

DISSERTATION

AN INVESTIGATION INTO THE EFFECTS OF WINNING THE MALCOLM BALDRIGE
NATIONAL QUALITY AWARD ON THE PERFORMANCE OF
HOSPITALS/HEALTHCARE SYSTEMS

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ABSTRACT

AN INVESTIGATION INTO THE EFFECTS OF WINNING THE MALCOLM BALDRIGE NATIONAL QUALITY AWARD ON THE PERFORMANCE OF HOSPITALS/HEALTHCARE SYSTEMS

The efficiency and efficacy of the U.S. healthcare system has been in question for decades. We spend more per capita than any other industrialized nation while consistently realizing inferior health outcomes for our population as a whole when compared with many industrialized nations. In 1965, the proportion of U.S. gross domestic product (GDP) attributed to healthcare was approximately 6%. Today, the share of GDP spent on healthcare by the United States is almost 18%. This number is 5% higher than the next two countries, the Netherlands and France (spending 12.0% and 11.8% of their GDP on healthcare respectively) according to the Organization for Economic Co-operation and Development (OECD). The proportion of GDP spent on healthcare in 2020 is estimated to reach 20%, with the nation's increasing healthcare expenditures reducing resources available for other worthy government programs, eroding wages, and undermining the competitiveness of U.S. industry.

This dissertation explores longitudinal outcome data for Malcolm Baldrige National Quality Award recipients in healthcare in the dimensions of patient outcomes (mortality, complications and patient safety), as well as hospital financial and efficiency measures (average length of stay, expense per discharge and profitability). Source data from Truven Health Analytics (formerly Thomson Reuters) are used to evaluate changes in level, immediacy/latency and trend in the years prior to versus the years after becoming a Malcolm Baldrige National Quality Award recipient.

In support of the hypothesis, being a recipient of the Malcolm Baldrige National Quality Award in healthcare explains slight enhancements in clinical outcomes, while hospital financial and efficiency measures all showed overwhelmingly positive operating results.

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CHAPTER 1: INTRODUCTION

This study, which is grounded in the healthcare industry, focuses on the performance of healthcare organizations that have received the Malcolm Baldrige National Quality Award (MBNQA) in healthcare. A statement of the problem that will form the focus of the research will follow. The purpose of the study will then be presented and followed by a definition of terms. A listing of the research questions will be proposed, followed by the assumptions and limitations of this study.

Background

The purpose of the Malcolm Baldrige National Quality Improvement Act is to provide a framework for businesses and organizations for increasing the quality of goods and services they produce and provide (One Hundredth Congress, 1987). While the Baldrige Program's effectiveness has been evaluated and validated in other industries (Baldrige Stock Study, 2011), little research has been done to validate the effectiveness of the Baldrige process in healthcare. Hospitals that win the MBNQA are organizations that have reached a level of performance maturity that should lead to better outcomes and allow them to outperform the competition (Montoya, 2011). Although there are numerous papers that describe what the Baldrige Program is and its value to organizations (DeCarlo, 1990; Rayner, 1992; Hodgetts, 1994; Frank & Chapman, 1995; Townsend & Gephardt, 1996; Frank, 1996; Frank, 1997; Meyer, 1998; DeBaylo, 1999; Ugwueke, 2001; Kelley, 2002; Meyer Goldstein & Schweikhart, 2002; Nesbitt, 2006), there are few published empirical studies that test the hypothesis that the Baldrige Criteria

does actually improve a healthcare organization's overall performance (Kelley, 2002) and there are very limited studies that focus on the healthcare industry exclusively.

In 2004, the "Baldrige Index" underperformed Standard & Poor's 500 (S&P 500) for the third year in a row after eight consecutive years of outperforming the index. The Baldrige Index is a fabricated fund of 17 publicly traded U.S. companies that received the Malcolm Baldrige National Quality Award between the years 1994 and 2004. In 2004, the fund lagged behind the S&P 500 by approximately -.51 to 1, only returning a -18.15% return, while the S&P 500 increased by 35.58%. This was a change from the previous eight year period, during which the Baldrige recipients outperformed the S&P 500 by 323% to 110% (Brown, 2004; Blazey, 2003). The study was discontinued in 2004 by the Baldrige Program, which stated that the majority of recipients were not publicly traded companies, but mostly nonprofit organizations and privately held companies. Nonprofit and privately held organizations do not issue or trade stock on public exchanges and business units cannot be separated from the corporation to determine stock price (NIST, 2011).

Statement of the Problem

The efficiency and efficacy of the U.S. healthcare system has been in question for decades. We spend more per capita than any other industrialized nation while consistently realizing inferior health outcomes for our population as a whole when compared with many of these nations (Anderson & Squires, 2010). In 1965, the proportion of U.S. gross domestic product (GDP) attributed to healthcare was approximately 6%. Today, the share of GDP spent on healthcare by the United States is

Table 1

NIST 2004 Stock Study of Malcolm Baldrige National Quality Award Recipients

Date of Investment	Whole Company Recipient or Parent (Subsidiary Recipient)	Stock Purchases		December 1, 2004 Close		
		Price	\$ Invested	Price	\$ Value	% Change
11/1/94	AT&T Business (AT&T Consumer Communications Services)	54.50	159.26	18.61	20.95	-86.84
11/1/94	Verizon (GTE Directories)	30.50	41.88	41.60	76.62	82.95
11/1/95	Armstrong World Industries (Building Products Operations)	58.875	118.25	3.08	6.19	-94.77
11/1/95	Corning Incorporated (Corning TPD)	25.75	36.41	12.84	63.67	74.86
11/1/96	Dana (Commercial Credit)	29.875	11.27	17.00	6.41	-43.10
11/3/97	3M (Dental Products Division)	92.1875	9.90	80.45	17.28	74.54
11/3/97	Merrill Lynch (Credit)	69.75	16.51	57.04	27.00	63.56
11/3/97	Solectron	40.875	1000.00	6.54	640	-36.00
11/3/97	Xerox (Business Services)	79.875	149.54	15.43	57.78	-61.36
12/1/98	Boeing (Airlift & Tanker Programs)	40.375	36.91	54.70	50.01	35.48
12/1/98	Solar Turbines, Inc.	51.9375	95.16	92.65	169.75	78.39
12/1/99	Marriott (The Ritz Carlton Hotel)	33.125	96.53	57.88	168.66	74.73
12/1/99	STMicroelectronics, Inc.	125.4375	92.52	20.20	44.70	-51.69
12/1/00	Dana (Spicer Driveshaft Division)	17.25	39.87	17	39.29	-1.45
12/2/02	Motorola (CGISS)	11.90	137.48	19.75	228.17	65.97
12/1/03	The Boeing Company (Aerospace Support)	37.60	79.48	54.70	115.62	45.48
12/1/03	Caterpillar (Financial Services Corp. U.S.)	76.25	10.34	92.65	12.56	21.51
Totals	Baldrige Award Recipients		2131.30		1744.53	-18.15
	S&P 500		2131.30		2889.54	35.58

Note: NIST, 2005

almost 18% (Berwick & Hackbarth, 2012). This is 5% higher than the next two countries, the Netherlands and France (spending 12.0% and 11.8% of their GDP on healthcare respectively) according to the Organization for Economic Co-operation and Development (OECD) (OECD, 2011).

Norway’s and Switzerland’s spending for healthcare was more than \$5,000 per capita in 2009, while the United States spent an average of \$7,960 per capita (two-and-a-half times more than the OECD average of \$3,223) (OECD, 2011). The amount of GDP spent on healthcare in 2020 is estimated to reach 20%, with the nation’s increasing healthcare expeditors reducing the resources available for other worthy government programs, eroding wages, and undermining the competitiveness of U.S. industry (Berwick & Hackbarth, 2012).

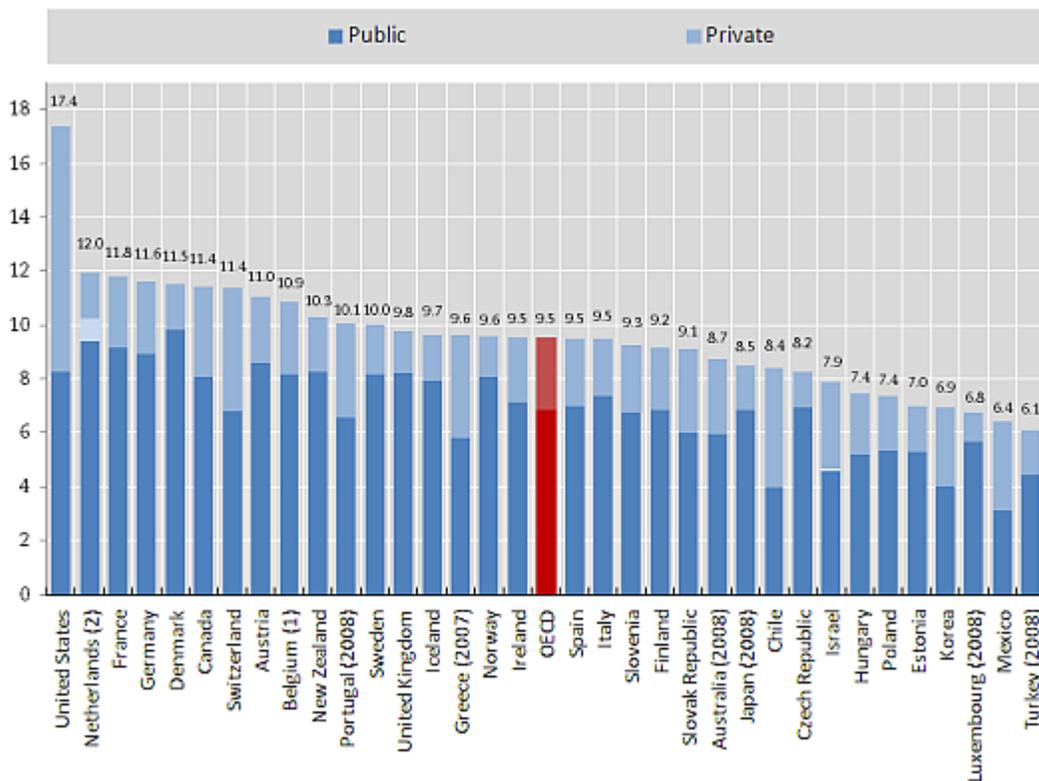


Figure 1. Total healthcare expenditure as a share of GDP, 2009

Not only does the research suggest that the United States healthcare system is extremely expensive, but that at least one-fourth of hospital deaths may be preventable. Over 180,000 people per year may die from the care provided by medical or diagnostic treatment, a surgeon or physicians. Unfortunately, the care provided to improve health often does not in fact do that. Research suggests that one-third of drugs prescribed may not be indicated, one-third of lab tests showing abnormal results may not be followed up by physicians, and one-third of hospital procedures expose patients to risk without actually improving their health (Dubois & Brook, 1988; Leape, 1994; Brook et al., 1990; Shortell et al., 1998). The Institute of Medicine's (IOM) report "To Error Is Human" estimates that the "total national costs of preventable adverse events were estimated to be between \$17 billion and \$29 billion" (p.1).

Purpose of the Research

This study will determine whether being a recipient of the Malcolm Baldrige National Quality Award in healthcare leads to improvements in patient outcomes as well as improved hospital financials and efficiency over time.

Definition of Terms

Average Length of Stay (ALOS), as defined by Truven Health Analytics (formerly Thomson Reuters), is the total number of acute care inpatient days in a hospital divided by the total number of acute care discharges from the hospital.

Categories is a term associated with the broad division of the MBNQA Criteria for Performance Excellence. As an example, leadership is a category and has two items beneath it.

Centers for Medicare & Medicaid Services (CMS) is the national government agency responsible for the Medicare and Medicaid programs in the United States.

Continuous Quality Improvement (CQI) is a philosophy for process improvement, as well as a mnemonic for process teams that cross department lines.

Diagnostic Related Groups (DRG) is a payment system used by CMS for provider payment. DRGs provide comparisons for similar clinical events.

Examiners are individuals who evaluate the narrative of the Baldrige application and may later go on-site to conduct an official examination. Examiners are trained to evaluate an organization's application (answers to the questions posed by the MBNQA Criteria for Performance Excellence) and determine if the organization has other suggested improvements that may lead to organizational success.

A *feedback report* is generated by the examiners after a site visit. The report lists key business factors (taken from the organizational profile) and key themes, as well as making comments regarding strengths and opportunities for improvement (OFI). The feedback report outlines how the organization may also become more aligned with the MBNQA Criteria for Performance Excellence and other ways in which the organization might improve.

Healthcare as a general term denotes the preservation of mental and physical health through services offered by the health profession.

The *Joint Commission on the Accreditation of Healthcare Organizations (JCAHO)* is an organization that ensures compliance with healthcare standards via an accreditation process.

The *Malcolm Baldrige National Quality Criteria for Performance Excellence* is a set of guidelines designed to strengthen the global competitiveness of the organization. The Criteria

for Performance Excellence are constantly evolving and adapting to the latest content aimed towards a higher level of organizational effectiveness.

The *Malcolm Baldrige National Quality Award (MBNQA)* was established in 1987 by the Malcolm Baldrige National Quality Improvement Act. The Baldrige Program is run by the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) and a private foundation.

MedPAR comprises of data compiled from Medicare beneficiaries using hospital inpatient services. Data is stratified by state and DRG for all short-stay and inpatient hospitals. According to Truven Health Analytics, MedPAR data looks at: total days, covered charges, Medicare reimbursement, number of discharges, total charges, average days and total days. Hospitals that accept Medicare and Medicaid reimbursement are required to submit accurate and complete information or face substantial penalties (Thomson Reuters, 2011).

Occupancy rate percentage is the ratio of a hospital's average daily census to the number of beds in service. Discharges include acute care, nursery and sub-provider units of the hospital. Acute care discharges include discharges from acute care units of the hospital and may also include discharges from the nursery unit.

Quality is exceeding expectations and providing excellence.

Quality control, often referred to as quality assurance (QA), is taken to constitute the activities and techniques employed in order to achieve and maintain the quality of a product, process or service.

Quality management is a process by which organizations define quality objectives, develop plans for accomplishing those objectives, and deploy and measure the success of the plans.

According to Truven Health (Formerly Thomson Reuters), *risk-adjustment methodology* provides a fair statistical comparison between disparate populations or groups. Significant differences in demographic and clinical risk factors are found among patients treated in different hospitals.... Risk-adjustment of the data is needed to make accurate and valid comparisons of clinical outcomes at different hospitals. Risk factors include those clinical and demographic variables that influence patient outcomes in significant and systematic ways. (2008, p.2)

Truven Health has also identified risk factors including “age, sex, specific procedure performed, and comorbid conditions such as hypertension, chronic renal failure, congestive heart failure, and diabetes” (2008, p.3).

Truven Healthcare Analytics (formerly Thomson Reuters) is a healthcare information company that compares organization-wide performance rather than a single aspect of excellence.

Total quality management (TQM) in healthcare is a systematic process for obtaining input from all areas of the organization in the planning and implementation of services to meet and exceed patient needs and wants (McCausland, 2006).

Research Questions

The purpose of this study is to analyze whether any association exists between receiving the Malcolm Baldrige National Quality Award in healthcare and the performance of quality indicators for these winning hospitals. The three research questions are:

1. To what extent does being the recipient of an MBNQA in healthcare influence patient outcomes in hospitals?
2. To what extent does being the recipient of an MBNQA in healthcare influence financial and efficiency outcomes in hospitals?

3. To what extent do these influences appear to vary across different measures of patient, financial and efficiency outcomes?

The actual winning of the MBNQA serves as a proxy for the effective implementation of the Baldrige principles. Therefore, the hypotheses are as follows:

H1: Winning the Malcolm Baldrige National Quality Award does positively affect risk-adjusted mortality.

H2: Winning the Malcolm Baldrige National Quality Award does positively affect risk-adjusted complications.

H3: Winning the Malcolm Baldrige National Quality Award does positively affect risk-adjusted patient safety.

H4: Winning the Malcolm Baldrige National Quality Award does positively affect severity-adjusted average length of stay.

H5: Winning the Malcolm Baldrige National Quality Award does positively affect case mix- and wage-adjusted inpatient expenses per discharge.

H6: Winning the Malcolm Baldrige National Quality Award does positively affect adjusted operating margins.

Table 2

Correlation of Truven Healthcare Analytics Performance Indicators to Baldrige Outcomes

Baldrige Outcomes	<i>Truven</i> Performance Indicators
Patient outcomes.	Mortality, complications and patient safety.
Financial and efficiency indicators.	Profitability, expense and length of stay.

Note. Chenoweth & Foster, 2011 (p.2)

Assumptions

Due to the small number of Malcolm Baldrige National Quality Award winners (29 winners to date), all of the 29 winners' complete outcome data, as well as three years pre and post data from the year of receiving the MBNQA, will be used in the study. After applying exclusions, the final number of study participants is seven hospitals. The healthcare organizations are headquartered in California, Michigan, Mississippi and Wisconsin. It is assumed that recipients of the Malcolm Baldrige National Quality Award are committed to and have mature processes since they relate to the Baldrige Criteria.

Also, the multidimensional construct of quality (Garvin, 1987; Seawright & Young, 1996) makes it something that is very difficult to measure with any precision (Tamimi & Sebastianelli, 1996). Another assumption is that the external assessment conducted as part of the Malcolm Baldrige National Quality Award is rigorous. Therefore, it is assumed that actually being a recipient of the award demonstrates superior healthcare quality and that the organization has both an effective process improvement program (Hackman & Wageman, 1995) and has demonstrated "significantly improved quality" (Hendricks & Singhal, 1997).

Limitations

This study has several limitations, the first of which is the size of the study sample. Since the inception of the Baldrige Criteria in 1999, only 29 healthcare organizations have received the award.

Another limitation includes the fact that the evaluation of overall hospital performance depends on the choice of measures used, but that there are relatively few established measures of quality and those that exist are imperfect (Eddy, 1998). Also, this study has utilized single-case

research design. In single-case research design the need to show a “reversal” of behavior is pivotal if causal inferences are to be drawn about the impact of an intervention. Without the ability to “reverse” the impact of being a Baldrige recipient, it is not clear that the intervention is responsible for any change. It is also hard to confirm validity because of the passing of time and history which may influence the outcome (Kazdin, 2011).

Finally, this research has focused on the convenient hospital setting as a proxy for healthcare, therefore any conclusions must be limited to the hospital setting. However, hospitals account for less than half of domestic healthcare expenditures (Suk, 1998), leaving outpatient, clinical care, chronic care settings, and home care to future investigations (Wadsworth, 2007).

CHAPTER 2: LITERATURE REVIEW

Current State of Healthcare and Healthcare Reform

When congress passed healthcare reform legislation it approved close to \$1 trillion in new government spending. These funds will be focused on decreasing the number of uninsured. The current estimate is that this reform will reduce the number of uninsured by 60%. The economic impact of healthcare reform is less clear. The Congressional Budget Office (CBO) believes that reform will decrease the federal deficit by as much \$138 billion by 2019, which contradicts a CMS study that expects minimal if any reduction in overall expenditure.

