Focusing the Power of Six Sigma in the Healthcare Insurance Industry: Lowering Medical Costs while Improving Patient Service and Outcomes

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Introduction

While a great deal of process improvement work has finally begun to take hold within healthcare around patient safety and hospital operational efficiencies, what about the *other* non-clinical aspects of the overall healthcare system which can consume physician resources and adversely impact hospital finances? Healthcare insurance processes can have a major impact on both patient care as well as operational efficiencies. This paper describes how one healthcare insurance company has begun to use Six Sigma to not only make itself more efficient and effective internally, but is now also directing its energies toward lowering medical costs while improving patient service and outcomes.

The use of Six Sigma within the healthcare insurance industry is relatively new, and has generally started off in areas similar to the financial industry, i.e., with focus on those processes for handling high volumes of financial transactions, such as claims and billing. While these areas are certainly ripe for improvement and lend themselves easily to traditional quality improvement tools, what about the voice of the customer? Besides the employers who purchase the insurance for their employees, the other key stakeholders are the providers of healthcare services and the recipients of those services. How can Six Sigma help them? Under the guidance of their Six Sigma consultant partner, this healthcare insurance company's new Business Excellence team is making headway in addressing that question in a variety of ways. These include the incorporation of a holistic, 3-tier approach to project selection and deployment, a focus on such key metrics as medical costs and provider and member satisfaction, and a common improvement approach which helps pull together all aspects of patient care, leveraging learnings across dental, vision, pharmacy, mental health and core medical. The incorporation of Six Sigma statistical tools to analyze medical cost histories, to forecast future costs and to help guide disease and case management efforts is a vast area of opportunity this company is beginning to explore.

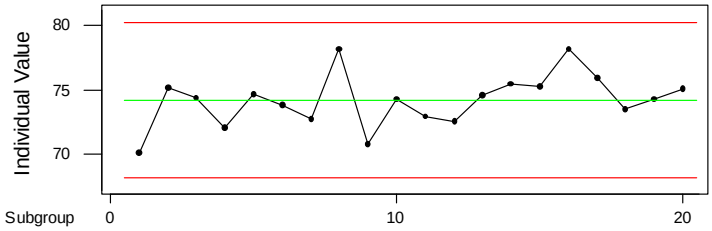
Changing the Paradigm

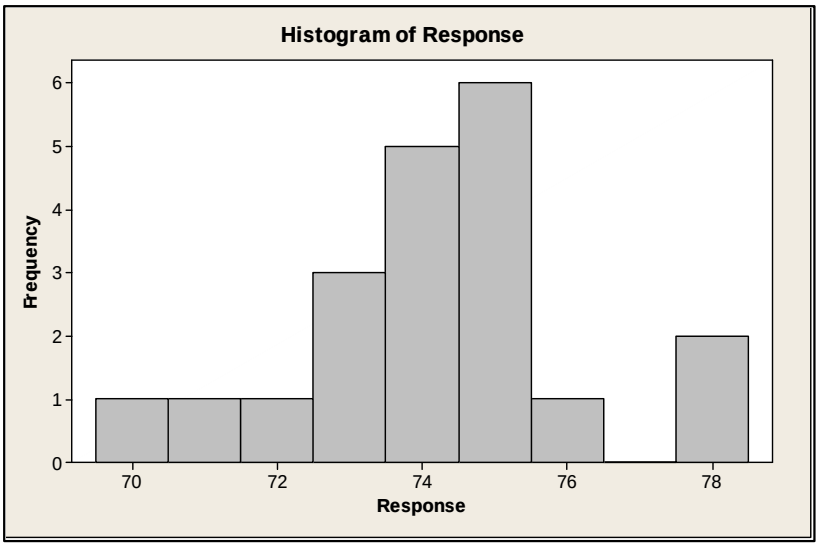
For some, the current paradigm regarding medical costs and medical care quality is a directly-correlated relationship. Many think that if we cut spending on medical costs, then the quality of care will go down. Insurance companies are often viewed in a negative light, forcing their members to leave the hospital prematurely, or not allowing critical treatments or medicines. While in some instances this may have been the case in the past, expectations are changing. Whether to be better citizens or to avoid customer dissatisfaction and potential liabilities, insurance companies are looking for ways to cut costs while at the same time *improving* the quality of healthcare services. This can be done if one focuses on the right metrics and on the efficiency of activities not directly related to the provision of medical care. Six Sigma does this, when applied properly. Let's first take a look at metrics.

