



Adult Mental Health Project Brief

Spring 2022



NC DEPARTMENT OF
HEALTH AND HUMAN SERVICES



Contents

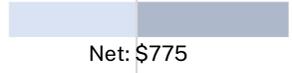
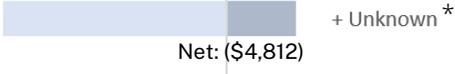
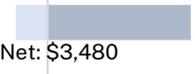
Executive Summary.....	1
Evidence of Program Effectiveness.....	3
Benefit-Cost Analysis.....	7
Return-On-Investment.....	10
Critical Time Intervention.....	11
Individual Placement and Support.....	12
Mobile Crisis Management.....	15
Peer Support Services	17
Resource Intensive Comprehensive Case Management.....	19
General Recommendations.....	21
About North Carolina Results First.....	21

Executive Summary

Investing in effective programs and services for adults with mental health and substance use disorders benefits program participants and the state. Programs that reduce the prevalence and severity of mental health conditions generate positive outcomes including higher employment and earnings, lower crime, reduced homelessness, and lower healthcare costs.

This report examines the effectiveness and return on investment from state-funded adult mental health programs supported by the Adult Mental Health Services Team (AMH). Ten of the 26 total programs are proven effective by rigorous evidence, showing a positive impact on at least one targeted outcome. The remaining programs need additional research to confidently measure their effects.

Five of the programs had sufficient research evidence to estimate the return on investment the state can expect if the programs are implemented according to the core design and delivery elements from the research. All five programs are proven to generate positive outcomes for participants.

Program	Benefits Minus Costs Per Participant ^[1]	Benefit-Cost Ratio
		
Individual Placement and Support (IPS)	 Net: \$6,793	\$2.55 : 1
Peer Support Services	 Net: \$775	\$1.19 : 1
Resource Intensive Comprehensive Case Management (RICCM)	 Net: \$7,616	\$2.81 : 1
Critical Time Intervention (CTI)	 Net: (\$4,812) + Unknown*	\$0.31 : 1
Mobile Crisis Management: Justice-Involved	 Net: \$3,480	\$4.44 : 1
Mobile Crisis Management: General	 Net: (\$352)	\$0.64 : 1

Return on Investment Findings

IPS, Peer Support Services, and RICCM show a positive return per dollar spent on these programs.

*While research shows CTI effectively reduces homelessness among individuals with serious mental illness, this primary outcome could not be monetized. Therefore, this analysis only provides a partial comparison of CTI's costs and benefits.

Mobile Crisis Management (MCM) generates a high return on investment when delivered to criminal justice-involved individuals because of the program's effect on crime reduction. Program costs outweigh the expected benefits for a general population.

1. Costs and benefits are modeled on a per person basis. They include the short- and long-term effects of program treatment over the participant's lifetime. Costs and benefits are presented in 2020 dollar values, calculated using a 3.5% discount rate.

Next Steps

These results underscore the value of investing in high-quality and proven effective programs that reduce the symptoms and occurrence of serious mental illness for North Carolinians. While the analysis shows that the Division of Mental Health, Developmental Disabilities and Substance Abuse Services supports several proven and cost-effective programs, it also highlights opportunities in North Carolina to fill knowledge gaps and improve service delivery to maximize positive outcomes. In alignment with strategic priorities of the Division, the Adult Mental Health team plans to take the following next steps:

Increase availability and access to high-quality programs

Expand proven effective and promising programs through funding and training, prioritizing programs shown to have a positive return on investment and long-term benefits from increased employment and avoided hospitalization: IPS, Peer Support Services, and RICCM.

MCM – Increase referrals among criminal justice-involved population: AMH will communicate MCM's recidivism reduction benefits and encourage adult criminal justice staff to increase referrals.

Integrate behavioral healthcare into primary and physical care

IPS – Integrate behavioral health services into all IPS teams: AMH will address implementation barriers to ensure all individuals receive both employment support and behavioral health services through IPS, in alignment with a person-centered model of care.

Use data to ensure continuous quality improvement

Evaluate programs lacking rigorous evidence: AMH will develop research partnerships to evaluate the effectiveness of programs that are theory based but need additional research to measure their effects.

Track program outcomes: AMH will collect data on program delivery and outcomes for Peer Support Services, MCM and CTI to determine whether they are achieving the expected effects from the research.

Ensure programs are delivered according to best practices: AMH will offer enhanced technical assistance to IPS providers facing implementation barriers and will require LME-MCOs to develop an action plan to strengthen program fidelity.

CTI – Explore feasibility of monetizing CTI's effect on homelessness: To provide a more complete estimate of CTI's benefits, AMH will investigate approaches for addressing research and data gaps.

Lead innovation to leverage and maximize resources

Expand Value-Based Payment Models (VBP): AMH will explore expanding VBP to additional programs and recommends that all LME-MCOs participate in VBP for IPS.

Engage stakeholders and build partnerships

IPS – Collaborate with DVR to enhance available resources: AMH plans to strengthen collaboration with the NC Division of Vocational Rehabilitation to reduce agency specific costs and provide a more robust array resources to help clients find and keep a job.

IPS – Increase engagement to strengthen support for IPS: AMH will engage providers, agency leadership, and other stakeholders to increase involvement and support for expanding the reach of IPS.

Evidence of Program Effectiveness

The Adult Mental Health Services Team (AMH), within the Department of Health and Human Services (DHHS) Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMH/DD/SAS), supports state-funded programs that aim to reduce the incidence or symptoms of mental illness and substance use disorders among adults and improve functioning for individuals with serious mental illness.

AMH provides program oversight and consultation to Local Management Entities – Managed Care Organizations (LME-MCOs) and other stakeholders who deliver these programs and services. AMH also reviews behavioral health programs and policies and recommends changes, as necessary.

Through the North Carolina Results First Initiative, AMH and the Office of State Budget and Management (OSBM) reviewed high-quality research evidence to determine the effectiveness of these programs.

