

EMGT 835 FIELD PROJECT

A guide to display provider quality information and involving consumers in generating provider ratings for Consumer Driven Health Plans web site

By

Sourav Biswas

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Name	Date
Committee Chair Chick Keller	

Name	Date
Committee Member Annette Tetmeyer	

Name	Date
Committee Member Dr. Robert Zerwekh	

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Executive Summary

Provider's quality information is one of the most important pieces of information that a consumer seeks out when searching for a health care provider. Most often, a consumer finds a provider by word of mouth from friends or relatives. This approach has its benefit but often times it does not work because each individual consumer has his or her own priority and likings. The ideal approach would be to have a web tool that provides quality ratings for providers from claim information as well as from consumer feedback. Current tools in the market do not involve the consumer intricately enough to generate provider ratings. These tools also do not provide adequate information about providers upon which a user can make an informed decision regarding providers for their treatments.

This paper will discuss a prototype web user interface(UI) where a consumer can lookup a provider by various criteria and view quality ratings information. A process will be outlined on how to involve the consumer in generating provider ratings. Quality metrics will be suggested upon which quality ratings could be assigned to health care providers in order to aid the consumer in the decision making process.

Acronyms (or Abbreviations)

Term/Phrase	Definition
AHRQ	Agency for Healthcare Research and Quality, an Agency of the Federal government
CDHP	Consumer Driven Health Plan
CMS	Center for Medicare and Medicaid Services
DME	Durable Medical Equipment.
HIPAA	Health Insurance Portability And Accountability Act
HIT	Health Information Technology
HMO	Health Maintenance Organization
HRA	Health Reimbursement Account
HSA	Health Savings Account
NPID	National Provider Identification Program
PDCA / PDSA	Deming’s quality cycle of Plan, Do , Check(Study) and Act
PPO	Preferred Provider Organization
UI	User Interface

Table 1: Acronyms

1 Background

¹U.S. spends the most money on healthcare in the world but its ranked fifth for the measures of quality among developed countries. To understand the whole healthcare industry and the way to improve it, this project paper will start off with the evolution of healthcare insurance program, and provide overview of Consumer Driven Health Plans. This paper will stress the importance of web tools, which provide opportunities for increased values and quality to consumers. The following sections will discuss these items in more detail.

1.1 Evolution of U.S. Healthcare Insurance Program

Typically, people in US have access to three types of insurance programs. Public sector programs, known as Medicare and Medicaid; are funded by Federal and State revenue. These programs cover low-income families that are underserved and people over sixty-five. Community-funded programs cover insurance for about 11 million people. These programs provide high quality, comprehensive primary and preventive care for the uninsured and medically underserved. Finally, private sector programs are funded by employers of corporation and private business owners and cover almost 200 million people in U.S.

Since private corporations provide healthcare for a large number of American citizens, there has always been a push for an affordable healthcare costs. Before 1990, employers offered a “fee for service” structure to their employees. This structure allowed employees to get the specialist care they needed without a gatekeeper provider authorization. Next

came the era of “Managed Care” in the U.S. healthcare industry, where a gatekeeper provider authorized specialist service for patient. This structure heavily invested on prevention and disease management. The “Managed Care” approach kept healthcare costs low for a decade by reducing utilization and reimbursement. However, the tide against managed care was rising as consumers became frustrated due to the administrative loop and delays in health care. Finally, “Consumer Driven Health Plan (CDHP)” structures took the best from both structures and involved the employee in sharing the burden of healthcare costs. With the rising cost of healthcare and reluctance from employers to pay full insurance premiums, CDHP’s call for employees to pay a set amount of the healthcare costs they incurred, namely a deductible, before the company starts to pay. Once the deductible is met, CDHP’s provisions require employees to burden a percentage of their healthcare costs until their maximum out of pocket cost is met. At this point, employers will pay off the rest of the healthcare cost for that year.

1.2 Overview of Consumer Driven Health Plans

CDHP’s are still in their infancy but early results show that private employers are strong proponents for the plan.² To date, there are 1.5 million subscribers for CDHP’s. The CDHP’s are slowly taking market share away from managed care plans like Preferred Provider Organization (PPO) plans and Health Maintenance Organization (HMO) plans.³ Forrester predicts that CDHP’s will lure away 40 percent of current PPO members and 20 percent of the HMO market and will grow from \$88 billion to \$413 billion by 2010.

The strong argument in favor of CDHP's is that since consumers spend their own money they will better manage their health care costs. Cost sharing structures of CDHP's come in three different flavors:

- Health Reimbursement Account(HRA)/Health Savings Account(HSA)
- Personalized or "Design your own plan"
- Customized package plan

The first option allows employers to set aside dollar credits for an employee's HRA account. Employees can use this HRA money to pay their healthcare costs. Once this account is exhausted, the employee will pay their further healthcare cost out of pocket until their deductible is met. After meeting the deductible, the employee will pay 20% and employer will pay 80% of the healthcare cost until the employees "out of pocket maximum" is met. Once an employee has satisfied their out of pocket maximum, the employer will pay rest of their healthcare costs for that year. A HSA works exactly the same way but instead of an employer opening up a HRA account with a set amount, an employee can elect to fund their account with pre-tax money to pay their deductible and out of pocket maximum healthcare costs.

In personalized or "Design your own plan", employees choose their network of providers, hospitals and benefit packages. The premiums for these plans are cheap as long you stay within your in network providers. Services provided from out of network providers and hospitals are reimbursed at 50%-60% of the cost.

In the customized package plan, employees are offered a predetermined selection of network of providers and hospitals. The benefit packages ranges from rich, premium and thin. All of these plans give employee's greater flexibility in choosing the plan which best fits their needs.

1.3 Web Tools in Consumer Driven Health Plans

At the core of these plans is Health Information Technologies (HIT) that enables consumers to be more informative and cost conscious regarding their health care. The tools are broadly categorized in three areas; cost optimization, disease management and provider lookup.