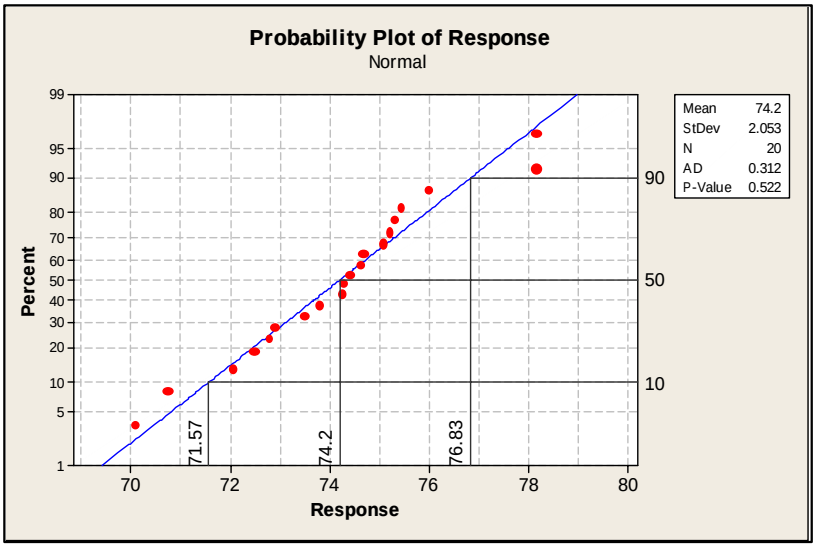
The high level goal of any business *should be* to create **M**ore **C**ustomers and **C**ash. An organization's **E**xistence and **E**xcellence depend on it. Couple that thought with the right use of metrics, and one can come up with a whole new way of viewing $\mathbf{E=MC^2}$. Traditional approaches to management metrics generally include tabular reporting and classic trend and bar charts. A balanced scorecard may be used to capture various aspects of the business, such as financial health and customer and employee satisfaction. While these are all helpful, they can fall short of providing all the rich information that resides within your data. They, by themselves, do not give one a sense of the metric's stability nor of its likely future. A stable time-series control chart presentation lets us make a futuristic statement that is independent of calendar boundaries. An example is provided below:

Example data set

Time	Response
1	70.10
2	75.20
3	74.40
4	72.07
5	74.70
6	73.80
7	72.77
8	78.17
9	70.77
10	74.30
11	72.90
12	72.50
13	74.60
14	75.43
15	75.30
16	78.17
17	76.00
18	73.50
19	74.27
20	75.05







Prediction Statement

Unless something changes, we predict a future median of 74.2, with an 80% frequency of occurrence rate between 71.6 and 76.8

While a simple trend chart is useful, adding control limits allows us to see if the trend is currently stable and predictable (in control), and, if so, allows us to go further with a probability plot. This kind of plot provides the information we need to make futuristic estimates. If we do not like the projections we need to do something differently; i.e., we need to create Six Sigma project. With this strategy we are "pulling" for the creation of Six Sigma projects, as opposed to pushing Six Sigma projects into the system that may or may not be beneficial to the overall enterprise. Traditional trend and bar charts do not allow us to do this and can lead to fire-fighting or playing games with the numbers; e.g., shipping product we know will be returned, just to meet our quarterly objectives.

