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THE TA NETWORK

Financing Tools for Systems of Care: A Series of Practical Guides

REPORT

Analyzing Return on Investment

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ABOUT THE NATIONAL TECHNICAL ASSISTANCE NETWORK FOR CHILDREN'S BEHAVIORAL HEALTH

The National Technical Assistance Network for Children's Behavioral Health (TA Network) operates the National Training and Technical Assistance Center for Child, Youth, and Family Mental Health (NTTAC), funded by the Substance Abuse and Mental Health Services Administration, Child, Adolescent and Family Branch. The TA Network partners with states, tribes, territories, and communities to develop the most effective and sustainable systems of care possible with and for the benefit of children and youth with behavioral health needs and their families. The TA Network provides technical assistance and support across the country to state and local agencies, including youth and family leadership organizations.

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Introduction

The landscape for the organization and financing of behavioral health (mental health and substance use disorder) services for children, youth and young adults is rapidly shifting due to a number of factors: state and local budgetary pressures, large-scale Medicaid redesign initiatives in states, and changes related to national health reform and mental health parity laws. Increased attention to the importance of behavioral health care within the larger health care arena and among other child-serving systems, such as child welfare and juvenile justice, is also having a substantial impact. Since the mid-1980s, the Substance Abuse and Mental Health Services Administration (SAMHSA) has invested resources in the development of systems of care, with the intent of improving the quality and outcomes of children's behavioral health services. With national evaluation data and other studies showing the quality and cost effectiveness of systems of care, SAMHSA has made a commitment to take systems of care to scale (SAMSHA, 2015). This guide is part of a series that provides tools to policymakers on various aspects of financing behavioral health services and supports for children, youth, and young adults and analyzing the return on investment of system of care approaches.

This guide describes methods for analyzing the return on investment (ROI) of system of care implementation. ROI data can be instrumental in helping policy makers recognize that systems of care make good economic sense and are sound investments. Specifically, the guide:

1. Defines the concept of ROI and discusses its application to the system of care approach
2. Describes methods for states, tribes, territories, and communities to systematically analyze ROI in the system of care approach
3. Outlines steps for getting started in ROI analyses

System of Care Definition

*"A spectrum of **effective community-based services and supports** for children, youth, and young adults with or at risk for mental health and related challenges and their families that is organized into a **coordinated network**, builds meaningful **partnerships with families and youth**, and addresses their **cultural and linguistic needs** in order to help them **function better** at home, in school, in the community, and throughout life" (Stroul, Blau, & Friedman, 2010).*

System of Care Philosophy

Values:

- *Community Based*
- *Family Driven, Youth Guided*
- *Culturally and Linguistically Competent*

Principles:

- *Broad Array of Effective Services and Supports*
- *Individualized, Wraparound Practice Approach*
- *Least Restrictive Setting*
- *Family and Youth Partnerships*
- *Service Coordination*
- *Cross-Agency Collaboration*
- *Services for Young Children*
- *Services for Youth and Young Adults in Transition to Adulthood*
- *Linkage with Promotion, Prevention, and Early Identification*
- *Accountability*

The methods are based on a review of ROI information related to systems of care from multi-site evaluations, research, and analyses conducted by individual states and communities. This review documented the growing body of evidence indicating that the system of care approach is cost effective and provides an excellent ROI (Stroul, Pires, Boyce, Krivelyova, & Walrath, 2014). Cost savings or cost avoidance are derived from reduced use of inpatient psychiatric hospitalization, emergency rooms, residential treatment, and other group care, even when expenditures increase for home- and community-based care and care coordination. Cost savings or cost avoidance are also derived from decreased involvement in the juvenile justice system, fewer school failures, and improved family stability, among other positive outcomes. This guide is intended as a starting point to assist stakeholders in conducting their own ROI analyses.

When and How to Analyze ROI in Systems of Care

What is ROI?

ROI compares the cost of an investment with its benefits, measured in monetary terms. This metric can be easily communicated to different stakeholders – policymakers, funders, administrators, providers, service recipients, and the general public – to explain the value of an investment. High ROI in an intervention *indicates greater gains relative to its cost.*

ROI is a type of economic evaluation that also includes:

- ***Cost Minimization Analysis*** – Compares the cost of alternative interventions or programs when the *outcomes are assumed to be equal*
- ***Cost-Effectiveness Analysis*** – Compares the cost of alternative programs or interventions to their outcomes, measured in *non-monetary* units (e.g., measure of functioning)
- ***Cost-Utility Analysis*** – Compares the costs of alternative programs or interventions to their outcomes, measured by a *generic utility* (e.g., quality of life)
- ***Cost-Benefit Analysis*** – Compares the costs of alternative programs or interventions to their outcomes, measured in *monetary* units (e.g., dollar value of reduced arrests)

(ICF Macro, 2009)

There are common elements across the various types of economic evaluation. All require the calculation of the costs of resources used to deliver the program or intervention (or economic costs) and all compare the cost[1] of the investment to the benefits derived from the investment (or economic benefits). The methods differ primarily in how outcomes are measured. Some express effects in terms of intangible outcomes and others express outcomes, including intangible outcomes, in terms of monetary values.

In many instances, full economic evaluations cannot be conducted due to lack of capacity or resources, and instead, "partial economic evaluations" are conducted. These evaluations examine either benefits *or* costs, but not both. Types of partial economic evaluations include: 1) efficacy or effectiveness studies that analyze only the outcomes of a program or intervention and 2) cost analyses that examine only the cost of a program or intervention. Cost analyses typically are reported as total annual cost, cost per person, cost per service provided, or cost per episode of services.

ROI analysis is a subset of cost-benefit analysis and can incorporate an assessment of the value of health and human services, as long as these values can be financially quantified. In this guide, ROI is defined as:

> *"A type of analysis used to examine profits or cost savings relative to investments or costs incurred. ROI may look at only the costs and benefits from the perspective of specific investors or payers, or may consider costs and benefits to recipients of an intervention and to society more generally. Methods to "monetize" outcomes (assign a monetary value to a particular result) for the purpose of conducting an analysis may be included to assess the more intangible costs and benefits of a program or intervention."*

ROI analyses offer flexibility in how they are designed and used for decision making, and findings may be expressed in different ways. This type of analysis can be adapted to examine a variety of health and human service interventions (See, for example, http://www.investopedia.com/terms/r/returnoninvestment.asp).