Cost optimization software tools aid consumers in determining the cost for conditions, procedures, drugs and Durable Medical Equipments (DME's). When calculating cost, these tools take into accounts the consumers HRA or HSA amount, deductibles, co-pay, coinsurance, maximum out of pocket cost and max coverage cost of the CDHP's. These tools aid the consumers in selecting the best CDHP's for their healthcare needs. The consumer typically uses this tool during the open enrollment period for their medical insurance.

Disease management software tools provide detailed information on healthcare topics. This information covers the cause of a condition, the options available to treat the condition and any other necessary details a consumer should know about that medical condition. The goal of these tools is to make the consumer knowledgeable regarding their medical conditions. These tools typically include utilities that guide consumers to manage their chronic conditions and improve their overall health.

Provider lookup encompasses provider quality ratings as quality is often the most important piece of data consumer seeks when searching for a provider. However, the concept of quality eludes consumer as they unaware of quality matrices that build the quality ratings. Moreover, consumers distrust quality ratings that insurance companies generate. Consumers tend to trust fellow consumer ratings for a provider. The web tools out in the market lack the process of including consumers intimately in the provider rating process.

A literature review will be conducted to highlight and better understands some of these deficiencies in the web tools.

2 Literature Review

“CDHC-Early evidence about effects on cost and quality (October, 2006)” by Melinda Beeuwkes Buntin, Cheryl Damberg, Amelia Haviland, Kanika Kapur, Nicole Lurie, Roland McDevitt, and M. Susan Marquis” states that existing information technology is inadequate in providing the need for standardized measures to compare quality among providers. A lack of uniform quality metrics has led to many different systems, rendering comparisons across plans and groups difficult, if not impossible. The article stated that better measures of quality would aid in network design and support better individual choices. The article gave importance on quality metrics and suggested that the Health Insurance Portability and Accountability Act (HIPAA) policy should be relaxed so that the Center for Medicare and Medicaid Services (CMS) data can be used for provider quality ratings. The article aptly noted that about half of all Americans now have the difficulty understanding health information, which would affect their ability to obtain high-quality care. The author of this field project thinks the cause of the difficulties in understanding the health information lies in the lack of details about the quality matrices that generates the provider quality ratings.

Lack of consumer incentives to choose high quality providers are inhibiting the usage of software tools in CDHPs. The authors of *“Consumer Experiences in Consumer Driven Health Plan (August, 2004)” by Jon B. Christianson, Stephen T. Parente, and Roger Feldman* noted that only 34% of enrollees visited web sites in a plan year. Thirty percent

of these enrollees used the provider directory to lookup a provider, twelve percent used the pharmacy pricing tools to verify drug information and eight percent used the disease management system to learn about medical procedures or conditions. Enrollees' were not satisfied with the usefulness of these sites and rated them very low. The sheer low number of the site usage and low ratings on usefulness indicates that enrollees were not finding the information they want. The article is a case study and did not offer any suggestions on how to increase the usage of these sites. However, the article pointed out that provider directories are the most commonly used components of these web sites. This indicates that consumers log on to these sites to find providers and with some innovative ideas, these sites can easily help consumer to choose high quality providers to get the best service in reasonable cost.

The article, "**Consumer Driven Health Plan- Are they more than talk now**" by **Jon R. Gabel, Anthony T. Lo Sasso, and Thomas Rice**, eloquently indicates that a "CDHP that can deliver provider-specific information on cost and quality will break away from its competitors". The article also notes that providing meaningful provider quality data is difficult as obtaining provider information from different health insurers is troublesome. Translating information from a large medical group to an individual clinic and then to individual provider is problematic as well. The article touched on the complexity required to generate quality ratings for provider. Nonetheless, it pointed out that good quality information on providers would be a distinguishing feature for successful website.

Arnold Milstein, in his Testimony to House/Senate Joint economic committee on February 25, 2004, suggested that Congress should encourage Center for Medicare and Medicaid Services (CMS) to support rapid expansions of minimally required hospital and professional billing data. This would enable much better performance comparisons of provider and treatment options by CMS and private sector health plans. Milstein also recommended speeding up the implementation of the National Provider Identification Program (NPID) to better identify individual providers and more accurately compare their performance via CMS and private sector claim data. The article pointed out the importance of using claim data to evaluate provider quality ratings.

Karen Davis in “Consumer-Directed Health Care: Will It Improve Health System Performance (August, 2004)?” suggested that we need to invest in health information technology. She suggested public reporting of cost and quality data on physicians, hospitals, nursing homes, other health care providers and health plans. She advocates the notion of paying for performance and provides better payment rates to providers that deliver superior quality care and no medical errors. Davis continued that failure to invest in research to improve quality and efficiency would move the healthcare industry backward. The article noted that *“The federal government pays \$455 billion for health care in the United States but devotes only \$300 million to the budget of the Agency for Healthcare Research and Quality (AHRQ) for learning effective ways to improve the performance of the U.S. health system”*. Michael O. Leavitt, U.S. Secretary of Health and Human Services, stated that the U.S. consumer needs value driven health care that provides high quality medical care at a low cost. Leavitt stated that by using standardized

electronic records we can connect all health information systems to securely communicate and exchange data. He suggested that doctors and hospitals should define and publish benchmarks to measure quality of care. Leavitt recommended that benchmarks can be achieved by standardizing procedures and services costs in each episode of care and by publishing those costs. The author of this field project thinks that investment in health information technology that provides easily accessible comparative price and quality data of providers and hospitals along with customized disease management systems and healthcare cost tracking for enrollees will pave the way to slow the rise of healthcare costs in United States.

The author of this field project agrees with the articles that to generate provider quality ratings we must first define a published standard on episode of care cost and quality matrices. These standards will provide comparative quality and cost data of providers by looking at their private sector claims and CMS data. The author also believes that claims data alone should not be used for provider ratings; consumers should be allowed to rate providers as well. The provider quality ratings should be generated from the consumer rating of the provider and their claims data.