Another aspect of using metrics wisely, in our $E=MC^2$ thinking, is to always keep in mind the idea of vertical linkage or drill-down. Always start first with what the business needs to generate more customers and cash. The metrics that a business uses to assess their uppermost performance can be viewed as "Satellite" level metrics, and would include such things as gross revenue, profit, net profit margin, EBIDA (earnings before interest, depreciation and amortization), and voice of the customer (VOC). However, an improvement effort generally cannot directly impact those highest metrics, but instead must be aimed down a bit, at what we might call the 30,000-foot-level metrics. These might be such things as defective rate of a facility, cycle time for order fulfillment, inventory, transactional reworks, and days sales outstanding (DSO) for invoices. High-level control charts are created such that typical process input variation occurs between subgroups. Satellite metrics may be reported monthly, while 30,000 foot metrics might be reported daily.

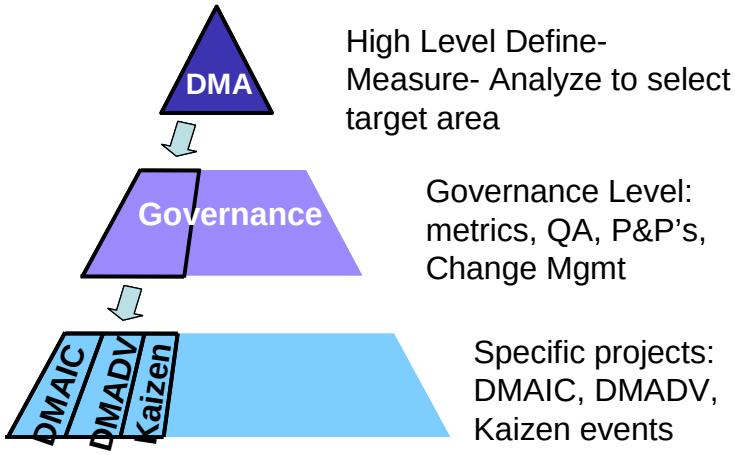
The metrics around medical costs may include such things as frequency and intensity of service, provider rates, and technology and administrative costs. The metrics around medical quality could be rolled up or assessed by way of patient or provider satisfaction survey results. Regardless, the medical arena follows the same rules as all the other business disciplines, namely, if one focuses just on cost, the quality often goes down, but, if one focuses on quality, then cost generally go down! Quality is not only free, it pays large dividends! To quote Dr. Kenneth Kizer, MD and president & CEO of the National Quality Forum, "If we would systematically apply what we currently know about quality management to healthcare, it has the potential to save more lives and otherwise improve health more than any foreseeable technological or scientific breakthrough of the next 20 years, including finding cures for diabetes, heart disease or cancer."[1]

CIGNA, a national healthcare insurance company, is using Six Sigma in several ways to drive down costs while improving medical outcomes, and it does this by applying a holistic, 3-tier approach to implementation.