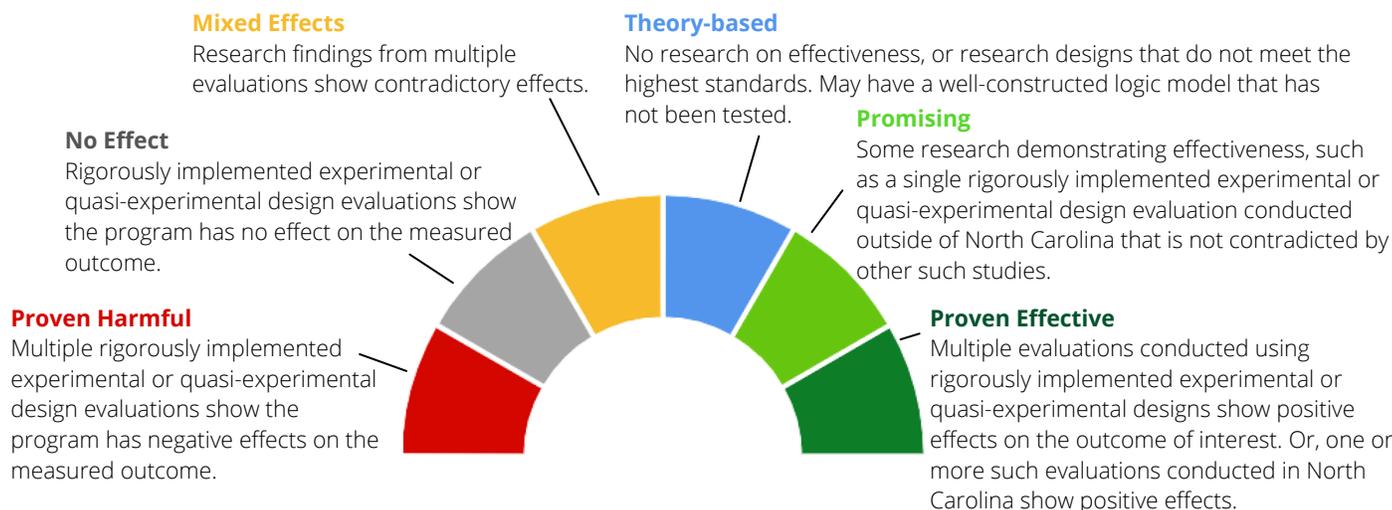
Program Inventory Scope

Program inventories provide a systematic way to assess what programs are being funded to achieve a policy goal or desired outcome, how those programs are being delivered, and who those programs target. The AMH team and OSBM, with assistance from staff from DHHS’s Division of Budget and Analysis, developed the [AMH Program Inventory](#). There are 26 state-funded adult mental health programs, administered in different care settings, that aim to reduce the incidence or symptoms of mental health conditions in adults. The AMH team also oversees programs that target individuals with Intellectual and Developmental Disabilities. These programs were excluded from the inventory because a significant body of evidence around IDD interventions is currently unavailable.

Strength of Evidence

OSBM and AMH reviewed the available research evidence to score each program or therapy based on their measured impact (positive or negative) and the rigor of the research designs. Programs were rated on a scale ranging from “proven effective” to “proven harmful.” The research includes outcomes verified by systematic reviews conducted by respected sources such as the [California Evidence Based Clearinghouse for Child Welfare \(CEBC\)](#), [Washington State Institute of Public Policy \(WSIPP\)](#), and the National Registry of Evidence-Based Programs and Practices (NREPP).^{[2],[3]}

Tiered Levels of Evidence



2. Cognitive Behavioral Therapy (CBT) is the only program matched to the CEBC. While the clearinghouse addresses programs that impact child welfare outcomes, the target population for CBT is adults with mental health disorders

3. The National Registry of Evidence-Based Programs and Practices was indefinitely suspended in 2017 but remains a resource on proven interventions to address behavioral health issues.

Ten of 26 Adult Mental Health Programs are Proven Effective

The program inventory and evidence review yielded insights into the effectiveness and design of state-funded AMH programs. The programs included in the inventory are administered to varying populations within a wide range of care settings. Settings range from recovery maintenance and health management for individuals who can live independently with minimal support, to residential programs for individuals who require intensive care.

Nearly half of the 26 AMH programs reviewed are proven effective, meaning a body of high-quality research shows they positively impact at least one outcome associated with the incidence of mental illness and substance use disorder, or that they improve functioning for individuals with severe mental illness.

Of the remaining programs, two are rated promising indicating that some research is available demonstrating their effectiveness, but more is needed.

Thirteen programs are theory-based. The effectiveness of theory-based programs is unknown. These programs may have a clear logic model, but existing research does not meet the rigorous standards to confidently measure program effects, or they may be too small to have warranted a rigorous evaluation. The inventory also identified one unrated diagnostic assessment tool.

The inventory and evidence review allows the AMH team to understand the strength of the existing evidence behind programs in their service array, and their proven outcomes. It also informs the need for additional research to determine the impact of theory-based programs.

Twelve Programs Proven to Improve At Least One Primary Outcome of Interest

Although all 10 of the rated proven effective programs positively impact outcomes related to reducing the incidence of mental health conditions and improving functioning, AMH worked with OSBM to identify four key outcomes of interest.

AMH identified the following primary agency goals for the programs:

- 1.increasing employment
- 2.reducing homelessness
- 3.reducing hospitalization ^[4]
- 4.reducing prevalence of psychiatric symptoms.

Evidence Rankings for 26 Programs Inventoried



For the complete Program Inventory, please see OSBM's [Results First website](#).

4. In this case, "hospitalization" reflects emergency department visits, psychiatric hospitalization, and psychiatric rehospitalization.

OSBM and AMH then reviewed available research to understand the extent to which these state-funded programs have a positive impact on the identified goals. Current research shows that eight of the 10 proven effective programs and both promising programs have a positive impact on at least one of the four key outcomes.