3 Conceptual Design of Web Interface Tool

An analysis was conducted before building the web interface prototype. The purpose was to analyze the sites viability of being successful in the consumer centric healthcare software arena and to identify areas to address when creating the prototype. The key components identified by the analysis are:

System Requirements Minimal hardware Accurate information Greater consumer involvement Easy access	Challenges Proprietary claim information Computer technology dependency Unskilled older user
Opportunities Value to employers Value to providers Informing consumer Reduce cost	Threats Decreased competition Lack of investment Lack of quality standards

Table 2: Conceptual Design Analysis

3.1 System Requirements

The tool uses web technology and user will not need any particular hardware or software requirements to use the tool. Any user with access to computer will be able to use the tool. The market is looking for “credible” quality and cost information on providers and hospitals and being the nations leading insurance provider; the tool can provide accurate

information on both quality and cost. The business process that is represented on the tools is accurate, as the quality data supplier company has access to knowledge expertise that deals with claims on daily basis. The tools provide definition and weighted average of a particular quality matrix in contextual format that makes up the quality ratings. The tool accommodates in- depth consumer participation on provider rating and presents consumer provider rating data, in easily accessible and readable format.

3.2 Challenges

Access to competitors claim data for providers and hospitals could be difficult as private insurance providers will be reluctant to disclose their claims information. Older generations require more healthcare needs but they are least interested in using computer technologies. The tools dependent on computer technology make it less desirable to older generation for usability. Consumer ratings on quality matrices will not be an exact mapping to claims data derived quality matrices.

3.3 Opportunities

Employers want provider-specific information to configure their provider networks and steer members to the best providers. Consumers are seeking information to make informed health care decisions on choosing providers for their conditions and treatments. Providers are looking for information to improve their performance, understand measurement and optimize revenue.

Government is offering incentive to insurance provider to display quality information to drive down health care cost. In 2007, President Bush signed an Executive Order for

obtaining provider transparency for cost and quality information. He asked cooperation from major employers in United States to share their employee health cost information. The information will help established a gold standard measure to rate provider quality. It will address the needs to process multiple claims experiences together to more fully measure the performance of a provider.

3.4 Threats

A Universal healthcare plan for United States has the potential to decrease the competition between healthcare insurance companies, providers and hospitals. This will lead to decreasing investment on innovative web tools and online ad revenues. The quality matrices generated from claims data are largely dictated by insurance companies thus has the potential to be bias toward the healthcare insurance industry.

A few key components stand out from the analysis:

- System Requirement: greater consumer involvement through internet usage
- Challenge: proprietary claim information
- Opportunity: reduce cost
- Threat: lack of quality standards

Several of these components involve the concept of quality and the need for continuous improvement. The next section will address how to incorporate these concepts into the building of the web interface prototype.

4 Quality and Continuous Improvement

W. Edwards Deming stated that by increasing quality we could decrease cost. Deming's theory can be applied both to the site and to the healthcare industry. Traffic to the website will increase if it displays good provider quality information. Increased traffic means more consumer ratings, which in turn translates to higher online ad revenues. The healthcare industry can apply Deming's quality cycle to lower costs. Deming's concept is referred to as the PDCA cycle and has four components: Plan, Do, Check and Act.

The healthcare industry can "Plan" to identify the quality matrices that influence a decrease in cost. Once a set of quality matrices are identified, the industry can begin ("Do") the process of standardizing those quality matrices measurements across the health care industry. Next, providers, hospitals and private insurers co-operatively accept and adhere to these quality standards. The industry then needs to "Check" the results. The study of these results can occur on claim databases of private insurers and CMS. Over a standard period, the individual quality matrix should influence how health care costs are established. Finally, the industry can "Act" by scrapping the quality matrices that do not influence the healthcare cost and look for new quality matrices that do. Figure 1 illustrates the PDCA cycle as applied to the healthcare industry.

