

# Using program theory to develop key performance indicators for child and adolescent mental health services

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## Abstract

*Key Performance Indicators are used increasingly by health services, but their relevance and utility may be questionable. In this article, Program Theory is used to model the irreducible stages in the system of clinical care in Child and Adolescent Mental Health Services, define the major program operations in each of these stages, and specify the intermediate outcomes of each stage and the final outcomes sought. National and State policy standards are used, with practice experience, to identify key program operations and intermediate outcomes sought. Systematic criteria are then applied to select KPIs that are measurable, reliable, valid for our program theory, utilitarian, and relevant to clinicians, clients and managers.*

## Introduction

Human service organisations use program operations to turn resources (inputs) into services (outputs) that aim to create outcomes for clients. This usually involves a series of intermediate work processes and proximal outcomes, as stages towards the final or distal outcome (Hodge 1993). Organisations can more readily learn after they develop the metrics to gain regular feedback about their performance and the outcomes they produce (Garvin 1993). The critical intermediate program operations for the quality of these outcomes are called Key Performance Areas, and the measures of their functioning are Key Performance Indicators (KPIs). This paper examines the program operations of Child and Adolescent Mental Health Services (CAMHS) and suggests a framework for selecting appropriate KPIs for CAMHS. It does not focus on outcome measurement for clients per se, as this is well described elsewhere (Bickman, Nurcombe, Townsend, Belle, Schut & Karver 1999).

## Why are KPIs important?

The Quality Movement evolved in manufacturing to overcome variations in program operations, as this proved to be the major source of variation in the quality of the final product (Batalden 1991). Performance indicators help us to identify these variations in program operations, confirm predicted links between these and client outcomes, and show actual performance at each stage of care. KPIs are like the dashboard dials of a vehicle that show different functions, such as the speed of travel, the engine temperature, oil pressure, and how far it has travelled. In the same way, they can inform a service about its rate of progress, which program operations are

running smoothly, and which components need to be examined, serviced or even re-engineered. Clinical Information Systems may collect the activity data and clinical information used in program operations, and provide automated feedback of quantitative data in reports.

Good KPIs will be useful to both service providers and funding bodies, and be able to support performance conversations internally and externally for organisations to improve the efficiency and effectiveness of their program operations or organisational arrangements (Arnold 1990). KPI feedback will highlight areas where relevant quality activity can usefully be targeted, and directly supports qualitative quality improvement processes, such as those involved in Hospital Accreditation, Quality Audits or Clinical Reviews. They complement the use of Carer and Client Satisfaction instruments which are ideal for assessing perceptions such as the utility of information provided to clients, timeliness of response and accessibility of services (Parker, Wright, Robertson & Gladstone 1996). These satisfaction studies also provide a window into clinical processes to complement record audits and clinical reviews (Plapp & Rey 1994).

KPI data may also be more directly linked to the care of individual clients. For example, our service has a performance guidance system that supports six-monthly clinical audit and review with clients and peers, and encourages reliable communication outside the service (Poertner & Rapp 1988). Our Clinical Information System (CIS) generates a monthly list for each case manager of their clients with age, gender, date of entry to the service, diagnosis, and duration of care. A Clinical Review Sheet (CRS) is also produced for every client at six months after allocation, and six monthly thereafter until case closure. Case managers are asked to rate progress, indicate whether the diagnosis or ISP has been updated, complete the date of review with team or supervisor, indicate whether assessment and review reports have been completed, and who will be sent a copy. The completed CRS is “signed off” by the supervisor or a team member, and administrative staff enter the data on the CIS.

If KPIs are useful for quality improvement and service development, and have relevance to managers and clinicians, we require a method for identifying which ones will be most useful.

## **Program Theory**

Bickman (1996) suggests that a logical starting point for developing the most appropriate KPIs is to create a model or “Program Theory”. This identifies the irreducible stages in the system of care, defines the major program operations in each of these stages, and specifies the intermediate outcomes of each stage and the final outcomes sought. A program theory makes explicit the hypothesised connections between program operations and outcome. Good outcomes are expected when program operations or work practices faithfully implement the program theory. Poor outcomes will arise from incomplete or inadequate application of program operations that affect service quality, from the influence of other factors external to the program, from incorrect assumptions and flaws in the model, or from factors associated with measurement error.