[1] Note: There is a difference between what a service costs and what was actually spent on it. referred to as a "service expenditure." For example, the cost to a provider of delivering a service may be higher than the expenditure made by the system purchasing the service. ROI analyses may use either cost and expenditure data or both. The term, "costs," is used in this guide to refer to both.

An example is the method used by the Finance Project that is referred to as "social return on investment" (SROI). This approach is used to measure the value of interventions that provide health, social, and education services and to communicate this value to stakeholders and public and private investors. SROI is defined as a principles-based method for measuring value relative to resources invested. The approach involves assessments of social and environmental benefits from the perspectives of multiple stakeholders including funders, beneficiaries (i.e., service recipients), service-providing organizations, taxpayers, and communities. The methodology uses indicators to assess what has changed over time, and financial "proxies" are calculated on these outcomes to determine their value, including outcomes that are not typically conceptualized in terms of money. Value is defined as: 1) the value of positive gains from specific outcomes that are attributed to an intervention and 2) the value of costs savings from negative outcomes that are avoided by implementing the intervention. This information can then be incorporated into determinations of ROI and used to better inform decision-making on resource allocation (The Finance Project, 2013). The Washington State Institute for Public Policy also describes a method to determine if the benefits of an intervention outweigh the costs, which involves monetizing outcomes such as crime, child abuse and neglect, substance use, mental illness, health care, special education, and high school graduation (WSIPP, 2012; 2013).

Benefits of ROI Analyses on Systems of Care

- Informs resource allocation for children's behavioral health services
- Supports use of the system of care approach for Medicaid and insurance benefits, managed care strategies, health homes, and other service delivery methods across child-serving systems
- Provides information to make the case for system of care expansion
- Encourages systematic data collection on utilization and cost

Why Analyze ROI in Systems of Care?

In the business world, ROI analyses are conducted to answer questions such as:

1. What do we receive for what we spend?
2. Do expected returns outweigh the costs?
3. Do the returns justify the costs?

(See https://www.business-case-analysis.com/return-on-investment.html)

ROI analyses address similar questions for health and human service interventions. Specifically, ROI analyses can play an important role in:

- Determining how to best allocate scarce resources
- Defining the value of outcomes related to an intervention in both monetary and non-monetary terms
- Communicating with a broad range of stakeholders and constituencies about the value of a program or intervention
- Providing a basis for increased investment in a particular approach to take it to scale

For systems of care, there are substantial data documenting positive outcomes for children, youth, and families, but data on the cost implications of the system of care approach have been more limited. Such data are useful to policymakers and system leaders as they strive to make resource allocation decisions in response to environmental pressures created by state deficits, implementation of the Affordable Care Act (ACA), redesign of state Medicaid programs, implementation of managed care, and reforms across child-serving systems. These changes in the larger environment all present opportunities to apply the system of care approach. ROI information is needed to support the adoption of this approach as new service delivery strategies are designed and implemented.

Cost information is particularly important when states and communities assess the benefits of systems of care and make decisions about taking systems of care to scale. With SAMHSA's current focus on expanding systems of care, documenting and sharing information on ROI can have a powerful impact on establishing the value of systems of care and "making the case" for expansion in states, tribes, territories, and communities (Gruttadaro, Markey, & Duckworth, 2009).

In addition to informing policy and resource decisions, ROI analyses encourage the systematic collection of data on service utilization and cost as part of evaluation and continuous quality improvement (CQI) efforts in systems of care.

What are the Challenges in Analyzing ROI in Systems of Care?

ROI analyses can be conducted with different methods at varying levels of complexity. There are challenges involved in each, most of which apply across methodologies:

- *Obtaining the resources and expertise needed for ROI analyses* – Allocating the needed time, money, and skilled staff to conduct ROI analyses, particularly with the more complex methods
- *Obtaining data from multiple sources* – Gathering data to capture cost savings across systems (e.g., costs saved by juvenile justice when placements in correctional facilities are decreased due to increased use of community-based treatment), Medicaid claims data, data from Statewide Automated Child Welfare Information Systems (SACWIS), internal MIS system data, etc.
- *Determining the cost implications of changes in service utilization* – Translating changes in service utilization patterns into the impact on expenditures (e.g., decreased utilization of inpatient and residential treatment)
- *Monetizing benefits from systems of care* – Quantifying specific, important outcomes in systems of care that typically are not assigned monetary values
- *Assessing short-term and long-term costs* – Exploring both immediate and longer term cost implications associated with the system of care approach

Examples of Monetizable Outcomes

Mental Health	Costs to health care system Labor market earnings and taxes paid
Substance Use	Costs to health care system Labor market earnings and taxes paid
Crime	Costs to juvenile justice system Costs to adult criminal justice system Costs to victims
High School Graduation	Labor market earnings and taxes paid
Special Ed. Placements	Costs to K-12 education system
Child Welfare	Costs of out-of-home care

Despite these challenges, there have been cost analyses of the system of care approach in multi-site studies and in assessments conducted by states and communities. These analyses address these challenges in different ways and offer guidance to others undertaking similar analyses.

Methods for ROI Analyses in Systems of Care

Analyzing ROI in systems of care is particularly complex due to the inherent characteristics of systems of care – they provide a comprehensive array of services and supports, they have multiple funding sources, and they have multiple goals at the system level and the child and family level. Because of the multi-faceted nature of the system of care approach, system of care ROI analyses have used a variety of methods. They may focus on the system level, measuring outcomes related to changes in service utilization patterns such as reductions in the use of residential treatment and related cost implications.

Other analyses may focus on the child and family level by measuring outcomes related to improved functioning, such as improved school performance or reduced arrests and related cost implications.