Program Impact on Key Outcomes

The program impact on the outcomes below is represented by:

Green Fill: positive impact, **Gray Fill:** neutral impact, **Blank:** no available evidence on the outcome

Program	Employment	Homelessness	Hospitalization	Psychiatric Symptoms	Other
Proven Effective Programs (10)					
Assertive Community Treatment		Decreased	Decreased	Neutral	
Cognitive Behavioral Therapy				Decreased	
Critical Time Intervention		Decreased	Decreased		
Dialectical Behavioral Therapy					Decreased
First Episode Psychosis (Pilot)			Neutral	Decreased	
Individual Placement and Support	Increased		Neutral	Neutral	
Mental Health First Aid					Decreased
Peer Support Services	Increased	Neutral	Neutral	Neutral	
Promoting Integration of Primary and Behavioral Health Care (Pilot)					Decreased
Resource Intensive Comprehensive Case Management (Pilot)		Decreased			
Promising Programs (2)					
Facility Based Crisis^[5]					
Mobile Crisis Management			Decreased		
Theory Based (13)	Unknown	Unknown	Unknown	Unknown	Unknown

Two Programs Proven to Improve Other Mental Health and Substance Use Outcomes

Although the primary goals of the programs are to increase employment and reduce homelessness, hospitalization, and psychiatric symptoms, these interventions may also generate other important benefits.

Dialectical Behavioral Therapy and Mental Health First Aid, both proven effective, do not impact the four primary outcomes but do positively impact other substance use and mental health and related outcomes such as treatment uptake, and the ability to provide support to individuals experiencing a mental health crisis.

Dialectical Behavioral Therapy (DBT) is a cognitive-behavioral treatment approach that uses a behavioral, problem-solving focus blended with acceptance-based strategies, and an emphasis on dialectical processes. Research shows that it is proven to decrease suicide attempts, non-suicidal self-injury, psychosocial adjustment, treatment retention, drug use, and symptoms of eating disorders.

Mental Health First Aid is a training program to improve participant’s knowledge and attitudes about mental health issues, enabling the community to support individuals experiencing a mental health crisis. It is targeted toward adults without mental health or substance use issues and is proven to increase an individual’s knowledge of specific mental health symptoms, knowledge of mental health support and treatment resources, and confidence helping an individual with mental health issues.

5. Facility Based Crisis is a promising program rated by The National Registry of Evidence-Based Programs and Practices, which was indefinitely suspended in 2017. Therefore, OSBM was unable to determine how the program impacts the four key outcomes.

Effectiveness of 13 Theory-Based Programs Is Unknown

The 13 theory-based programs identified through the inventory, summarized below, may have a well-constructed logic model. However, additional rigorous research is needed to determine the impact of the programs. Full program descriptions can be found in the AMH program inventory.

Behavioral Health Urgent Care provides various services to individuals with urgent or emergent crisis response needs.

Community Support Team is a community based rehabilitative program aimed at restoring an individual's ability to successfully live in the community.

Partial Hospitalization is a short-term service for adults with a serious or persistent mental illness, which is designed to prevent hospitalization or to support those leaving an inpatient facility.

Family Living, a program offered at two intensity levels, provides individuals with a family style environment to strengthen their social and life skills.

Transition Management Services is a rehabilitative service that is intended to increase and restore an individual's ability to live successfully in the community by maintaining tenancy.

Group Living is offered at three intensities with the goal of providing a home-like environment to individuals while providing supervision and therapeutic programming.

Supervised Living is a non-restrictive service offered at two intensities that provides a room for individuals who do not require 24-hour supervision.

Peer Operated Respite is a respite program that provides peer support services to individuals in a home-like environment for up to seven days.

Psychosocial Rehabilitation is an office or community-based group intervention that helps adults develop daily living skills, social skills, community integration, and pre-vocational skills.

Benefit-Cost Analysis

By reducing the incidence and symptoms of mental health conditions and improving functioning of individuals with serious mental illness through proven programmatic interventions, North Carolina can expect higher employment, lower healthcare costs and homelessness, and, as a secondary effect, lower crime. Five of the programs supported by AMH have sufficient research evidence to confidently measure their impact on these outcomes. The state's provider reimbursement expenditures for these programs exceed \$69 million.

For these five programs OSBM and AMH estimated the value of the outcomes generated by each program and then compared them against the delivery costs to determine the state's return on investment.

Expenditures for the Five Programs with Quantifiable Outcomes

Program	Reimbursements SFY 2021
 Critical Time Intervention (CTI)	\$214,697
 Individual Placement and Support (IPS)	\$9,675,481
 Mobile Crisis Management	\$15,485,590
 Peer Support Services	\$42,834,319
 Resource Intensive Comprehensive Case Management (RICCM)	\$1,199,805

Provider reimbursement costs for CTI, IPS, MCM, and Peer Support Services include state and Medicaid expenditures for claims paid in SFY 2021. RICCM is contract-funded.

These five proven-effective programs had sufficient research evidence to confidently measure and quantify effects.



Critical Time Intervention (CTI)



Individual Placement and Support (IPS)



Mobile Crisis Management



Peer Support Services



Resource Intensive Comprehensive Case Management (RICCM)

Overview of Benefit-Cost Process & Definitions

The Results First Model is based on the benefit-cost model originally developed by the [Washington State Institute for Public Policy \(WSIPP\)](#). Results First uses WSIPP's methodology and applies it to all programs that qualify for the benefit-cost analysis. OSBM customizes the model with North Carolina's program and demographic data to calculate return on investment for the programs in our state.

Components of the Benefit-cost Model

Monetized Benefits

For each program in the model, WSIPP conducts a literature review of a topic area of interest. For example, with Individual Placement and Support (IPS), WSIPP reviewed 14 studies that assessed the IPS model of supported employment compared to typical vocational services for individuals with serious mental illness. WSIPP uses these reviews to draw overall conclusions about the average effectiveness of programs on specific outcomes.

This change in an outcome can then be monetized based on the relationship between the outcome and the associated benefit. For example, if a program reduces psychiatric hospitalization, we can expect participants and taxpayers to benefit directly in the form of increased labor market earnings and avoided healthcare utilization.

Depending on the program, the following types of benefits, in the form of avoided costs and higher earnings, are computed for this policy area:

- **Reduced health care costs**
 - o Reduced emergency department visits
 - o Reduced general hospital utilization
 - o Reduced psychiatric hospital utilization
- **Reduced criminal convictions**
 - o Lower crime victimization costs
 - o Lower criminal justice system utilization costs
- **Higher earnings from increased employment for individuals with serious mental illness (SMI)**

The model is also able to show monetized benefits broken down by different perspectives. Included perspectives are program participants, government (taxpayers), and society. Adding the distributional lens allows decision-makers to see how different groups benefit from the program. For example, a program with a benefit of increased earnings will benefit both program participants (increase in earnings net of taxes) and taxpayers (increase in taxes).