1. ASQ *Quality Progress*, January 2005.

CIGNA's 3-Tier Approach

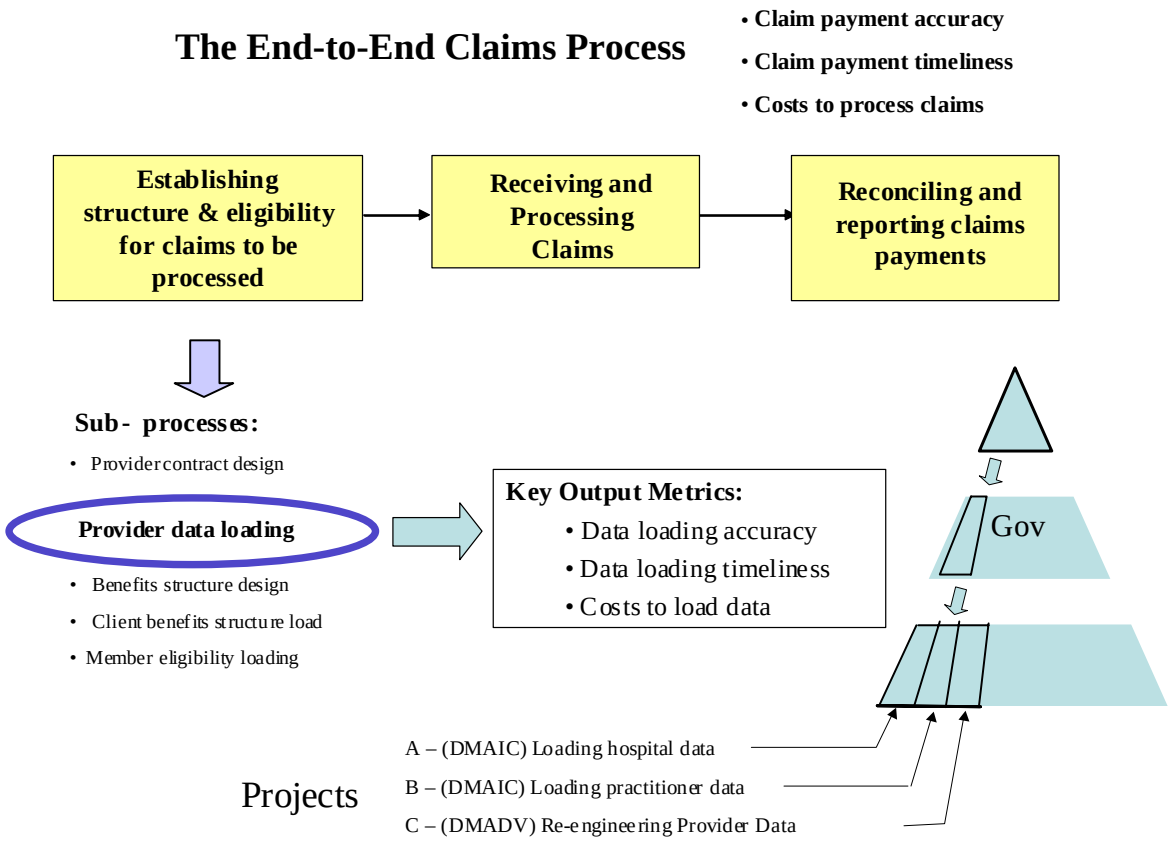
Just as we need to think about metrics in a tiered or drill-down way, so too do we need to implement a Six Sigma approach within a business or within each department of a large business. Let's talk about a 3-tier model.



At the top level of our Six Sigma implementation model, we look across the business or the department and do a high level Define-Measure-Analyze (DMA). We determine those metrics that define the success of that enterprise, relative to quality (defects, from the customer's point of view), timeliness (cycle time, and on-time delivery) and cost. We take an end-to-end process view to ensure we do not sub-optimize our intended improvements. Based on the analysis of these high level metrics, a target area is selected for further scrutiny. "Governance teams" take us down to the next level of our pyramid.

For the particular area selected via the high level DMA, more detailed, 30,000-foot-level metrics are determined, collected and assessed. A quality assurance framework is established, i.e., resources and processes are put into place to collect and chart the metrics and identify specific targets for improvement projects. A framework is also put into place to communicate and to centrally house the new policies and procedures (best practices), which are anticipated to arise from the improvement projects. The identification of the specific projects brings us finally down to the base of our pyramid.

At the base of our 3-tier, Six Sigma implementation structure are the specific projects. Some are done by process improvement teams, using DMAIC. Some are new process or product design teams, using DMADV. Some might simply be a quick-hit "Kaizen" event, where a team of subject matter experts uses Six Sigma and Lean tools to quickly work through a smaller, pinpointed problem. All of these efforts are coordinated by the Governance Teams, who ensure common metrics and an end-to-end process view. An example is provided, below:



In this example, the claims handling process is so large, it is considered to be at the top of the pyramid. A high level DMA, looking at metrics such as claims accuracy, determined that the loading of provider data (name, address, fee schedules, etc.) was a high potential target area for improvement. For that level, the Governance team determined the most critical supporting metrics, which, if improved, would have the most impact on claim accuracy. These represented the 30,000-foot-level metrics, such as Data Loading Accuracy, and served as the Key Process Output Variables (KPOV's) for the projects which were to be created. With that analysis completed, teams were launched to attack specific areas, such as facility data loading, practitioner data loading, etc. The work of the teams revolved around determining the 50-foot-level Key Process Input Variables (KPIV's), such as the experience and technical expertise level of the data loaders. The identified KPIV's are what we eventually control, to keep the KPOV's at the levels desired, positively impacting the uppermost satellite level metrics.