Many of the methods used to analyze systems of care can be categorized as partial economic evaluations. According to the World Health Organization (2000), full economic evaluations are rarely completed because they are resource intensive and require a high level of research expertise. Prior to conducting an analysis, a determination should be made as to whether a full economic evaluation is warranted or if partial evaluations can answer the analytic questions. These alternative types of cost studies can yield valuable information and may be more practical for assessing ROI with limited resources. Potential methods include cost analyses that examine only costs for one or more alternative interventions, as well as cost-offset studies that examine the impact of interventions on future costs. Although some evaluators may argue for the most complex or "rigorous" methods, no method is ideal or fits every situation, and there is no one "right" calculation or methodology. Methods should ultimately be chosen based on the purposes of the analysis, the availability of data, and the resources available for the analysis.

What Methods Can be Used to Analyze ROI in the System of Care Approach?

A 2014 document identified and synthesized available information on ROI in the system of care approach (Stroul, Pires, Boyce, Krivelyova, & Walrath, 2014). It describes methods and strategies for conducting analyses that can be useful to others undertaking similar efforts. Most of these analyses focused on cost savings, and were found in multi-site studies including the national evaluations of the SAMHSA Comprehensive Community Mental Health Services for Children and Their Families Program (referred to as the Children's Mental Health Initiative – CMHI) and the Medicaid Psychiatric Residential Treatment Facility (PRTF) Waiver Demonstration, as well as in the published literature. In addition, examples were identified in states and communities that have implemented systems of care and have been conducting their own analyses.

The systems of care included in the review share common characteristics:

- Service population of children and youth with serious and complex disorders with priority on those at high risk of out-of-home placement
- Array of home- and community-based treatment services and supports
- Individualized, Wraparound approach to service planning and care coordination
- Intensive care management at low ratios
- Goal of diversion and/or return of children from inpatient and residential settings

The methods used are summarized in Appendix A, along with the outcomes and costs that were measured and the data collected for analytic purposes. These analyses provide examples of the different methodologies that can be used to assess cost savings or cost avoidance.

Methods to analyze ROI in the system of care approach include the following, organized in order of increasing complexity, including the advantages and caveats associated with each:

- ***Analyses of Trends in Aggregate Expenditures*** – Analyze changes in total expenditures for various types of services following implementation of the system of care approach. New Jersey, for example, analyzed changes in overall state expenditures for residential treatment and inpatient services that occurred as the system of care approach was implemented statewide.

  Advantages: This approach may be the most straightforward and may require little or no additional data beyond what is routinely collected. It provides a very broad estimate of changes in expenditures.

Caveats: This calculation attributes any change in expenditures to implementing the system of care approach. However, there may be other factors that could impact expenditures during the same timeframe as system of care implementation, such as changes in the population size or characteristics of the population served. In addition, this approach may require data from the multiple systems that finance the system of care to obtain a complete picture (e.g., Medicaid, behavioral health, child welfare), and access to data from multiple systems may be a challenge.

- ***Analyses of Types Service Used and Associated Costs*** – Analyze changes in service utilization patterns and associated costs for children and youth following implementation of the system of care approach. For example, Wraparound Milwaukee analyzed changes in utilization of services such as inpatient, residential, and juvenile correction placements and computed resultant changes in costs.

  Advantages: This approach focuses more specifically on children receiving different types of services. It standardizes for changes in the population size by calculating the cost per youth or cost per youth for a particular timeframe (e.g., per day, per month, or per episode).

  Caveats: The approach does not control for the characteristics of the children receiving each of the services. Consequently, there is a risk of making comparisons in utilization and cost between youth at different levels of severity of mental health conditions. This concern can be mitigated by use of standardized tools to identify children appropriate for the system of care approach, e.g., Child and Adolescent Needs and Strengths (CANS) or Child and Adolescent Service Intensive Index (CASII).

- ***Pre-Post Comparisons*** – Compare data at two points in time, typically a period to time prior to entry into services using a system of care approach, with a period of time subsequent to involvement. An example is the national evaluation of the CMHI that compared costs during the 6 months prior to intake in a system of care with costs during the 6-month period prior to the 12-month follow-up interview.

  Advantages: This approach treats the children in systems of care as their own control group, thus avoiding issues about comparability of youth receiving specific services.

  Caveats: While this approach provides a comparison, it does not control for potential systematic changes that may occur post-entry into a system of care, such as changes in treatment approaches. These types of changes may also impact costs.

- ***Comparison Group Studies*** – Compare costs for children receiving services using a system of care approach with comparison groups receiving conventional services or "usual care." For example, a study of the Mental Health Services Program for Youth (MSHPY) in Massachusetts compared Medicaid costs for a system of care group with a matched comparison group. Randomized controlled trials are rare; this method was found in only one ROI study. However, comparison groups can be used effectively outside of randomized controlled trials to assess ROI.

  Advantages: This approach isolates the effect of system of care involvement by comparing children receiving services within systems of care to a similar group of children who are not receiving services with this approach. The only difference between the two groups should be exposure to a system of care, such that any differences in costs may be attributable to system of care involvement.

  Caveats: This approach may be more complex and difficult to implement as it requires a comparison group of children with similar characteristics as those children receiving services, and data collection on the comparison group in addition to children receiving services in systems of care. These studies may require more resources, expertise, and time.

How Have Costs Been Analyzed?