Monetized Costs

To provide comparable analysis of programs that may differ substantially in scale, the model reports the incremental, or marginal, costs and benefits of the program on a per-participant basis. Marginal cost is defined as the direct expense of providing the program to one additional client. Marginal costs exclude “fixed” costs such as overhead and other expenses that do not vary with a moderate change in enrollment.

Comparing marginal program costs to the per participant benefits allows for an estimation of expected benefits to North Carolinians from delivering the program to an eligible participant. OSBM worked with DHHS Adult Mental Health staff to estimate marginal costs for each of the programs in the benefit-cost model.

Net Impact: Benefits minus Costs

The model calculates the long-term benefits of the program per participant and subtracts the costs of delivering the intervention to the participant to estimate the return on investment from the program.^[6] This calculation shows the total magnitude of the gain (net benefits) or loss (net costs). It answers, “how much better off is North Carolina from investing in this program?” If the number is positive, it means the program has greater expected benefits than costs. If the number is negative, it means the program delivery costs outweigh the expected benefits.

Benefit-Cost Ratio

The total lifetime benefits divided by the lifetime costs ^[7] is the benefit-cost ratio. Another measure of return on investment, it presents the benefits earned per dollar spent on the program. Unlike the net impact (benefits less costs), the benefit-cost ratio does not consider the overall magnitude of the costs and benefits.

Likelihood Benefits Exceed Costs

The benefit-cost analysis relies on the best available data from agency administrative records, peer-reviewed research findings, and economic modeling conducted by WSIPP. By necessity, the analysis relies on averages or “most likely” point estimates to calculate lifetime benefits and costs attributable to program participation.

A risk analysis provides a measure of how confident we can be that the benefits will exceed the costs, accounting for a range of reasonable assumptions and variances. For each program, the benefit-cost model was re-run 10,000 times, each time varying key inputs within a range of high- and low-end values. OSBM reports for each program the percentage of cases from the simulations where benefits exceed costs.

Benefit-Cost Analysis Limitations

The benefit-cost analysis provides valuable information on the cost-effectiveness of an individual program by comparing the delivery costs to the total lifetime benefits generated by the program. This method also identifies the distribution of costs and benefits among different groups, such as the government, program participants, and other entities.

However, it is important to note that the benefit-cost analysis is only one tool to inform decision-making and that cost-effectiveness is only one of many important decision criteria. Stakeholders should also consider the local context and community needs where the program is being implemented and the goals of the individual programs. Programs with similar objectives may target very different population subgroups or target especially high-risk or under-resourced communities. This specific targeting may account for some differences in cost-effectiveness between programs. Stakeholders should also consider what other interventions and resources, if any, are available to address the specific problem or serve unique populations.

Furthermore, as previously discussed, program benefits and costs are monetized using existing research on the program’s effectiveness, economic models of lifetime outcomes, and administrative data.

6. All future benefits and costs are discounted to 2020-dollar equivalents using a 3.5% discount rate.

7. *ibid*

Return on Investment

Five of the 26 programs supported by AMH have sufficient research evidence to measure their effect on the incidence or symptoms of mental health conditions and the functioning of individuals with serious mental illness. These five programs are proven to generate positive outcomes for participants, in the form of long-term avoided healthcare expenses, increased employment and earnings, reduced crime costs, and reduced homelessness.

Three programs show a positive return on investment. Program delivery costs exceed the monetized benefits for two programs. While the benefits do not outweigh the costs for two programs, research evidence indicates that these programs may generate additional benefits that cannot be monetized or have positive impacts when targeted at higher risk populations.[8]

In some cases, research measures a program's effect on an outcome, but it is not possible to monetize benefits or research is too limited to confidently determine the program's impact.[9] For example, one of the primary outcomes of Critical Time Intervention is reducing instances of homelessness in the population served. While research measured the program's impact on homelessness, benefits related to homelessness reduction or avoidance were not monetized and are not reflected in the final benefit-cost results; this decision was due to the difficulty in placing a monetary value to having stable housing.

The return on investment results reflect the benefits North Carolina could expect if our programs and therapies follow the evidence-based practices from the research. To achieve these outcomes, programs must be implemented with fidelity to the core delivery elements that are proven effective.

8. For Mobile Crisis Management, reported benefits are attributable to a general population. When crime benefits are calculated specifically for a criminal justice system-involved individual, the program generates positive net impacts.

9. Additional information regarding WSIPP's general framework for determining what benefits can and should be monetized can be found on pages 31 and 32 of their [Technical Documentation](#).

Critical Time Intervention

NC Results First Program Evaluation

Critical Time Intervention (CTI) is a multi-phase treatment model that bridges the gap between critical transitions, such as long-term psychiatric hospitalizations, homelessness, institutionalization, or incarceration, and housing or community services. The program provides recovery-oriented, psychiatric rehabilitation, and community integration. Interventions may connect individuals to community supports such as peer support specialists, housing first or tenancy supports, medication management, outpatient therapy, employment services, primary and substance use care, and psychosocial rehabilitation.

Research evidence shows that CTI is effective at reducing homelessness, as well as the frequency of psychiatric hospitalizations, and negative psychosis symptoms.

AMH and OSBM used benefit-cost analysis tools to estimate the program's return on investment. Reducing homelessness is the program's primary objective. Research found that CTI participants had 1.5-3.6 times lower odds of experiencing one or more homeless nights over an 18-month follow-up period.^{[10],[11]} However, this positive outcome could not be monetized due to inconsistent measures of homelessness and the challenges of accurately estimating homelessness rates among the state's target population. Therefore, this analysis provides only a partial return on investment.

Monetized Benefits
 Reduced medical expenditures from avoided psychiatric hospitalization is the only monetized outcome for CTI. On average, for every individual who participates in the program, we can expect a benefit of \$2,172 related to a reduction in the occurrence of psychiatric hospitalization.

