AN EXPLORATORY STUDY OF
ASSESSED NEED FOR MENTAL HEALTH TREATMENT AND SERVICE UTILIZATION
AMONG CHILDREN IN A RURAL SYSTEM OF CARE

A Project

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MASTER OF SOCIAL WORK

by
Janet L. Stevens

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Janet L. Stevens

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Division of Social Work
Abstract

of

AN EXPLORATORY STUDY OF

ASSESSED NEED FOR MENTAL HEALTH TREATMENT AND SERVICE UTILIZATION

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This study was designed to investigate typical patterns of mental health service utilization among children and adolescents, and to explore whether there is a correlation between the level of recommended care as determined by a standardized assessment tool (CALOCUS) and the type and intensity of treatment services provided within a rural system of care. The study is based on secondary assessment and treatment data that was originally collected between July 2010 and December 2011 and is maintained in County clinical and billing records. The study population consists of 65 mental health clients aged 18 and under who received treatment services between July 1 and September 30, 2010 and had an available CALOCUS assessment dated during or after July 2010. Service utilization was measured by compiling the number of minutes of mental health services received during the six months following the month of CALOCUS assessment. Within study population, individual treatment accounted for nearly half (48.8%) of all mental health services provided; other modalities each accounted for less than 15% of the total treatment units. Children in the study received a wide range (0 – 11,219) of total
treatment minutes, with an average of 1,755 minutes of treatment received during the six months following CALOCUS assessment. The median number of treatment minutes was 983, indicating that the mean was positively skewed by individual cases of high utilization. The corresponding cost for all mental health services received by participants in the study ranged from $0 to $40,077, with a mean cost for each individual of $5,345 and a standard deviation of $7,837. Further analysis of the data indicates that the CALOCUS assessment score is correlated to total minutes of treatment ($r=.30$) and therefore the cost of service ($r=.34$). The resulting coefficient of determination ($R^2$) for total minutes of treatment ($R^2=0.09$) indicates that 9% of variance in the utilization of treatment services within the study group coincides with differences in assessed acuity as determined by the CALOCUS Level of Care score. Similarly, the coefficient of determination ($R^2$) for total cost of treatment ($R^2=0.11$) means that 11% of variance in the cost of treatment within the study group coincides with differences in acuity as assessed by the CALOCUS measure. While the correlation coefficients calculated in this study are typically understood to represent a “moderate” magnitude of association, ANOVA analysis demonstrates that the apparent correlation between CALOCUS Level of Care and treatment intensity is not statistically significant.

_______________________, Committee Chair
Francis Yuen, DSW

_______________________
Date
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Chapter 1

Statement of the Problem

Matching an individual’s mental health needs with adequate and appropriate services is a primary purpose of assessment and a fundamental task in social work. For children with serious emotional disorders, social workers often use a biopsychosocial evaluation to diagnose, plan intervention strategies, and coordinate mental health treatment with the provision of medication support, collateral family services, educational interventions and community-based support services. In a public mental health system, federal, state and local policies, resources, and funding limitations also impact the services provided.

The implementation of mental health managed care in the 1990’s and the more recent emphasis on evidence-based mental health practices have together contributed to an environment in which clinicians are often required to apply screening and eligibility criteria, implement evidence-based treatment modalities, and use standardized outcome measures. Increasingly, quantitative measures are utilized to assess client functioning, guide service recommendations, and evaluate change over time. While quantitative measures are generally not intended to replace clinical judgment or directly prescribe treatment, they are expected to contribute to sound assessment, aid level-of-care decision-making, and/or improve clinical outcomes. The often-untested assumption that quantitative measures have clinical utility is implicit in their use.

Among the many quantitative assessment tools available, a few are intended specifically to evaluate treatment needs and gauge the intensity of services required. The
equitable, effective, and cost-efficient use of resources is particularly compelling in a public, managed care environment. An objective tool that could help to balance resource availability with individual clinical need and predict service utilization would be a vital asset within the public mental health system. Issues related to access to care, unmet need, health disparities, risk of harm, and cost-efficiency are all impacted by level-of-care treatment decisions. The primary question is whether mental health treatment needs can be quantified, predicted, and correlated to the severity of the emotional or behavioral disorder; an associated question is whether a quantitative measure of service need has clinical utility.

Background of the Problem

In California, County Mental Health agencies are typically tasked with the primary responsibility of providing specialty mental health services to indigent clients and Medi-Cal enrollees residing within the county. Services for children and adults are supported by a combination of federal, state, and county funds, and potential clients are assessed for mental health service need and eligibility using uniform, statewide criteria for the establishment of medical necessity. Yet while a main goal of the State’s managed mental health care system involves the use of uniform treatment criteria and standards to control assessment and authorization processes, the treatment systems of care and services available vary widely across counties (Masland, Snowden, & Wallace, 2007). Once mental health services are authorized, ongoing decisions about treatment intensity and duration are typically made, within broad limits, by the clinician and the client.
Previous research on children’s mental health has demonstrated a high prevalence of behavioral and emotional disorders (U.S. Department of Health and Human Services, 1999; Hoagwood & Olin, 2002; Merikangas et al., 2010) in combination with a persistent unmet need for services (Bringewatt & Gershoff, 2010; McMorrow & Howell, 2010). Access to care is impacted by not only the severity of impairment, but by the type of disorder (Wu et al., 1999), by the child’s gender and ethnicity (Kataoka, Zhang & Wells, 2002), and by state, regional, insurance, and economic variables (Sturm, Ringel, & Andreyeva, 2003; Howell & McFeeters, 2008). Along with fiscal constraints and issues related to resource allocation, persistent service needs and disparities are often cited as evidence of the need for standardized tools to more equitably provide mental health treatment.

Tools to objectively and systematically assess service needs have examined various diagnostic factors, behavioral symptoms, degree of functional impairment, and co-morbidity. Some tools have considered multiple factors in formulas so complex that their inter-rater reliability was poor, while other tools are proprietary and not generally available to clinicians in public systems of care. In addition, many instruments have been designed primarily for fiscal reasons, with the main goal of restricting the utilization of services. Clinicians are reluctant to use such tools, and their validity has been questionable (Fallon, et al., 2006). Standardized and more well-established, evidence-based assessment tools that broadly evaluate the psychological adjustment and functioning of children and adolescents include the Child and Adolescent Functional Assessment Scales (CAFAS; LeCroy & Okamoto, 2009), the Child Behavior Checklist...
(CBCL; Holmbeck, et. al., 2008), the Children’s Global Assessment Scale (CGAS; Holmbeck, et. al., 2008), and the Child and Adolescent Child and Adolescent Level of Care Utilization System (CALOCUS), also known as the Child and Adolescent Service Intensity Instrument (CASII; Fallon, et al., 2006).

While researchers have assessed the psychometric characteristics of these measures (Holmbeck, et. al., 2008), there is generally much less evidence for the clinical utility of assessment measures and instruments (McGrath, 2001). The extent to which assessment measures have meaningful value in the provision of clinical services has been described as having three central components: effectiveness, the comparison of costs and benefits of implementation, and feasibility (Haynes, Smith, & Hunsley, 2011). More broadly, validity and reliability contribute to the likelihood that a measurement tool can work; clinical utility determines whether it will work (McGrath, 2001). Ideally, the clinical utility of tools intended to measure level-of-care needs would be demonstrated by the instrument’s ability to provide valid and reliable information to inform and facilitate treatment decisions, leading to more appropriate services, a reduction in the total cost of services, and/or improved client outcomes. Additionally, clinical utility requires that clinicians have adequate knowledge and training to use the instrument, and that use of the tool is not overly burdensome to clients, clinicians, or administrative staff.

Statement of the Research Problem

The correlation between assessment, treatment planning, and service utilization is both a clinical and an administrative concern in social work. For the clinician, assessment is a process of understanding a client’s psychosocial situation, for the primary
purpose of determining appropriate interventions (Meyer, 1993). Yet traditional assessment data generally does not allow administrators to predict patterns of service utilization or manage mental health treatment resources (Fallon, et al., 2006). This study will explore the extent to which a quantitative assessment measure, the Child and Adolescent Child and Adolescent Level of Care Utilization System (CALOCUS), can predict mental health service utilization among children and adolescents in a rural system of care.

Purpose of the Study

The primary goal of this study is to explore the extent to which assessment is linked to treatment intensity, and factors that may be associated with variance between assessment and the utilization of mental health services. The question of whether mental health treatment needs can be quantified, predicted, and correlated to the severity of the emotional or behavioral disorder as well as issues related to the clinical utility of the CALOCUS instrument will also be examined.

Theoretical Framework

The type of information that is gathered during the intake assessment, and the ways in which information is formulated by the clinician to develop a conceptualization of the client’s situation and an approach to treatment depends in large part on the theoretical framework of the practitioner (Jordan & Franklin, 2011). In a public mental health setting, the utilization review policies and expectations of the practice setting are equally significant in determining the type, extent, and formulation of client information at assessment and in shaping the development of a treatment plan.
The biopsychosocial (BPS) assessment is one of the most common, integrative, and well-known approaches to mental health assessment; intake forms based on the BPS model are used extensively by social work practitioners, psychologists, and marriage and family therapists. Widespread consensus for implementation of the BPS model has also been demonstrated in practice guidelines, accreditation standards and assessment textbooks across mental health specializations (Meyer & Melchert, 2011). BPS assessment is a holistic process that includes gathering information about the client’s biological, psychological, and social development and functioning, integrating the various perspectives, formulating a diagnosis, and developing a treatment plan. Various tools that may aid in the development of the BPS assessment include genograms, self-reports, mental status exams, and eco-maps (Vandiver & Corcoran, 2009). In addition, BPS assessment has been described as both an art and a science, involving exploration, inference, evaluation, problem definition, and intervention planning; it is informed by the clinician’s practice wisdom and theoretical orientation and guided by purpose, values, client concerns, and the professional relationship (Meyer, 1993). The BPS approach also continues to guide the mental health treatment process beyond assessment, through the implementation of planned interventions and the evaluation of treatment outcomes (Meyer & Melchert, 2011).

Biopsychosocial assessment is founded in the general systems and ecological theories, which originated in the natural sciences (Hepworth, Rooney, Dewberry Rooney, Strom-Gottfried, & Larson, 2010). Systems theory proposes that all levels of an organization are linked in dynamic, hierarchical relationships, so that change in one level
affects change in other levels (Engel, 1977). Arguing against the biomedical model of disease, Engel (1977) reasoned that biopsychosocial concepts more fully account for the multiple and interacting determinants of both physical and psychiatric illness, including important psychological and sociological factors. In addition, Engel proposed that systems theory provides the foundation not only for expanding the understanding of illness but also for conceptualizing disease and medical care as interrelated processes.

In social work, ecological systems theory incorporated ideas from the environmental movement in biology as well as general systems theory. In particular, ecological theories stress the reciprocal and nonlinear influence of individuals and other systems within the environment; biopsychosocial assessment therefore considers not only how people react to their environment, but rather how people and environmental systems influence one another (Hepworth, Rooney, Dewberry Rooney, Strom-Gottfried, & Larson, 2010).

Yet despite its widespread acceptance and use, there is little research supporting the efficacy of biopsychosocial assessment (Jordan & Franklin, 2011). In a meta-analysis of thirty-eight studies published between 1995 and 2006, researchers found that psychiatric diagnoses obtained from clinical evaluations were often different than those based on the standardized diagnostic interviews used in clinical research (Rettew, Lynch, Achenbach, Dumenci, & Ivanova, 2009). In addition, while few studies have investigated the extent to which mental health assessments and case formulations conform to the BPS model, initial findings suggest that in clinical practice, the collection
of BPS information is not sufficiently comprehensive or integrated in formulations
designed to maximize treatment effectiveness (Meyer & Melchert, 2011).

In contrast, evidence-based assessment (EBA) is founded on a clinical science
orientation and relies on the measurement of psychological and behavioral variables, the
compilation of valid and useful assessment data, the use of scientific reasoning and
relevant research as the basis of treatment decision-making (Haynes, Smith, & Hunsley,
2011). While the BPS assessment is a qualitative, narrative summary of the client’s
history and current functioning, evidence-based quantitative measures add specificity and
concreteness to the assessment (Jordan & Franklin, 2011) and are intended to reduce the
likelihood of common errors in clinical judgment (Haynes, Smith, & Hunsley, 2011).