In turn, KPIs can help us to assess the application of our program theory. For example, we may believe that an accessible service Intake is expected to increase client satisfaction and attendance at the initial appointment, and this is a necessary, although not sufficient, condition for engaging clients in assessment and treatment. We can measure accessibility to check whether the Intake program operation is being implemented effectively, and measure attendance to check the hypothesis that accessible Intake leads to better attendance. We can begin to develop a range of possible KPIs by analysing key policy documents to reveal the explicit or implicit underpinning of program operations, by examining the work operations that actually occur and building a model of these, and by selecting items that are thought most critical and may be most feasibly collected. This paper describes such a process in CAMHS.

As this paper has been written within a Victorian context, it will emphasise the Victorian mental health system and its policy framework. Victoria’s Mental Health Services: The Framework for Service Delivery - Child & Adolescent Services (H&CS 1996), describes the service system and identifies many of the criteria required of a good system of care. These aim to establish a strong consumer focus for services and to build collaborative partnerships with clients, families and other professionals. This seems a logical key to improving treatment adherence, reducing drop-out and enhancing outcomes. Other criteria relate to broader policy imperatives such

as the National Standards for Mental Health Services (Gianfrancesco 1998) and delivering value for money. Some major assumptions for CAMHS are outlined below:

- responsive services must be accessible to the community serviced
- an inclusive single point entry (intake) to the service gives more reliable access
- high risk groups with more severe or complex disorders should receive priority
- informed clients can collaborate and participate more effectively
- collaborative care enhances treatment adherence
- a case manager ensures accountability for appropriate service utilisation for each client
- multi-disciplinary and specialist assessments improve diagnostic validity
- individualised service plans allow treatment to be tailored to individual need
- clients with severe disorders or disabilities may need a comprehensive continuum of care
- the least restrictive setting must be used consistent with safety and human rights
- evidence-based and goal directed treatments focus care more effectively
- treatment must be regularly reviewed to ensure it remains appropriate
- transition planning is necessary if the level of care needs to change
- an appropriate individualised service mix requires inter-sectoral collaboration
- services must be efficient and effective to give best value for money.

However, neither the National Standards nor the Framework documents articulate all the links between these elements and the work processes required to deliver quality care. The development of a program theory is important for this purpose.

CAMHS clinicians carry out a wider range of functions than the direct provision of clinical care, and this threatens to complicate our theory. However, their work may be simplified into the areas of clinical care, community activity and academic activity (H&CS 1996). Academic activity aims to understand the factors that influence the origin and course of child and adolescent mental disorders, and to improve the effectiveness of treatment and service delivery arrangements. It can be argued that a research orientation is essential for all quality clinical services. Similarly, community activity also has major relevance to clinical activity that increasingly depends on effective partnerships with other services (CDH&AC 1998). Program Theory can be used to map community activity, as outlined in Figure 1. However, as this paper focuses on clinical care, these other activities will not be described in any further detail.

**Figure 1. Program Theory for Community Activity in CAMHS**

Program Operations	Proximal Outcomes	Final Outcomes
<ul style="list-style-type: none"> <li>• Education</li> <li>• Health Promotion</li> <li>• Prevention</li> <li>• Consultation</li> <li>• Primary</li> <li>• Secondary</li> <li>• Tertiary</li> </ul>	<ul style="list-style-type: none"> <li>Increased Mental Health Awareness</li> <li>Less Stigmatisation</li> <li>Enhanced Primary Mental Health Care</li> <li>Earlier Intervention</li> <li>Improved Access to Services</li> <li>Improved Service Utilisation</li> <li>More Co-ordinated Care</li> </ul>	<ul style="list-style-type: none"> <li>Improved Social Capital</li> <li>Lower Prevalence of Mental Illness</li> <li>Enhanced Resilience and Coping</li> <li>Reduced Impact of Mental Illness</li> </ul>
Inter-sectoral Case Liaison		
Joint Programs with Primary Care		
Community Development		

## Program Theory for Clinical Care in CAMHS

Clinical care in CAMHS has five basic stages: case identification and referral, intake, assessment, case management or treatment, and case closure. Most clients receive only outpatient care, but some need episodes of more intensive care by a specialist outreach team, day program or inpatient unit. The focus of care may be stabilisation, recovery, rehabilitation or adjustment (Nurcombe 1998). However, similar basic program operations occur whatever the focus, and whether patients are receiving regular care or more intensive treatment. Figure 2 summarises the program theory of CAMHS Clinical Care in Victoria, and these program operations are now discussed.

