

**Evaluation of the Business Case
for Quality, Phase II**

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While we benefited from the help of others, we alone are responsible for any errors or omissions in the report. Any opinions expressed in the report also are our own and do not necessarily reflect the views of any of the involved organizations.

DEDICATION

This report is dedicated to Carol Porter, a long-time analyst at the Cecil G. Sheps Center at the University of North Carolina at Chapel Hill, for her extensive work on the BCQII claims data analysis.

CONTENTS

	EXECUTIVE SUMMARY	vii
I	INTRODUCTION	1
	A. BCQII Interventions.....	2
	B. Identifying a Business Case for Quality in Medicaid and Aligning Financial Incentives	3
	C. Organization of this Report	4
II	METHODS	5
	A. Evaluation Design for Each Grantee	5
	B. Data Sources	7
	C. Statistical Methods to Examine Intervention Impacts.....	7
	D. Key Informant Interviews	8
	E. Return on Investment Analysis.....	8
III	FINDINGS FROM THE BCQII EVALUATION	11
	A. Detailed Findings by BCQII Grantee.....	13
	1. The Alameda-CHRCO ATTACK Clinic	13
	2. Cincinnati Children’s Asthma Improvement Collaborative	17
	3. Monroe Plan’s Pediatric Asthma Care Enhancement Project.....	23
IV	CONCLUSIONS FROM BCQII AND IMPLICATIONS FOR THE BUSINESS CASE FOR QUALITY IN MEDICAID	28
	REFERENCES.....	35
	APPENDIX A: TECHNICAL APPENDIX ON EVALUATION METHODS	A.1
	APPENDIX B: ROI TECHNICAL METHODS	B.1
	APPENDIX C: KEY INFORMANT INTERVIEWS	C.1

TABLES

II.1	Overview of Evaluation Design, by BCQII Grantee	6
II.2	Primary Research Analyses and Subgroup Analyses, by BCQII Grantee.....	7
III.1	Percentage Of Children with Asthma-Related Emergency Department (ED) Visits	15
III.2	Alameda Alliance: Return on Investment from BCQII Intervention	16
III.3	CHRCO ROI Analysis Results for Two Scenarios.....	17
III.4	Differences in the Average Annualized Number of Emergency Department Visits Between Treatment and Comparison Group Populations in the Asthma Improvement Collaborative Study Population, Regression-Adjusted.....	20
III.5	Differences in Asthma Medication Use Between Treatment and Comparison Group Populations in the Asthma Improvement Collaborative Study Population, Regression-Adjusted.....	21
III.6	Return on Investment for the Cincinnati Children’s AIC Intervention	22
III.7	Select Outcome Measures for the PACE Intervention, Regression-Adjusted ..	25
III.8	Monroe Plan Return on Investment	26
III.9	PACE Treatment Group Practices’ Average Return on Investment for the BCQII Intervention, By Practice Size	27

EXECUTIVE SUMMARY

The Business Case for Quality, Phase II (BCQII) initiative sought to develop targeted, rigorous, and actionable evidence on improvements in the quality of care and the return on investment (ROI) that may be generated to multiple stakeholders if financial incentives are aligned and health care delivery changed to improve care for Medicaid beneficiaries with chronic medical conditions—in this case, children with asthma. BCQII was sponsored by the Center for Health Care Strategies (CHCS) and funded by the Robert Wood Johnson Foundation and the Commonwealth Fund. Based on a competitive process, three grantees— (1) a partnership between the Alameda Alliance for Health and the Children’s Hospital and Research Center at Oakland (Alameda-CHRCO), (2) Cincinnati Children’s Hospital Medical Center (Cincinnati Children’s), and (3) the Monroe Plan for Medical Care (Monroe Plan)—were selected to participate. Applicants proposed specific interventions consistent with existing evidence and agreed to participate in a research study structured to determine the impact of their interventions and their ROI.

BCQII was a followup to the original BCQ demonstration launched in April 2004. That initiative tested the existence of a business case for quality for ten Medicaid managed care organizations that implemented a range of pilot interventions. Interventions with positive results from the original BCQ initiative included: a complex case management program for adults with multiple co-morbidities; case management for children with high-risk asthma; a community-based outreach program for high-risk pregnant women; and a care management program for adults with diabetes. BCQII built off the findings from its predecessor and learned from its challenges. In particular, BCQII focused on a condition with a strong evidence base (pediatric asthma), included a grantee-planning period, had a longer demonstration period than BCQ, and relied on rigorous intervention and evaluation design.

The grantees tested three interventions over an intervention period that began in July 2008 and ended in June 2011.

- The **Alameda-CHRCO** intervention, a partnership between a Medicaid managed care plan and a children’s hospital in Alameda County, California, referred children using the emergency department (ED) for asthma to the *Asthma Tools and Training Advancing Community Knowledge (ATTACK)* clinic to improve knowledge of asthma and asthma-management skills. At this newly established clinic, staff taught children and their family members how to treat asthma, recognize asthma triggers, and avoid future asthma attacks, with the goal of improving their asthma management skills and decreasing their return ED visit rate.
- **Cincinnati Children’s** Asthma Improvement Collaborative (AIC) undertook a system-wide approach to improving pediatric asthma care in Hamilton County, Ohio. It included an inpatient quality improvement initiative, care coordination services in outpatient clinics, and a home health program. The inpatient initiative sought to improve patient medication use and asthma assessment tools by hospital staff. In the outpatient setting, care coordinators worked with children and their families on asthma self-management skills. The home health program provided support to families in the

form of in-home visits from a registered nurse who would assess the home for asthma triggers and offer asthma education. This multifaceted approach sought to improve asthma management, increase appropriate use of asthma medications, reduce return ED and hospital visits for asthma, and improve quality of care.

- **Monroe Plan's** Pediatric Asthma Care Enhancement (PACE) project engaged primary care providers to improve quality of care for children with asthma. Monroe Plan offered providers a monetary incentive to conduct chart reviews, which included an array of asthma care measures, for a sample of their own Monroe-insured children with asthma, and reviewed their performance compared with that of other participating treatment group practices. Monroe also led collaborative meetings for participating treatment group practices every six months to discuss best practices in asthma care management. PACE aimed to increase providers' awareness of how often they provide care in accordance with accepted clinical guidelines, with the goal of improving care and ultimately reducing asthma-related ED and hospital use.

We tailored the research designs used in the evaluation to suit each grantee's intervention. All three designs, however, included common quantitative and qualitative components. Features of the quantitative analysis included examination of changes in care as measured through interventions' impacts on key outcomes of interest (such as ED visits and hospital admissions) using Medicaid claims, relative to a randomly assigned control group or a nonexperimental comparison group. We also estimated the financial ROI for each intervention, taking into account changes in health care costs and the operational costs to implement the interventions, from multiple stakeholder perspectives. The qualitative portion of the evaluation included an implementation analysis that relied on key informant interviews to identify intervention details, challenges encountered by grantees, and lessons learned during BCQII.

WHY THE BUSINESS CASE IS IMPORTANT FOR MEDICAID

Many recent health reform efforts and initiatives have focused on the three-part aim of enhanced patient experience, improved population health, and reduced per capita costs (Berwick et al. 2008). Payment reforms—central to many aspects of health reform—represent a general movement away from fee-for-service (FFS) reimbursement (that is, paying for each visit or procedure) and toward paying for quality and coordination to provide financial incentives for *better*—rather than *more*—care and, ultimately, better health. This is perhaps most evident in the recent focus on accountable care organizations (ACOs), which combine both delivery and payment reform and thereby push providers to take a collective approach to provide more organized, coordinated care for patients in return for the promise of sharing in any resulting cost savings. (See McGinnis and Small [2012] for more information on Medicaid ACOs.)

Cost containment is a particularly acute issue for Medicaid, as many state agencies have encountered serious financial distress with the economic downturn of the past several years. Moreover, the upcoming coverage expansions in 2014 could result in further strain (Bachrach 2010). In such an environment, the tendency has often been to engage in across-the-board cost cutting to ease financial hardships. However, simply cutting payment rates or services could result in restrictions on care, worse outcomes, and even higher costs if health care use rises. A focus on high-yield activities that improve quality and reduce costs (or at least do not add to them) encourages

providers to invest in primary care to reduce the need for expensive hospitalizations and ED visits, rather than limit services. Because asthma is the most common chronic childhood illness and disproportionately affects low-income populations (Barta 2006), it is not surprising that it is an important driver of high costs for the pediatric Medicaid population.

Cost containment alone, however, is insufficient; programs must also improve health care quality and demonstrate a positive ROI, given the nationwide trend toward value-based purchasing and accountable care combined with the budget pressures facing Medicaid programs. Interventions that can improve quality while demonstrating a positive ROI for all stakeholders allow Medicaid agencies and health plans to collaboratively target effective strategies to improve quality and still gain financially. This is particularly important in an environment where neither stakeholder (payer or provider) can afford to lose money that it does not have to spend. Given this context, studies that demonstrate the business case for pediatric asthma interventions are becoming more prevalent in the literature (Cloutier et al. 2009; Hoppin et al. 2010; Sommer et al. 2011; Karnick et al. 2007). This BCQII evaluation adds to existing literature by tracking the results of three disparate asthma intervention programs in three different setting types, using several years of pre- and post-intervention data; rigorously comparing the results to randomly assigned control groups or robust, nonexperimental comparison groups; and calculating ROI for multiple stakeholders.

EVALUATION FINDINGS

Grantees' success at achieving the goals of improving quality of care and demonstrating a business case for quality was mixed. Although implementation was fairly successful, and there were promising signs that grantees were able to affect some intermediate outcomes, grantee interventions did not have a measurable impact on the rate of ED visits or hospitalization rates. As a result, the grantees did not achieve a positive ROI during the relatively short intervention period. Collectively, these findings demonstrate that achieving a business case is difficult, particularly for newly established interventions, with their unanticipated challenges, their need to implement process improvements, and the time required for improvements to affect health care use and produce financial gains.

Despite findings from the outcomes and ROI analyses, each grantee successfully implemented its multi-year intervention, which required engagement of children with asthma and their families as well as the involvement of stakeholders with the opportunity to gain or lose financially from the initiatives. However, they each did so primarily because of ongoing monitoring that identified and addressed problems that arose in the course of implementation. Although the grantees implemented quite different interventions, each shared the common goals of increasing quality of care for children with asthma, aligning financial incentives to provide high-quality care, and demonstrating an ROI— or making a business case—for quality in Medicaid.

Moreover, despite a lack of evidence on ROI, two of the three BCQII sites were able to sustain their interventions after the initiative ended. This reflects not only successful implementation of the interventions, but also stakeholder buy-in and an internal assessment among leadership that the work improved patient care and might have yielded an ROI. Although the evaluation found no positive financial returns, these grantees are still committed to demonstrating an ROI in the future, which is important to sustaining support from leadership. The primary evaluation findings for each grantee are described below.

Alameda-CHRCO ATTACK Clinic

The Alameda-CHRCO ATTACK clinic’s attempt to affect the rate of return ED visits for asthma at the population level had to overcome *slow recruitment of eligible children, initial reluctance of ED staff to support the intervention, and limited participation by those referred to the clinic*. Although 40 percent of children who were referred to the clinic actually visited the clinic, only 13 percent of all children in the treatment group ever visited the ATTACK clinic. In addition, while the ATTACK visit was quite intensive—likely providing patients and their families with more asthma education than they had ever received and connecting them to other resources in the community—it involved a single visit and may not have been enough to affect patient outcomes over the longer term.

The ATTACK clinic *did not affect the return ED visit or hospitalization rate for asthma* among children randomly assigned to its experimental treatment group or those who visited the clinic compared to a nonexperimental comparison group. The one-time clinic visit also did not affect other intermediate outcomes such as subsequent office visits or asthma medication use among Alliance-insured children. Even after accounting for potential reimbursement to CHRCO for ATTACK clinic visits, the ROI for both the Alliance and CHRCO was negative—due partially to lack of impacts on utilization but also to high clinic operating costs.

Despite the lack of impacts at the population level, *the insurers are working with CHRCO to begin reimbursing for ATTACK clinic services based on the belief that the clinic provides valuable asthma education services that reduce risk of return emergency department visits in the future*. After providing asthma education to nearly 550 children and their families, the ATTACK clinic was moved to the hospital’s primary care clinic with a signed contractual agreement from the Alliance to reimburse for asthma education services. Moreover, at the time of this report, CHRCO was also in negotiations with Anthem Blue Cross, the other Medicaid managed care plan in Alameda County, about reimbursement for these services.

Cincinnati Children’s Asthma Improvement Collaborative

Cincinnati Children’s AIC activities evolved continuously and resulted in *successful implementation in the hospital, outpatient clinic, and home settings*. While the intervention encountered staffing challenges in the inpatient setting and work flow issues in the outpatient setting, the Cincinnati Children’s team reacted to such issues quickly and adjusted its approach accordingly.

The system-wide intervention had positive *results on process and inconclusive results for outcome measures*. Trends in inpatient process measures related to patients having asthma medications at discharge and transitioning patients into case management improved over the intervention period. In the outpatient setting, there was also evidence of improvement in the proportion of patients receiving written asthma care plans and, among those who received coaching, improvements in the proper use of asthma devices such as spacers and metered-dose inhalers. The ED visit rate decreased faster in Hamilton County than in comparison counties during the intervention period; however, this difference is more likely due to *the long-term, preexisting downward trend in ED use by children with asthma in Hamilton County rather than to program impacts*.

The Cincinnati Children’s system-wide approach made inroads at *changing the culture of asthma care at the hospital* during the BCQII initiative, and AIC activities will continue into the future as part of Beacon Communities and other work. The close collaboration of staff across multiple health

care settings was a critical component, and one that distinguished BCQII from Cincinnati Children's prior asthma work.

Monroe Plan Pediatric Asthma Care Enhancement Project

The Monroe Plan *successfully implemented the PACE intervention*, meeting regularly with almost all physician practices invited to participate in one-on-one meetings, through periodic collaborative meetings, and via other activities designed to improve pediatric asthma care. In addition, 11 of 13 treatment group practices completed each round of chart audits, although *some participating practices found it difficult to complete* chart audits in a timely way, which stretched data collection and reporting periods. Moreover, confusion among practices about how to collect certain data elements, such as asthma action plans, led Monroe Plan staff to provide additional technical assistance and training.