**Definition of Terms**

**Biopsychosocial (BPS) Assessment:** A comprehensive approach to assessment,
which involves the use of a clinical interview to obtain information about the client’s
biological, psychological and social development and functioning. The biological
assessment includes past and current health history, medications, family health and health
behaviors; psychological assessment includes behavior, speech and language, thought
process and content, mood, affect, and cognitive functioning; and sociocultural
assessment includes the evaluation of family and social relations, community ties,
economic status, living conditions, cultural background, and spiritual beliefs. The
clinician then integrates information from each of these domains to formulate a diagnosis
and develop a treatment plan (Vandiver & Corcoran, 2009).
Child and Adolescent Level of Care Utilization System (CALOCUS) and the Child and Adolescent Service Intensity Instrument (CASII): An assessment instrument developed in the late 1990’s and designed to help determine the intensity of services needed for use with children and adolescents between the ages of six and eighteen years of age served in a mental health system of care. The content of the CALOCUS and the CASII are virtually identical; the difference between the two is that users of CASII are required to be clinicians with training and experience assessing and treating children, adolescents and families; there are no specified qualifications or training requirements for the use of CALOCUS. The CASII/CALOCUS instrument contains eight parameters that are rated following a comprehensive clinical evaluation. The dimensions are risk of harm, functionality, co-morbidity, environmental stressors, environmental supports, the child’s resiliency, and the child and family’s willingness to engage in treatment. A rubric connects the ratings to a level of care recommendation that ranges from basic prevention services to treatment provided in a secure environment with 24-hour psychiatric monitoring (Fallon, et. al., 2006).

Child and Adolescent Service System Program (CASSP): A Federal program approved by Congress in 1984 to provide initial funding of 1.5 million dollars in competitive grants to the states earmarked to improve children’s mental health services (Knitzer, 1993). The CASSP system of care approach supports a continuum of mental health and other services that are: (1) individualized and child-centered; (2) family-focused and developed in partnership with the family throughout the clinical process; (3) community-based; (4) multisystemic and planned in collaboration with all systems
involved in the child’s life; (5) non-discriminatory and culturally competent; and (6) provided in settings that are the least restrictive and least intrusive available to meet the clinical needs of the child. These principles were widely implemented in state and local agencies across the United States, and remain a cornerstone in community-based children’s mental health services (Ayers & de Toledo, 2009).

**Clinical Utility:** The extent to which the use of assessment data assists the clinician in making judgments about a client, enhances the validity of the assessment, and/or leads to improvements in mental health services and as a result, improvements in client functioning (Haynes, Smith, & Hunsley, 2011).

**Evidence-Based Assessment (EBA):** The use of assessment methods that are based on empirical evidence of their validity, reliability, and clinical usefulness for prescribed populations and purposes (Mash & Hunsley, 2005). Evidence-based assessment is a significant component in the field of evidence-based practices, and measurement tools are available to assess child and adolescent functioning in several broad areas, including anxiety, depression, attention deficit hyperactivity disorder, and conduct disorders (Kazdin, 2005).

**Level of Care:** In a continuum of available treatment services, levels of care reflect services grouped by progressive degrees of resource intensity. In the CASII/CALOCUS model, each level of care is defined by four service-intensity variables: clinical services, support services, crisis stabilization and prevention services, and care environment. At higher levels of care, a greater number, intensity, and variety of services are used (Fallon, et al., 2006).
Managed Care: Health care systems that achieve cost savings through the use of financial, administrative, organizational, and monitoring policies to maximize efficiency. In a managed care system, health care decisions are subject to external review and may require pre-authorization. This process shifts the decision-making control from the client and practitioner to the managed care organization. In addition, managed care systems generally require or encourage clients to use preferred providers, require providers to accept quality controls, replace fee-for-service care with group-rate contracted services (Cohen, 2003).

Serious Emotional Disturbance (SED): The term “serious emotional disturbance” is used in both State and Federal statues to identify a population of children with significant functional impairment due to mental, emotional, or behavioral problems; children who are identified as having a serious emotional disturbance typically have a high need for mental health treatment and are entitled to receive a variety of mandated services. SED is not itself a formal or specific diagnosis, but it refers to a diagnosed mental health problem that substantially disrupts a child’s ability to function socially, academically, and emotionally (U.S. Department of Health and Human Services, 1999).

System of Care: An integrated service delivery model consistent with CASSP principles, focused on keeping children in the least restrictive setting possible, and providing a comprehensive array of community-based services (Rapp-Paglicci, 2009).

Wraparound: An individualized, family-driven and team-based approach to providing mental health services that was initially developed in the late 1980’s to address the needs of children and adolescents with serious emotional and behavioral disorders.
Services are “wrapped around” the child and family in their homes and communities, and are flexible, strengths-based, individualized and developed collaboratively. The child and family are included as full partners in the team process and no decisions are made about treatment plans, goals, or needs without parent or caregiver participation. Flexible funds for other services related to improving the child’s mental health, including those such as housing or transportation assistance that are not generally reimbursed through categorical mental health funding sources, are a key component of wraparound strategies (Winters & Metz, 2009).

Assumptions

This study assumes that the CALOCUS assessments were administered, scored, and recorded consistently and in accordance with the protocol established for this instrument. This study further assumes that the mental health treatment services provided were accurately recorded by clinicians and captured by the County’s electronic billing system.

Justification

Outcomes of this exploratory study will contribute to ongoing discussions about the allocation of County mental health resources, the development of defined benefit packages, and the feasibility of predicting utilization and associated costs of children’s mental health services.

Limitations

This study explores the correlation between the utilization of children’s mental health services in a small, rural, County mental health agency and the anticipated level of
care required as determined by the CALOCUS assessment instrument. A number of variables have been shown to impact mental health utilization in rural settings, including transportation problems, stigma, and the availability of recommended services. The extent to which these factors may have influenced the utilization of mental health treatment services among individual children and families was not examined. In addition, the study investigates treatment intensity but does not evaluate treatment duration beyond a six-month period and does not measure treatment outcomes. Finally, while the content of CALOCUS and CASII are identical, a higher level of training is required to administer the CASII, and the clinicians who completed the CALOCUS assessments did not meet these more stringent training guidelines. The impact that training variables may have had on the accuracy of the assessment data was not explored.
Chapter 2

Review of the Literature

Access to care, assessment of need, and utilization of services are long-standing critical issues in the area of children’s mental health. For social workers, these issues involve not only the practice skills of engagement, assessment, and treatment planning but also reflect broad ethical principles embodied in the field: to help people in need of service, to expand clients’ ability and opportunity to change, and to ensure that those in need have access to information, services, and resources (National Association of Social Workers, 2008).

This chapter provides an overview of literature and research directly related to the provision of children’s mental health services: service needs and access to care; the development of a system of care; system challenges in rural areas; individual biopsychosocial assessment and the development of a standardized assessment tool – the Child and Adolescent Service Intensity Instrument /Child and Adolescent Level of Care Utilization System (CASII/CALOCUS) - to link assessment with intensity of treatment; and finally, the role of social workers and other clinicians in care coordination. Included are issues and barriers that have been identified at the macro, community and individual level as well as program and policy innovations that have improved children’s mental health services.

Mental Health Service Utilization Among Children

The prevalence of serious mental disorders among children and adolescents has remained consistently high since the 1980’s, despite heightened awareness of the problem
and significant advances in treatment options (Hoagwood & Olin, 2002). While national surveys have collected only a limited amount of data on children’s mental health issues (National Research Council and Institute of Medicine, 2009), there is consistent and compelling evidence that emotional and behavioral problems are not uncommon among children and adolescents:

- In 1990, a review of research on child mental disorders conducted by the Institute of Medicine concluded that at least 12% of children under the age of 18 suffer from a mental disorder, and nearly half of those are severely disordered or handicapped by mental illness. The report noted that “recent studies suggest that the prevalence may now range between 17 and 22 percent (or 11 to 14 million children)” and that “this figure may excess of 20 percent in some populations” (p. 33).

- In 1999, the Surgeon General’s Report on Mental Health estimated that nearly 21% of children in the United States between the ages of 9 and 17 had a diagnosable mental or addictive disorder associated with at least minimal impairment; 11% suffered significant functional impairment at home, in school or with peers; and 5% experienced extreme functional impairment as the result of a mental illness (U.S. Department of Health and Human Services, 1999).

- A community longitudinal study of more than 1400 children aged 9 to 13 in the western rural counties of North Carolina found that at any one time approximately one in six children had a psychiatric disorder, and that
cumulatively more than one in three children (31% of girls and 42% of boys) experienced at least one psychiatric disorder by the age of 16. As children in the study grew older, their level of functional impairment associated with psychiatric disorder also increased. In addition, researchers found that approximately 25% of children with a psychiatric diagnosis had two or more disorders and that once a child was diagnosed with a psychiatric disorder, the likelihood of that child continuing to have psychiatric symptoms, or developing a subsequent disorder after remission, was three times higher than the likelihood of psychiatric disorder among peers with no previous diagnosis (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003).

- More recently, analysis of a nationally representative face-to-face survey of 10,123 U.S. adolescents between the ages of 13 to 18 found that the overall prevalence of mental disorders with severe impairment and/or distress was 22.2%. Using data from the National Comorbidity Survey-Adolescent Supplement (NCS-A), researchers found that 49.5% of the total sample was affected by at least one class of disorder with at least some impairment and moderate symptoms. Among affected adolescents, the median age of onset for anxiety disorders was 6; for behavior disorders the median age of onset was 11; for mood disorders the median age of onset was 13; and for substance use disorders the median age of onset was 15 (Merikangas, He, Burstein, Swanson, Avenevoli, Cui, Benjet, Georgiades, & Swendsen, 2010).
In addition to the high prevalence of emotional and behavioral disorders among youth, the unmet need for mental health services has been a longstanding concern among policy leaders and treatment providers. The publication of *Unclaimed Children: The Failure of Public Responsibility to Children and Adolescents in Need of Mental Health Service* (Knitzer, 1982) focused on system inadequacies and estimated that at least two-thirds of the seriously disturbed children and adolescents in the United States did not receive necessary mental health services. Knitzer further identified specific youth populations for whom services were either not effective or not widely available: infants and preschool-aged children whose needs are not frequently identified or addressed; adolescents who are occasionally or chronically aggressive and have additional needs for educational, vocational or health care services; children of all ages who have been placed in psychiatric hospitals; abused or neglected children in state custody; children of parents with a mental illness or addictive disorder; and minority children.

Although a number of policy initiatives and programmatic changes were implemented following the publication of *Unclaimed Children*, widespread concerns about the mental health services available to children remain. A recent, extensive literature review that included 53 studies gauging access, use, quality, and cost of mental health services for children and youth published by the Urban Institute found “limited and widely varying access to care, relatively low but increasing rates of use, disparities in service use, less than desirable quality of care, and a high cost of services” (McMorrow & Howell, 2010, p. 11). Another comprehensive analysis cites not only gaps in funding and systems of mental healthcare delivery, but also individual, family, and community-
level barriers that result in unmet needs (Bringewatt & Gershoff, 2010). The authors note that low-income parents in particular face barriers that arise from a lack of information about the services to which their children are entitled, encounter difficulties due to a shortage of public mental health providers, bear financial and logistical burdens, and are more likely than the parents of privately-insured children to experience fear and distrust when seeking services.

Individual studies have addressed other issues of mental health access, service intensity, quality of care, and utilization:

- As states began implementing the principles and practices of managed care into their provision of Medicaid services in the 1990’s, concerns were raised about access and utilization of children’s behavioral health services. For example, the results of a survey of all local agencies in the Fayetteville, North Carolina and Fort Bragg communities that provided or collaborated in the provision of mental health services for children and adolescents found that implementation of managed care had a significant and negative impact on quality of care. Comparing survey results from two and a half years before the transition to managed care to results from the same survey conducted eighteen months after the transition, researchers found a significant increase in service delivery problems along with reported decreases in the quality of available behavioral health and related services, the coordination of services, and the extent to which mental health service system goals were being attained (Heflinger & Northrup, 2000).
The likelihood of children receiving mental health services is impacted not only by the severity of impairment, but also by the type of disorder. Using data from the National Institute of Mental Health (NIMH) Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) Study, researchers found that children diagnosed with a disruptive disorder are more likely to utilize specialty mental health services than children with depressive disorders. Results of this study also demonstrated that, while depressed children used mental health services less frequently, they reported a greater need for services than children with disruptive disorders (Wu et. al., 1999).

Utilizing data collected between 1996 and 1998 from the National Survey of America’s Families, the National Health Interview Survey, and the Community Tracking Survey, researchers found that male children had higher rates of mental health use than did female children. In addition, among children between 6 and 17 years of age and estimated to have need for mental health services, 80% had not received services in the past twelve months. The percentage of Hispanic children in need who had not received care was higher than Caucasian children, and in addition, a higher percentage of uninsured children than those with public insurance received no care (Kataoka, Zhang & Wells, 2002).

Similarly, using data pooled from the National Survey of America’s Families (NSAF) of 1997, 1999, and 2002, researchers found that both rural and urban Hispanic children were less likely than White children to receive mental
health services, while Black children were less likely than White children to receive mental health services only in urban areas. In addition, White children in rural areas were significantly less likely to have a mental health visit than those living in urban areas (Howell & McFeeters, 2008).

- State, regional and economic variables have also been found to have significant impact on children’s access to care and on the quality of care they receive. For example, the rate of unmet need in California has been estimated at 80.6%, compared to the national average of 64.7%. Confounding this problem, children in California from high-income families are more likely to receive mental health services than those from low-income families (Sturm, Ringel, & Andreyeva, 2003).