Benefit-Cost Analysis

When considering CTI's effect on psychiatric hospitalization reduction only, the program delivery costs of \$6,983 per person exceed the value of the expected hospitalization savings of \$2,172 resulting in a net loss of \$4,812 per person, a return of 31 cents per dollar invested in the program. The value of the program's positive effect on homelessness and psychiatric symptoms is unknown.

Accounting for variation in key estimates, there is a 29 percent chance that the benefits will exceed the costs CTI is used as an intervention for adults with serious mental illness.

CTI is comprised of four distinct steps, totaling 352 fifteen-minute units. On average, about 90 to 95% of participants complete all four steps- or 317 units. As AMH has set a standard per unit rate of \$20.64, this results in a per participant cost of \$6,983.

Benefits per participant		\$ 0.31 per dollar invested Benefit to cost ratio
<i>Psychiatric Hospitalization</i>	\$ 2,172	
<i>Homelessness</i>	<i>Unmonetized</i>	
<i>Psychiatric Symptoms</i>	<i>Unmonetized</i>	
<i>Psychosis Symptoms</i>	<i>Unmonetized</i>	
Costs per participant	\$ (6,983)	
Benefits less costs	= \$ (4,812)	29% Likelihood benefits will exceed costs

10. Conover, S., Gorroochurn, P., Hinterland, K., Hoepner, L., & Susser, E. S. (2011, July). Randomized trial of Critical Time Intervention to prevent homelessness after hospital discharge. Psychiatric services (Washington, D.C.). Retrieved December 20, 2021, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3132151/>

11. Susser E;Valencia E;Conover S;Felix A;Tsai WY;Wyatt RJ; (n.d). Preventing recurrent homelessness among mentally ill men: A "Critical time" intervention after discharge from a shelter. American journal of public health. Retrieved December 20, 2021, from <https://pubmed.ncbi.nlm.nih.gov/9103106/>

Of the \$2,172 in benefits per person served by CTI, taxpayer-funded medical care savings account for \$1,753, while participants are expected to save \$24 in out-of-pocket costs. A total of \$395 in other benefits are expected over the course of a participant's lifetime.

Table 2: Benefits by Perspective

Taxpayer	\$1,753
<i>Federal</i>	\$1,275
<i>State</i>	\$477
Participants	\$24
Other	\$395
Total	\$2,172

Non-Monetized Outcomes

This analysis does not capture the full value of CTI's proven benefits. Research evidence shows CTI reduces the odds that participants will experience homelessness, but the associated benefits are not monetizable and are not reflected in the return-on-investment results. Current research is not sufficiently rigorous to confidently measure the program's effect on psychiatric and psychosis symptoms. As a result, these outcomes could not be monetized.

Recommendations & Next Steps

Explore Feasibility of Monetizing CTI's Effect on Homelessness

Current available research found that individuals who participate in CTI are less likely to experience homelessness following program completion. However, the positive effect of CTI on homelessness could not be monetized through this analysis due to the difficulty of accurately estimating baseline homelessness rates among the target population, inconsistent measures of homelessness in the research, and the challenges of valuing the cost of homelessness in the state.

AMH will explore the feasibility of addressing these research and data gaps, in partnership with academic researchers, to provide a more complete estimate of CTI's benefits for individuals with serious mental illness.

Expand the Availability of CTI Across the State

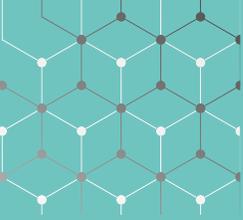
AMH recommends that one CTI team is housed within each Local Management Entities – Managed Care Organizations (LME-MCO) to ensure that CTI is available across the state. One team currently operates in central North Carolina. AMH plans to release a Request for Application (RFA) in spring 2022 to support the start-up of two new CTI teams that are expected to begin serving individuals in early SFY 2023.

Ensure CTI Teams Are Implementing the Program to Fidelity

Although AMH has a fidelity monitoring tool, all fidelity monitoring has been “paused” during the NC State of Emergency and CTI services are being offered via telehealth although CTI is most effective as a face-to-face program. Therefore, following the reinstatement of in-person services, the AMH team plans to monitor program fidelity to ensure CTI teams across the state are implementing the program to reflect the NC state-funded service definition.

Collect State Specific Outcome Data

Though the research used in this analysis confidently estimates CTI's impact on North Carolinians, it is not state specific. Once CTI services return to in-person treatment, AMH plans to track client outcomes including incarceration, homelessness and housing status, and hospital emergency department visits. Tracking these three outcomes will allow AMH to collect state-specific data and determine whether participants are achieving the expected program outcomes based on the research literature.



Individual Placement and Support

NC Results First Program Evaluation

Individual Placement and Support (IPS) is an international, evidence-based behavioral health model that aids individuals with serious mental illness (SMI) choose, acquire, and maintain competitive paid employment in the community.

Research evidence shows that IPS is effective at increasing employment and reducing psychiatric hospitalization.

AMH and OSBM used benefit-cost analysis tools to estimate the program's return on investment. The impact of IPS represents the effect of the program above and beyond what would be expected from traditional Vocational Rehabilitation Supported Employment Service (Supported Employment) outcomes and costs. If IPS were not available, individuals with SMI would likely receive support through traditional Supported Employment. Benefits include the avoided cost of alternative treatment and the value of benefits associated with IPS participation.

Benefit-Cost Analysis

On average, the IPS program benefits of \$11,163 per person exceed the delivery cost of \$4,369, resulting in a net benefit of \$6,793 per person, a return of \$2.55 per dollar invested in the program.

Accounting for variation in key estimates, there is a 96 percent chance that the benefits will exceed the costs when IPS is used as an intervention for adults with serious mental illness.

Although research evidence shows that IPS reduces the persistence of psychiatric symptoms, this positive outcome could not be monetized due to inconsistent measures across research and challenges accurately estimating the prevalence of psychiatric symptoms among the target population.

Participants use an average of 259.6 units (64.9 hours) of IPS services at an average cost of \$17 per unit, based on claims data. This results in an estimated per-person cost of \$4,369.