PACE practices *improved adherence to recommended guidelines for asthma care* relative to control group practices, including providing written asthma action plans to patients, prescribing appropriate asthma medications, providing flu vaccines, and conducting environmental assessments for smoke more regularly. Children with asthma assigned to treatment group practices also had more office visits for asthma in the first and third years of the initiative and were more likely to have fills for appropriate (more controllers and fewer rescue) medications than children in control group practices. However, the intervention did not have an effect on ED or hospital utilization of children with asthma.

The overall ROI for Monroe Plan was negative and was driven by large incentive fee costs paid to practices and the lack of impact on ED and hospital use. However, *Monroe Plan did achieve a positive ROI among the subgroup of small physician practices* (those with fewer than 100 children with asthma), a result primarily of changes in inpatient and outpatient use.¹ Moreover, *all participating practices achieved a substantial positive ROI* from the intervention, as a result of the sizable chart audit incentive fees practices received relative to the amount of time required to conduct the chart audits.

IMPLICATIONS FOR THE BUSINESS CASE IN MEDICAID

BCQII provides lessons for health care agencies and organizations that wish to implement quality improvement programs for pediatric asthma and for policymakers wishing to better align incentives to reward quality. Lessons include considering ROI during program design, targeting the appropriate populations, identifying potential challenges proactively, engaging providers and patients, monitoring performance, and managing expectations. As the Centers for Medicare & Medicaid Services and state Medicaid agencies consider initiatives that encourage value while controlling costs, providers must begin to think beyond FFS, toward a paradigm in which they are accountable for care, and ultimately, health. Efforts that target high-cost, high-risk populations—

¹ This analysis allocated investment and operating costs between small, medium, and large practices proportionally by number of members allocated to each practice size at baseline; as a result, we allocated 18 percent of investment and operating costs to small practices, 38 percent to medium, and 44 percent to large. Since a portion of investment and operating costs are fixed, this allocation will underestimate the expected cost to Monroe Plan of implementing the PACE intervention on only one practice size subgroup. However, even if we had increased the amount of investment and operating costs attributed to small practices by threefold, Monroe Plan would have still achieved a positive ROI on the small practices subgroup.

such as patients with asthma among Medicaid children—are likely to continue to receive considerable attention. Sound structuring of financial incentives for such initiatives will be particularly important. Moreover, a clear understanding of their implementation and careful monitoring of intermediate outcomes will be crucial to understanding whether and how they are affecting the quality of care in Medicaid. Targeting these efforts to the practices (or other care delivery entities) in the system where they can have the greatest impact, and tailoring these efforts to the needs and preferences of patients, will be critical to success.

Consider ROI During Program Design and Set Financial Incentives Appropriately

To achieve a positive ROI for improved quality of care, BCQII grantees had to not only improve quality of care and health care utilization, but do so in such a way that savings from quality improvement exceeded intervention costs. However, achieving such a goal can be daunting, particularly if investment and operating costs are high. For example, to match its high operating costs, Alameda-CHRCO would have had to realize substantial reductions in hospital and ED use. To help maximize an initiative's potential for achieving a positive ROI, health care organizations should factor ROI considerations into their program design as BCQII did at the start of this initiative. For instance, Monroe Plan's incentive program resulted in sizable payouts to large practices. Achieving a positive ROI in such a situation would require large shifts in ED and hospital use among patients of those practices, something which intervention leaders understood from the start. Conducting a preliminary analysis of potential intervention costs and possible ROIs would provide implementers with a guide from which to benchmark their performance related to ROI during the intervention period.

Because there was little evidence of an immediate positive ROI for BCQII grantees, their experience indicates that agencies and organizations seeking to align financial incentives with improved quality should consider incentive design at the outset of any initiative to identify the appropriate balance of incentive size to potential intervention value. In many cases, financial incentives must be tailored to different settings or stakeholders to ensure that they elicit the appropriate level of participation while still providing the opportunity for a positive ROI if quality of care does in fact improve. For instance, the Monroe Plan's ROI was positive when we considered only the experiences of small practices to which it made considerably smaller total payments than it made to other providers.

Attain Meaningful Engagement with a Large Proportion of High-Risk Populations

Focusing on high-risk populations, as Alameda-CHRCO and Cincinnati Children's did in their BCQII interventions, is not enough to achieve a positive ROI without also attaining meaningful engagement of a large proportion of that population. BCQII grantees attempted to affect quality of care and health care utilization for large populations of children with asthma either by directly working with children and their families or by interacting with primary care practices. To have an effect on quality or utilization at the population level, it is necessary to identify and engage high utilizers of care who also tend to be high-risk members. Further, a considerable proportion of the high-risk population must be engaged in quality improvement activities in a meaningful way; otherwise, desired effects are unlikely. For example, while 55 percent of the highest-risk children (those with *two or more* previous ED visits for asthma) in the Alameda-CHRCO study population were referred to the ATTACK clinic by an ED physician, only 20 percent of these children actually visited the clinic. Thus, while the ATTACK clinic intervention was designed to target higher-risk children, having only a small proportion of these children visit the clinic made it more difficult for ATTACK clinic staff to affect the return ED visit rate for asthma among this group. Furthermore, children and families in this population also face considerable barriers to achieving appropriate care and these same barriers likely made it challenging to visit the ATTACK clinic or Cincinnati Children's outpatient clinics.

The BCQII experience also demonstrates that patient engagement is difficult at the population level in Medicaid and likely affects the ability of an intervention to have an impact on health care outcomes and to achieve a positive ROI. Among the three interventions tested, Cincinnati Children’s engaged patients over multiple visits, both in the outpatient clinic and in its home health component, where a registered nurse would visit children’s homes. However, the degree to which children and their families were actively engaged over time is unclear. Engaging patients in quality improvement activities, and perhaps in the design of those activities—so that they become motivated to improve their own health—might be an option for organizations to consider. During the intervention planning stages, organizations must identify the appropriate level of intervention intensity (for example, one-time visit versus ongoing coordination of care) and engagement that balances optimal patient engagement and the potential to achieve a positive ROI.

Identify Strategies to Proactively Overcome Recruitment and Participation Barriers

Interventions that successfully recruit eligible members of a target population and achieve a high level of participation among these members are more likely to have an effect on outcomes and generate a positive ROI. Two of the three BCQII grantees, Monroe Plan and Alameda-CHRCO, experienced some challenges with patient or provider recruitment and participation. Alameda-CHRCO relied on ED physicians to refer children to the ATTACK clinic on treatment days, but the physicians did not always remember to do so, while some might have been opposed to random assignment of children into treatment and control groups. In addition, various barriers to visiting the ATTACK clinic on a separate date meant that only 13 percent of eligible treatment group patients ever attended, which reduced the likelihood that the intervention could have much impact at the population level. Monroe Plan relied on the active engagement and participation of providers and was able to achieve a relatively good rate of participation among this group, but still found it challenging to consistently engage those practices outside the Rochester area.

Identifying strategies to overcoming obstacles to recruitment and participation should be an integral part of intervention planning and design, as such barriers can significantly influence programs’ abilities to make a business case for quality. Organizations pursuing such programs should leverage the experiences of multiple stakeholders to proactively identify lessons learned from prior efforts and successful strategies for working with the target populations.

Engage Providers and Patients Actively by Targeting Interventions at Both Groups

For interventions focused on changing the way care is delivered, it is critical to actively engage providers and to ensure that they “buy in” to the intervention’s goals and are motivated to participate fully in the intervention. For all BCQII grantees, clinical leadership played a vital role in engaging other providers, and physician champions proved essential to implementation success. Monroe Plan’s success in persuading almost all treatment group providers to participate in the intervention was facilitated by their ongoing, strong relationships with many providers, but considerable work was required to keep providers engaged and participating throughout the three-year period. For Cincinnati Children’s, the approach of holding regular, collaborative meetings for providers across settings helped to engage them and facilitated coordination across the various pieces of the intervention.

In addition, interventions must include components that engage both providers and patients. Interacting to affect change with one group without engaging the other can prove inefficient and costly. Because interventions like the ones tested for BCQII propose to change health care delivery systems, it is necessary to change both provider and patient behavior to improve quality of care. As such, before implementation can begin, health care organizations should identify the ways in which both groups will be targeted. For example, at Cincinnati Children's, the intervention team included not only provider- and patient-level components to improve health care delivery at the hospital and outpatient clinics for asthma, but also to better engage high-risk children and their families.

Monitor Implementation to Gauge Early Performance and Track Progress Throughout

Monitoring program implementation, in the form of intermediate outcome measures (such as the percentage of children who have an asthma action plan, who are prescribed appropriate medications, or who visit a clinic) helped BCQII grantees gauge whether their interventions were being implemented as planned and accomplishing short-term objectives. Such monitoring allowed grantees to address implementation issues, barriers, and shortfalls. Cincinnati Children's, in particular, used intermediate process and outcome data to continuously improve its processes and activities—tracking these measures on a monthly basis and communicating them to a variety of clinical staff involved with the AIC work. Monroe Plan used the data from physician chart audits to provide feedback to treatment group practices every six months, showing them how well they did on various measures compared with their PACE treatment group peers.

Without positive changes in intermediate outcome measures, it is unlikely that interventions will have an impact on longer-term outcomes or ROI. However, intermediate outcomes that move in the right direction do not alone guarantee a positive ROI. Such measures must be relevant and proximate to the outcomes of interest; a logic model may help in determining which intermediate measures are most appropriate in this regard. Additionally, tracking implementation at different stages of an intervention is critical to a complete understanding of the mechanisms through which the intervention affects patient and provider behavior. Once appropriate intermediate outcome measures have been established, organizations must also develop feasible information-gathering methods that promote quality improvement without hindering the usual workflow of a health care practice.

Manage Expectations About the Time Needed to Achieve a Positive Return on Investment

The BCQII experience indicates that achieving a positive ROI requires careful planning and inevitably includes many challenges, and that reaching this ultimate objective might not happen in the desired time frame. Health care organizations that initiate quality improvement programs should consider that even three years might not be enough to realize a positive ROI. Therefore, innovators must manage expectations of senior leadership on how long the organization must wait and how much it must invest before realizing a return. Moreover, organizations must plan ahead for how they will determine whether initiatives are effectively achieving an ROI, based either on internal calculations or external review, and identify the extent to which changing the culture around health care delivery matters as much as a positive financial return in the short term.

NEXT STEPS FOR MAKING THE BUSINESS CASE IN MEDICAID

Health care delivery system and payment reforms at the state and national levels rely on aligning the financial incentives of payers, providers, and patients to improve population health and patient experience with care, and to reduce health care costs. One argument for such initiatives is their potential win-win scenario in which shifting financial incentives improve quality of care but also result in positive returns to payers, providers, and patients. The experience of BCQII grantees suggests that such a scenario is difficult to obtain and that identifying the appropriate level and mix of financial incentives is not straightforward. Moreover, even if optimal financial alignment is identified, achieving success still requires (1) considerable upfront investment before realizing returns, (2) ongoing commitment and coordination across stakeholders, (3) meaningful engagement of providers and patients, and (4) interventions that result in reductions in costly health care utilization that outweigh the costs of implementation. As health care organizations and governments pursue new initiatives and reforms, leaders and policymakers should recognize that achieving a business case for quality in Medicaid rests on careful planning, patience, collaboration, and the development of evidence-based interventions that engage providers and patients in processes that result in higher-quality health care.

I. INTRODUCTION

In an era when health care costs are rising without a proportionate improvement in health care quality or patient outcomes, improving quality of care in Medicaid, and other settings, in a way that reduces cost has become a primary policy focus at the state and national level. In an environment of state and federal budget deficits, policymakers are interested in finding ways to cut Medicaid costs that consume an ever-growing percentage of annual budgets and leave them with a population that receives increasingly fragmented care and uses the health care system inefficiently. In recent years, state and federal interest has increased substantially in payment reform that moves the health care delivery system away from fee-for-service (FFS) and toward paying for health care quality and outcomes (such as accountable-care organizations and shared-savings programs), in an effort to achieve financial sustainability while improving the health of the populations they serve.

The Business Case for Quality, Phase II (BCQII) initiative sought to examine whether correcting financing misalignments that impede quality and improving quality of care for the Medicaid population can simultaneously provide a return on investment (ROI) for the various organizations that provide or pay for their care. Specifically, the BCQII initiative sought to develop targeted, rigorous, and actionable evidence on the ROI in improving the quality of care for Medicaid beneficiaries from the perspective of multiple stakeholders and to identify financial misalignments that discourage investments in quality as well as strategies for correcting them. Sponsored by the Center for Health Care Strategies (CHCS) and funded by the Robert Wood Johnson Foundation (RWJF) and the Commonwealth Fund, BCQII was a follow-up to the original BCQ initiative.² Unlike its predecessor, which examined ROI for a diverse number of medical conditions and Medicaid populations, BCQII focused on Medicaid-insured children with asthma, included a grantee planning period, had a longer demonstration period than BCQ, and relied on rigorous intervention and evaluation design.

CHCS chose to focus on pediatric asthma because of its prevalence (it is the most common chronic condition among Medicaid-insured children) and because of the high incidence of preventable utilization in Medicaid (during the baseline period, at least half of all children in the BCQII grantees' study populations had one or more ED visits for asthma). This creates an ideal environment in which to test interventions designed to improve quality and achieve a positive ROI. Three grantees—a partnership between the Alameda Alliance for Health and the Children's Hospital and Research Center Oakland (Alameda-CHRCO), the Cincinnati Children's Hospital Medical Center (Cincinnati Children's), and the Monroe Plan for Medical Care (Monroe Plan)—participated in BCQII, implementing different interventions that they conducted for three years between 2008 and 2011, with two of them (Alameda-CHRCO and Cincinnati Children's) obtaining support to continue their interventions beyond the BCQII grant period.