**Figure 2. Program Theory for Clinical Care in CAMHS**

	Program Operations	Proximal Outcomes
Intake	Intake: Is Accessible & Responsive Gathers Information Sensitively Provides Information	Increased Client Satisfaction with Intake More appropriate clients Good attendance at first appointment
Assessment	Assessment is: • Prompt • Explained to clients • Standardised • Comprehensive • Multidisciplinary • Involves client and family • Involves other services	Valid diagnosis and formulation Written Individualised Service Plans (ISPs) that are: • Linked to diagnosis & formulation • Bio-psycho-social • Goal-oriented • Agreed with clients Increased Client Satisfaction with Assessment Higher client commitment to ISP
Treatment	Treatment is: • Evidence-based • Collaborative • Well Documented • Reviewed Regularly • Planned Transitions Continuum of Care available Multidisciplinary skills available	Quality Care that is: • Less Restrictive • Greater Continuity • More individualised • Fewer dropouts • More focused • Better client adherence • Fewer complaints Increased Client Satisfaction with Treatment
Final Outcomes		Better Identification and Referral Better Mental Health Outcomes Lower Costs per case Fewer Clients in Continuing Care Higher overall Client Satisfaction

### 1. Case Identification and Referral

The mental ill-health of communities and the need for CAMHS may be identified through epidemiological studies, although demand also depends on the social capital of a community, the availability of education, health and welfare services, the effectiveness of identification, prevention and early intervention programs, and on community perceptions of CAMHS (CDH&AC 1998). In developed countries, a comprehensive range of services has tiers of increasingly specialist care (Health Advisory Service 1996), with more specialised

(expensive) services targeted at clients with more complex problems. Appropriate referral to CAMHS occurs when primary providers identify mental health problems but are unable to provide treatment themselves. External criteria for judging need for referral to a specialist service are severity, complexity or co-morbidity, impact of disorder, including risk, and inability to access alternate services (H&CS 1996).

The proximal outcomes of effective community education by CAMHS, will be that referrers will understand the service and referral pathways, and will better orient clients (Figure 1). Ideally, there will be low levels of stigma or fear associated with referral so that referred clients are willing to attend, and services will be available and accessible.

## 2. Intake

This provides a single point of access where referral information is collected in a preliminary assessment for triage. CAMHS must accept complex higher risk patients, and those from high-risk groups identified in policy documents (H&CS 1996). Intake also provides information to referrers, redirects inappropriate referrals to alternate services, and orients accepted clients to the process of assessment. The proximal outcomes of an effective Intake service will be to maximise the number of appropriate referrals and enhance attendance at the first appointment. Attendance is enhanced if telephone contact is made and the time between referral and first interview is brief (Mathai & Markantonakis 1990).

## 3. Assessment

Assessment must balance comprehensiveness and brevity, and a semi-structured interview format allows exploration of problems, strengths and relevant history while scanning less-relevant areas (Rutter, Taylor & Hersov 1994). Brief assessments may reduce costs, but their advantages and disadvantages are unknown, and the optimum length of a basic CAMHS assessment has not yet been empirically determined (Luk, Robinson, Birlson & Cooper 1999). Standardised assessment processes are likely to increase the reliability of diagnosis, which is a prerequisite for diagnostic validity. Well-trained clinicians, with multidisciplinary support, are expected to establish a valid diagnosis and formulation of the patient's psychiatric disorder or psycho-social predicament, identify the difficulties that restrain recovery and determine the resources and strengths available for recovery. An appropriate service plan can then be developed.

Outcomes include written assessment reports for referring agents, client and family, that are said to increase client understanding and better orient everyone to the work ahead (Wilkinson 1999). These articulate the pivotal areas that require change, and link these logically to an Individualised Service Plan (ISP) that specifies treatment methods and outlines goals and strategies, as the basis of a treatment contract (Nurcombe 1998). Negotiated contracts with consumers seem likely to increase client commitment to treatment, make ISPs more realistic and increase client satisfaction.

