Abstract: In this time of budget reductions and fiscal pressures, government funded programs are facing the need to justify their return on investment and public value. One approach to evaluating government programs is known as cost-benefit analysis and in the context of community based health programs known as Return on Community Investment (ROCI). ROCI is an approach that weights the government investment versus the public and private value created. This report assesses the ROCI for the Rural Hospital Performance Improvement Program (RHPI), which serves the Mississippi Delta region. The RHPI Project utilizes federal funding to assist rural hospitals with improving financial, operational, and clinical performance. The findings here will help policy makers in assessing the overall value of the RHPI Project.
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I. Introduction

RHPI Program Background
The Rural Hospital Performance Improvement Project (referred to as RHPI) is a federally funded initiative to build and sustain the capacity of local rural hospitals located in the Mississippi Delta region of the United States. The RHPI Project serves rural designated hospitals with 199 or fewer beds located in Delta Regional Authority counties and parishes in an eight states, which include Arkansas, Kentucky, Alabama, Illinois, Tennessee, Mississippi, Louisiana, and Missouri. The RHPI project targets three specific program goals:

- Improve the operations and financial characteristics of rural hospitals in the Delta
- Build state and local capacity to support these hospitals long term
- Collect best practices and disseminate that information more widely

The RHPI Project is funded by the Department of Health and Human Services Health Resources and Services Administration’s Office of Rural Health Policy (ORHP) through a contract to The National Rural Health Resource Center (The Center), which is located in Duluth, Minnesota. The Center is the federal contracting agency for the RHPI Project. As the contracting agency, The Center works in partnership with Delta state health care organizations (RHPI state partners include State Office of Rural Health, Hospital Associations, and State Quality Improvement Organizations) to strengthen rural hospitals through onsite technical assistance services and educational trainings.

Since its origination in 2001, the RHPI Project goal is to improve and sustain the financial, operational, and clinical performance of Delta hospitals through comprehensive onsite consultation services and ongoing educational trainings. Services are designed to assist hospitals in achieving improved performance and sustaining gains post consultation. The RHPI Project works to achieve the program goals by two approaches. First, RHPI utilizes field experts that provide hands-on technical assistance directly to hospital staff, administration, and board. Second, RHPI works collaboratively with Delta state partners to meet ongoing training needs. The trainings are correlated with the onsite consultations. The onsite consultations target the
Performance improvement needs for each hospital and individual projects are tailored to fit that facility. The RHPI approach requires CEOs to prioritize needs, define services, select a consultant, develop a scope of work, and establish a timeline prior to the initiation of the project.

Consultation projects are classified into categories according to type of performance improvement (PI) activity undertaken by the hospital. These PI categories include activities such as financial and operational assessments, operational and clinical assessments, revenue cycle management and business office assessments, and strategic planning projects that include balanced scorecards or Studer-Pillar models. Specific interventions (that is, consultant best practice recommendations) were targeted to each hospital based upon the PI needs of that particular facility. The hospital’s PI needs are initially identified by Chief Executive Officer (CEO). The PI needs are then further evaluated by the executive and management teams with the project consultant. The consultant provides best practice recommendations based upon the discovered PI opportunities and/or identified gaps in services. Lastly, the consultant works with the executive and management teams to develop department action steps to support the implementation of the best practice recommendations. It is the hospital’s responsibility to prioritize the best practice recommendations and take action to implement the specific interventions. Following the completion of the project at approximately 9 – 12 months, the RHPI staff contacts the hospital CEO to evaluate the progress of the hospital through the Recommendation Adoption Progress (RAP) interview. RAP utilizes a scoring system to summarize the overall impact of PI activities on the hospitals. It is also a process to capture accomplishments and document project outcomes. The RAP score is used later in this return on community investment (ROCI) analysis to weight individual projects to determine the value of the RHPI Project.

RAP is an evaluation tool that captures the degree to which program activities have been implemented and/or services utilized by the program participants. The purpose of the RAP is to gather information on the adoption of consultant recommendations, and ultimately project
outcomes, by interviewing CEOs approximately one year after completion of a project. The goal of RAP is to demonstrate a hospital’s progress over time by showing the extent to which a facility has implemented best practice recommendations. Moreover, RAP attempts to demonstrate ways the project has become embedded in the culture of the organization, and enhanced leadership and management skills, which is critical to sustainable. Ultimately, RAP evaluates the adoption status of the consultant performance improvement recommendations (which is the interventions) by participating hospitals. The RAP interview is administered via phone interview with the hospital CEO approximately one year following the completion of the project. The objective is to report the hospital’s progress in implementing the consultant’s recommendations, and document successes and lessons learned from RHPI sponsored projects. The information gathered is utilized to demonstrate how the project is being sustained in the hospital, and/or to assist the hospital in developing strategic next steps to further sustain performance gains.

The CEO scores (or rates) the overall implementation process of the consultant’s best practice recommendations. The CEO’s RAP score ranges from 1 to 5. A score of one (1) represents none or few recommendations were adopted by the hospital. A score of five (5) demonstrates that most to all recommendations were adopted by the hospital. A RAP score of three (3) is also considered by RHPI as very positive, as it indicates that the hospitals have projects “in process” and have leadership commitment to continue and sustain projects. A score of 3.0 often was correlated with outcomes associated with cost savings and/or cost containment. Hospitals whose RAP scores demonstrate substantial progress (over 4.0) are growing and expanding services. The concept is that the higher the score, then the greater number of recommendations were implemented by the hospital to sustain the project, which should improve performance.

RAP findings are used to monitor and modify internal processes to improve services to hospitals. The evidence gathered through RAP reports demonstrate the individual hospital project outcomes, but also illustrate the overall impact of the program. Therefore, the RAP
score is contributing factor in this ROCI analysis as it used, along with other information, to compute a weighted score, which is explained in methodology and data section.

**Cost Benefit Analysis (CBA) and Return on Community Investment (ROCI)**

The RHPI is one of thousands of federally funded projects that occur on an annual basis. In appropriating funds, Congress and the President must choose among a vast array of competing programs from education and healthcare to military spending and homeland security. There are several mechanisms or tools that have been developed over the years in which such choices can be addressed beyond political calculations. Cost Benefit Analysis (CBA) and Return on Community Investment (ROCI) are standardized tools that are used by the federal government to evaluate programs.

Cost benefit analysis is over 70 years old. It was first used by the Federal government with the Army Corps of Engineers to examine the potential economic feasibility of building water control or dam projects. In 1920, the formal use of Cost Benefit analysis was required in all river and harbor federally funded projects. At that time, the Corps actually denied more than half of the projects based on the economic infeasibility.

In 1992, the U.S. Office of Management and Budget (OMB) issued circular A-94. The circular laid out federal guidelines for cost benefit analysis. The circular applies to any "analysis used to support government decisions to initiate, renew or expand programs or projects" (OMB, 1992). The circular does not apply where executive order or legislation supersedes such a requirement. Although there has been some controversy on the use and abuse of cost benefit over the decades among competing political parties and administrations, it remains a valuable tool when used in an objective and nonbiased context.

There are two types of cost benefit analysis in general. Ex ante cost benefit analysis is based on assessing the potential benefits and opportunity costs of an investment option before it happens. Ex post cost benefit analysis is based on assessing their actual costs and benefits after
the fact. Ex ante analysis requires careful consideration of the timing of benefits and costs and the use of a discount rate. Ex post analysis does not require the use of a discount rate. The biggest challenge facing users of ex post analysis is determining cause and effect. In the project being undertaken here in this ROCI analysis, an ex post cost benefit analysis is being used as the RHPI investment has already occurred.

