



Planning and Conducting a Cost-Benefit Analysis of Health IT and HIE Projects: A Workshop for Medicaid/CHIP Agencies

*A Web-based Workshop
1:00 p.m. – 4:00 p.m. (EST)
August 13, 2009*

Workshop Workbook
Presentation Materials and Resources

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Welcome to the AHRQ Medicaid and CHIP TA Web-based Workshop -
***Planning and Conducting a Cost-Benefit Analysis of Health IT and HIE
Projects: A Workshop for Medicaid/CHIP Agencies***

Thursday, August 13, 2009, 1:00 – 4:00 pm Eastern

Presented by:

Marc Freiman, Senior Research Economist, Division for Health Services and Social Policy Research, RTI International

Anthony Rodgers, Director, Arizona Health Care Cost Containment System

Ryan McCartney, Director, Medicaid Informatics and Systems, Office of Medicaid Policy and Planning, Indiana Family and Social Services Administration

Moderated by:

Barbara Massoudi, Health Informatics Program, Research Computing Division, RTI International

Overview

- **Welcome** – Barbara Massoudi, Health Informatics Program, Research Computing Division, RTI International
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- **Presentations**
 - ***Module 1: Basics of Evaluating the Costs and Value of Health IT***
 - Presented by Marc Freiman, Senior Research Economist, Division for Health Services and Social Policy Research, RTI International
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 - Presented by Anthony Rodgers, Director, Arizona Health Care Cost Containment System
 - ***Module 2: Discussion***
 - ***Module 3: Revisiting the Value of Health Information Exchange***
 - Presented by Ryan McCartney, Director, Medicaid Informatics and Systems, Office of Medicaid Policy and Planning, Indiana Family and Social Services Administration
 - ***Module 3: Discussion***
- **Closing Remarks** – Barbara Massoudi

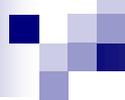
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Module 1: Basics of Evaluating the Costs and Value of Health IT

Presented by:

Marc Freiman, Senior Research Economist,
Division for Health Services and Social Policy
Research, RTI International



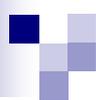
Setting the Stage—Some Terms

- Cost-benefit analysis
 - Requires attaching dollar values to benefits
- Cost-effectiveness analysis
 - Does not require attaching dollar values to benefits
- In either case, it is difficult to do a quality evaluation.



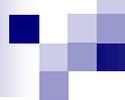
Which Type Applies to You?

- Value of health IT is usually a mix
 - Can (conceptually) have dollar measures of:
 - administrative cost-savings
 - reduced hospitalizations and other types of health care
 - reduced duplication of tests, prescriptions, etc.
 - More difficult to have dollar measures of:
 - Better targeted selection of tests and treatments
 - Faster communication of test and visit results
 - Reduced administrative contacts between providers to clarify orders, prescriptions, etc.
 - Reduced time spent by enrollees in obtaining health care



From What Perspectives Are You Looking at Health IT Costs and Value?

- Your Medicaid/CHIP program's costs
- Program enrollees
- Providers
- Organizations contracted to administer or manage parts of the program



When Are You Analyzing Health IT?

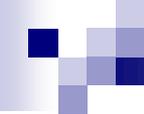
- Three basic timeframes:
 - Prospective
 - Early implementation
 - Retrospective

Prospective Evaluation

- Why? Make the best decision at the very start.
- Have little or no data on specific health IT costs and value for your state program to work with.
- Likely need to take estimates from elsewhere and apply them to your program.
- This means making a lot of assumptions.
- How good are the estimates from somewhere else?
- How relevant are they to your program?
- While health IT holds great promise, the data for actual health IT adoptions are limited.

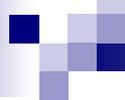
Early Implementation Analysis

- Why? Can make valuable mid-course corrections.
- You will have some data for your specific health IT and your specific program.
- But program still in early stage of implementation.



Retrospective Analysis

- Why? You may need to make a decision on whether to continue use of the health IT or modify it or the contract.
- You will have a largely complete set of data for your specific health IT and your specific program.



Analyzing Costs and Value for a State Medicaid/CHIP Program

- Different environment than analyzing a health IT implementation in a single hospital
 - An AHRQ guide does a good job of providing an evaluation toolkit for this latter purpose (Cusack and Poon, 2007)
- What are the differences?
 - Large number of enrollees
 - Large number of separate providers
 - Large amount of fairly comprehensive administrative data
 - Chart abstraction, surveys are ambitious undertakings given the program magnitude

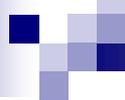


Categories of Costs and Value

- Direct “program” costs for health IT adoption and maintenance
 - Example: contractual costs for vendor
- Other costs incurred
 - Example: agency staff costs to design and implement the health IT adoption or manage the vendor contract
- Cost savings
 - Example: decreased need by providers for administrative staff
 - Should these savings be counted as “value,” or be subtracted from costs?
- Value generated by health IT
 - Example: fewer ER visits and hospitalizations resulting from e-Rx technology adoption

Which Value Measures?