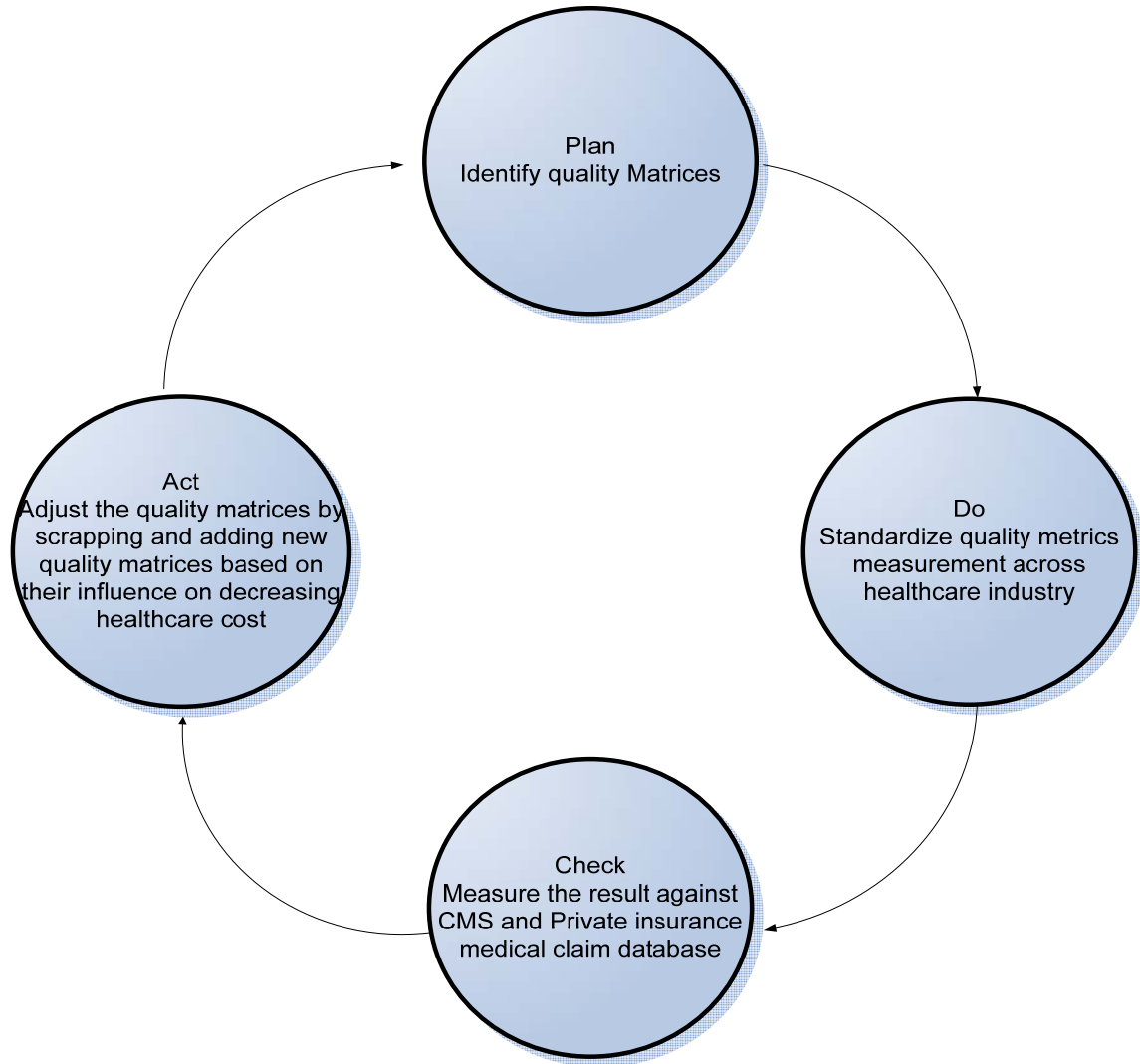


Figure 1: Deming's PDCA cycle to healthcare industry

Implementing this continuous process of Deming's PDCA cycle to quality matrices will drive healthcare costs down and improve the quality of provider, hospitals and overall healthcare. Providers will increasingly try to get higher quality ratings in order to attract more patients. Increases in quality will improve patient care which will in turn decrease costs by eliminating mistakes and waste. In turn, this will generate more accurate

provider ratings which will allow consumers to make informed choices in order to choose a healthcare provider.

5 Generating Provider Quality Ratings

Providing quality ratings for the consumer is a key component of the web interface prototype. These ratings will be generated from industry claim data and from consumer involvement in the feedback process.

5.1 Industry Claim Data

The medical insurance claims that hospitals and providers submit to private insurance companies and CMS contains all the necessary information to generate provider quality ratings. These claim data can be mined to record all the services encountered for an episode of care. The records then can be analyzed to determine whether providers and hospitals provided all the recommended services to the patient.

5.2 Consumer Involvement for Generating Provider Quality Ratings

The ability to draw traffic to the site depends largely on consumer access to provider quality ratings. The site will be popular if it is able to attract enough consumers to start an organic growth of feedback in a consumer forum setting. Potential consumers can identify themselves with others who have had real life experiences with a particular provider. Therefore, the site needs to engage consumers to provide quick ratings of the provider.

Consumers can provide feedback on any provider if the consumer has first registered with the site. The consumer is asked to rate a series of questions on a five point scale

ranging from poor to excellent that are tied to quality metrics. The site then generates a score for quality metrics based on the ratings from all the consumers. The following screen shot shows sample questions a consumer will be asked when rating a provider. The questions are categorized under quality metrics which are explained in detail in section 8: Quality Matrices

The screenshot shows a web interface for rating a provider. At the top, there are five navigation tabs: 'Provider Search', 'Physician Reports', 'Comments/History', 'Administrative Reports', and 'Show Client'. Below these is a blue header for the 'Rate Provider' section. The form is divided into three categories of questions, each with five radio button options: 'Poor', 'Fair', 'Good', 'Very Good', and 'Excellent'.

Category	Question	Poor	Fair	Good	Very Good	Excellent
Quality of Care	1. How do you rate this provider on following standard guidelines?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	2. How do you rate this provider in engaging you on decision-making?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	3. How do you rate this provider on listening to you and answering your question?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	4. How do you rate this provider on spending amount of time with you during office visit?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	5. How do you rate this provider on getting response to your questions during non-office visit period?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	6. How efficient and timely this provider is on refilling your requested prescription?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	7. How do you rate this provider on explaining your medical condition to you?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	8. How do you rate this provider on up-to-date with recent medical innovation?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost Efficiency	9. How do you rate this provider on charging you fairly?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	10. How do you rate this provider on insisting you to get unnecessary medical services?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Number of Patient Treated	11. How do you rate this provider on treating number of patient similar like your condition?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	12. How do you rate this provider on treating number of patient similar on your age group?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

At the bottom of the form is a yellow 'Submit' button.

Figure 2: Consumer feedback on provider quality interface

6 Rewarding Consumer Feedback

Consumer repeat visits to this site can only be guaranteed if the consumer trusts that the provider quality ratings are accurate. The site also needs to generate ample consumer feedback on an ongoing basis to account for a wide spectrum of consumer data.

Therefore, a process needs to be created to reward customers for useful feedback about providers.

One option might be to provide a monetary reward for feedback. Each time a consumer provides a verifiable provider rating, a specified amount of dollar will be credited to their HRA/HSA account. In the event of a consumer not having a HRA/HSA account, their deductible or out of pocket max will be reduced by some dollar amount. This dollar credit or decreased deductible will also occur if the consumer avails themselves to further inquiry regarding the feedback given for a specific provider. The following are some of the ideas the site could offer as a part of consumer reward system.