In 2000, the Ford Motor Company paid \$2 billion for employee healthcare. These numbers increased to \$3.2 billion in 2003 according to William Clay Ford Jr. The Ford Motor Company now provides healthcare coverage to over a half million employees and retirees. Japan's Honda pays \$150 in healthcare expenditures per car, while General Motors (GM) automobiles adds \$1,500 and \$2,000 to the sticker price of every automobile to cover the cost of healthcare for its employees. GM's spending for employee healthcare is so high that Warren Buffet has called the corporation "a health and benefits company with an auto company attached" (Relman, 2007, p.86). Howard Schultz, chairman and CEO of Starbucks spends more on insurance for his employees than he spends on his core product, coffee. Before healthcare began to approach 18% of U.S. GDP, Dr. W. Edwards Deming identified healthcare costs as one of his three "deadly diseases" with the ability to derail our international viability and stifle productivity (James, 1991).

Many company officials agree that waste in the healthcare industry continually escalates their costs. The former head of the Internet Business Solutions Group at Cisco Systems'

Healthcare Practice and former physician, Jeffrey Rideout, states that, “the amount businesses pay for employee insurance is just one element of their total healthcare costs.” Rideout further asserts that businesses incur a triple tax:

First, they pay for insurance programs through health benefits. Second, businesses indirectly subsidize Medicare and Medicaid, the federally supported programs for primarily poor and elderly Americans. Businesses pay higher insurance premiums to make up for the fact that Medicare and Medicaid reimbursements often do not match the total costs hospitals incur treating these patients. Third, Rideout says, businesses also subsidize the strain on the system wrought by the cost of treating America's uninsured, again through higher insurance premiums. (Johnson, 2010)

Hospitals are also struggling to maintain their competitive advantage. Healthcare organizations face other issues, including government regulations and, in the current economy, providing care and services to a growing population of unemployed or uninsured customers (Montoya, 2011).

Furthermore, the government’s role in healthcare has changed. Initially, the government only provided funding, yet in recent years the government has provided a focus on quality outcomes and alternative payment methodologies. Additionally, the industry is shifting from a seller-oriented industry to a buyer-oriented market. These changes are due to the increasing influence of public pressure, the insurance industry and consumer organizations. These changes have put the patient at the center of quality improvement initiatives throughout the industry (Kunst & Lemmink, 2000).

History of Management Theory

Over time there has been a multitude of management theories. The first management theory appears to have been established by Niccolo Machiavelli in the 1500’s, with his focus on the ends justifying the means. Modern theories date back to the 1840’s with Henri Fayol’s command and control theory. The 1880's saw the advent of Fredrick Taylor's Scientific

Management which lasted well into the 1920's. The 1930's saw the advent of the Hawthorne Effect. Organizational Development and Sociotechnical System theories were established in the 1940's. The 1950's focused on the development of Maslow's "Hierarchy of Needs" and the establishment of "Management Grids". Theories X and Y were also embraced during this timeframe. Learning Theories were the focus of the 1960's and in 1978, "In Search of Excellence" was written and management focused on becoming a "Learning Organization".

It is evident the way we interact with each other has changed over time. With that said, the structure of organizations appears to have changed very little over the past 150 years with the fundamental structure being relatively stable. It appears management theories provide focus for organizations which improve outcomes. According to Robinson, Kiessling and Harvey:

The majority of management thinkers and gurus are American, thus reinforcing the belief (so criticised by Mintzberg) that the USA is the fount of all knowledge about things managerial. Doubtless Hofstede would say that this is inevitable, given the masculine and individualistic nature of US society. Finally, it is very hard to discount any management theory completely, even those we instinctively do not like. Perhaps this is a function of the perplexing, complicated, multi-faceted, confusing, yet always fascinating nature of management? (Robinson, Kiessling and Harvey, 2005)

Definition of Total Quality Management

Total quality management is a management approach for building quality consciousness into the daily operations of an organization, thus integrating these principles into every decision and activity throughout the organizational value chain (Evans, 1992). Three TQM principles include meeting and exceeding patient expectations, reducing and preventing errors, and measuring the cost of not doing things correctly the first time.

TQM is a philosophy that analyzes the people and processes involved in providing care and then develops ways to improve. Processes include inputs such as raw materials, the

knowledge of employees, the type of equipment used and the methods by which work is done (Duke & Price, 1993). TQM principles were first recognized and applied by Japanese engineers after World War II. Following this period, the increasing market share of Japanese companies in global markets due to quality leadership resulted in a quality “revolution” worldwide (Handfield, 1989). The focus of TQM is to be proactive in identifying defects and using technology improve the organizations capability. TQM provides tools to establish a customer focused culture delivering the right product or service at the right time at a competitive price (Fisher, 1997; Fisher, Raman & McClelland, 2000).

Through intensive literature reviews and discussions, the Report of the Total Quality Leadership Steering Committee and Working Councils came up with the following definition of total quality management (Evans, 1992):

Total Quality is a people-focused management system that aims at continual increase of customer satisfaction at continually lower real cost. Total Quality is a total system approach (not a separate area or program) and an integral part of high-level strategy; it works horizontally across functions and departments, involves all employees, top to bottom, and extends backwards and forwards to include the supply chain and the customer chain.... The foundation of Total Quality is philosophical: the scientific method, Total Quality includes systems, methods, and tools. The systems permit change; the philosophy stays the same. (pp.1-8)

The primary contribution of a quality program forces people to understand the explicit and implicit needs of the customer (Kotler, 1986) and enables them to translate these needs into specific product and process responses (Handfield & Ghosh, 1995). Research has indicated that firms that adopt quality not just as a program, but also as a way of doing business, enjoy the greatest benefits, but that quality programs must become part of the culture of the organization. Through TQM an organization can maintain customer focus and continuously improve in order to better conform to and satisfy customer needs (Duke & Price, 1993). As D. A. Crosby points

out, “What costs money is the unquality things – all the actions that include not doing the job right the first time” (McMurtrie & Gupta, 2003, p.23).

Joseph Juran, a well-known and respected quality guru believes TQM, and specifically the Baldrige Award criteria to be the most comprehensive criteria for achieving world-class results (NIST, 2013).

History of Total Quality Management

The Evolution of Total Quality Management

Though not necessarily in line with the above definition of TQM, according to Davies (2003) the ancient Egyptians must have had a concept of quality in order to build the pyramids with such precision. The first application of the concept of interchangeable standard parts occurred when the German printer Johannes Gutenberg (c1398-1468) ensured that various letters fitted into all the relevant places on the printing press and could still be moved at will. Another example of quality control is that of the huge arsenal in Venice during the sixteenth century. This arsenal covered over 24 hectares, employed 2000 workers and supplied the city-state’s war fleet. State planning implemented a standardization policy, which ensured that the arrows matched the bows and the ores fitted the ships.

As the mass production of cars evolved in the United States, so did the concept of quality control. Quality control was taken to a new level with the advent of the Hawthorn effect, which refers to an inspection that took place at a Chicago electrical company (the Hawthorn Works) after product completion. It was found at the Hawthorn Works that workers intuitively interpreted change as an indication of managerial concern and so increased productivity.

Total quality is thought to have developed in Japan in the 1960s, in the USA, Hong Kong

and South Korea in the early 1980s, in Taiwan in 1983, in Europe in 1985, and in Egypt, Mexico, Brazil and China in the 1990s (Chaun & Soon, 2000). Various theories concerning the development of TQM exist. Boje and Winsor (1993) have identified four possible scenarios.

Scenario 1: TQM Missionaries from America (Boje & Winsor, 1993). TQM is the “breakthrough” invention of W. Edward Deming, who, beginning in 1950, educated Japanese companies in quality control. His transfer of knowledge allowed Japan to correct its faltering post-war economy and become a model of production for all other countries. In Deming’s book *Out of the Crisis* (1986), he lists 14 points that are essential for productivity or, simply put, essential for establishing a TQM environment. These 14 points form the essence of TQM and are highlighted below with some explanation of each (Deming, 1986).

The first point advocates the creation of constancy of purpose for the improvement of products and services. Simply put, this means that if a company becomes totally concerned with today’s problems, there may be no tomorrow. A company must have a constancy of purpose to improve its competitive position not just for today but also for tomorrow. Constancy consists of innovation, education and the continuous improvement of production and services.

The second point urges companies to adopt the new philosophy and take on leadership for change. This means that the accepted style of management, tolerance for mistakes and defects, and job-hopping in management must be relinquished to have a complete transformation into TQM philosophy.

Third, companies must no longer depend 100% on inspection to improve quality levels since mass inspection is ineffective and costly. It occurs much too late in the production process and leaves people doing less than their best, knowing that their mistakes will be caught. A reworking of the defective items is also time-consuming and costly, and thus quality must be built-in.

The fourth point asserts an end to the practice of awarding business for price only. The lowest bidder generally does not have any regard for quality or service and tends to want to cut corners and consequently not deliver the best product.

Fifth, the system of production and service must be improved forever and constantly: improvement should be a never-ending process. There will never be a perfect production process or service and as thus the practice of using a process for years without questioning why it is being used must stop.

The sixth point urges the use of institute training. Here management must forget the practice of training its employees to do acceptable work since merely acceptable is not part of the TQM philosophy. Training must be totally restructured in order to reflect a need for quality, not only among the workers, but also in the management.

The seventh point essential for productivity states that companies must both adopt and institute leadership. Here, management should provide leadership and not supervision and managers must focus on outcome. Management by numbers and not quality must be abolished.

Eight, fear must be driven out in order to achieve TQM. Fear must be overcome in many areas and management must not be afraid to ask questions or to point out problems. The fear of not being promoted, the fear of admitting mistakes or the fear of contributing a valuable idea, that someone may not take you seriously, waste your time or worse yet, take your idea as their own, is dangerously detrimental to quality.

The ninth point encourages steps to be taken towards breaking down and eliminating barriers between staff areas. All departments within a company have a common goal, that is, to provide quality products or services that will satisfy customer needs. All departments are

therefore members of the same team, working for the same goal and not moving in separate directions.

The elimination of slogans and posters used to urge workers to increase productivity comprises Deming's tenth point. Slogans have never helped people to do a better job since posters and slogans are directed only at the workers and not at the system from within which problems are generated.

Eleventh, eliminate numerical quotas for the work force since quotas only serve to rate individuals against standards: quality is not in the picture. Work must be done to include quality and eliminate the fear of not meeting quotas, which only speeds up production and foregoes any thoughts about quality. Furthermore, eliminate numerical goals for people in management. For example, a management quota might have to decrease cost by 10% within a designated time. Yet this only leads to haphazard cuts, with no thought given to quality or process improvement.

The twelfth point urges an elimination of those barriers that rob people of pride in what they do. There are many things that will rob employees of pride in what they do, including not being informed as to whether standards have changed (thus creating rework), having maintenance calls ignored or slowly responded to, having to make do with not having any new supplies, having managers that are interested only in quantity and not quality, and, the biggest thing of all, not being listened to.

Encouraging education and self-improvement for everyone constitutes the thirteenth point in *Out of the Crisis*. Education is required in an ever-changing technological society and new jobs are created while old jobs disappear. Management must make it clear that no one will be fired when his or her job is eliminated and that instead they will be retrained for a new job.

Deming's fourteenth and final point calls for companies to take action. The entire TQM philosophy cannot even begin unless action is taken. Such action is that as described in the Shewart cycle and there are four steps involved: (1) plan, (2) do, (3) check and (4) act. This in turn leads to two further steps: (5) repeat step (1) with the knowledge accumulated, and (6) repeat step (2) onwards.

Deming also lists seven deadly diseases that must be avoided in order for TQM to succeed. All workers and managers in a company must be familiar with the 14 points and the seven deadly diseases in order for the TQM philosophy to work. If only management or only workers are acquainted with the 14 points or the seven deadly diseases then the TQM transformation is off to a doomed start (Elshennawy & McCarthy, 1992). The seven deadly diseases constitute a lack of constancy of purpose, putting an emphasis on short-term profits, evaluation by performance, merit rating or annual review of performance, mobility of management, running a company on visible figures alone, excessive medical costs, and excessive costs of warranty fueled by lawyers that work for contingency fees (Deming, 1986).

The meaning of the seven diseases is very apparent since they comprise the roots of the problems that the 14 points are meant to deal with: failure to follow the 14 points results in the deadly diseases. Disregarding only one point tends to multiply the effect throughout the organization and thus cripple the TQM effort (Elshennawy & McCarthy, 1992).

These diseases are not the only obstacles that must be overcome in order to have a successful TQM philosophy for work. There are also many obstacles that Deming discusses that management must be aware of and conquer. These obstacles should be apparent to any company actively seeking quality improvement through TQM (Walton, 1986):

1. Neglect of long-range planning.

2. Relying on technology to solve problems.
3. Seeking examples to follow rather than developing solutions.
4. Excuses, such as “Our problems are different”.
5. Obsolescence in schools.
6. Reliance on quality control departments.
7. Blaming workers for problems.
8. Quality by inspection.
9. False starts.
10. The unmanned computer.
11. Meeting specifications.
12. Inadequate testing of prototypes.
13. The idea that “anyone who comes to try to help us must understand all about our business”.

Also central to this story are the contributions of Joseph Juran, Genichi Taguchi and Armand Feigenbaum, all of who brought to the problem the message of statistical methods as applied to quality control. Juran’s acid test for quality focused the attention on the customer for the products and services provided. He believed all quality control must be based on developing processes that deliver the product or service with the highest quality in the most economical manner. (McMurtrie & Gupta, 2003). Losses incurred before and after the delivery of a product or service to the customer form the theme of Genichi Taguchi’s approach to quality. These losses encompass those arising during production, those incurred through warranty claims, and those due to performance failures and dissatisfied customers (McMurtrie & Gupta, 2003). According to McMurtrie and Gupta, the Taguchi philosophy has two strands: first, the reduction in variation

of a product or process represents a lower loss to society, and second, the proper development strategy can intentionally reduce variation. Taguchi sees the design and development phase of a product's lifecycle as divided into three stages: system design, parameter design and tolerance design.

Scenario 2: The Japanese Copied Lean Production from Ford (Boje & Winsor, 1993). Eiji Toyota journeyed to the United States in 1950 to visit Ford's River Rouge juggernaut of American production might. Toyota studied the plant for three months and took the principal concepts of highly integrated production back to Japan where he incorporated these ideas into Toyota, making adaptations for differences in Japanese culture where necessary (Womack et al., 1990). Two decades prior to this, in 1929, Eiji Toyota's uncle (Kilichiro Toyota) visited Ford plants, taking information back to what was then known as Toyota Automatic Loom Works. The Loom Works evolved into automobile production during the Korean War effort.

Scenario 3: The Japanese Learned about Taylorism from GM of Japan (Boje & Winsor, 1993). In *My Life with Toyota* (1976), Shotaro Kamiya disclosed that he worked for General Motors of Japan during the 1920s and 1930s. He brought his knowledge of General Motors' management practices to the Toyota Automatic Loom Works and patterned Toyota Motors' sales division after GM of Japan (Suzuki, 1991, p.279).

Scenario 4: The Japanese Learned Taylorism at University (Boje & Winsor, 1993). Japan industrialized in the late 1800s and early 1900s, Western capitalism was imported and new Japanese capitalists showed they cared more for profits than workers. Members of the owner families studied at the University of Cambridge and implemented capitalism by pushing love of country, respect for family, and loyalty to emperor in order to adapt Western capitalism to Japanese culture. Furthermore, immediately after the publication of Taylor's *Principles of*

Scientific Management in the U.S. in 1911, 1.5 million copies were translated into Japanese and distributed throughout Japan (Maurice, 1993). According to Frederick Taylor (1911), the four elements of scientific management are: first, the proper design of work tasks such that the absolute maximum amount of work can be extracted from a given laborer (using time and motion studies); second, the selection of proper workers (finding workers who are highly motivated and controllable); third, the “inducement” of workers into participating in the system (getting workers to internalize the rationale of workers, with the concomitant use of surveillance and subversion to derail workers’ “natural” tendency toward sabotage, conspiracy, and “systematic soldiering”, namely concealing from management the speed at which work can actually be done); and fourth, intimate and friendly cooperation between management and workers. (pp.58-60)

Total Quality Management in the Healthcare Setting

Today’s competitive healthcare environment has organizations looking to streamline operations. Although healthcare is a lagging industry, the forces that drove U.S. manufacturing to adopt TQM are now pushing the healthcare industry (particularly hospitals) towards TQM: competition from other hospitals and niche providers, pay for value versus volume, patient satisfaction, population health, publicly available outcomes data, market share, and above all, the need to remain profitable under healthcare reform (Huq & Martin, 2000). The use of the Baldrige Criteria and other tools, such as lean process improvement, are proliferating the industry.

TQM was introduced into healthcare by Berwick (1989) and Laffel and Blumenthal (1989), who were the first to link quality improvement initiatives in other industries to healthcare (Berwick, Godfrey & Roessner, 1990). With that said, the use of TQM in the healthcare industry

was not widely discussed in the literature until the 1990s (Meyer Goldstein & Schweikhart, 2002). Today, nearly all healthcare organizations in the United States use some form of a total quality improvement program as required for Joint Commission accreditation, state and local accreditation programs, magnet credentialing, etc.

It has been noted that the measurement for and definition of quality that exist in healthcare organizations are absent from the industrial model of TQM (Meyer & Collier, 1998). An appropriate model of TQM for healthcare organizations must account for those aspects that differentiate this high-contact service from the manufacturing environment. Manufacturing generally consists of a number of repetitive sequences in which customers have little or no involvement (Meyer Goldstein & Schweikhart, 2002). As the amount of customer contact in production increases, and as processes move from being manufacturing based to service based, worker skills, processes, and organizational goals must change (Chase, 1983). Evaluating worker performance in environments with high worker discretion, measuring variable or non-repeatable processes, and determining the correct measures of quality performance all become more difficult in service-based organizations (Meyer Goldstein & Schweikhart, 2002). Healthcare managers will continue to be placed under pressure to provide evidence that quality intervention expenditures produce tangible benefits for their organizations (Hassan, 2006).

Assessing the impact of TQM in healthcare is difficult for several reasons. According to Shortell, Bennett and Byck (1998) it is difficult to measure outcomes in a reliable and valid fashion, in addition to it not always being possible to rule out alternative explanations for findings because there exist relatively few appropriate controls or randomized trials. Also, the cause-and-effect relationships in many conditions (particularly medical) are not understood (Eddy, 1984; Office of Technology Assessment, 1994) and most studies focus on a single site of

care. Finally, research has a tendency to focus on a single process or intervention within an organization, which may or may not be transferable to other areas.

The strengths of TQM in healthcare include an increased focus on patient outcomes and satisfaction, enhanced benchmarking, the need to empower the providers of care in managing for daily improvements and thinking critically, as well as a focus on the mission, vision and values of the organization. Healthcare organizations must focus on meeting the needs of their customers (patients), because customers (patients) have a significant influence on an organization's long-term viability. As a starting point, any organization should realize what it is that its customers require. These requirements then help to define the process for the ultimate output. Continuous improvements in the process result in a higher value-added service for meeting patient needs.

Along with meeting the needs of the healthcare customer, other attributes necessary for being successful with TQM implementation have been identified (Shin, Kalinowski & El-Enein, 1998; Zabada, Rives & Munchus, 1998; McNabb & Sepic, 1995; Kivirnaki, Maki & Lindstrom, 1997; Huq & Martin, 2000). These attributes include upper management support and leadership, physician engagement and integration with quality/customer service initiatives, a continued focus on customer satisfaction initiatives and measurements, increasing employee engagement and satisfaction, a focus on process improvement, partnerships with suppliers, and a strong strategic planning process.