- Unmet needs and disparities in mental health treatment utilization were also demonstrated in the recent analysis of data from the National Comorbidity Survey-Adolescent Supplement (NCS-A). Researchers found that more than half of adolescents with severely impairing mental disorders had never received mental health treatment. Service rates were highest in those with attention-deficit/hyperactivity disorder (59.8%) and behavior disorders (45.4%), but fewer than one in five affected adolescents received services for anxiety, eating, or substance use disorders. Hispanic and non-Hispanic Black adolescents were less likely than Whites to receive services for mood and anxiety disorders, even when their disorders were associated with severe impairment. In addition, researchers noted that among adolescents who did
receive mental health treatment, a substantial proportion reported receiving few visits; for example, approximately one half of youth with ADHD, behavior disorders, and substance use disorders received six or fewer outpatient mental health visits (Merikangas, He, Burstein, Swendsen, Avenevoli, Case, Georgiades, Heaton, Swanson, & Olfson, 2011).

The high prevalence of mental health needs in combination with limited access, disparities in service utilization, and scarce resources available to address mental health service needs led to the observation in the Surgeon General’s Report on Mental Health that, “Even more than other areas of health and medicine, the mental health field is plagued by disparities in the availability of and access to its services” (U.S. Department of Health and Human Services, 1999, p. xi). To address disparities and the multiple problems that are associated with serious emotional disturbance (SED) in children and adolescents, the Surgeon General’s Report recommended a “systems” approach of integrated, collaborative care.

*Systems and Levels of Care*

The concept of a “system of care” for improving access and coordinating services for children with serious emotional disturbance (SED) was developed following the publication of *Unclaimed Children: The Failure of Public Responsibility to Children and Adolescents in Need of Mental Health Service* (Knitzer, 1982). In addition to chronicling inequities and unmet mental health needs, Knitzer’s report identified two key practices that compromised the effectiveness of mental health treatment: children’s mental health issues were addressed in isolation, and State mental health agencies had little or no
interaction with other public agencies that are mandated to serve large numbers of children at risk for mental illness - including juvenile justice, special education, and child welfare systems. While existing outpatient mental health services were often inadequate to meet the needs of children and adolescents, Knitzer also reported that at least 40% of hospital placements for children were unnecessary. “Either the children should never have been admitted to the institutions or they have remained there too long” (Knitzer, 1982, p. ix).

In 1984, Congress authorized the creation of the Child and Adolescent Service System Program (CASSP) under the direction of the National Institute of Mental Health. CASSP provided initial funding of 1.5 million dollars in competitive grants to the states to improve children’s mental health services, and specifically to enhance leadership and visibility, improve collaboration among state agencies serving children, and to strengthen community-based services (Knitzer, 1993). CASSP further outlined core priorities that guided the development of the system of care model for children’s mental health services nationwide. The CASSP system of care approach supports a continuum of mental health and other services that are: (1) individualized and child-centered; (2) family-focused and developed in partnership with the family throughout the clinical process; (3) community-based; (4) multisystemic and planned in collaboration with all systems involved in the child’s life; (5) non-discriminatory and culturally competent; and (6) provided in settings that are the least restrictive and least intrusive available to meet the clinical needs of the child (Ayers & de Toledo, 2009).
In California, early efforts to implement system of care principles began in 1985 with Ventura County’s Child Demonstration Project. At that time, mental health services were isolated from other community service agencies, in part because the State operated under a Medicaid plan that restricted reimbursement to services provided in licensed mental health facilities. Mental health services provided in-home or in community settings, such as schools, were generally ineligible for federal matching funds (Jordan, 1996). The Ventura Child Demonstration Project was originally funded through State legislation (Assembly Bill 3920, Wright, 1985) intended to develop mental health alternatives to residential care. The Project’s priority was to provide mental health services that would enable children already incarcerated or housed in high-cost residential facilities to return to the community, and to prevent out-of-home placement by serving children most at risk. Consequently, the Child Demonstration Project targeted children with the highest level of need, based on diagnosis, assessed risk of out-of-home placement, functional impairment, and psychiatric history; in addition, children who were eligible for special education services and those who were victims of a natural disaster or severe local emergency were also eligible for services. The Project focused on goals directly related to improving the child’s functioning in the community, and worked to create partnerships with public agencies, private providers, and families and to help the child stay out of trouble and succeed at home and in school. Employing a “whatever-it-takes” approach, Ventura County mental health staff worked directly with families and staff from other community agencies to determine the child’s needs and access the array
of services necessary to meet those needs, including but not limited to traditional mental health treatment (Jordan, 1996).

When the State of California applied for CASSP funding, the California Department of Mental Health proposed statewide system-of-care efforts to be modeled after core principles developed from the Ventura Child Demonstration Project. Specifically, reform efforts in California were focused on interagency collaboration and coordinated service delivery; family participation in service planning, delivery, and evaluation; and cultural competence (Clausen, Dresser, Rosenblatt, & Attkisson, 1998). Evaluation of the CASSP program in California, conducted after four years of implementation, found that the program improved interagency collaboration, increased parental involvement in mental health planning and service delivery, and had limited positive impact on cultural competency. However, clinical effectiveness was not demonstrated; progress attributed to CASSP was described as primarily “organizational and structural” without perceived improvement in family and consumer outcomes for children with serious emotional disturbance (Clausen, Dresser, Rosenblatt, & Attkisson, 1998, p. 121).

Similarly, while recommending a systems approach, the Surgeon General’s Report on Mental Health provides a mixed review of the effectiveness of systems of care nationwide, stating that evaluation suggests that integrated systems have achieved important system improvements, but that improved clinical outcomes have not yet been demonstrated. In addition, the Surgeon General’s Report notes uncertainty with regard to
the cost effectiveness of systems of care (U.S. Department of Health and Human Services, 1999).

Other investigators have described the challenges of evaluating systems of care. Stroul (2002) points out that systems of care are substantially different in every community, and that they are continually evolving. Further, systems of care serve highly diverse populations of children who have multiple needs and receive a flexible, individualized array of services and supports. In contrast, standard clinical research evaluates a well-defined treatment protocol applied to children with specified service needs. Stroul (2002) argues that systems of care involve interventions at multiple levels, and that outcome measures must be linked to the level of the intervention being assessed; “system-level changes cannot be examined and measured by looking at clinical and functional outcomes” (p. 9).

Hernandez and Hodges (2003) further advanced the idea that systems of care are more appropriately evaluated by their ability to achieve system-wide goals, rather than by outcomes realized at the individual or family level. In particular, they point to the need for better articulation of the essential components and expectations of a system of care, yet caution that systems of care are more than a network of services. System of care values and principles are operationalized and implemented incrementally; as a result, a shared and consistent vision of the local “system” is rare. In addition, a measurement of fidelity to system of care values and principles across localities is difficult to establish.

The practice parameter on child and adolescent mental health care in community systems of care developed and approved by the American Academy of Child and
Adolescent Psychiatry (2007a) outlines individual-level, clinical practices recommended to integrate system of care values into the provision of direct services. While the parameter emphasizes the roles of child and adolescents psychiatrists in a system of care, it is applicable to a broad range of mental health professionals, including clinical social workers, and is consistent with an ecosystems perspective. The minimum standards of care established for clinicians by the parameter include the provision of assessment and treatment approaches that incorporate all community systems in which the child is involved, including the immediate and extended family systems along with the child’s school, peers, primary health care, and neighborhood, as well as the larger community, employment, and cultural institutions that are part of the child and family's life experience. Understanding the legal, social, and financial issues that affect care are also included as part of the child's assessment. Interventions are developed in partnership with families, and may involve addressing barriers to care or accessing strengths and resources in the child's natural environment that can promote positive change. In addition, mental health interventions are actively coordinated and integrated with the services other care providers and community agencies. The practice parameter also specifies that treatment be culturally competent and appropriate, evidence-based, and delivered in the least restrictive, clinically-appropriate setting. It is further expected that children and adolescents will have access to a continuum of care and that the level or intensity of treatment services will be individualized and determined by clinically-informed decision making rather than by standardized protocols.
Wraparound is another example of an individualized, practice-level intervention strategy built around the CASSP system of care guiding principles. Rather than a specific set of services, wraparound is an individualized, family-driven and team-based process model that was initially developed in the late 1980’s to address the needs of children and adolescents with serious emotional and behavioral disorders. Services are “wrapped around” the child and family in their homes and communities, and are flexible, strengths-based, individualized and developed collaboratively. The child and family are included as full partners in the team process and no decisions are made about treatment plans, goals, or needs without parent or caregiver participation. Interventions are designed to reinforce strengths of the child and family and may include culturally relevant and nontraditional therapies. Flexible funds for other services related to improving the child’s mental health, including those such as housing or transportation assistance that are not generally reimbursed through categorical mental health funding sources, must also be available to support a wraparound plan (Winters & Metz, 2009).

The essential elements and evidence base of the wraparound approach, existing models, and a discussion of standards, quality monitoring, and fidelity measures, were presented in a Promising Practices monograph funded by the Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, United States Department of Health and Human Services (Burns & Goldman, 1999). Since publication of this resource, wraparound practices have been further defined, described, studied, and documented through the creation of a national “community of practice” known as the National Wraparound Initiative (NWI) that offers both individual and organizational
subscriptions and provides extensive online resources (http://www.wrapinfo.org) (Bruns & Walker, 2010).

**Rural Systems of Care**

Community context plays a significant role in efforts to address unmet mental health needs and implement system of care principles. In particular, residents of rural areas face multiple challenges that are frequently characterized as issues of availability, accessibility, and acceptability (New Freedom Commission on Mental Health, 2004; Mohatt, Bradley, Adams, & Morris, 2006). Availability is a measure of the presence or absence of mental health services and service providers; accessibility refers to whether or not people can reach the services they need; and acceptability is the indication of a person’s attitude toward mental health issues, and willingness to seek services and enter treatment. “Rural Realities” as described by the New Freedom Commission on Mental Health (2004) includes scarce and inadequate mental health resources, severe shortages of mental health professionals, underuse of services, and the absence of collateral support services.

Disparities in unmet need between urban and rural areas appear to impact children’s mental health services, including those in a system of care. *The Comprehensive Community Mental Health Services for Children and the Families Evaluation Findings* for FY 2004 reports that a lower percentage of children in rural systems of care received services than those urban areas. At six months after entry into the system of care, a lower percentage of rural children had reported receiving services in multiple areas, including crisis stabilization, family therapy, day treatment, transportation, and flexible fund
assistance (U.S. Department of Health and Human Services, 2007). Similarly, data pooled from the National Survey of America’s Families of 1997, 1999 and 2002 found that while the prevalence of children’s mental health issues to be comparable in urban and regional areas, rural children were significantly less likely to receive mental health services (Howell & McFeeters, 2008).

A recent qualitative study using a grounded theory approach and involving semi-structured, one-on-one interviews with staff members and caregivers in a rural system of care offers additional insight into the barriers that make it more difficult for rural families to utilize mental health services (Pullmann, VanHooser, Hoffman, & Heflinger, 2010). Researchers in this study found that residents in a small, rural community can share information via word-of-mouth and provide one another emotional and practical support. At the same time, fears of public surveillance, gossip, and stigma were significant barriers for these rural families and discouraged utilization of mental health services. Moreover, researchers found that issues of abuse, custody, relationships, poverty, and isolation were widespread among the rural families studied. These concerns, together with a lack of transportation, affected the day-to-day lives of family members and were most often named as the principle barrier to participating in services for their children.

Assessment of Children and Adolescents

Assessment is an essential competency in the practice of social work. Broadly defined as “the social work function of acquiring an understanding of a problem, what causes it, and what can be changed to minimize or resolve it” (Barker, 2003, p. 30), assessment is an ongoing process involving both quantitative and qualitative techniques
of information gathering and decision-making. More specifically, clinical assessment applies assessment methods and strategies to answer questions that arise in a clinical context. Haynes, Smith and Hunsley (2011) identify a number of the questions addressed through the process of clinical assessment: What are the client’s concerns, behavior problems, and treatment goals? What contributes to the intensity, severity, and duration of the problems? How is the client’s daily life and interpersonal relationships impacted? What interventions might be most effective? How will treatment goals be defined and measured, and how can improvements be achieved and maintained? Ultimately, the goals of clinical assessment focus on “the selection, design, implementation, and evaluation of treatments that reduce clients’ behavior problems and help them achieve their anticipated treatment goals” (Haynes, Smith, & Hunsley, 2011, pp. 2-3).

The complexity of assessment is typically increased when the client is a child or adolescent: developmental variables and changes over time as well as the dependence of children on their families and their peer groups necessitate a larger number and greater array of assessment methods than are typically used with adults. Naturalistic observations of the child in school and at home, along with assessment of play, observations of attachment, and interviews of significant participants in the client’s life (parents, teachers, other caregivers) are common in the assessment of children and adolescents but similar methods occur much less frequently in adult assessment (Mash & Hunsley, 2005). In addition, the current practices in child assessment recognize the importance of obtaining information directly from the client, and age-appropriate self-reports for children and
adolescents are increasingly recognized as important tools in assessment (LeCroy & Okamoto, 2009).

