CYCLE III EVALUATION
Final Summary Report

Abstract
The results and summary of our collaborative evaluation of the Cycle III APCD improvement project. Herein we provide our methods, results, and supporting documentation.

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Executive Summary

We present our process and report of the evaluation of the All Payer Claims Databases (APCDs) improvement project through the use of a collaborative evaluation process. To support health care reform in Utah, Cycle III project teams were tasked to enhance the Utah APCD by improving analytic capacity and providing pricing and cost-transparency reports. Our program evaluation model included key methods and tools, recommendations from the APCD Development Manual (Porter et al., 2015), the use of a Collaborative Evaluation Model, logic models, and development and use of best practices as measures. Stakeholders felt that our transparent evaluation efforts facilitated the project's success.

Feedback about the application and utility of APCD data to fulfill all other use cases was overwhelmingly positive. Users of APCD data were incredibly positive about their experiences working with Utah Department of Health (UDOH) staff throughout the entire process. Best practices in data quality and data security were adhered to and improved upon throughout the project, which was also reflected in positive feedback from users. Additionally, the recent APCD Community Update 2016 reflected the success that we have observed in the Cycle III project implementation.

Introduction

All-Payer and Claim Databases (APCD) currently operate in thirteen states, with five more being implemented (APCD Council, 2016). In broad terms, an APCD's purpose is to facilitate curtailing the rising costs of healthcare (Gross et al., 2013; Green et al., 2014; Love et al., 2010; Miller et al., 2010; Peters et al., 2014; Porter et al., 2015). Utah has had an APCD since September 2009, with 21 health insurance carrier plans submitting enrollment, pharmacy, and medical file data as early as 2007 (Utah Office of Health Care Statistics, 2013). In an effort to improve the capability of Utah's APCD, the Utah Department of Health (UDOH) Center for Health Data and Informatics' Office of Health Care Statistics (OHCS) partnered with the Utah Insurance Department (UID), University of Utah (UU) and two non-profit organizations of *HealthInsight* and the Utah Health Information Network (UHIN). In 2013, this partnership successfully applied for *CMS Grants to States to Support Health Insurance Rate Review and Increase Transparency in Health Care Pricing, Cycle III* ("Cycle III") funds to enhance the existing capacity and functionality of Utah's APCD to produce online pricing/cost transparency reports for consumers, employers, researchers, and the general public in Utah. The Utah legislature authorized OHCS through the Utah Health Data Authority Act (§26-33a) to use its collected data to "assist the Legislature and the public with awareness of, and the promotion of, transparency in the health care market," and support the UID to establish rates and risk adjusting methods.

As coordinating interdependent decision-making among all projects is a key factor to successful implementation, the evaluation team was established to facilitate the coordination within and between projects throughout the implementation. We also used a Socio-technical Model to consider the important aspects of health IT that have bearing on context including hardware and software, clinical content, and workflow and communication. In this report, we discuss our methods and results to our evaluation of the APCD enhancement project, including feedback from the stakeholders about the evaluation.

Program Rationale

The goal of the Cycle III project was to increase the availability of actionable information available to consumers in Utah. This was accomplished by enabling HealthInsight, UID and UDOH to provide consumer-friendly price information in context, and in various display strategies will facilitate value-based decision making for relevant healthcare conditions. We described the theory of change as "improving the existing capability and functionality of the APCD, price transparency information will be provided to consumers, employers, researchers and the general public in Utah to support public health and health reform efforts." To undertake our work, we developed research questions, determined uses cases, assisted in the creation of quality measures, developed logic models, created evaluation methods, undertook the evaluation activities and summarized results.

Description of the Program

Implementation was divided into three Aims, focused on specific components of the overall program. They are: 1) data quality and standards, 2) IT analytics and infrastructure, and 3) dissemination, with each Aim managing its own goals, milestones, work plans, and deliverables.

- Aim 1 – Data Improvement: Improve the APCD system security, quality, completeness, and patient-provider attribution by working with participating stakeholders and using

        appropriate methods and technology to collect all necessary data elements, including fee
   schedules, for rate review and risk adjustment.