History of the Malcolm Baldrige National Quality Award

The Malcolm Baldrige National Quality Improvement Act of 1987 was signed by President Ronald Reagan on August 20, 1987, making quality a priority and stimulating the economy during the 1990s. According to the National Institute of Standards and Technology (NIST)

(2012), Public Law 100-107 created the Malcolm Baldrige National Quality Award and Public Law 100-107 led to the creation of a new public-private partnership. Principal support for the Program comes from the Foundation for the Malcolm Baldrige National Quality Award, established in 1988, and the award is named after Malcolm Baldrige, who served as Secretary of Commerce from 1981 until his death in 1987. His managerial excellence contributed to long-term improvements in efficiency and effectiveness in government.

The Malcolm Baldrige National Quality Award Criteria for Performance Excellence created a public-private partnership designed to enhance quality standards, maximize productivity growth, and boost quality practices by setting standards of excellence for American companies in order to combat global competition (Brown, 2004). Public Law 100-107 Finding and Purpose states that:

1. The leadership of the United States in product and process quality has been challenged strongly (and sometimes successfully) by foreign competition, and our Nation's productivity growth was less than our competitors' over the last two decades.
2. American business and industry are beginning to understand that poor quality costs companies as much as 20% of sales revenues nationally and that improved quality of goods and services goes hand in hand with improved productivity, lower costs, and increased profitability.
3. Strategic planning for quality and quality improvement programs, through a commitment to excellence in manufacturing and services, are becoming more and more essential to the well being of our Nation's economy and our ability to compete effectively in the global marketplace.
4. Improved management understanding of the factory floor, worker involvement in quality, and greater emphasis on statistical process control can lead to dramatic improvements in the cost and quality of manufactured products.
5. The concept of quality improvement is indirectly applicable to small companies as well as large, to service industries as well as manufacturing, and to the public sector as well as private enterprise.
6. In order to be successful, quality improvement programs must be management led and customer-oriented and this may require fundamental changes in the way companies and agencies do business.
7. Several major industrial nations have successfully coupled rigorous private-sector quality audits with national awards giving special recognition to those enterprises the audits identify as the very best; and

8. A national quality award program of this kind in the United States would help improve quality and productivity by:
 - helping to stimulate American companies to improve quality and productivity for the pride of recognition while obtaining a competitive edge through increased profits;
 - recognizing the achievements of those companies that improve the quality of their goods and services and providing an example to others;
 - establishing guidelines and criteria that can be used by business, industrial, governmental, and other organizations in evaluating their own quality improvement efforts; and
 - providing specific guidance for other American organizations to learn how to manage for high quality by making available detailed information on how winning organizations were able to change their cultures and achieve eminence. (NIST: Baldrige Performance Excellence Program, 2010)

Numerous studies have found the Malcolm Baldrige National Quality Award framework to be the best embodiment of TQM traits when compared with other organization-wide excellence models. A study conducted by Curkovic, Melnyk, Calantone and Hanfield (1999) has identified ten traits that are associated with TQM. These traits focus on continuous improvement, continued focus on meeting customer needs, long-range planning, working to involve employees in decisions, looking to refine processes, benchmarking against the industry, team-based decision making, continual measurement of outcomes, increased participation of the customer in decision making, and a commitment from management to improving the organization. In 2003, Byrne and Norris stated that:

The seven categories of the Baldrige Criteria – leadership; strategic planning; customer and market focus; information, analysis and knowledge management; human resource management; process management; and business results – have become synonymous with performance excellence.... The Criteria are routinely used as a framework to help organizations assess their leadership competencies, their prowess in strategy development and deployment, and their strengths in the arenas of customer care, product and service quality, operational efficiency, human resource management and financial accountability and management. (Byrne & Norris, 2003, pp.13-21)

According to Tang and Bauer (1995), while many organizational leaders address challenges through the deployment of strategic and quality initiatives, very few achieve a level of organizational maturity that integrates both. Because organizational success depends on more than just the maturity of their quality management system, hospitals seeking excellence should focus on increasing organization-wide performance maturity by evaluating the entire organization and systematically improving their processes to drive performance excellence (Montoya, 2011). To do this they need a model that is designed to drive such improvement. The Baldrige National Quality Program asserts that the Baldrige Criteria for Performance Excellence provides such a model. The Malcolm Baldrige National Quality Award Criteria provides a framework for integrating strategy and quality throughout the organization. According to Baldrige, as organizations mature in their ability to develop and deploy integrated approaches to their strategic plans and use learning to improve their quality, they will achieve the highest levels of performance excellence (NIST, 2011). The “Baldrige Journey” refers to the cycles of learning and improvement that organizations experience while they use the Criteria to self-assess, write and submit an application at the state or national level. According to Evans and Lindsay (2005), cycles of learning include planning, execution, assessment and refinement based on findings. Each of these stages is part of the Baldrige process and as organizations continue on this journey they achieve “maturity”, eventually attaining the highest level of performance excellence. The purpose of the MBNQA Criteria for Performance Excellence is threefold (Brown, 2004). First, the objective of the Criteria is to assist the organization in improving performance practices, capabilities and results. Second, the program works to disseminate best practices throughout the United States, regardless of the industry. Lastly, while the criteria is not prescriptive, it does act as a guide for strategic planning, identifying areas of opportunity and managing overall

organizational performance (Senge, 1990).

According to the National Institute of Standards and Technology, print and electronic copies of the Criteria have been distributed to millions of people around the world. A 1995 pilot project demonstrated that the Malcolm Baldrige National Quality Award could also be valuable and relevant in the healthcare and education sectors (Berman, 1995; Gropper, 1996; NIST, 2005). The education and healthcare categories were added to the original three categories – manufacturing, service and small business –in 1999. Since 2005, healthcare organizations have represented more than 50% of the applicants for the MBNQA (Foster & Chenoweth, 2011).

The newest category focuses on nonprofit organizations and was added in 2007 (NIST, 2011). Industry and academic experts who hypothesized causal links among the Criteria of the award developed the original Baldrige Criteria. While the Criteria was developed by quality experts from different industries throughout the United States, there is still little evidence to suggest that adhering to the Baldrige Criteria improves performance. The Criteria have been updated every year since the MBNQA's inception in 1998 and are now more focused and aligned. The National Institute of Standards and Technology claims that the impact of the program has been far-reaching.

According to NIST, and as stated in the *Malcolm Baldrige National Quality Award 2011-2012 Health Care Criteria for Performance Excellence* (2011), since the Baldrige Program's inception in 1987 there have been nearly 1,500 applicants for the Malcolm Baldrige National Quality Award. All of these applicants received vigorous evaluations by the Board of Examiners using the Criteria for Performance Excellence. In addition, during 2011 a small subset of 95 recipients were selected across six categories, these comprised: 28 manufacturing companies, 15 service companies, 22 small businesses, 9 education organizations, 15 healthcare organizations

(29 hospitals), and 4 nonprofit organizations. There are also in excess of than 35 active state and local, regional and sector-specific quality award programs that are based in states throughout the U.S. All of these programs are, to some extent, modeled after the Baldrige National Quality Program. Their award criteria are based on the Criteria for Performance Excellence. NIST goes on to highlight that from 1996 to 2009, 45 of the 60 MBNQA recipients were previous winners of state award programs, and that since 1988 the Baldrige Program has trained more than 8,800 examiners. Since 1991, the state and local programs have trained more than 39,000 examiners. In 2001, the first three education award recipients – the Chugtach School District (Alaska), the Pearl River School District (New York), and the University of Wisconsin-Stout – were announced and just one year later, in 2002, the first healthcare award recipient – SSM Health Care (St. Louis, Missouri) – was announced. A dedication to organizational excellence that has driven them to achieve levels of maturity that enable them to become leaders within their industry is common to each of the MBNQA recipients (NIST, 2011, p.81). The Baldrige Criteria Framework for Healthcare is demonstrated in figure 2.



Figure 2. Baldrige Criteria framework: A systems perspective (NIST, 2011, p.iv)

The organizational profile at the top of the above figure describes the operating environment as well as setting the context for the organization: “The organization’s environment, key working relationships, and strategic situation – including competitive environment, strategic challenges and advantages, and performance improvement systems – serve as an overarching guide for your organizational performance management system” (NIST, 2011 p.iv).

Organizations implementing the MBNQA Criteria for Performance Excellence are initially required to complete an organizational profile used for internal self-assessment (Brown, 2004).

The organizational profile is used to identify key suppliers, customers and customer needs, as well as better define the key operating strategic initiatives for the organization (McGuire, 2006).

After completing the organizational profile, the organization discusses the seven categories in the same manner by addressing questions regarding how and what the organization does to accomplish business requirements (Brown, 2004; Blazey, 2003; Hutton, 2000).

According to the *Malcolm Baldrige National Quality Award 2011-2012 Health Care Criteria for Performance Excellence* (2011):

The Leadership (category 1), Strategic Planning (category 2), and Customer Focus (category 3) represent the leadership triad. These categories are placed together to emphasize the importance of a leadership focus on strategy and on patients and stakeholders. Senior leaders set your organizational direction and seek future opportunities for your organization. Workforce Focus (category 5), Operations Focus (category 6), and Results (category 7) represent the results triad.

Your organization’s workforce and key operational processes accomplish the work of the organization that yields your overall performance results.

All actions point toward Results – a composite of healthcare and process outcomes, customer-focused outcomes, workforce-focused outcomes, leadership and governance outcomes and financial and market outcomes. Measurement, Analysis, and Knowledge Management (category 4) are critical to the effective management of your organization and to a fact-based, knowledge-driven system for improving healthcare and operational performance and competitiveness. Measurement, analysis, and knowledge management serve as a foundation for the performance management system.

The horizontal arrow in the center of the framework links the leadership triad to the results triad, a linkage critical to organizational success. Furthermore,

the arrow indicates the central relationship between Leadership (Category 1) and Results (Category 7). The two-headed arrows indicate the importance of feedback in an effective performance management system. Measurement, Analysis, and Knowledge Management (Category 4) are critical to the effective management of the organization and to a fact-based, knowledge-driven system for improving healthcare and operational performance. Measurement, analysis and knowledge management serve as a foundation for the performance management system. (p.1)

The National Malcolm Baldrige Healthcare Criteria for Performance Excellence

Since 2005, over 50% of all applicants for the MBNQA have come from the healthcare industry (Foster & Chenoweth, 2011). The Malcolm Baldrige Healthcare Criteria for Performance Excellence was developed by industry and academic experts, and developed using similar concepts to those of the original MBNQA (Meyer, 1998). A 1995 pilot project demonstrated that the Malcolm Baldrige National Quality Award could also be valuable and relevant in the healthcare and education sectors (Berman, 1995; Gropper, 1996; NIST, 2005). These criteria were piloted and 46 healthcare organizations completed applications for the healthcare award pilot study (Meyer, 1998). On October 30, 1998, President Clinton signed the Technology Act of 1998, thus expanding award eligibility to nonprofit and for-profit education and healthcare organizations (Kelly, 2002).

According to Harry S. Hertz, director of the Baldrige National Quality Program:

[H]ealthcare organizations from coast to coast have used the Baldrige Healthcare Criteria to help them address challenges such as focusing on core competencies, introducing new technologies, reducing costs, communicating and sharing information electronically, establishing new alliances with healthcare providers, or just maintaining market advantage. Whether the organization is small or large, is involved in ambulance service or health maintenance, or has one facility or multiple sites across the country, the Criteria provide a valuable framework that can help plan in an uncertain environment. The Criteria can be used to assess performance on a wide range of key indicators: healthcare outcomes; patient satisfaction; and operational, staff, and financial indicators. The Healthcare Criteria can help align resources and approaches, such as ISO 9000, Plan-Do-

Study-Act cycles, Balanced Scorecard, and Six Sigma; improve communication, productivity, and effectiveness; and achieve strategic goals. (Hertz, 2012, p.i)

The purpose of the Baldrige Criteria is to provide organizations with the ability to undertake self-assessment of their operations. The Baldrige Program also provides organizations with opportunities for external assessment. External assessment is performed by Baldrige examiners trained to use and assess organizational performance against the Criteria. In addition, the *Malcolm Baldrige National Quality Award 2011-2012 Health Care Criteria for Performance Excellence* states that the Criteria play three important roles in strengthening U.S. competitiveness (2011): the first is to help improve organizational performance practices, capabilities, and results; the second is to facilitate communication and the sharing of best practices information among healthcare organizations and among U.S. organizations of all types; and the third is to serve as a working tool for understanding and managing performance and for guiding organizational planning and opportunities for learning (p.49).

The Criteria are based on core “Values and Concepts”, which include:

[V]isionary leadership, patient-focused excellence, organizational and personal learning, valuing workforce members and partners, agility, focus on the future, managing for innovation, management by fact, societal responsibility and community health, focus on results and creating value for patients, and a systems perspective. The Criteria are designed to help organizations use an integrated approach to organizational performance management that results in the delivery of ever-improving value to patients and other customers, contributing to improved healthcare quality; improvement of overall organizational effectiveness and capabilities as a healthcare provider; and organizational and personal learning. (NIST, 2011, p.49)

State Quality Awards and Quality Awards from Around the World

Recent changes to the application process for the MBNQA require the applicant to be the recipient of its state’s highest award prior to applying to the national program. This has made the state and local programs, of which there are over 35, an important component of the program

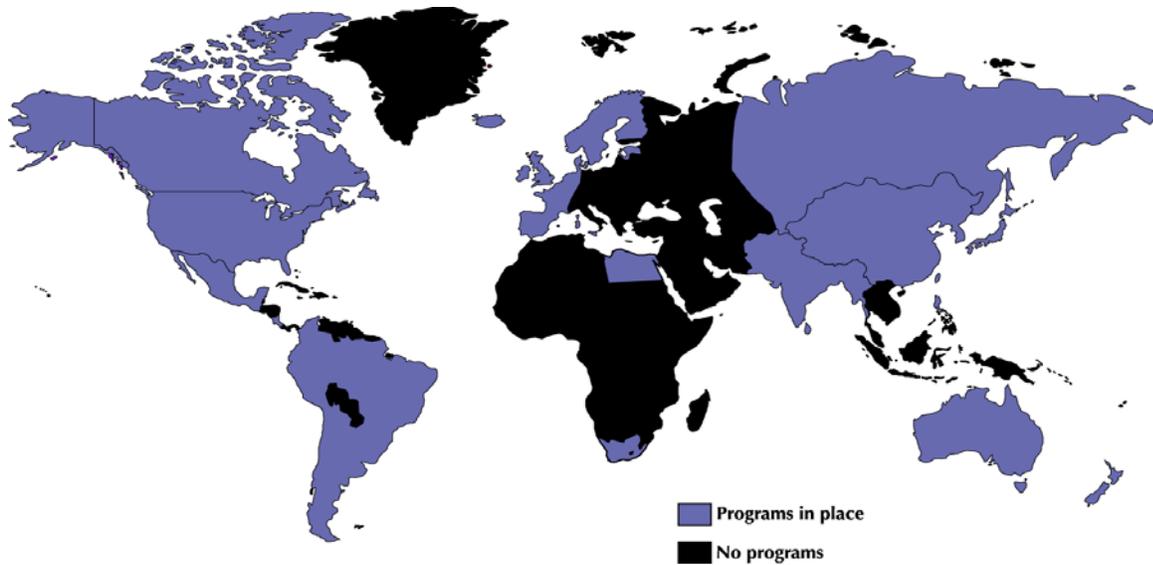


Figure 4. Quality awards from around the world (NIST, 2004)

Because of the success of the Japanese Deming Prize (DP), the United States developed the Malcolm Baldrige National Quality Award (NMBQA) and the European Quality Award (EQA) was established. (Chuan & Soon, 2000). Research indicates that these national awards are indeed strongly based on the foundations of TQM (Bemowski & Sullivan, 1992; Stauss, 1994). The common characteristics of these programs are a focus on approach, deployment and results. Table 3 lists countries with quality awards in place.

Table 3

Major Emphasis and Characteristics of the World's National Quality Awards

Country	Quality Award	Emphasis of National Quality Award Criteria and Model
Japan	Deming Application Prize	The emphasis is on the examination of quality control practices on a company-wide basis.
USA	Malcolm Baldrige National Quality Award	The set of award criteria is results-oriented. It supports a systematic approach to maintaining goal alignment throughout the organization and a goal-based diagnosis of the organization. The criteria also emphasize a customer and market focus in all organizational activities and operations.
Hong Kong	Hong Kong Management Association Quality Award	The criteria and their emphases are identical to those of the MBNQA, except that in the area of performance tracking their action plans are not as strong as those of the MBNQA.
Mauritius	Mauritius National Quality Award	The criteria and their emphases are similar to those of the MBNQA, except that more weight is given to the development of strategy and human resource plans. There is also less use of relevant indicators for tracking and improving an organization's performance.
New Zealand	New Zealand National Quality Award	The emphasis of the criteria is identical to that of MBNQA because the criteria are identical.
Western Europe	European Quality Award	The criteria address more areas than the MBNQA. The major emphases are still on the results achieved by the organization in the various criteria. In general, the criteria focus more on an organization's management of resources, employee work satisfaction, and the impact of an organization's operations, products and services on society.
Western Europe	European Quality Award (Small and Medium-Sized Enterprises)	Like the EQA (large companies) criteria, the main emphasis is on results achieved by the company. However, it addresses fewer areas in the criteria on the leadership system, the management of the employee and the impact on society. More focus is placed on the criteria of customer focus and management of quality systems and processes than that of the EQA (large companies).
Ireland	Irish Business Excellence Award	The emphasis is identical to that of the EQA (SMEs).
Slovenia	Slovenia National Quality Award	The emphasis is identical to that of the EQA (SMEs).
Sri Lanka	Sri Lanka National Quality Award	The major emphasis, like most NQAs, is on the results achieved by the organization for the various criteria. The criteria are similar to those of the MBNQA. They are, however, more focused on strategy deployment and human resource planning. Generally, there is less emphasis placed on the well-being of employees, the development of positive relationships with customers, and the effective use of the organization's performance review findings.

Israel	National Industrial Quality Award	Unlike most NQAs, the criteria are not results-oriented. Rather, the emphasis is on the importance of developing good quality systems and processes in the company. This is in order to have a long-range organizational perspective (instead of just focusing on short-term gains in results) and to make appropriate investments and resource allocation for the long-term excellence and survival of the organization. There is also greater focus on the implementation of quality control and assurance in all company activities.
Sweden	Swedish Quality Award	The major emphasis is also on the results achieved by the organization. The criteria framework is identical to that of the MBNQA but the areas to address and the focus of the criteria are different. There is greater emphasis on the evaluation and improvement in all the criteria addressed and on the practice of TQM principles in all organizational activities. In general, there is more emphasis on the organization's impact on society and on the organization's commitment to the customers compared with other NQAs studied.
South Africa	South African Business Excellence Award	The criteria are results-oriented and are essentially made up of a combination of criteria for the EQA (large companies) and the MBNQA, with the EQA criteria making up the majority of the features.
Singapore	Singapore Quality Award	The major emphasis of the criteria is on results and the criteria contain features of the criteria for the MBNQA, the EQA and the DP. Generally, there is more emphasis on learning cycles and the alignment of learning cycles in an organization. Fewer areas are addressed in the strategic planning process but more emphasis is placed on the criteria on the leadership system and the organization's management of its employees, as compared to that of the MBNQA.
Taiwan	Taiwan National Quality Award	In general, the emphasis of the various criteria for the TNQA is not on the achievement of results by an organization. The major emphasis is on the management of the quality assurance in the organization's operations and activities. Another characteristic is their focus on the research and development activities in an organization – this is not seen in the other NQAs.
India	Rajiv Gandhi National Quality Award	The major focus of the criteria is on the achievement of results. The criteria contain most of the features of the criteria for the EQA (large companies) but address more areas than the EQA does in most of the criteria. Generally, the RGNQA places most emphasis on the concern of the company's impact on the society. It is least concerned with an organization's management of its employees and employee satisfaction compared with all the other NQAs.