Return on Community investment is simply a form of cost benefit analysis. The term "community" may have various meanings other than a local area. Community may refer to the federal government. Alternatively, community may represent a state or local government, area jurisdiction, or even just a town or region. Within this ROCI analysis, the community is defined to be the nation as a whole ROCI is thus a species or form of cost benefit analysis.

There are many types of outcomes that any type of public project may seek to achieve. In a medically oriented project, the outcomes targeted may include adequate access to health care, improved patient health and satisfaction or better disease prevention. These outcomes may be very desirable in and of themselves from the perspective of, for example, medical science, hospital management, or community improvement. From an economic perspective, the goal is to create a common metric upon which all project activities can be rated. In this case, the common metric is the in- and outflow of dollars. A positive inflow of dollars relative to those expended for any given project results in a positive economic outcome. It should be noted that other disciplines take a different perspective on how to value outcomes. This project takes the view of the economics discipline, which has honed the use of cost-benefit analysis over 70 years.

**Report Objective**
The goal of this ROCI analysis is to assess the overall impact of the RHPI Project and determine the value of its services from the perspective of the federal government. For this ROCI analysis, a total of 33 selected RHPI projects from Fiscal Years 2011 and 2012 were investigated. The 33
projects are distributed across the eight (8) Delta states\footnote{In total across the fiscal years, 60 projects were undertaken by the RHPI. However, only 33 projects have been included in this analysis. The excluded projects were customer service lean, IRs compliance and leadership development projects. These types of projects are being dropped in the future and were thus not considered useful in informing the RHPI program moving forward. All costs and benefits accounted for in this analysis reflect the 33 projects and not the total 60 projects.}. These 33 projects included 10 performance improvement assessments, 10 quality and process improvement projects, 7 revenue cycle and business office improvement projects, and 6 strategic planning projects.

The ROCI assessment evaluates the payback from the federal investment in this specific program, which in this case, is the RHPI Project. In essence, the RHPI Project represents a “government by contract” project. The U.S. Government, via the Department of Health and Human Services, contracts with an outside entity (The Center) to carry out specific initiatives that support financial, operational, and clinical performance improvement in small rural hospitals. In the case of the RHPI, the goal is to use federal funds to intervene in specific hospitals to improve performance and quality, and sustain those gains post-project. The federal government must determine, given all of the priorities it faces, whether these funds are being used in a socially beneficial manner. The investment in the RHPI must be compared to other possible investments the government must make. This information can be used by policy makers to determine the relative effectiveness of the RHPI investment as opposed to alternative investments.

II. Methodology and Data
The methodology section describes the data and outlines the process to perform the Return on Community Investment (ROCI) analysis of the Rural Hospital Performance Improvement (RHPI) Project. The first part of this section explains the program and community opportunity costs of the investment analysis. The second part of the methodology defines the program and community benefits of the RHPI Project. Also in the second section, RHPI program benefits are quantified to provide a monetary value to the Performance Improvement Activity (PIA) in order to determine the return on investment. It also includes the assumptions made to develop the
model and the approaches used to complete the analysis. Finally, these two pieces are brought together to complete the return on investment analysis in the Analysis and Results section of the report.

Data
The data for the analysis was retrieved from RHPI program documents, which was obtained from the National Rural Health Resources Center staff. Data sources included spreadsheets that track expenditures by consultations and administrative costs, hospital project summaries, and Recommendation Adoption Progress (RAP) reports. This analysis reviewed Fiscal Years (FY) 2011 and 2012 data for 33 selected hospital projects.

For this ROCI analysis, a total of 33 RHPI projects were investigated. These 33 hospital consultation projects were supported in fiscal years 2011 and 2012. Three of the hospitals received more than one onsite consultation project during this time period. The 33 projects are distributed across the eight (8) Delta states with an average of approximately 4 projects per state. The total per state ranged from 1 project in Tennessee to 8 consultations in Louisiana. The total projects per state are distributed as indicated in the Table 1 below.

Table 1: Total Projects by State

<table>
<thead>
<tr>
<th>State</th>
<th>Number of Projects Per State Evaluated in ROCI</th>
</tr>
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<tbody>
<tr>
<td>AL</td>
<td>5</td>
</tr>
<tr>
<td>AR</td>
<td>5</td>
</tr>
<tr>
<td>IL</td>
<td>4</td>
</tr>
<tr>
<td>KY</td>
<td>3</td>
</tr>
<tr>
<td>LA</td>
<td>8</td>
</tr>
<tr>
<td>MO</td>
<td>5</td>
</tr>
<tr>
<td>MS</td>
<td>2</td>
</tr>
<tr>
<td>TN</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
</tr>
</tbody>
</table>
Program and Community Opportunity Costs Overview
This section defines the program and ‘social’ (or community) opportunity cost of the RHPI ROCI analysis. It describes the data and methodology used to determine the opportunity cost, and explains the accounting of the costs used in the analysis.

The total cost of the RHPI Project is a critical variable in assessing the ROCI. The overall cost of any government program is based on the total funds expended by the project to complete program goals and objectives. The total costs are the resources used by the Federal government to fund the RHPI Project. The “opportunity” here would be defined as other types of programs such as education or defense that the federal government could invest. Opportunity costs represent one part of the full ROCI financial analysis.

There are two types of opportunity costs we will consider in this analysis. The first type is program opportunity costs and the second is community (or social) opportunity costs. Program (or intended) opportunity costs are those costs that are directly incurred by the contracting agency to administer the services. Some adjustments may be applied to these program opportunity costs. These adjustments would be appropriate for ROCI analysis in order to treat program costs as the community or social opportunity costs. The purpose of the adjustment is to ensure that the full cost is actually being taken into account in the analysis. This could be that the full cost of a particular item is not an opportunity cost from a community or social point of view. For example, underutilized resources that are transferred to another use because of a government program may only have a social opportunity cost of half of their "market" cost from a social viewpoint. Specifically, if a government program directly hires an unemployed worker, the workers “opportunity cost” would not be the full wages paid to them but something less. This is because they were not employed prior to the government program with another employer.
Program Opportunity Costs
The program costs are all of the direct costs that have been expended in carrying out the RHPI Project services and activities. For the RHPI Project, program costs would include administrative and consultant costs to provide the technical assistance to hospitals. Administrative costs are those costs incurred by the contracting agency to manage the RHPI Project. Administrative costs are necessary expenditures to support the day-to-day activities of the program on behalf of the U.S. Department of Health and Human Services. Consultant professional fees and travel support are also considered direct program cost. Professional fees and associated travel expenses are those expenditures that support the consultants’ time and services. Consultants are contracted by RHPI to intervene in a specific hospital project to fulfill the program mission and goals. The administrative and consultant costs are then summed to equal total program costs. These expenditures represent a foregone opportunity to fund an alternative government program or to even return the money to the private economy. For the ROCI, these costs are then compared to the benefits generated by the program later in the analysis.