## 4. Case Management and Treatment

Evidence-based treatments are thought to increase effectiveness and efficiency, but their efficacy in clinical populations is often unknown (Nathan & Gorman 1998). Treatment adherence is facilitated if clients experience the treatment alliance as collaborative (Orlinsky & Howard 1986). The case manager must organise and co-ordinate care, reliably document progress and regularly review the ISP (Gianfrancesco 1998). Comprehensive treatment programs can deal with a wider range of disorders and client groups, and multi-disciplinary intensive treatment programs are required for the most complex problems or high-risk clients (HAS 1996). If the level of care needs to change, for example, using in-patient programs, transition planning is essential to redefine goals and orient all parties to the next phase of care. As situations in life continually change, the ISP needs to be open to modification over time (Nurcombe 1998).

The proximal outcomes of these treatment program operations aim for least restrictive care, continuity of involvement between staff and client across different levels of care, more individualised and more focused episodes of care, with high co-operation and treatment adherence by clients and carers, less unplanned drop-out and fewer patient complaints.

## 5. Case Closure

If the quality and integrity of these program operations are maintained, one may expect better final mental health outcomes for patients and their families at case closure. Outcomes may be measured by standardised instruments that assess the range and severity of symptoms, the impact and burden of the illness on the person in multiple areas of life, and perceptions of their quality of life. Another key measure is client satisfaction with each stage in a system of care. This may be explored during the stage itself, or after the episode of care is completed and clients are discharged, when patients are thought less likely to bias their responses to please or placate the clinician (Williams & Wilkinson 1995). Where systems of care are optimised, treatment costs will be minimised, recovery periods will be shorter and fewer clients will need ongoing care, although some clients with chronic vulnerabilities and disabilities will have continuing needs for care.

## Selecting the KPIs

We have outlined the system of care, the major program operations and the proximal outcomes for each stage. As the system of clinical care is complex and each KPI gives only a fragment of the total picture, multiple KPIs are necessary for an impression of overall clinical care, and each measure must be interpreted with reference to others. For example, less restrictive care will result in fewer inpatient admissions from the community, shorter lengths of stay, and briefer periods of care provided by Day Programs or outreach teams. However, too few admissions and too rapid discharge from intensive programs will reduce the effectiveness of these interventions, raise numbers of clients requiring continuing care, and increase unplanned treatment drop-out rates and unplanned re-admissions. Comprehensive consumer measurement systems for CAMHS will allow these relationships to be explored (Bickman et al. 1998).

Without an articulated program theory, KPIs are likely to be less relevant, over inclusive or poorly linked with the program operations they purport to measure. Until a more sophisticated model is developed, we recommend that the KPIs chosen for CAMHS should be consistent with the program theory outlined here. This means including each of the stages of Referral, Intake, Assessment, Treatment, the process of transition between levels of intensity of care, and Case Closure. As our measurement technologies are limited, several critical work processes cannot easily be monitored automatically. For example, standards of documentation, diagnostic practices, appropriateness of ISPs, utilisation of evidence-based treatments, and appropriate use of medication may currently be best assessed through Continuous Quality Improvement activity or Clinical Reviews.

As there are many more potential indicators than can be usefully collected, several criteria can help us select the most appropriate (Poertner & Rapp 1988). Good KPIs will be:

- understandable by service managers and funding bodies (e.g. involve high cost activities, meet key policy imperatives or cover areas with high potential for adverse outcomes)
- significant for individual clients (e.g. involve key decisions or potentially adverse outcomes from their perspectives)
- observable in those areas that are susceptible to variation and change
- valid in measuring the major program operations and proximal or intermediate outcomes thought most relevant to program efficiency and effectiveness in our program theory
- reliable, replicable and standardised so that they may be used by other providers to allow comparisons between services
- utilitarian using as few measures as possible, from existing information, i.e. there must be a high cost-benefit ratio for each KPI, given that resources are needed to collect each item.

Managers and clinicians may use these criteria to choose KPIs that may be changed after trialing them in practice and determining their value.

## Key Performance Areas for CAMHS Clinical Care

### 1. Case Identification and Referral

Figure 3 lists the KPIs recommended here. In the absence of local epidemiological data, the volume of Intake activity provides a minimum contextual indicator of need. This is influenced by community awareness and perceptions of the service, and by the availability of other regional services. For inter-service comparison, a standard data-set of referral sources would be useful.