Irrespective of the analytic method used, similar costs are measured across these analyses to assess the cost implications of the system of care approach. Analyses typically consider average cost per day for types of services and/or average costs per youth per day, per month, per year, or per episode. Examples of how costs have been analyzed are detailed in Appendix A and include:

Trends in Expenditures

- Changes in total Medicaid spending on psychiatric inpatient services, residential treatment services and home- and community-based services
- Changes in total spending by state child-serving agencies on specific services, including psychiatric inpatient services, residential treatment services, home- and community-based services, juvenile corrections placements, and child welfare placements

Comparisons of Service Utilization and Costs for Youth

- Comparison of costs (Medicaid and/or state costs) for youth in systems of care with average costs in other service settings, including comparing the costs of system of care services with the average cost of psychiatric inpatient, residential treatment, juvenile justice placements, child welfare placements, and other out-of-home placements (e.g., cost per day in a system of care versus average cost per day in a residential treatment center)
- Comparison of costs (Medicaid and/or state costs) for youth in systems of care with youth receiving usual care, including comparing the costs of inpatient, residential treatment, juvenile justice placements, child welfare placements, other out-of-home placements, emergency room (ER) use, physical health care services, and total service utilization (e.g., with comparison groups)
- Comparison of placement costs incurred by child welfare and juvenile justice for youth served with the system of care approach with costs for youth not involved with the system of care approach

Changes in Costs for Youth Following System of Care Involvement

- Changes in costs (Medicaid and/or state costs) per youth following involvement in a system of care, including changes in costs for inpatient, residential treatment, home- and community-based services, ER, and physical health care services
- Changes in total cost (Medicaid and/or state costs) per youth served within the system of care approach
- Changes in costs post-system of care involvement related to arrests, juvenile justice recidivism, school dropout, grade repetition, caregiver employment and missed work
- Changes in cost per family served

What Data are Needed?

Data needs for an ROI analysis vary based on its purpose and methods selected. For the examples of analyses previously conducted, the data used included utilization data, facility costs, average costs per youth for specific types of services, average total costs per youth, aggregate expenditures for specific types of services, and estimated monetary values for particular outcomes achieved through the system of care approach. The types of data used are shown below.

Utilization Data	Facility Costs	Costs Per Youth	Aggregate Expenditures	Monetized Outcomes
Utilization and length of stay for: • Psychiatric inpatient hospital • Residential treatment center • Home- and community-based services (e.g., care management, outpatient, crisis, in-home, etc.) • Juvenile correction facility • ER visit • Foster care • Medical services	**Average cost per day for:** • Psychiatric inpatient hospital • Residential treatment center • Juvenile correction facility • ER visit • Foster care	**Average cost per youth per day, per month, per year, or per episode for**: • Psychiatric inpatient hospital • Residential treatment center • Juvenile correction facility • Home- and community-based services (e.g., care management, outpatient, crisis, in-home, etc.) **Average total costs per youth per day, per month, per year, or per episode for**: • Behavioral health services • Medical services • Behavioral health and medical services combined • Psychotropic medications	**Total aggregate expenditures (Medicaid and/or state) for:** • Psychiatric inpatient hospitals • Residential treatment centers • Juvenile correction facilities • Home- and community-based services (e.g., care management, outpatient, crisis, in-home, etc.) • Psychotropic medications	**Estimated costs for:** • Arrest • Grade repetition • School dropout • Caregiver inability to work • Caregiver unemployment

Steps for ROI Analysis

Regardless of the methodology selected, a common protocol can be applied to designing and implementing an ROI analysis. The four-step process involves:

Step 1: Determining the Purpose and Uses of the Analysis

Step 2: Creating a Plan for the Analysis

Step 3: Implementing the Analysis

Step 4: Creating Products and Using the Analysis

Each step is described below. Worksheets (adapted from the SROI method) are included as Appendix B and provide a guide for initiating this process (The Finance Project, 2013).

Step 1: Determine the Purpose and Uses of the ROI Analysis

The first step in an ROI assessment is to "frame" the analysis in terms of its purposes, intended audiences, uses of results, planned products, timeframe, and resources. Key stakeholders should be engaged in this process, often through an advisory or work group. The group may include policy makers in child-serving agencies, family and youth leaders, and payers such as Medicaid or managed care organizations, as well as the evaluators or in-house staff who will conduct the analysis.

Purpose and Questions to be Addressed

- ☐ Why is the ROI analysis being undertaken?
- ☐ What specific questions need to be answered through the analysis? What do policymakers and other stakeholders or constituencies need to know?
- ☐ What perspectives will be considered when selecting system of care outcomes and costs to be measured (e.g., policy makers; child-serving systems; providers; payers, children, youth and families; taxpayers; society)?
- ☐ Who should be involved as advisors to frame and plan the analysis?

Target Audience and Uses of Data

- ☐ Who will primarily use the results and how will they use them?
- ☐ What other audiences will be interested in the results of the analysis and for what purposes?
- ☐ How can the results be used strategically to support system of care implementation and expansion?

Types of Products

- ☐ What products will best communicate the results of the ROI analysis?
- ☐ What different types of products are needed for strategic communications with different target audiences to convey information on ROI in the system of care approach?
- ☐ How will products for strategic communications be developed?

Timeframes and Resources

- ☐ What is the timeframe for completion of the analysis?
- ☐ What is the level of expertise needed for the analysis and what staff and/or consultants can be used to plan and implement the analysis?
- ☐ What financial resources are available for the analysis?

Step 2: Create a Plan for the Analysis

Step 2 involves developing a plan for the analysis including determining the methodology, outcomes and costs to be measured, outcomes to be monetized, data that are needed, data sources, and data collection process. All of these elements of the plan should be based on the framework for the analysis completed in Step 1.

Methods to be Used

- ☐ What method is most appropriate to address the specific questions for the analysis?
- ☐ Over what time period will outcomes and costs be examined?
- ☐ Will all youth served through the system be included or only a sample? If a sample, what sample will be used for analysis (e.g., how many and, which youth)?

Outcomes and Costs to be Analyzed, Compared, Monetized

- ☐ What are the goals and intended outcomes of the system of care?
- ☐ What outcomes will be measured based on the goals of the system of care and the purposes and questions to be addressed in the analysis (e.g., service utilization changes, child functional measures)?
- ☐ What comparisons will be made (e.g., comparison of children pre- and post-involvement in the system of care, comparison with children in usual care)?
- ☐ What costs will be measured and what will be included in the cost analysis (e.g., program or intervention costs, overhead/administrative costs, in-kind costs, costs to service recipients)? Or, will the analysis examine expenditures, rather than costs?
- ☐ How complete are the costs or expenditures to be measured?
- ☐ What outcomes will be monetized (i.e., quantified with a monetary value or with a financial proxy as in SROI analyses)?