Monetized Benefits

On average, for every individual who utilizes IPS services, we can expect \$11,163 in total benefits over the lifetime of the participant. Of the total benefits per person, \$4,196 accounted for benefits stemming from higher labor market earnings, while \$7 accounted for cost avoidance related to a reduction in psychiatric hospitalization. Additionally, for each individual served through IPS, the state can expect to avoid an estimated \$6,960 in costs that would otherwise be spent on traditional Supported Employment services.

Increased employment is measured by changes in full- or part-time employment attributable to IPS participation compared to the employment effects of traditional Vocational Rehabilitation Supported Employment. Associated benefits are measured in terms of the additional income earned by the participants.

Reduced psychiatric hospitalization is measured by the program's impact on admissions to a psychiatric ward or hospital. Monetization of the impact relies on statewide and national data on psychiatric hospitalization rates and average costs.

Benefit-Cost Summary Explanation (2020 Dollars)		
Total Benefits per participant	+ \$ 11,163	\$ 2.55 per dollar invested Benefit to cost ratio
<i>Increased Employment</i>	\$ 4,196	
<i>Reduced Psychiatric Hospitalization</i>	\$ 7	96% Likelihood benefits will exceed costs
<i>Reduced Psychiatric Symptoms</i>	Unmonetized	
<i>Avoided Cost of Alternative Treatment</i>	+\$6,960	
Costs per participant	-\$ (4,369)	
Benefits less costs	+ \$6,793	

Of the \$11,163 in benefits per person served by IPS, taxpayer gains from higher employment and the avoided costs of alternative employment support services account for \$8,218. Higher earnings for participants account for \$2,943.

Benefits By Perspective	
Taxpayer	\$8,218
<i>Federal</i>	\$807
<i>State</i>	\$7,215
<i>Local</i>	\$195
Participants	\$2,943
Other	\$1
Total	\$11,163

Recommendations & Next Steps

Strengthen Collaboration with the Division of Vocational Rehabilitation

IPS providers must apply to become a Division of Vocational Rehabilitation (DVR) vendor and collaborate with the Division on referrals, shared clients, access to funding, and other areas. AMH recommends improving collaborations with the DVR to increase shared funding for IPS and to provide a more robust array of resources to help individuals with serious mental illness to find and keep competitive employment.

Expand Value-Based Payment Models to All Local Managed Entities-Managed Care Organizations

Value-Based payment (VBP) models can be used to reward providers for delivering high-quality, appropriate care and improved outcomes. The VBP model is currently applied to IPS in two LME-MCOs and ties payments directly to milestones, reducing administrative burden and enhancing an individual's quality of care. To improve the quality of IPS service delivery and maximize funding, AMH recommends expanding the VBP model for IPS to all LME-MCOs.

Connect All IPS Teams to A Behavioral Health Team

The IPS service definition establishes that IPS services should be co-located with a behavioral health treatment service to ensure consistent behavioral health integration with employment supports. Some IPS providers, especially those who do not provide behavioral health services themselves, face difficulties with successfully integrating these supports. AMH plans to expand assistance to IPS providers facing barriers in integrating comprehensive behavioral health services to ensure all IPS clients are receiving adequate and timely employment and behavioral health treatment services.

Expand Targeted Training and Technical Assistance to Enhance Program Fidelity

AMH measures IPS program fidelity and provides training and technical assistance to LME-MCOs and IPS provider networks to support the implementation of IPS with exemplary fidelity. To build on this support, AMH plans to target technical assistance to providers facing program barriers such as behavioral health integration, career profile services development, and follow along supports.

Additionally, AMH will begin requiring LME-MCOs to meet with IPS provider teams with fidelity scores of "fair" or lower to discuss their barriers and develop an action plan to strengthen program fidelity.

Increase Engagement to Strengthen Support of the IPS Model

AMH recommends including LME-MCO and Department of Health and Human Services leadership in the quarterly IPS steering committee call to continue strengthening program buy-in.

Mobile Crisis Management

NC Results First Program Evaluation

Mobile Crisis Management (MCM) is a crisis community outreach program that provides immediate telephonic response to assess crises and determine the risk, mental status, medical stability, and appropriate response for an individual. Once triaged, MCM can provide callers access to services, treatment, and supports for acute mental health, developmental disabilities, or substance use.

Research evidence shows that Mobile Crisis Management is effective at reducing psychiatric hospitalization and crime related to serious mental illness.

AMH and OSBM used benefit-cost analysis tools to estimate the program's return on investment. Given uncertainties around the exact makeup of the population served by mobile crisis management, crime outcomes are modeled in two distinct ways. The first analysis provides an estimate of the expected per person return on investment for an individual whose likelihood of becoming involved in the criminal justice system mirrors that of the general population. Meanwhile, the second analysis provides a per person estimate of the return on investment for individuals whose likelihood of crime mirrors that of individuals who have had contact with the criminal justice system and are considered low risk.

This program generates higher benefits when delivered to criminal justice system-involved participants because impacts from reduced crime are more pronounced for a population with a higher likelihood of recidivism. In contrast, the benefits for the general population do not outweigh the cost of delivery. It is not possible to determine whether the state can expect an overall positive return on investment without a better understanding of the population being served.

Benefit-Cost Analysis

A marginal cost analysis was conducted to determine the per person cost of the average mobile crisis management interaction. OSBM worked with AMH staff to pull billing data for MCM to determine the average number of units reimbursed per person and the average rate billed per unit. On average, individuals utilize 15.3 units (3.8 hours) of MCM services at an average cost of \$65.06 per unit. This results in an average cost of \$998 per interaction with Mobile Crisis Management.

Accounting for variation in key estimates, there is a 16 percent chance the benefits will outweigh the program delivery costs when the program is delivered to the general population, increasing to 86 percent when MCM is delivered to criminal justice system-involved participants.

Table 1: Benefit-Cost Summary (2020 Dollars)	General Population	Criminal Justice System-Involved, Low Risk
Benefits per participant	\$ 645	\$ 4,477
<i>Reduced Crime</i>	\$43	\$ 3,875
<i>Reduced Psychiatric Hospitalization</i>	\$602	\$ 602
Costs per participant	\$ (998)	\$ (998)
Benefits less costs	= \$ (352)	= \$ 3,480
Benefit to cost ratio	\$0.64 per dollar invested	\$4.44 per dollar invested
Likelihood benefits will exceed costs	16%	86%

Monetized Benefits

Monetization of the program's impact on psychiatric hospitalization relies on statewide and national data on psychiatric hospitalization rates and average costs.