This report presents findings from the BCQII initiative, evaluating each intervention from both a quality outcomes and an ROI perspective. That is, we assess the effect that the interventions had on health care outcomes associated with quality and identify the financial implications (in other words, the business case) for improving quality from the perspective of multiple stakeholders. We

² Results from the original BCQ initiative are presented in Greene, Reiter et al. 2008.

also describe the interventions being tested, present process data (collected by the grantees), and identify implications for policymakers and other organizations wishing to implement programs that improve quality while providing a financial ROI.

In this chapter, we introduce the BCQII initiative, briefly describing each grantee intervention, and illustrating the potential for a business case for each. We then identify and describe the existing financing misalignments that were present for each grantee and associated stakeholders, and describe the potential financial returns that were possible as a result of each intervention

A. BCQII Interventions

Three grantees were selected for BCQII via a competitive process. The grantees' common goal was to improve quality of care for children with asthma while reducing health care costs and demonstrating a positive ROI.

The **Alameda-CHRCO** team developed the *Asthma Tools and Training Advancing Community Knowledge* (ATTACK) clinic to improve knowledge of asthma and asthma-management skills of children and their caregivers who visited the CHRCO emergency department (ED). ATTACK clinic staff taught children and their families how to treat asthma, recognize asthma triggers, and avoid future asthma attacks. Staff also referred children whose home environments might contribute to their asthma to further case management already available in Alameda County and made primary care appointments for all children who visited the clinic. The goal of these services was to enable children and their families to better manage asthma and its symptoms, resulting in a decrease in the overall return ED visit rate for children with asthma.

Cincinnati Children's *Asthma Improvement Collaborative* (AIC) consisted of an array of quality improvement activities that reflected a system-wide approach to improving pediatric asthma care in Hamilton County, Ohio. The intervention included an inpatient initiative, care coordination services in outpatient clinics, and a home health program. Specific activities included (1) improving asthma care coordination, including enhancements to medication discharge planning; (2) providing education on the proper use of spacers and inhalers to improve self-management skills; and (3) identifying environmental factors that exacerbate asthma symptoms. This multifaceted approach was expected to improve appropriate use of asthma medications, reduce the rate of ED and hospital visits for asthma, and improve overall quality of care.

Monroe Plan's *Pediatric Asthma Care Enhancement* (PACE) project was a provider-focused program that sought to improve children's quality of care by engaging providers through a chart audit intervention. Providers were asked to conduct chart reviews, which included an array of asthma care measures, for some of their patients with asthma, and review their performance compared with those of all other participating practices. PACE aimed to increase providers' awareness of whether the care they provide is consistent with clinical guidelines, such as providing patients with asthma action plans, monitoring symptoms, and prescribing appropriate medications. Monroe Plan staff also held collaborative meetings for practices and met every six months with invited speakers to discuss the project and best practices in asthma care management. By increasing providers' awareness of their performance relative to guidelines and their peers, the intervention expected to improve the care provided to children and ultimately reduce asthma-related ED and hospital use.

B. Identifying a Business Case for Quality in Medicaid and Aligning Financial Incentives

All three BCQII grantees were chosen because their proposed interventions (1) were designed to implement evidence-based approaches to improving quality of care for children with asthma, and (2) had the potential to make a business case for quality for multiple stakeholders. Next we present the business case for each intervention and identify the financing misalignments that each grantee sought to correct.

The Alameda-CHRCO ATTACK clinic offered asthma education and case management services to children who present with asthma in the ED. Alameda-CHRCO expected that children who received these services at the ATTACK clinic would have a lower rate of return ED visits, improve their control of asthma, and enjoy a higher quality of life. Because, at the beginning of the BCQII intervention period, the Alameda Alliance paid CHRCO on a capitated basis for its members' ED visits, the hospital stood to gain financially if it could reduce ED visits by Alliance members while operating the ATTACK clinic without a loss.³ This capitation arrangement was critical to garnering support from CHRCO leadership for the ATTACK clinic. The hospital also stood to gain if it could substitute non-Alliance Medicaid-insured children's ED visits with visits from privately insured children, because the marginal gain from a private visit is higher than for a Medicaid visit. Payers with an FFS payment arrangement with CHRCO for their members' ED visits and hospitalizations also stand to benefit by reimbursing CHRCO for ATTACK clinic visits, as long as the fees they pay to CHRCO are no greater than the savings they accrue from lower overall utilization.

While the Alameda-CHRCO team did not modify financial incentives at the outset of BCQII, through the ATTACK clinic intervention, CHRCO sought to re-align future financial incentives by making the case to payers such as the Alameda Alliance for reimbursement of ATTACK clinic services. While payers might benefit financially from CHRCO's efforts to improve quality of care for children with asthma, in the absence of BCQII, CHRCO would have had to pay the full cost of initiating these efforts. The BCQII grant enabled CHRCO to work in partnership with the Alameda Alliance to implement the ATTACK clinic, which provided it with the financing it needed to devote staff time and other resources to the clinic. As of the end of the BCQII intervention period, after the Alameda Alliance had switched to a FFS payment arrangement with CHRCO, the Alameda Alliance had started reimbursing CHRCO for these services. This demonstrates that the Alameda Alliance felt that the ATTACK clinic was a worthwhile investment based on its own analysis of asthma-related ED visits that suggested the intervention might have helped its enrollees..

Through the AIC, Cincinnati Children's implemented various evidence-based asthma interventions, including an inpatient quality improvement initiative, the introduction of care coordination services in outpatient clinics, and a home health program. Because, on average, the hospital loses money on Medicaid patients, Cincinnati Children's felt that these efforts would result

³ While most payers reimburse CHRCO on a FFS basis for ED and hospital visits, at the start of the ATTACK clinic intervention the Alameda Alliance paid CHRCO on a capitated basis. This changed toward the end of the ATTACK clinic intervention (in March 2011), when the Alliance switched to a FFS payment arrangement with CHRCO.

in an ROI as the freed-up capacity could be filled with “higher-need, higher-margin patients drawn in from the surrounding region.” Cincinnati Children’s also expected that a reduction in ED visits and hospital use would result in a financial return for Medicaid and other payers who reimburse Cincinnati Children’s on an FFS basis for such services. Their goals were to show that intervention activities result in a financial return for both the hospital itself and other payers, to garner support internally for future initiatives and to demonstrate a business case that might convince payers to reimburse these services in the future.

Cincinnati Children’s hoped that the AIC activities would reduce ED visits and hospitalizations among children with asthma and result in savings for Medicaid and other payers, as well as potentially produce savings for the hospital itself. Demonstration of such savings would also help to garner internal support for similar initiatives. Cincinnati Children’s receives Medicaid reimbursement for home health visits (which staff report do not cover costs), and is working with Medicaid managed care organizations to negotiate financial support for care coordination and home health.

Monroe Plan’s PACE intervention paid physician practices to conduct chart audits of their Monroe Plan-insured children with asthma, with the goal of increasing provider awareness of areas in which they could provide care more consistently with evidence-based asthma-care guidelines. In turn, as prior research has shown, this awareness motivates providers to provide care more consistently with evidence-based guidelines (Foels 2006), which may result in better patient outcomes including lower rates of ED visits and hospitalization. If successful, this would translate to cost savings for the Monroe Plan, which pays all hospitals on an FFS basis. Ultimately, Monroe Plan would attain a positive ROI from PACE if the savings from reduced ED visits and hospitalizations outweighed the resources invested in the form of staff time and incentive payments to physicians participating in the PACE chart audit intervention.

Through PACE, Monroe Plan sought to align the financial incentives for physician practices to improve the quality of care provided to the children it insures. There were no financial incentives to adhere more consistently to practice guidelines prior to the PACE intervention. Through this “pay for participation” initiative, Monroe Plan aligned financial incentives for providers to practice more consistently with these guidelines by paying them an incentive fee of \$5 per eligible Monroe Plan member per month to participate in the PACE intervention.

C. Organization of this Report

Chapter II presents an overview of our evaluation methodology. Chapter III presents evaluation findings for all three grantees. Chapter IV provides conclusions and examines the implications of BCQII for policymakers and other organizations wishing to implement programs that improve quality while providing a financial return. A separate addendum to this report contains case studies for readers seeking an in-depth look at each grantee intervention. Each case study includes (1) a detailed description of the intervention and the ways it sought to correct financing misalignments, (2) a presentation of evaluation findings, and (3) a discussion of their implications for other organizations wishing to implement similar initiatives.

II. METHODS

We tailored the evaluation design for each of the three grantee interventions to their context, with the goal of creating as strong a point of comparison as feasible to assess change resulting from the interventions (Table II.1). For the Alameda-CHRCO and Monroe Plan interventions, we employed random assignment of patients and practices, respectively. For Cincinnati Children's, we used a quasi-experimental design that compared pre- to post-intervention changes for children in the study county to changes in comparison counties. Here we summarize the evaluation designs, describe the data sources used, review the statistical methods used to estimate intervention impacts, describe interviews conducted for an implementation analyses, and detail the ROI analysis. Complete details on evaluation methods are in Appendix A.

A. Evaluation Design for Each Grantee

For the Alameda-CHRCO ATTACK clinic intervention, we randomly assigned children who visited the CHRCO ED for asthma by calendar day to a treatment or control group. Under this approach, Medicaid children who visited the ED for asthma on treatment days would be referred to the ATTACK clinic, and on a control days the staff followed usual care protocols, suggesting that these children follow up with their primary care physicians.⁴ Because some children who visited the ATTACK clinic were not randomized into the treatment group, we also compared outcomes of children referred to the ATTACK clinic to other children eligible for the intervention, using a propensity score matching technique.

For the Cincinnati Children's AIC, we examined changes in health care utilization over time in Hamilton County compared to three comparison counties. The study population is defined as Medicaid-insured children with asthma in Hamilton County who had some interaction with CCHMC via its inpatient units, ED, or outpatient clinics. To study this multi-pronged intervention, we compared changes in utilization for Medicaid children in Hamilton County who met patient eligibility criteria to changes in utilization for children who met the same criteria in Cuyahoga, Franklin, and Montgomery counties.

For the Monroe Plan PACE initiative, we used a randomized design in which we assigned 25 eligible practices to treatment and control groups, stratified by the number of eligible Monroe Plan enrollees at each practice (large, mid-sized, and small), whether the practice is a federally qualified health center (FQHC), and whether the practice has a single physician or multiple physicians. We compared patient-level health care utilization between those children assigned to treatment and control group practices, adjusting the analysis to account for the fact that the unit of random assignment was practices and not children.

⁴ Some children visited the ED multiple times during the intervention and thus could potentially be assigned to different experimental groups depending on the days they visited. Because the primary outcome measure for the ATTACK clinic intervention is the return ED visit rate, we consider only the first experimental assignment.

Table II.1. Overview of Evaluation Design, by BCQII Grantee

Grantee	Alameda- CHRCO	Cincinnati Children’s	Monroe Plan
Study Population	Medicaid-insured children with asthma, aged 1 to 19, who visit the CHRCO ED	Medicaid-insured children with asthma, aged 2 to 17, who use outpatient, inpatient, or ED services at Cincinnati Children’s Hospital and Medical Center	Monroe Plan-enrolled children with asthma, aged 2 to 19, who are assigned to eligible physician practices
Intervention Setting	Children’s hospital ED and ATTACK clinic	All venues in county, although most care is through Cincinnati Children’s and its clinics	Health plan and practices with which the plan contracts
Research Design	Random assignment of eligible children based on calendar day (4-to-3 treatment-to-control ratio) ^a	Nonexperimental treatment county (Hamilton) and comparison counties (Cuyahoga, Franklin, and Montgomery)	Random assignment of eligible physician practices
Study Period ^b	July 11, 2008, to June 30, 2011 ^c	July 1, 2008, to December 31, 2010 ^d	January 1, 2009, to June 30, 2011 ^e
Data Source	CHRCO discharge data, Alameda Alliance Medicaid claims and enrollment data for its enrolled children (51.1 percent of the sample)	Medicaid claims and enrollment data	Monroe Medicaid Managed Care Plan claims data
Sample Size	3,648 children (2,115 treatment, 1,533 control) ^f	9,604 (1,691 in Hamilton County, 7,913 in comparison counties)	7,731 children (3,721 treatment, 4,010 control) in 25 practices (13 treatment, 12 control)

Source: BCQII grantees and claims and enrollment data obtained for the evaluation.

Note: See Appendix A for details on the evaluation designs for all grantees, including grantee-specific eligibility criteria.

^aThe initial treatment-to-control ratio (3-to-2) was changed in March 2009 at the request of Alameda-CHRCO to garner more support from CHRCO ED staff.

^bStudy period is for the BCQII evaluation. Grantee interventions may extend beyond these dates as noted.

^cJuly 11, 2008, represents the first calendar day that Mathematica randomly assigned; the first ATTACK clinic day was July 17, 2008, and the last day in the data occurred on July 14, 2011.

^dIntervention activities were in a pilot stage in early 2008. This date reflects the effective start date for the evaluation.

^eMonroe Plan began data collection with practices in the fourth quarter of 2008 after contacting treatment group practices soon after random assignment in late July 2008. We stop selecting patients for sample population January 1, 2011. The PACE intervention continues through February 2012.

^fThe figures are for the randomly assigned treatment and control groups. For the non-experimental analysis, there were 1,364 treatment and 2,812 comparison group members.

Alameda-CHRCO = Alameda Alliance for Health-Children’s Hospital and Research Center at Oakland; ATTACK = Asthma Tools and Training Advancing Community Knowledge; Cincinnati Children’s = Cincinnati Children’s Hospital Medical Center.

B. Data Sources

We used a variety of data sources to evaluate the interventions, specifically, Medicaid claims and enrollment data for the primary outcomes analyses. We also used these data, in addition to financial data provided by each grantee and by other stakeholders, for ROI analyses. To evaluate the Alameda-CHRCO intervention, we used hospital and ED administrative data provided by CHRCO and enrollment, claims, and prescription drug data for Alameda Alliance members. Monroe Plan provided claims, financial, and enrollment data for its evaluation. Data sources for the Cincinnati Children’s evaluation included claims, enrollment, and prescription drug data provided by the Ohio Department of Job and Family Service (ODJFS) Medicaid division and cost data provided by Cincinnati Children’s.