- Not feasible to measure and evaluate everything.
- Which cost savings and value outcomes are most important for policy or politics?
- Which cost savings and value outcomes occur most frequently?
 - Example: decreased transmission time for e-prescriptions
- Which cost savings and value outcomes have the biggest impact when they do occur?
 - Example: hospitalization due to adverse drug event



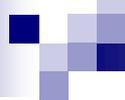
Issues in Estimating Costs and Value

- Comparing “like” with “like”
- Discounting of future benefits and costs
- Sensitivity analysis



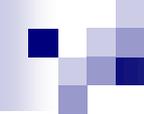
Comparing Like with Like

- Estimating value requires a comparison group. Some possibilities:
 - Before and after comparison for same group—same group, different time periods.
 - Comparing a pilot or partial implementation with those not in it—different groups, same time period.
 - Comparing program participants affected by health IT with a group not involved—different groups, same time period.
 - Example: enrollees in Medicaid/CHIP in a nearby state
 - Example: persons with other health coverage in your state



Comparing Like with Like (Cont.)

- Important to control for differences in:
 - Type of provider
 - Size of provider
 - Location of provider
 - Specialty of provider
 - Characteristics of Medicaid/CHIP enrollees treated



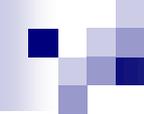
Comparing Like with Like (Cont.)

- How can you control for differences?
 - Before and after comparison will mean no differences in participants, but environment could have changed.
 - Multivariate statistical analysis can estimate effects, holding other factors constant.
- Differences in differences



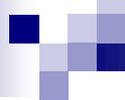
Discounting

- Including multiple years is important for the costs and value of health IT
 - Initial high investment costs may yield a stream of benefits for many years.
- Why discount?
- Choosing a discount rate
 - U.S. OMB provides rates for federal government project evaluations.



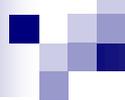
Sensitivity Analysis

- Especially important for a prospective analysis.
- Select important assumptions and see how results vary with different assumptions.



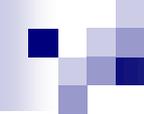
Brief Discussion of Some Measures that Require Dollar Outcomes

- Net Present Value
 - The preferred measure for cost-benefit analysis.
- Benefit-cost Ratio
 - Different results depending on where you put “cost-savings.”
- Return on Investment
 - A measure that can be positive, zero, or negative.
 - Doesn't incorporate scale of investment.
- Internal Rate of Return
 - Results can get funky.



Concluding Comments

- While other factors play major roles, careful analysis of costs and value can help lead to decisions that conserve scarce public dollars while improving health care.
- Some elements of an evaluation are technical—may want to consider how best to incorporate relevant technical expertise.
- Sometimes knowing good questions to ask is as important as knowing the answers.



Module 1: Discussion

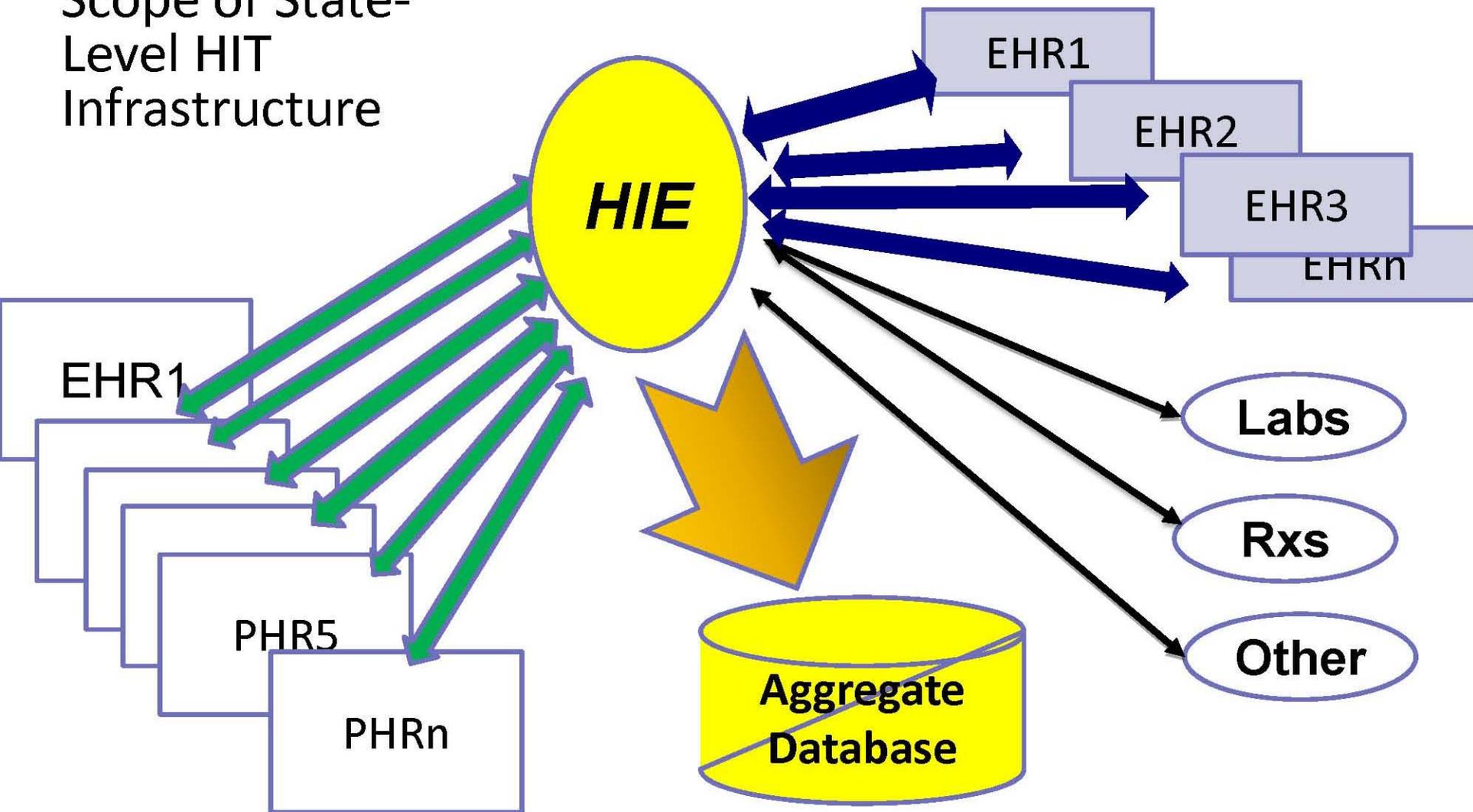
- Are you currently planning an evaluation of cost and value of some type of health IT, or is such an evaluation already ongoing?
- If so,
 - What type of technology are you evaluating?
 - At what stage of the technology life cycle is this evaluation being conducted?