Benefits related to reduced crime reflect avoided criminal justice system and victimization costs associated with a conviction. The estimated program impact on crime is applied to the likelihood an individual will be convicted of a criminal offense.^[12] This analysis reflects the crime outcomes of a general population as well as a criminal justice-involved population that is considered low risk.

12. Benefits may include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

Of the \$645 in benefits per person for the general population, taxpayer gains from reduced psychiatric hospitalization and crime account for \$498. Reduced crime victimization accounts for \$148.

In comparison, when MCM is delivered to individuals who have been involved in the criminal justice system it reduces their likelihood of a future criminal conviction, generating higher benefits from avoided crime victimization and criminal justice system utilization costs. Benefits total \$4,478 per person served.

Table 2: Benefits by Perspective	General Population	Criminal Justice System-Involved, Low Risk
Taxpayer	\$491	\$1,027
<i>Federal</i>	\$354	\$354
<i>State</i>	\$135	\$394
<i>Local</i>	\$3	\$279
Participants	\$7	\$7
Other ^[13]	\$148	\$3,444
Total	\$645	\$4,478

Recommendations & Next Steps

Strengthen Outreach to Criminal Justice System Involved Individuals and Track Utilization Data

When Mobile Crisis Management is utilized by criminal justice system-involved individuals, defined as convicted individuals in community supervision who are considered low risk, benefits associated with reduced crime are much higher with overall benefits totaling \$4.44 for every dollar invested in the program. This analysis suggests that the program is extremely beneficial to this population and the AMH will strengthen coordination with Court Services and Community Supervision to ensure they are aware of Mobile Crisis Management and referring individuals they work with to the service when appropriate.

Track Service Population Characteristics and Program Outcomes

Additionally, to better estimate the average return on investment of the program and improve targeting, Adult Mental Health staff will work with LME-MCOs to track data on the population utilizing Mobile Crisis Management services. This should include source of referral and follow through tracking on outcomes of intervention – diversion from emergency department use, inpatient hospitalization, and criminal justice system involvement.

13. The likelihood that an individual will be convicted of a criminal offense is based on a Washington State baseline. Analysis assumes that the North Carolina baseline would be the same or similar.

Peer Support Services

NC Results First Program Evaluation

Peer Support Services reduces symptoms, promotes recovery, and increases functioning and community living skills among individuals with mental illness and substance use disorders.

Research evidence shows that Peer Support Services is effective at reducing psychiatric hospitalization and increasing employment.

AMH and OSBM also used benefit-cost analysis tools to estimate the program's return on investment.

Benefit-Cost Analysis

The analysis found that, on average, the value of expected benefits of \$4,767 per person exceed the program delivery costs of \$3,992 resulting in a net benefit of \$775 per person, a return of \$1.19 per dollar invested in the program. Accounting for variation in key estimates, there is a 65 percent chance that the benefits will exceed the costs.

A marginal cost analysis was conducted to determine the average per person cost of Peer Support Services. OSBM worked with AMH staff to compile billing data for Peer Support to determine the average number of units reimbursed per person and the average rate billed per unit.

Both group and individual Peer Support Services are available from providers, but individual services are most often used. On average, individuals utilize 308 units (77 hours) of individual Peer Support Services at an average cost of \$13 per unit. This results in an average cost of \$4,369 per person for individual Peer Support Services.

On average, individuals utilize 19 units (4.8 hours) of group Peer Support Services at a cost of \$3 per unit. This results in an average cost of \$55 per person for those services. The cost estimates were weighted based on relative utilization of group versus Individual Peer Support Services for a final cost of \$3,992 per person.

Monetized Benefits

On average, for every individual who utilizes Peer Support Services, we can expect \$4,767 in total benefits over the lifetime of the participant. Of the total benefits per person, \$4,468 accounted for benefits stemming from higher labor market earnings, while \$118 accounted for cost avoidance related to a reduction in psychiatric hospitalization.

Reduced psychiatric hospitalization is measured by the program's impact on admission to a psychiatric ward or hospital. Monetization of the impact relies on statewide and national data on psychiatric hospitalization rates and average costs.

Increased employment is measured by changes in any employment, including part-time employment. Monetization of the outcome estimates increases in labor market earnings attributable to the program.

Table 1: Benefit-Cost Summary (2020 Dollars)

Benefits per participant	+ \$ 4,767	\$ 1.19 per dollar invested Benefit to Cost Ratio
<i>Increased Employment</i>	\$ 4,648	
<i>Reduced Psychiatric Hospitalization</i>	\$ 118	
<i>Reduced Crime</i>	Unmonetized	
<i>Increased Global Functioning</i>	Unmonetized	
<i>Reduced Homelessness</i>	Unmonetized	
<i>Reduced Psychiatric Symptoms</i>	Unmonetized	65% Likelihood benefits will exceed costs
Costs per participant	-\$ (3,992)	
Benefits less costs	= \$775	

Taxpayer gains from higher employment and reduced psychiatric hospitalization account for \$1,483 of the per person benefits. Higher earnings for participants account for \$3,262. Other benefits may include the benefits from employer-paid health care, or the economic benefits from a more educated workforce.

Benefits By Perspective

Taxpayer	\$1,483
<i>Federal</i>	\$959
<i>State</i>	\$307
<i>Local</i>	\$216
Participants	\$3,262
Other ^[14]	\$21
Total	\$4,767

Non-Monetized Outcomes

Outcomes related to reduced crime, measured by number of convictions, were not monetized for the program because of the lack of rigorous research evidence. The remaining outcomes not monetized in the analysis are difficult to quantify monetarily and were excluded.

However, benefits related to increases in global functioning, or how well individuals with serious mental illness have adapted to activities of daily life, had the greatest observed effect of all outcomes related to the utilization of Peer Support Services.

Recommendations & Next Steps

Expand Provider Training Opportunities

Given the strong evidence behind the effectiveness of Peer Support Services, AMH recommends additional providers across the state offer Peer Support Services. Peer Support Specialists are required to complete a 40-hour training program to become a Certified Peer Support Specialist. To ensure the training is accessible, AMH plans to direct more funding to cover provider training costs for all providers that do not currently offer Peer Support Services due to their lack of Certified Peer Support Specialists. AMH expects that eliminating training costs that must be covered by providers will promote expansion of providers across the state, increasing access for North Carolinians.