Each grantee also submitted process measure data, which we used to gauge progress on intermediate outcomes such as the prescription of appropriate medications or the use of written asthma action plans. CHRCO submitted process measure data that showed, for example, how many eligible children were referred to or visited the ATTACK clinic. Monroe Plan submitted all chart audit data and asthma survey data for caregivers of children with asthma. Cincinnati Children’s provided process measure data that identified, for example, how many children were discharged from the hospital with needed medications in hand.

C. Statistical Methods to Examine Intervention Impacts

We conducted multivariate regression analyses to estimate intervention impacts, controlling for observable patient characteristics and prior health care utilization. Table II.2 shows the primary research sample for each grantee and summarizes the subgroup analyses. For each grantee, we examined the effect of the intervention on a variety of health utilization outcomes: ED visits, hospital admissions, outpatient visits, and prescription drug use. We chose the functional form of each regression model to match the form of each outcome variable (for example, logit models for binary outcomes), and we use weights to account for varying lengths of Medicaid enrollment.

Table II.2. Primary Research Analyses and Subgroup Analyses, by BCQII Grantee

	Primary Analysis	Subgroup Analyses
Alameda-CHRCO	Compare outcomes in entire study period and, separately, in the first, second, and third study years for children who visit the CHRCO ED on a treatment or control day	Conduct subgroup analyses by age, previous asthma utilization, insurance type, and race/ethnicity
Cincinnati Children’s	Compare change in outcomes for children in treatment and comparison counties (1) from baseline to the study period, and (2) separately, from baseline to first, second, and third study years	Test for similar trends in treatment and comparison counties prior to intervention period; conduct subgroup analyses for children identified at the start of (or during) the intervention period, children confirmed to have visited Cincinnati Children’s clinics, and children with low or high asthma severity (based on previous utilization)
Monroe Plan	Compare outcomes for children with asthma assigned to treatment and control practices in entire study period and, separately, in first, second, and third study years	Conduct subgroup analyses by the child’s first date of eligibility, practice location (Rochester area versus not), and practice size

Note: Every Child’s first study year is defined as that child’s first 12 months of eligibility for the intervention. The second and third study years are defined similarly.

To estimate impacts for the Alameda-CHRCO and Monroe Plan interventions, we estimated treatment-control differences for intervention period outcomes for all children who met selection criteria. Each child is assigned a unique “index date” upon first becoming eligible for the study, as well as unique baseline (the 12 months before the index date) and study periods (up to 36 months following the index date). The Cincinnati Children’s outcomes analysis relied on a difference-in-differences approach, because a number of factors other than the intervention—such as changes in statewide Medicaid policies, other quality improvement efforts, and other trends in health outcomes—may have affected outcomes during this period. We estimated the difference between the change in outcomes observed for children in Hamilton County and the change in outcomes in the comparison counties, controlling for factors that vary across counties (but are fixed over time) and a variety of child-level covariates.

D. Key Informant Interviews

Throughout the intervention period, but focused primarily during the intervention’s final year, we conducted interviews with individuals working closely on each intervention. The goal was to gain an understanding of each intervention, learn about challenges encountered and successes achieved, and gather insight into program implementation. Specifically, to assess progress and challenges encountered during implementation, we conducted calls with grantees every six months during the intervention period. During the last six months of the intervention period, we also conducted interviews with other individuals and stakeholders directly involved with the intervention. Interview subjects for Alameda-CHRCO included CHRCO staff overseeing the intervention, ATTACK clinic staff, the CHRCO primary care clinic director, and Alameda Alliance staff. For Cincinnati Children’s, interviewees included staff overseeing AIC activities, senior leadership, and the providers delivering services to children. For Monroe Plan, we interviewed staff overseeing the intervention, as well as senior leadership and five providers participating in the PACE intervention. A complete list of people interviewed is included in Appendix D.

E. Return on Investment Analysis

For each intervention, we conducted an ROI analysis from primary and secondary stakeholder perspectives. In what follows, we describe the common method used to conduct the primary analyses and the different methods used to conduct the secondary stakeholder analyses. Complete methodological details are in Appendix B.

Primary Stakeholder Analysis

To conduct the primary stakeholder analysis for each intervention, we collected data on all costs associated with the BCQII intervention for the primary stakeholder, including operating, investment, and indirect costs. For the ATTACK clinic intervention and the PACE intervention, we used Medicaid claims data to calculate per-member-per-month payments for children in treatment and control groups. In each case, the managed care organization (the Alameda Alliance and Monroe Plan) was the primary stakeholder. We used (1) a difference-in-differences calculation to determine cost-savings (or losses) attributable to the intervention each year, and (2) annual cost and cost-savings or losses data to calculate the net present value of the intervention, cash flows, and the ROI

(by dividing discounted incremental cost savings or losses by discounted costs).⁵ For the Cincinnati Children's AIC intervention for which the hospital was the primary stakeholder, we collected data on the hospital's investment costs associated with the intervention, asthma-related ED and hospital utilization data, and associated estimates of hospital payer mix and average margin for each year of the intervention period. To estimate the savings or loss from changes in ED and hospital visits, we used the estimated ED and hospital visit rates identified in the outcomes analysis. To estimate savings or losses to Cincinnati Children's resulting from changes in the numbers of ED visits or hospitalizations for asthma during the intervention period, we used a difference-in-differences calculation using financial data obtained from Cincinnati Children's and medical claims data obtained from the Ohio Department of Jobs and Family Services. Finally, we used the previously calculated annual investment and operating costs and cost-savings (or losses) to determine ROI.

Secondary Stakeholder Analysis

For the ATTACK clinic ROI analysis, CHRCO is considered the secondary stakeholder. To determine whether there was an ROI for CHRCO, we collected data on CHRCO's investment costs associated with the ATTACK clinic intervention, including staff resources and operating costs. We also collected utilization data from CHRCO for asthma-related ED visits and hospitalizations over the study period, and associated estimates of payer mix and average margin for fiscal year 2009. To estimate the savings or loss from changes in ED visits, we used the estimated return ED visit rate identified in the outcomes analysis. To estimate savings or losses to CHRCO resulting from changes in the numbers of asthma inpatient hospitalizations during the intervention period, we used a difference-in-differences calculation based on data obtained from CHRCO. Finally, we used the previously calculated annual costs and cost-savings (or losses) to determine ROI.⁶

The secondary stakeholder for the Cincinnati Children's intervention is Ohio Medicaid. This analysis considers whether children in the treatment county had less health care utilization than children in the comparison counties. Because the ODJFS could not share payment data with the evaluation team, we can only present information on utilization changes for the ROI analysis and speculate as to whether the intervention had an ROI. Because there was no "investment" in the intervention by Medicaid, there were also no program costs to consider.

For the PACE ROI analysis, the participating treatment group practices are considered the secondary stakeholders. To evaluate whether PACE provided an ROI for these practices, we collected data on the practices' estimated costs associated with conducting chart audits. We also collected data on average reimbursement per office visit, utilization data from Monroe Plan for office visits over the study period; data reflected averages for small, medium and large practices. To estimate savings or losses to the physician practices resulting from changes in the numbers of office visits during the intervention period, we used a difference-in-differences approach, relying on

⁵ A negative ROI indicates a financial loss; a value between 0 and 1 indicates the intervention produced financial savings, but not enough to recoup costs; and a value greater than 1 indicates that the savings were greater than costs.

⁶ Because results of the outcomes analysis showed no statistically significant difference in the return ED visit rate between the treatment and control groups, we conducted a sensitivity analysis to evaluate the ROI assuming a return ED visit rate of 1 percent. We conducted an additional sensitivity analysis to evaluate ROI under varying assumptions about ATTACK clinic reimbursement.

averages across practices classified as small, medium and large. We also collected data on the amount of incentive fees that Monroe Plan paid to treatment group practices and calculated the value of these payments net of costs to practices to conduct the chart audits. Finally, we used the calculated annual costs, cost-savings (or losses), and net incentive payments to determine ROI.

III. FINDINGS FROM THE BCQII EVALUATION

Grantees' success at achieving the goals of improving quality of care and demonstrating a business case for quality was mixed. Although there were promising indications that grantees were able to affect some intermediate outcomes, grantee interventions did not affect the rates of ED use or hospitalization. As a result, the grantees did not achieve a positive ROI during the relatively short intervention period. However, demonstrating a business case is difficult in the short term, particularly for newly developed interventions, because of unanticipated challenges that arise, the need to implement process improvements, and the time needed for any improvements to affect the rates of ED or hospital use and translate into financial gains.

Despite findings from the outcomes and ROI analyses, each grantee successfully implemented a multi-year intervention, which required engagement of children with asthma and their families as well as the involvement of stakeholders with the opportunity to gain or lose financially from the initiatives. During the implementation period all grantees also encountered a flu pandemic in 2009 involving the H1N1 virus that resulted greater than anticipated number of people (including children) requiring medical attention for flu-like symptoms and other complications of the virus, adding strain to the health care systems where grantees operated their interventions. Although the grantees implemented quite different interventions, each shared the common goals of increasing quality of care for children with asthma, aligning financial incentives to provide high-quality care, and demonstrating an ROI—or making a business case—for quality in Medicaid. The primary evaluation findings are described below.

Alameda-CHRCO Asthma Tools and Training Advancing Community Knowledge Clinic

The ATTACK clinic's attempt to affect the rate of return ED visits for asthma at the population level was *hindered by slow recruitment of eligible children, initial reluctance of ED staff to support the intervention, and limited participation among children referred to the clinic*. Although 40 percent of referred children visited the clinic, this group made up only about 13 percent of all children in the treatment group. In addition, while the ATTACK visit was quite intensive—likely providing patients and their families with more asthma education than they had ever received and connecting them to other resources in the community—it involved a single visit and may not have been enough to affect patient outcomes over the longer term.

The ATTACK clinic *did not affect the return ED visit rate for asthma* among children randomly assigned to its experimental treatment group or those who visited the clinic compared to a nonexperimental comparison group. The one-time clinic visit also did not affect other intermediate outcomes, such as the number of subsequent office visits or asthma medication fills among Alliance-insured children. The ROI for both the Alliance and CHRCO was negative—partially because there were no impacts on utilization, but also because clinic operating costs were relatively high.

Despite the lack of impacts at the population level, *the insurers are working with CHRCO to reimburse for ATTACK clinic services in the future, providing an incentive for CHRCO to invest in asthma education services*. After providing asthma education to nearly 550 children and their families, the ATTACK clinic was moved to the hospital's primary care clinic with a signed contractual agreement from the Alliance to reimburse for asthma education services. Moreover, at the time of this report, CHRCO was also in negotiations with Anthem Blue Cross, the other Medicaid managed care plan in Alameda County, about reimbursement for these services.

Cincinnati Children's Asthma Improvement Collaborative

Cincinnati Children's AIC activities evolved continuously and resulted in *successful implementation in the hospital, outpatient clinic, and home settings*. While the intervention encountered staffing challenges in the inpatient setting and work flow issues in the outpatient setting, the Cincinnati Children's team reacted to such issues quickly and adjusted its approach accordingly.

The system-wide intervention had *positive results on process measures and inconclusive results on outcome measures*. Trends in inpatient process measures related to patients having asthma medications at discharge and transitioning patients into case management improved over the intervention period. In the outpatient setting, there was also evidence of improvement in the proportion of patients receiving written asthma care plans and, among those who received coaching, improvements in the proper use of asthma devices such as spacers and metered-dose inhalers. The ED visit rate decreased faster in Hamilton County than comparison counties during the intervention period; however, this difference might be due to the long-term, preexisting downward trend in ED use by children with asthma in Hamilton County, rather than to program impacts.

Cincinnati Children's system-wide approach *made inroads at changing the culture of asthma care at the hospital* during the BCQII initiative, and AIC activities will continue into the future, as part of a Beacon Communities grant and other work. Staff reported that close collaboration across multiple health care settings was a critical component of the intervention—and one that distinguished BCQII from the prior asthma work of Cincinnati Children's.

Monroe Plan Pediatric Asthma Care Enhancement Project

Monroe Plan *successfully implemented the PACE intervention*, meeting regularly with almost all physician practices invited to participate in one-on-one meetings, through periodic collaborative meetings, and via other activities designed to improve pediatric asthma care. Some participating practices found it difficult to complete chart audits in a timely way, stretching data collection and reporting periods. Moreover, confusion among practices on how to collect certain data elements, such as asthma action plans, resulted in Monroe Plan staff providing additional technical assistance and training.

PACE practices *improved adherence to recommended guidelines for asthma care* relative to control group practices, including providing asthma action plans, prescribing appropriate asthma medications, providing flu vaccines, and conducting environmental assessments for smoke more regularly. Children with asthma assigned to treatment group practices also had more office visits for asthma in the first and third years of the initiative and were more likely to have fills for appropriate (more controllers and fewer rescue) medications than children in control group practices. However, the intervention did not have an effect on ED or hospital utilization of children with asthma.

The overall ROI for Monroe Plan was *negative* and was driven by large incentive fee costs paid to practices and the lack of impact on ED and hospital use. However, *Monroe Plan did achieve a positive ROI among the subgroup of small physician practices* (those with fewer than 100 children with asthma), primarily due to changes in inpatient and outpatient use. Moreover, all *participating practices achieved a substantial positive ROI* from the intervention—reflecting the sizable fees relative to the amount of time required to conduct chart audits.

A. Detailed Findings by BCQII Grantee

1. The Alameda-CHRCO ATTACK Clinic

The Alameda-CHRCO intervention, a partnership between a Medicaid managed care plan and a children's hospital in Alameda County, California, referred children using the ED for asthma to a new ATTACK clinic to improve knowledge of asthma and asthma-management skills. Education during this one-time visit included information on how asthma affects breathing, the proper use of medications, and the recognition of asthma attack triggers. When deemed necessary, clinic staff referred children to further case management available in Alameda County and made follow-up primary care appointments for all children who visited the clinic. The anticipated benefit of this visit was improved asthma management, resulting in a drop in the return ED visit rate for asthma, which was about 40 percent in the 12 months before the intervention began.