Table 2 below summarizes the program administrative costs for Fiscal Years 2011 and 2012 of implementing the RHPI Project. Administrative costs include personnel, indirect, and other expenditures. Other represents administrative costs for project supplies, phone services, postage, printing, office rent, staff travel, and meeting expenditures. These administrative costs are incurred in order to oversee the contract consultants and ensure accountability for the project. These costs represent real resource use from a social standpoint that could have been used in alternatives ways. Personnel costs represent about half of the administrative expenditures.
Table 2: Administration Expenditures

<table>
<thead>
<tr>
<th></th>
<th>FY 2011</th>
<th>FY 2012</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td>$261,261</td>
<td>$273,323</td>
<td>$534,584</td>
</tr>
<tr>
<td>Other</td>
<td>$72,031</td>
<td>$45,267</td>
<td>$117,298</td>
</tr>
<tr>
<td>Indirect</td>
<td>$134,707</td>
<td>$127,823</td>
<td>$262,530</td>
</tr>
<tr>
<td>Total Administrative Costs</td>
<td>$467,999</td>
<td>$446,413</td>
<td>$914,412</td>
</tr>
</tbody>
</table>

The community opportunity cost question is whether the personnel positions should be fully costed or whether there is some logic for a differential between program costs and social costs. In this case, the logic appears to suggest that the full cost should be recognized. There are no market externalities or public goods that would require an adjustment from program costs to social costs. Although one could argue that the labor market is not a perfectly functioning market, it is deemed worth the effort at this time to account for those distortions. The full $914,412 amount expended will be one of the social or community costs used in the financial analysis of the RHPI Project. Again, these are full social or community opportunity cost against which the benefits of the program must be compared. However, as we are examining only 55% of the total projects undertaken by RHPI in FY 2011 and 2012, this adjustment will be used to determine the administrative costs that will be accounted for in the ROCI. In this case, the social cost related to administration will be $502,927.

The second major program cost category is the expense of contracting the consultants to work with the hospitals. The goal of such an intervention is to transform some aspect of hospital operations and realize performance improvements that would not have occurred in the absence of the intervention. The main form of this policy intervention is to hire third party consultants who work with each hospital to complete a project. The RHPI staff work with each hospital to identify the type of performance improvement project needed. After that process, a third party consultant is interviewed by the hospital and contracted by RHPI to develop a scope of work, identify issues, recommend changes and interventions, and begin implementation of the action plan. Table 3 depicts total RHPI consultation budget for Fiscal Years 2011 and 2012.
hospital projects. These program costs are broken down by travel expenses and professional fees, which represents the funding support for the hospital consultation projects. RHPI does not utilize federal funding to cover the consultant’s materials, printing, supplies, software, nor other proprietary products that the field experts may utilize to complete a hospital consultation project. RHPI supports the consultant’s professional time and associated travel expenses.

### Table 3: Consultation Costs (FY 2011 and FY 2012)

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<thead>
<tr>
<th></th>
<th>FY 2011</th>
<th>FY 2012</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>Consultant Professional fees</td>
<td>$623,181</td>
<td>$642,000</td>
<td>$1,265,181</td>
</tr>
<tr>
<td>Travel Support</td>
<td>$79,408</td>
<td>$66,251</td>
<td>$145,659</td>
</tr>
<tr>
<td><strong>Total Consultation Project Costs</strong></td>
<td>$702,589</td>
<td>$708,251</td>
<td>$1,410,840</td>
</tr>
</tbody>
</table>

<p>| | | | |</p>
<table>
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<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Projects Supported Per Year</strong></td>
<td>28</td>
<td>32</td>
<td>60</td>
</tr>
<tr>
<td><strong>Average Cost Per Project</strong></td>
<td>$25,092</td>
<td>$22,132</td>
<td>$23,514</td>
</tr>
<tr>
<td><strong>Estimated Costs to Support 33 Projects in FY11 – 12</strong></td>
<td></td>
<td></td>
<td>$775,962</td>
</tr>
</tbody>
</table>

Again, the ROCI logic requires asking the question of whether these program costs are identical to or different from the social or community costs. Thus, the total cost of consultants over the two fiscal years was $1,410,840. However, again as we are only examining 33 of the 60 projects, we will adjust this figure by the 55% percent factor. Thus, the total consultant cost will be estimated to be $775,962. These costs would appear to the full social costs of the program. The logic would strongly appear to support the full costing and equivalence between program and social or community costs in this category as well.

There is a third potential category of costs that must be considered, that is, the hospitals’ expenses for performing the RHPI Project and implementing the consultant best practice recommendations. The hospital itself may incur costs associated with the specific policy intervention. In some cases, these may be opportunity costs that would not have been incurred absent the intervention of the federal government. The opportunity cost would be what alternative actions or processes the hospitals may have engaged in otherwise. Given that
this is a very difficult question to answer and particularly challenging to quantify, this analysis will not include the hospitals’ associated expenses for the RHPI projects. Since the costs are assumed to be minimal, if not negligible, no attempt has been made to place a cost value on these foregone options. This cost logic absence will be counterbalanced by a conservative set of assumptions on the benefit side.

**Social or Community Opportunity Costs**

Another category of opportunity costs to consider would be related to externalities or market failure. There are no known major externalities associated with the hospitals in these settings. While each hospital may produce a degree of waste or external costs on the community or society in general, these costs are at least in part already addressed by federal or state regulations. There does not appear to be any major evidence that can be brought to bear regarding negative externality costs that should be associated with this program or these hospitals in this analysis.

At this point, there are two major program cost categories that are evaluated in the overall ROCI analysis. These program costs, both administrative and consultant costs, are social or community costs of the RHPI. There has been no logic found to reduce these program costs relative to a social or community perspective. Thus, these program costs will be presented as the social or community opportunity costs in the full ROCI financial analysis. The overall total program costs for the intervention (again, the intervention is the hospital consultation projects) from a social opportunity cost standpoint is $1,278,889. This value (which is obtained from Tables 2 and 3) includes the total administrative costs plus consultation expenditures. This will be the cost figure used in the ROCI analysis of the RHPI Project for FY 2011 and 2012.

**Program and Community Benefits Overview**

This section of the methodology documents the benefits and financial returns section of the ROCI analysis. It also describes the process for quantifying program benefits and providing a monetary value to them. The quantifying process utilizes tier and weighting system to rank
hospital projects to quantify the confidence level of the analysis. The process further ties the projects to a monetary value to determine the overall benefit of the project. This ROCI analysis conducted focused on 33 projects from FY 2011 and FY 2012 for the RHPI Project. Each of these projects has a potential return on investment. The quantification of this benefit into dollar terms is both challenging and critical to an ROCI process.

The general process is to examine the hospital post-project to discover if the intervention has produced an outcome. Next, that outcome is then determined if it could be linked to a financial outcome such as a reduction in expenditure or an increase in patient revenue. Ideally, the outcome should be linked to the project from a financial perspective. For example, a particular hospital may focus on developing and executing a strategic plan utilizing a balanced scorecard framework with the assistance of a government funded consultant. The benefit question becomes what is the monetary value to both the hospital and society from the use of federal funding to support such an intervention. A balanced scorecard may involve major changes to hospital operations as part of its implementation process including, for example, a quality improvement initiative. Therefore, can the adoption of quality initiative and/or the balanced scorecard be quantified and a dollar value placed on it? To answer this question, this ROCI analysis utilizes a typology approach to rate the overall confidence of the project related to financial outcomes.