- Aim 2 – Analytics: Develop and implement analytics IT infrastructure, capacity and appropriate statistical methods to produce meaningful information for online reporting and query of healthcare cost and quality information.
- Aim 3 – Dissemination: Develop web applications to broadly disseminate available healthcare cost and price information for selected health services by patient population, geographic area, healthcare setting, and providers if the data quality is acceptable.

Evaluation Methods

Many projects in IT and Health IT are often not successful in development stages (Kaplan and Harris-Salamone, 2009). In order to have the best chance of success, we chose a collaborative evaluation model that involves a substantial degree of interaction between evaluators and stakeholders (Rodriguez-Campos and Rincones-Gomez, 2013). We adopted the Model for Collaborative Evaluations (MCE) developed by Rodriguez-Campos (Rodriguez-Campos and Rincones-Gomez, 2013). Using the MCE requires a cyclical interaction with collaborative members (CMs) providing feedback throughout the process. MCE goals include "identifying the situation," "clarifying expectations," "establishing a shared commitment," "ensuring open communication," "encouraging best practices," and "following specific guidelines." The visual representation of this model can be seen in Figure 1.

This approach is unique among evaluation models in that CMs are stakeholders that work jointly with evaluators to help achieve the overall project and evaluation vision (Rodriguez-Campos and Rincones-Gomez, 2013). These CMs are members of relevant groups that provide immediate contribution and feedback throughout the duration of the evaluation. Through the use of collaboratively developed logic models, CMs are actively engaged in understanding the components of the complicated projects through a logic model, which include inputs, critical activities, outputs, and outcomes, both from their own groups' perspectives and with respect to the "big picture" or overall project perspective. Identifying the theory of change is a key component of an evaluation plan because it facilitates identifying the desired outcomes and evaluation questions to assess the project.

Figure 1. Model for Collaborative Evaluations, updated from Rodriguez-Campos, 2015. We adopted this collaborative model for our evaluation of the Cycle III projects (used with permission from the author).

Model for Collaborative Evaluations (MCE)
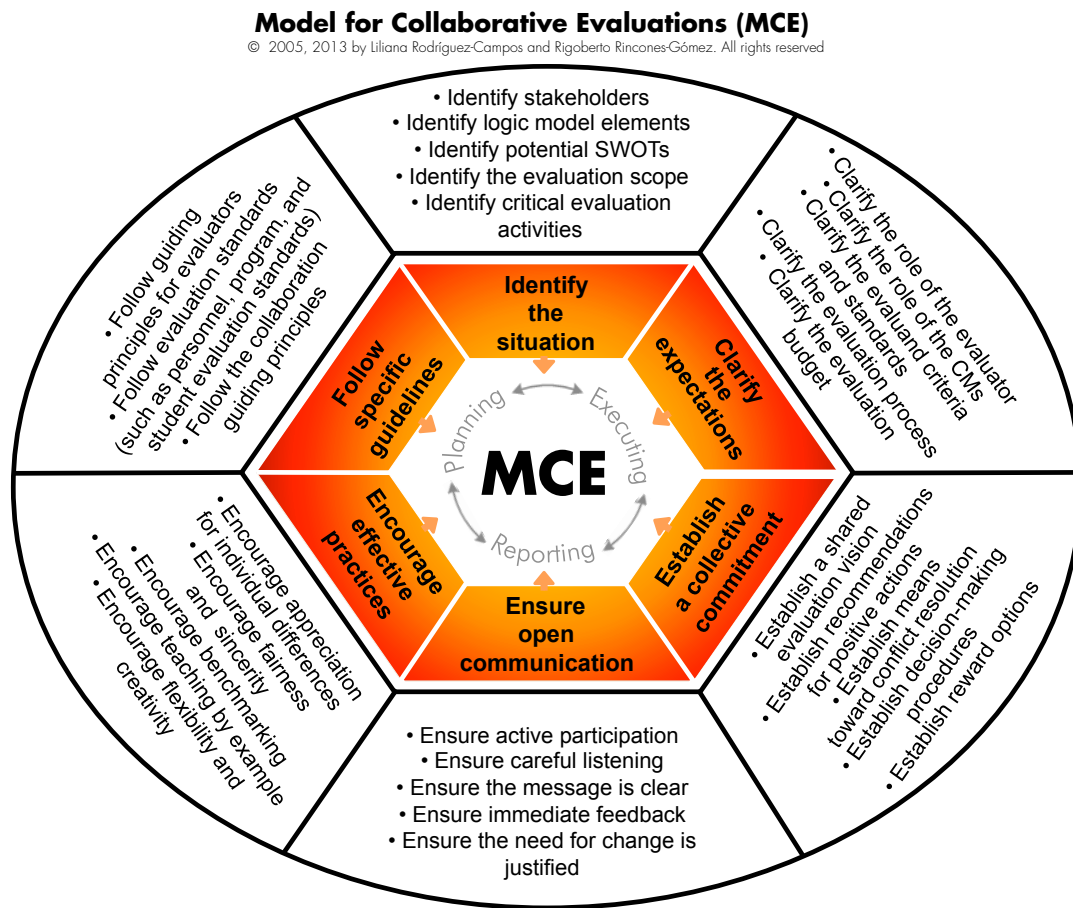
In our program evaluation process, we utilized an established development manual to identify components and categories to a successful APCD implementation (Porter et al., 2015). Using these components as a foundation, we built upon the techniques in the APCD Development Manual to further strengthen our evaluation. We used additional methods such as the Collaborative Evaluation Model, logic models, and the development and use of best practices as measures. We describe components in the APCD Development Manual as fundamental aspects in developing an APCD (Table 1, second column) and the related overarching foundational six categories (Table 1, first column). We added components as shown in the third column.