Patient recruitment for the ATTACK clinic began when a child visited the ED for asthma. To facilitate evaluation, each calendar day during the intervention period (July 11, 2008, to June 30, 2011) was randomly assigned to treatment or control status. Children who visited the ED for asthma on treatment days could be referred to the clinic, while those who visited on control days were treated according to the existing standard of care (that is, recommended follow-up with their primary care physician) but were not supposed to be referred to the ATTACK clinic. In practice, more than half the children who were referred to or visited the clinic were not randomized into the treatment group. Therefore, we also examined whether the clinic had an effect on all children who were referred to the clinic (regardless of whether they were randomized to the treatment group or not) by comparing them to a non-experimental, matched comparison group.

ATTACK Clinic Implementation

The Alameda-CHRCO team encountered several implementation challenges, particularly obtaining buy-in from ED physicians and other providers to refer eligible children to the ATTACK clinic; with many other tasks to complete in a busy ED setting, providers did not always remember to refer eligible patients on treatment days. Some ED physicians were also initially resistant to the intervention's experimental study design, which called for referring patients to the ATTACK clinic on treatment but not control days. Only about 30 percent of all children eligible for the treatment group were referred to the ATTACK clinic. Moreover, persuading parents and other family members to visit the ATTACK clinic was often challenging. Some hospital staff estimated that as many as half the families who come to the ED with a child with asthma are not interested in attending the ATTACK clinic. Specifically, after a multi-hour stay in the ED, many families simply do not want to spend additional time (usually necessitating a return trip to the hospital on a different day) for asthma education, regardless of its potential value to their children. In addition, families often faced a number of barriers to attending the ATTACK clinic, such as inadequate transportation and the inability to obtain time off from work.

Achieving participation among the recruited population was also challenging for the ATTACK clinic and in the end was not very successful. To boost participation, clinic staff employed a number of strategies, including telephone calls to all families with children who were eligible for the clinic (as identified from the ED census), posters and flyers advertising the clinic, and reminder calls made by the Alliance to the families of eligible children. An asthma educator also called the family on the day before the visit as a reminder. About 42 percent of children who were referred to the clinic ever

visited. Overall, the clinic reached only 13 percent of children eligible for the treatment group. Children who visited the clinic were generally younger than 10, and about 85 percent of them did not have well-controlled asthma; about half the children who visited the ATTACK clinic were referred for further asthma case management.

ATTACK Clinic Impact on Emergency Department Visits and Other Outcomes

The ATTACK clinic intervention did not have an impact on the return ED visit rate or other health care use (office visits, medication use, or inpatient use) of children randomly assigned to the treatment group compared to the control group or among children referred to the clinic compared to a matched comparison group (Table III.1).⁷ We also examined the return ED visit rate for each intervention year, but there were no statistically significant differences between the treatment and comparison groups. We also found no impacts when we defined the return ED visit rate using an expanded definition of asthma (including other respiratory symptoms and acute respiratory infections) and the overall ED return rate. The ability to identify impacts for the randomly assigned treatment group was likely compromised by the low participation rate among children in the eligible population.

The ATTACK clinic intervention did not affect office visits or medication use among treatment group members insured by the Alliance relative to the control group. The proportions of children with an office visit were similar in the treatment and control groups in the 30 to 60 days after children's index visits to CHRCO. Within 60 days, a little more than half of children in either group had an office visit for any reason, and about a third had one for asthma. There were also no differences for these outcomes in the 90- through 180-day periods. In the six months after their index visit, children insured by the Alameda Alliance filled an average of 1.7 controller medications and 2.1 rescue medication prescriptions. About 60 percent of children had no controller medications filled, and 40 percent had no rescue medications filled in the six months after their index dates. In the same period, less than 20 percent of children had 90 or more days of controller medication available, and about 30 percent had that much rescue medication available.

⁷ We also did not see impacts for the subgroup of children who visited the clinic compared to a matched comparison group.

Table III.1. Percentage of Children with Asthma- Related Emergency Department (ED) Visits

	Treatment	Control/Comparison	Difference	<i>p</i> -value
Comparing Randomly Assigned Treatment and Control Groups^a				
Number	2,115	1,533		
Percentage with an asthma-related return ED visit (from initial visit) within:				
30 days	4.7	5.0	-0.3	0.634
60 days	7.2	7.0	0.2	0.854
90 days	10.4	9.5	0.9	0.451
Comparing Nonexperimental Treatment and Comparison Groups^b				
Number	1,364	2,812		
Percentage with an asthma-related return ED visit (from initial visit) within:				
30 days	3.9	4.2	-0.4	0.559
60 days	6.8	6.2	0.5	0.480
90 days	9.7	8.4	1.3	0.151

Source: Children's Hospital and Research Center at Oakland ED data.

Note: Includes all children who had an ED visit for asthma from July 11, 2008, to June 30, 2011. On his or her index date, the child must be at least 1 year old and younger than 19, have a primary or secondary diagnosis of asthma, be insured by Medi-Cal or a Medicaid managed care organization, and reside in a Bay Area city.

All estimates are regression adjusted. See Appendix A of the final evaluation report for complete details.

^a This analysis compares the randomly assigned treatment and control groups (that is, eligible children visiting the CHRCO ED on a randomly assigned treatment or control day during the intervention period). Appendix A contains further details on random assignment for the ATTACK clinic intervention.

^b Because some children assigned to the control group visited the ATTACK clinic and therefore received the intervention, we also conducted a separate analysis comparing outcomes for all children who visited the ATTACK clinic (including those assigned to the original treatment and control groups) with a nonexperimental comparison group. Appendix A contains further details on how this analysis was conducted.

Alameda-CHRCO = Alameda Alliance for Health-Children's Hospital and Research Center at Oakland; ED = emergency department.

ATTACK Clinic Return on Investment Analysis

The primary ROI analysis considers whether there were financial benefits to the Alameda Alliance in the form of savings—due to reduced ED, hospital, or other types of utilization—that exceed its implementation costs. The multi-stakeholder ROI analysis compares CHRCO's financial benefits (or losses) resulting from the ATTACK clinic to its operating and investment costs.

Alameda Alliance Return on Investment

Primarily because of a lack of impacts on ED and hospital utilization, the ATTACK clinic intervention did not generate a positive ROI for the Alameda Alliance (Table III.2). Total investment and operating costs incurred by the Alliance were only about \$32,000, but the health care utilization costs of children in the treatment group were almost \$100,000 more than those of the control group, which resulted in a net present value of -\$129,000 and a benefit-cost ratio of -3.0. The large negative ROI was driven primarily by inpatient costs, which made up about one quarter of all costs for Alliance members in the study population. Inpatient costs rose considerably in the first and third years of the intervention for children in the treatment group, while control group costs were relatively stable throughout the intervention period. Because we would not expect the intervention to result in greater inpatient use for the randomly assigned treatment group, we suspect

that these differences in costs were due to chance and were not intervention effects. The findings are consistent with the outcomes analysis, where we found that the asthma-related hospitalization rate was higher for children assigned to the treatment group relative to the control group in the 120 and 180 days after their index dates.

Table III.2. Alameda Alliance: Return on Investment from BCQII Intervention

Discounted Investment/Operating Costs	\$32,262
Discounted Cost Savings/Loss from the Intervention	\$(96,782)
Cumulative Benefit-Cost Ratio	-3.00
Net Present Value	(\$129,044)

Note: Investment and operating costs exclude BCQII grant funding received and passed through to CHRCO. Appendix B describes the methodology used to calculate ROI. We assumed a discount rate of 3 percent.

CHRCO Return on Investment

For the CHRCO ROI analysis, we used ATTACK clinic intervention investment and operating costs, utilization data on ED visits and hospitalizations, estimates of payer mix and average margin for fiscal year 2009, and estimates of ATTACK clinic reimbursement rates by payer obtained from CHRCO. To estimate the savings or loss from changes in ED visits, we used an estimated return ED visit rate identified from CHRCO ED data. To estimate savings or losses to CHRCO resulting from changes in the numbers of asthma hospitalizations during the intervention period, we used a difference-in-differences calculation (the difference in hospitalizations for the treatment group minus the difference between hospitalizations for the control group). We calculated ROI under four scenarios where we varied the ATTACK clinic visit and the return ED visit rates because these rates might vary in the future and provide context for how much rates would need to vary for CHRCO to have a positive ROI. Specifically, we assumed the ATTACK visit rate to be the same as during the intervention period (denoted as “Actual Visits” in Table 3.3) and the maximum number of operational visits (denoted as “Max Visits”). For the return ED visit rate, we assumed either that it did not change (per evaluation findings) or that it dropped to 1 percent.

From CHRCO’s perspective, the ATTACK clinic intervention did not generate a positive ROI and would require a large shift in the return ED visit rate to demonstrate a positive return (Table III.3).⁸ Even if the ATTACK clinic had been able to achieve a substantial drop in the return ED visit rate for asthma, it would have been able to generate a positive ROI for CHRCO only if the number of children who visited the clinic each week had more than doubled and all visits had been reimbursed. Making a business case for the ATTACK clinic was hindered by its high operating costs. A combination of greater attendance, lower operating costs, and a reduction in the return ED visit rate (to about 7 percent) are all necessary to have the potential for a positive ROI. Now that CHRCO has incorporated the ATTACK clinic into its primary care clinic (a recent development after the intervention period ended), it might be able to bring in enough patients to make the clinic financially sustainable from CHRCO’s perspective.

⁸ We focus on the return ED visit rate here because reducing rates of return ED visits for children with asthma was the primary goal of the ATTACK clinic intervention.

Table III.3. CHRCO ROI Analysis Results for Two Scenarios

	Scenario 1: Hold ED Visit Rate Constant		Scenario 2: Reduce ED Visit Rate	
	Actual ATTACK Clinic Visits	Max ATTACK Clinic Visits	Actual ATTACK Clinic Visits	Max ATTACK Clinic Visits
Investment and Operating Costs	\$410,483	\$410,483	\$410,483	\$410,483
Total Revenue	\$223,817	\$366,879	\$223,817	\$366,879
Loss/Gain to CHRCO on ED/Hospital Use	\$(692)	\$(692)	\$56,867	\$56,867
Net Present Value	\$(197,357)	\$(37,346)	\$(139,799)	\$20,213

Source: ATTACK clinic investment and operating costs reported by CHRCO. Analysis of CHRCO ED data by the BCQII evaluation team.

Notes: Under Scenario 1, we hold the return ED visit rate constant, reflecting that the ATTACK clinic did not have an impact on the rate during the intervention period. Under Scenario 2, we assume that the ATTACK clinic reduces the return ED visit rate to 1 percent (from 18 percent). Under the “Actual Visits” sub-scenario, we assume that the number of children who visit the clinic during the three-year period is equal to the actual number of children who visited during the intervention period. Under the “Max Visits” scenario, we assume that 10 children visit per week over a 50-week year, for 500 children annually.

Investment and operating costs include in-kind contributions provided to the ATTACK Clinic. All scenarios assume no substitution of commercial visits for Medicaid visits.

All values are discounted at a 3 percent rate.

CHRCO = Children’s Hospital and Research Center at Oakland; ED = emergency department

2. Cincinnati Children’s Asthma Improvement Collaborative

Cincinnati Children’s AIC—a comprehensive, system-wide approach to improving pediatric asthma care—includes three primary components: (1) an inpatient quality improvement initiative, (2) the introduction of care coordination services in outpatient clinics, and (3) a home health program. In the words of one staff member, the approach of addressing asthma care on multiple fronts sought to create a “fail-safe process” so children with asthma are accounted for as they move through the Cincinnati Children’s system. The inpatient quality improvement initiative for asthma care focused on increasing the proportion of children who take home their medications at discharge, notifying managed care plans in real time about inpatient admissions of their members, and providing each patient a copy of his or her asthma action plan. As part of this initiative, the hospital also standardized its approach to asthma assessment, including regular use of an asthma skills checklist.

Two full-time care coordinators work with Cincinnati Children’s primary care patients and their families on self-management of asthma. The care coordinators help patients gain access to medications; provide patient education; help coordinate care across settings (such as specialty and inpatient care, and in some cases communication with school nurses); communicate information to managed care plans as appropriate; and connect patients to community resources as needed. The coordinators work closely with physicians in the clinic, as well as a nurse practitioner who focuses on patients with the most severe cases of pediatric asthma. In addition, the care coordinators are able to track patients’ fill and refill patterns for asthma medications, using Medicaid pharmacy data.

The home health visiting program for children with asthma is part of a broader home health program that helps bridge inpatient and outpatient care by bringing care management and self-management support by a registered nurse (RN) into the child's home. Children often are referred to the program following an inpatient stay, although referrals also come from Cincinnati Children's outpatient clinics, specialists, community physicians, or a managed care plan. An RN assesses the home environment for asthma triggers and offers education through a series of three or more home visits. At the initial visit, the nurse focuses on the child's and family's understandings of asthma as a chronic disease, identifies asthma triggers, and confirms that the child has the appropriate medications and understands how to use them. Coordination with the physician occurs if the RN has medication or treatment concerns. While some discussion of self-management can occur during this visit, the second visit tends to focus on it to a greater degree. Patient education and self-management builds over time as the RN has an opportunity to reinforce content.

Asthma Improvement Collaborative Implementation

Cincinnati Children's encountered several implementation challenges but often found solutions. For example, in the inpatient setting, Cincinnati Children's recognized early on that using respiratory therapists to lead the work was not an effective strategy, because RNs have the most interaction with patients before discharge from the hospital. As a result, the team revised its staffing approach to make the inpatient component an RN-based process.

In the outpatient setting, Cincinnati Children's found that intervention activities were harder to implement in a larger clinic (PPC Clinic) with a lot of medical residents on staff and thus a higher turnover compared with a small clinic having a smaller staff with longer tenure (Hople Clinic). At both clinics, the team attempted to conduct an asthma skills assessment of all children with asthma, regardless of the reason for their office visit. With office space limited, this approach created flow issues as the asthma skills assessment lengthened the patient visit, which meant that the office space could not be used to see other children waiting for an appointment. Cincinnati Children's therefore decided to target the Metered Dose Inhaler skills assessment to those children who had not been assessed in the past year or had been assessed in the past year but did not perform well. This allowed medical assistants and RNs to move patients through the screening process more quickly, freed up office space, and minimized burden on staff.