Data Needed and Available for Specified Analyses and Data Sources

- ☐ What data are needed to assess the specified outcomes and costs or expenditures?
- ☐ What data are readily obtainable for the analysis and what are the sources for each of the data elements or indicators (e.g., outcomes from service utilization data, evaluations, reporting systems; costs from budgets, agency accounting systems, expenditure and claims data)
- ☐ How will outcomes be monetized and what data sources will be used (e.g., national cost estimates, research, and statistics for outcomes such as the economic value of high school graduation)?
- ☐ What rate will be used to convert the value of future benefits and cost to their present value (i.e., value of costs in 2020 dollars to 2014 dollars)?
- ☐ What arrangements and procedures are needed with agencies or organizations that have relevant data?

Data Collection Process

- ☐ How will data be collected? Who will be responsible and when?
- ☐ How will data be organized and managed (e.g., data housing, electronic system, software)?

Step 3: Implement the Analysis

Step 3 includes tasks involved in implementing the analysis, including data collection and analysis.

- ☐ Collecting data according to the plan
- ☐ Analyzing results by evaluators and/other staff
- ☐ Varying the assumptions used to analyze outcomes and costs to determine the extent to which differences in the valuation of outcomes or costs affect ROI
- ☐ Interpreting results with the group of key advisors

Step 4: Develop the Products and Use the Results for Strategic Communications

The final step involves producing products that are aligned with the purposes and uses of the analysis and employing these products strategically to support system of care expansion.

- ☐ Developing products that communicate the value of the system of care approach based on the analysis (e.g., policy briefs, announcements, reports, web-based communication)
- ☐ Developing products geared to specific stakeholders and constituencies including internal and external decision makers and investors (e.g., policymakers, Medicaid agencies, child-serving agencies, managed care organizations, families and youth, community leaders, advocates, or for articles adding to the literature on systems of care)
- ☐ Using the products for strategic communications with intended target audiences

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Appendix A: Methods Used by States, Communities, and Multi-Site Studies for Analysis of ROI in the System of Care (SOC) Approach

(Full report available at http://gucchdtacenter.georgetown.edu/publications/Return_onInvestment_inSOCsReport6-15-14.pdf)

	Methods	Costs Analyzed	Data Collected
Analyses of Trends in Aggregate Expenditures			
Massachusetts	Analyzed changes in expenditures from 2009 – 2012 for home- and community-based services, inpatient hospitalization, and emergency room (ER) use related to implementation of the SOC approach for youth in the Children's Behavioral Health Initiative	• Change in aggregate Medicaid spending on inpatient services and on intensive home- and community-based services over a 3-year period • Shift in annual Medicaid spending for inpatient and home- and community-based services as a percentage of total Medicaid spending	• Rate of psychiatric hospitalization and length of stay in hospital (% of members hospitalized in a quarter and bed days per 1000 members) • Utilization of intensive community-based services (intensive care coordination with Wraparound, family peer support, in-home services, mobile crisis intervention) • Medicaid expenditures for inpatient and home- and community-based services
New Jersey	Analyzed changes in expenditures for residential treatment and acute inpatient services related to statewide SOC implementation during a specified time period	• Change in aggregate expenditures for acute inpatient services • Change in aggregate expenditures for residential treatment	• Utilization of acute inpatient psychiatric services • Utilization of residential treatment • Length of stay in residential treatment centers • Expenditures for inpatient and residential treatment
North Carolina: Durham County	Analyzed changes in expenditures for out-of-home placements, institutional care, and court-ordered placements related to implementation of the SOC approach	• Change in aggregate expenditures for institutional care • Change in aggregate expenditures for court-ordered placement	• Rate of out-of-home placement • Expenditures for institutional care • Expenditures for court-ordered placement
Comparisons of Service Utilization and Costs			
Choices: Multiple States	Analyzed costs for youth served in Choices SOC compared with costs of residential care	• Comparison of cost per day per youth in Choices with cost per day per youth in residential treatment • Comparison of cost per youth per episode in Choices with cost per episode in residential treatment • Comparison of cost to child welfare systems for services in Choices with cost of residential treatment	• Average # of out-of-home placements for youth in Choices and youth in child welfare • Average # of days in out-of-home placements for youth in Choices and youth in child welfare • Average length of stay in Choices and in out-of-home placements • Cost per day and per episode in Choices and cost per day and per episode in residential treatment
Maryland	Analyzed costs for youth participating in Medicaid PRTF Waiver Demonstration Program compared with costs for serving youth in a residential treatment center	• Comparison of total cost per youth of waiver services (Medicaid claims plus care coordination) with cost per youth in a residential treatment center	• Medicaid claims data for Medicaid costs per year for waiver participants for all services (mental health, physical health, dental, and pharmacy) • Costs of care coordination per youth provided by the Care Management Entity

	Methods	Costs Analyzed	Data Collected
Wisconsin: Wraparound Milwaukee	Analyzed changes in service utilization and costs for youth in specified time periods (e.g., from 2007 to 2012, from 2008 to 2012, from 2010 to 2012, and from 1996 inception to 2012)	• Change in average total all-inclusive cost per child per month • Comparative costs of Wraparound Milwaukee, group home, correctional facility, residential facility, inpatient hospitalization • Changes in costs to the county for juvenile corrections placements • Estimates of costs avoided since inception, factoring in estimated increase in population served and cost increases over time	• Utilization of residential treatment, psychiatric inpatient services, and juvenile correction placements, and home- and community-based services (e.g., care coordination, crisis mentoring and stabilization, intensive in-home therapy) • Days spent in residential treatment and inpatient hospitals • Cost of inpatient services • Cost of residential treatment • Cost to county of juvenile corrections placements
Pre-Post Comparisons			
CMHI National Evaluation	Compared period of 6 months prior to intake (pre SOC enrollment) with 6 months prior to 12 month interview (post SOC enrollment)	Inpatient • Change in inpatient costs per child • Projected change in costs for larger population in SOCs ER • Change in ER costs per child • Projected change in costs for larger population in SOCs Arrest • Change in arrest costs per child • Projected change in costs for larger population in SOCs Grade Repetition • Change in cost of grade repetition per child • Projected change in costs for larger population in SOCs School Dropout • Change in cost per child of dropping out of school • Projected change in costs for larger population in SOCs Caregiver Missed Work Days • Change in costs of missed days of work	• Unit cost and average cost of inpatient psychiatric hospital care per day based on national data from Agency for Healthcare Research and Quality (AHRQ) • Unit cost and average cost of ER visit based on AHRQ data • Unit cost and average cost of arrest (based on national data) • Costs of grade repetition based on costs cited in literature • Estimated economic gains linked to reductions in dropout rates (e.g., average annual earnings of dropouts compared with graduates calculated over a lifetime based on national data) • Cost of missed days of work by caregivers (imputed average daily wage based on national data) • Cost of unemployment for caregivers (average cost of unemployment based on national data)