Table 1. Components in the APCD Development Manual and Utah APCD program evaluation.

Technical Manual Category	Technical Manual Component	Cycle III Evaluation Plan
Engagement	Develop use cases	Iteratively and collaboratively develop use cases [a]
	Identify data needs	Collaboratively engage each development team
	Articulate APCD goals	Develop logic models for each stakeholder group [a]

		Develop logic model for entire APCD project [a]
	Identify and engage stakeholders	Regularly engage stakeholders
		Clarify expectations
		Establish a shared commitment
Governance	Receive authorizing legislation	Determine whether an IRB or exemption is necessary [a]
	Describe data collection and release rules	Use and track best practices in Healthcare Privacy and Security
	Participate with governing board	Meet regularly with Steering Committee
		Meet with governing stakeholders individually
Funding	Clarify funding and budget	Participate in grant application development [a]
Technical Build	Evaluate that data releases and stages support use cases	Iteratively evaluate staged data release with stakeholders
		Gather and track needed data elements as they support the use cases
	Describe core data elements and format	Develop selection criteria matrix for technical design
	Use quality assurance	Use and track best practices in data quality
		Use continuous quality improvement
	Develop data submission manuals	Gather and track submission manuals to improve quality control
Analysis and Applications Development	Gather and develop data policy principles	Use and track best practices in state-regulated software development life cycles
	Utilize a technical advisory group	Regularly meet with technical teams and leaders
		Use and track best practices in large-scale Health IT implementation
	Describe data use and release	Gather and track data release documentation
Feedback Loops and Continuous Engagement	Foster inclusiveness of all groups	Ensure open communication
		Engage stakeholder groups individually
	Utilize transparent and open process	Make evaluation plans and materials available to stakeholders
	Manage stakeholder expectations	Provide methods for anonymous feedback [a]
		Iteratively and collaboratively refine logic models [a]
	Continuously evaluate if project is on course	Regularly interview project management
		Regularly review and refine evaluation plan

[a] Additional refinement executed by the Evaluation Team to improve upon what is specified in the APCD Development Manual based on our program evaluation approach

In accordance with our chosen model, we engaged stakeholders by sharing information about how our program evaluation plan follows the six major precepts of the collaborative model mentioned previously. Stakeholders, such as employers, the public, insurers, and payers, all participate in healthcare decisions. Any or all stakeholders are influential drivers in cost reduction (Love et al., 2010). Public health researchers at universities and UDOH and policy makers are also interested in the quality of care and are influential in optimal use of APCDs (Gross et al., 2013). Gathering and engaging a stakeholder pool with diverse interests is important for development of the APCD (Miller et al., 2010; Porter et al., 2015). As described in other successful evaluation efforts, ongoing and systematic evaluation, including development and use of logic models, is also important (Fisher et al., 2012).