- Provide free membership to medical literature
- Provide free storage space for uploading documents related to consumer's provider encounter experience. The storage space will increase based on their feedback and reference activity on the site.
- Provide free email system quarterly or bi-yearly basis based on their productive activity on the site.

- Provide utility tools like Weight Management tools, Calorie Intake Calculator, Blood Pressure Tracking tools etc.

A test market study could be conducted to validate this reward system and to generate additional ideas.

Consumer can drive the organic growth of the site. The more feedback received about consumers' encounter of providers and hospitals, the more successful and viable the site becomes.

7 Rating Administration and Reconsideration

Routinely, providers will challenge the rating that has been assigned to them. Quality ratings can bear significant values to patient when choosing a provider. The high importance of the ratings will become a contentious issue between provider and the rating assignment process. The site needs to facilitate a rating administration and reconsideration process in order to give providers the opportunity to resolve ratings disputes.

7.1 Rating Administration

Together with displaying the provider quality ratings, invariably there will be a need to suppress the ratings data. When a provider has issues with their ratings, they will have the opportunity to suppress their ratings while they start the reconsideration process for these ratings. The suppression logic will follow the two-tiered quality metrics logic. This means when providers suppress "Quality of Care" ratings, dependent matrices will

suppress as well. The provider can choose to suppress ratings for their specialty or by conditions that they treat (see Figure 3).

Selected Provider
Provider Name: Timothy E Doerr MD
Provider ID:

Specialty: Orthopedist

Metric	Value	Suppress Graphic Display	Suppress Numeric Value
Quality of Care	71	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Cost Efficiency	46	<input type="checkbox"/>	<input type="checkbox"/>
Number of Patients Treated	240	<input type="checkbox"/>	<input type="checkbox"/>
Follow Standard Guidelines	80	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Hospital Days per year	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Unnecessary Services	0.5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Emergency Room Visits per year	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Comment:

Reason for Suppression:

SAVE CANCEL

Figure 3: Provider quality ratings suppression interface

7.2 Rating Reconsideration Process

Once a provider chooses to suppress a rating, the reconsideration process will begin. The following is the proposed rating reconsideration process:

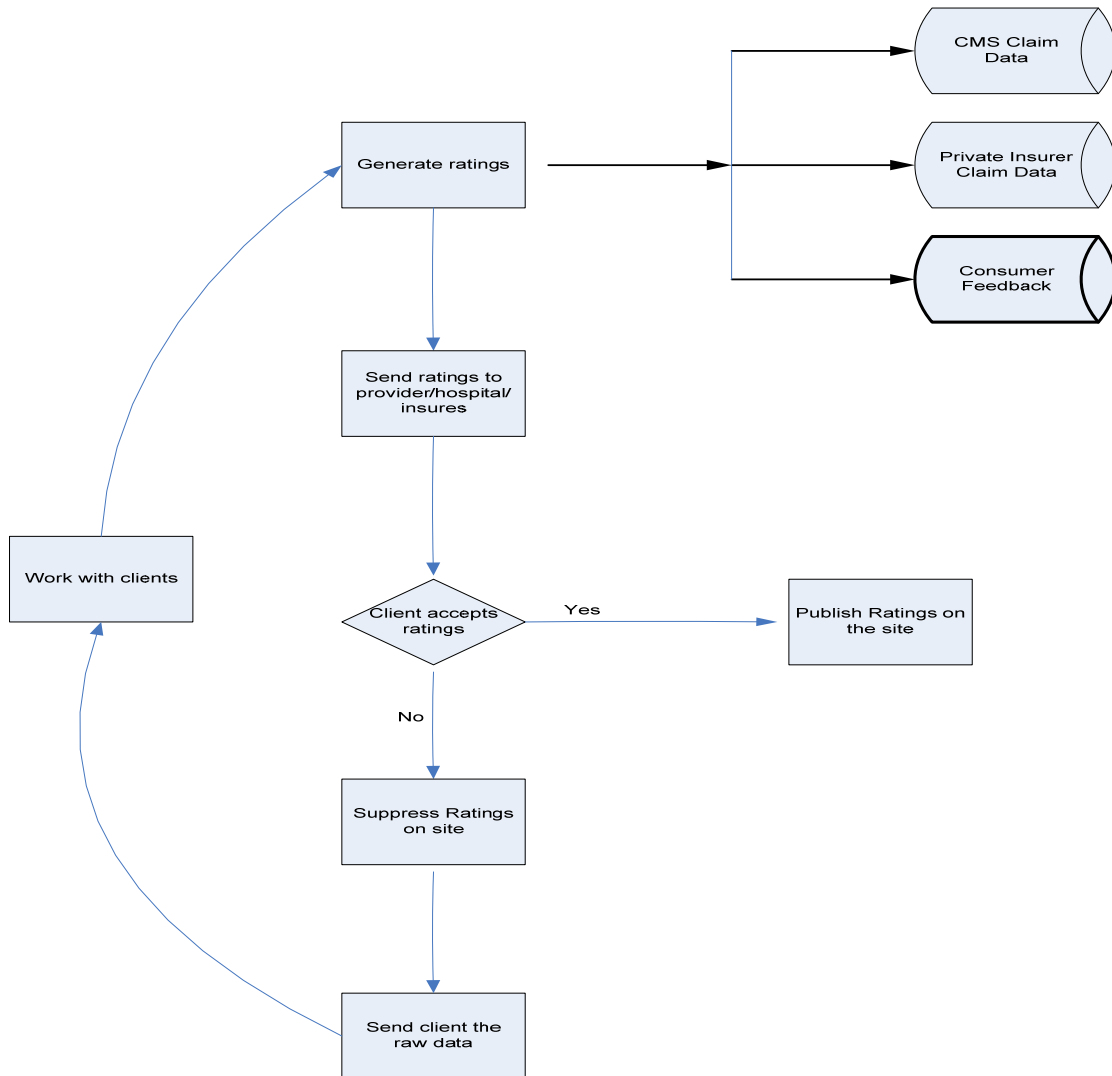


Figure 4: Provider ratings reconsideration process

The concept of provider ratings and the link to quality matrices was briefly introduced in this section. Next, the categorization and analysis for these matrices will be discussed.