Note. Chuan & Soon, 2000, pp.10077-78

Strengths of the Malcolm Baldrige Criteria for Performance Excellence

The primary purpose of the MBNQA is to provide criteria for organizations by which to assess performance, make awards, and give feedback to applicants. When President Ronald Reagan signed the law into effect, there were three primary purposes behind strengthening U.S. competitiveness. First, the aim was to help improve organizational performance practices, capabilities, and results. Facilitating communication and the sharing of best practices information among U.S. organizations of all types formed the second purpose. The third purpose was for the law to serve as a working tool for understanding and managing performance, in addition to guiding organizational planning and opportunities for learning (NIST, 2005).

According to NIST, although not prescriptive, the Criteria are helpful in integrating performance management within organizations (2011). They were developed in order to lead to the delivery of ever-improving value to customers, thus contributing to improved quality, as well as an improvement in overall organizational effectiveness, capabilities and organizational and personal learning (NIST, 2011).

In the literature related to the MBNQA, a number of other strengths have been identified. For Yong and Wilkinson, the higher the quality of the product or service that the organization is able to produce, greater customer loyalty will follow (2003). DeBaylo notes that the MBNQA encourages an alignment of the mission, vision and values of the organization with its overall strategy. Once this strategy is both defined and implemented then assessment is important in determining overall performance and this cannot be achieved without the involvement and support of senior leadership (1999). Both Adam, McQueen & Seawright (1999) and Hendricks & Singhal (2000) highlight that recipients of the MBNQA typically see their stock price increase on the day that they are announced as a recipient of the award. Returning to Yong and Wilkinson,

the authors have found that workforce engagement is enhanced by implementing the MBNQA, while employee and customer satisfaction is also improved (2003). Both Brown (2004) and Blazey (2003) contend that the MBNQA Criteria for Performance Excellence can substantially improve an organization's market share. In reviewing previous award recipients, Calhoun (2002) has found that organizations that adopt and implement the MBNQA Criteria for Performance Excellence gain specific benefits from winning, with Evans (2003) identifying particular benefits, such as increasing pace of improvement and validating key results. Finally, Young (2002) has found that the real payoff derives from the rigorous and systematic self-assessment process and identification of performance gaps delineating areas of improvement.

According to Brown (2004), "the MBNQA Criteria for Performance Excellence is a powerful set of guidelines for operating an effective organization and he emphasizes the need to proactively adopt the criteria if the organization's goal is performance improvement" (Leonard & McGuire, 2007, p.5). The criteria for Performance Excellence makes organizations ask key questions about their operations and how they are going to work to improve. This improvement enables an organization to remain viable in the future. The questions also allow the organization to determine how they might address inquiries and where gaps in performance occur. The MBNQA provides a structure for strategic planning and the ability to analyze an organizational system in one document (Hall & Lawson, 2003; McDonald, Zairi & Idris, 2002). The ability to have on-document tracking for all organizational improvements yields clarity and coordination in the efforts. Economic payoffs are reported as being a significant benefit for organizations (Rajan & Tamimi, 1999; Brown, 2004; Blazey, 2003).

MBNQA winners between 1988 and 1997 outperformed the S&P 500 by almost three-to-one. Based on their research, Rajan and Tamimi (1999) recommend that long-term investors

would benefit from investing in Baldrige winners. By focusing on customer, shareholder, and employee support Baldrige winners are financially very successful.

The MBNQA Criteria provides a for an internal assessment of operations (Young, 2002), leading to improvements in employee relations, providing higher productivity, ensuring greater customer satisfaction, increasing market share, and improving profitability (Rajan & Tamimi, 1999). Evans (2003) believes that the greatest benefit is the increase in furthering improvements across the organization. With all the information and research considered, the adoption and implementation of the MBNQA Criteria for Performance Excellence can be an effective tool when fully implemented in an organization (Brown, 2004; Blazey, 2003; Hutton, 2000; DeBaylo, 1999). Winning the MBNQA is not a roadmap for success however; sustaining improvements and refining more processes in order to continually improve are considered the long-term keys to success (McGuire, 2006).

Criticisms of the Malcolm Baldrige Criteria for Performance Excellence

Over time, the Malcolm Baldrige Criteria for Performance Excellence has received criticism from various well-known quality gurus. Crosby for one believed the NMBQA would not serve a useful purpose and believed the process to be nothing more than a form filling exercise (Main, 1991). In addition, Deming has called the MBNQA a nonsense (Chuan & Soon, 2000).

Blumenthal and Epstein (1996) note that “Despite its clear success in particular instances, there is so far no convincing evidence that the application of the techniques of total quality management in healthcare improves the quality of care in entire institutions or among large numbers of physicians” (Shortell, Bennett & Byck, 1998, p.606).

Historically, a major criticism of the Baldrige framework has been that it is not based on empirical evidence (Black & Porter, 1995). Research has been limited due to the data confidentiality requirements of both public and private companies (Kelley, 2002):

The one source of complete data, the National Institute of Standards and Technology, which oversees the Award, has its own confidentiality requirements. NIST refuses to release aggregate data for scrutiny. There are valid reasons for its refusal, but without the data, serious study of quality principles will continue to be hampered. (Garvin, 1991. p.84)

Others argue that while the MBNQA provides a framework for values-based leadership and employee engagement, it may not go far enough in actually providing a roadmap for higher performance. Because the MBNQA is not prescriptive in nature it is difficult to determine the right thing to do in order to achieve the Criteria's overall objectives (Byrne & Norris, 2003).

Most organizations that embark on the Malcolm Baldrige Criteria for Performance Excellence probably would like to win the MBNQA. Many organizations embark on the journey wanting to improve overall quality within the organization. Focusing on the award alone may cause some negative side effects. In the effort to win employees and staff may feel stressed during the application process. There is a true danger of emphasizing both the award and process improvement at the expense of making sound business decisions.

A 1996 survey showed that of the approximately one million copies of the Criteria that had been distributed since 1987, about 180,000 were thrown away and 819,000 were used at least once (Bemowski & Stratton, 1995). The survey also indicated that of the 819,000, 70.7% were used as a source or framework for process improvement and only 23.69% were used to apply for the MBNQA.

Hamilton (2003) has found a broad recognition of the MBNQA among a group of leaders surveyed from Fortune 100 companies in the manufacturing, service, education, healthcare, and

small-business sectors. More than 70% of the leaders surveyed agreed that they may use the Criteria in the future; however, the leaders indicated they had no real in-depth knowledge of the Criteria or the requirements for implementation. Adoption problems cited include a lack of familiarity with the Criteria, a lack of understanding of the Criteria's components, perceived or real complexity of the criteria and the associated costs of implementing the Criteria, as well as the related logistics and resource requirements of applying for the MBNQA. Brown (2004) and Blazey (2003) strongly suggest that leader are the key to implementation and so vital to the success of the Baldrige Criteria. Additionally, they contend that leaders must positively address the resulting organizational changes that accompany the adoption and implementation of the Baldrige Criteria.

While the Baldrige website suggests significant financial excellence when MBNQA winners are matched against non-winners, the relatively small sample size could be misleading (Wilson, et al., 2003). A few star performers could skew the results and ensure that MBNQA winners appear to excel when that is not in fact the case. According to the research conducted, MBNQA winners do not appear to provide better financial results than other companies (Wilson et al., 2003). Other research that has reviewed all MBNQA winners from 1988 to 1999 has revealed that winners did outperform the market, but that it was possible to have a portfolio of competing firms that outperformed MBNQA winners (Przasnysk & Tai, 2002).

Other common weaknesses observed in MBNQA winning organizations include weak information systems, a partially adopted quality system, unclear quality definitions, lack of alignment, failure to use listening posts, and a lack of measures, indicators or benchmarks (McGuire, 2005). Other concerns expressed in the literature related to the MBNQA include that it costs too much (Herrington, 1994) and prompts increased investment in labor hours for

documentation and for application preparation, as well as workforce readiness for site visitation (Lee, Rho & Lee, 2003).

A lack of research linking improved financial performance to the Baldrige process (Hart, 1993) is a further concern, as is Holland's conclusion that the Criteria are vague and open to considerable interpretation (1992). Another limiting factor is the lack of commitment to total quality improvement by top management., while Garvin cites a lack of correlation between being an award recipient and market competitiveness and profit potential (1991). In addition, the award has not proven, in all cases, to bring increased sales and earnings growth (Kearns-Hockman, 1992), while Herrington has demonstrated that it will drain all of a company's time and resources (1994). Herrington has also shown that it is highly probable that the company's examination team does not understand the Criteria or assessment process well enough (1994).

The criticisms and concerns continue with Hart having found that the Criteria are so focused on process that they fail to measure the actual product or service being offered, in addition to management being unable to see the benefits of using the Baldrige Criteria for internal assessment (1993). Zempke has further asserted that the Criteria are biased against small companies and firms in the service sector (1991), while Bergman has shown that they are not applicable to nonprofit organizations (1994). It has been reported that some TQM indicatives are unattainable (Slack, 1991; Zaire, 1995), with some organizations losing ground after an initial improvement following the implementation of a quality program (Hughes & Halsall, 2002). In the United States, failure rates of 15% to 50% are noted for quality improvement initiatives (Harrington, 2004). Harrington also believes that recipients of the NMBQA may not be better role models for business than the top 10% of *Fortune* magazine's most admired companies (2004).

To round up the list of criticisms, Chrusciel and Field have found that leaders must adopt and support implementation of the process, which takes precious time to fully support (2003), while numerous authors have concluded that training programs are required and incentives must be attached to the implementation to signal support from leaders. Indeed, problems with implementation and a lack of clear financial incentives need to be addressed early in the process (Wilson, Walsh & Needy, 2003; Prsasnyk & Tai, 2002). There is also a chance that the quest for the award overwhelms the resources within the organization. Finally, it typically requires five to seven years to fully implement a quality program (Brown, 2004; Blazey, 2003; Hutton, 2000; Young, 2002; Rajan & Tamimi, 1999).

Table 4

Advantages and Disadvantages of Implementing the MBNQA Criteria for Performance Excellence

Advantages	Disadvantages
System-wide approach, leaders must become committed, employees are empowered and trained.	Requires a review and evaluation across organizational structure/system, which will take precious leader time.
Advocates that leaders become heavily involved in long-term planning by developing a strategic plan.	Requires intensive senior-leader involvement, a long-term view, and commitment.
Advocates that leaders analyze work systems and review organizational priorities regularly.	Requires leadership to be competent in the Baldrige model and understand organizational work and priorities.
Advocates measurements of critical goal comparisons with competitors, and the proactive monitoring of the overall vision.	Requires intensive commitment to review and evaluate measurements and goals on a regular basis.
Indicates financial success is possible with commitment to total implementation and linking resources to goals.	Does not guarantee financial success – some mixed results – whether fully implemented or not.
Suggests employees at all levels must	Requires a senior leader commitment to

become involved through intentional training events and active participation.	develop employees and have some change agents (leaders of the change) receive intensive and dedicated training.
Accomplishes long-term gains but may not be fully effective in the short term.	Requires a long-term view and there are not any short cuts to implementation.
Time, energy and resources are required with the possibility of rich dividends.	Requires precious time, energy and resources in order to fully implement.
Winning Baldrige-based awards may lead to improved business processes but secondary to performance excellence.	Winning does not guarantee long-term success as sustainment and further improvements are always necessary.
Implementation is a journey, not a destination – long-term exercise.	Requires continual commitment to excellence and continual improvements.

Note. McGuire, 2005 p.32

Quality Management and Organizational Performance

Organizational Performance

According to Evan and Jack (2003), there have been many studies looking at the effect of management practices on quality outcomes. Adams, McQueen and Mandelkar (1992) looked at different quality improvement approaches to determine if they have an impact on operational and financial performance. Samson and Terziovski (1999) examined the effect a total quality management (TQM) program has on leadership, management of people and customer satisfaction and whether these factors influence or can predict overall organizational performance. Wilson and Collier (2000),

[A]ppplied the MBNQA model to a manufacturing environment and investigated its relationships with leadership, quality system and customer satisfaction/financial results. The results showed that process management and information management were related significantly with financial results, while human resource management and strategic quality management were not. For customer satisfaction, they had the same results; process and information management were significant but human resource management and strategic quality management were not. (p.xxx)

Choi and Eboch (1998) found correlations between plant operations and customer satisfaction. Zairi and Sinclair (1995) analyzed results from 22 organizations with a focus on strategic planning and the outcomes achieved.

Ugwueke (2001) evaluated the effect of state quality awards patterned after the MBNQA on the overall performance of hospitals and healthcare systems based on the average length of stay, profitability, occupancy rate, and efficiency. Ugwueke found that with the exception of profitability, the other three indicators (ALOS, occupancy and efficiency) did not show any significant difference. As stated previously, profitability was the only indicator that showed a significant difference between MBNQA winners and non-winners: it clearly showed that non-winners outperformed winners (Ugwueke, 2001).

However, research has shown financial benefits from TQM implementation in manufacturing firms, for example, Easton and Jarrell (1998), Wilson (1997), Hendricks and Singhal (1996), and Handfield and Ghosh (1995). The results of these studies suggest a disconnection between goals and performance measurements in the healthcare industry. Other similar studies include Flynn, Schroeder and Sakakibara (1994), Anderson, Rungtusanatham, Schroeder and Devaraj (1995), Dow and Sampson (1995), Powell (1995), Chapman, Murray and Mellor (1997), Handfield, Ghosh and Fawcett (1998), Dow et al. (1999), Tan and Kannan (1999), Forza and Filippini (1998), Ittner and Larcker (1997), Shin, Wilson and Collier (2000), Cua, McKone and Schroeder (2001), Germain, Droge and Christensen (2001), and Evans and Jack (2003). But none of these authors have studied the empirical relationship between winning the Malcolm Baldrige National Quality Award and the impact on hospital/healthcare system performance.

Since the healthcare industry faces healthcare reform and the reality that while costs are rising, quality can be improved, it is important to empirically study the cost and benefits of implementing a quality improvement program (Ugwueke, 2001).

Malcolm Baldrige National Quality Awards and its Effects on Organizational Development and Change Efforts

According to Matta, Davis, Mayer and Conlon (1996), the impact of implementing the MBNQA criteria permeates all areas of an organization. These changes were found to have a positive effect on the sales and production teams and a positive impact on customers and suppliers. Table 5 demonstrates the findings from the Matta, Davis, Mayer and Conlon (1996) study.

Table 5
TQM Change Drivers

	Before TQM	After TQM
Strategic planning and management	Financial and marketing issues (profitability, ROI, market share).	Quality planning intertwined with strategy (customer satisfaction, defectiveness, process cycle).
Customers and suppliers	Competition among suppliers (the more the better). Customers outside enterprise (the domain of marketing and sales). Quality (freedom from defects).	Partnership with suppliers (long-term contracts). Chain of customers. Quality exceeds needs and expectations.
Organizational structure	Separate, highly functional and specialized performances of units (connections are made by intermediaries close to the top), competition and conflict encouraged among units.	Interdependent processes.
Organization change	Management's job is to prevent tinkering with a successful formula.	Management's job is to provide leadership for continual improvement of processes.

Teamwork	Narrowly defined job to advance relationship horizontally across individuals and between management and labor.	Cooperation in team structures. A whole view and commitment to whole process or system partnership between management and unions.
Motivation and job design	Fear of punishment. Avoidance of failure.	Employees are process managers. Meaningful contributors to enterprise.
Management and leadership	Recognition and reward system puts people in an internally competitive environment. A view of people as interchangeable commodities. People as passive contributors with little autonomy. Control achieved through rules and procedures.	Recognition of individual contributors and team contribution. People provide competitive advantage, valued for creativity and intelligence. Leadership provides people with the opportunity to grow. TQM control is achieved through shared vision and beliefs.

Note. Matta, Davis, Mayer & Conlon, 1996, p.41

According to Terziovski, Sohal & Moss (1999), a company claiming to use MBNQA Criteria practices tends to have the following attributes: a quality mission/statement, TQM philosophy applied across all functional areas, all people in the company are likely to have received some training in the philosophy of quality management practices, a well-developed awareness of customer/supplier relations, including both internal and external customers. Organizations will also have closer relationships with suppliers, which will include vendor pre-qualification and some involvement in the company's training program for quality management practices. Finally, technical methodologies, such as statistical process control (SPC) and quality circles (QC), will be in place and operational (p.4).

Terziovski, Sohal and Moss have also reached major conclusions as drawn from MBNQA/TQM studies. These conclusions include that organizational performance suffers when responsibility for quality and change processes is allocated to a specialized quality and change

department. Responsibility for quality and change rests with all employees in the organization. Quality management practices were least implemented in the area of human resources and most implemented in the area of operations. This implies that managers still believe, albeit erroneously, that 'quality' pertains to the area of operations only. There has been a significant jump in the implementation of quality management practices in the area of administration. The popularity of tools and techniques has diminished, even though managers believe that these practices have a positive impact on performance. The extent to which leadership training is provided influences organizational performance and change efforts. Finally, companies that have invested in leadership training are more likely to succeed than those companies that have not invested in leadership training. Customer surveys and continuous improvement concepts have a significant effect on organizational performance. Yet customer involvement in design and development and in inspection and testing does not influence organizational performance (1999, pp.12-13).

While leadership is not always involved in developing day-to-day processes, leadership is often referred to as an influence process. A widely adopted text has defined leadership as “an influence relationship among leaders and followers who intend real change and outcomes that reflect shared purposes” (Bell & Elkins, 2004 p.13). Furthermore, Daft has asserted that, “Leadership is about creating vision for the future, designing social architecture that shapes culture and values, inspiring and motivating followers, developing personal qualities, and creating change, to improve organizational effectiveness” (Daft, 2002, p.5). Kotter (1988) has defined leadership as developing vision, networking and allowing the work to be done. Bolman and Deal (1997) have reframed leadership to conclude that it is a “subtle process of mutual influence fusing thought, feeling, and action to produce a cooperative effort in the service of

purposes and values of both the leader and the led. They see effective leaders as those who help establish a vision, set standards for performance, and create focus and direction for collective efforts” (p.339). Finally, after more than 50 years of working with numerous leaders and organizations, Peter Drucker has concluded that all the effective leaders he encountered knew four simple things. “First, that the only definition of a leader is someone who has followers: some people are thinkers, some are prophets, and both roles are important and badly needed, but without followers there can be no leaders. The second is that an effective leader is not someone who is loved or admired, instead he or she is someone whose followers do the right things. Popularity is not leadership, results are. Third, leaders are highly visible and therefore, they set examples. Finally, leadership is not rank, privileges, titles, or money, but instead it is responsibility” (Drucker, 1996, p.ii).

Malcolm Baldrige National Quality Award and its Effects on Organizational Culture

Based on previous studies of MBNQA recipients, the difficulties of implementing quality programs can be traced to the all-encompassing change in culture and processes that must occur throughout the organization in order to be successful (Bau, 1986; Sargent, 1986).