Track Program Outcomes

AMH does not currently track Peer Support Services client outcomes when it is delivered as a standalone program. AMH will explore how to track client program outcomes, including increased employment and reduced psychiatric hospitalization. Tracking outcomes will allow AMH to collect state-specific data and determine whether participants are achieving better outcomes as observed in the research literature

14. Benefits may include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

Resource Intensive Comprehensive Case Management

NC Results First Program Evaluation

Resource Intensive Comprehensive Case Management (RICCM) is a pilot case management program that assists individuals not currently connected to services access a wide variety of community resources with the goal of decreasing emergency department utilization for non-emergent behavioral health crises.

Research evidence shows that RICCM, currently implemented as a pilot in North Carolina, is effective at reducing the frequency of emergency department visits and hospitalization

AMH and OSBM also used benefit-cost analysis tools to estimate the program's return on investment.

Benefit-Cost Analysis

On average, the expected program benefits of \$11,819 per person exceed the per person cost of \$4,203 resulting in a net benefit of \$7,616 per person, a return of \$2.81 for every dollar invested in the program.

Accounting for variation in key estimates, there is a 49 percent chance that the benefits will exceed the costs RICCM is used as an intervention for adults with serious mental illness.

The analysis found on average, RICCM costs \$4,203 per participant. RICCM is a six-month program that serves between 300- 350 individuals per year. To account for the participation range, program costs were calculated based on a midpoint estimate of 325 individuals per year.

Monetized Benefits

Emergency department (ED) visits and hospitalization are the two monetized benefits for RICCM. The model estimates the impact of participation in RICCM in terms of the avoided health care costs attributable to the reduced likelihood of ED visits or admissions and hospital admissions.

Of the total benefits per person, \$3,791 accounted for benefits stemming from decreased admissions, while \$8,026 accounted for cost avoidance related to a reduction in ED visits.

Table 1: Benefit-Cost Summary (2020 Dollars)

Benefits per participant	\$ 11,819	\$ 2.81 per dollar invested Benefit to cost ratio
<i>Hospitalization</i>	\$ 3,791	
<i>ED Visits</i>	\$ 8,026	
Costs per participant	\$ (4,203)	49% Likelihood benefits will exceed costs
Benefits less costs	= \$ 7,616	

On average, for every individual who participates in RICCM, we can expect a benefit of \$11,819 related to a reduction in hospitalizations and ED visits. Taxpayers can expect a total of \$5,338 in benefits while participants are expected to receive \$546 in benefits.

A total of \$5,934 in other benefits are expected over the course of a participant's lifetime, which may include reductions in crime victimization, the economic benefits from a more educated workforce, and benefits from employer-paid health insurance.

Table 2: Benefits by Perspective

Taxpayer	\$5,338
Federal	\$4,666
ED Visits	\$1,130
Hospitalizations	\$3,535
State	\$672
ED Visits	\$251
Hospitalizations	\$421
Participants	\$546
ED Visits	\$375
Hospitalizations	\$171
Other ^[15]	\$5,934
Total	11,819

Recommendations & Next Steps

Fund One Additional RICCM Team

AMH plans to release a new Request for Application (RFA) to fund one additional RICCM team, expanding the proven, cost-effective program. The provider that is selected through the request for application process will work with the existing team to replicate the process and data collection to ensure program fidelity. Community needs and ED utilization will dictate where the additional RICCM team will be placed in the state.

Monitor North Carolina Specific Program Outcomes

Once the additional RICCM team is operational, AMH will continue to track individual ED utilization, hospitalizations, and outpatient services engagement. Tracking these three outcomes will allow AMH to collect state-specific data and determine whether participants are achieving the expected program outcomes based on the research literature.

15. Benefits may include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

General Recommendations

Increase Funding to Expand Proven Effective and Promising Programs

AMH plans to prioritize budget requests for proven effective and promising, cost-effective programs including IPS, Peer Support Services, and RICCM, which are currently not available throughout the state. Increasing funding for these programs will expand program access to individuals across North Carolina. Additionally, the return on investment analysis for these three programs shows that long term benefits from avoided hospitalization and increased employment outweigh the short-term investments in expanding the program.

In addition to requesting funding during the budget process, AMH also plans to apply for grants to support program expansion and to enhance their capacity to monitor program outcomes as programs are expanded across the state.

Expand the Use of Value-Based Payment Models to Improve Outcomes

Value based payment (VBP) models can be used to reward providers for delivering high-quality care and improved outcomes. A VBP model is currently implemented with several LME-MCOs for IPS. AMH recommends that all LME-MCOs participate in VBP for IPS. AMH will also explore expanding VBP to Assertive Community Treatment (ACT) to incentivize improved outcomes and maximize funding.

Create Research Partnerships to Evaluate Programs Lacking Rigorous Evidence

AMH will develop research partnerships to evaluate the 13 theory-based programs included in the inventory that require additional research to measure their effects. Of the 13 theory-based programs, AMH will prioritize Community Support Team (CST), Psychosocial Rehab, Peer Operated Respite, and Transition Management Services (TMS).

About the North Carolina Results First Initiative

The North Carolina Results First Initiative helps the state identify programs that generate positive outcomes and maximize the value of taxpayer dollars. Through Results First, OSBM and agency partners review high-quality evidence to determine the effectiveness of publicly funded programs and conduct benefit-cost analyses to identify high-return investments.

The Results First framework is based on research synthesis and benefit-cost modeling developed by the Pew Charitable Trusts^[16] and the Washington State Institute for Public Policy (WSIPP). OSBM customizes the benefit-cost model to the North Carolina context and provides support for agency partners to implement the analytical tools within the Results First framework.

Insights from conducting evidence reviews and benefit-cost analyses of publicly funded programs can inform program delivery, contract design, resource allocation, and future research priorities.

16. Results First Cost-Benefit Model Aids Policymakers in Funding Decisions | The Pew Charitable Trusts (pewtrusts.org)