### 2. Intake and Triage

The ratio of accepted clients to referred clients reflects capacity-demand relationship, which is related to community awareness of the service and the availability of other services. This may also be considered against measures of severity of disorders presented by clients. Stallard and Potter (1999) and Yates, Garralda and Higginson (1999) have independently proposed indices of complexity factors that could be used to check whether CAMHS are seeing clients with severe problems. Routine measures of the Severity, Impact and Burden of disorder, as measured by the Extended Strength and Difficulties Questionnaire (Goodman 1999), can be also used to measure the sensitivity and specificity of Intake processes. The Health of the Nation Outcome Scales (HoNOSCA) may be used as a clinician-rated measure of the extent and severity of disorder, as well as change (Gowers, Whitten & Harrington 1998).

The client profile may indicate the effectiveness of Intake in using policy guidelines to give priority to particular patient groups, such as homeless youth or welfare service clients (H&CS 1996). This requires monitoring the legal or socio-economic status of clients, their domiciliary status or whether they are concurrently receiving welfare services. First attendance rate will reflect the effectiveness of Intake in orienting clients to the first appointment and waiting time.

### 3. Assessment

Service responsiveness may be measured by the mean interval between the referral date and the date of the first appointment. Timeliness of response reflects the efficiency of organisational and case allocation systems, as well as the demand / resource balance, and seems a useful KPI. Client Satisfaction studies of assessment may show whether the process was experienced by clients as collaborative and relevant, which is critical for developing a treatment alliance (Orlinsky & Howard 1986). The construct of client's post-assessment commitment to treatment (PACT) seems a desirable intermediate outcome of assessment, reflecting an emotional and intellectual readiness to engage. Theoretically, this construct has more explanatory value than client satisfaction with assessment, and could help to identify those who are at risk of dropout (Gould, Kaplan & Shaffer 1985).

The duration of the assessment process is a proxy for assessment efficiency, provided the validity of the assessment can be ensured through clinical audit or review. There is debate in Australia about the optimal length of assessment (Luk et al. 1999). The proportion of non-completed assessments, or pre-treatment dropout rate, may also be a useful indicator of the effectiveness of engagement and orientation during the assessment process. This will be affected by other factors such as family poverty, parental disorganisation and service accessibility. If diagnoses and service plans are recorded on a CIS, the date of entry of a diagnosis and ISP may be a proxy for completion of assessment. The proportion of cases with completed assessments, and the proportion with recorded ISPs within a month of the initial appointment, indicates the efficiency and effectiveness of the assessment program.

### 4. Treatment

Because the different levels of care emphasise different processes, and have varying costs, it is useful to develop separate KPIs for community, day and inpatient care.



#### **4.1. Treatment - Community-based Care**

The mean level of activity helps to contextualise other KPIs and might be used to compare mean levels of service between equivalent teams. Client groups can also usefully be sub-divided by their characteristics, such as the length or amount of care and the type of care provided (Meadows, Gielewski, Falconer, Kelly, Joubert & Clarke 1997). For example, clients who receive short-term care (under 12 sessions), medium-term care (13-25 sessions), or long-term care (over 25 sessions), can be compared to determine whether care is being appropriately matched to clinical need. The average amount of treatment, or proportion of clients requiring continuing care, will have a relationship to the severity and complexity of problems, family resources, personal strengths and other services available, and the effectiveness of treatment. Contact hour cost may be a useful metric for service comparison, if other outcomes are comparable.

Reliability of review procedures may be measured through recording the entry date of a checklist or review report on the Information System, and estimating the rate of completed reviews against total reviews due. Case closure is another critical event and routine recording of the mode of case closure is recommended. Cases are closed by agreement when goals are reached, when a client has achieved enough gain, or when they move away or are referred on. Cases are closed by default or non-mutual agreement when clients fail to attend, refuse contact or die. The proportion of cases closed by default, or overall drop-out rate, provides a simple indicator of unsatisfactory engagement or progress. Our program theory predicts that the use of effective treatments and collaborative practices are expected to improve outcomes, shorten the average course of a period of care and minimise client dropout.

#### **4.2. Treatment - Day-patient Services**

Services that routinely measure the severity or extent of psychiatric disorder on entry, discharge and transition between programs, may check the appropriateness of referral to more intensive (and expensive) programs, to test the integrity of their referral and selection processes. The Strengths & Difficulties Questionnaire (Goodman 1999) or the total HoNOSCA score (Gowers et al. 1998) can measure this. These tools can also monitor degree of symptom change in all programs. As the major aim of a day program is rehabilitation, degree of change in social functioning may be a more appropriate indicator of its impact. Recommended KPIs reflect the client numbers treated, drop out rate and the level of service provided. The adjusted cost per client is an efficiency measure that can be used to compare programs, providing client groups are comparable.