A key issue that plagues change management processes is that managers have predominantly neglected to tailor quality initiatives to suit their own organizational cultures (Hill, 1991). Saraph, Benson and Schroeder (1989) have suggested that it is imperative for upper management with the business unit develop policy, quality departments and training tailored to the work that must be done to achieve the desired product or service outcome.

Various authors have referenced the effects of culture on a firm’s performance. One can therefore conceive that culture does have a positive or negative impact on the financial

performance of an organization (Denison, 1984) and that it can be a strategic advantage in or detriment to overall success (Bluedorn & Lundgren, 1993). Culture has also been identified as the key to success and failure of corporate mergers (Fairclough, 1998).

Other researchers have suggested that leadership plays a critical role in the implementation of a cultural change (Leonard & Sasser, 1982; Deming, 1986; Burke & Litwin, 1992). Surveys administered to MBNQA winners rank leadership as the key to implementing a quality program and influencing a cultural change within and organization (Matta, Davis, Mayer & Conlon, 1996). Leadership has been identified as a critical component in developing a vision, communicating this vision and leading by example (Deming, 1986; Bau, Eisenstat & Spector, 1990), with leadership by example being the prevalent tool used by these firms to reinforce TQM principles and the MBNQA. Matta, Davis, Mayer & Conlon (1996) have found that in addition to the traditional leadership role of creating and communicating a vision, creating a consistency of purpose throughout the organization is an important determinant in a successful TQM cultural transformation. Matta, Davis, Mayer and Conlon (1996) have also found the following:

Researchers have commented that TQM impacts long-term results, and that leadership has to play a critical role in maintaining the focus of the organization until results, and some successes, become apparent. Leadership is also important in overcoming the resistance to change inherent in any organizational response to cultural change. An examination of the MBNQA winners reveals that the resistance to change is most pronounced in management. This is attributable to management's perceived loss of authority and control as a result of employee empowerment – a key component of TQM. Even functions of top executives are impacted and, therefore, their commitment is critical. (pp. 42-43)

One must also consider the individualism/collectivism dimension of the organization or the degree to which people are oriented towards team-based approaches to solutions. Many Baldrige constructs are oriented toward collectivism. Group problem solving, high performance teams, group compensation schemes, partnerships and cooperative relationships within and

external to an organization are typical of organizational cultures that are strong in the values of cooperation, customer satisfaction, trust and empowerment. Group consensus is important in strategic planning and process management relies on group problem-solving efforts. In contrast, the construct of leadership implies individualism. Although effective leadership is related to the collective good, leaders develop individuals to take on new organizational responsibilities and reward them for performance and the development of advanced or multiple skills (Flynn & Saladin, 2002). This leads to the notion that any framework for quality management will be more effectively implemented if it matches the culture of the organization. These issues must be considered when an organization is contemplating or currently implementing the MBNQA Criteria.

The development of a stable workforce and a decrease in employee turnover creates an advantage when implementing quality management. Besides the separation, replacement and training costs tied to staff resignations (Morrell, Loan-Clarke & Wilkinson, 2001), labor turnover is detrimental to the QM process as it disturbs the organizational memory of the company (Yong & Wilkinson, 2003). The lack of literature and research focusing on the MBNQA and its effect on culture demonstrates that future research is need.

Human resource management also plays a key role in the implementation of quality programs. A focus on human resources and providing a stable workforce are key in change initiatives (Choppin, 1997). Working to develop a high performance workforce allows an organization to adapt to and embrace change (NIST, 2004). The MBNQA also points to human resource management and process management directly affecting business results.

It is important to gauge the culture and assess the values of an organization, while also addressing working conditions and committing a company to maintaining a complete focus on

strategic objectives. This allows the organizational climate to work for quality improvement instead of against it, which ultimately drives employee involvement and trust (Wilkinson & Brown, 2003). The MBNQA winners demonstrate employee engagement at a high level, with mechanisms in place in order to continually survey the workforce. Employees not only see their job as work, but also consider themselves to be owners. Being an owner gives employees the right to speak their opinions and improve the company climate, working processes and ultimately, the products produced. Another barrier to success is a culture or climate that is resistant to change. This issue is detrimental to moving the organization forward and lessens the overall impact of change processes. With these issues now identified, training of the workforce becomes increasingly important.

CHAPTER 3: RESEARCH METHODOLOGY

Introduction

This chapter explains how the research for this study was conducted and explains single-case research design, which forms the framework used for the design of this research. The study is based on data from the Truven Health Analytics 100 Top Hospitals database, which itself is based on the historical performance data of hospitals that have won the MBNQA. The study period represents data from recipients of the MBNQA for the calendar years 2002 through to 2010. This chapter is organized as follows: statement of the problem, identification of the research questions and overall description of the research approach.

Statement of the Problem

After eight winning years the Baldrige Index underperformed against the Standard & Poor's 500 for the third year straight. The Baldrige Index was a fictitious stock fund made up of publicly traded U.S. companies that had received the Malcolm Baldrige National Quality Award between 1993 and 2004. The Baldrige Index had consistently outperformed the S&P 500 by as much as 6.5 to 1 (NIST, 2004). While the picture is improving, technology companies, which comprise a significant component of the Baldrige publicly held recipients, underperformed the stock market starting from 2002 through to 2004 (NIST, 2004). The Baldrige Program discontinued the study in 2004 since by that date the vast majority of MBNQA recipients were either business units of larger publicly traded companies, privately held companies or nonprofit organizations. Neither of the latter two types of organizations issues or trades stock on the public exchanges, and business units cannot be disaggregated from the corporation as a whole.

According to the National Institute of Standards and Technology, the Malcolm Baldrige National Quality Award has played an important role in helping thousands of U.S. companies improve not only their products and services, their customer satisfaction, and their bottom line, but also their overall performance. The MBNQA's tough performance excellence standards can help stimulate their improvement efforts as well. Just as it has for U.S. businesses, a Baldrige Program can help these organizations improve performance and foster communication, increase the sharing of "best practices", and generate successful partnerships among healthcare organizations. From 1999 to 2011, 382 healthcare organizations applied for the MBNQA, signifying that millions of dollars are being spent in the healthcare setting in order to achieve superior outcomes. While the Baldrige Program's effectiveness has been evaluated and validated for other industries (Baldrige Stock Study, 2011), little research has been done to validate the effectiveness of the Baldrige process in healthcare.

Research Questions

The purpose of this study is to analyze whether any association exists between receiving the Malcolm Baldrige National Quality Award in healthcare and the performance of quality indicators for those hospitals. The three research questions:

1. To what extent does being a recipient of the MBNQA in healthcare influence patient outcomes in hospitals?
2. To what extent does being a recipient of the MBNQA in healthcare influence financial and efficiency outcomes in hospitals?
3. To what extent do these influences appear to vary across different measures of patient, financial and efficiency outcomes?

Actually winning the national MBNQA has served as a proxy for the effective implementation of the Baldrige principles. Therefore, the hypotheses are as follows:

H1: Winning the Malcolm Baldrige National Quality Award does positively affect risk-adjusted mortality.

H2: Winning the Malcolm Baldrige National Quality Award does positively affect risk-adjusted complications.

H3: Winning the Malcolm Baldrige National Quality Award does positively affect risk-adjusted patient safety.

H4: Winning the Malcolm Baldrige National Quality Award does positively affect severity-adjusted average length of stay.

H5: Winning the Malcolm Baldrige National Quality Award does positively affect case mix- and wage-adjusted inpatient expense per discharge.

H6: Winning the Malcolm Baldrige National Quality Award does positively affect adjusted operating margins.

Study Design

The experimental group includes all general, non-federal, acute care hospitals and health systems in the U.S. that have won the Malcolm Baldrige National Quality Award in healthcare. The study was based on single-case research methods designed to use the visual analysis of graphed data for the interpretation of longitudinal pre and post results belonging to recipients of the Malcolm Baldrige National Quality Award. The unique feature of single-case design is the ability to conduct experimental investigations with one subject or a single case. The methodology is distinguished by including an approach and multiple designs that rigorously

evaluate interventions with one or a small number of cases (Kazdin, 2011). The interventions analyzed were changes in mean, level, trend and latency. The study utilized interpretative procedure and visual analysis to address if there were any changes in the data patterns, as well as if changes corresponded with the year an organization was the recipient of the MBNQA.

Population, Sample and Sampling Design

Theoretical Population

The theoretical population for this study is all hospitals and hospital systems that have engaged in process improvement efforts within their organization. This population includes the majority of hospitals and health systems within the United States.

Sample

The sample for this study is all of the hospitals that have been the recipient of the Malcolm Baldrige National Quality Award in healthcare. The sample was chosen as a proxy for hospitals that have engaged in process improvement and done so successfully, as measured by sampling only the recipients of the award. More specifically, in the absence of any specific data by which to establish the exact dates when the hospitals first implemented the Malcolm Baldrige Management Principles, or when the Program was considered reasonably effective, the year of actually winning of the Malcolm Baldrige National Quality Award was considered a proxy for effective implementation (Ugwueke, 2001). The first healthcare recipient was SSM Health Care in 2002. The sample for this study includes MBNQA recipients between the years 2002 and 2010. The actual study sample of award-winning hospitals was obtained from the National Institute of Standards and Technology website.

Sampling Design

Since the inception of the Malcolm Baldrige Healthcare Criteria for Performance Excellence in 1999, only 29 hospitals have received the MBNQA. Of the twenty-nine, one was eliminated because it lacked complete data for patient, efficiency and financial outcomes. An additional 21 hospitals were then eliminated because of the need to visually analyze the trends that exist for each performance indicator. These 21 hospitals did not have adequate pre and post data (three years pre and three years post data), making it impossible to establish a trend.



Figure 5. Sample Selection

Below are listed the Malcolm Baldrige National Quality Award recipients in healthcare, the year when they received the award, their location, and highlights of the achievements that they attribute to the Criteria.

Table 6

MBNQA Recipients by Year

Organization	Year Award Received
Healthcare Organization A	2002
Healthcare Organization B	2003
Healthcare Organization C	2003
Healthcare Organization D	2004
Healthcare Organization E	2005
Healthcare Organization F	2006
Healthcare Organization G	2007
Healthcare Organization H	2007
Healthcare Organization I	2008
Healthcare Organization J	2009
Healthcare Organization K	2009
Healthcare Organization L	2010

Note. NIST, 2011

Healthcare Organization A, Midwest, 2002 (NIST, 2002). Of the previous year’s operating margin, 33% was allocated to the care of people who could not pay. Against a benchmark of 64%, Healthcare Organization A gave Coumadin treatment to more than 80% of patients with congestive heart failure and atrial fibrillation. Healthcare Organization A reached national benchmark levels for the percentage of heart-attack patients receiving lipid-lowering agents to decrease morbidity and mortality.

Healthcare Organization B, Gulf Coast, 2003 (NIST, 2003a). Healthcare Organization B ranked in the 99th percentile for overall satisfaction among inpatients, outpatients, ambulatory surgery patients, and home healthcare clients. Hospital staff morale was 84% positive. Healthcare Organization B donated 67% of total revenue to the care of indigent patients.

Healthcare Organization C, Midwest, 2003 (NIST, 2003b). Healthcare Organization C ranked in the top 5% of U.S. hospitals in total margin and operating margin. For financial performance the Council of Teaching Hospitals ranked Healthcare Organization C in the top 5%. Finally, of the 21 facilities in the market area, consumers ranked Healthcare Organization C as having the highest-quality healthcare and the best doctors and nurses.

Healthcare Organization D, 2004, Atlantic Coast (NIST, 2004). Retention rates reached 96% for employees and 98% for registered nurses. Satisfaction with the Emergency Department reached 90% and the market share for cardiology, surgery, and oncology grew by 30%.

Healthcare Organization E, 2005, Midwest (NIST, 2005). Patient satisfaction reached 97% and the Medicare mortality rate decreased from 4.8% in 2002 to 3.5% in 2005. Turnover was 5.6% for employees and 4.7% for registered nurses, while vacant positions for registered nurses fell by 6.5%.

Healthcare Organization F, Southern, 2006 (NIST, 2006). Overall satisfaction among physicians reached 99%. Furthermore, the deep vein thrombosis (blood clot) rate fell by 65% and the pulmonary embolism rate fell by 45%, resulting in cost savings of more than \$760,000. Healthcare Organization F saved \$11 million due to care-based cost management.

Healthcare Organization G, Midwest, 2007 (NIST, 2007a). Against a benchmark of 4%, the community-acquired pneumonia mortality rate was 1.2%. Healthcare Organization G was named one of “Best Employers for Workers Over Age 50” by the American Association of Retired Persons, as well as one of *Working Mother* magazine’s “100 Best Companies in Which to Work”. Finally, 18% of hospital revenue and 2% of clinic revenue went to charity care.

Healthcare Organization H, Pacific Coast, 2007 (NIST, 2007b). Net revenue increased by \$900 million from 2001 to 2007 and Healthcare Organization H ranked in the top 10% nationally for treatment of non-intensive-care-unit, community-acquired pneumonia. Healthcare Organization H was one of only nine healthcare organizations to receive the “100 Most Wired” award for nine consecutive years.

Healthcare Orgnaization I, Mountain West, 2008 (NIST, 2008). *Modern Healthcare* magazine named Healthcare Organization I one of “America’s 100 Best Places to Work in Healthcare” in 2008. For the past five years, Healthcare Organization I has been on the *Hospitals & Health Networks* list of the “100 Most Wired Hospitals and Health Systems” and the *Information Week* list of the “Top 500 Information Technology Innovators”. After first establishing relationships with physicians, Healthcare Organization I expanded its partner base to include entities such as home health agencies, a long-term care provider, community health organizations, and a health plan administrator – a partnership that saves local employers \$5 million each year. A free community case management program, which pairs advanced-practice nurses and social workers with high-risk, chronically ill patients, decreased emergency department visits for these patients by 50% annually and has resulted in more than \$850,000 worth of savings in each of the past three years.

Healthcare Organization J, Atlantic Coast, 2009 (NIST, 2009). Healthcare Organization J achieved the Centers for Medicare and Medicaid Services national top 10% performance in 2008 for patient care measures relating to congestive heart failure, acute myocardial infarction and pneumonia. Healthcare Organization J was recognized in 2008 by the American Nurses’ Credentialing Center as a Magnet nursing organization, receiving the nursing profession’s highest honor for the second time. For the past four years, Healthcare Organization

J's Home Health has been awarded HomeCare Elite™ status by OCS (formerly Outcome Concept Services), based on quality outcomes, quality improvement, and financial performance. This designation places Healthcare Organization J's Home Health in the top 100 nationally out of 8,222 Medicare-certified home healthcare agencies. From 2000 to 2008, system revenues grew from \$280 million to \$651 million, reflecting an 11% compound annual growth rate, compared with a State of New Jersey average of 5.6%. During this time period, Healthcare Organization J's medical center volume increased from about 34,000 to over 56,000 discharges, that is, more than twice the state average.

Healthcare Organization K, Midwest, 2009 (NIST, 2009). Healthcare Organization K achieved 90% ratings in overall outpatient satisfaction and in key drivers of outpatient satisfaction between 2006 and 2009. Members have rated Healthcare Organization K's Community Health Plan above the National Committee for Quality Assurance (NCQA) 90th percentile for healthcare and specialist care. Healthcare Organization K is ranked in the top 15% of hospitals nationally for patient safety according to the HealthGrades (an independent healthcare-ratings organization) "Best Hospital Scores". In promoting quality improvement and deploying its core competencies as part of the organizational culture, Healthcare Organization K applies Six Sigma methods within its Process Improvement Model to control costs, prevent rework and errors, and minimize the costs of inspections, tests and audits. Cost savings as a result of process improvements increased from approximately \$8 million in the fiscal year 2005 to more than \$25 million by the fiscal year 2009.

Healthcare Organization L, Midwest, 2010 (NIST, 2010). Risk-adjusted mortality (actual mortality divided by expected mortality where 1.0 equals the expected) decreased from 0.73 in 2004 to 0.25 in 2010. A brand preference study of Healthcare Organization L and its

closest competitors ranked Healthcare Organization L as the overall most preferred hospital, as well as the top choice for its main service offerings. Healthcare Organization L has established a strategic context and vision for a synergistic hospital-physician partnership that has enabled the organization to generate some of the best clinical outcomes in the United States. Overall patient satisfaction levels for outpatient, emergency, ambulatory surgery, and convenient care exceed the top decile.

Data Collection

“The Baldrige Board of Governors identified the Thomson Reuters (now Truven Healthcare Analytics) database as a statistical approach for assessing similar aspects of organizational improvement and performance in hospitals and health systems” (Chenoweth & Foster, 2011, p.1). This research investigates the relationship between healthcare organizations that have received the MBNQA in healthcare using longitudinal performance measures from the Truven Health dataset.

Truven Health Analytics is the leading source of healthcare business intelligence. The company provides comprehensive, results-oriented information to drive business growth, manage costs, and help deliver quality care. Truven Health Analytics (formerly Thomson Reuters’) expertise and proven solutions enable providers, payers, employers, and pharmaceutical companies to achieve results and realize value. The company maintains the nation’s largest healthcare database, comprising more than 22.6 million discharges per year from 5,114 hospitals.

The database uses only publicly available data. The data for this study primarily comes from the Medicare Provider Analysis and Review (MedPAR) dataset and the Medicare cost

report. Truven Health Analytics uses MedPAR patient level medical record information to calculate mortality, complications, patient safety and length of stay. The MedPAR dataset contains information on the approximately 12 million Medicare patients discharged annually from U.S. acute care hospitals. Truven Health Analytics also uses the Medicare Cost Reports to create their database, which contains hospital specific all-payer revenue and expense data. The Medicare Cost Report is filed annually by every U.S. hospital participating in the Medicare program. Hospitals are required to submit cost reports in order to receive reimbursement from Medicare. The Medicare Cost Report promotes comparability and consistency among hospitals in reporting. It should be noted, however, that cost report data include services for all patients, not just Medicare beneficiaries (Thomson Reuters, 2012).

Truven Health Analytics, and many others in the healthcare industry, have used the MedPAR and Medicare Cost Report databases for many years. Truven Health Analytics believe these to be accurate and reliable sources for the types of analyses performed in this study. Performance based on Medicare data has been found to be highly representative of that of all-payer data (Thomson Reuters, 2012).

The clinical indicators mortality and complications show how the hospital is performing for the most basic and essential care standards – survival and error-free care – while treating patients in the hospital. Patient safety is another important measure of hospital quality that is closely tracked in the industry. The risk-adjusted patient safety index is based on the AHRQ Patient Safety Index. Patient safety measures reflect both clinical quality and the effectiveness of systems within the hospital. The risk-adjusted patient safety index facilitates a comparison of national and individual hospital performance.

Operationalization of Variables

The six variables used in this study are Risk-Adjusted Mortality Index, Risk-Adjusted Complications Index, Patient Safety Index, Severity-Adjusted Average Length of Stay, Case Mix- and Wage-Adjusted Inpatient Expense, and Adjusted Operating Profit Margin.

The rationales for choosing these variables and the Truven Health Analytics calculations are shown in table 7 below.