Module 2: Approaches to Cost-Benefit Analysis of Health Information Exchange Adoption and Meaningful Use in Arizona Medicaid Program

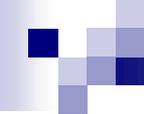
Presented by:

Anthony Rodgers, Director, Arizona Health Care
Cost Containment System

Scope of State-Level HIT Infrastructure



- Highly desirable to couple with HIE



Stages of Health Information Technology Project Life Cycle

- Planning and Development Life Cycle for Health Information Technology
 - Planning and Design Phase
 - Development Phase
 - Implementation Phase
 - Performance Management and Operations Phase

Return on Investment From HIT



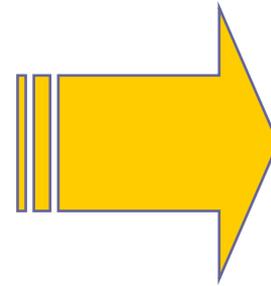
Return on Investment:

Widespread Adoption of Electronic Health Information (EHI) Technologies Can Result in Better Outcomes and Lower Costs

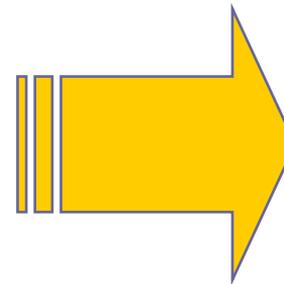
Improving Health Care Quality and Cost Performance

ROI of EHI at Point of Care:

- Improved patient safety
- Reduced complications rates
- Reduced cost per patient episode of care
- Enhanced cost and quality performance accountability
- Improved quality performance