	Methods	Costs Analyzed	Data Collected
		• Projected change in costs for larger population served by SOCs Caregiver Inability to Work • Change in cost of unemployment • Projected change in costs for larger population served in SOCs	
PRTF Multi-Site Study	Compared outcomes prior to and subsequent to involvement in Medicaid PRTF Waiver Demonstration Program	• Change in average per capita costs for home- and community-based services • Change in average per capita costs of institutional care based on Medicaid PRTF claims • Costs of waiver services as a percentage of PRTF costs	• Medicaid cost per youth for home- and community-based services provided through the waiver demonstration • Medicaid cost per youth for institutional care in a PRTF
Georgia	Compared service utilization changes in the 6 months prior to enrollment with the first 9 months of Wraparound/SOC enrollment	• Change in average Medicaid cost per youth for services in PRTFs • Change in average cost for youth in a juvenile correction facility based on an average daily rate	• Medicaid data for utilization and cost of PRTFs, inpatient hospitalization • Juvenile correction facility service utilization data
Maine: THRIVE System of Care	Compared service utilization and costs at 3 intervals – 6 months before enrollment (prior), 6 months immediately following enrollment (immediate), and 6 months after the immediate period of enrollment (post)	• Change in overall Medicaid cost • Change in average cost per child per month • Change in inpatient hospital costs • Change in costs for ER visits • Change in costs for home- and community-based services	Medicaid claims data for utilization and cost of: • Targeted case management • ER services • Crisis support • Outpatient services • Home-based services • Inpatient mental health services • Cost per child per month • Overall per child cost
Maine: Wraparound Maine	Compared changes in service utilization and expenditure patterns for the 12 months preceding the initiation of Wraparound/SOC approach with the 12 months following enrollment	• Change in overall mental health expenditures • Change in expenditures for residential treatment and inpatient treatment • Change in costs for home- and community-based services • Change in per youth per year expenditures	Medicaid claims data for utilization and cost of: • Hospitalizations • Residential treatment • Outpatient clinical services • Targeted Case Management • Overall mental health expenditures • Per youth per year expenditures
Nebraska	Compared changes in service utilization and expenditures at enrollment and at disenrollment from a SOC approach with Wraparound	• Changes in costs for residential care, psychiatric hospitals, juvenile corrections facilities, and community placements • Change in average cost per family served	• # of youth in group or residential care • # living in psychiatric hospitals • # living in juvenile detention or correctional facilities

	Methods	Costs Analyzed	Data Collected
		• Comparison of average cost per family served with costs in the child welfare and juvenile justice systems • Estimated cost savings from avoidance of state custody • Estimated cost savings of bringing youth home from high levels of care outside the community	• # living in the community (at home, with a relative, foster care, independent living) • # youth who became state wards • # youth who avoided state custody • Costs for residential, inpatient, juvenile corrections, and community placements • Average cost per family
Comparison Group Studies			
California: Los Angeles	Exploratory Study compared outcomes and costs for children who graduated from SOC and children who graduated from residential treatment placements Comparison Study compared outcomes and costs for youth graduating from SOC with matched sample of children discharged from residential settings	• Comparison of placement costs for types of placements incurred by child welfare system	• # of out-of-home placements • # days in out-of-home placements (duration) • Restrictiveness of out-of-home placements • Costs for out-of-home placements
Massachusetts: Mental Health Services Program for Youth (MHSPY)	Compared MHSPY system of care group with a matched comparison group in usual care	• Comparison of total service utilization by intervention group with comparison group based on average per month expenditures • Comparison of costs for residential treatment • Comparison of costs for ER use • Comparison of costs for inpatient psychiatry services	Medicaid claims data for: • # days enrollees spent at home • Rates of hospitalization and residential treatment • Total costs of MSHPY (medical, mental health, and Wraparound) • Total per member per month claims expense (including pediatric inpatient, ambulatory pediatric, ER, pharmacy, inpatient and outpatient mental health) • Cost of inpatient hospitalization • Cost of residential treatment
Oklahoma	Randomized controlled trial to compare a group served with SOC approach and Wraparound for high-resource utilization youth with a control group Predictive modeling analysis	• Comparison of average total costs for behavioral health and medical costs combined and for behavioral health services alone • Comparison of average total inpatient costs for behavioral health and medical combined and for behavioral health services alone • Comparison of average total outpatient cost for behavioral health and medical combined and for behavioral health alone • Comparison of average total per youth per month cost for behavioral health and medical services combined and for behavioral health services alone	Medicaid claims data for: • Ratio of inpatient and outpatient expenditures • Total behavioral health and medical costs combined and behavioral health alone • Total inpatient costs for behavioral health and medical combined and for behavioral health alone • Total outpatient cost for behavioral health and medical combined and for behavioral health alone • Total per youth per month charge for behavioral health and medical services combined and for behavioral health services alone

