental health services in Hawaii.

Out-of-Home Placement

Although the trend toward increasing out-of-home services may initially seem to counter to the system value on least restrictive treatment, in broader context immediate concern does not seem warranted. Analysis of child status variables found that average differences between admission and discharge scores remained fairly stable across years. The typical length of registration episodes is reasonable and average length of service for all out-of-home settings except therapeutic foster homes have decreased. Thus, it seems that the increased placement in out-of-home services has coincided with continued improvements in functioning and regular discharges. Therefore, while out-of-home placement is not a desirable first order treatment, out-of-home placements appear to provide an important setting for therapeutic change and are generally used appropriately within the CAMHD array.

Future Analysis

These comments are based on the best analysis available at present. Nevertheless, continued development of models for analyzing CAMHD's outcomes are needed. When analyses were performed examining changes in youth over time, limited sample sizes were available. Considerable energy has been invested in promoting completion of standardized child status measures and rates have increased dramatically (Daleiden et al., 2003). This has greatly increased the information available for analysis. The current model for analysis compared follow-up assessments to baseline (a.k.a., intake) assessments. Surprisingly, a main factor limiting sample size was the availability of baseline assessments. In the current model, it did not matter how many follow-up assessments were available if the baseline assessment was missing.

Because the present child status analysis required a minimum service episode of six months in duration, many of the recent improvements in assessment completion rates were not recognized. In the future, reanalysis using the present strategy will likely yield more robust sample sizes and results. However, other analytic models, such as Hierarchical Linear Modeling (Raudenbush & Bryk, 2002), that allow estimation of individual growth curves using varying assessment points may provide a better fit to the CAMHD structure. Nevertheless, because many positive gains

often appear early in the course of treatment, the absence of baseline assessments will lead to underestimates of the amount of change associated with services.

Further investigation of the reasons for limited baseline data is recommended, as is analysis of the amount of data available at key service transitions. One hypothesis that merits future investigation is that baseline assessments are being completed through DOE before the youth is registered with CAMHD. These assessments may not be captured electronically by the CAMHD system because CAMHD personnel did not complete them. If this were the case, CAMHD should consider adopting a policy of entering the available data to make this information available for analysis.

This evaluation provides a broad perspective on the functioning of the CAMHD system and changes over recent years. As with all evaluations, these findings raise as many questions as they answer. Continued analysis of the many complex interactions and specific relationships among services is recommended. Considerable resources were invested in assembling and validating the dataset for these analyses. Much of the information potential remains untapped. Additional analyses are recommended to examine the common service pathways that youth have followed over the past three years. Clusters of services may be identifiable that could help predict utilization and outcomes patterns. Results of the discriminant function analyses performed here could be applied to the active CAMHD population to estimate youth who are likely to be placed out-of-home or utilize services at a high rate. The characteristics of the specific disorder groups and service populations may each be profiled with respect to selected variables. CAMHD has built the infrastructure and generated the data set to support these analyses, but continued resource investment will be necessary to produce useful knowledge from this raw data.

Finally, near the end of fiscal year 2003, CAMHD initiated a revised monthly summary procedure through which network providers regularly report the targets of their intervention, youth progress on meeting these targets, and the specific therapeutic practices that constitute the intervention. These new data elements should allow for much more in-depth analysis of service practices and provide another mechanism for understanding therapeutic change. The complexity of the data analysis required will increase beyond that described here, but it is recommended that the development of analytic procedures for capitalizing on this data source be made a high priority.

This report has summarized many analyses and findings from CAMHD's fiscal year 2003 annual evaluation. Reporting findings is but the first step in the process of promoting system improvement based on evidence. This report gives little attention to the implications of these findings for CAMHD policies and operations. The next steps are to review and discuss these findings at the various committees that constitute CAMHD's quality management structure. Based on these discussions, an addendum to this report should be produced that summarizes the policy and practice recommendations appropriate to these findings.

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CAMHD Reports are available on-line at http://www.state.hi.us/doh/camhd/index.html

Author's Note

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