Better Outcomes



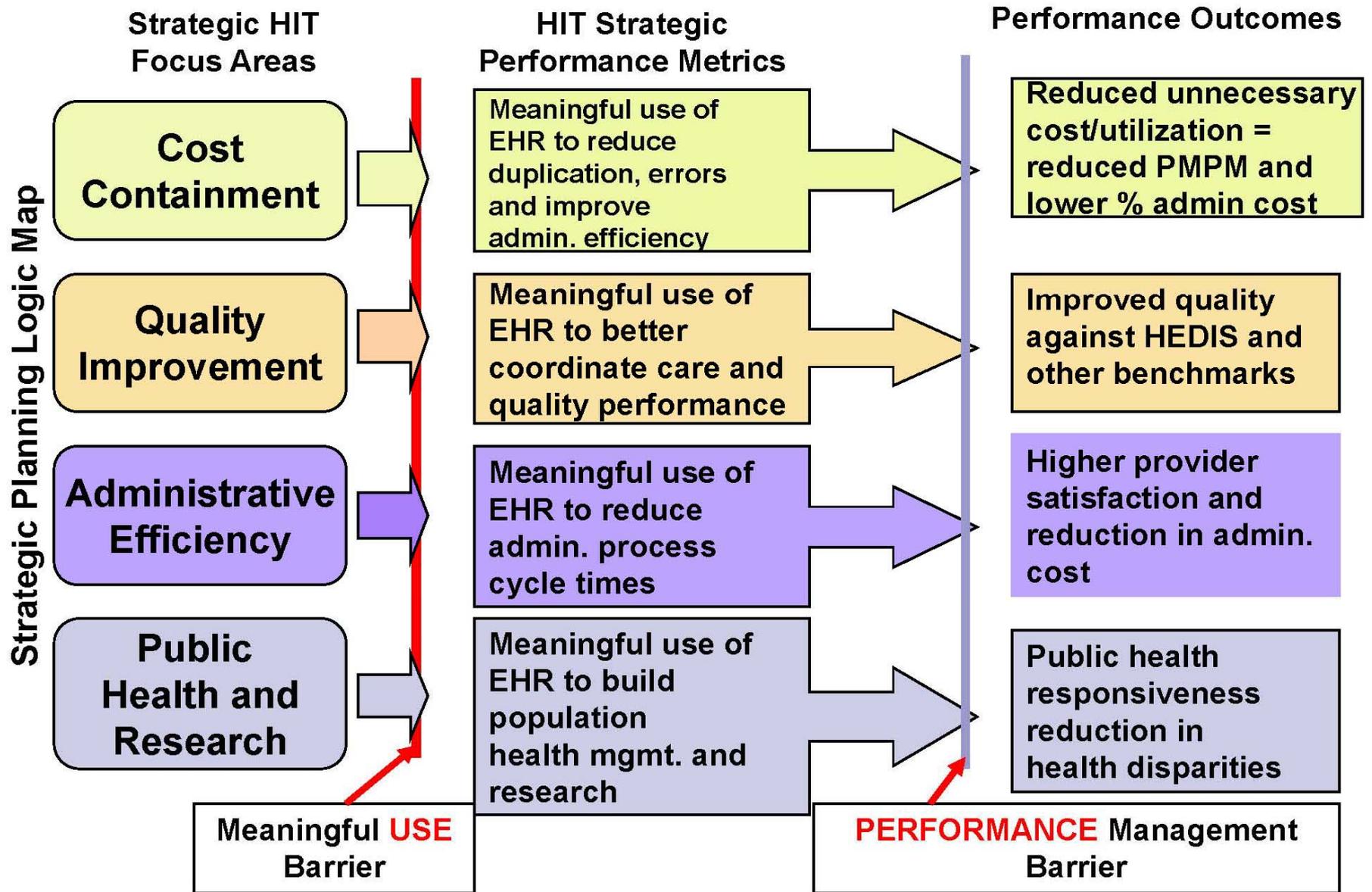
Lower Costs



Justifying the Investment in HIT

- What areas within Medicaid medical management and cost containment are the most positively impacted by the widespread adoption and meaningful use of HIE/EHR?
- How do you model and document potential Medicaid program value of HIE/EHR?
- How do you validate the actual benefits and value of HIE/EHR in the future?

Developing Performance Outcomes for HIT



Challenges in Developing Stakeholder Return on Investment or Stakeholder Investment Value Analysis for HIT

- Determining HIT expenses/costs over the project life cycle
- Determining categories of benefits or value expected from Medicaid HIT projects
- Developing a stakeholder value-based cost-benefit model or simulation
 - Data source for “as is” cost
 - Data source for “to be” cost
 - Data source for benefit/value documentation
- Tracking costs and benefit/value over time to verify
- Nonfinancial tangible benefits
 - Improved quality performance
 - Improved continuity of care
 - Increased network capacity
 - Administrative efficiency (may or may not translate to tangible cost-benefit)
- Determining intangible benefits
 - Provider satisfaction
 - Beneficiary satisfaction and compliance
 - Increased integration of care



Areas that Research Has Shown Are Impacted By HIE/EHR Adoption

- Medication management, Rx cost, and utilization
- Laboratory test cost and utilization
- Diagnostic procedure costs and utilization
- Hospital admission rates per 1,000 beneficiaries
- Hospital ER utilization rates per 1,000 beneficiaries
- Rates of avoidable patient safety events per 1,000 beneficiaries



Data Sources for Medical Cost Analysis

- Claims data
- Utilization management data
- Admission records
- Medical record reviews
- Managed care plan data



Factors that Impact Positive Stakeholder Value/Benefit HIT

- HIT project management failure or suboptimization of system functionality
- Significant change in project scope, budget, or timeline
 - Caused regulatory change
 - User requirements
 - Legal issues
 - Technology change
 - Resource conflicts
- Percentage of available health records
- User community utilization rates (penetration rate)
- Inadequate capital investment

Building a Simple Stakeholder Value or Cost-Benefit Analysis Model

Estimated accumulated project costs/expenses over the project life cycle

-

Estimated cumulated benefit/value over the planned benefit period

=

Stakeholder value/benefit or return on investment

Adjusted for provider user utilization and/or system adoption level



Modeling Cost of Health Information Exchange Planning, Implementation, Operations, and Performance Management

Modeling Cost of HIE Arizona Medicaid:

Return on Investment Summary Cost Analysis (in 000)

Fiscal Year: Expense/Costs	2009	2010	2011	2012	2013
HIE Infrastructure	\$7,480	\$2,800	\$3,500	\$4,600	\$5,500
Lab Results	\$150	\$300	\$400	\$300	\$300
Medication History	\$800	\$400	\$400	\$400	\$400
Clinical Documentation /Discharge Summaries	\$450	\$550	\$850	\$850	\$500
Total Expense/Cost	\$8,880	\$4,050	\$5,150	\$6,150	\$6,700
Cumulative Expense	\$8,880	\$12,850	\$18,000	\$24,150	\$30,850

Adjusted Stakeholder Value/Benefit Based on Percentage
of Arizona Medicaid Records Available on HIE:
Record Availability Rate

Fiscal Year	2009	2010	2011	2012	2013
Lab Results	40%	75%	85%	95%	95%
Medication History	50%	80%	90%	95%	95%
Clinical Documentation/ Discharge Summary	15%	30%	50%	80%	90%

Maximum Value = 100%

Adjusted Stakeholder Value/Benefit Based on Percentage of Arizona Medicaid Providers Utilizing HIE: Provider Utilization Rates

Fiscal Year	2009	2010	2011	2012	2013
Hospitals	30%	40%	60%	80%	95%
Community Providers	15%	30%	50%	75%	90%
Other Providers	15%	30%	50%	80%	90%