In general, financial outcomes, in the case of this ROCI analysis, are defined as an improvement in the overall bottom line of the individual hospital. Thus, either a reduction in expenses or an improvement in revenue may result in an improved hospital margin. This improved margin then considered in the return on community investment analysis on the benefit side of the balance sheet. Of course, one must still consider the social benefits generated via return on community investment analysis (see Appendix 2). Given the range of projects funded, it was determined that a typology would be created to rate the overall confidence of the project related to financial outcomes.
A word on the nature of outcomes, and particularly financial outcomes, is necessary before describing the mechanics of the process. Any given project funded by RHPI may have a variety of anticipated outcomes. The final outcomes vary from soft interview summaries to hard measurable evidence based on industry accepted financial, operational, and clinical indicators. Outcomes, for an ROCI process, must be translated from qualitative or quantitative changes in hospital operations or patient outcomes into financial results. Final outcomes are dependent upon the hospitals’ ability to take action to implement the consultants’ best practice recommendations. The degree to which the final outcomes are achieved by an individual hospital (and to the extent that the final outcomes vary from project to project) is dependent upon the hospitals’ leadership to remain focused to complete the implementation phase. RHPI has discovered that the implementation phase takes on average approximately 1.5 years to implement at least 80 percent of the recommendations. The variation is based on the nature of the project. For example, the strategic planning projects may have less financial data tied to the outcome compared to a financial operational assessment. However, project outcomes also vary due to numerous other reasons that are outside the hospital’s control. For example, changes in Medicare and Medicaid reimbursement and other federal mandates can directly affect the hospitals bottom line and operations both positively and negatively. Regardless, the hospital is reacting to these strong changes and influences, which is in addition to the current actions taken by staff to implement the RHPI Project. Therefore, it is unclear as to exactly how the RHPI Project fully influenced the hospital given the various outside influences that are also affecting the facility and culture.

**Tier levels for Determining Program Benefits**

In order to complete this typology, the consultation projects were categorize by type of performance improvement activities (PIA) undertaken by the hospitals. The PIAs were then systematically ranked into tiers based on the type of intervention. In total, 33 hospital projects were ranked into one of four (4) possible tiers. The tier system includes four options, which again, is developed based on the PIA and soundness of the financial outcomes from the projects. The PIA factors were divided into four categories or tiers. These tiers are:
• Tier 1 - financial operational assessments
• Tier 2 - operational assessments and quality improvement processes
• Tier 3 - revenue cycle assessments and business improvement
• Tier 4 - strategic planning with either a balanced scoreboard or Studer-pillar model framework

The tier 1 category includes primarily financial operational assessments. These assessments typically produce outcome measurements that have resulted in a direct financial correlation or benefit that was achieved by the project. From an economic standpoint, these projects have the highest level of confidence, and thus, weighted accordingly. In these cases, the projects specifically speak about financial metric improvements such as operating margins, gross revenue, net patient revenue, and other financial metrics.

Tier 2 and 3 projects were weighted less heavily than tier 1 projects in the analysis. Tiers 2 and 3 include projects that may result in a lesser degree of confidence compared to the financial operational assessments in Tier 1. Thus, Tier 2 and 3 projects are weighed less than Tier 1 Performance Improvement activities (PIA). This is because the outcomes, while potentially valuable, pose a more significant challenge in ascertaining their financial benefits.

Tier 2 projects include operational assessments that target quality of care process improvement activities. These projects may have some outcomes that can be given an imputed financial value based on previous evaluation work from published research. In this case, the expected or actual outcome may be an operational process improvement, better information flows, better utilization of hospital bed space, or other operational characteristics. These operational factors may be to have a financial value placed on them from other hospital experiences. However, they typically produce impacts that may be more difficult to place values on since the outcomes are broader. For example, Tier 2 projects have reported that the projected improved medical necessity documentation, utilization review, and discharge planning activities. All of these outcomes have a direct impact on the hospital’s revenue cycle and reimbursement.
Tier 3 projects are in the area of business process improvements and revenue cycle management, and may also result in some financial measurable outcomes. However, Tier 3 projects may impact the hospitals by reducing denial of claims and billing errors, increasing office operational efficiency, and improving compliance, which is more difficult to quantify actual values.

Tier 4 projects involve strategic planning initiatives that include Balanced Scorecards and Studer-Pillar models to support the execution of the hospitals’ plan. These projects seem to produce less direct financial measurable outcomes compared to the first three tier groups. Therefore, they were weighted less than Tiers 1, 2, and 3. In general, it is more difficult to place a monetary value on strategic planning projects. Unless the specific hospital or program has carried out its own financial evaluation work to show measurable outcomes, it is also more challenging to conduct the ROCI analysis on these PIAs. Strategic plans are very valuable intervention, but there appears to be less research as to the financial effectiveness of them. In order to be conservative, these interventions are given a weighting of 25 percent as compared to Tier 1 projects. Typical measurements for Tier 4 might include, but not limited to, market share, physician utilization, and quality of care. The balanced scorecard, if properly implemented, should contain financial measures. In some cases, the weighting of Balanced Scorecard may be elevated if evidence of such financial outcomes can be documented. However, peer reviewed research is very slim regarding the financial effectiveness of adopting the Balanced Scorecard or other strategic planning initiatives and this needs to be addressed. In the future, better financial analysis and metrics should be given to these types of projects so that a higher weighting can be used.

The Balanced Scorecard (BSC) is a tool for improving the overall fit between strategy and action in an organization. The scorecard helps organizations align all parts of their operations and systems using a common set of goals and metrics and that can be filtered through the organization. It also allows the organization to establish several related goals as equal priorities including for example patient satisfaction, market share, and financial objectives. The balanced
A scorecard approach has been implemented in a number of RHPI projects. The BSC involves a new form of strategic thinking where hospitals attempt to understand how various forces within the operation affect one another such as the impact on employee investments in market share and profitability. It may also involve a tool known as strategy mapping. However, there is no available peer reviewed research on a link between the adoption of the balanced scorecard and hospital revenues and costs or profitability. While this is not to deny that such a link exists, without peer research, we can provide a reliable research transference value for the adoption of such tools.

The Studer-Pillar development initiative is similar in that assists organizations with setting goals and developing evaluation metrics to assess progress against those goals. Again, this initiative has only minimal peer reviewed research to support its deployment relative to the status quo. Any hospital projects identified as using these tools was classified into tier 4. This classification was not to deny the validity of these initiatives but rather to recognize the lack of peer review research that exists at this time. Better peer review research over time could boost the findings from implementing such initiatives.

The tier level was based on the type of PIAs. The tiers are not meant to state that a lower tier project is necessarily better or worse form an overall hospital standpoint; rather it distinguishes our confidence in the potential financial results of the intervention. Lower tier ratings may have great merit from a patient quality that cannot be as easily quantified in financial terms. Table 4 below illustrates the distribution of projects by tiers and correlates those tiers with the PIA. The projects were fairly evenly spaced between the tier groupings. Every attempt was made to act in a conservative fashion when classifying projects into the tiers and placing a weighted score on them. Given the limited measurable outcomes from the hospitals, these projects require special consideration in weighting them and applying financial values to their outcomes.
Table 4: Distribution of Projects by Tiers

<table>
<thead>
<tr>
<th>Tier</th>
<th>Project Type by Performance Improvement Activity (PIA)</th>
<th>Volume of Projects Per Tier</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Financial operational assessments (FOA)</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Operational assessment (OA) and quality improvement (QI) projects</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Revenue cycle assessments and business office process improvement projects (RC/BO)</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Strategic planning (SP) projects to include Balanced Scorecard and Studer-Pillar development initiatives</td>
<td>6</td>
</tr>
</tbody>
</table>

Weighting System for Determining Program Benefits

The weighting scheme is undertaken to ensure that projects are given a reasonable relative value in terms of their financial and economic impact. Projects that are classified as tier 1 are given the greatest weight with projects at a tier 4 level given the least weight. Each project within the tier class is given the same weight.