#### **4.3. Treatment - Inpatient Services**

In adult mental services, suicide rates may be monitored as useful sentinel event quality indicators (ACHS 1998). The rarity of suicide limits its use as a routine KPI in CAMHS. Since inpatient units are an expensive resource, their main KPIs will logically focus on their utilisation and length of stay, but could include symptom change and use of particular treatments, such as medications.

Admission rate provides a measure of Inpatient Service utilisation in a comprehensive CAMHS. Involuntary Admission Rate can be used to compare the restrictiveness of treatment. Length of stay can be compared between periods of time or client groups. As with outpatients, useful data can be derived from examining particular patient groups, by diagnosis or other characteristics, or by classifying them into short stay (1-2 days), medium stay (11-30 days) and longer stay (over 31 days). Bed Occupancy is a complex indicator of inpatient resource utilisation, and reflects need for service, the relationship between Unit and Community Services, and availability or effectiveness of less restrictive treatments or support services.

### **5. Final Outcomes**

The five areas outlined in Figure 2 cannot be measured simply, but may each be monitored routinely.

#### **Mental Health Outcomes**

Services that use measures of symptomatology, functioning, burden and impact can more readily monitor mental health outcomes for individual clients and groups of clients, by comparing before and after scores and estimating the “effect-size” of the program (Smith & Glass 1977). Bickman et al (1998) have recently described the advantages and disadvantages of a range of instruments. Our service has chosen to use HoNOSCA and the SDQ because of their feasibility, robust psychometrics, client acceptability and their capacity to assist diagnosis and review.



### **Client Satisfaction**

External annual audits are useful, or clients may be sent follow-up questionnaires after completing a treatment program, discharge or case closure (Plapp & Rey 1994).

### **Clients in Continuing Care**

Monitoring the length of the episode of care for each client or client groups, will assist in determining the client groups who require ongoing or continuing care, and for which current treatments may be less effective. The proportion of clients in continuing care, from one year to another, should be known so that their care can be assessed for its appropriateness.

### **Costs per Case**

There are many more children that might benefit from specialist mental health services than can be offered treatment (Zubrick, Silburn, Burton & Blair 2000), so it is ethically necessary to deploy these resources equitably and effectively. Measuring the mean costs per case and feeding the results back to clinicians is likely to increase clinician awareness of the cost of their time, and encourage more thoughtful deployment of time. For community services, Contact Hour Cost may be estimated from the total Contact Hours and the total Community Service Funding. This activity indicator can be used to compare the overall efficiency of a community service to convert resources (inputs) into a standard service delivery unit (an output), provided quality standards are maintained. Similar calculations may be made for day programs and inpatient services.

### **Identification and Referral**

The proportion of cases referred or seen may be measured in a community, with their mean level of problems. The mental health literacy of the referral community is more difficult to measure. Community activity, such as consultation, education and collaboration, is particularly important for CAMHS, because the mental health of children is affected by many environmental factors, and the capacity to influence risk, protection, resilience and vulnerability of children is shared by many services (CDH&AC 1999). This area needs further KPI development.

## **Conclusion**

The list of KPIs presented in Figure 3 aims to balance comprehensiveness with feasibility, given the costs of collecting and examining these measures (Marks 1998). Indicators of Referral Systems and Intake function comprise five items; Community Assessment involves three items and Treatment involves three items; and Day Patient and Inpatient items are three and four items respectively. This number of items seems reasonable to us. They are related to our program theory and to a basic understanding of work-flow in CAMHS. We have articulated our theory, identified program operations and outcomes for each stage and then chosen feasible measures to implement routine monitoring of KPIs. Every element is not measured here, as some seem less critical, while others seem better monitored through other processes, such as clinical audit or review, at this stage of development of our information systems. Some services may be able to measure more items than we can, as their theories, tools and information systems may be more advanced, or they may be prepared to invest more in gaining feedback about their work. A more complete list of items is possible within our program theory, or from considering other aspects of clinical care.