Data Analysis

The data relating to the performance indicators (Risk-Adjusted Mortality Index, Risk-Adjusted Complications Index, Patient Safety Index, Severity-Adjusted Average Length of Stay, Case Mix- and Wage-Adjusted Inpatient Expense, and Adjusted Operating Profit Margin) of the sample population (recipients of the Malcolm Baldrige National Quality Award) were collected and analyzed. The year that the hospital received the MBNQA served as the base year for the data analysis. The assumption herein is that the process and performance improvement that results from being a recipient of the MBNQA is more demonstrable in the year of the award, more so than in any other year. This study looks at longitudinal data from hospitals that were awarded the MBNQA with at least three years pre-award and three years post-award data from 2002 through to 2010.

The data were analyzed using a visual analysis of graphed data. In single-case research graphing is not only or merely a descriptive tool, it is part of the inferential process (Kazdin, 2011). The interpretations of both pre and post results were analyzed using single-subject research design. The purpose of the visual analysis was to document any changes in the data patterns pre and post receiving the MBNQA. The purpose of the experimental criterion was to decide whether a veridical or reliable change has been demonstrated, as well as whether that

Table 7

Performance Indicator Measures/Calculations

Patient Outcomes Measures	Why It Was Chosen	Calculation
Risk-adjusted mortality index (in-hospital)	<p>Patient survival is a universally accepted measure of hospital quality. The lower the mortality index, the greater the survival of the patients in the hospital, considering what would be expected based on patient characteristics. While all hospitals have patient deaths, this measure can show where deaths did not occur but were expected, or the reverse, given the patient's condition.</p> <p>Relates to Baldrige outcomes for product and process measures.</p>	<p>We rank hospitals on the difference between observed and expected deaths expressed in normalized standard deviation units (z-score). Hospitals with the fewest deaths, relative to the number expected, after accounting for standard binomial variability, received the most favorable scores. We use two years of MedPAR data to reduce the influence of chance fluctuation.</p> <p>Favorable values: Lower Data Range: .956 to 1.049</p>
Risk-adjusted complications index	<p>Keeping patients free from potentially avoidable complications is an important goal for all healthcare providers. A lower complications index indicates fewer patients with complications, considering what would be expected based on patient characteristics. Like the mortality index, this measure can show where complications did not occur but were expected, or the reverse, given the patient's condition.</p> <p>Relates to Baldrige outcomes for product and process measures.</p>	<p>We calculate an index value based on the number of cases with complications in 2009 and 2010, divided by the number expected, given the risk of complications for each patient. We normalize the index based on the observed and expected complications for each comparison group. This measure uses our proprietary, expected complications rate index models. These models account for patient-level characteristics (age, sex, principal, diagnosis, comorbid conditions, and other characteristics), as well as differences in hospital characteristics (size, teaching status, geographic location, and community setting). Complication rates are calculated from normative data for two patient risk groups: medical and surgical. POA data are considered part of the risk model. The reference value for this index is 1.00; a value of 1.15 indicates that 15% more complications occurred than were predicted, and a value of 0.85 indicates 15% fewer complications than predicted.</p> <p>Favorable values: Lower Data Range: .881 to 1.190</p>
Risk-adjusted patient safety index	<p>Patient safety has become an increasingly important measure of hospital quality. Patient safety measures are reflective of both clinical quality and the effectiveness of systems within the hospital. The AHRQ, a public health service agency within the federal government's Department</p>	<p>For each of the 10 included PSIs, we calculated an index value based on the number of actual PSI occurrences for 2009 and 2010, combined and divided by the number of normalized expected occurrences, given the risk of the PSI event for each patient. Values were normalized by comparison group. We applied the hospital-level PSI methodology from AHRQ to the 2009 and 2010 MedPAR acute care data, using AHRQ program code to adjust for risk .22 POA data are considered as part of the</p>

of Health and Human Services, has developed a set of PSIs. These indicators are widely used as a means of measuring hospital safety. Because they use hospital administrative data and include surgical complications and other iatrogenic events, we feel that AHRQ's PSIs provide an unbiased look at the quality of care inside hospitals. Such objective analysis is central to the 100 Top Hospitals mission.

PSI model.

The reference value for this index is 1.00; a value of 1.15 indicates 15% more events than predicted, and a value of 0.85 indicates 15% fewer.

Favorable values: Lower
Data Range: .837 to 1.752

Relates to Baldrige outcomes for product and process measures

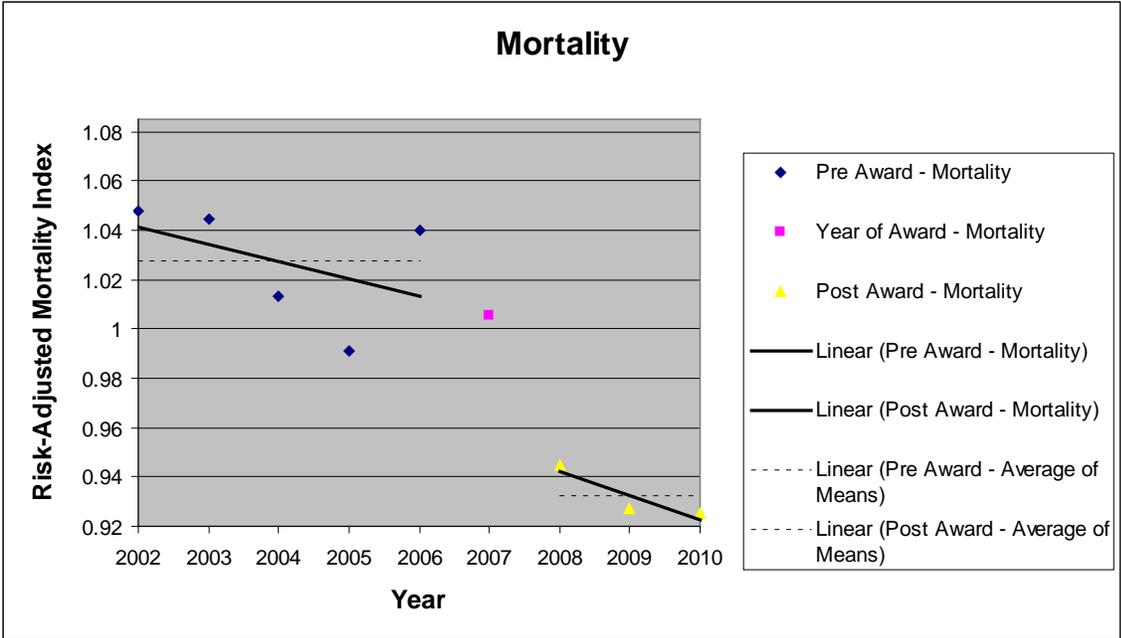
Efficiency Measure	Why It Was Chosen	Calculation
Severity-adjusted average length of stay (ALOS)	<p>A lower severity-adjusted length of stay generally indicates more efficient consumption of hospital resources and reduced risk to patients.</p> <p>Relates to Baldrige outcomes for financial and market measures.</p>	<p>We calculate an LOS index by the normalized expected LOS. Expected LOS adjusts for difference in severity of illness using a linear regression model. We normalize the expected values based on the observed and expected LOS of the hospitals in the comparison group. Each hospital LOS index is converted into an average LOS in days by multiplying by the in-study population grand mean LOS.</p> <p>Favorable values: Lower Data Range: 4.761 to 7.234</p>
Financial Measures	Why It Was Chosen	Calculation
Case mix- and wage-adjusted inpatient expense per discharge	<p>This measure helps to determine how efficiently a hospital cares for its patients. Low values indicate lower costs and thus better efficiency.</p> <p>Relates to Baldrige outcomes for financial and market measures.</p>	<p>We calculate the inpatient expense per discharge measure by aggregating the cost center-level inpatient expense from the hospital cost report and dividing by the total acute inpatient discharges, adjusted for case mix and area wage indexes.</p> <p>Favorable values: Lower Data Range: 4543.31 to 10995.79</p>
Profitability adjusted operating profit margin	<p>Operating profit margin is one of the purest measures of a hospital's financial health. It is a measure of the amount of income a hospital is taking in versus its expenses.</p> <p>Relates to Baldrige outcomes for financial and market measures.</p>	<p>We calculate the adjusted operating profit margin by determining the difference between a hospital's total operating revenue and total operating expense, expressed as a percentage of its total operating revenue, adjusted for related organization expense, total operating revenue is the sum of net patient revenue plus other operating revenue. Operating expense is adjusted for related organization expense.</p> <p>Favorable values: Higher Data Range: -8.550 to 14.352</p>

Note. Adapted from *100 Top Hospitals: Study Overview and Research Findings, 19th Edition, April 16, 2012* (pp.27-31)

change can be attributed to the intervention (receiving the MBNQA) (Kazdin, 2011). In single-subject research three types of changes may be noted in data patterns. The assessment included a change in the level of the average of means, immediacy/latency of change and consistency or change in trend.

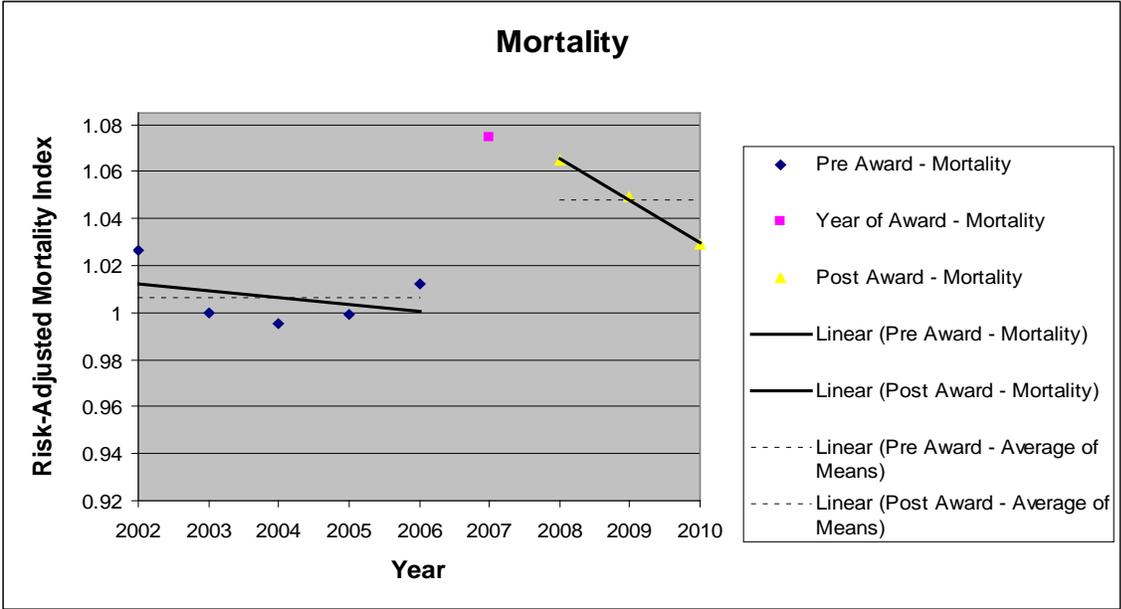
Changes in Level of the Average of Means

Changes in level of the average of the means represent changes in the average of means pre receiving the MBNQA when compared with the post-award average of means. This change in level can then be considered in relation to the goal of the intervention (Riley-Tillman & Burns, 2009). The mean is only a defensible measure of central tendency if the outcome data have a normal distribution. If however, one or two of the data points are very high or low, the mean will be artificially “pulled” in that direction (Riley-Tillman & Burns, 2009). If the level shifts in a positive direction post-MBNQA it is coded a +1. If the level shifts in a negative direction the code is -1 and a neutral shift is coded a 0. The two graphs below are examples of the coding process for the change in average means.



Change in Level: Positive (Coded: 1)

Figure 6. Mortality Analysis (Lower is Better)

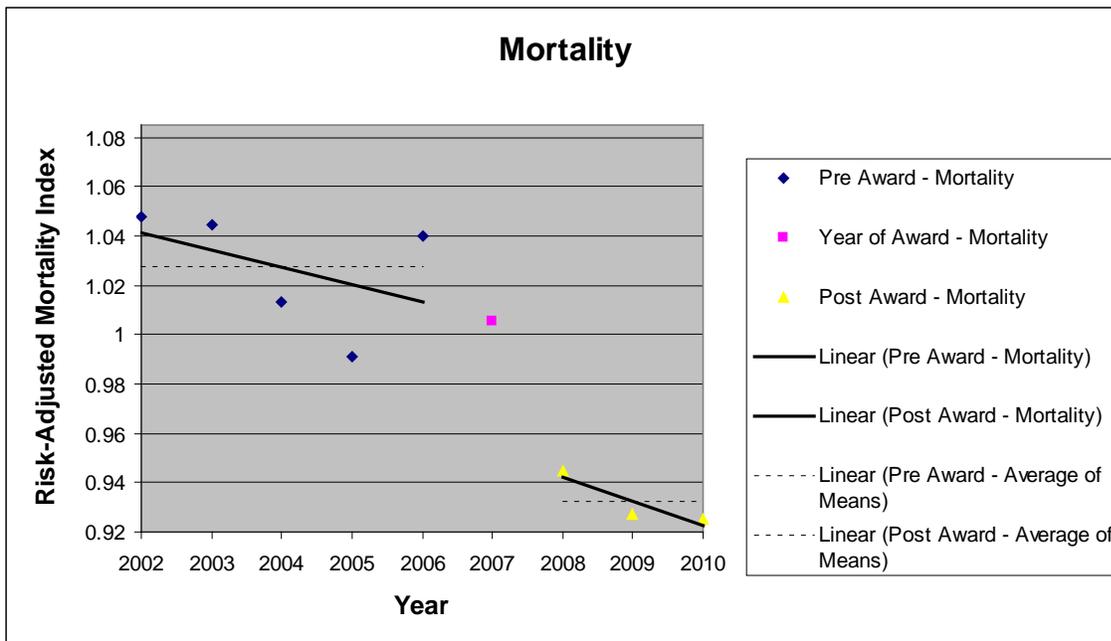


Change in Level: Negative (Coded: -1)

Figure 7. Mortality Analysis (Lower is Better)

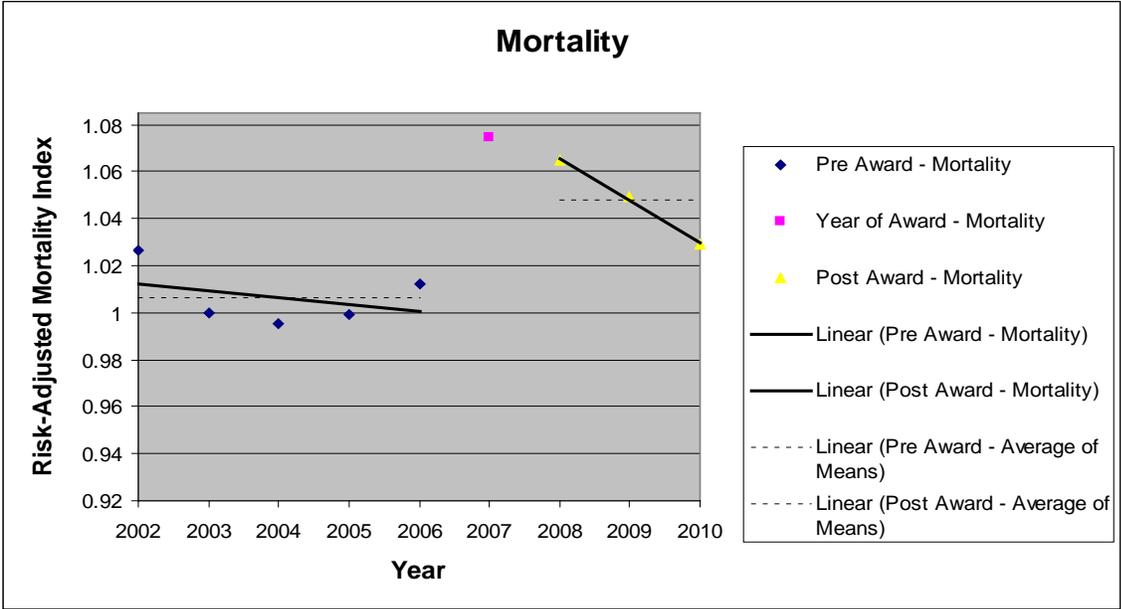
Immediacy/Latency of Change

Immediacy/latency of change refers to the shift or discontinuity of performance from the range of data points pre-MBNQA to the first data point of the post-Baldrige phase. Visual analysis also involved an examination of data immediately after the intervention was initiated. In an ideal situation an intervention changes the target behavior in such a manner that one can literally observe a “step” in the graph at the time of the intervention application (Riley, Tillman & Burns, 2009). If the first data point, post becoming a recipient of the MBNQA, is outside the range of the highest and lowest pre-MBNQA data points, the analysis is coded a 1, or a -1 depending on whether the data has improved or declined. If the first data point post-MBNQA falls within the range of the highest and lowest pre-MBNQA range, it is coded a 0. The three graphs below show examples of the coding process for immediacy/latency of change.



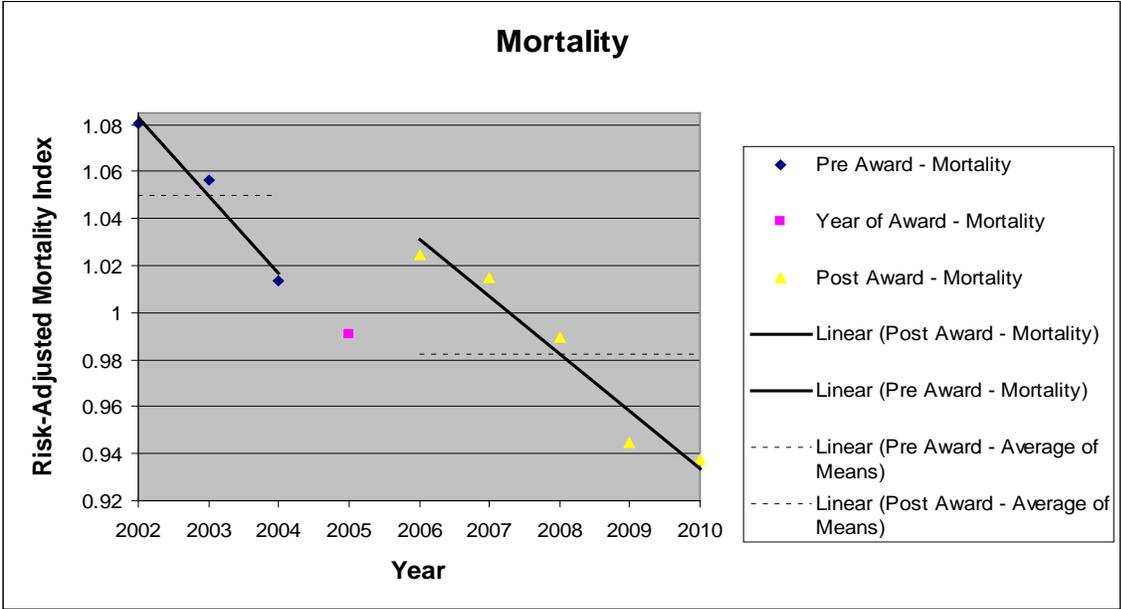
Immediacy/Latency of Change: Yes (Coded: 1)

Figure 8. Mortality Analysis (Lower is Better)



Immediacy/Latency of Change: Yes (Coded: -1)

Figure 9. Mortality Analysis (Lower is Better)



Immediacy/Latency of Change: No (Coded: 0)

Figure 10. Mortality Analysis (Lower is Better)

Changes in Trend or Slope

Trend, or slope, refers to the tendency for the data to show systematic increases or decreases over time (Kazdin, 2011). Trend represents the direction in which the data pattern is progressing pre- and post-MBNQA. A data series that systematically increases or decreases over time, even though it may be stable, is described as a trend. A change in trend is demonstrated by a change in the direction in which the data pattern is moving. A marked change in slope conveys that something happened that was reliable and changed the predicted pattern (slope) of performance in relation to each prior phase (Kazdin, 2011). Once again, if there is not any change in trend then it is coded a 0. A change in trend in the positive direction is coded a +1 and a change in trend in the negative direction is coded a -1. The three graphs below are examples of the coding process for changes in trend or slope.