Tier 1 projects are the normalized base upon which the weighting scheme operates. Thus, a tier 1 project’s financial value is given the full weight or a weighting factor of one (1). A tier 2 project is weighed at three quarters of what a type 1 project is given. Tier 2 projects are weighted as .75 or 75% of their imputed financial value. Tier 3 projects are only valued at one-half the value of a tier 1 project. Tier 3 projects are weighted as .5 or 50% of their imputed financial value as compared to a type 1 project. Tier 4 projects are weighed at .25 or 25% of the value of a tier 1 project. These weights do not reflect the overall importance of these initiatives or hospital interventions, but rather the relevant financial evidence from peer reviewed research and or direct observation of financial outcomes. From other perspectives, these projects may contain a great deal of value.

Using one of these two routes, a relative hospital financial impact can be calculated from the adoption of new strategies. The second part of the process is to take the financial results and
weight those by the degree of implementation as reported by the hospital CEO in the RHPI. These ratings were identified as RAP scores. These anticipated and actual implementations cores are ranked from zero to five. Thus, a five on the implementation scale is weighted as 100% or full value while a score of 1 would be given only a 20% weight as compared to one that scored a five (1/5).

Table 5: ROCI Weighting Scheme

<table>
<thead>
<tr>
<th></th>
<th>RAP (5) (1.0)</th>
<th>RAP (4) (.8)</th>
<th>RAP (3) (.6)</th>
<th>Rap (2) (.4)</th>
<th>Rap (1) (.2)</th>
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<td>.30</td>
<td>.15</td>
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<td>Tier 3 (.50)</td>
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<td>.30</td>
<td>.23</td>
<td>.15</td>
<td>.08</td>
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<tr>
<td>Tier 4 (.25)</td>
<td>.09</td>
<td>.08</td>
<td>.06</td>
<td>.04</td>
<td>.02</td>
</tr>
</tbody>
</table>

Thus, the combination of the RAP scores (implementation score) with the tier rating (type of intervention) is combined to assess the full weighting that will be given to the hospital project under consideration. For example, a project with a RAP score of 5 (full implementation) and a tier 1 rating with be given a full rating based on observed financial outcomes in the ROCI. On the other hand a project with only partial implementation (RAP score of 2) and a tier rating of 3 would be given a weight of .15 percent of the potential financial outcomes of that type of intervention based on available research. The chart above gives the reader a full understanding of weights applied to any given project (see appendix for details of each project).

Let us work through one example of a tier 1 project. The hospital’s goal was to increase market share, improve patient satisfaction, improve revenue cycle efficiency and improved employee retention. This project occurred in FY 2011. The facility in the process opened six new clinics, received a number of national awards, and had a significant financial swing due to these changes and a major improvement in quality scores. They experienced a net financial gain from FY 11 to 12 of nearly $5 million. Their RAP or implementation score was a 3, so a little more than half of the gain can be attributed to the RHPI program or $3 million.
Quantifying Program Benefits
The private or program benefits are the intentional benefits of the RHPI program. These results will be aggregated across all hospitals to produce an overall RHPI program benefit financial value. The other question to obtain total social financial value is the related issue of social value or unintended value as opposed to intended value.

Social value is a more problematic concept. It essentially implies that a project has potentially intended and potentially intended consequences beyond those specifically targeted by a program intervention. In healthcare, a specific program may be attempting to improve the financial performance and maintain a hospital in a particular location. At the same time, the intervention to sustain the hospital may also lead to better health outcomes for patients. This in turn may lead to a healthier local population, fewer work absences, and improved business productivity. These indirect and in many cases unintended results may become part of an ROCI analysis.

What drives the decision to include these unintended or social benefits? The biggest factor in including such benefits would be a clear-cut estimate of the correlation between hospital performance, patient outcomes, and resulting economic outcomes. Unfortunately, such studies are often few and far between. For the analysis presented here, these external type benefits will not be included. This will provide for a more conservative set of benefit estimates.

Another set of external benefits relate to the economic impact of the hospital. If a given hospital shuts down, it not only eliminates its own jobs but also may reduce jobs from suppliers and other local business. This is the so-called multiplier effect. In previous ROCI analysis, these types of benefits were used in the calculation as part of the external benefits. For this analysis, this type of economic impact of external benefits is not utilized. For one reason, it is unclear if the policy interventions in the RHPI can be clearly identified as ensuring the ultimate viability of any given hospital. The second reason is that not using these types of external benefits provides again for a more conservative financial estimate.
III. Analysis and Results
This section will present the results of the return on community investment analysis. The ROCI is based on all of the evidence, research, and necessary assumptions derived in the previous sections. The final number is assessed for its sensitivity to changes in assumptions.

ROCI Analysis
The actual ROCI analysis, especially in an ex post case, is a relatively straightforward calculation. The analysis simply compares the costs of the investment versus the benefits produced by the investment using a simple ratio analysis. A figure greater than one indicates a positive return on investment while a figure less than one would be a negative return on investment. The ratio ultimately should be compared with other actual government program return on investments, if they are available.

Benefit or Value Side of Equation
On the benefit side, the impact of the RHPI on each hospital was assessed. In this analysis, careful consideration had to be given to the reported impact from the project consultant, hospital CEO and staff reports, and any possible hospital financial or operational reports. Attempting to sort out cause and effect can be a difficult business. Many factors may influence the financial well-being of a hospital, which may occur simultaneously with the RHPI project. Factors may include, for example, changes in state or federal policy, changes in the economy or the local community, and changes in medical insurance. In this analysis, a variety of sources were used, as discussed above, to determine a true picture of the impact of the specific RHPI project. Since this methodology cannot guarantee that certain impacts are overstated, every attempt was made to err on the very conservative side when choosing impact values.

Financial Calculations: Positive Net Margin Hospitals
The calculation process began with an analysis of financial results. Financial results were calculated using net patient revenue, operating expenses and operating margin. Net patient revenue was assessed using either FY 2011 or FY 2012 depending on the year in which the RHPI
project was initiated. A calculation as made to determine if between the two fiscal years (FY 10 to FY 11) or (FY 11 to FY 12) an increase in net patient revenue was generated. The second calculation was then assessed using operating expenses and the same method as with net patient revenue to determine if costs had risen or fallen over the time period under analysis. Finally, the change in net patient revenue and operating expenses were brought together to calculate change in operating margin. As a starting point, the change in operating margin was used to assess the initial net financial results for each hospital in this study.

First, let us review the financial results that these projects achieved in general, aside from any specific intervention of the RHPI program. The base results are analyzed using net patient revenue and operating expenses. For net patient revenue, these hospitals experienced a $31.4 million increase between FY 2010 and 2012. For operating expenses, the hospitals saw an increase of $14.7 million across the two fiscal years. Thus, on a net margin basis, the financial result was an improvement of $16.7 million. In individual cases, some hospitals may have experienced a decrease in net patient revenue or a decrease in operating costs. Regardless, the results above present the aggregate financial outcome. The question then becomes as to how we sort out the financial improvement that might be the result of the RHPI of this $16.7 million. However, before the analysis can proceed, several adjustment factors must be undertaken.