All services need to determine what KPIs to use, based on their motivations, relative priorities and sophistication of their informatics, if they are to monitor and improve their systems of clinical care through making the effects of their work processes more transparent. These decisions are grounded in organisational leadership, values and culture, as well as in the pragmatics of resource allocation decisions. Our experience has suggested that the Learning Organisation model has proved to be a useful basis for service development and quality improvement, as well as supporting a learning culture (Birleson 1998). Program theory has assisted us to make our underlying assumptions more explicit and testable, thus allowing management decisions to be more pragmatic and grounded in empirically derived theory rather than ideology. Our program theory may in the long run prove to be a flawed model of CAMHS, but it has helped the service to examine its operations. This encourages reflection to determine why anticipated results and actual results may be different, supports problem-solving and promotes learning from the results of our work.

## References

- Australian Council of Healthcare Standards 1991, *Clinical Indicators. A User's manual: Hospital-wide medical indicators*, ACHS, Zetland.
- Australian Council of Healthcare Standards 1998, *Clinical Indicators. A Users Manual: Psychiatry Indicators. Version 2*, ACHS, Sydney.
- Arnold C 1990, 'Performance Indicators - Can you afford not to have them? Royal Children's Hospital - A Structured Approach', *Australian Health Review*, vol 13, pp 319-231.
- Batalden P 1991, 'Organisation-wide quality improvement in health care', *Topics in Health Care Record Management*, vol 11, no 3, pp 1-12.
- Bickman L 1996, 'The Application of Program Theory to the Evaluation of a managed Mental Health Care System', *Evaluation & Program Planning*, vol 19, no 2, pp 111-119.
- Bickman L, Nurcombe B, Townsend C, Belle M, Schut J, & Karver M 1998, *Consumer Measurement Systems in Systems in Child and Adolescent Mental Health*, Commonwealth Department of Health & Family Services, Canberra.
- Birleson P 1998, 'Building a Learning Organization in a Child and Adolescent Mental Health Service', *Australian Health Review*, vol 21, no 3, pp 223-240.
- Commonwealth Department of Health & Aged Care 1999, *Mental Health Promotion and Prevention National Action Plan*, Commonwealth Department of Health & Aged Care, Mental Health Branch, Canberra.
- Department of Health & Community Services 1996, *Victoria's Mental Health Services: The Framework for Service Delivery - Child & Adolescent Services*, DH&CS, Melbourne
- Garvin DA 1993, 'Building a Learning Organization', *Harvard Business Review*, July-August, vol 71, pp 78-91.
- Gianfrancesco P 1998, *Tools for Reviewing Australian Mental Health Services, Vol 1: Self- Assessment Task*, Australian Health Minister's Advisory Council National Mental Health Working Group, Commonwealth of Australia, Canberra.
- Goodman R 1999, 'The Extended Version of the Strengths and Difficulties Questionnaire as a Guide to Child Psychiatric Caseness and Consequent Burden', *Journal Child Psychiatry and Psychology*, vol 40, no 5, pp 791-799.
- Gould MS, Kaplan D & Shaffer D 1985, 'The characteristics of dropout from a child psychiatry clinic', *Journal of the American Academy of Child Psychiatry*, vol 24, pp 316-328.
- Gowers SG, Whitton A & Harrington RC 1998, *HoNOSCA: Health of the Nation Outcome Scales - Child and Adolescent version. Report of Research and Development September 1995 - March 1997*, University of Manchester.
- Health Advisory Service 1996, *Mental Health Services for Children and Adolescents*, Health Advisory Service, London.
- Hodge G 1993, *Minding Everybody's Business: Performance Management in Public Sector Agencies*, Public Sector Management Institute, Monash University, Melbourne.
- Luk ESL, Robinson P, Birleson P & Cooper H 1999, 'Assessment in Child and Adolescent Psychiatry: Interstate Difference', *Australasian Psychiatry*, vol 7, no 3, pp 141-142.
- Marks I 1998, 'Overcoming obstacles to routine outcome measurement. The nuts and bolts of implementing clinical audit', *British Journal of Psychiatry* vol 173, no 8, pp 181-286.
- Mathai J & Markantonakis A 1990, 'Improving initial attendance at a child and family psychiatry clinic', *Psychiatric Bulletin of the Royal College of Psychiatrists*, vol 14, no 3, pp 151-152.
- Meadows G, Gielewski H, Falconer B, Kelly H, Joubert L & Clarke M 1997, 'The pattern-of-care model: A tool for planning community mental health services', *Psychiatric Services*, vol 48, no 2, pp 218-223.