Asthma Improvement Collaborative's Effects on Process

Cincinnati Children's tracked a number of inpatient and ambulatory measures during the intervention, and used these measures internally to monitor progress and, to some extent, modify intervention activities as needed. These data were available only for the post-intervention period and were not compared to a control or comparison group. Therefore, no observed changes in the measures can be attributed solely to intervention activities.

The inpatient intervention focused on (1) making sure patients had asthma medications in hand at discharge, and (2) getting patients into case management. Trends in the measures associated with these areas suggested notable process improvements in the inpatient setting during the intervention period. For example, the proportion receiving multi-dose medications increased from 15–25 percent in early 2009 to 80–90 percent by the end of the intervention. Similarly, at the start of the intervention, 70–75 percent of children in Medicaid managed care were actively identified and

transitioned to case management at discharge; the proportion transitioned to case management at discharge increased to 100 percent throughout the final 1.5 years of the intervention.

Cincinnati Children’s care coordination activities in the clinic setting were intended to provide patient education and assist with self-management, to better coordinate care and improve information flow between clinical settings, and to connect patients to social services if needed. The proportion of patients with written asthma care plans increased over the intervention period though somewhat modestly (especially for PPC patients). The proportion who received coaching on mask and mouthpiece use for asthma medication (among new patients and those who had demonstrated difficulty in the past) fluctuated from month to month but was about the same at the start and end of the intervention. Finally, among those who received coaching, the proportion demonstrating good asthma medication mouthpiece and mask use increased from about 27 percent at the start of the intervention to 67 percent at the end.

Asthma Improvement Collaborative Impacts on ED Visits and Other Outcomes

Because of the complex and comprehensive nature of the AIC initiative, and the market penetration of Cincinnati Children’s in Hamilton County, the only rigorous evaluation strategy available to us was to compare population-level outcomes of children with asthma who reside in Hamilton County to outcomes of children with asthma who reside in three other Ohio counties with metropolitan areas. Our primary evaluation strategy was to conduct a difference-in-differences analysis comparing the treatment county to these comparison counties. Through this approach we were able to control for changes external to the intervention at the county and individual level and for potential trends in the outcome measures of interest.

Overall, we find limited evidence that the AIC initiative had an effect on the rate of ED visits during the BCQII intervention period (Table III.4). Although some statistically significant differences suggest that the ED visit rate fell faster in Hamilton County than in the comparison counties, other evidence indicates that the rate was already falling faster in the baseline period for children in Hamilton County. Therefore, we should interpret any potential impacts of the AIC initiative cautiously, since decreases in the ED visit rate during the intervention period may be related to a preexisting trend rather than to the intervention itself.

If the AIC intervention did affect the rate of ED visits in Hamilton County, the most compelling evidence is in a couple of specific subgroups of the study population. We investigated impacts for various subgroups because it is often difficult for a new program to have immediate effects at the population level but easier among distinct subgroups, depending on how well the intervention targets them. We first compared impact estimates for children who met program eligibility criteria during the intervention period to those among children who had met them at the start of BCQII. Because the former group presented with asthma during the intervention period and the latter group might have presented at any time in the year before the start of the AIC, these findings—which were consistently in the right direction and statistically significant—are suggestive of a potential impact on ED visits. We also examined impact estimates for children we classified as having low asthma severity (based on previous asthma-related health care use) compared to those classified with high severity. The resulting difference-in-differences estimates were also favorable and statistically significant. This finding suggests that the intervention outpatient activities helped stabilize children with lower-severity asthma and reduce their ED use over time relative to similar children in comparison counties in Ohio.

We also examined whether there were differences in the ED visit rate for children who visited the Hopple or PPC clinics more than once during their first study year; we refer to this group as the *high-touch* subgroup. To conduct this analysis, we constructed a matched comparison group of children from comparison counties using a propensity score approach (see Appendix A for details). Findings from this analysis were mixed. In the first year, differences between the high-touch and the matched comparison groups were statistically significant, but in the wrong direction. In the second year, children in the high-touch subgroup had a lower ED visit rate than comparison group children, but there were no differences in the third year. Overall, these findings suggest that there were no impacts on the aggregate rate of ED use among members in the high-touch subgroup. Notably, more than two-thirds of children in the high-touch subgroup were classified as having low asthma risk, and the average number of baseline ED visits for the high-touch subgroup was much smaller than for other children (0.85 versus 1.2), which suggests that the children with asthma who visited the Hopple and PPC clinics regularly might have been relatively healthy compared to children who were not visiting regularly.

Table III.4. Differences in the Average Annualized Number of Emergency Department Visits Between Treatment and Comparison Group Populations in the Asthma Improvement Collaborative Study Population, Regression- Adjusted

	Number of Children		Treatment- Comparison Differences		Difference- in- Differences		p- value
	Treatment	Comparison	Baseline	Intervention	Unadjusted	Adjusted	
Entire Study Population							
Year 1	1,691	7,913	0.28	0.15	-0.13	-0.11	<0.01
Year 2	1,525	7,203	0.30	0.10	-0.20	-0.16	<0.01
Year 3	1,036	4,759	0.30	0.18	-0.12	-0.09	<0.01
Children Who Met Eligibility Criteria at the Start of Intervention Period							
Year 1	687	3,066	0.22	0.15	-0.07	-0.02	0.634
Year 2	619	2,833	0.22	0.07	-0.15	-0.11	<0.01
Year 3	568	2,687	0.23	0.17	-0.06	-0.03	0.481
Children Who Met Eligibility Criteria During the Intervention Period							
Year 1	1,004	4,487	0.34	0.15	-0.19	-0.16	<0.01
Year 2	906	4,370	0.37	0.09	-0.26	-0.19	<0.01
Year 3	468	2,072	0.39	0.12	-0.27	-0.13	<0.01
Children with Low Asthma Severity							
Year 1	956	5,457	0.14	0.12	-0.02	-0.07	<0.01
Year 2	861	4,987	0.15	0.08	-0.07	-0.12	<0.01
Year 3	589	3,309	0.17	0.14	-0.03	-0.09	<0.01
Children with High Asthma Severity							
Year 1	735	2,456	0.14	0.11	-0.03	-0.01	0.775
Year 2	664	2,216	0.14	0.02	-0.12	-0.09	0.019
Year 3	447	1,450	0.12	0.19	0.07	0.09	0.040
Children in the "High- Touch" Population							
Year 1	871	7,913	-0.03	0.21	0.24	--	<0.01
Year 2	697	7,203	-0.01	-0.09	-0.08	--	0.047
Year 3	416	4,759	-0.07	-0.01	0.06	--	0.864
Comparability Test of Children in Baseline Cohorts							
Year 1	746	2,777	0.29	0.12	-0.17	-0.14	<0.01
Year 2	605	2,999	0.32	0.20	-0.12	-0.08	0.116
Year 3	581	2,940	0.30	0.09	-0.21	-0.13	<0.01

Source: Ohio Department of Jobs and Family Services claims and enrollment data.

Notes: Includes all children who met program eligibility criteria from July 1, 2007, through June 30, 2010. The first, second, and third years of the study refer to each child's first, second, and third 12-month periods of eligibility. For complete details, see Appendix A.

We classified children as having high asthma severity if they had one or more asthma-related hospitalizations or two or more asthma-related ED visits in their 12-month baseline period. All other children were classified as having low asthma severity.

The high-touch subgroup includes children who had two or more outpatient visits to the Cincinnati Children's outpatient clinics during their first study year. Because the study and comparison groups are balanced at baseline, we conducted only t-tests in descriptive statistics for the high-touch analysis.

For the comparability test, we identified children with asthma using data from July 2004 through June 2005 and conducted a differences-in-differences analysis for those children using that 12-month period as a baseline year and the subsequent three 12-month periods (July 2005 to June 2006, July 2006 to June 2007, and July 2007 to June 2008) as follow-up years.

During the intervention period, children in Hamilton County were more likely than those in comparison counties to have both rescue medications and controller medications filled (any fill and number of fills) (Table III.5). There were some small but statistically significant effects on outpatient visits, with the number of visits decreasing in years 2 and 3 of the intervention, relative to the comparison group. The intervention appeared to have no impact on hospital use, and we were unable to estimate regression-adjusted effects of hospital readmissions given the small number of patients with readmissions.

Table III.5. Differences in Asthma Medication Use Between Treatment and Comparison Group Populations in the Asthma Improvement Collaborative Study Population, Regression- Adjusted

	Number of Children		Treatment-Comparison Differences		Difference-in-Differences	p-value
	Treatment	Comparison	Baseline	Intervention		
Proportion with Any Controller Medication Fill						
Year 1	1,691	7,913	0.00	0.03	0.02	0.102
Year 2	1,525	7,203	0.00	0.06	0.06	<0.01
Year 3	1,036	4,759	-0.01	0.07	0.08	<0.01
Average Number of Controller Medication Fills						
Year 1	687	3,066	-0.15	0.10	0.24	0.187
Year 2	619	2,833	-0.17	0.26	0.42	0.02
Year 3	568	2,687	-0.49	0.61	1.11	<0.01
Proportion with Any Rescue Medication Fill						
Year 1	1,004	4,487	0.00	0.04	0.03	<0.01
Year 2	906	4,370	0.01	0.05	0.04	<0.01
Year 3	468	2,072	0.01	0.07	0.06	<0.01
Average Number of Rescue Medication Fills						
Year 1	956	5,457	0.10	0.30	0.20	0.10
Year 2	861	4,987	0.11	0.44	0.33	<0.01
Year 3	589	3,309	0.09	0.61	0.52	<0.01

Source: Ohio Department of Jobs and Family Services claims and enrollment data.

Notes: Includes all children who met program eligibility criteria from July 1, 2007, through June 30, 2010. The first, second, and third years of the study refer to each child's first, second, and third 12-month periods of eligibility. Controller medications include inhaled corticosteroids, leukotriene inhibitors, long-acting bronchodilators, and mast-cell stabilizers. Rescue medications include short-acting beta agonists and noninhaled corticosteroids. For complete details, see Appendix A.

Asthma Improvement Collaborative Return on Investment Analysis

For the Cincinnati Children’s ROI analysis, we estimated three different scenarios (worst-case, most likely, and best-case) because there was little to no reimbursement for intervention activities during the implementation period and because we wanted to simulate different potential ROI scenarios for those who might implement similar initiatives. The assumptions underlying each scenario vary based on (1) the reimbursement that Cincinnati Children’s received or could have received for AIC activities, and (2) estimated patient substitution effects. For example, in the most likely scenario, we assumed that Cincinnati Children’s received reimbursement for home health visits for all three years at four visits per child monitored by a care coordinator, and that any reductions in asthma inpatient admissions (relative to the comparison group) were replaced with Medicaid-covered, general pediatric patients.⁹ In the worst-case scenario, we assumed three visits per child for home health services, and no revenue replacement for reduced inpatient utilization. The best-case scenario represents our best guess at potential reimbursement for the intervention, and includes 5 home health visits per child, and reimbursement in the second and third years for care coordination services (the two years in which those services were offered). Calculation of utilization-related gains and/or losses, grant funding, investment, and operating costs remain unchanged across scenarios. Nonetheless, the scenarios differ considerably in potential revenues, and offer different perspectives on potential ROI.

Under all scenarios, the net present value of the AIC intervention is negative and the ROI was less than 1, indicating that the AIC recouped less than \$1 for every dollar invested (Table III.6). This result is mainly due to the cost of the intervention (approximately \$1.2 million, discounted at a 3 percent rate over the three-year intervention period, as reported by Cincinnati Children’s). Under the best case scenario, potential reimbursement for some of its intervention activities (including estimated reimbursement for home health visits, which Medicaid reimburses on a fee-for-service basis, and estimated potential reimbursement for care coordination services, which are not currently reimbursed by Medicaid), non-BCQII grant funding, and financial gains related to utilization savings and patient substitution effects all helped to offset the costs of implementing the intervention, but still not enough for Cincinnati Children’s to break even financially.¹⁰

Table III.6. Return on Investment for the Cincinnati Children’s AIC Intervention

	Scenario		
	Worst Case	Most Likely	Best Case
Total discounted revenue	340,686	441,850	919,093
Total Discounted Intervention Costs	1,190,029	1,190,029	1,190,029
Net Present Value	\$(849,343)	\$(748,179)	\$(270,936)
Cost-Benefit Ratio	0.29	0.37	0.77

⁹ Substituting visits by children with asthma with general pediatric patients was only one option available. Assuming substitution with higher (or lower) margin visits would result in higher (lower) discounted revenue overall but not enough to materially affect the results.

¹⁰ Cincinnati Children’s did not receive reimbursement for care coordination services during the BCQII intervention period. Hence, the best case scenario represents only the potential ROI that the AIC could have achieved and does not reflect actual ROI for the intervention.

Sources: Ohio Department of Jobs and Family Services Medicaid claims and enrollment data and Cincinnati Children's financial data.

Note: We assumed a 3 percent discount rate. For more detail on ROI calculations, see the Cincinnati Children's case study. Total discounted intervention costs include initial investment costs (primarily staff time to develop an implementation plan and prepare for implementation) and intervention costs in the form of salaries for project leaders, care coordinators, home health staff, and other staff responsible for implementing different portions of the intervention. Although Cincinnati Children's would have paid the salaries of many staff members regardless of this intervention, staff members' participation in this initiative meant that other potential initiatives or hospital work was foregone.

3. Monroe Plan's Pediatric Asthma Care Enhancement Project

Monroe Plan is a Medicaid Managed Care Organization in Rochester, New York, with 225,000 members. The PACE intervention was a provider-focused, pay-for-participation program designed to increase primary care providers' awareness of how well the care they supply aligns with practice-based guidelines for children with asthma, such as providing asthma action plans, comprehensively assessing symptoms, and prescribing appropriate medications. The intervention sought to achieve this goal by offering providers a monetary incentive to conduct a chart review for Monroe Plan-insured children with asthma. By increasing providers' awareness of how often they incorporate these activities, the intervention aimed to improve their adherence to evidence-based asthma care guidelines. The goal of the Monroe Plan team was to help children better manage their asthma and thus experience fewer asthma-related ED and hospital visits.