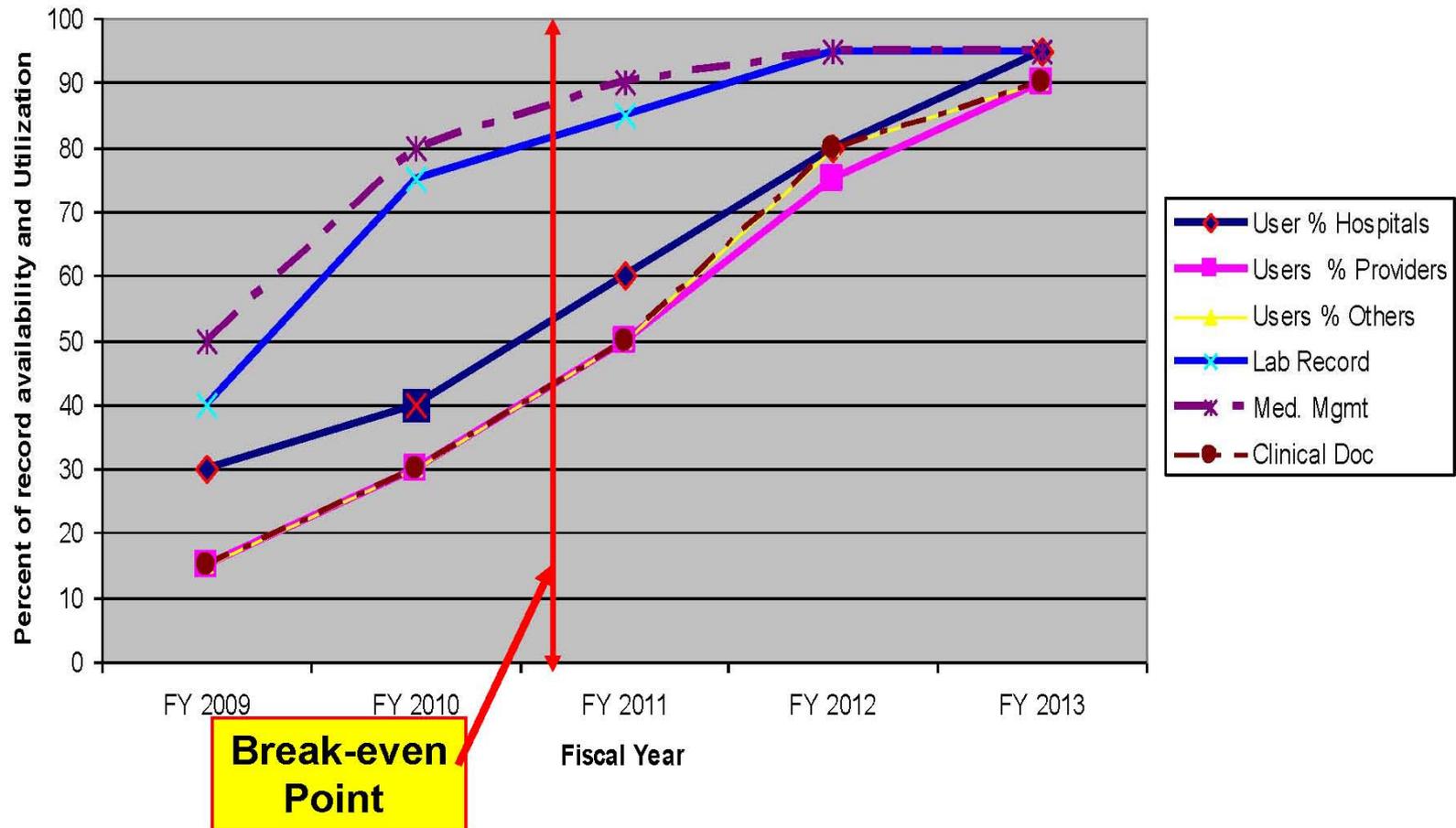
Maximum Value = 100%

Estimated Adjusted Arizona Medicaid Stakeholder Value: Stakeholder Value (in 000)

Fiscal Year	2009	2010	2011	2012	2013
Lab Test Orders (2% reduction)	\$200	\$2,850	\$8,500	\$12,250	\$13,500
Improved Medication Management (5% reduction)	\$250	\$4,590	\$14,600	\$18,100	\$22,750
Clinical Documentation Continuity of Care (5% ER reduction)	\$500	\$1,100	\$2,850	\$8,500	\$12,200
Reduction in Inpatient Admissions (5% reduction)	\$200	\$2,200	\$3,450	\$5,650	\$6,580
Annual Cumulated Benefit Value	\$1,150	\$11,890	\$41,290	\$85,790	\$140,820

Mapping User Utilization and Record Availability

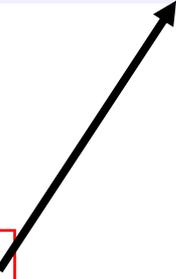
User Utilization and Record Availability



Estimated Return on Investment for Arizona Medicaid: Annual Stakeholder Value (000)

Fiscal Year	2009	2010	2011	2012	2013
Cumulated HIT Expense/Costs	\$8,800	\$12,850	\$18,000	\$24,150	\$30,850
Cumulated Benefits Value	\$1,150	\$11,890	\$41,290	\$85,790	\$140,820
Benefit Value (Cumulated Expense – Cumulated Benefit)	- \$7,650	- \$960	\$23,290	\$61,640	\$109,970

Break-even Point





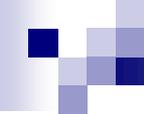
Tracking Results

- Use the accumulative benefit model to track actual cost
- Annually evaluate utilization and claims costs to validate percentage change by 1,000 beneficiaries
- Adjust value/benefit expectation based on record availability and provider utilization



Developing Stakeholder Value/Benefit Analysis

- Conclusion
 - Determine data source and timing for Medicaid medical cost and medical utilization
 - ER utilization and cost
 - Admission rates and cost
 - Lab test orders and cost
 - Rx cost and utilization
 - Estimate the project life cycle costs
 - Determine the phasing of adoption and record availability to adjust value/benefit parameters
 - Determine the expected break-even point
 - Establish benefit/value timeframe horizon (e.g., 5 years from project initiation)



Module 2: Discussion

- In evaluating costs and value, how important is it for you to consider costs and value from the perspective of
 - Your Medicaid/CHIP program?
 - Your program's enrollees?
 - Your participating health care providers?