Note that improving claims accuracy and timeliness drives down the administrative costs borne by providers who are making phone calls and writing letters because of such problems. These tasks are not value-added, and they drive up operational costs. Administrative costs such as these drive up physician rates and therefore medical costs. Eliminating such tasks brings down medical costs without adversely impacting the quality of care.

Other Ways Six Sigma is Helping Improve Care while Driving Down Costs

In many larger companies, departments often act independently, not sharing information and not keeping in mind the needs of the total business. Six Sigma is being used effectively at CIGNA to eliminate such "stovepipe" behaviors, bringing about a number of benefits. Cross-functional teams, each focusing on a common process improvement effort, map and learn the end-to-end process, seeing

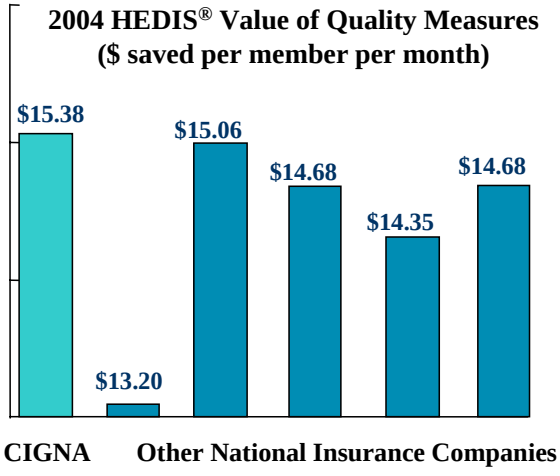
how each function affects the others. They begin to better appreciate the linkage of metrics both vertically (drilling down from satellite to 30,000 feet to 50 feet) and horizontally (one process' output is the downstream process' input). They meet one another and share lessons-learned. Having a common language and approach to problem solving makes for easier communications. In a multi-divisional healthcare company, such activity results in strong, synergistic solutions for customers.

In the example of claims processing, CIGNA has a number of teams, some from core medical, some from behavioral health, some from dental, and some from pharmacy, working together and sharing best practices regarding claims call handling, benefits loading, provider data loading, exceptions handling, etc. As a result, service levels and customer satisfaction have been rising across all aspects of the business.

As team leaders (Black and Green Belts) and team members (Yellow Belts) get trained and experienced in the use of Six Sigma tools, they are finding more ways to improve clinical outcomes while reducing medical costs. One recent example involved a Six Sigma team tasked with examining mental health-related readmission rates. Using their newfound skills and tools, they were able to "slice and dice" the data a number of ways, finding interesting and unexpected top-hitters and correlations. Having identified more precisely the highest risk groups and their respective top causal factors, they were able to recommend to professional case managers more proactive, effective interventions. Costs went down, but member satisfaction went up. In a second, similar example, another team of medical and pharmacy workers used Six Sigma tools to look at hospital emergency room visits and medication refill rates for members with selected, chronic diseases, resulting again in improved outreach programs to providers and patients. Items like these are evidenced in such measures as the annual HEDIS report, where CIGNA has led its national competitors for four years in a row in the area of preventive and chronic care.

CIGNA leads National Competitors for fourth straight year for majority of preventive and chronic care measures …

- **4,390 more diabetics** were treated to acceptable blood glucose level
- **1,755 more** children received immunizations
- **10,933 more members** were screened for colorectal cancer
- **3,998 more** mothers received timely prenatal or postpartum care



In Summary

Lower Medical Costs do not have to equate to Lower Quality Outcomes; Six Sigma is helping to change that paradigm. The use of control and probability charts brings a greater richness of information to the

business, beyond the traditional tables and line and bar charts, particularly if these metrics are then cascaded downward to pull the most strategic Six Sigma projects. CIGNA is using a holistic, 3-Tier approach to Six Sigma deployment, letting metrics pull the right projects. In addition, Six Sigma facilitates cross-divisional collaboration, leveraging benefits and resulting in more robust solutions. Six Sigma data analysis tools provide new insights into medical services utilization, costs and proactive solutions for improved clinical outcomes.