This initial positive net margin of $16.7 million actually included a number of hospitals with negative net margins. Removing these negative net margin projects resulted in a positive net margin of $22.5 million. This is an un-weighted raw number and not all of these positive financial results can be attributable to RHPI at this point in the calculation. After using the ROCI weighting matrix (see table 5) to calculate the weighted score for these net margin positive projects, the result is $9.5 million. Thus, out of a total possible $22.5 million, around 40 percent of that value ($9.5 million) can be attributed to the RHPI as a net social or community benefit value.

2 Net patient revenue and operating expense were used to reflect hospital operations as opposed to other issues and conditions that might hospital finances such as donations or depreciation.
In some cases however, a project’s financial result indicated that a negative net margin existed. This negative net margin is likely due to other conditions influencing the project; it is not considered here that the RHPI has resulted in a negative net margin. For all 33 projects across the two fiscal years, there were 12 projects that had a negative net margin. In total, these hospitals had a negative net margin of $5.9 million. The question was how to handle these projects given that the net negative figure was not considered to be due to RHPI.

**Negative Net Margin Adjustment Process**

A hospital’s financial conditions may change over the course of year for any number of reasons unrelated to the federal project intervention. This is a difficult set of circumstances to tease out in the analysis. Given the need to be conservative, any hospital where a net negative financial result occurred, a judgment call must be made. An analysis of both the individual net patient revenue and operating expenses was analyzed. If net patient revenue or operating expense results were positive despite the overall result being negative, this was the first step in assessing where a financial impact could be computed. In seven projects, there was negative net financial result but a positive result in the case of net patient revenue. The next step was to determine if a case could be made that the net patient revenue impact could be associated with the project intervention. In all seven situations, a clear-cut case could be made that the revenue impact was associated with the intervention. The next step was to use the weighting matrix to multiply the appropriate weight to the change in net patient revenue. This figure was then used as the financial impact of the RHPI project intervention.

A second adjustment was needed to account for the negative net margin hospitals. In this analysis, we consider whether the hospital has experienced an increase in net patient revenue or a reduction in operating expenses. If the RHPI intervention specifically addresses these issues in the program plan, credit will be given for an improvement on net patient revenue or a reduction in operating expenses as related to the RHPI financial outcome. With these adjustments, several hospitals could be brought back into the analysis. After this analysis, three hospitals were brought back into the analysis because of positive change in net patient revenue.
that could be reasonably attributed to RHPI. With these second adjustments and the total financial benefit of the negative net margin hospitals was calculated to be $7.3 based on either increased revenue or decreased costs as individual components. The next question is to what degree is this $7.3 million attributable to RHPI.

Based on the distribution of these projects across tier groups and their associated RAP scores, we can compute the total community value of these net negative margin hospital projects. Using the $7.3 million as a base number, the associated weighted value would be $4.8 million ($4,789,510) in total. This will be part of the total community or social value that was used in the ROCI analysis along with the figure for the positive net margin hospital projects.

**Final Financial results or Benefits of RHPI**

Using the methods described above, each of the 33 projects were given a computed financial result. The tier and RAP score scores were combined, as discussed earlier, in a matrix to derive a weighting scheme that is applied to this financial result to provide the final social benefit for each project. With the final social financial benefit calculated for each project, the 33 project values were then aggregated with simple summation to generate a final imputed value for the entire RHPI program. This final financial result, in aggregated form, is the benefit side of the ROCI equation.

As we discussed earlier, the total social benefits were calculated for positive net margin hospitals was $9.5 million and for negative net margin hospitals was $4.8 million. By combing these figures, we will be able to derive the total social or community benefit of the RHPI program. This number is then approximately $14.3 million (14,303,638). The appendix has a complete description of how each hospital is ranked on that system. This is the figure that was used in the final ROCI analysis. This is the value that will be placed into the ROCI ratio to determine the final analysis. This figure is based on all the methods discussed in the above sections. It is an aggregation of each hospitals financial results or outcome (see appendix 2). Appendix 2 provides the full results of financial results considered in this analysis broken down
by each hospital. These benefit results are considered to be relatively conservative. Where any question was raised as to the validity of any individual hospital outcome, the numbers were shifted down or not used at all to avoid any bias. There will be an assessment of the sensitivity of these results to changes in assumptions in a later section of the paper.

**Cost Side of Equation**

The cost side of the equation is derived from the analysis presented earlier in the report in tables 2 and 3. Those tables will be combined here to present the total costs of the ROCI process. The total cost of the program over FY 2011 and 2012 would be $1,278,889. These program costs also represent the social or community costs of the program. There were no adjustments made as described in the methodology section. This is the cost of the federal government participating in this program in FY 2011 and 2012 and includes the direct and indirect program and administrative costs.

**ROCI Results and Sensitivity Analysis**

The ex post ROCI analysis, the simple ratio of costs to benefits, provides a figure of 11.2. This number means that for every dollar of federal money invested in the RHPI program, a total of 11.20 dollars were returned. Of course, unlike a private investor, the government did not directly receive this return on investment. These returns accrued to the hospital, which would include the employees and staff, physicians, local businesses and other community stakeholders. Most importantly perhaps, these rural hospitals that did experience a positive net benefit were potentially more likely to sustain themselves and continue to provide health care access to rural populations.

A legitimate question is the sensitivity of this result to any changes in methodology or assumptions. In other words, how robust or how much confidence do we have in the ROCI figure? In this case, the opportunity cost figures are relatively straightforward and do not present much challenge. The benefit figures may be subject to some consideration for review.
In general, every attempt was made to use very conservative figures. In fact, nearly half of the projects, across mostly tier 2 and 3 categories, were not given a value or financial outcome figure (see Appendix 1). This is because no evidence of impact could be found or the evidence that did exist was not considered to have enough confidence to be included in the analysis. No figures or values were used for projects that involved leadership development for example, because no peer-reviewed research could be uncovered to support that cause and effect relationship.

One question is the potential impact of any given project especially if it large in size relative to other projects. Three projects stick out for sensitivity analysis including Tallahatchie Hospital with a projected impact of $3.7 million and Harrisburg Medical center with a projected impact of $3.05 million. If these two projects are removed, this would reduce the total ROCI to 5.9 ROI or $5.90 per dollar spent of federal investment. This is still a respectable result in either case. These two projects represents about 47% of the total ROCI net result. No other projects come close in representing a major portion of the ROCI result. Even with this adjustment due to the two outlier project, if the rest of the benefit side was off considerably, given the magnitude of the return, it would require a major downshift in benefit values for the ROCI to reveal a negative return. Therefore, the positive ROCI has a high degree of confidence. However, this is the second year in a row that one or two projects have represented a major portion of the ROCI result.

IV. Conclusion and Summary
In an era of austerity and declining government resources, every program must face scrutiny. There are many tools to assess the effectiveness and efficiency of government programs. One of those tools is called cost benefit analysis. In its form used in community based health care programs, it has often been termed return on community investment (ROCI). In essence, these two approaches are essentially identical.
This report analyzes the program known as the Delta Rural Hospital Performance Improvement program (RHPI). This program has been funded by the Federal Office of Rural Health Policy through a contract to The National Rural Health Resource Center. The intention of this program is to support rural hospitals in the Mississippi Delta region with performance improvement projects to help generate fiscal sustainability. This sustainability can then lead to retaining health care access to rural populations.