Practices with at least 20 Monroe Plan children with asthma in the Rochester area and surrounding regions (Southern Tier and Finger Lakes) were randomized to either a treatment or a control group. Monroe Plan offered treatment group practices an "incentive fee" of \$5 per eligible Monroe Plan member per month for their participation in PACE, in exchange for conducting chart audits on a certain percentage of the practice's eligible members every six months.¹¹ Chart audits were conducted seven times throughout the three-year intervention period. In addition, treatment group practices were also given feedback on their own chart audit results compared with those of peer practices. After each round of chart audits, a provider from each treatment group practice met with Monroe Plan's Chief Medical Officer to discuss the practice's results. Treatment group practices also participated in twice-yearly "learning collaboratives": hour-long lunchtime meetings during which invited speakers presented on various pediatric asthma care topics, with time allowed for practices to learn from each other's experiences.

PACE Implementation

Nearly all PACE practices randomly assigned to the treatment group agreed to participate in the intervention, with only 2 of 13 declining. Monroe Plan kept participating practices engaged throughout the intervention and provided technical assistance and support as needed. In aggregate, treatment group practices reviewed between 325 and 397 charts (9 to 102 charts per practice) for children with asthma in each round of data collection. The audits themselves were completed using a secure internet-based tool that only treatment group practices could access.

A few challenges arose during implementation, but Monroe Plan confronted each one to minimize its impact on the evaluation. For example, although Monroe Plan staff provided training to

¹¹ The total amount received varied by the number of Monroe-enrolled children with asthma at any particular practice, ranging from \$1,800 to \$9,750 for smaller practices to as much as \$82,000 for one large practice.

all treatment group practices on the definition of each chart review data element and on how to use the web-based survey tool, when it came time to conduct the chart audits, some providers showed a limited understanding of the definition of an *asthma action plan*. This became apparent in the first round of data collection, which showed a large discrepancy in the percentage of children in the treatment group for which an asthma action plan was reported (36 percent) compared with those in the control group (12 percent). Through discussions with providers individually and at the group collaborative meeting, Monroe Plan learned that some providers misinterpreted the measure. To correct the issue, Monroe Plan explained the definition in detail at the third collaborative meeting and reviewed the measure with some practices individually.

Keeping providers engaged during the intervention presented another challenge. Because of competing demands, some practices struggled to complete the chart audits on time. However, with only a few exceptions, nearly all participating practices completed audits in all rounds of data collection. Monroe Plan also found it challenging to engage practices located outside the Rochester area. These practices typically were unable to attend the collaborative meetings, either in person or by phone. Monroe Plan sought to engage them by sending a health plan representative to visit them and encourage them to attend the meetings. Persuading time-constrained providers to participate in the twice-yearly collaborative meetings also could have presented a potential challenge; however, participation in terms of the number of practices represented at these meetings was strong. Participation may have been enhanced by (1) Monroe Plan's efforts to bring in presenters to discuss topics that were timely and relevant to the practices, (2) the networking opportunities the meetings presented, and (3) the distribution of the chart audit incentive fee at these meetings.

We examined the PACE chart audit data to determine whether treatment group physicians made any changes in adherence to practice-based guidelines compared with control group practices. Overall, there were statistically significant, positive trends for the treatment group compared to the control group for some outcomes, including the percentage of children (1) receiving an asthma action plan, (2) prescribed appropriate medications, (3) with a recent office visit where asthma was addressed, and (4) having an environmental assessment for smoke. These findings suggest that the PACE intervention began to have an effect on the practice of asthma care at treatment group practices, the first step in realizing potential gains in health care utilization.

PACE Impacts on Outcome Measures

The impact of the PACE intervention on outcomes for children with asthma was mixed (Table III.7). Children with asthma assigned to treatment group practices had more office visits for asthma in the first and third years of the initiative and were more likely than children in control group practices to have fills for appropriate medications (more controllers and fewer rescue). However, the intervention did not have an effect on ED or hospital use.

Office visit results suggest that treatment group children are visiting their physician for asthma more frequently compared with control group children. Specifically, in the first and third years of the intervention, a higher percentage of treatment group children had at least one office visit *for asthma* compared with the control group. The favorable differences in medication use for PACE indicate that children in the treatment group were more likely to fill appropriate asthma medications.

Table III.7. Select Outcome Measures for the PACE Intervention, Regression- Adjusted

	Number of Children		Outcome Measure Value			p- value
	Treatment	Control	Treatment	Control	Difference	
Proportion with an ED Visit for Asthma ^a						
Year 1	3,721	4,010	18.1	16.9	1.2	0.581
Year 2	2,733	2,983	15.6	12.6	2.9	0.054
Year 3	1,612	1,773	13.1	13.2	-0.1	0.957
Proportion with an Office Visit for Asthma ^a						
Year 1	3,721	4,010	49.0	44.7	4.4	0.048
Year 2	2,733	2,983	41.5	38.2	3.3	0.256
Year 3	1,612	1,773	43.4	34.7	8.6	0.002
Percentage with Four or More Controller Medication ^b Fills						
Year 1	3,721	4,010	21.7	21.9	-0.0	0.630
Year 2	2,733	2,983	21.6	21.2	0.3	0.210
Year 3	1,612	1,773	19.7	16.2	3.5	0.008
Percentage with Four or More Rescue Medication ^b Fills						
Year 1	3,721	4,010	14.6	15.5	-0.9	0.007
Year 2	2,733	2,983	14.3	15.8	-1.5	0.479
Year 3	1,612	1,773	5.5	9.0	-3.5	<0.01

Source: Monroe Plan for Medical Care prescription drug claims and enrollment data.

Notes: Includes all children with asthma who are enrolled in the Monroe Plan Medicaid managed care plan, are at least 2 years old and younger than 19, have a diagnosis of asthma (493.xx) on any medical claim in the year before or during the intervention period, and are affiliated with a treatment or control group practice. Because children in the study population are enrolled for different lengths of time, we weighted results according to number of days enrolled during the intervention period. We normalized weights so that they sum to the total number of sample members. We adjusted standard errors for clustering at the practice level.

^aWe define an ED or office visit as being for asthma if any diagnosis code was for asthma.

^bWe measure use of controller and rescue medications in the 12 months before a treatment or control group member's index date. Controller medications include inhaled corticosteroids, leukotriene inhibitors, long-acting bronchodilators, and mast-cell stabilizers. Rescue medications include short-acting beta agonists and noninhaled corticosteroids.

Return on Investment Analysis

The PACE ROI analyses were conducted from the perspectives of Monroe Plan and the participating treatment group practices. For the primary analysis, we considered potential savings to Monroe Plan from reduced utilization costs compared with PACE investment and operating costs, including staff time and resources, chart audit incentive payments, and other costs. For our analyses of the ROI for treatment group practices, we compared benefits from the incentive payment and increased office visits to the costs of conducting the chart audits.

Monroe Plan Return on Investment

The PACE intervention yielded a negative ROI overall for Monroe Plan (Table III.8). However, there were some signs of potential promise. First, there was an estimated positive ROI¹² within the

¹² This analysis allocated investment and operating costs between small, medium, and large practices proportionally by number of members allocated to each practice size at baseline; as a result, we allocated 18 percent of investment and

small practice subgroup, defined as those with fewer than 100 eligible Monroe patients with asthma. However, the utilization cost-savings among children in these practices were not from changes in ED visits (as we might expect from the intervention's logic model), but from other types of utilization (outpatient and prescription drug). Monroe Plan also achieved cost savings in year 3 for the subgroup of children eligible from the beginning of the intervention, although the ROI was still negative (not shown) and it is unclear whether this finding is random or due to the intervention itself. If Monroe Plan had paid physician practices an incentive payment about half as large, Monroe would have had a positive ROI overall in year 3. However, these utilization cost-savings resulted not from reduced ED visits, but from reductions among treatment group patients in other types of utilization (inpatient and outpatient).

Table III.8. Monroe Plan Return on Investment

	All Practices	Small Practices
Discounted Investment/Operating Costs	\$385,547	\$66,871
Discounted Cost Savings/Loss from the Intervention	\$(399,548)	\$286,939
Cumulative Benefit-Cost Ratio	-1.04	4.29
Net Present Value	(\$785,095)	\$220,067

Notes: Refer to Appendix B for a description of the methodology used to calculate the ROI. We assumed a discount rate of 3 percent.

Quality improvement programs for pediatric asthma such as PACE likely require a substantial initial financial investment up front and a willingness to wait several years (at least) for possible savings to accrue (if at all); interventions that successfully improve physician adherence to evidence-based asthma-care practice guidelines, as Monroe Plan appears to have done with PACE, will not necessarily make an immediate impact on rates of ED visits or hospitalizations. In addition, a positive ROI for Monroe Plan among the subgroup of small practices suggests that focusing efforts on subgroups of providers that are most likely to be affected by quality improvement efforts may be the best route to a positive financial return.

(continued)

operating costs to small practices, 38 percent to medium, and 44 percent to large. Since a portion of investment and operating costs are fixed, this allocation will underestimate the expected cost to Monroe Plan of implementing the PACE intervention on only one practice size subgroup. However, even if we had increased the amount of investment and operating costs attributed to small practices by threefold, Monroe Plan would have still achieved a positive ROI on the small practices subgroup.

Return on Investment to PACE Treatment Group Practices

There was a substantial, positive ROI for the PACE treatment group practices (Table III.9). The favorable results were due both to an increase in office visits for children affiliated with treatment group practices (resulting in increased revenue for these practices) and to the low (relative to their incentive fees) resource costs to practices associated with completing the chart audits.¹³

While practices of all sizes achieved a positive ROI, PACE was especially lucrative for large physician practices. Because of the structure of the PACE incentive fee and the chart audits required (\$5 per eligible Monroe Plan child with asthma per month, and the number of charts that a practice had to complete was based on a percentage of eligible patients but was capped), larger practices derived the most benefit from the intervention compared with medium and small practices. Monroe Plan could have structured the incentive fee differently (for example, paid the physician practices 50 percent less, capped the per-member-per-month total, or otherwise shifted some funds to smaller practices) and still allowed the PACE treatment practices to achieve a positive ROI, while boosting its own chance at achieving a positive ROI for the intervention.

Table III.9. PACE Treatment Group Practices' Average Return on Investment for the BCQII Intervention, By Practice Size

	Large	Medium	Small
Average Net Incentive Payments per Practice	\$48,840	\$21,033	\$4,328
Average Net Incentive Payments Plus Utilization Gains per Practice	\$105,120	\$15,978	\$10,194

Notes: Net incentive payments include incentive payments from Monroe Plan to the practice less the estimated cost of performing the chart audits. Utilization gains are the average incremental increases in office visits in the small, medium and large treatment group practices multiplied by the average payment per service. We used the maximum estimated cost of conducting chart audits to calculate costs to each practice.

¹³ Utilization gains were estimated as the average incremental increases in office visits for small, medium and large treatment group practices multiplied by the average payment per visit. Because we did not have data on the number of office visits by practice, these estimates do not reflect the actual gains achieved by any individual practice.

IV. CONCLUSIONS FROM BCQII AND IMPLICATIONS FOR THE BUSINESS CASE FOR QUALITY IN MEDICAID

This chapter describes conclusions from the BCQII evaluation and discusses the implications of making the business case for quality in Medicaid. On balance, findings from the BCQII initiative demonstrate that it is difficult to achieve a positive ROI for asthma interventions targeting Medicaid children. Moreover, identifying the appropriate level and mix of financial incentives is not straightforward. Even if optimal financial alignment is identified, achieving success still requires considerable upfront investment before realizing returns, ongoing commitment and coordination across stakeholders, meaningful engagement of providers and patients, and interventions that result in reductions in costly health care utilization that outweigh the costs of implementation.

CONCLUSIONS

We draw the following conclusions from our evaluation of BCQII:

- Interventions to improve asthma care for children in Medicaid are feasible to implement, although successful implementation is enhanced by ongoing monitoring of intermediate performance measures to identify and address problems that may arise in the course of implementation.
- Meaningful engagement of high-risk Medicaid-insured children with asthma may prove difficult, as shown by low rates of engagement among the highest-risk children for both of the patient-based BCQII interventions (the Alameda-CHRCO ATTACK clinic intervention, and the Cincinnati Children's Asthma Improvement Collaborative), despite grantees' efforts to target this group.
- The creators of BCQII originally anticipated that interventions targeting pediatric asthma would convey both improved health and lower ED and hospital use for Medicaid-insured children with asthma, and financial gains for the sponsoring organization and other stakeholders. However, findings from BCQII show that even with successful implementation and the support of rigorous study designs, translating this into improved patient outcomes (reduced ED and hospital use) and demonstrating positive ROI are challenging. None of the BCQII grantees were able to improve ED or hospital use for the treatment group compared with the control or comparison group, or to demonstrate a positive financial return. Affecting rates of ED use and hospitalization may require (1) more meaningful and complete engagement of higher-risk patients and (2) a more comprehensive set of intervention activities than was present in BCQII.
- Despite a lack of evidence on ROI, two of the three BCQII sites were able to sustain their interventions after the initiative ended. This reflects not only successful implementation of the interventions, but also stakeholder buy-in and a qualitative assessment among leadership that the work improved patient care, even if such perceived improvement did not translate into improved ED or hospital outcomes or positive financial return as measured in the evaluation.

IMPLICATIONS

The BCQII evaluation provides lessons for health care organizations wishing to implement quality improvement programs for pediatric asthma and for policymakers wishing to better align incentives to reward quality. As the Centers for Medicare & Medicaid Services and state Medicaid agencies consider initiatives that encourage value while controlling costs, providers must begin to think beyond fee-for-service to a paradigm in which they are accountable for care, and ultimately, health. Efforts that target high-cost, high-risk populations—such as Medicaid children with asthma—are likely to continue to receive considerable attention. Sound structuring of financial incentives for such initiatives will be particularly important. Moreover, a clear understanding of their implementation and careful monitoring of intermediate outcomes will be crucial to understanding whether and how they are affecting quality of care. Targeting these efforts to those practices (or other care delivery entities) in the system where they can have the greatest impact, and tailoring these efforts to the needs and preferences of patients, will be critical to success.