8 Quality Matrices

As a starting point for the development of the web interface prototype, a set of quality matrices must be determined. Each category is then prioritized and weighted in order to provide analytical data to display on the web site.

8.1 Categories of Quality Matrices

Identifying quality matrices is the most important step toward provider quality ratings. Good quality matrices will help to point out the unnecessary cost and services that push up the healthcare cost while increasing the overall quality of healthcare.

Once the quality matrices are defined the next step is to disclose the information to patient so that they can easily digest it. The patient would like to know the criteria's the provider was judged during the process. A detail quality report with individual scoring of quality metrics gives patient the full picture to understand the quality ratings. Patient can chose to give more importance to a particular aspect of quality rather than the overall quality ratings while choosing a provider. After careful consideration, the author suggested the following quality matrices:

- Quality of Care
 - Follow Standard Guidelines
 - Hospital Days per Year
 - ER Visits per Year
 - Unnecessary Services

- Cost Efficiency
- Number of Patients Treated

1. Quality of Care

Quality of Care evaluates a physician's compliance to medical guidelines established by the medical community. Physicians with higher quality of care scores indicate a high compliance with medical guidelines.

a. Follow Standard Guidelines

A measure of how closely a physician treats his or her patients according to established medical guidelines. Guidelines are used to identify physicians who may have "gaps in care" when research has clearly shown that certain tests or treatments are beneficial for patients with a given medical condition.

b. Hospital Days per Year

A measure of how many days, on average, per episode, the physician's patients are hospitalized yearly. A high number of hospital days will lower a physician's quality score given that the goal is to keep people healthy and prevent hospitalization.

c. ER Visits per Year

A measure of how many patient emergency room visits occur for a physician's patients on average, compared to the "average physician." A high number of emergency room visits will lower a physician's quality

scores given that the goal is to keep people healthy and prevent emergency care.

d. Unnecessary Services

A measure that uses extremes in high cost for a given condition or episode of care, to identify whether a physician is performing unnecessary services when treating patients.

2. Cost Efficiency

Cost efficiency provides an estimated overall cost comparison by the specialty or condition selected. Cost efficiency is comprised of the fees a physician charges and the number of services required. Physicians with higher than average cost efficiency will save more out of pocket cost for the patient.

3. Number of Patients Treated

Physicians with higher number of patients are usually more experienced and may provide better quality of care. Physicians with higher number of patients are likely to be more efficient at treating the patient's condition.

Now that the quality categories have been defined, a method for determining quality averages is needed.

8.2 Quality Matrices Weighted Averages

Based on informal interviews with other healthcare industry professionals, the recommended weighted average for the quality categories need to be determined.

The Quality of Care category is based on four components. From these components, following standard guidelines has a more significant impact than the other components.

Therefore, the weighting for these components was set to:

- Follow Standard Guidelines (70%)
- Hospital Days per Year (10%)
- Emergency Room Visits per Year (10%)
- Unnecessary Services (10%)

The numerical score for “Quality of Care” is then generated by taking the weighted average of these components:

$$\text{Quality of Care} = \frac{\text{Follow Standard Guidelines}}{70\%} + \frac{\text{Hospital Days}}{10\%} + \frac{\text{ER visits}}{10\%} + \frac{\text{Unnecessary Services}}{10\%}$$

Cost efficiency ratings represent the average savings ratio for a provider fee versus their cost of service for a single episode of care.

Number of patients treated ratings are based on the total number of patients treated versus the average number of patients treated by other providers.

These averages represent a starting point for calculating quality rankings. As with other elements of this project, it will be important to continuously analyze and improve these ratings.

9 Description of the Web Interface Prototype

The author decided that the World Wide Web (WWW) would be used to display provider quality data to consumer and to involve consumers in provider quality ratings. The web site described in the paper is a prototype site that does not currently exist on the web.

This web site is intended to be publicly accessible and consumers could view content without registering to the site. The site provides three major functionalities. It allows a consumer to lookup a provider by various search criteria. Once the consumer has selected a provider, he or she can look at their quality ratings. Alternatively, the consumer has the functionality to rate the selected provider. These functionalities are described in detail in the following sections.

9.1 Lookup a Provider

The first and foremost important functionality of this website is to allow consumers to lookup a provider using various criteria. These criteria include:

1. Last Name – wild cards or partial search is available
2. First Name – wild cards or partial search is available
3. Hospital Affiliation – hospitals the provider is affiliated with
4. Specialty – medical field the provider is specialized in
5. Condition – medical condition the provider is specialized in
6. City and State / Zip code – location of the provider office

7. Radius – search for a provider from the specified zip code

Combinations of data may be inputted for a more refined search. For example, the consumer can bypass the name search and lookup a list of providers by hospital association and/or medical specialty. The search provides optional features of displaying matching providers within certain mile radius of specified zip code. The default radius is 10 miles of the specified zip code. Figure 5 shows a prototype web UI of provider lookup page.

The screenshot displays a web interface for provider search. At the top, there are five navigation tabs: 'Provider Search' (highlighted in blue), 'Physician Reports', 'Comments/History', 'Administrative Reports', and 'Show Client'. Below the tabs are two search sections, each with a blue header and a white body containing search criteria and a yellow 'Search' button.