There are many approaches to investing in health care access. The CBA or ROCI approach is designed to create a common financial metric upon which different health care programs or even other government programs can be compared to each other. The ROCI approach first examined was the cost side. The costs incurred in this program include the administrative costs of the primary contractor along with the consultants used in the program, which would be termed direct costs. These costs came to approximately $1.3 million over fiscal years 2011 and 2012.

The benefit or value side of the equation was more difficult. Project value was based on the financial improvements to the hospitals revenues and profits that could be attributed to the onsite project. These projects included financial operational assessments, operational assessments, quality improvement, revenue cycle assessments, business office process improvement, and strategic planning. The total benefits generated by the RHPI were estimated to be $14.3 million.

In order to gain confidence in the results, several adjustments were made to these estimated financial improvements. Projects were stratified into tier 1, 2, 3, and 4 categories. Projects were classified into tiers based on their goals and projected outcomes. These tiers were then further supplemented in terms of impact via a score that addressed the level of implementation. This matrix combined with the net margin figures represented the total
benefits of the project. Further, project improvements were adjusted based on the degree of implementation success.

With these adjustments, a figure was generated from the ROCI analysis. The analysis indicated that for every $1 invested in this program, a return of almost $11 was generated. This value was then tested for robustness by removing two of the more prominently successful projects that were acting as outliers. Even with that adjustment, the project still returned nearly $6 for every dollar invested. These results indicate that there has been a reasonably positive return on investment from the RHPI program for the Federal Government. The following recommendations should be pursued as a result of the conclusions of this study:

1. RHPI needs to target Tier 1 (RAP 5) projects to the greatest extent possible to maximize total project investment from the federal government.

2. Tier 1 does not imply that every project must be explicitly financially oriented such as business process reengineering or new accounting processes; rather any type of project must have solid analysis and research behind the financial results regardless of the type of intervention being pursued.

3. Further, construct projects to push hospitals to initiate the implementation phase and take action to implement best practice recommendations (that is specific interventions).

4. Develop tool or approach to further enhance the hospital data submission to better capture pre-/post-project values.

5. Develop approach to further support the consultant reporting process.

6. Develop projects to include specific guidance to build evaluation tool for pre/post evaluation to improve measurable outcomes and better document project impact.

7. Identify key concepts and current variables that impact 1) reduction of cost, 2) increase in revenue, and improve quality. These variables may impede the overall ROCI analysis and financial performance of the hospital, and may be out of the control of RHPI Project and the hospital administration.
References and Useful Materials


Koska, Mary T. "High Quality Care and Hospital Profits: Is There a Link". Hospitals 64:5 (March 5, 1990).


Solberg, Leif I., C. Alan Lyles, Andrew Shore, Klaus Lemke and Jonathan Weiner. “Is Quality Free? The Relationship between Cost and Quality Across 18 Provider Groups”. The American Journal of Managed Care, Vol. 8, No. 5.


## Appendix 1: Individual Hospital Benefit or Value Outcomes used in Analysis

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Tier</th>
<th>RAP Score</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta Memorial Hospital</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>LaSalle General Hospital</td>
<td>1</td>
<td>4</td>
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<tr>
<td>Camden Medical Center</td>
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</tr>
<tr>
<td>Washington County Memorial Hospital</td>
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<td>Tallahatchie General Hospital</td>
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<td>Madison Medical Center</td>
<td>1</td>
<td>3.5</td>
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<tr>
<td>D.W. McMillan Memorial Hospital</td>
<td>1</td>
<td>3</td>
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Appendix 2: Template: Return on Community Investment and Cost-Benefit Analysis

There are ex post and ex ante cost benefit analysis approaches (CBA). Ex post is an analysis after a program has started or even after a program has finished. Ex ante analysis occurs before a program investment has been made. The goals of the two approaches are different. Ex post analysis attempts to determine if a given investment met its targeted objectives or how it compares to other projects. Ex post analysis can also be used to learn about the possibilities and options facing future projects. Ex ante analysis occurs to determine if a given investment should move forward depending on targeted financial outcomes or other objectives specified by policy makers.

Return on community investment is a form of cost benefit analysis with a general focus on community based health care programs. The key difference is that it defines a community in a broad context, which could include a city, county, region, state or entire country. The term "community simply refers to the fact there is flexibility as to the level of analysis and where it occurs. Cost benefit analysis is generally associated with the federal government. Otherwise, the two approaches are very similar.

Ex Ante ROCI Analysis

This section of the report details the use of a return on community investment analysis for future ROCI program extensions or expansions with an ex ante view. A return on community investment analysis, a form of CBA, can be broken up into six steps (Sassone and Schaffer, 1978).

1. Defining the scope of the return on community investment analysis:
2. Identifying relevant costs and benefits:
3. Quantify relevant costs and benefits:
4. Choice of social discount rate:
5. Sensitivity analysis
6. Perform investment analysis
7. Present results
Each numbered step will be described below. Step one is defining the scope of the return on community investment analysis. A return on community investment analysis is a consideration, either before the project has occurred, during the project's existence or after the project, to assess whether the community's opportunity costs have been met or exceeded by the benefits generated by the program. In order to undertake this analysis, the responsible party must carefully define what project is being analyzed and if it is before or after the project implementation. Questions such as, are we evaluating the entire project or just part of the project, is the project underway, finished or not started yet, what is the geographic scope of the project should be answered in the first step.

Step two is the identification of relevant benefits and opportunity incurred by the project. If the identification of the project in step one is done properly, this step becomes much easier. The benefits are the changes in the community that occur due to the project. Examples are a reduction in lack of health care access, new jobs and wages, improvement in the local natural environment and other factors. Opportunity costs are the resources consumed by the program to accomplish the benefits. These include capital items, operating or annual expenses. It must be recalled that both direct and indirect project benefits and opportunity costs should be captured. The indirect effects, both positive and negative, include items or factors that are not considered in the project budget or operating plan but occur in the community regardless.

Step three is the quantification of benefits and opportunity costs. Both benefits and costs must be valued in dollar terms for an investment analysis to be performed. Potential benefits or opportunity costs that cannot be explicitly valued should be noted in the presentation.

Step four is the choice of a social discount rate. The social discount rate is the figure that reflects changes in prices over time for both program benefits and opportunity costs. As stated in previous text, it reflects the willingness of a community to tradeoff current consumption or program benefits versus waiting for future program benefits.

In choosing a social discount rate, there is little reason to imagine that a community within the United States has a specific discount rate as opposed to a nationally determined social discount
rate. The analyst must consider if there is some specific community deviation from current national social discount rates. If the federal government is a major funder of the program, the analyst should consider using the Office of Management and Budget’s current social discount rate. Current information can be obtained at the Office of Management and Budget’s website (www.omb.gov).

Step five is the actual completion of the return on community investment analysis. This step is fairly straightforward. Once the analyst has identified and quantified the benefits and opportunity of the program and the social discount rate has been selected, one of the investment criteria is selected. In most cases, the net present value is the appropriate tool for return on community investment analysis. The previous text (pages 21-25) contains a detailed description of the strengths and weaknesses of various investment calculation methods.