Social work has generally taken a holistic, person-in-environment perspective on assessment, exemplified by the biopsychosocial (BPS) approach. The BPS assessment is typically based on a loosely structured interview revolving around three distinct areas: the impact of biological systems and physical health on psychology; the psychosocial and cultural factors that influence the client’s current mental health status; and the client’s developmental and mental health history (Vandiver & Corcoran, 2009). The BPS assessment provides a narrative summary of the client’s history and current functioning, and includes stressors, coping mechanisms, key developmental issues, environmental supports, and challenges (Jordan & Franklin, 2011).

Current trends in brief treatment and evidence-based practices, however, have led to the development of a multitude of standardized and more narrowly targeted assessment tools. Evidence-based assessment (EBA) methodologies have not been developed, documented, or implemented to the extent of evidence-based treatment (EBT) protocols (Mash & Hunsley, 2005), yet a wide array of measures are available to assess childhood anxiety, depression, bipolar disorder, attention deficit hyperactivity disorder, conduct disorder, autism spectrum disorder, and learning disabilities. Kazdin (2005) reports that there are “thousands of measures of child and adolescent functioning, many thousand more assessment studies” (p. 550) – yet no “gold standard” to validate assessment measures.
In addition, the empirical support for many assessment methodologies has been almost exclusively focused on reliability and validity criteria (Mash & Hunsley, 2005). The extent to which assessment can demonstrably contribute to a positive treatment outcome was termed “treatment utility of assessment” in a journal article written by Hayes, Nelson, and Jarrett in 1987. These authors note that measures of the treatment utility of assessment became increasingly critical as both assessment scales and methods of clinical intervention have become more specific. To the extent that clinicians apply the same general approach to their clients, assessment data and case formulations have few implications for treatment. As clinical interventions become more precise, the findings of assessment have a more significant impact on the choice of treatment and, potentially, a more direct impact on treatment outcome.

In the years since 1987, assessment measures for children and adolescents have moved away from generic intelligence, achievement, and projective tests to brief instruments that are disorder, symptom, or problem-specific (Mash & Huntley, 2005). Nationwide implementation of mental health managed care is widely cited as having significant impact on both assessment and treatment practices, including the increased emphasis on standardized outcome measures (Eisen & Dickey, 1996), shorter forms of treatment designed to address behavioral problems (Cantor & Fuentes, 2008), and limitations on the use of psychological testing (Cashel, 2002). More recently, the term “clinical utility” has been used to describe the extent to which the use of assessment data leads to improvements in mental health services and as a result, improvements in client functioning (Haynes, Smith, & Hunsley, 2011).
The clinical utility of an assessment measure is based largely on the purpose for which the measure is intended. Researchers advocating for evidence-based assessment have identified a number of different purposes for which clinicians use assessment; these include screening, diagnosis, case formulation, treatment selection and planning, and treatment progress and outcome evaluation (Mash & Hunsley, 2005; Haynes, Smith, & Hunsley, 2011). A measure that is intended as a screening tool, for example, should be able to identify people likely to meet the diagnostic criteria for the disorder of interest with high levels of sensitivity and specificity. Another measure may be used to help clinicians in treatment planning; clinical utility would be demonstrated if data provided by this tool could identify clients who are likely to respond better to a specific type of treatment.

In addition to assessment measures that are disorder, symptom, or problem-specific, some evidence-based assessment measures are focused more broadly on psychological adjustment and functioning. For example:

- The Child and Adolescent Functional Assessment Scales (CAFAS) measures the degree of functional impairment in children and adolescents between the ages of seven and seventeen. Clinicians rate client behaviors in eight areas (school/work, home, community, behavior towards others, moods/emotions, self-harmful behavior, substance use, and thinking) on a scale from severe to minimal impairment. The CAFAS includes strengths-based and goal-setting items that can aid in treatment planning, and a computerized program is
available that scores the CAFAS, generates a treatment plan, and produces outcome reports (LeCroy & Okamoto, 2009).

- The Child Behavior Checklist (CBCL), the Youth Self-Report (YSR), and the Teacher Report Form (TRF) are scales designed to assess competencies, adaptive functioning, and problem behaviors in children between the ages of six and eighteen years. Items are evaluated on eight scales: anxious/depressed; withdrawn/depressed; somatic complaints; rule-breaking behaviors; aggressive behavior; social problems; thought problems; and attention problems (Holmbeck, et. al., 2008).

- The Children’s Global Assessment Scale (CGAS) is a clinician-rated scale that assesses social and psychological functioning in youth between the ages of seven and sixteen years (Holmbeck, et. al., 2008). The measure is based on prior completion of a clinical assessment, provides a rating on scale of 0-100, and follows the same general structure as the Global Assessment of Functioning (GAF) in the Diagnostic and Statistical Manual (DSM) IV-TR.

Standardized and evidence-based assessment tools are not intended to usurp clinical judgment or substitute for psychosocial assessment; in fact, many of these tools depend upon the clinician establishing rapport, engaging the client, and understanding the psychosocial history prior to completing the assessment measure. The tools have been shown to complement the assessment process, aid in clinical decision-making, and track progress over the course of treatment.
The Children and Adolescent Level of Care Utilization System (CALOCUS) is an assessment instrument developed in the late 1990’s through collaboration between members of the American Academy of Child and Adolescent Psychiatry’s Work Group on Community Systems of Care and the American Association of Community Psychiatrists (Fallon, et al., 2006). It is based on a similar tool for adults, the Level of Care Utilization System (LOCUS), but was adapted for use with children and adolescents between the ages of six and eighteen years of age. In 2004 the American Academy of Child and Adolescent Psychiatry (AACAP) changed the name of the instrument to the Child and Adolescent Service Intensity Instrument (CASII) (American Academy of Child and Adolescent Psychiatry, 2007b). The content of the CALOCUS and the CASII are virtually identical; the difference between the two is that AACAP requires users of CASII to be clinicians with training and experience assessing and treating children, adolescents and families, while the American Association of Community Psychiatrists (AACP) does not specify personnel qualifications or training in the use of CALOCUS (Fallon et. al., 2006).

Both the LOCUS and the CASII/CALOCUS require that a comprehensive clinical assessment be complete prior to use. The instruments then quantify relevant variables from the clinical assessment and link needs with treatment services and resources through a standardized “level of care” rubric (Sowers, Pumariega, Huffine, & Fallon, 2003). The principal differences between the LOCUS and the CASII/CALOCUS reflect the different and additional variables that are important to consider in the

CASII/CALOCUS
assessment and treatment of children and adolescents. CASII/CALOCUS incorporates
tenets of child and adolescent development and is also modified to reflect the critical role
of the child’s family and community in determining service needs. In addition, whereas
LOCUS is applicable to adults with psychiatric and substance use disorders,
CASII/CALOCUS is appropriate for determining the intensity of service needs for
children and adolescents with developmental disabilities as well as those with emotional
disturbances and substance use disorders. While neither instrument is dependent upon a
diagnostic categorization, the CASII/CALOCUS rating system is useful in a variety of
service agencies beyond mental health, including health care, child welfare, juvenile
justice and educational settings (Fallon, et. al., 2006).

Development of the CASII/CALOCUS instrument stems in large part from the
concepts of a system of care for children and adolescents and more specifically is built on
Child and Adolescent Service System Program (CASSP) guiding principles, which
support a continuum of mental health and other services that are individualized, family-
focused, multisystemic, and community-based. The levels of care prescribed by
CASII/CALOCUS include services provided by mental health, social and community
agencies, the juvenile justice system, health care providers, educational and recreational
agencies, vocational programs and developmental disability specialists. For children with
higher levels of need, the CASII/CALOCUS level of care protocol includes home-based
wraparound services and intensive case management (Klaehn, O’Malley, Vaughan, &
Kroeher, 2003).
In addition, by linking clinical needs to a level of care, CASII/CALOCUS is compatible with managed care practices. Managed care systems seek to improve efficiency and contain costs, in part through the use of standardized treatment criteria and uniform assessment and authorization processes (Masland, Snowden & Wallace, 2007). The CASII/CALOCUS instrument quantifies clinical severity across an array of diagnostic categories, and links clinical assessment with recommendations for the type and intensity of treatment resources to be offered. Furthermore, the levels of care provide a broad estimate of the staff time involved in delivering services at different levels (Klaehn, O’Malley, Vaughan, & Kroehler, 2003). CASII/CALOCUS evaluation parameters, the algorithm for determining the level-of-care, and associated treatment recommendations are presented in Tables A1, A2, and A3 in Appendix A.

The initial field studies of CASII/CALOCUS were conducted at four locations: an outpatient community mental health program in Philadelphia; a group of day treatment providers in Portland, Oregon; select public mental health sites in the State of North Carolina; and the State of Hawaii public mental health system. Results of these studies (Fallon & Pumariaga, 2001) are summarized below:

- Reliability was demonstrated through the use of seven clinical vignettes, each oriented to a specific level of care. A total of seventy-eight non-psychiatrists with a minimum bachelor’s level education and at least six months of clinical experience completed a six-hour CASII/CALOCUS training workshop, and subsequently rated at least two vignettes. In addition, sixteen child and adolescent psychiatrists already familiar with the tool also rated at least two
vignettes. Among the non-psychiatrists, the correlation coefficient for the CASII/CALOCUS composite score was .93, with correlation of the subscales ranging from .57 to .95. The correlation coefficient for the CASII/CALOCUS composite score ratings by psychiatrists was .89, with correlation of the subscales ranging from .73 to .93. Non-psychiatrists were also found to score the vignettes an average of 1.9 points higher than the psychiatrists.

- Validity was measured by comparing CASII/CALOCUS composite scores of children between the ages of six and eighteen years from inpatient, outpatient, intensive community and residential settings with scores on child and adolescent assessment measures that were in wide use at that time. Researchers paired CASII/CALOCUS scores for a population of 182 patients with the Child Global Assessment Scale (CGAS). In addition, CASII/CALOCUS scores for a population of 614 patients were paired with scores on the Child and Adolescent Functional Assessment Scale (CAFAS). The correlation between CASII/CALOCUS and CAFAS composite scores was .62 and between CASII/CALOCUS and CGAS composite scores the correlation was .33. The authors note that CASII/CALOCUS dimension scores directly related to the child’s clinical assessment (risk of harm, functional status, and resiliency) were generally more highly correlated to CGAS and CAFAS composite scores, while lower correlations were evident between CGAS and CAFAS composite scores and CASII/CALOCUS
dimension scores related to family and environment (level of support and acceptance and engagement of the parent).

After the conclusion of the initial studies, the Hawaii Department of Health Child and Adolescent Mental Health Division maintained ongoing training and continued to test, implement and assess CASII/CALOCUS along with another child and adolescent clinical measure, the Child and Adolescent Functional Assessment Scale (CAFAS). Using data July 1, 2000 to June 30, 2003, a follow-up study of 3,305 youth analyzed the concurrent, predictive, and incremental validity of the CASII/CALOCUS as compared to CAFAS and in relation to service intensity (measured by total hours of service), service restrictiveness (ordinal measure, by type of service, ranging from case management to residential), proportion of service hours provided in out-of-home settings, and total cost. Higher scores on the CASII/CALOCUS, which would indicate a higher level of impairment and more intensive level of service needs, were expected to positively correlate with the various measures of service intensity, restrictiveness, and overall cost. Results of this study (Daleiden, 2004) are summarized below:

- Both CASII/CALOCUS and CAFAS were assessed quarterly, and concurrent validity was examined by calculating correlation coefficients between the CASII/CALOCUS scales and the CAFAS scales for measures completed during the same fiscal quarters. The average correlation between the CASII/CALOCUS total score and the CAFAS total score was .66. Smaller but significant correlations were also evident between the CASII/CALOCUS total score and measures of total cost (average correlation= .23), service
restrictiveness (average correlation = .21), and proportion of out-of-home service hours (average correlation = .22), but not with total number of service hours (average correlation = .00).

- Predictive validity was examined by measuring correlations between CASII/CALOCUS scores in one quarter and service utilization in the following quarter. The pattern of predictive correlations for the CASII/CALOCUS and service variables was very similar but slightly higher than the pattern of concurrent correlations: the average predictive correlation between the CASII/CALOCUS total score and measures of total cost was calculated at .28; the averaged predictive correlations between the CASII/CALOCUS total score and both the service restrictiveness and the proportion of out-of-home service hours were calculated at .24; and the average predictive correlation between the CASII/CALOCUS total score and total number of service hours was .03. The author of this study concluded that the slight increase in predictive as compared to concurrent correlation could be due to the use of the CASII/CALOCUS in treatment planning and decision-making.

- Incremental validity was calculated by analysis of the extent to which CASII/CALOCUS and CAFAS total scores improved the one-quarter predictive value of gender and age alone, with total hours, proportion of out-of-home service hours, and total cost as the dependent variables. Multivariate analysis demonstrated that CASII/CALOCUS and CAFAS scores jointly
improved prediction of service variables beyond the demographic variables in
100% of the samples examined. Univariate regression coefficients were then
calculated to assess the unique contribution of the CASII/CALOCUS or
CAFAS. This analysis demonstrated that the CAFAS provided more unique
information in the prediction of total service hours, the CASII/CALOCUS
provided more unique information in predicting the proportion of out-of-home
service, and both instruments provided unique information in the prediction of
total costs.