Search Provider by Name and Hospital Affiliation

Search Criteria

Provider Last Name	<input type="text" value="smith"/>	Provider First Name	<input type="text"/>
Hospital Affiliation	<input type="text" value="Alaska Medical Center"/>		
Geographic Area City	<input type="text"/>	State	<input type="text" value="AK"/>
		Zip	<input type="text"/>

Search Provider By Specialty and Condition

Search Criteria

Provider Specialty	<input type="text" value="Acupuncture"/>	Condition	<input type="text" value="ACNE (PIMPLES)"/>
Geographic Area City	<input type="text"/>	State	<input type="text" value="AK"/>
		Zip	<input type="text"/>

Figure 5 : Provider search interface

A web page similar to Figure 6 shall appear once the user clicks on the search button.

This page shows the list of providers whose last name starts with “smith” in state of Alaska who has a hospital affiliation with “Alaska Medical Center”.

[Provider Search](#)
[Physician Reports](#)
[Comments/History](#)
[Administrative Reports](#)
[Show Client](#)

Provider Reconsideration Admin Application										
View Search Criteria										
Select	Client ID	Provider Name		NPI	Number	Geographic Area	Provider Type	Provider Specialty	Network	Status
<input type="checkbox"/>	1111	Smith, Barbara W	0	242424	9999	Anchorage,AK 99503	Physician		All Networks	Open
<input type="checkbox"/>	1111	Smith, Barbara W	0	242424	9999	Anchorage,AK 99501	Physician		All Networks	Open
<input type="checkbox"/>	1111	Smith, Dwight W	0	242424	9999	Anchorage,AK 99508	Physician		All Networks	Open
<input type="checkbox"/>	1111	Smith, Harold	0	242424	9999	Soldotna,AK 99669	Physician		All Networks	Open
<input type="checkbox"/>	1111	Smith, Lawrence J	0	242424	9999	Anchorage,AK 99508	Physician		All Networks	Open
<input type="checkbox"/>	1111	Smith, Lawrence J	0	242424	9999	Eagle River,AK 99577	Physician		All Networks	Open
<input type="checkbox"/>	1111	Smith, Stanley N	0	242424	9999	Anchorage,AK 99508	Physician		All Networks	Open

[Show Ratings](#)
[Show Details](#)

Figure 6: Provider list based on search criteria

The web tools might also provide information such as physician reports, comments/history, administrative reports, show clients and other details.

9.2 View Provider Details

Consumers are interested in many pieces of information while searching for a provider online. They rank providers based on criteria they deem important. Provider details are an important part in identifying quality providers. Consumers often search for specific details about doctors such as their residency location, graduating university, year of graduation, etc., before delving into their quality ratings. For these reasons, displaying provider details along with their quality ratings is essential. Below is the information that a website should display regarding a provider:

Provider Particulars	Significance for choosing a provider
Full Name and Specialty	Information are needed to identify the provider
Accepted Medical Insurance	To identify if a provider is in-network or out-of-network. This is important because out-of-network providers and hospitals cost tremendously more than in-network providers and hospital.
Gender	Consumer might feel more comfortable disclosing problems to a certain gender
Graduating University	Some consumers may have strong proponents for a specific academic university and would only choose a provider graduating from that university.
Graduation year	The date of graduation gives consumer the sense of current technologies of the provider.
Internship Hospital	Hospital reputation, experience and the availability of modern technologies influence consumer decisions.
Hospital Affiliation	Consumers want information to verify if the affiliated hospitals for the provider are in-network for their medical insurance plan. Some consumer also trust certain hospitals and want a provider affiliated with that hospital
Ethnicity and Language spoken	Foreign-born consumers feel more comfortable talking about their symptoms in their native language with their native providers.
Age	Consumers look for this information because some may prefer an older provider because of their experience in their specialty. Others may lean toward a younger provider because the consumer perceives younger providers to be more actively involved, as they are just starting to build a patient base.
Office Location	Convenience, distance, geographic location can be a significant factor

Table 3: Provider Detail Fields

9.3 Show Provider Quality Ratings

Once the consumer locates a provider, the consumer can choose to drill down into the details of the ratings. The ratings detail page will show the quality metrics that made up the ratings. The score for the quality metrics are calculated in two different ways, using claim data and/or consumer feedback. Private insurance and CMS can provide the claim data needed to generate the provider quality ratings. The NPID number of the provider will be same on the CMS data and private insurance claim data. The NPID number and the standard episode of care will help to gather all the relevant data for a provider for a given medical procedures or conditions that the provider performed. Each of the metrics displays its weighted average used for computing the overall ratings.

Provider quality ratings encompass three major components:

Display of Quality Metrics Ratings

Quality matrices are the standard measures upon which providers are rated.

These measures need to be approved by AHRQ and agreed by providers and insurance companies.

Display of Top Condition Treated Ratings

Providers who specialized in a specific medical field are specialty providers.

Some specialist providers further specialized in specific medical condition (like endometriosis). Providers' top conditions treatment data helps them to generate their quality ratings for those conditions.

Display of Patient Age Ranges

The age ranges that a provider most treats speak to their performance for those demographics.

The following section will discuss in detail the above mentioned ratings components.








9.3.1 Display Quality Metrics Ratings

The quality metrics will show the aggregate rating in a numerical and graphical format. Primary quality metrics are displayed first followed by the secondary quality metrics. The primary metrics are “Quality of Care”, “Cost Efficiency”, and “Number of Patients Treated”. The details of these quality metrics and their weighted average is discussed under the heading “Quality Matrices Weighted Averages”. Figure 7 shows a mockup of how these quality metrics data could be represented. Each panel shows graphically the ratings on a scale of 1 to 5 where 5 is the highest rating (indicated by a full panel). The number beside the panel is the numerical score assigned to the ratings that varies by the quality metrics. The numerical score for “Quality of Care” is generated by taking the weighted average of “Follow Standard Guidelines (70%)”, “Hospital Days per Year (10%)”, “Unnecessary Services (10%)” and “Emergency Room Visits per Year (10%)”. The number beside “Number of Patients Treated”, “Hospital Days per Year”, “Unnecessary Services” and “Emergency Room Visits per Year” represents the actual volume number for that provider. The number beside cost efficiency panel represents the average savings ratio for a provider fee versus their cost of service for a single episode of care.