Consider ROI During Program Design and Set Financial Incentives Appropriately

To achieve a positive ROI for improved quality of care, BCQII grantees had to not only improve quality of care and health care utilization, but do so in such a way that savings from quality improvements exceeded intervention costs. Achieving such a goal can be daunting, particularly if investment and operating costs are high. For example, to match its high operating costs, Alameda-CHRCO would have had to realize substantial reductions in hospital and ED use. Similarly, Monroe Plan's incentive program resulted in sizable payouts to large practices. Achieving a positive ROI in such a situation would require large shifts in ED and hospital use among patients of those practices, something which intervention leaders understood from the start. In fact, Monroe Plan had a positive ROI only for small practices—to which it made considerably smaller total payments.

To improve quality with the expectation of some financial return to stakeholders, BCQII grantees sought to provide appropriate financial incentives for quality and work to correct any financing misalignments in the most efficient way possible. For example, Monroe chose to provide a chart audit incentive fee to treatment group providers by paying them a \$5 per-member-per-month fee per eligible patient. This added up to a much larger financial incentive for larger practices compared with small practices. Had Monroe chosen to pay practices differently (for example, paying per chart audit conducted rather than per eligible Monroe member with asthma associated with the practice), it likely would have affected each practice's incentives for participating in PACE and their motivation for making changes in the way they deliver care. However, it would also have provided Monroe Plan with a different, and potentially positive, ROI.

To help maximize an initiative's potential at achieving a positive ROI, health care organizations should factor ROI considerations into their program design. Conducting a preliminary analysis of potential intervention costs and possible ROIs would provide implementers with a guide from which to benchmark their performance during the intervention period. By monitoring costs in particular, organizations can assess whether they are staying within projected budgeted amounts. Monitoring benefits of the intervention might be more challenging given typical delays in health care utilization data; however, reviewing intervention cost data regularly will provide at least some assurance that budget targets are being met.

Because there was little evidence of an immediate positive ROI for BCQII grantees, their experience indicates that agencies and organizations seeking to align financial incentives with

improved quality should consider incentive design at the outset of any initiative to identify the appropriate balance of incentive size to potential intervention value. In many cases, financial incentives need to be tailored to different settings or stakeholders to ensure that they elicit the appropriate level of participation while still providing the opportunity for a positive ROI if quality of care does in fact improve. For instance, the Monroe Plan's ROI was positive when we considered only the experiences of small practices to which it made considerably smaller total payments than it made to other practices.

Attain Meaningful Engagement of a Large Proportion of High-Risk Populations

BCQII grantees attempted to affect quality of care and health care utilization for large populations of children with asthma either by directly working with children and their families (Alameda-CHRCO and Cincinnati Children's) or through interaction with primary care practices (Monroe Plan). However, to have an effect on quality or utilization at the population level, it is necessary to identify and engage high utilizers of care who also tend to be high-risk members. It is also necessary that a considerable proportion of the high-risk population be engaged in quality improvement activities in a meaningful way; otherwise, desired effects are unlikely. For example, while 55 percent of children with two or more previous ED visits for asthma in the Alameda-CHRCO study population were referred to the ATTACK clinic, only 20 percent of these children actually visited the clinic. Thus, while the ATTACK clinic intervention was designed to target higher-risk children, having only a small proportion of these children visit the clinic made it more difficult for ATTACK clinic staff to affect the return ED visit rate for asthma among this group. Similarly, although Cincinnati Children's targeted high-risk children in the inpatient component of its intervention, only about a third of all children who visited its primary care clinics were classified as high-risk (defined as having a previous asthma-related hospitalization or two or more ED visits). If Cincinnati Children's had been able to engage a greater proportion of high-risk children in the clinic setting where care coordination activities were most prominent, it may have been able to have an impact on outcomes. Thus, targeting high-risk populations, as was the case with Alameda-CHRCO and Cincinnati Children's, is not enough to achieve a positive ROI without also attaining meaningful engagement of that population.

Targeting and engagement take on different meanings when the planned interventions are provider-focused, such as was the case for Monroe Plan. To have a chance to affect population-level outcomes, the intervention must engage providers and stress the importance of their active engagement of high-risk members. Thus, the organization implementing the intervention might have to indirectly target high-risk patient populations through providers. In the context of PACE, Monroe Plan actively engaged physician practices, and there was some evidence that asthma care improved. The target population of children with asthma included those with both well-controlled and not-well-controlled asthma. Aligning the financial incentive for practices such that chart audits are conducted primarily for children with not-well-controlled asthma, and coupling that with additional office visits for these children might be one strategy to consider in the future in an attempt to affect health care utilization and achieve a positive ROI.

Interventions that pursue meaningful patient activation in health care in addition to active engagement of providers are likely to be more successful than those that include only one of these two components. Engaging patients in quality improvement activities—for example, through asthma education in an outpatient setting—such that they become motivated to improve their health has the potential to pay dividends to the organization that makes the investment. During the intervention

planning stage, organizations must identify the appropriate level of intervention intensity (for example, one-time visit versus ongoing coordination of care) that balances optimal patient engagement and the potential to achieve a positive ROI.

Identify Strategies to Overcome Recruitment and Participation Barriers Proactively

Interventions that successfully recruit eligible members of a target population and achieve a high level of participation are more likely to have an effect on outcomes and generate a positive ROI. For BCQII, recruitment and participation of eligible patients played a role in grantees' ability to achieve impacts. Two of the three BCQII grantees, Monroe Plan and Alameda-CHRCO, experienced some challenges with patient or provider recruitment and participation. Alameda-CHRCO relied on ED physicians to refer children to the ATTACK clinic on treatment days, but the physicians did not always remember to do so and might have been opposed to random assignment of children into the control group. In addition, various barriers to visiting the ATTACK clinic on a separate date meant that only 12 percent of eligible treatment group patients ever attended, which reduced the likelihood that the intervention could have an impact at the population level. Monroe Plan relied on the active engagement and participation of providers and was able to achieve a relatively good rate of participation among this group, but still found it challenging to consistently engage those practices outside the Rochester area.

Cincinnati Children's intervention was less influenced by participation or recruitment challenges, as the grantee intervened directly with patients who were admitted to the hospital (a particularly captive audience for asthma education) or who visited Cincinnati Children's outpatient clinics. Such patients did not have to make a separate trip to receive the intervention activities, as they did for the ATTACK clinic intervention. This approach allowed Cincinnati Children's to potentially affect children presenting in the ED or clinic settings.

Identifying strategies to overcoming obstacles to recruitment and participation should be an integral part of intervention planning and design, as such barriers can significantly influence programs' abilities to make a business case for quality. Organizations pursuing such programs should leverage the experiences of multiple stakeholders to proactively identify lessons learned from prior efforts and successful strategies for working with the target populations.

Engage Providers and Patients Actively by Targeting Interventions at Both Groups

For interventions focused on changing the way care is delivered, it is critical to actively engage providers and to ensure that they "buy in" to the intervention's goals and are motivated to participate fully in the intervention. For all three BCQII grantees, clinical leadership played a vital role in engaging other providers, and physician champions proved essential to implementation success. For Monroe Plan, persuading almost all treatment group providers to participate in the intervention was facilitated by their ongoing, strong relationships with many providers, but it required considerable work to keep providers engaged and participating throughout the three-year period. For Cincinnati Children's, the approach of holding regular, collaborative meetings on the AIC work for providers across the system helped to engage them in the intervention activities and allowed efforts to be better coordinated; according to several staff, this collaborative approach differentiated this work from Cincinnati Children's prior initiatives on asthma. For Alameda-CHRCO, the lack of provider engagement and buy-in was an ongoing challenge, even though a well-respected physician served as the intervention's advocate. ED physicians would sometimes forget to

refer patients to the ATTACK clinic, and not all physicians bought into the intervention's experimental design. While this design approach brought needed rigor to the evaluation, its effects on providers highlight the need for balancing design decisions with implementation considerations.

In addition, interventions must include components that engage both providers and patients. Interacting to affect change with one group without engaging the other can prove inefficient and costly. Because interventions like the ones tested for BCQII propose to change health care delivery systems, it is necessary to change both provider and patient behavior to improve quality of care. As such, before implementation can begin, health care organizations should identify the ways in which both groups will be targeted. For example, at Cincinnati Children's, the intervention team included not only provider- and patient-level components to improve health care delivery at the hospital and outpatient clinics for asthma, but also to better engage high-risk children and their families.

Monitor Implementation to Gauge Early Performance and Track Progress Throughout

Monitoring program implementation, in the form of intermediate outcome measures—such as the percentage of children who have an asthma action plan, who are prescribed appropriate medications, or who visit a clinic—helped BCQII grantees gauge whether their interventions were being implemented as planned and accomplishing short-term objectives. Such monitoring allowed grantees to address implementation issues, barriers, and shortfalls. Cincinnati Children's in particular used intermediate process and outcome data to continuously improve its processes and activities—tracking these measures on a monthly basis and communicating them to a variety of clinical staff involved with the AIC work. Monroe Plan used the data from physician chart audits to provide feedback to treatment group practices every six months, showing them how well they did on various measures compared with their PACE treatment group peers.

Without positive changes in intermediate outcome measures, it is unlikely that interventions will have an impact on longer-term outcomes or ROI. However, intermediate outcomes that move in the right direction do not alone guarantee a positive ROI. Such measures must be relevant and proximate to the ultimate outcomes of interest; a logic model may help in determining which intermediate measures are most appropriate in this regard. Additionally, tracking implementation at different stages of an intervention is critical to a complete understanding of the mechanisms through which the intervention affects patient and provider behavior. Once appropriate intermediate outcome measures have been established, organizations faced the additional challenge of developing feasible information-gathering methods that promote quality improvement but do not hinder the usual workflow of health care practice.

Manage Expectations About the Time Needed to Achieve a Positive Return on Investment

The BCQII experience indicates that achieving a positive ROI requires careful planning and inevitably includes many challenges; it indicates also that reaching this ultimate objective might not happen within the desired time frame. All BCQII grantees were hopeful at the start that their interventions would yield a financial return, as predicted, but none did so. Even the potential promise at Monroe Plan among small practices is limited by the fact that only limited savings were achieved during the intervention period for outpatient and inpatient expenditures, the latter of which can be volatile.

Health care organizations that initiate quality improvement programs should consider that even three years may not be enough time to realize a positive ROI. Therefore, innovators must manage

expectations of senior leadership on how long the organization must wait and how much it must invest before realizing a return. Moreover, organizations must plan well ahead for how they will determine whether initiatives are effectively achieving an ROI, based either on internal calculations or external review, and identify the extent to which changing the culture around health care delivery matters as much as a positive financial return in the short term.

NEXT STEPS FOR MAKING THE BUSINESS CASE IN MEDICAID

Health care delivery system and payment reforms at the state and national levels rely on aligning the financial incentives of payers, providers, and patients to improve population health and patient experience with care and to reduce health care costs. One argument for such initiatives is their potential for a “win-win” scenario—that is, one in which shifting financial incentives improve quality of care but also result in positive returns to payers, providers, and patients. The experience of BCQII grantees suggests that such a scenario is difficult to obtain and that identifying the appropriate level and mix of financial incentives is not straightforward. Moreover, even if optimal financial alignment is effected, achieving success still requires considerable upfront investment before realizing returns, ongoing commitment and coordination across stakeholders, meaningful engagement of providers and patients, and interventions that result in reductions in costly health care utilization that outweigh the costs of implementation. As health care organizations and governments pursue new initiatives and reforms, leaders and policymakers should be mindful of these lessons and recognize that achieving a business case for quality in Medicaid rests on careful planning, patience, collaboration, and evidence-based interventions that engage providers and patients in processes that result in higher-quality health care.

REFERENCES

- Bachrach, Deborah. "Payment Reform: Creating a Sustainable Future for Medicaid." CHCS Policy Brief, May 2010.
- Barta, Patricia. "Improving Asthma Care for Children: Best Practices in Medicaid Managed Care." CHCS Toolkit, 2006.
- Cloutier, M.M., S.D. Gross, D.B. Wakefield, T.A. Nurmagambetov, and C.M. Brown. "The Economic Impact of an Urban Asthma Management Program." [*American Journal of Managed Care*](#), vol. 15, no. 6, 2009, pp. 345-351.
- Foels, Thomas J. "Second-Generation P4P: Rational Design, Purposeful Implementation, Proven Results." Presentation at National Pay for Performance Summit, Los Angeles, CA, February 7, 2006.
- Greene, S., Reiter, K., Kirkpatrick, K., Leatherman, S., Somers, S., Hamblin, A. "Searching for a Business Case for Quality in Medicaid Managed Care." *Health Care Management Review*, Vol. 33, no. 4, 2008, pp. 350-360.
- Hoppin, P., L. Stillman, and M. Jacobs. "Asthma: A Business Case for Employers and Health Care Purchasers." Lowell Center for Sustainable Production Policy and Practice Report, February 2010.
- Karnick, P., H. Margellos-Anast, G. Seals, S. Whitman, G. Aljadeff, D. Johnson. "The Pediatric Asthma Intervention: A Comprehensive Cost-Effective Approach to Asthma Management in a Disadvantaged Inner-City Community." [*Journal of Asthma*](#), vol. 44, no. 1, 2007, pp. 39-44.
- McGinnis, T., and David Marc Small. "Accountable Care Organizations in Medicaid: Emerging Practices to Guide Program Design." CHCS Policy Brief, February 2012.
- Sommer, S.J., L.M. Queenin, S. Nethersole, et al. "Children's Hospital Boston Community Asthma Initiative: Partnerships and Outcomes Advance Policy Change." [*Progress in Community Health Partnerships*](#), vol. 5, no. 3, 2011, pp. 327-335.

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