CALOCUS has been used in the California public mental health system, with
similar successes and challenges reported. For example, San Mateo County Mental
Health Services implemented the use of LOCUS and CALOCUS in 2003 to ensure that
clients received services appropriate for their clinical need and to aid clinicians in making
treatment decisions. Shortly after implementation the department evaluated and found
strong inter-rater reliability. Responding to concerns of clinicians, in 2005 the Quality
Improvement (QI) staff conducted a follow-up survey to gauge the reliability of the
LOCUS and CALOCUS tools as they were being used in practice. While the study again
found strong inter-rater reliability, the QI staff found that LOCUS and CALOCUS scores
did not predict estimated client treatment plan hours of service. While clinicians were
able to use LOCUS and CALOCUS scores to distinguish between clients with low,
medium and high mental health service needs, there was little agreement between
clinicians about estimated hours of service needed and treatment plans did not reflect
differences between clients with low, medium and high mental health service needs.
Clinicians reported finding the tools helpful for assessment and tracking progress, but were not using the scores to make treatment-planning decisions (Krahn & Miles, 2005).

More recently, the California Institute for Mental Health published clinical guidelines for better integration of specialty mental health services with primary health care (Adams & Naylor-Goodwin, 2009). The guidelines were developed in collaboration with twenty-five clinical and administrative leaders from the county-operated public mental health system and primary care agencies in California. The guidelines consist of fifteen recommendations organized into five clusters; one of those five clusters is focused on the development of consensus around determining the severity of mental health needs and/or functional impairment. Among the recommendations in this cluster is the call for “explicit agreement on referral/acceptance criteria for facilitating integration of patient care across primary care and specialty mental health systems, based upon a level of care instrument that can be easily applied in all settings” (Adams & Naylor-Goodwin, 2009, p. 11). The authors of the report further recommend LOCUS and CALOCUS as tools that show promise in achieving this goal.

*Mental Health Professionals*

The successful application of new assessment tools and practices depends in part on the attitudes, experience, and behaviors of the clinicians who are tasked with implementing these changes. The response of clinicians to mandated implementation of standardized measures to assess clinical outcomes was tested in California, following a State mandate that required residentially-based, publicly funded mental health programs to collect and submit assessment measures at intake and at specified intervals. The
Performance Outcome Project (POP) assessment protocols for children mandated implementation of the Child Behavior Checklist (CBCL), the Youth Self-Report (YSR), the Child and Adolescent Functional Assessment Scale (CAFAS), and the Client Satisfaction Questionnaire (CSQ) beginning in July 1997. In 1999 researchers conducted structured interviews and focus groups in San Diego County with 50 randomly-selected clinicians who had been trained in the use of the POP measures and worked in public agencies where the data collection and reporting was mandated (Garland, Kruse & Aarons, 2003). Researchers in this study summarized their findings as follows:

- Clinicians were divided in their beliefs about whether quantitative measures could be useful in evaluating the effectiveness of clinical treatment. Approximately 25% of clinicians were strongly opposed to the use of quantitative measures and felt that they could never accurately evaluate therapeutic outcomes.

- Clinicians reported using many other methods to evaluate the effectiveness of treatment, including functional indicators such as grades or disciplinary actions, clinician intuition/feelings, and client’s self-reports of functioning and symptoms. Clinicians reported using standardized measures significantly less frequently than these other methods.

- A strong majority (92%) of clinicians reported that they had never used the scores from the mandated standardized scales to guide clinical decisions such as diagnosis, treatment planning, or treatment monitoring. Among the
clinicians interviewed, 25% reported that they didn’t read the measure results and 15% said they didn’t understand the results.

- While the majority of clinicians (60%) reported that they had received feedback from parents and youth about completing the evaluation forms, only 10% reported receiving positive feedback.

More recently, researchers examined attitudes towards the use of standardized assessment measures in a national survey of 1,442 child and adolescent clinicians (Jensen-Doss & Hawley, 2010). The clinicians had educational backgrounds in the fields of psychiatry, psychology, social work and marriage and family counseling, with just over half (56.3%) of the sample having completed doctorate degrees, and the remainder having completed master’s degrees. The overall rate for these clinicians reporting that they “often” used at least one standardized assessment tool was 61.5%. While those with higher degrees reported slightly higher ratings of standardized assessment measures, in general the researchers found that clinicians continue to be somewhat skeptical about the value of standardized assessment measure over clinical judgment alone, and often find the tests time-consuming and impractical to administer.

**Summary**

Providing children and adolescents with the mental health services that are best matched to meet their individual needs requires resources and professional skill in a number of different areas. Children must be able to access services; they must be assessed using methods that are culturally appropriate and likely to result in an accurate diagnosis; they and their family must be engaged in the development of a treatment plan;
and an array of community-based services must be available to address the identified needs. Since the 1980’s, the “System of Care” model has been the standard for providing mental health services to children and adolescents.

Assessment strategies intended to determine mental health needs and provide children and adolescents with access to the system of care have traditionally been based on a biopsychosocial (BSP) approach. This approach relies on narrative data compiled by clinicians through a loosely structured interview process. The inability to standardize BSP assessment data makes it difficult for administrators to predict patterns of service utilization or equitably distribute mental health treatment resources. CASII/CALOCUS is a quantitative, evidence-based assessment tool that incorporates the system of care model in order to better link service needs with a treatment plan. Whether the treatment plan and treatment utilization will correlate to the level of assessed need will ultimately depend not only of the clinical utility of the assessment tool, but also on the services that are available, accessible and acceptable in the community system of care, and on the attitude and experience of clinicians using the assessment tool.
Chapter 3

Methodology

Study Design

This study was designed to investigate typical patterns of mental health service utilization among children and adolescents, and to explore whether there is a correlation between the level of recommended care as determined by a standardized assessment tool (CALOCUS) and the type and intensity of treatment services provided within a rural system of care. Factors that have previously been thought to influence the utilization of children’s mental health services (e.g., gender, age, and diagnosis) were also included for investigation as potentially significant independent variables.

Children and adolescents receiving County mental health services receive a comprehensive biopsychosocial (BSP) assessment at intake. In fiscal year 2008-09 the County added CALOCUS as an assessment measure to be used at intake and for the reauthorization of services, which is typically required on an annual basis. The study population consists of County mental health clients, aged 18 and under, who were assessed by means of the CALOCUS instrument in or after July 2010 and who continued to receive children’s mental health services after this assessment.

Service utilization was determined from treatment records maintained on the County billing system. Treatment is recorded by service type: Individual Services, Group Services, Collateral Services, Assessments, Plan Development, Rehabilitation, In-patient Placement Services, Therapeutic Behavior Services, Medication Support, Crisis Intervention; and by intensity, measured by the minutes of service billed. Aggregate data
consisting of minutes of service billed per month was compiled by service type and by CALOCUS assessed level of care over a period of six months after assessment. The study was designed to evaluate whether the patterns of service type vary by CALOCUS level of care, and whether overall service intensity is greater among children assessed at the higher CALOCUS levels.

Sampling Procedures

An initial list of mental health clients aged 18 and under who received mental health services between July 1, 2010 and September 30, 2010 was produced from the County’s electronic billing system. A simple random sample of 150 cases was selected from this list and those records were accessed to determine the client’s CALOCUS score as recorded during July 2010 or later. A total of 85 clients who did not have a CALOCUS assessment during or after July 2010 were excluded from further analysis. The study sample was comprised of the remaining 65 children and adolescents who received County mental health services between July 1 and September 30, 2010 and had an available CALOCUS assessment dated during or after July 2010.

Data Collection

This study is based on secondary assessment and treatment data that was originally collected by the County between July 2010 and December 2011 and is maintained in clinical and billing records. The El Dorado County Health and Human Services Department, Mental Health Division approved this study and provided access to the data. Findings in this study reflect aggregate assessment and treatment information collected for 65 children and adolescents.


**Instruments**

A data collection form was used to compile secondary data from client billing and clinical records. Section 1 of this form was developed to facilitate the compilation of billing data by service type, minutes billed, and date of service over a period of six months following the month of CALOCUS assessment. Section 2 allows of the collection of clinical data, including CALOCUS sub- and composite scores, as well as diagnostic and demographic information that previous literature has shown to impact treatment decisions. The complete data collection form is provided in Appendix B, Table B1.

**Data Analysis**

The study uses a non-experimental research design; this design has been found to be appropriate in social work when the desired outcome is a better understanding of clinical issues that could not be obtained from other types of research designs (Grinnell & Unrau, 2011). Descriptive statistics were used to measure and compare the typical array of treatment services utilized by clients at each CALOCUS assessed level of care. These statistics help to define the typical “benefit package” that currently exists for mental health clients, and determine whether there are measurable differences in service utilization dependent upon assessed severity of symptoms. In addition, the relationship between CALOCUS assessed level of care and the total monthly cost of treatment was explored using measures of correlation. It was expected that as the severity of symptoms increased, as measured by CALOCUS, the total minutes (intensity) of treatment and therefore the cost of care would also increase. A one-way analysis of variance (ANOVA)
was used to determine whether monthly treatment costs were significantly different
among clients with assessed at different CALOCUS levels of care.

Protection of Human Subjects

The Protocol for the Protection of Human Subjects was submitted and approved
by the Division of Social Work as minimal risk. Secondary data was collected without
the inclusion of the identifiers of individual participants and precautions were taken to
protect data integrity. The results describe only aggregate data and upon completion of
the study, all individual data collection forms were destroyed.

Summary

This is an exploratory study that was intended to examine the relationship
between the severity of assessed need and the treatment services that are utilized in
response to children’s mental health problems. The County recently added a quantitative
assessment measure (CALOCUS) to its comprehensive BPS assessment protocol, and
this study was intended to investigate the correlation between assessment and treatment
variables. The sampling procedures as well as the protection of human subjects, the
process of data collection, and the methods of data analysis have been described. Results
of this study, described in the following chapters, will be used to inform discussions
about the allocation of County resources and the feasibility of predicting the utilization of
children’s mental health services.
Chapter 4

Study Findings and Discussion

Background

This study was designed to explore the extent to which mental health assessment is linked to treatment intensity, and whether treatment needs for children can be quantified, predicted, and correlated to severity of the emotional or behavioral disorder. The study was conducted in a County mental health clinic located in a largely rural area of California. In addition to a comprehensive biopsychosocial assessment, the County implemented the use of CALOCUS during fiscal year 2008-09 to provide a standardized measure of the level of care a child is expected to need. A cohort of 150 youth were randomly selected from a total of 599 children and adolescents who received mental health services between July 1 and September 30, 2010; the 150 selected for analysis represents 25% of clients aged 18 and under who received mental health services during that time.

CALOCUS scores were obtained from County clinical records and assessments received from contract providers. A total of 85 clients (57%) did not have an available CALOCUS assessment dated during or after July 2010 and were excluded from further analysis. For the remaining 65 clients, treatment intensity was measured by mental health utilization data obtained from billing records for services received during the six months immediately following the month of CALOCUS assessment. The correlation between the CALOCUS score, units of treatment by modality, and the overall cost of treatment was calculated. Higher scores on the CALOCUS indicate a more intensive
level of service needs and greater impairment in functioning. Consequently, a strong positive correlation between CALOCUS score and treatment utilization units and/or cost would indicate that children with higher mental health needs are utilizing services at a higher rate than those with needs assessed at a lower level. A weak or negative correlation would indicate poor alignment between treatment needs and utilization.

Overall Findings

The study sample was comprised of 65 children and adolescents who received County mental health services between July 1 and September 30, 2010 and had an available CALOCUS assessment dated during or after July 2010. The age of participants at the time of CALOCUS assessment ranged from 6.5 to 18.2 years, with a mean of 13.9 years and a standard deviation of 3.15 years. As shown in Figure 1, the age distribution was negatively skewed, with a higher representation of adolescents over younger children. The representation of latency age children (aged 6 to 12 years), adolescents (aged 13 to 15 years), and transitional-aged youth (aged 16 to 18 years) was approximately equal.
Nearly 71% (n=46) of the study sample was male; this was somewhat but not significantly higher than the proportion of males (62%) in the cohort of 150 youths randomly selected for analysis. The study sample was also largely White (n=46, 71%) with Hispanic (n=7, 10.8%), Asian/Pacific Islander (n=4, 6.8%), and Native American (n=1, 1.5%) youths represented in smaller proportions. Approximately 57% (n=37) of the sample lived with their biological or extended family; 18% (n=12) lived in foster homes; 14% (n=9) were adopted and for 11% (n=7) of the study sample, family composition was unspecified. Approximately 35% (n=23) of the study sample was receiving school-related mental health services specified by an Individualized Education Plan (IEP) and 14% (n=9) were identified as having co-occurring problems caused by drug or alcohol use.