Module 3: Revisiting the Value of Health Information Exchange

Presented by:

Ryan McCartney, Director, Medicaid Informatics and
Systems, Office of Medicaid Policy and Planning,
Indiana Family and Social Services Administration



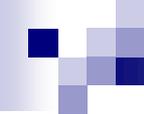
The Value of Health Information Exchange

- Quality
- Safety
- Efficiency



Benefits to Hospitals

- Reduces clinical errors
- Reduces duplicative testing, hospitalizations, lengths of stay
- Improves treatment outcomes with patient information available to physicians at the point of care
- Enhances disease management capability
- Improves tracking and collection of quality performance measures
- Reduces cost of data communication with local physicians, labs, imaging centers, and payers via shared network infrastructure
- Reduces costs for internal system-to-system integrations within the hospital
- Eliminates costs to transport medical records between facilities



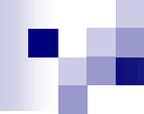
Benefits to Patients

- Improves medical decision-making by providing otherwise difficult-to-obtain information in the right place at the right time
- Addresses need for patient information instantly available when the patient is physically unable to deliver it
- Makes care more efficient, which may result in lower overall health care cost
- Medical research is expedited, especially for the areas of safety and effectiveness



Benefits to Physicians

- Supports medical decision making through access to community-wide patient information
- Fosters performance and productivity improvement through secure access to clinical information at the point and place of service
- Allows physicians and hospitals to more easily comply with HIPAA regulations
- Reduces staff time handling chart requests and referrals
- Reduces cost and increases speed of information sharing with hospitals, physicians, labs, imaging centers, and payers via shared network infrastructure
- Reduces duplicative testing
- Enhances disease management capabilities with patients
- Provides single destination for all patient results and information
- Enhances patient recruitment and marketing through transparency



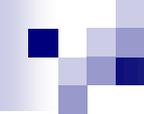
Benefits to Employers

- Potential to improve efficiency of care
- Potential to reduce overall health care costs
- Potential to reduce absenteeism and increase worker productivity



Indiana Mission Statement

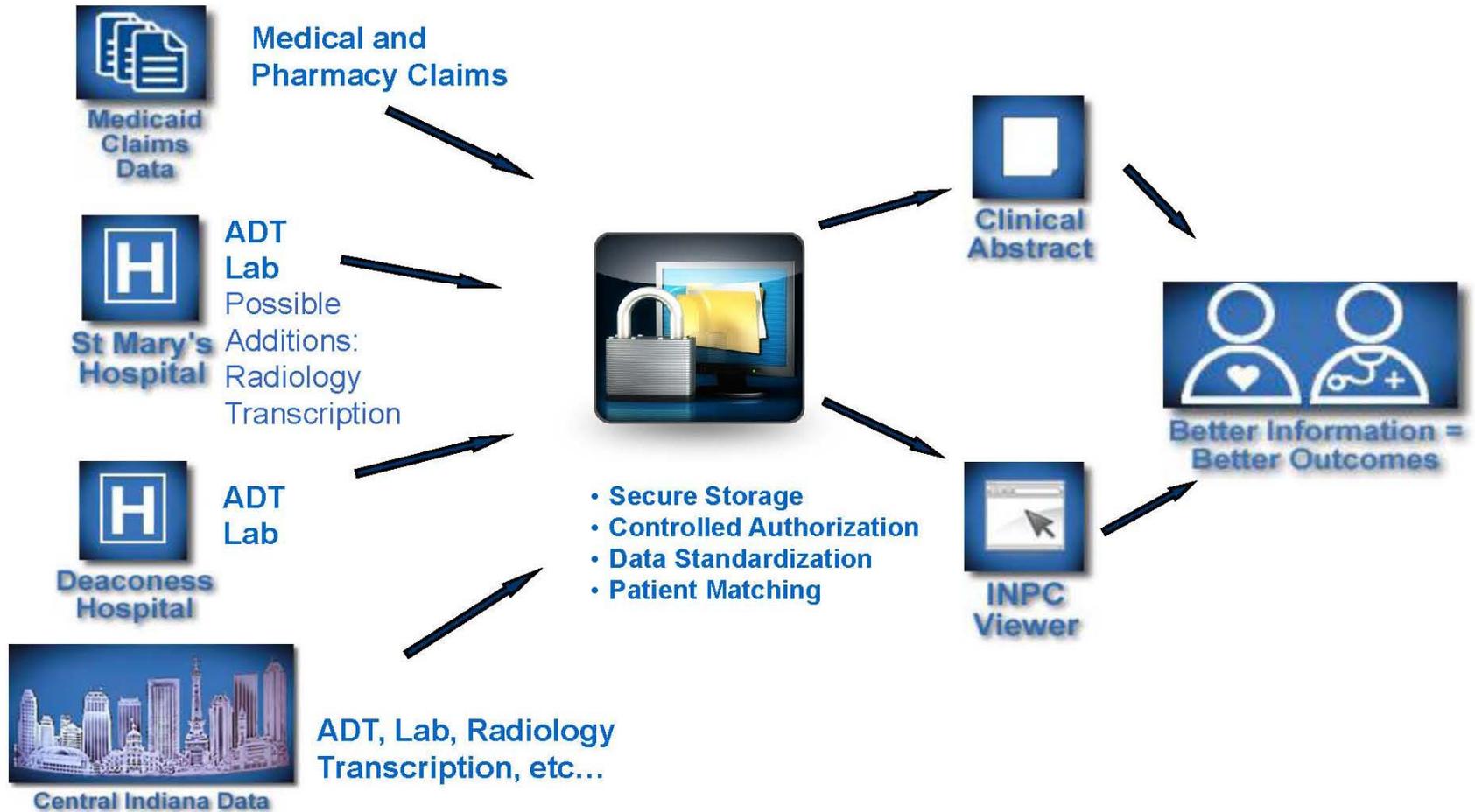
- Value-driven health care
 - Universal coverage—individual enfranchisement over institutional entitlement
 - Four cornerstones
 - Interoperable health information technology
 - Measure and publish quality information
 - Measure and publish price information
 - Promote quality and efficiency of care