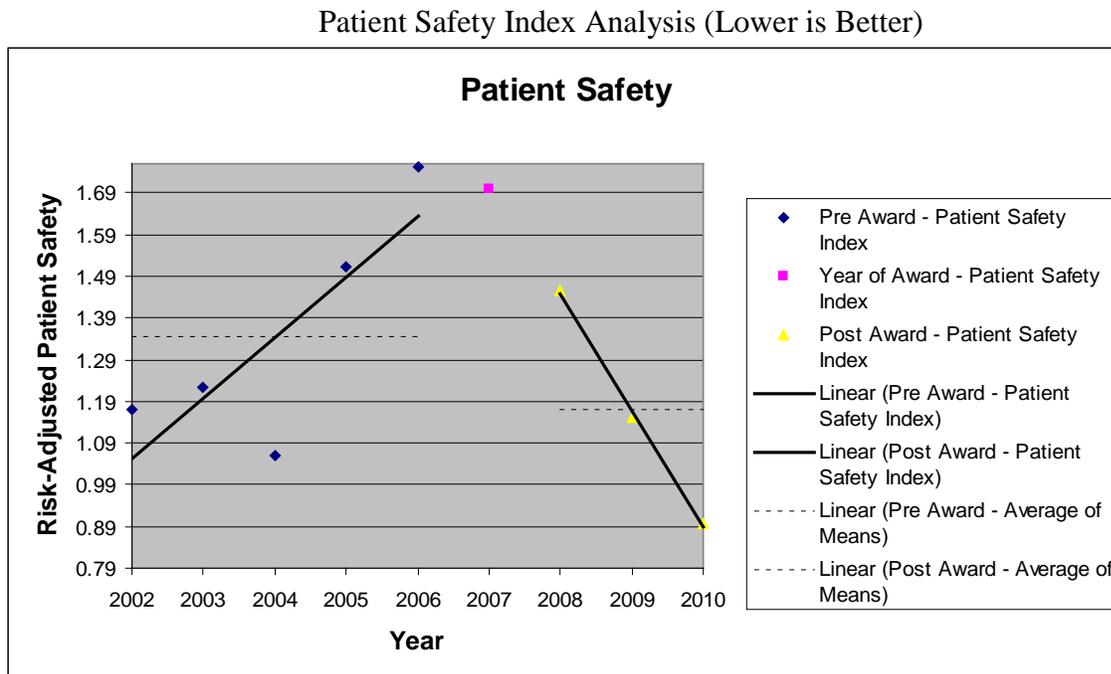
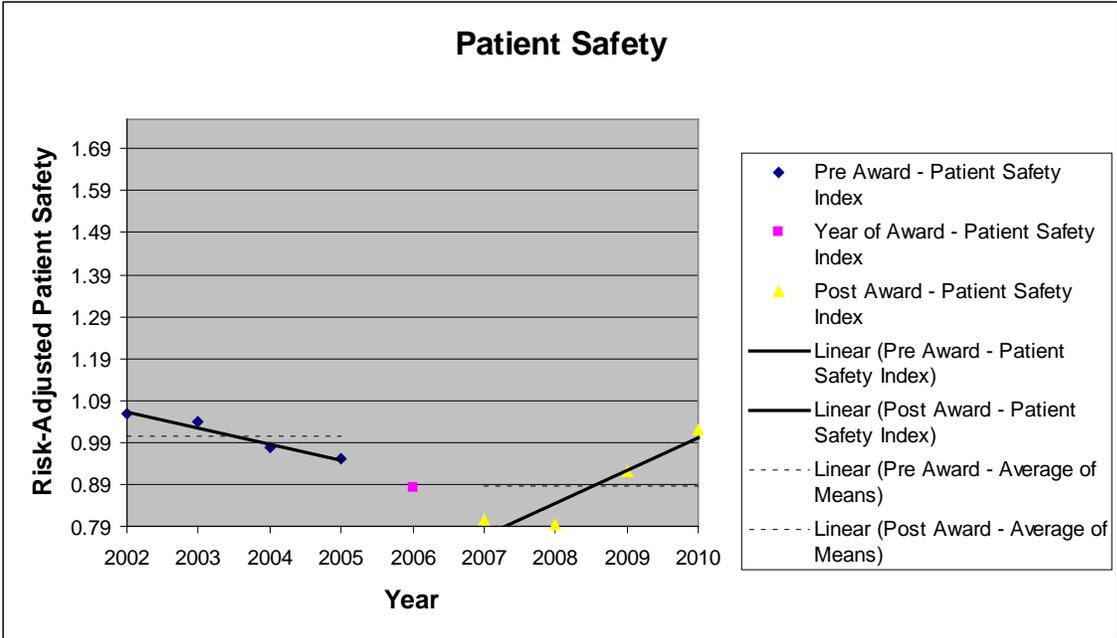
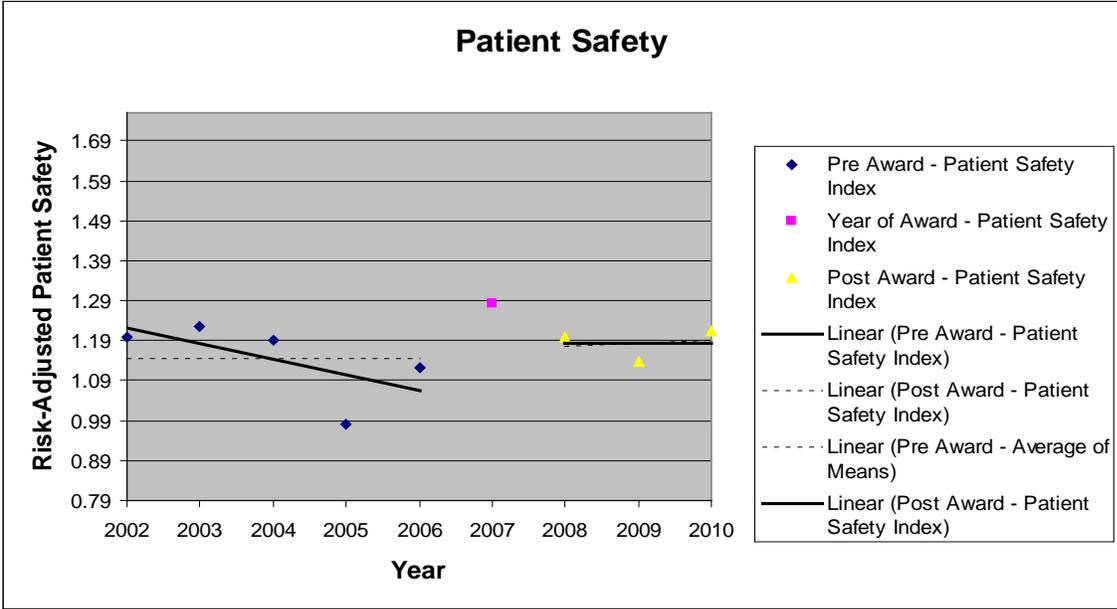


Figure 11. Patient Safety Index Analysis (Lower is Better)



Change in Trend: Yes (Coded: -1)

Figure 12. Patient Safety Index Analysis (Lower is Better)



Change in Trend: No (Coded: 0)

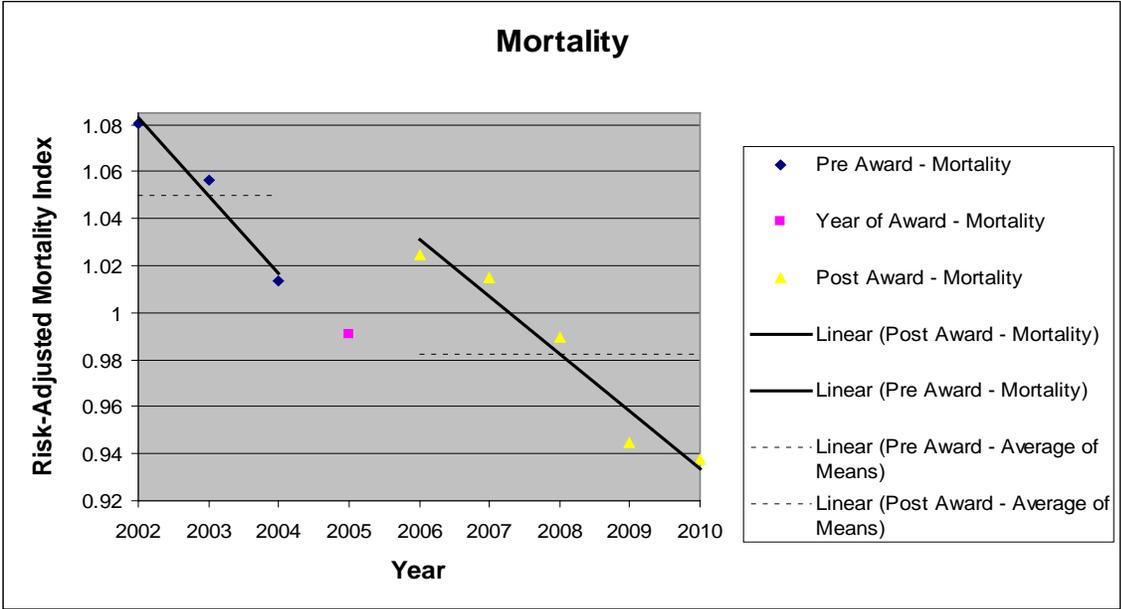
Figure 13. Patient Safety Index Analysis (Lower is Better)

Reliability Check

The reliability of the coding was verified by a trained, second coder (an independent coding expert) who had been trained in the coding construct used for this study. The second coder verified the initial coding analysis by once again using visual analysis.

Summary

Six outcome variables were examined for this study. Three patient variables (mortality, complications and patient safety), as well as three financial/system variables (average length of stay, expense per discharge and operating margin), were analyzed using three visual analysis techniques (change in level, immediacy/latency of change and change in trend). Each indicator was analyzed for all seven hospitals. The blank table below demonstrates how the codes will be displayed for each outcome measure across all seven hospitals, with this table being replicated six times for each outcome variable. Each table will be followed by a sample graph and then the whole set of six tables will be aggregated into a single table with frequencies of aggregated coded results, followed by a summary narrative.



Change in Level: Positive (Coded: 1)
 Immediacy/Latency of Change: No (Coded: 0)
 Change in Trend: No (Coded: 0)

Figure 14. Example of Mortality Analysis (Lower is Better)

Table 8

Example of Summary Tables

	Mortality									
	Pre-Baldrige Award Values				Post-Baldrige Award Values					
	Level	Latency		Trend	Level	Latency		Trend		
Average of Means	↑ Value	↓ Value	↑ or ↓	Average of Means	Code	Value 1st Data Point	Code	↑ or ↓	Code	
Hospital A	1.049911	1.080137	1.013309	↓	0.982216	1	1.024438	0	↓	0
Hospital B										
Hospital C										
Hospital D										
Hospital E										
Hospital F										
Hospital G										

Table 9

Example of Summary of Results

	Change in Level			Immediacy/Latency of Change			Change in Trend		
	Negative	No Change	Positive	Negative	No Change	Positive	Negative	No Change	Positive
Mortality	1	0	6	3	2	2	0	5	2
Complications									
Patient Safety Index									
Summary									

	Change in Level			Immediacy/Latency of Change			Change in Trend		
	Negative	No Change	Positive	Negative	No Change	Positive	Negative	No Change	Positive
Average Length of Stay									
Expense Per Discharge									
Profitability									
Summary									

CHAPTER 4: RESULTS

The results of this study are presented using both line graphs and tabled data. The data is analyzed separately by research question and also by the hypotheses. For simplicity, only sample line charts are provided in the body of the text with the remaining line charts and tabled data provided in the appendices.

Research Question 1: To what extent does being a recipient of a Malcolm Baldrige National Quality Award in healthcare influence patient outcomes in hospitals?

For the purpose of this study, patient outcomes are defined as mortality, complications and the patient safety index. Healthcare reform and the emphasis of value-based purchasing – linking reimbursement to outcomes – has made these patient outcome indicators increasingly more important for hospitals and healthcare systems.

The first three research hypotheses address this research question and are analyzed separately. The actual winning of the MBNQA served as a proxy for effective implementation of the Baldrige principles. Therefore, the three research hypotheses related to research question 1 are stated below:

H1: Winning the Malcolm Baldrige National Quality Award does positively affect risk-adjusted mortality.

H2: Winning the Malcolm Baldrige National Quality Award does positively affect risk-adjusted complications.

H3: Winning the Malcolm Baldrige National Quality Award does positively affect risk-adjusted patient safety.

Tables 10, 11 and 12 provide a summary of the visual analysis of the scores for mortality, complications and patient safety. This visual analysis is reported separately for each hospital on three different change patterns from pre to post level, latency and trend.

Patient Outcome Results.

As described in chapter three, mortality, complications and patient safety outcomes were examined and scrutinized from three visual perspectives.

Level of change from pre to post. Upon completion of the visual analysis a numeric code was applied to the change in level of the average of means for mortality, complications and patient safety. These data were coded as 1, 0 and -1. 1 being a positive change in level of the average of means, meaning mortality, complications and patient safety outcomes had declined from pre to post. 0 being no change in level and -1 being a negative change in level of the average of means, meaning mortality, complications and patient safety outcomes had increased from pre to post. Six of the seven hospitals experienced a positive change for mortality and complications with five of the seven hospitals experiencing a positive change in level, thus supporting the positive effect of being a MBNQA recipient on patient safety.

Latency of change from pre to post. The next step was to code the latency of change. Latency was established by determining if the first data point after becoming a recipient of the MBNQA fell within or outside the high and low range of pre-Baldrige recipient data. Once again, the codes 1, 0 and -1 were used to data the findings. A code of 1 represented that the first data point after becoming a recipient of the MBNQA fell below the lowest pre data point. A 0 represented that the first data point after becoming a

Table 10

Coded Mortality Data

	Mortality									
	Pre-Baldrige Award Values				Post-Baldrige Award Values					
	Level	Latency		Trend	Level	Latency		Trend		
	Average of Means	↑ Value	↓ Value	↑ or ↓	Average of Means	Code	Value 1st Data Point	Code	↑ or ↓	Code
Hospital A	1.049911	1.080137	1.013309	↓	0.982216	1	1.024438	0	↓	0
Hospital B	1.016838	1.025258	1.002161	↓	0.983347	1	1.007042	0	↓	0
Hospital C	1.027323	1.047792	0.991156	↓	0.932505	1	0.944588	1	↓	0
Hospital D	0.997665	1.005623	0.984553	↓	0.95778	1	0.976907	1	↓	0
Hospital E	1.004051	1.054038	0.956553	↑	1.000705	1	1.061142	-1	↓	1
Hospital F	1.038653	1.051329	1.028616	↑	1.036021	1	1.062915	-1	↓	1
Hospital G	1.006444	1.026268	0.995059	↓	1.047727	-1	1.065066	-1	↓	0

Table 11

Coded Complications Data

	Complications									
	Pre-Baldrige Award Values				Post-Baldrige Award Values					
	Level	Latency		Trend	Level	Latency		Trend		
Average of Means	↑ Value	↓ Value	↑ or ↓	Average of Means	Code	Value 1st Data Point	Code	↑ or ↓	Code	
Hospital A	0.967122	0.97051	0.963075	↓	0.953651	1	0.958222	1	↓	0
Hospital B	1.00946	1.021416	1.001459	↑	0.977141	1	0.996414	1	↓	1
Hospital C	1.134353	1.190009	1.067746	↓	1.055075	1	1.073282	0	↓	0
Hospital D	0.990975	0.996588	0.981978	↓	1.024149	-1	1.036792	-1	↓	0
Hospital E	0.947101	1.024151	0.881244	↑	0.908292	1	0.971602	0	↓	1
Hospital F	1.019068	1.032541	0.9982	↑	1.006632	1	1.014194	0	↓	1
Hospital G	1.033425	1.042752	1.027433	↑	1.024495	1	1.039629	0	↓	1

Table 12

Coded Patient Safety Index Data

	Patient Safety Index									
	Pre-Baldrige Award Values				Post-Baldrige Award Values					
	Level	Latency		Trend	Level	Latency		Trend		
Average of Means	↑ Value	↓ Value	↑ or ↓	Average of Means	Code	Value 1st Data Point	Code	↑ or ↓	Code	
Hospital A	1.002457	1.064794	0.965485	↓	0.975961	1	1.025092	0	↓	0
Hospital B	1.006119	1.056536	0.949159	↓	0.884262	1	0.80563	1	↑	-1
Hospital C	1.14373	1.22364	0.982597	↓	1.183119	-1	1.197082	0	↓	0
Hospital D	0.968033	1.06919	0.886856	↓	0.883999	1	0.844427	1	↑	-1
Hospital E	1.343528	1.752147	1.0604	↑	1.168509	1	1.456802	0	↓	1
Hospital F	1.045618	1.187643	0.837502	↑	1.03073	1	1.169986	0	↓	1
Hospital G	0.934184	1.041393	0.862252	↓	1.103436	-1	1.08754	-1	↑	-1

recipient of the MBNQA fell within the range of the high and low data points of the pre data. A -1 represented that the first data point after becoming a recipient of the MBNQA was higher than the highest data point from the pre dataset. The results for mortality showed two hospitals with positive latency, two hospitals that fell within the pre data range and three hospitals that demonstrated a negative trend or higher mortality the year after being a recipient of the MBNQA. The results for both complications and patient safety demonstrated two hospitals with positive latency, four hospitals that fell within the pre data range and one hospital that demonstrated a negative trend or higher mortality the year after being a recipient of the MBNQA. These varied results – with the highest number of hospitals falling within the pre data range – make it difficult to draw a direct correlation for latency of change and being a recipient of the MBNQA.

Trend change from pre to post. The last step in the process was to code the trend data. A trend was established for the pre as well as the post dataset. A demonstrated increase in the mortality, complications and patient safety data prior to becoming a MBNQA recipient, then a reversal in the post trend results, demonstrating improved outcomes for mortality, complications and patient safety, was coded with a 1. If there was not any change in the trend from pre to post, regardless of whether it was a positive or negative trend, this was coded a 0. Finally, if there was a negative trend pre becoming a MBNQA recipient, and then that trend reversed and was negative post becoming a MBNQA recipient, then the code was -1. The mortality results indicated five hospitals without any change in the trend data (coded 0) and two hospitals that demonstrated a positive reversal of trend (coded 1), thus indicating the positive effect of being a recipient of the MBNQA. Trend results for complications showed three hospitals without any change in trend data (coded 0) and four hospitals that showed a positive reversal of trend (coded

1) indicating a positive effect for being the recipient of the MBNQA. Finally, patient safety trend data revealed three hospitals with negative trends (coded -1), two hospitals without any change in trend data and two hospitals with a positive reversal of trend (coded 1) indicating an almost even distribution of outcomes.