We used grant documents as reference points, observed and participated in grant meetings, and reviewed vision statements and work plans to create initial Logic Models. These models depict inputs, critical activities, outputs, and outcomes. Logic models were shared through individual and group meetings with CMs and iteratively refined. Each model was refined until no additional feedback is provided. These logic models were "big picture" depictions for the program teams associated with all Aims of the work. We developed an overall logic model for the project as well as one for each Aim. Particularly at the beginning of the project, the logic models helped to identify critical inputs, activities and participation (outputs) to achieve the overall project outcomes as well as the interconnectivity of each part of the project. We used logic models because they provide an overview of critical elements and because they facilitate use of project management techniques by program staff for each project Aim.

Our evaluation questions were based in the critical components of IT developmental best practices. Through targeted literature searches and by consulting active Utah Department of Technology Services internal policy, we identified components to fulfilling these best practices. These best practices were shared with each of the project teams and iteratively and collaboratively throughout the project. Final versions of best practices were used annually to assess team performances.

We assessed use cases to evaluate the success of APCD data application. We assisted in the development of use cases by planning and facilitating a stakeholder brainstorming session. We prepared topics of interest for the session including questions about data sources and needs, analytic tools, reports, and documents. In this session, we led an open but guided discussion to generate ideas from various teams in UDOH. Based on suggestions from the event, we developed a large set of use cases that we shared with all project groups. Project teams prioritized and iteratively developed the use cases. Ultimately, we selected five use cases that would best represent each stakeholder group identified in our theory of change, and can be found in Table 2.

Table 2. The five use cases selected for the evaluation of the APCD.

Use Case	Stakeholder Group
Determine asthma incidence and control	UDOH Research
Use of APCD to capture tumor markers for the SEER Registry	Academic Research
Use of APCD to support UID Effective Rate Review	UID
Undertake opioid surveillance	Public Health
Determine the cost of maternity in Utah	Employers and Consumers

Evaluation Results and Findings

Evaluation results are split into three components: 1) evaluation of the use cases; 2) best practices fulfillment; and 3) feedback about our evaluation methods. Overall our results are very positive, and reinforce that the APCD improvement project was successful. Our results also support the assertion that our collaborative approach helped to facilitate that success.

Use Cases

In accordance with the collaborative evaluation model, we worked with internal stakeholders, including Cycle III project collaborators, UDOH staff, and external stakeholders, to develop the model to evaluate the overall project and the vision for evaluation (Gross et al., 2013). Near the

conclusion of the project, we evaluated the use cases through a series of interviews with stakeholders. Key informants were chosen to represent each stakeholder group and were interviewed to obtain feedback about their experience with the APCD in fulfilling their requests and use cases. Individual and summative findings were gathered and coded to answer the following questions:

1. What did the stakeholder express about:
   a. Requesting data?
   b. Applying APCD data to a use case?
   c. Utility/value of APCD use?
   d. Quality of the data?
   e. Effectiveness of the staff?
   f. Ease of use of the data?
   g. Security of the data?
2. What other issues were communicated from the stakeholder?

After gathering and coding, we performed a thematic analysis on the coded findings to determine our results.

We were only able to evaluate four of the five use cases, as we were unable to evaluate the use of the APCD to support effective rate review due to time constraints and technical barriers for the stakeholder. A summary of negative and positive comments based on evaluating the use of data by Stakeholder to fulfill key evaluation uses cases can be found in Table 3.

Table 3. Summary of feedback from interviews of key informants about their experience with the APCD.