Table 1 presents more detailed demographic analysis of the study sample.
Participants in the study were most frequently diagnosed with disruptive disorders (42%), mood disorders (25%), and anxiety disorders (14%). Common Axis I diagnoses, as defined in the DSM-IV-TR (American Psychiatric Association, 2000), included Attention-Deficit/Hyperactivity Disorder, Oppositional Defiant Disorder, Depressive Disorder NOS, Mood Disorder NOS, and Anxiety Disorder NOS. Ratings on the Axis V Global Assessment of Functioning (GAF) scale ranged from 30 to 70 with a mean of 54.3 and a standard deviation of 7 points. Assessed CALOCUS Levels of Care ranged from 1 to 6 with a median level of 3, mean of 3.4, and a standard deviation of 1.5; the composite sub-scores ranged from 11 to 32 with a mean of 19.6 and a standard deviation of 5 points. Diagnostic variables are summarized in Table 2.
<table>
<thead>
<tr>
<th>CALOCUS Level of Care</th>
<th>Frequency</th>
<th>Percentage</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 5 Years</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6 to 12 Years</td>
<td>22</td>
<td>33.8%</td>
<td>3</td>
<td>6</td>
<td>7</td>
<td>2</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>13 to 15 Years</td>
<td>23</td>
<td>35.4%</td>
<td>0</td>
<td>7</td>
<td>8</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>16 to 18 Years</td>
<td>20</td>
<td>30.8%</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>46</td>
<td>70.8%</td>
<td>3</td>
<td>10</td>
<td>16</td>
<td>4</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Female</td>
<td>19</td>
<td>29.2%</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>46</td>
<td>70.8%</td>
<td>3</td>
<td>9</td>
<td>13</td>
<td>5</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Hispanic</td>
<td>7</td>
<td>10.8%</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>African American</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>4</td>
<td>6.2%</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Native American</td>
<td>1</td>
<td>1.5%</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unknown</td>
<td>7</td>
<td>10.8%</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>All (Total)</strong></td>
<td>N=65</td>
<td>100%</td>
<td>n=5</td>
<td>n=15</td>
<td>n=18</td>
<td>n=6</td>
<td>n=16</td>
<td>n=5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(7.7%)</td>
<td>(23.1%)</td>
<td>(27.7%)</td>
<td>(9.2%)</td>
<td>(24.6%)</td>
<td>(7.7%)</td>
</tr>
</tbody>
</table>
Table 2: Diagnostic Distribution and Assessment of Functioning

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Frequency</th>
<th>Average Global Assessment of Functioning</th>
<th>Average CALOCUS Level of Care</th>
<th>Average CALOCUS sub-score composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscellaneous Disorders of Infancy, Childhood &amp; Adolescence</td>
<td>N=6</td>
<td>51.7</td>
<td>4.5</td>
<td>22.5</td>
</tr>
<tr>
<td><em>Includes Pervasive Developmental Disorder (n=3), Reactive Attachment Disorder (n=2), and Other Disorders of Infancy, Childhood and Adolescence, NOS (n=1)</em></td>
<td>(9.2%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disruptive Disorder</td>
<td>N=27</td>
<td>56.4</td>
<td>3.1</td>
<td>18.2</td>
</tr>
<tr>
<td><em>Includes Attention-Deficit Hyperactive Disorder (ADHD, n=16), Oppositional Defiant Disorder (n=9), and Intermittent Explosive Disorder (n=2)</em></td>
<td>(41.5%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizophrenia and other Psychotic Disorders</td>
<td>N=2</td>
<td>37.5</td>
<td>5.5</td>
<td>27.5</td>
</tr>
<tr>
<td><em>Includes Schizophrenia, Residual Type (n=1), Schizoaffective Disorder (n=1)</em></td>
<td>(3.1%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mood Disorders</td>
<td>N=16</td>
<td>52.9</td>
<td>3.5</td>
<td>20.3</td>
</tr>
<tr>
<td><em>Includes Major Depressive Disorder (n=2), Depressive Disorder, NOS (n=4), Bipolar I Disorder (n=3), Bipolar II Disorder (n=1), Bipolar Disorder NOS (n=1), and Mood Disorder, NOS (n=5)</em></td>
<td>(24.6%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety Disorders</td>
<td>N=9</td>
<td>54.2</td>
<td>3.4</td>
<td>20.0</td>
</tr>
<tr>
<td><em>Includes Generalized Anxiety Disorder (n=2), Anxiety Disorder NOS (n=5) and Post Traumatic Stress Disorder (PTSD, n=2)</em></td>
<td>(13.8%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Disorders/Diagnoses</td>
<td>N=5</td>
<td>56.8</td>
<td>3.0</td>
<td>17.0</td>
</tr>
<tr>
<td><em>Includes Adjustment Disorder (n=4), Neglect of Child (n=1)</em></td>
<td>(7.7%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Disorders/Diagnoses (Total)</td>
<td>N=65</td>
<td>54.3</td>
<td>3.4</td>
<td>19.6</td>
</tr>
<tr>
<td></td>
<td>(100%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Treatment utilization data is maintained in County billing records by the categories of case management, collateral services, family services, assessment, individual treatment, group treatment, medication services, crisis services, plan development, and inpatient/residential services. Among the study sample, individual treatment accounted for nearly half (48.8%) of all mental health services provided; about 13% of treatment minutes were devoted to group services and 11% of treatment minutes to plan development. Other treatment modalities each accounted for less than 10% of the total treatment units. In-patient/residential services are recorded in days rather than minutes and therefore were tallied separately. Table 3 presents a more detailed analysis of the modalities of treatment utilized by participants in the study sample. Overall cost for all mental health services received by participants in the study sample during the six months immediately following their CALOCUS assessment ranged from $0 to $40,077, with a mean cost for each individual of $5,345 and a standard deviation of $7,837. An overview of the total utilization of treatment services and costs accrued during the six months following CALOCUS assessment is presented in Tables 4 and 5.
<table>
<thead>
<tr>
<th>Treatment Modality (Excludes In-Patient/Residential)</th>
<th>Total Treatment Minutes</th>
<th>Percentage</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Management</td>
<td>9,517</td>
<td>8.3%</td>
<td>3.8%</td>
<td>7.9%</td>
<td>5.0%</td>
<td>13.4%</td>
<td>9.1%</td>
<td>13.7%</td>
</tr>
<tr>
<td>Collateral</td>
<td>6,881</td>
<td>6.0%</td>
<td>17.7%</td>
<td>5.6%</td>
<td>6.4%</td>
<td>5.4%</td>
<td>5.9%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Family</td>
<td>10,292</td>
<td>9.0%</td>
<td>0.0%</td>
<td>7.9%</td>
<td>9.6%</td>
<td>16.4%</td>
<td>8.2%</td>
<td>11.3%</td>
</tr>
<tr>
<td>Assessment</td>
<td>1,448</td>
<td>1.3%</td>
<td>0.0%</td>
<td>0.9%</td>
<td>0.2%</td>
<td>9.1%</td>
<td>1.7%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Individual</td>
<td>55,717</td>
<td>48.8%</td>
<td>11.3%</td>
<td>55.0%</td>
<td>46.6%</td>
<td>13.1%</td>
<td>51.6%</td>
<td>60.1%</td>
</tr>
<tr>
<td>Group</td>
<td>14,286</td>
<td>12.5%</td>
<td>55.8%</td>
<td>11.0%</td>
<td>20.0%</td>
<td>26.5%</td>
<td>6.9%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Medication</td>
<td>2,683</td>
<td>2.4%</td>
<td>5.0%</td>
<td>1.5%</td>
<td>1.3%</td>
<td>6.7%</td>
<td>2.7%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Crisis</td>
<td>1,181</td>
<td>1.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>4.0%</td>
<td>1.0%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Plan Development</td>
<td>12,067</td>
<td>10.6%</td>
<td>6.6%</td>
<td>10.3%</td>
<td>10.9%</td>
<td>5.5%</td>
<td>12.9%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Total Minutes of Treatment</td>
<td>114,072</td>
<td>100%</td>
<td>n=3,198 (2.8%)</td>
<td>n=15,638 (13.7%)</td>
<td>n=31,576 (27.7%)</td>
<td>n=4,949 (4.3%)</td>
<td>n=45,968 (40.3%)</td>
<td>n=12,743 (11.2%)</td>
</tr>
</tbody>
</table>
Table 4: Utilization of Treatment Services in the Six Months Following CALOCUS Assessment

<table>
<thead>
<tr>
<th>CALOCUS Level of Care</th>
<th>Number of Youth</th>
<th>Total Treatment Minutes</th>
<th>Mean</th>
<th>Median</th>
<th>Range</th>
<th>Standard Deviation</th>
<th>Additional Days of In-Patient Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>3,198</td>
<td>640</td>
<td>835</td>
<td>45 - 1,126</td>
<td>528</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>15,638</td>
<td>1,043</td>
<td>390</td>
<td>0 – 7,620</td>
<td>1,920</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>31,576</td>
<td>1,754</td>
<td>1,269</td>
<td>30 – 3,990</td>
<td>1,252</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>4,949</td>
<td>825</td>
<td>762</td>
<td>40 – 2,208</td>
<td>808</td>
<td>126</td>
</tr>
<tr>
<td>5</td>
<td>16</td>
<td>45,968</td>
<td>2,873</td>
<td>1,916</td>
<td>0 – 11,219</td>
<td>3,333</td>
<td>160</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>12,743</td>
<td>2,549</td>
<td>2,120</td>
<td>309 – 6,976</td>
<td>2,612</td>
<td>115</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>114,072</td>
<td>1,755</td>
<td>983</td>
<td>0 – 11,219</td>
<td>2,231</td>
<td>401</td>
</tr>
</tbody>
</table>
Table 5: Cost of Treatment Services Accrued during the Six Months Following CALOCUS Assessment

<table>
<thead>
<tr>
<th>CALOCUS Level of Care</th>
<th>Number of Youth</th>
<th>Total Cost of Treatment</th>
<th>Mean</th>
<th>Median</th>
<th>Range</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>$8,977</td>
<td>$1,795</td>
<td>$2,012</td>
<td>$196 - $3,287</td>
<td>$1,496</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>$37,573</td>
<td>$2,505</td>
<td>$1,018</td>
<td>$0 - $16,129</td>
<td>$4,140</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>$77,152</td>
<td>$4,286</td>
<td>$3,718</td>
<td>$88 - $8,962</td>
<td>$2,598</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>$42,234</td>
<td>$7,039</td>
<td>$3,065</td>
<td>$202 - $31,127</td>
<td>$11,928</td>
</tr>
<tr>
<td>5</td>
<td>16</td>
<td>$132,836</td>
<td>$8,302</td>
<td>$4,940</td>
<td>$0 - $40,077</td>
<td>$10,629</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>$48,675</td>
<td>$9,735</td>
<td>$5,465</td>
<td>$1,115 - $33,214</td>
<td>$13,262</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>$347,446</td>
<td>$5,345</td>
<td>$2,918</td>
<td>$0 - $40,077</td>
<td>$7,837</td>
</tr>
</tbody>
</table>
Specific Findings

To more directly explore the extent to which mental health assessment can be quantified and linked to treatment intensity, the correlation between CALOCUS scores and minutes of treatment was calculated. Using Pearson’s product moment correlation (Pearson’s $r$) and the coefficient of determination ($R^2$), the association between CALOCUS assessment and treatment received during the six months following assessment was analyzed. Correlational values are used to measure the strength of association between two variables, and range from -1.0 to 1.0. Positive and negative signs indicate the direction of the relationship between the two variables. Correlational values that approach -1.0 or 1.0 indicate a strong linear relationship between the two variables, while values closer to zero indicate a weak or trivial association (Grinnell & Unrau, 2011). Calculation of the coefficient of determination ($R^2$) allows researchers to describe the proportion of common variation between two variables; in other words, the extent to which changes in one variable will coincide with changes in the other variable. The coefficient of determination ($R^2$) ranges from 0 to 1.0, with values close to zero indicating weak covariance and values nearing 1.0 reflecting a large proportion of common variation; for example, if Pearson’s $r$ is calculated to be 0.5, then $R^2$ is equal to .25 and 25% of the change in the two variables will overlap. Social scientists interpreting the magnitude of correlation coefficients have generally agreed that that values greater than 0.5 are large; those between 0.5 and 0.3 are moderate; those in the range of 0.3 to 0.1 are small, and values less than 0.1 are insubstantial (Hopkins, 2002).
In this study, all treatment modalities except group therapy demonstrated a small to moderate positive correlation between minutes of treatment and CALOCUS Level of Care assessment, indicating that children assessed as having a higher level of need are somewhat more likely to utilize a higher intensity of treatment services of all types except group therapy. A small, negative correlation was found between the utilization of group therapy and CALOCUS Level of Care; this suggests that children and adolescents who have lower levels of need are slightly more likely to utilize group treatment than are youth with higher levels of need.

Specific findings within this study population include the following: the CALOCUS Level of Care score is moderately correlated to utilization of crisis services \((r=0.37)\) and case management \((r=0.33)\). The CALOCUS score is also correlated to total minutes of treatment \((r=0.30)\) and therefore the cost of service \((r=0.34)\). Small correlations were also found between the CALOCUS Level of Care score and utilization of medication services \((r=0.28)\), individual therapy \((r=0.28)\), days of in-patient/residential placement \((r=0.26)\), and family services \((r=0.25)\). The resulting coefficient of determination \(R^2\) for total minutes of treatment \(R^2=0.09\) indicates that 9% of variance in the utilization of treatment services within the study group coincides with differences in assessed acuity as determined by the CALOCUS Level of Care score. Similarly, the moderate correlation \((r=0.34 \text{ and } R^2=0.11)\) found between total cost of treatment and the CALOCUS Level of Care score means that 11% of variance in the cost of treatment within the study group coincides with differences in assessed acuity as determined by the
CALOCUS Level of Care score. Table 6 details the correlation between CALOCUS Level of Care and both utilization and cost of treatment.