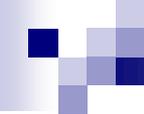


Medicaid Transformation Grant

- Indiana Medicaid awarded \$1.3M to create specific health information exchange (HIE) functionality to support Indiana Medicaid providers
 - Provides a major investment towards an HIE infrastructure
 - Implements the OMPP HIE in one urban market
- Evansville selected as the appropriate market
 - Appropriately sized Medicaid population for the grant dollars
 - Market interested in progressing toward an HIE

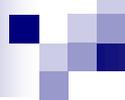
Clinical Results Review





Clinical Results Review

- Aggregate clinical information from various data sources
 - Hospitals
 - Clinics
 - Labs
 - Medicaid claims
- Clinical information available to Medicaid providers
- Contract with health information exchange partners
 - Interface major data sources
 - Map data to standards
 - Provide a Web-based application for providers



Expand Existing Data Flow

- ADT (admission, discharge, transfer) data
- Emergency room data
 - Patient demographics, chief complaint, treating physician, date/place of visit, diagnosis, and procedures
- Vital signs
- Dictate text reports (op notes, discharge summaries)
- Laboratory data
- Radiology data
- Cardiology studies
- Pathology reports
- Other diagnostic tests

To be added for the Medicaid Transformation Grant:

- Evansville participant data to include:
 - ADT (admission, discharge, transfer) data
 - Laboratory data
 - Medicaid claims (including pharmacy claims)

HIE Partners

- **Regenstrief Institute, Inc.**, is an internationally recognized informatics and health care research organization dedicated to the improvement of health through research that enhances the quality and cost-effectiveness of health care. Established in 1969 by philanthropist Sam Regenstrief on the campus of the Indiana University School of Medicine in Indianapolis, the Institute is supported by the Regenstrief Foundation and closely affiliated with the IU School of Medicine and the Health and Hospital Corporation of Marion County, Indiana.

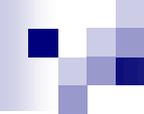
Regenstrief's **Indianapolis Network for Patient Care (INPC)** is a regional HIE that has been developed over the last 13 years, and currently serves more than 30 hospitals and 6,000 physicians across Indiana.

- **The Indiana Health Information Exchange (IHIE)** is a nonprofit venture created in 2005. It was formed by the Regenstrief Institute, private hospitals, local and state health departments, BioCrossroads, and other prominent organizations in Indiana; IHIE is dedicated to providing clinical data and quality standards to assist providers and other relevant parties in achieving the highest quality patient care. The services marketed by IHIE are based upon tools and technology developed at Regenstrief Institute; IHIE exists largely to bring the intellectual property of the Regenstrief Institute to hospitals, physicians, and other entities that can benefit.

Interdependency of HIE Components

- HIE assets are interdependent and once created can be leveraged to deliver a variety of resources

PHESS	Clinical Messaging	New Value Added Services	RIPSS	RX Profile	OMPP HIE	Quality Health First	Inpatient Results Review	Ambulatory Results Review	ED Abstract and Results	New Value Added Services
					Repository Services					
					Mapped Normalized Data					
Interface Engine										



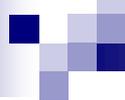
Benefits to the State

- Improve quality of care
 - More complete information
 - More accurate information
 - More timely clinical information
- Decrease costs
 - Reduce redundant services
 - Improve information for care management



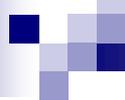
Lessons Learned

- Given that an HIE transcends an organization's own HIT system (but does not replace it), CIOs or CFOs may be reluctant to implement an HIE. This is due to the resources needed to interface with the organization's systems. Additionally, the ROI is sometimes difficult to quantify due to the reduction in redundant tests (based on the reduction in a hospital's revenue from claims). Therefore, it has been shown that CEO (or similar) support that is focused on quality is needed. Otherwise, CIO- and CFO-types may push back due to a potential initial negative ROI. The CEO must champion the HIE as "the right thing to do."



Lessons Learned (Cont.)