Areas of Evaluation	Snippets from Evaluation Interviews from Key Informant Stakeholders
Requesting data	**Positive:** *"There was quick turnaround. Sent what was wanted." "UDOH staff were very knowledgeable and helpful to work with us."* **Negative:** *"Could improve internal data access." "Complicated use of inclusion and exclusion criteria to get what is needed."*
Applying APCD data to use cases	**Positive:** *"The data completely fulfilled the request." "Gave us data that we cannot get anywhere else." "Very helpful to get data at a granular level." "Allows us to apply the same measure from one database to another for data quality measures."*
Utility/value of APCD use	**Positive:** *"Good place to start testing the reliability of measures." "Gives us opportunities to compare rates of various surveillance systems." "Used to gather data for the State Innovation Model measures."* **Negative:** *"No standard procedure for patient-provider attribution."*
Quality of the data	**Positive:** *"More complete than what was anticipated." "I would say it was good-really good." "It seemed like their identifiers and deduplications were really good."* **Negative:** *"There were few instances where patients linked to multiple records."* **Both:** *"I talked about a small group of identifiers they were getting social, date of birth and not name…the project manager found that one insurer was not submitting names and were corrected."*
Overall effectiveness of the UDOH staff	**Positive:** *"Responsive to feedback right away." "They have been doing a good job." We found the UDOH staff to be very helpful and available, knowledgeable to work with us." "I want to give credit…they have an impossible task and they are trying." They are making an effort to be good stewards." "They have done a good job to reestablished credibility."*

	Negative: *"We would have liked to have the Data Use Committee review go more quickly."*
Ease of use of the data	**Positive:** *"Because I have experience with Medicare data, it was straightforward" "there was good documentation."* **Negative:** *"Nothing easy about it." "There is a long learning curve." "It would be awesome to have a really good codebook." "Before we got any data we had to go through the variable to figure out what we needed. Some of them were not clear." "If there was a dashboard for basic queries, that would be very useful."*
Security of the data	**Positive:** *"It met our standards of security protocols so that is a good thing." "UDOH said if there was data with too few people they had to suppress that data." "We had to go through the IRB and the data use process to get permission for identifiers."*

In agreement with our own findings, HealthInsight hosted an APCD Community Update 2016 to showcase the success of a variety of use cases that had utilized APCD data. In addition to other use cases not evaluated by the evaluation team, the Community Update included many of our selected use cases. These were "Asthma Care Utilization," "Feasibility of Capturing Chemotherapy and Tumor Maker Tests Through State All-Payer Claims Data," and "Healthcare Unit Cost and Utilizations Trends in Utah." These, and the other featured use cases were positively received by the community, and demonstrates the extent that the APCD is being used, and reflects improved value and utility of the APCD.

Best Practices and Logic Models

We asked if best practices were being used in: 1) Large-scale Health IT? 2) Administrative data use and quality? 3) Continuous quality improvement? 4) Healthcare Information Security and Privacy? 5) Software Development Life Cycles (SDLC)? After developing targeted metrics that were established in the literature, we collaboratively evaluated the implementation based on these criteria throughout the course of the project. These criteria were reviewed regularly with project teams. Project teams and leadership readily received these best practices, and we found that there was steady and increasing use of component parts of best practices throughout development. By the final year of the implementation, all best practices had been fulfilled by the implementation teams.

Ultimately, we feel that project teams' use of these best practices and our collaboratively developed logic models contributed to the overall success and quality of the implementation. Our CMs agreed, as feedback about our best practices and logic models was overwhelmingly positive. We attribute this success to the positive reception of best practices and logic models by project leaders, who iteratively and collaboratively revisited each model and criteria with us throughout the project.

Feedback about Collaborative Evaluation

We gathered feedback about the evaluation process with surveys. We used survey results to clarify the goals of the collaborative evaluation model by sharing the formalized evaluation plan including the process of change and evaluation process framework. We began with project leadership, met with the various stakeholder groups, and then provided updates on our progress throughout the remainder of the implementation.

Surveys were used that focused on best practices, logic models, and collaborative evaluation. Feedback from our survey yielded encouraging results and showed that our CMs had increased confidence in our collaborative efforts. Responses were tremendously positive. The

majority of respondents specifically felt the evaluation plan positively contributed to the Cycle III project. Several respondents expressed that the logic model and collaborative model provide "valuable guidance" for "what tasks/activities need attention." Engagement with our collaborative stakeholders remained positive throughout the duration of the Cycle III project.