Table 6: Correlation between CALOCUS Level of Care and Utilization of Treatment

<table>
<thead>
<tr>
<th>Treatment Modality</th>
<th>Pearson’s r</th>
<th>Coefficient of Determination (R²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Management</td>
<td>0.33</td>
<td>0.11</td>
</tr>
<tr>
<td>Collateral</td>
<td>0.11</td>
<td>0.01</td>
</tr>
<tr>
<td>Family</td>
<td>0.25</td>
<td>0.06</td>
</tr>
<tr>
<td>Assessment</td>
<td>0.15</td>
<td>0.02</td>
</tr>
<tr>
<td>Individual</td>
<td>0.28</td>
<td>0.08</td>
</tr>
<tr>
<td>Group</td>
<td>-0.11</td>
<td>0.01</td>
</tr>
<tr>
<td>Medication</td>
<td>0.28</td>
<td>0.08</td>
</tr>
<tr>
<td>Crisis</td>
<td>0.37</td>
<td>0.14</td>
</tr>
<tr>
<td>Plan Development</td>
<td>0.18</td>
<td>0.03</td>
</tr>
<tr>
<td>In-patient/Residential</td>
<td>0.26</td>
<td>0.07</td>
</tr>
<tr>
<td>Total Minutes of Treatment (excludes Inpatient/Residential)</td>
<td>0.30</td>
<td>0.09</td>
</tr>
<tr>
<td>Total Cost of Service</td>
<td>0.34</td>
<td>0.11</td>
</tr>
</tbody>
</table>

Further analysis tested the correlation between treatment utilization variables and the composite of CALOCUS sub-scores, the individual CALOCUS sub-scores, and the DSM-IV-TR (American Psychiatric Association, 2000) Global Assessment of
Functioning (GAF). The moderate magnitude of correlation that was found between the CALOCUS Level of Care score and the total minutes of treatment ($r=.30$), as well as the total cost of service ($r=.34$), was stronger than the correlation derived from each of these alternate variables. Taken alone, the CALOCUS sub-scores demonstrate a small ($0.3 > r > 0.1$) to trivial ($r < 0.1$) correlation to treatment variables; the CALOCUS composite score also has a much weaker association to the treatment variables than does the Level of Care score. Only the sub-scores measuring functional status and resiliency approached the moderate level of association with treatment variables.

Unlike CALOCUS, higher GAF scores indicate improved levels of functioning, and consequently the direction of the relationship between the CALOCUS measures and the GAF score is expected to be negative. In this study population, the correlation between the CALOCUS Level of Care and the DSM-IV-TR GAF score was calculated to be -0.41. In addition, the correlation coefficient calculated between GAF scores and the total treatment minutes was negative, but just slightly less strong than the association of treatment minutes to the CALOCUS Level of Care measure. Pearson’s $r$ between treatment minutes and the GAF score was calculated to be -0.26. Table 7 compares the correlation of various quantitative assessment measures to the primary treatment variables.
Table 7: Correlation between CALOCUS Sub-Scores and Utilization of Treatment

<table>
<thead>
<tr>
<th>Assessment Measure</th>
<th>Total Minutes of Treatment (Excludes In-Patient/Residential)</th>
<th>Total Cost of Treatment</th>
<th>Individual Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALOCUS Level of Care</td>
<td>0.30</td>
<td>0.34</td>
<td>0.28</td>
</tr>
<tr>
<td>CALOCUS Composite Score</td>
<td>0.16</td>
<td>0.15</td>
<td>0.10</td>
</tr>
<tr>
<td>CALOCUS Sub-scores:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. Risk of Harm</td>
<td>0.14</td>
<td>0.16</td>
<td>0.09</td>
</tr>
<tr>
<td>II. Functional Status</td>
<td>0.27</td>
<td>0.24</td>
<td>0.24</td>
</tr>
<tr>
<td>III. Comorbidity</td>
<td>-0.04</td>
<td>0</td>
<td>-0.08</td>
</tr>
<tr>
<td>IV-A. Environmental Stress</td>
<td>0.15</td>
<td>0.12</td>
<td>0.03</td>
</tr>
<tr>
<td>IV-B. Environmental Support</td>
<td>0.13</td>
<td>0.06</td>
<td>0.10</td>
</tr>
<tr>
<td>V. Resiliency</td>
<td>0.25</td>
<td>0.27</td>
<td>0.22</td>
</tr>
<tr>
<td>VI. Engagement</td>
<td>0.09</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>DSM-IV-TR GAF</td>
<td>-0.26</td>
<td>-0.19</td>
<td>-0.23</td>
</tr>
</tbody>
</table>

Additional Findings

To better assess the ability of CALOCUS to predict treatment utilization, a One-Way Analysis of Variance (ANOVA) was used to test for treatment differences among the six CALOCUS Levels of Care. The total minutes of treatment utilized during the six months directly following CALOCUS assessment did not vary significantly across
CALOCUS Levels of Care, $F(5, 59) = 1.800, p = 0.13$. The cost of treatment provided during this period also did not differ significantly across the Levels of Care, $F(5, 59) = 1.555, p = 0.19$.

**Summary**

This was an exploratory study intended to examine the relationship between the acuity of assessed need, as determined by CALOCUS, and the treatment services that are utilized in response to children’s mental health problems. One of the most surprising results was the initial finding that only 65 of the randomly selected cohort of 150 youth (43%) had an available CALOCUS assessment dated during or after July 2010. CALOCUS is a required component of comprehensive assessment and reassessment in the Children’s Services program; it is unknown whether the missing data is the result of clinical or administrative error. In addition, the extent to which individual treatment dominates all other treatment modalities, accounting for nearly half (48.8%) of all treatment services provided, is also significant. CALOCUS is designed to coordinate treatment planning within a children’s system of care, which includes a continuum of available services. In a rural mental health system, lack of access to the necessary continuum of care components may result in implementation of CALOCUS without adequate fidelity to the model.

Analysis of the data also indicates that while the correlation coefficients calculated in this study are typically understood to represent a “moderate” magnitude of association, ANOVA analysis demonstrates that the apparent correlation between CALOCUS Level of Care and treatment intensity is not statistically significant. The
minutes and costs of treatment vary widely within each level of care. As can be seen in Figure 2, there are some children at all levels of care who withdrew from treatment shortly after assessment, and consequently underutilized available services. Children who utilized a significantly greater intensity of services than others in the study group appear as outliers in Figure 2; these children also have a profound influence on the value of the correlation coefficient. Finally, the analysis of treatment minutes was also complicated by in-patient/residential treatment, which is a flat-rate service measured in days rather than minutes. This was particularly noticeable within the small group of children assessed at CALOCUS Level of Care 4 (n=6) and Level of Care 6 (n=5); in both groups, one child spent approximately half of the six-month data-collection period in residential care, and during this time few other mental health service minutes accrued. Because residential care is expensive, these children have disproportionately high costs but low utilization of treatment minutes.

Despite these problems, the correlation between CALOCUS scores and treatment variables in this study are equal to or greater than those found in the large-scale evaluation of CALOCUS and the Child and Adolescent Functional Assessment Scale (CAFAS) conducted by the State of Hawaii between July 1, 2000 and June 30, 2003 (Daleiden, 2004). In the Hawaiian study, clinicians assessed children quarterly using both CALOCUS and CAFAS; predictive validity was based on services provided during quarter immediately following evaluation. Using Pearson’s r, Daleiden (2004) reported an average correlation of 0.27 between quarterly cost of treatment and CALOCUS Level
of Care, but an insignificant relationship ($r=0.07$) between total service hours and CALOCUS Level of Care.

Figure 2: Scatterplot of Treatment Minutes by CALOCUS Level of Care
Chapter 5
Conclusions, Summary, and Recommendations

Summary of Study

The importance of matching children’s mental health needs with the appropriate type and intensity of treatment services came to national attention with the publication of *Unclaimed Children: The Failure of Public Responsibility to Children and Adolescents in Need of Mental Health Service* (Knitzer, 1982). The “system of care” model, developed in the mid-1980’s following the publication of *Unclaimed Children*, supports a continuum of mental health and other community-based services that are individualized, child and family-centered, and planned in collaboration with all systems involved in the child’s life (Ayers & de Toledo, 2009). In the 1990’s, efforts to improve efficiency and control costs led to the implementation of mental health managed care, which includes the standardization of assessment and treatment criteria (Masland, Snowden & Wallace, 2007). Yet despite these divergent efforts to match mental health needs with appropriate services, research continues to document disparities in access to care and treatment utilization.

The assessment process is a vital step in the development of a mental health treatment plan that matches the acuity of need. Traditionally, social work practitioners and other mental health professionals have used a biopsychosocial (BPS) model to gather information about the client’s development and functioning, formulate a diagnosis, and develop a treatment plan. The BPS assessment is typically based on a loosely structured interview, and provides a narrative summary of the client’s history and current
functioning. However, the qualitative nature of the BSP assessment makes it difficult to systematize treatment planning and evaluate outcomes. More recently, standardized, quantitative, and evidence-based assessment (EBA) methodologies have been developed to complement more narrowly targeted brief therapy and evidence-based treatment (EBT) protocols. This study was designed to explore the extent to which assessment of mental health needs are correlated with treatment intensity, and whether a quantitative assessment measure (CALOCUS) can predict treatment utilization.

The study was conducted in a County mental health clinic located in a largely rural area of California. In addition to a comprehensive biopsychosocial assessment, the County implemented the use of CALOCUS during fiscal year 2008-09 to provide a standardized measure of the level of care a child is expected to need. CALOCUS measures level of care on a scale of 0 to 6 with higher scores indicating increased acuity of need. The study sample was comprised of 65 children and adolescents who received County mental health services between July 1 and September 30, 2010 and had an available CALOCUS assessment dated during or after July 2010.

Treatment data was obtained from County billing records and measured minutes of treatment by modality: case management, collateral services, family services, assessment, individual treatment, group treatment, medication services, crisis services, and plan development. In addition, inpatient/residential services were recorded by number of days. Specific findings from the study indicate that:

- Despite the fact that CALOCUS is a required component of comprehensive assessment and reassessment in the County’s Children’s Services program,
less than half of the randomly selected cohort of 150 youth (n=65, 43%) had an available CALOCUS assessment dated during or after July 2010.

- Individual treatment accounted for nearly half (48.8%) of all mental health services provided.

- Children received a wide range (0 – 11,219) of total treatment minutes during the six months following their CALOCUS assessment. On average, the children received 1,755 minutes of treatment during the six months following their CALOCUS assessment; however the median number of minutes was 983, indicating the mean was positively skewed by clients who used a high level of treatment.

- The overall cost for all mental health services received by participants in the study sample during the six months immediately following their CALOCUS assessment ranged from $0 to $40,077, with a mean cost for each individual of $5,345 and a standard deviation of $7,837.

- All treatment modalities except group therapy demonstrated a small to moderate positive correlation (0.11 ≤ r ≤ 0.37) between minutes of treatment and CALOCUS Level of Care assessment, indicating that children assessed as having a higher level of need are somewhat more likely to utilize a higher intensity of treatment services of all types except group therapy.

- A small, negative correlation (r = -0.11) was found between the utilization of group therapy and CALOCUS Level of Care, suggesting that children and
adolescents who have lower levels of need are slightly more likely to utilize
group treatment than are youth with higher levels of need.

- One-Way Analysis of Variance (ANOVA) demonstrated that neither the total
minutes of treatment utilized during the six months directly following
CALOCUS assessment nor the total cost of treatment varied significantly
across CALOCUS Levels of Care.

- The correlation between CALOCUS scores and treatment variables in this
study were equal to or greater than those found in the large-scale evaluation of
CALOCUS and the Child and Adolescent Functional Assessment Scale
(CAFAS) conducted by the State of Hawaii between July 1, 2000 and June 30,
2003 (Daleiden, 2004).

Overall, the study results raise significant questions about whether CALOCUS
has clinical utility when implemented in a small, rural county system of care. The tool
appears to be underutilized by clinicians, and CALOCUS Level of Care scores could not
be queried from either County billing records or the client electronic health record. As a
result, CALOCUS scores could not be readily accessed to either monitor or predict
treatment utilization.

Moreover, the extent to which individual services dominate the treatment
provided to the majority of children and adolescents in the study sample is contradictory
to a system of care model. Whereas individual treatment accounted for nearly half of all
treatment minutes provided, collateral and family services combined accounted for only
15% of total treatment minutes. CALOCUS Level of Care services are based on the
availability of an array of treatment variables, with a greater number and variety of services required as the level of care increases. Beginning at Level 3, Wraparound plans, family collaboration, and community supports are used to complement outpatient clinical services; by Level 5, “a complex array of services should be in place around the child and a higher level of care coordination is needed” (Klaehn, O’Malley, Vaughan, & Kroehler, 2003, p.9). Implementation of an increasing number and complexity of treatment variables as Level of Care increases is not evident from County billing records.