- The lab interface is challenging due to the complexity and diversity of data. A large amount of time was spent on a few technical issues. Sharing technical solutions between stakeholders by the contractor improved progress and built goodwill between stakeholders and the contractor. While resources were allocated to the project, this made it possible to leverage them to achieve additional value for the grant funding. As the lab interface work came to a close, stakeholder team members agreed to implement additional interfaces (radiology and transcription) to ensure a more robust HIE. After working through the complexity of the lab interfaces, the radiology and transcription interfaces were much easier and quicker to implement.



Module 3: Discussion

- If you were to evaluate the costs and value of some type of health IT, would you be most likely to perform this evaluation in house or contract it out?
- What challenges do you think are inherent to this approach?
- If you were to evaluate the costs and value of some type of health IT, is there a particular area where you would most want to have additional expertise or assistance?



Comments and Recommendations for Future Sessions

- Please send your comments and recommendations for future sessions to the project's e-mail address:

Medicaid-SCHIP-HIT@ahrq.hhs.gov



Project Information

Please send comments and recommendations to:
Medicaid-SCHIP-HIT@ahrq.hhs.gov

or call toll-free:

1-866-253-1627

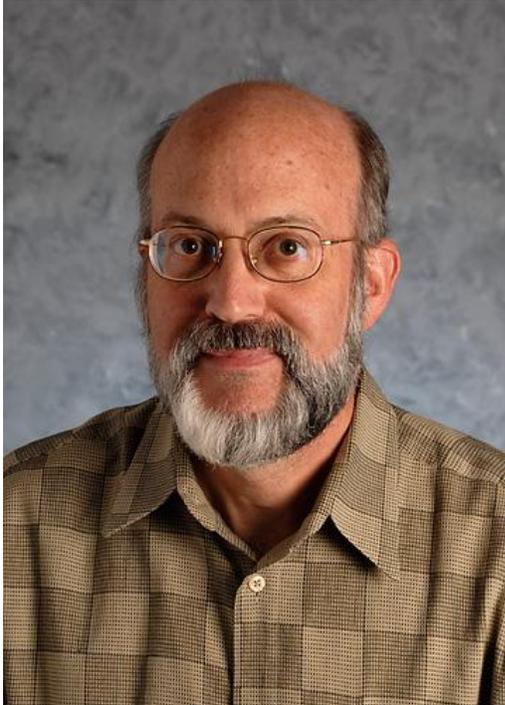
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RESOURCES

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WORKSHOP PRESENTERS AND FACILITATORS

Module 1 – Understanding the Core Concepts involved in a Cost-benefit Analysis of Health IT Projects



Marc P. Freiman, PhD

Marc P. Freiman, PhD, is an economist with more than 25 years of experience in research on health and long-term care. He joined RTI International at the end of 2006, and is currently the leader for tasks involving collecting, generating, and synthesizing information on the costs and value of adopting and implementing health information technology and health information exchange for this contract with Agency for Healthcare Research and Quality (AHRQ) on Technical Assistance for Health IT and Health Information Exchange in Medicaid and CHIP. For several years at what is now AHRQ, Dr. Freiman was co-director of the 1996 Nursing Home Expenditure Survey, a component of the Medical Expenditure Panel Survey. His responsibilities included supervision and review of the editing of survey data, the construction of analytical and public use files, and the production of data findings. Dr. Freiman has published over 20 articles in refereed journals, in addition to several book chapters and numerous technical reports. He also has significant policy experience through his previous employment at AARP and the Congressional Budget Office.

Module 2 – Walking through a Cost-benefit Analysis of a Medicaid/CHIP Health IT Project



Anthony Rodgers

Anthony Rodgers has over 30 years of health care executive management experience in public hospital systems, health plans, and Medicaid Programs. In 2003, he was appointed to the position of Director of the Arizona Medicaid Program, known as the Arizona Health Care Cost Containment System (AHCCCS).

As Director, Mr. Rodgers reports to the governor and is responsible for health coverage for over 1.2 million Arizonans. The agency administers multiple sources of governmental and private funds and is responsible for oversight and compliance of Medicaid managed care health plans and health care providers to assure quality of care, fiscal accountability, and cost containment. Mr. Rodgers is also Chair of the Multi-State Collaboration on Medicaid Health System Transformation.

Mr. Rodgers has an MS in Public Health and a BA in Economics and Political Science from UCLA. He holds visiting professor appointments at Arizona State University, the W.P Carey School of Business, and the UCLA School of Public Health.

Module 3 – Addressing Health IT/HIE Cost-benefit Analysis Issues and Challenges from Medicaid/CHIP Agencies

Ryan McCartney

Ryan McCartney is a 1998 graduate of the Purdue University engineering program. Since 2007, he has been with the Office of Medicaid Policy and Planning (OMPP), Indiana Family and Social Services Administration, where he is working to improve the condition of Indiana's OMPP Informatics program.

Mr. McCartney is currently the Director of Medicaid Informatics for OMPP. In addition, he is Indiana's Director for Health Information Exchange (HIE) and Medicaid Transformation Grants. In March 2009, he began managing the State's Medicaid Management Information System.

Mr. McCartney has implemented informatics for the state, including two relatively new programs, HIP and Care Select. He helped bring encounter data completion for the managed care programs from below 50% to above 90%, and assisted in implementing Pay for Performance measures into all Medicaid contracts. He is currently approaching completion of Indiana's HIE expansion into one urban market, Evansville.