Discussion

We feel that our collaborative evaluation framework was instrumental in the development and success of Utah's APCD implementation to date. We found that communication is essential to effective collaboration. We promoted stakeholder engagement by extensive, ongoing contacts by email and meeting to explain the project, address concerns, and promote ownership of APCD among different participants.

A collaborative program evaluation approach, including the use of best practices in developing and implementing enhancement for APCDs, builds on the foundation provided by the APCD Development Manual (Porter et al., 2015). Collaborative program evaluation provided additional data, processes, and value to facilitate successful completion of the project. Due to the nature of APCD development, the development team benefits from continual engagement of stakeholders and bi-directional feedback loops. The successful enhancement of the APCD will benefit stakeholders by improving online pricing and cost transparency reports for consumers, employers, researchers, and the public in Utah.

In addition to our evaluation, we have also completed tasks following what we proposed we would do for the project. We regularly submitted quarterly and annual reports, including annual updates of our evaluation plan to the steering committee and project manager. We also publicly presented our evaluation process on two separate occasions at the American Medical Informatics Association (AMIA) conference:

- Cardwell JH, Doing-Harris K, Kalsy M, Xu W, and Garvin JH. Adopting a Collaborative Program Evaluation Model to Aid Administration and Evaluation of a Large-Scale Public Health IT Grant. Poster session presented at: AMIA Annual Symposium 2014; Nov 15-19; Washington DC
- Garvin JH, Doing-Harris K, Davis K, Cardwell JH, Hawley C, and Xu W. Developing a Collaborative Evaluation Framework for Utah's APCD. Podium session presented at: AMIA 2015 Annual Symposium; Nov 14-18; San Francisco, CA

We also plan to present in 2017 at the International Improvement Science and Research Symposium:

- Garvin JH, Doing-Harris K, Cardwell JH, Bolton D, Snow LA, Hawley CW, and Xu W. 2017. Collaborative evaluation for the Utah All Payer Claims Database capacity enhancement. Podium presentation to be presented at: International Improvement Science and Research Symposium 2017; Apr 26; London, UK

At the conclusion of our evaluation, we have prepared a manuscript for publication, which is currently undergoing additional additional revisions:

- Garvin JH, Doing-Harris K, Cardwell JH, Bolton D, Snow LA, Hawley CW, and Xu W. 2017. Collaborative evaluation for the Utah All Payer Claims Database capacity enhancement. Under revision.

Moving forward, we will submit one at least one manuscript for publication.

Conclusion

Over the course of the Cycle III project, we gathered documentation and tracked the project though the use of various data collection tools, such as stakeholder engagement sessions, group discussions, direct observation, program records, and interviews. We have also attended committee meetings and various program meetings for different Aims to create documentation to track deliverables and outcomes. Throughout the process, we assisted in the creation of quality measures and metrics for each Aim, including facilitating the identification and tracking of short-, medium-, and long-term goals through the use of logic models and other documentation, tracking changes from the original plan. We utilized an Evaluation Framework and Process to monitor and evaluate key evaluation questions throughout the program. With it, we tracked data associated with each question and our subsequent analysis and communication plans. Through these methods and tools we were able to evaluate the Cycle III project.

Overall, we consider the Cycle III APCD improvement project a success. Feedback about the application and utility of APCD data to fulfill all other use cases was overwhelmingly positive. Although requesting and obtaining APCD data was met with mixed reviews, users of the data were incredibly positive about their experiences working with UDOH staff throughout the entire process. Best practices in data security and data quality were adhered to and improved upon throughout the project, which was also reflected in positive feedback from users. In addition to tracking best practices in healthcare information security, privacy, and data quality, we also tracked best practices in large-scale HIT implementation and development life cycles, and we found that these standards were addressed and followed.

In addition to our findings, a variety of selected use cases were presented at a recent APCD Community Update event hosted by HealthInsight. These use cases were showcased as successful applications of utility and value of APCD data. These positive validations reaffirmed our own results, and demonstrated successful outcomes of the Cycle III project implementation.

Acknowledgements

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