Regardless of which method is chosen, the investment calculation will provide a result as to whether the benefits of the program exceed the opportunity costs of the program. It is at this step that one should recall that if benefits and costs are not properly identified or measured, then the rest of the analysis would be similarly flawed. This step reveals the potential net benefits or net costs of the program. However, the analyst should point out that, in most cases, not all benefits or opportunity costs could be quantified or measured at the time of the analysis. Further, return on community investment analysis is simply one piece of information for decision makers and not the sole evaluation method for any project.

Step six is the use of sensitivity analysis. Sensitivity analysis is the careful adjustment of certain key parameters in the analysis. It is used to determine if the results of the analysis are dependent on certain assumptions or pieces of information. For example, it could be that the choice of social discount rate has a major impact on whether the program produces net positive or negative benefits. If this is the case, the analyst must carefully consider and justify the use of a given parameter or assumption. In either case, the sensitivity analysis should be reported and brought to the attention of policymakers or decision makers.
Step seven is the presentation of results. The analyst should prepare an abbreviated version of the results for the decision maker(s) to use in examining the analysis. It is important in this presentation to highlight the potential caveats or sensitivity analysis results for the project.

**Ex Post ROCI Analysis**

The step in an ex post ROCI analysis are similar but do not require taking into account the time dimension of the analysis. This is because the analysis has taken place in the past and we do not need to take into account the future time dimension of money. An ex post analysis occurs when the project or program investment has already occurred and there is analysis of how well a certain investment worked. The steps in an ex post ROCI or CBA analysis are essentially the same as an ex ante CBA or ROCI analysis.

As stated earlier, the biggest challenge for ex post CBA or ROCI is determining if the investment caused the effects as initially stated in the investment plan. So in community based health care programs, the question would be whether a federal program investment resulted in specific set of financial outcomes for that hospital. In some cases, a sophisticated methodology may be undertaken, such as regression analysis or other forms of evaluation analysis, to ensure that the cause and effect relationship are clear.
Appendix 3: Project Benefits Literature Review

There is a research basis to examine regarding the financial returns to hospital patient satisfaction. In theory, there are two financially related returns for patient satisfaction (Rust et al., 1995). The first is an improvement in satisfaction can lead to improved marketing and new patient’s visits via word of mouth. The second outcome can occur when existing patients decide to use the hospital in the future is an increase in patient retention.

In the related industry of nursing care, Maldanado et al. (2003) found that there was a positive relationship between nursing home operating profit margin and patient satisfaction. Part of this relationship is because high quality care also results in improved staff productivity, fewer errors and thus a positive impact on financial performance.

Nelson et al. (1992) also examine the question of the relationship between hospital financial performance and patient satisfaction. The hospitals were generally larger with an average of 250 beds and were generally medical/surgical hospitals. A sample of 15,000 patients were tested across 100 hospitals mostly in the southern U.S. The findings are that almost 30% of a hospital’s operating profit can be explained with reference to variations in perceived patient satisfaction. The analysis was cross sectional in nature and not able to answer the direct question of how a change in patient satisfaction would impact operating profit.

Koska (1990) has been widely cited in the academic literature as providing evidence of a link between patient satisfaction and hospital finances. The analysis reviewed the evidence of a set of hospitals in the Hospital Corporation of America (HCA). They found that higher patient satisfaction was associated with improved profitability rankings. The study emphasized that quality care should not be associated only with higher costs or being seen as a tradeoff between higher care and financial stability.
Self et al. (2009) also examined more recently the link between hospital performance and quality of care perceptions. This study looked at a data set from 2006-2007 of over 6,000 U.S. hospitals. The finds of the study was that quality of care was directly related to hospital profitability. Profit was defined as average revenue per case minus average costs. The analysis controls for hospital size and severity of illness as well. Quality was measured as the proportion of patients receiving recommended treatments or practices per Center for Medicare and Medicaid recommendations. While there is a significant amount of findings in this work, the general focus for this analysis was the relation between general medicine procedures and quality of care. The empirical finding, which is statistically significant, is that a 1 percent increase in quality of care would result in a 3 percent increase in average profitability. These results are statistically robust although the standard deviations were not reported so it is impossible to know the range of results.

Yasin et al. (2002) examined the link between hospital quality management and leadership and operational and strategic outcomes. Their sample was 170 facilities and the target respondent was the hospital CEO/Administrator. They asked each respondent to assess their implementation of a variety of quality management tools including total quality management, business process reengineering, just in time, continuous improvement, benchmarking and job reengineering. The findings, will not specified in exact quantitative terms, did indicate that only slightly more than of the respondents felt that these quality management measures led to a "positive" or "very positive" improved return on investment.

Laffel and Blumenthal (1989) provide what is still an excellent overview of the general role of quality management ideas, originally developed in manufacturing, and their implications in a healthcare setting. They cite as the classic definition of quality in healthcare as “that kind of care which is expected to maximize an inclusive measure of patient welfare, after one has taken into account of the balance of expected losses and gains that attend the process of care in all its parts” (pg. 2869). More colloquially, its means collecting data, comparing data to standards and improving performance when standards are unmet (Laffel and Blumenthal,
Thus, in essence, while they go by different names, many policy interventions focus on the notion of quality management in healthcare.

New York Presbyterian Hospital sought major improvements via quality management and reported on their success with lean six sigma in a hospital setting (Craven et al., 2006). While a case study of one larger hospital, it does allow us to understand the potential return on investment calculations. The hospital experienced a 6 to 1 return on investment in cost savings from lean six sigma. The hospital was also able to reduce patient stays and greatly improve patient flow through the hospital.

Cohen et al. (2008) conducted a survey of hospital quality management initiatives from 2006. They surveyed 470 hospitals in the United States with more than 25 beds. Part of the analysis looked at the impact of quality management on expenses. Managers reported a 5% reduction in expenses on average with a range from 1 to 10%. In terms of margin, two thirds of managers reported that quality management had a positive impact on margin.

Alexander et al. (2007) studied over 1,700 hospitals in the United States. They assess both the scope and intensity of quality improvement adoption. Scope was measured as the percent of managers and other staff involved in the initiative. Intensity was measured as the use of clinical guidelines by physicians and the use of data in supporting clinical guidelines. The survey was sent to all 6,150 hospital CEO’s in the U.S. with a response rate of nearly 40%. Cash flow and cost per case were the impact variables. Greater intensity of quality management adoption across hospitals was associated with improved cash flow. For example, the greater number of units in hospital that adopted QI was associated with a 1% improvement in cash flow. The use of quality management tools was associated with a 15% increase in cash flow.

Carpenter (2009) provided some further evidence on the link between hospital profits and quality management initiatives. She argues that while it is likely that quality initiatives may improve revenues it depends on the payer mix. For example, revenues may not increase under
the current Medicare reimbursement system. The case for lower variable costs appears clearer cut for quality management initiatives. Thus, she argues that it depends on the mix between revenue and expense impacts.

The general body of evidence suggests that quality initiatives, such as lean management, continuous improvement, total quality management, and similar strategies all result in improved cash flow and hospital margins. Of course, the range of the return on investment results does vary over the studies. But, these results have been found by researchers in a variety of settings, hospital sizes, time periods and with different definitions of adoptions, scope and intensity. Because of the substantive evidence backing these types of studies, a hospital intervention with a focus primarily on quality or related initiatives was classified in the tiers.