In addition, results from this study demonstrate a large range and significant variance in the treatment minutes utilized across the study sample of 65 children and adolescents. Some children withdraw from services immediately or shortly after assessment while others utilize a significantly greater intensity of services; individual instances of extremely high or unusually low treatment utilization is evident at all levels of care. CALOCUS in no way predicts these outliers.

**Implications for Social Work**

CALOCUS was designed to link clinical assessment with recommendations for the type and intensity of treatment resources to be offered. In this study, a moderate positive correlation ($r=0.30$) was found between total minutes of treatment and CALOCUS Level of Care, indicating that 9% of variance in the utilization of treatment services within the study group coincides with differences in assessed acuity as determined by the CALOCUS Level of Care score. The CALOCUS score was also moderately correlated to the cost of service ($r=.34$). In the public mental health system, there is some expectation that this correlation “should” be higher, and social workers and
other clinicians are concerned that CALOCUS assessment may be used to prescribe rather than predict mental health service use. In fact, program managers in the County’s mental health division have introduced “benefit packages” that are directly linked to the CALOCUS Level of Care assessment. The concern is that without a full system of care to link clinical and community support services, and essentially without fidelity to the model, CALOCUS will be implemented with the intention of limiting expenditures and restricting the use of mental health resources.

In this scenario, CALOCUS is transformed from a clinical assessment measure to a cost-saving, resource management tool. However, review of the literature found no study in which the correlation of the CALOCUS Level of Care score to subsequent treatment utilization was greater than 0.30. This points to the fact that social worker clinicians and administrators who aim to implement evidence-based practices, including assessment practices, should be familiar with the literature and aware of the strengths and limitations of the specific practice.

**Evaluation and Conclusion**

This study was intended to explore the extent to which assessment of mental health acuity is correlated with treatment intensity in a small, rural, County mental health agency. While no attempt was made to evaluate the logistical and social factors that have been shown to impact mental health utilization, the wide variance in service utilization at all assessed levels of care had a significant impact on the correlation between mental health acuity and treatment. Future qualitative studies are needed to explore the circumstances that lead children to underutilize treatment services as well as those that
result in children utilizing services at a rate much higher than average. Understanding the large disparities in treatment minutes that became evident within a six-month period and among a small cohort of 65 children may better inform future efforts to provide the appropriate level of treatment and control costs.

In addition, this study considered treatment intensity but did not evaluate treatment duration beyond a six-month period and did not measure treatment outcomes. The study included children and adolescents who were evaluated using CALOCUS as part of their initial, comprehensive evaluation, as well as others who had received mental health services for a year or longer and were evaluated with the CALOCUS measure as part of the reassessment process. Some of the variation in treatment utilization may be explained by differences in treatment history. Furthermore, both treatment duration and outcomes directly impact future treatment utilization and costs. A longitudinal study that includes treatment history and outcome data may result in a better understanding of the variables that impact treatment intensity.

It is fairly clear from this study and others in the literature that treatment intensity is driven by factors in addition to the CALOCUS-defined acuity of need. A better understanding of those factors is directly related to the question of, “Who gets mental health treatment and why?” and may be key to addressing mental health disparities among children in rural settings. Rather than imposing CALOCUS as a fiscal management tool, children and families would be better served if future studies were to posit and evaluate those other factors.
Appendix A

CASII/CALOCUS
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Definition</th>
<th>Score</th>
</tr>
</thead>
</table>
| I         | Risk of Harm | 1. Low Potential  
2. Some Potential  
3. Significant Potential  
4. Serious Potential  
5. Extreme Potential |
| II        | Functional Status | 1. Minimal Impairment  
2. Mild Impairment  
3. Moderate Impairment  
4. Serious Impairment  
5. Severe Impairment |
| III       | Co-Morbidity/Co-occurrence of Conditions: Developmental, Medical, Substance Use, and Psychiatric | 1. No Co-Morbidity  
2. Minor Co-Morbidity  
3. Significant Co-Morbidity  
4. Major Co-Morbidity  
5. Severe Co-Morbidity |
| IV-A      | Recovery Environment – Level of Stress | 1. Minimally Stressful  
2. Mildly Stressful  
3. Moderately Stressful  
4. Highly Stressful  
5. Extremely Stressful |
| IV-B      | Recovery Environment – Level of Support | 1. Highly Supportive  
2. Supportive  
3. Limited Support  
4. Minimal Support  
5. No Support |
| V         | Resiliency and Treatment History | 1. Full Response  
2. Significant Response  
3. Moderate Response  
4. Poor Response  
5. Negligible Response |
| VI-A      | Acceptance and Engagement – Child/Adolescent | 1. Optimal  
2. Constructive  
3. Obstructive  
4. Destructive  
5. Inaccessible |
| VI-B      | Parent/Primary Caretaker | (Record the higher of VI-A, VI-B) |

Composite Score

Table A1 Notes: CASII/CALOCUS provides criteria and examples for each dimension and rating score. Source: Klaehn, O’Malley, Vaughan, & Kroehrer (Eds.), 2003; American Academy of Child & Adolescent Psychiatry, 2007b.
Table A2: CASII/CALOCUS Levels of Care Utilization Criteria

<table>
<thead>
<tr>
<th>Level of Care</th>
<th>Definition [1]</th>
<th>Composite Score [2]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero</td>
<td>Basic Services for Prevention and Maintenance</td>
<td>7-9</td>
</tr>
<tr>
<td>One</td>
<td>Recovery Maintenance and Health Management</td>
<td>10-13</td>
</tr>
<tr>
<td>Two</td>
<td>Outpatient Services</td>
<td>14-16</td>
</tr>
<tr>
<td>Three</td>
<td>Intensive Outpatient Services</td>
<td>17-19</td>
</tr>
<tr>
<td>Four</td>
<td>Intensive Integrated Services without 24-hour Psychiatric Monitoring</td>
<td>20-22</td>
</tr>
<tr>
<td>Five</td>
<td>Non-Secure, 24-hour Psychiatric Monitoring</td>
<td>23-27</td>
</tr>
<tr>
<td>Six</td>
<td>Secure, 24-hour Psychiatric Monitoring</td>
<td>28+</td>
</tr>
</tbody>
</table>

Table A2 Notes: [1] At each level of care CASII/CALOCUS describes the clinical services, support services, crisis stabilization and prevention services, and care environment required, as well as the placement criteria. [2] A score of “5” in Service Need Dimensions I, II, or III results in placement at Level Six regardless of composite score. A score of “4” in Service Need Dimensions I results in placement at Level Five regardless of composite score. A score of “4” in Service Need Dimensions II or III will result in placement at Level Five regardless of composite score unless the recovery environment (Dimensions IV-A and IV-B) is minimally stressful and highly supportive (IV-A + IV-B = 2). Source: Klaehn, O’Malley, Vaughan, & Kroehler (Eds.), 2003; American Academy of Child & Adolescent Psychiatry, 2007b.
Table A3: CASII/CALOCUS Levels of Care Services

<table>
<thead>
<tr>
<th>Level of Care</th>
<th>Service Array [1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero</td>
<td>Basic Prevention and Maintenance services assumed to be available to all people in the community, regardless of need for mental health services.</td>
</tr>
<tr>
<td>One</td>
<td>Recovery Maintenance and Health Management services are typically intended for those who are stepping down from higher levels of care and need minimal or brief services to maintain their current level of function.</td>
</tr>
<tr>
<td>Two</td>
<td>Outpatient Services most closely resemble traditional office-based practice and require limited use of community-based services.</td>
</tr>
<tr>
<td>Three</td>
<td>Intensive Outpatient Services begin to become more complex and more coordinated. The use of case management begins at this level, along with use of child and family teams to develop Wraparound Plans that incorporate informal community supports. More frequent contact between providers of care and the youth and his family is also required.</td>
</tr>
<tr>
<td>Four</td>
<td>Intensive Integrated Services without 24-hour Psychiatric Monitoring describes the services necessary for the “multisystem, multi-problem” child requiring more extensive collaboration between the increased number of providers and agencies. Formal supports are incorporated within a more elaborate Wraparound plan, and may include respite, homemaking services or paid mentors. In traditional systems, this level of service is often provided in a day treatment or a partial hospitalization setting.</td>
</tr>
<tr>
<td>Five</td>
<td>Non-Secure, 24-hour Psychiatric Monitoring requires a complex array of services. Traditionally, this level of care is provided in group homes or unlocked residential facilities, but may be provided in foster care and even family homes if a high level of Wraparound services is available.</td>
</tr>
<tr>
<td>Six</td>
<td>Secure, 24-hour Psychiatric Monitoring: Most commonly, these services are provided in inpatient psychiatric settings or highly programmed residential facilities. Case management remains essential to minimize the time each child spends in a restrictive setting.</td>
</tr>
</tbody>
</table>

Table A3 Notes: [1] CALOCUS Level of Care recommendations are distinguished by a combination of service variables that include the treatment environment as well as clinical, support, crisis and prevention services. At higher levels of care, there is an increase in the number and variety of services recommended. Source: Klaehn, O’Malley, Vaughan, & Kroehler (Eds.), 2003; American Academy of Child & Adolescent Psychiatry, 2007b.
Appendix B

Data Collection Forms
### Table B1: Secondary Data Compilation Form

<table>
<thead>
<tr>
<th>Research ID:</th>
<th>Month/Year of most recent CALOCUS assessment:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section 1: Billing Information</strong></td>
<td><strong>Treatment Received in:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minutes of Service per month, by type:</th>
<th>the first calendar month after assessment</th>
<th>the second calendar month after assessment</th>
<th>the third calendar month after assessment</th>
<th>the fourth calendar month after assessment</th>
<th>the fifth calendar month after assessment</th>
<th>the sixth calendar month after assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group Services</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collateral Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-Patient Residential Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crisis Intervention</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Treatment Minutes billed:</td>
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<td></td>
<td></td>
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</tr>
</tbody>
</table>
Table B1: Secondary Data Compilation Form, continued

<table>
<thead>
<tr>
<th>Section 2: Clinical Information</th>
<th>Research ID:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALOCUS Sub-Scores:</td>
<td>CALOCUS Composite Score: _____</td>
</tr>
<tr>
<td>I. Risk of Harm: _____</td>
<td></td>
</tr>
<tr>
<td>II. Functional Status: _____</td>
<td></td>
</tr>
<tr>
<td>III. Co-Morbidity: _____</td>
<td>(sum IV-A + IV-B)</td>
</tr>
<tr>
<td>IV-A. Recovery Environment – Stress: _____</td>
<td></td>
</tr>
<tr>
<td>IV-B. Recovery Environment – Support: _____</td>
<td></td>
</tr>
<tr>
<td>V. Treatment History: _____</td>
<td>(record higher of VI-A, VI-B)</td>
</tr>
<tr>
<td>VI-A. Engagement – Child: _____</td>
<td></td>
</tr>
<tr>
<td>VI-B. Engagement – Parent/Caregiver: _____</td>
<td></td>
</tr>
<tr>
<td>Corresponding CALOCUS Level of Care:</td>
<td></td>
</tr>
<tr>
<td>☐ Level 1 ☐ Level 2 ☐ Level 3 ☐ Level 4 ☐ Level 5 ☐ Level 6</td>
<td></td>
</tr>
<tr>
<td>Age at Assessment: _________</td>
<td></td>
</tr>
<tr>
<td>Gender: ☐ Male ☐ Female ☐ Other/Unknown</td>
<td></td>
</tr>
<tr>
<td>Race/Ethnicity:</td>
<td></td>
</tr>
<tr>
<td>☐ African American ☐ Asian/Pacific Islander</td>
<td></td>
</tr>
<tr>
<td>☐ Hispanic ☐ Native American</td>
<td></td>
</tr>
<tr>
<td>☐ White/Caucasian ☐ Multiple Race/Ethnicity ☐ Other/Unknown</td>
<td></td>
</tr>
<tr>
<td>Diagnosis: Axis I: _____ Axis V (GAF): _____</td>
<td></td>
</tr>
<tr>
<td>Current resides:</td>
<td></td>
</tr>
<tr>
<td>☐ With his/her biological family ☐ As a Dependent of Juvenile Probation</td>
<td></td>
</tr>
<tr>
<td>☐ In Foster Care/Child Welfare ☐ In Group Home Care</td>
<td></td>
</tr>
<tr>
<td>Has child received Educationally-Related Mental Health Services in the past year?</td>
<td></td>
</tr>
<tr>
<td>☐ Yes ☐ No ☐ Unknown</td>
<td></td>
</tr>
<tr>
<td>Has the co-occurring use of drugs or alcohol been identified as a problem?</td>
<td></td>
</tr>
<tr>
<td>☐ Yes ☐ No ☐ Unknown</td>
<td></td>
</tr>
</tbody>
</table>
References


http://www.surgeongeneral.gov/library/mentalhealth/home.html