	Methods	Costs Analyzed	Data Collected
		• Projection of savings for entire population of moderate to high Medicaid utilization youth for medical and behavioral health services combined and for behavioral health services alone	
Pennsylvania	Analyzed changes in expenditures for youth in the 12 months following enrollment in a SOC with Wraparound compared with a control group	• Comparison of Medicaid claims for Wraparound and control groups	Medicaid claims data for: • Medicaid costs for children in SOC with Wraparound • Medicaid costs for control group
Washington: Clark County	Analyzed costs of SOC approach with Wraparound for youth in juvenile justice with costs for a comparison group receiving conventional mental health services	• Comparison of costs of SOC approach with Wraparound with costs for comparison group based on utilization of detention • Change in costs related to change in recidivism rates	• # episodes of detention • # of days in detention • Cost of detention • Commission of subsequent offense (recidivism rate) • Estimated lifetime costs of chronic offending (based on literature)

Appendix B: ROI Analysis Worksheets

Worksheet #1: SAMPLE SYSTEM OF CARE GOALS AND OUTCOMES

(Examples from Previous System of Care Evaluations)

SYSTEM OF CARE GOALS	OUTCOMES (MONETIZEABLE)
GOAL #1 Systems of Care Benefit Children and Families: Children and families experience positive clinical and functional outcomes	
	Improved mental health (reduced symptomatology)
	Avoided substance use/abuse
	Avoided psychiatric inpatient hospitalization
	Avoided residential treatment
	Increased treatment in home- and community-based settings
	Avoided crime and delinquency
	Successful in education settings (e.g., pre-school, school, community college)
	Successful in employment (young adults)
	Avoided out-of-home child welfare placements
	Increased caregiver employment
	Others?
GOAL #2 Systems of Care Benefit Agencies and Payers: More efficient and effective investment of resources in less costly home- and community-based services with demonstrated positive outcomes	
	Decreased utilization rates of psychiatric inpatient services
	Decreased utilization rates of residential treatment
	Increased utilization rates of home- and community-based services and supports
	Decreased juvenile corrections placement rates
	Decreased out-of-home child welfare placement rates
	Decreased out-of-school placement rates
	Decreased medical and emergency room (ER) costs
	Resources are shifted to increased investment in home- and community-based services and supports
	Others?

GOAL #3 Systems of Care Benefit Taxpayers and Society: Avoidance of danger and costs from potential negative outcomes	
	Decreased crime and recidivism rates
	Decreased need for costly institutional facilities
	Increased productivity and tax contributions
	Others?

Worksheet #2: COST SAVINGS ANALYSIS PLAN

(Selected Examples from Previous Analyses)

SYSTEM OF CARE OUTCOMES (MONETIZEABLE)	OUTCOME INDICATOR	POPULATION AND SAMPLE SIZE	DATA AVAILABILITY AND SOURCES	COST INDICATOR	DATA AVAILABILITY AND SOURCES
Benefits to Children and Families: Children and families experience positive clinical and functional outcomes					
Improved mental health (reduced symptomatology) *No Examples from Previous SOC Analyses*	Use of mental health services			*Potential cost indicators:* *Current mental health treatment costs* *Projected future treatment costs (e.g., lifetime treatment costs)*	
Avoided substance use/abuse *No Examples from Previous SOC Analyses*	Use of substance abuse services			*Potential cost indicators:* *Current substance use treatment costs* *Projected future treatment costs* *(e.g., lifetime treatment costs)*	
Avoided psychiatric inpatient hospitalization *Example from CMHI Evaluation*	# days 6 months prior to intake and at 6 months prior to 12 month interview	Sample of children served in federally funded systems of care	Interviews at intake and 12 months	Average cost/day in psychiatric inpatient facility	National data
Avoided residential treatment	# of youth experiencing out-of-home event	Children in Community-Based Alternatives for	Medicaid data	Average cost of services in community-based care	Medicaid data

SYSTEM OF CARE OUTCOMES (MONETIZEABLE)	OUTCOME INDICATOR	POPULATION AND SAMPLE SIZE	DATA AVAILABILITY AND SOURCES	COST INDICATOR	DATA AVAILABILITY AND SOURCES
Example from Georgia	Utilization of residential treatment and psychiatric hospitalization	Youth		Average cost of services for youth in residential treatment and inpatient hospital	
Increased treatment in home-and community-based settings *Example from Oklahoma*	Utilization of behavioral health services and types of services per youth per month in year prior to system of care and year during care	High-resource utilization youth eligible for Medicaid in system of care/care management group and control group	Medicaid data	Total charges and per child per month cost of inpatient and outpatient services and inpatient and outpatient combined	Medicaid data
Avoided crime and delinquency *Example from CMHI Evaluation*	Juvenile arrests 6 months prior to intake and at 6 months prior to 12 month interview	Sample of children served in federally funded systems of care	Interviews at intake and 12 months	Average cost of processing a juvenile arrest	National data
Successful in education settings (e.g., pre-school, school, community college) *Example from CMHI Evaluation*	High school graduation rates	Sample of children served in federally funded systems of care		Projected earnings associated with high school completion	National estimates
Successful in employment (young adults) *No Examples from Previous SOC Analyses*	Productivity (Earnings)			*Potential cost indicators:* *Estimated cost of productivity (current earnings, projected lifetime earnings)* *Estimated future tax contributions*	
Avoided out-of-home child welfare placements *Example from Los Angeles*	Out-of-home placement rate and type and restrictiveness of out-of-home placement (e.g., relatives, foster parents, residential treatment) during 12-month follow-up period Child welfare case closure	Group of children who graduated from community-based services and group of children who graduated from residential treatment	Child welfare data	Post-graduation placement costs	Child welfare expenditures
Increased caregiver employment	Number of days of work missed due to child's mental health issues	Employed caregivers in sample of children served in federally funded	Interviews at intake and 12 months	Estimated loss of daily wage	National data on average daily wage by education level