- Nathan PE & Gorman JM (eds) 1998, *A Guide to Treatments that Work*, Oxford University Press, New York.
- Nurcombe B 1998, 'Clinical Formulation, Clinical Decision Making, Intervention Strategy Planning', In Noshpitz J D (ed) *A Handbook of Child and Adolescent Psychiatry*, John Wiley & Sons, New York, pp 749-773.
- Orlinsky DE & Howard KI 1986, 'Process and Outcome in Psychotherapy', In Garfield SL and Bergin AE (eds), *Handbook of Psychotherapy and Behaviour Change*, John Wiley & Sons, New York, pp 311-381.
- Parker G, Wright M, Robertson S & Gladstone G 1996, 'The development of a patient satisfaction measure for psychiatric outpatients', *Australia and New Zealand Journal of Psychiatry*, vol 30, pp 343-9.
- Plapp J & Rey J 1994, 'Child and Adolescent Psychiatric Services: Case Audit and Client Satisfaction', *Journal of Quality Practice*, vol 14, pp 51-56.
- Poertner J & Rapp CA 1988, 'Designing Social Work Management Information Systems: The Case for Performance Guidance Systems', In Patti RJ, Poertner J, Rapp CA (eds), *Managing for Service Effectiveness*. Haworth Press, New York, pp 177-190.
- Rutter M, Taylor E & Hersov L (eds) 1994, *Child and Adolescent Psychiatry: Modern Approaches*, Blackwell, London.
- Smith ML & Glass GV 1977, 'Meta-analysis of Psychotherapy Outcome Studies', *American Psychologist*, vol 32, pp 752-760.
- Stallard P & Potter R 1999, 'Making sense of child and adolescent mental health services', *Psychiatric Bulletin*, vol 23, pp 217-221.
- Wilkinson I 1998, *Child and Family Assessment: Clinical Guidelines for Practitioners*, Routledge, London.
- Williams B & Wilkinson E 1995, 'Patient Satisfaction in Mental Health Care', *British Journal of Psychiatry*, vol 116, pp 550-562.
- Yates P, Garralda ME & Higginson I 1999, 'Paddington Complexity Scale and Health of the Nation Outcome Scales for Children and Adolescents', *British Journal of Psychiatry*, vol 174, pp 417-423.
- Zubrick SR, Silburn SR, Burton P & Blair E 2000, 'Mental health disorders in children and young people: scope cause and prevention', *Australian and New Zealand Journal of Psychiatry*, vol 34, pp 570-578.

**Figure 3. Recommended KPIs for CAMHS.**

1. Referral	Referral Rate - (No. New Referrals per 10,000 population per Year)
	Profile of Referral Sources per time period (usually per annum)
2. Intake and Triage	Acceptance Rate - (No. Registration / Total No. Referrals)
	Disadvantaged Client Rate (e.g. No. Disadvantaged / Total clients)
	First Attendance rate - (No. Clients attending first appoint. / No. Clients accepted)
3. Assessment	Assessment Timeliness - (Mean time in weeks between Referral and Initial Appointment date)
	Assessment Completion Rate - (No. Accepted clients with recorded diagnosis and ISP/Total No. Clients accepted)
4.1 Treatment - Community	Mean Service Provision - (Total No. Contact Hours / No. New Registered clients entering program during period + Continuing Clients from previous period)
	Community Client Drop-out Rate - (Default Case Closures / Total Case Closures)
	Review Completion Rate - (Review completed within 4 weeks of the due date / Clients in continuing care)
4.2 Treatment - Day-patients	Mean Day Patient Service - (Day Program Attendances x Day Program Hours / Number of Day Patients)
	Day Program Drop-out Rate - (Default Non-Attendees / Total Clients accepted)
	Day Program Admission Numbers and Rate - (No. Day patients x 100 / Total Registered Clients)
4.3 Treatment - Inpatients	Inpatient Admission Rate - (No. Admitted clients x 100 / Total Registered Clients)
	Involuntary Admission Rate - (No. Involuntary admissions / Total No. Admissions)
	Mean Length of Stay - (Mean length of stay in days)
	Bed Occupancy - (Mean No. Occupied beds / No. Available beds)