Selected Provider
Provider Name: Timothy E Doerr MD
Provider ID:

Specialty

Specialty: Orthopedist Suppress all measures for specialty

Quality of Care  71	Cost Efficiency  46	Number of Patients Treated  240	
Follow Standard Guidelines  80	Hospital Days per year  1	Unnecessary Services  0.5	Emergency Room Visits per year  1

Comment:

Reason for Suppression:

SAVE
CANCEL

Figure 7: Provider quality matrices ratings interface

9.3.2 Display of Top Conditions Treated Ratings

Consumers should know what conditions a provider most frequently performed. This gives an idea to consumer of the proficiency and expert level of a provider for certain medical conditions. Consumers would like to go to a provider who has successfully treated the condition that they are encountering. A provider should list a minimum of one and a maximum of five top conditions that they mostly treat. The provider should also list out how many actual patients he/she treated for that condition and what percentage level those patients represents for the provider total number of patients. A sample UI should include the following:

The screenshot shows a web interface for displaying top conditions treated by a provider. At the top, there is a section titled "Selected Provider" with the following information:

- Provider Name: Timothy E Doerr MD
- Provider ID:

Below this, there is a section titled "Top Conditions Treated" with a checkbox labeled "Suppress all Top Conditions treated." Below the checkbox is a table with the following data:

Condition	Number of Patients	% Patients Treated
Condition: Joint dislocations, Broken bones, non-surgical treatment	61	25.00%
Condition: Back or neck problems	51	21.00%
Condition: Arthritis or other joint problems, excluding rheumatoid arthritis	36	15.00%
Condition: Muscle or tendon, problems of extremities, non-surgical treatment	24	10.00%
Condition: Injury to bone and muscle (excluding broken bones or dislocations)	46	19.00%

Below the table, there is a "Comment:" field with a text area and a "Reason for Suppression:" field with a dropdown menu. At the bottom right, there are two buttons: "SAVE" and "CANCEL".

Figure 8: Provider top condition information interface

9.3.3 Display Patient Age Ranges

Consumers sometimes want to find out if the provider can interact well with a certain age group and may feel more at ease knowing that the provider treats large number of patient of his/her age range. The provider should display the percentage points by age ranges for all the patients treated. A sample UI should include the following:

The screenshot shows a web interface for displaying provider information. At the top, there is a section titled "Selected Provider" with the following details:

- Provider Name: Timothy E Doerr MD
- Provider ID:

Below this, there is a tab labeled "Age of Patients Treated". Underneath the tab is a table showing the percentage of patients treated in different age ranges:

Age Ranges	% Patients Treated
0 - 17	22.00%
18 - 44	39.00%
45 - 64	36.00%
65+	3.00%

Below the table, there is a "Comment:" field with a text input area and a vertical scrollbar. At the bottom left, there is a "Reason for Suppression:" field with a dropdown menu. At the bottom right, there are two orange buttons: "SAVE" and "CANCEL".

Figure 9: Provider age of patients treated information interface

Displaying provider quality matrices in simplified way are key to understand the provider quality ratings. Engaging consumers in provider ratings are essential in determining the holistic view of a provider. Next the paper will identify additional areas in engaging consumer in the ratings process.

10 Recommendations for Additional Work

This field project addressed the importance of using standardized quality matrices for providers in order to decrease healthcare costs and increase the overall quality of U.S. healthcare. However, additional recommendations for future improvement would include adding cost optimization and disease management functionalities. The site could be created jointly with reputed hospitals, such as the Mayo clinic, to research literature regarding medical condition that includes symptoms, condition prevention, diagnosis options and coping methods. Patients could be paid to write blogs for the site regarding their lifestyle and specific medical condition such as cancer, endometriosis, diabetes, AIDS, stroke, MS and other conditions. Links to Special Interest Groups (SIGs) where persons with medical conditions like cervical cancer or prostate cancer could be provided so that they may share information. The site could offer various lifestyle tracking tools to encourage a healthy life style. A calorie tracking tools could calculate overall calories burned by a consumer for a day based on input data of their daily activities. Health tracker tools can be set up with a goal to improve their health conditions. Once the goal is met; the tools will contribute reward dollars that could be used toward deductibles, co-pay, coinsurance or purchase of approved medical devices for the consumer.

These are just a few recommendations that could be implemented in order to continuously improve the site.

11 Conclusion

Today's buzzword is rising health care costs. Everybody is affected by it. Employees are paying more and more medical insurance premiums every year. Employers are spending almost as much for healthcare costs as they are for payroll. It is no accident that healthcare issues dominate the president and the presidential candidates' fiscal policies. U.S. citizens rank healthcare issues as a top priority. Although everybody is focusing on cost, the importance of good quality healthcare sometimes seems to elude us. The author of this paper thinks the most important step to decrease healthcare costs is to improve the quality of healthcare. In order to measure quality we need to standardize quality matrices upon which the provider and hospital will be scored. Providers, hospitals and insurance companies should accept these quality matrices. This rating should be generated from both CMS and private insurers claim data as well as from consumer feedback. Consumer involvement in the quality ratings is of utmost priority. Consumers will trust fellow consumers to provide quality ratings as compared to ratings solely generated by an insurance company or government agency. A website that facilitates the process of generating consumer ratings for healthcare provider as well as claim ratings of provider should revolutionize the healthcare industry. The site will allow consumer to play a greater role in provider quality ratings. Highly rated healthcare providers will be in greater demand and quality will become the mantra of the healthcare industry. With higher quality, unnecessary cost and mistakes will not occur which will push down the healthcare cost.

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3. *Consumer-Driven Health Plans: Are They More Than Talk Now?* by Jon R. Gabel, Anthony T. Lo Sasso, and Thomas Rice. This reference site provided information that consumer-driven plans are catching on and could be in the mainstream of healthcare in a few years.