SYSTEM OF CARE OUTCOMES (MONETIZEABLE)	OUTCOME INDICATOR	POPULATION AND SAMPLE SIZE	DATA AVAILABILITY AND SOURCES	COST INDICATOR	DATA AVAILABILITY AND SOURCES
Example from CMHI Evaluation		systems of care			
Benefits to Agencies/Payers: More efficient and effective investment of resources in less costly home- and community-based services with demonstrated positive outcomes					
Decreased utilization rates of psychiatric inpatient services *Example from Maine THRIVE System of Care*	Service utilization for youth 6 months prior to enrollment, 6 months immediately following enrollment, 6 months after (e.g., inpatient, ER use, crisis support, outpatient, home-based services)	Children enrolled in system of care	Medicaid data	Cost of individual services (e.g., inpatient) Overall Medicaid costs Average cost per child per month	Medicaid data
Decreased utilization rates for residential treatment *Example from evaluation of Medicaid Psychiatric Residential Treatment Facility (PRTF) Waiver Demonstration*	Utilization and cost of home- and community-based services through PRTF Waiver Demonstration and cost of treatment in residential treatment centers	Children participating in PRTF Waiver Demonstration 3,000+	Medicaid data for Waiver Years 1, 2, 3	Average cost/child in home- and community-based services through PRTF Waiver Demonstration Average cost/child in PRTF	Medicaid data
Increased utilization rates for home- and community-based services and supports *Example from Oklahoma*	Increased utilization of community-based care and decreased use of inpatient care	1,000 high-resource utilization youth	Medicaid data	Charges per youth per month for inpatient and outpatient behavioral health services (inpatient and outpatient) Ratio of inpatient and outpatient expenditures	Medicaid data
Decreased juvenile corrections placement rates *Example from Wraparound Milwaukee*	Average # of youth in juvenile correction placements in Milwaukee County	All youth in county in juvenile correction placements (Note: Nearly all youth at risk for juvenile correction placement are enrolled in Wraparound Milwaukee)	County juvenile justice data	Expenditures by county for juvenile corrections placements	Budget and expenditure tracking
Decreased out-of-home child welfare placement rates	Out-of-home placement rate and type and restrictiveness of out-of-home placement	Group of children who graduated from community-based services and group of	Child welfare data	Post-graduation placement costs	Child welfare expenditures

SYSTEM OF CARE OUTCOMES (MONETIZEABLE)	OUTCOME INDICATOR	POPULATION AND SAMPLE SIZE	DATA AVAILABILITY AND SOURCES	COST INDICATOR	DATA AVAILABILITY AND SOURCES
Example from Los Angeles	(e.g., relatives, foster parents, residential treatment) during 12-month follow-up period Child welfare case closure	children who graduated from residential treatment			
Decreased out-of-school placement rates *No Examples from Previous SOC Analyses*	Out-of-school placement rates			Cost of placements in alternative schools Costs of placements in residential treatment/special educational programs	
Decreased medical costs (e.g., physical health care, ER use) *Example from Massachusetts Mental Health Services Program for Youth (MHSPY)*	Utilization of pediatric inpatient, ambulatory pediatric, ER, pharmacy, and inpatient and outpatient mental health services	System of care group and matched comparison group	Medicaid data	Total per child per month claims expense	Medicaid data
Benefits to Taxpayers and Society: Avoidance of danger and costs from potential negative outcomes					
Decreased crime and recidivism rates *Example from Clark County, Washington*	Episodes and days in detention Recidivism rate and type of offense (e.g., felony)	System of care/Wraparound group and group receiving conventional services	Juvenile justice system data	Cost of services for youth in system of care/Wraparound group Cost of detention Estimate of cost of crime Estimate of cost lifetime of criminal behavior	County juvenile justice expenditures National estimates
Decreased need for costly institutional facilities *Example from New Jersey*	Decreased expenditures for inpatient and residential treatment services	All children served by statewide system of care	N/A County juvenile justice system data	Total expenditures for inpatient services Total expenditures for residential treatment	Budget and expenditure tracking

SYSTEM OF CARE OUTCOMES (MONETIZEABLE)	OUTCOME INDICATOR	POPULATION AND SAMPLE SIZE	DATA AVAILABILITY AND SOURCES	COST INDICATOR	DATA AVAILABILITY AND SOURCES
Example #2 from Wraparound Milwaukee	Closure of juvenile corrections facilities	All youth with or at risk for placement in a juvenile corrections facility (nearly all referred to Wraparound Milwaukee)		Utilization of juvenile corrections placements Capacity and closure of facilities	County juvenile justice system data

Worksheet #3: RESULTS

SYSTEM OF CARE OUTCOMES	INDICATOR	POPULATION	CHANGE IN UTILIZATION	COST/FINANCIAL VALUE	CHANGE IN COST	COST SAVINGS
Benefits to Children and Families: Children and families experience positive clinical and functional outcomes						
Inpatient Hospitalization *Example from CMHI Evaluation*	# days in psychiatric inpatient hospital	Sample of children served in federally funded system of care 3,752	Difference in utilization 6 months prior to enrollment, 6 months prior to 12 month interview -0.53 days	Cost/day $2,708 (2013 $s)	-$1,433 per child -42% per child	Estimated savings when extrapolated to all children served in federally funded systems of care $37,114,831
Benefits to Agencies/Payers: More efficient and effective investment of resources in less costly home- and community-based services with demonstrated positive outcomes						
Benefits to Taxpayers and Society: Avoidance of danger and costs from potential negative outcomes						

SYSTEM OF CARE OUTCOMES	INDICATOR	POPULATION	CHANGE IN UTILIZATION	COST/FINANCIAL VALUE	CHANGE IN COST	COST SAVINGS

Worksheet #4: CROSS-SYSTEM COST ANALYSIS PLAN

Potential cross-system cost analysis based on analysis of utilization and costs for youth receiving services within system of care approach

Child-Serving System	Cost to System (Prior to SOC Involvement or Comparison Group)	Cost to System (Post SOC Involvement)	Change in Cost to System	Cost Savings
Medicaid *Example from Oklahoma*	$3,368 per child per month Year prior	$2,190 per child per month Year post	$1,178 per child per month (35% decline)	$16,777,805 projected for 1 year if entire study population received SOC approach (1,943 moderate to high Medicaid utilization youth)
Mental Health Agency				
Child Welfare Agency				
Juvenile Justice Agency				
Federal Grant				
Private Insurance				
Client Out-of-Pocket				