Research Question 2: To what extent does being the recipient of a Malcolm Baldrige National Quality Award in healthcare influence financial and efficiency outcomes in hospitals?

For the purpose of this study, financial and efficiency outcomes are defined as severity-adjusted average length of stay, inpatient expense per discharge and operating margin.

The actual winning of the Malcolm Baldrige National Quality Award served as a proxy for effective implementation of the Baldrige principles. Therefore, the hypotheses are as follows:

H4: Winning the Malcolm Baldrige National Quality Award does positively affect severity-adjusted average length of stay.

H5: Winning the Malcolm Baldrige National Quality Award does positively affect case mix- and wage-adjusted inpatient expense per discharge.

H6: Winning the Malcolm Baldrige National Quality Award does positively affect adjusted operating margin.

Tables 13, 14 and 15 provide a summary of the visual analysis of the scores for average length of stay, expense per discharge and profitability. This visual analysis was reported after looking at pre and post level, latency and trend.

Table 13

Coded Average Length of Stay Data

	Average Length of Stay									
	Pre-Baldrige Award Values				Post-Baldrige Award Values					
	Level	Latency		Trend	Level	Latency		Trend		
Average of Means	↑ Value	↓ Value	↑ or ↓	Average of Means	Code	Value 1 st Data Point	Code	↑ or ↓	Code	
Hospital A	5.42126	5.597045	5.17669	↓	4.865859	1	5.087402	1	↓	0
Hospital B	6.064103	6.168011	5.859391	↓	4.862693	1	4.846643	1	↑	-1
Hospital C	5.339118	5.534867	5.241465	↓	4.983073	1	5.343509	0	↓	0
Hospital D	6.707699	7.234969	6.369058	↓	5.357172	1	5.448311	1	↓	0
Hospital E	5.444168	5.73787	5.11074	↓	4.453056	1	4.634169	1	↓	0
Hospital F	5.132777	5.366219	4.761854	↓	4.339546	1	4.528478	1	↓	0
Hospital G	5.443047	5.606868	5.125646	↓	4.823001	1	4.956752	1	↓	0

Table 14

Coded Expense Per Discharge Data

	Expense Per Discharge									
	Pre-Baldrige Award Values				Post-Baldrige Award Values					
	Level	Latency		Trend	Level	Latency		Trend		
Average of Means	↑ Value	↓ Value	↑ or ↓	Average of Means	Code	Value 1 st Data Point	Code	↑ or ↓	Code	
Hospital A	6038.945	6442.287	5783.414	↓	5574.741	1	5097.196	1	↑	-1
Hospital B	6749.685	7017.673	6453.588	↔	5218.665	1	4828.385	1	↑	-1
Hospital C	5678.01	6393.697	4900.467	↑	5000.039	1	4704.964	1	↑	0
Hospital D	5260.723	5716.131	4921.789	↑	6223.644	-1	5714.347	0	↑	0
Hospital E	9365.36	10829.23	7362.758	↓	7437.808	1	8379.173	0	↓	0
Hospital F	5481.142	5992.769	4543.318	↑	6310.801	-1	6251.924	-1	↔	1
Hospital G	9411.021	10995.79	7818.865	↑	7722.457	1	7462.525	1	↑	0

Table 15

Coded Profitability Data

Profitability										
Pre-Baldrige Award Values					Post-Baldrige Award Values					
Level	Latency		Trend	Level	Latency		Trend			
Average of Means	↑ Value	↓ Value	↑ or ↓	Average of Means	Code	Value 1st Data Point	Code	↑ or ↓	Code	
Hospital A	5.172274	7.058033	3.799599	↓	6.2501378	1	5.074881	0	↑	1
Hospital B	9.977531	14.35239	5.319929	↓	8.82081	-1	13.05898	0	↓	0
Hospital C	5.532139	6.634014	3.060848	↑	6.509911	1	7.004892	1	↓	-1
Hospital D	0.085923	3.045853	-3.85811	↑	3.11935	1	3.290376	1	↑	0
Hospital E	-3.33851	-0.00435	-8.55093	↓	-1.36111	1	-1.42651	0	↑	1
Hospital F	3.893285	5.338418	2.610675	↓	3.615334	-1	3.77789	0	↓	0
Hospital G	7.170789	11.08209	3.84562	↓	9.90693	1	9.566445	0	↑	1

Hospital Financial and Efficiency Results

As described in chapter three, average length of stay, expense per discharge and profitability are examined. The outcomes have been scrutinized from three visual perspectives.

Level of change from pre to post. Upon the completion of the visual analysis, a numeric code was applied to the change in level of the average of means for average length of stay, expense per discharge and profitability. These data were coded as 1, 0 and -1. 1 being a positive change in level for the average of means, meaning average length of stay and expense per discharge declined from pre to post and that the change in level increased from pre to post for profitability. 0 being no change in level and -1 being a negative change in level of the average of means, meaning average length of stay and expense per discharge had increased from pre to post and profitability had decreased from pre to post. All seven hospitals experienced a positive change in level for average length of stay, and five of the seven hospitals experienced a positive change in level, thus supporting the positive effect of being an MBNQA recipient for average length of stay and profitability, with two hospitals experiencing a negative change in level for these two indicators.

Latency of change from pre to post. The next step was to code the latency of change. Latency was established by determining if the first data point after becoming a recipient of the MBNQA fell within or outside the high and low range of the pre data. Once again, the codes 1, 0 and -1 were used to code the findings. A code of 1 represented that the first data point after becoming a recipient of the MBNQA fell below the lowest pre data point for average length of stay and expense per discharge and above the highest data point for profitability. 0 represented that the first data point after becoming a recipient of the MBNQA fell within the range of the high and low data points of the pre data. -1 represented that the first data point after becoming a recipient of the MBNQA was higher than the highest data point from the pre dataset for average length of stay and expense per discharge and below the lowest data point from the pre dataset for profitability. The latency results for average length of stay demonstrated six hospitals with positive latency and one hospital that fell within the pre data range. Four hospitals demonstrated a positive trend (coded 1) or lower expenses the year after being a recipient of the

MBNQA, two hospitals (coded 0) demonstrated neutral latency and one hospital demonstrated negative latency (coded -1). The results for hospital profitability indicated two hospitals with positive latency and five hospitals that fell within the pre data range the year after being a recipient of the MBNQA. The latency results were overwhelmingly positive for average length of stay and positive for expense per discharge. The results for profitability were somewhat neutral for profitability, with two hospitals showing positive latency and five hospitals showing neutral latency.

Trend change from pre to post. The last step in the process was to code the trend data. A trend was established for the pre as well as the post dataset. A demonstrated increase in the average length of stay and expense per discharge data prior to becoming a MBNQA recipient, then a reversal in the post trend, was coded as a 1. A decrease in the trend for profitability prior to being a MBNQA recipient, then a reversal in the post trend data, was coded as a 1. If there was not a change in the trend from pre to post, regardless of whether it was a positive or negative trend, it was coded a 0. Finally, if there was a negative trend pre becoming an MBNQA recipient, then that trend reversed and was negative post becoming an MBNQA recipient, the code was -1 and vice versa for profitability. The average length of stay results indicated six hospitals without any change in the trend data (coded 0) and one hospital that demonstrated a negative reversal of trend (coded -1), thus indicating a positive effect for being a recipient of the MBNQA. Trend results for the expense per discharge demonstrated four hospitals without any change in trend data (coded 0), two hospitals that demonstrated a negative reversal of trend (coded -1) and one hospital with a positive reversal in trend (coded 1). These findings indicate a neutral to negative effect for being the recipient of the MBNQA. Finally, profitability trend data demonstrated three hospitals with positive trends (coded 1), three hospitals without any change in trend (coded 0) and three hospitals with a positive reversal of trend (coded 1), thus indicating an even distribution of positive and neutral trend data.

Research Question 3: To what extent do these influences appear to vary across different measures for patient, financial and efficiency outcomes?

All six research hypotheses address this research question and are analyzed for overall patient and hospital financials and efficiency. For the purpose of this study, patient outcomes are defined as mortality, complications and the patient safety index and hospital financials and efficiency are defined as severity-adjusted average length of stay, inpatient expense per discharge and operating margin.

Actually winning the Malcolm Baldrige National Quality Award served as a proxy for effective implementation of the Baldrige principles. Therefore, the hypotheses are as follows:

H1: Winning the Malcolm Baldrige National Quality Award does positively affect risk-adjusted mortality.

H2: Winning the Malcolm Baldrige National Quality Award does positively affect risk-adjusted complications.

H3: Winning the Malcolm Baldrige National Quality Award does positively affect risk-adjusted patient safety.

H4: Winning the Malcolm Baldrige National Quality Award does positively affect severity-adjusted average length of stay.

H5: Winning the Malcolm Baldrige National Quality Award does positively affect case mix- and wage-adjusted inpatient expense per discharge.

H6: Winning the Malcolm Baldrige National Quality Award does positively affect adjusted operating margin. Table 16 provides a summary of the visual analysis for all of the scores for mortality, complications, patient safety, average length of stay, expense per discharge and profitability.

Table 16

Summary Table of Patient, Financial and Efficiency Results

	Change in Level			Immediacy/Latency of Change			Change in Trend		
	Negative	No Change	Positive	Negative	No Change	Positive	Negative	No Change	Positive
Mortality	1	0	6	3	2	2	0	5	2
Complications	1	0	6	1	4	2	0	3	4
Patient Safety Index	2	0	5	1	4	2	3	2	2
Summary	4	0	17	5	10	6	3	10	8

	Change in Level			Immediacy/Latency of Change			Change in Trend		
	Negative	No Change	Positive	Negative	No Change	Positive	Negative	No Change	Positive
Average Length of Stay	0	0	7	0	1	6	1	6	0
Expense Per Discharge	2	0	5	1	2	4	2	4	1
Profitability	2	0	5	0	5	2	1	3	3
Summary	4	0	17	1	8	12	4	13	4

Overall Patient, Financial and Efficiency Results

Patient, Financial and Efficiency Results. As described in chapter three, mortality, complications, patient safety index, average length of stay, expense per discharge and profitability will be examined. The outcomes were scrutinized from three visual perspectives.

Level of change from pre to post. Upon the completion of the visual analysis, a numeric code was applied to the change in level of the average of means for mortality, complications, patient safety, average length of stay, expense per discharge and profitability. Patient outcome measures were coded as follows. 1 being a positive change in level for the average of means, meaning mortality, complications and patient safety outcomes had declined from pre to post. 0 being no change in level and -1 being a negative change in level of the average of means, meaning mortality, complications and patient safety outcomes had increased from pre to post. Financial and efficiency data was coded as 1, 0 and -1, with 1 being a positive change in level for the average of means, meaning average length of stay and expense per discharge had declined from pre to post and that the change in level had increased from pre to post for profitability. 0 being no change in level and -1 being a negative change in level for the average of means, meaning average length of stay and expense per discharge had increased from pre to post and that profitability had decreased from pre to post. When summarizing all seven hospitals' patient, financial and efficiency data the outcomes were identical. Thirty-four (seventeen each) of the patient, financial and efficiency measures resulted to a positive change in level. Eight indicators (four each) experienced a negative change in level for overall patient, financial and efficiency outcomes, thus supporting the overwhelmingly positive results for being an MBNQA recipient.

Latency of change from pre to post. The next step was to code the latency of change. Latency was established by determining if the first data point after becoming a recipient of the MBNQA fell within or outside the high and low range of the pre data. Once again, the codes 1, 0 and -1 were used to code the findings. Patient outcome data coded with a 1 represented that the first data point after becoming a recipient of the MBNQA fell below the lowest pre data point. A 0 represented that the first data point after becoming a recipient of the MBNQA fell within the range of the high and low data points of the pre

data. A -1 represented the first data point after becoming a recipient of the MBNQA was higher than the highest data point from the pre dataset. Financial and efficiency results coded a 1 represented that the first data point after becoming a recipient of the MBNQA fell below the lowest pre data point for average length of stay and expense per discharge and above the highest data point for profitability. 0 represented the first data point after becoming a recipient of the MBNQA fell within the range of the high and low data points of the pre data. A -1 represented that the first data point after becoming a recipient of the MBNQA was higher than the highest data point from the pre dataset for average length of stay and expense per discharge and below the lowest data point from the pre dataset for profitability.

The combined latency results showed eighteen indicators (six patient outcome and twelve financial and efficiency) with positive latency. Eighteen indicators once again experienced neutral latency (ten patient outcomes and 8 financial and efficiency). Finally, six indicators (five patient and one financial and efficiency) demonstrated negative latency of change. The majority of indicators fell in the positive and neutral latency range.

Trend change from pre to post. A trend was established for the pre as well as the post dataset and analyzed in aggregate. An increase in the mortality, complications and patient safety data prior to becoming an MBNQA recipient and then a reversal in the post trend results demonstrated improved outcomes for mortality, complications and patient safety and was coded a 1. If there was not any change in the trend from pre to post, regardless of whether it was a positive or negative trend, this was coded a 0. Finally, if there was a negative trend pre becoming an MBNQA recipient, and then that trend reversed and was negative post becoming an MBNQA recipient, the code assigned was a -1. Similarly, a demonstrated increase in the average length of stay and expense per discharge data prior to becoming an MBNQA recipient, and then a reversal in the post trend, was coded as a 1. A decrease in the trend for profitability prior to becoming an MBNQA recipient, and then a reversal in the post trend data, was coded a 1. If there was not any change in the trend from pre to post, regardless of whether it was a positive or negative trend, this was coded a 0. Finally, if there was a negative trend pre becoming an MBNQA

recipient, then that trend reversed and was negative post becoming an MBNQA recipient, the code was -1 and vice versa for profitability.

The combined change in trend results showed twelve indicators (eight patient outcomes and four financial and efficiency) with positive changes in trend data. Twenty-three indicators experienced no change in trend (ten patient outcomes and thirteen financial and efficiency). Finally, seven indicators (three patient and four financial and efficiency) experienced a negative change of trend. The majority of indicators fell in the no change in trend, with substantially fewer numbers of indicators falling in the negative change in trend category.

CHAPTER 5: RESULTS, CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS

Introduction

With healthcare consuming nearly 18% of gross domestic product (GDP) for the United States, and healthcare reform putting immense pressure on the industry to control cost and improve quality, hospitals are looking towards quality and process improvement efforts in order to remain viable. With a multitude of studies having researched the impact of quality programs on other industries, this research has studied the effects of being a recipient of the Malcolm Baldrige National Quality Award in healthcare and the impact on key hospital outcome measures. The population for this single-case research design was limited to the 29 hospitals that received the MBNQA between the years 2002 and 2010.

Results

This study set out to answer three research questions:

1. To what extent does being the recipient of an MBNQA in healthcare influence patient outcomes in hospitals?
2. To what extent does being the recipient of an MBNQA in healthcare influence financial and efficiency outcomes in hospitals?
3. To what extent do these influences appear to vary across different measures of patient, financial and efficiency outcomes?

An analysis of the summary tables reveals that being a recipient of the MBNQA does not “turn around” hospital performance (no consistency in trend reversals) for patient, financial or efficiency outcomes. That said, being a recipient of the MBNQA does provide better than

average outcomes for both patient (mortality, complications and patient safety) and hospital system outcomes (average length of stay, profitability and expense per discharge) as they relate to the level of change. Being a recipient of the MBNQA also appears to give hospitals a performance boost immediately after receiving the award (immediacy/latency) in the financial, efficiency and patient outcomes measures. Finally, there is an overall correlation between improved outcomes for hospital financial, efficiency and patient outcomes, with a stronger correlation for improvement in financial and efficiency outcomes.

Conclusions

This research clearly demonstrates a connection with improved clinical, efficiency and financial outcomes for hospitals with mature MBNQA quality improvement processes. If costly mistakes can be avoided by implementing quality improvement initiatives, such as using the MBNQA Criteria in healthcare, then one may conclude that the average cost per discharge will also be reduced, while operating revenue will be increased and more importantly, lives will be saved.

Recent findings by Montoya (2011), compared the clinical outcomes of organizations who were where recipients of the MBNQA with similar organizations, have revealed that MBNQA winners demonstrated significantly better performance in seven of the twelve clinical outcome measures. Although this evidence is not overwhelming, it does demonstrate improved clinical outcomes in comparison with those organizations not using the MBNQA Criteria. Coupled with the research presented in this study that indicates improved clinical performance, and the positive and immediate impact on hospital financial and efficiency measures for MBNQA recipients, this demonstrates the efficacy of the Criteria. Economic payoffs as being of

significant benefit to organizations is substantiated by this study and others (Rajan & Tamimi, 1999; Brown, 2004; Blazey, 2003).

Recommendations

This research and other studies in the field have proven that using the MBNQA Criteria in the healthcare industry has the potential to increase financial performance and improve patient outcomes. The act of implementing a quality model requires continuous improvement and monitoring. To understand the long-term effects of these quality models one must continuously collect data on key metrics in order to demonstrate the positive, negative or neutral trends. Much like the Hawthorne effect, the simple act of continuously monitoring and adjusting in order to achieve improved performance should have a net positive affect on healthcare organizations and the industry as a whole. Continued study of the effects of quality programs will be required.

Because of the local nature of the industry, healthcare is a very high fixed-cost business. As a result, and like other high fixed-cost industries (steel, autos, airlines), healthcare may need to undergo convulsive change before weaning itself from volume dependent strategies (Wadsworth, 2007) and increase the focus on quality improvement. When the criteria setting committee for the MBNQA meet to update the Criteria, they should scan the business press and demonstrate how rapid changes in the healthcare environment impact upon Criteria updates (Aborne, 2012). How the industry adopts the MBNQA Criteria, and other process quality improvement initiatives for improvement, will be vital to not only for the long-term viability of the healthcare system, but also for the long-term viability of the nation as a whole. Deming declared that transformative change would only occur when problems reached a crisis state (Deming, 1986). I would argue that the healthcare industry is nearing this crisis state.

Since 2005, healthcare organizations have represented more than 50% of the applications for the MBNQA (Foster & Chenoweth, 2011). Although hospitals represent a high number of Baldrige applicants, the overall number of organizations actually applying for the MBNQA is low when compared with the number of hospitals in the United States. A key question for future research is why is the adoption of the MBNQA Criteria in healthcare so low, especially with quality improvements having been demonstrated by this study and other studies in both healthcare and other industries?

As the rapid transformations in healthcare occur, the Criteria need to evolve at a much faster pace to keep up with innovation, government regulation and the changing marketplace for healthcare services. The MBNQA must directly tie each category of the criteria to overall improved operating results for hospitals and health systems (Aborne, 2012).

Future research questions to be answered include the following: Are healthcare organizations using the Criteria but not applying for the award because of either the stringent requirements of the application process or the possibility that the Criteria are too complex to understand? Should the national award process emulate many of the state programs and enable hospitals and/or health systems to submit applications at lower levels instead of just requiring the full application?

Future research should also focus on the variations in cost from hospital to hospital and region to region. One important question is why are “best practices”, such as the implementation of the MBNQA, not disseminated or adopted by industry as a whole? If further research can identify the specific underlying principles that separate MBNQA recipients from other institutions that are not currently utilizing the criteria, then is there the possibility that these factors might help organizations to remove the prevailing fear of change and might assist other

organizations by encouraging them to take the first step towards a quality-based environment (Nesbitt, 2006)?

Additional research into the quality level versus financial strength of MBNQA recipients in relation to their financial strength over time is necessary. Suggested future research would include regression analysis research to determine the link between financial strength and the MBNQA at all levels of quality achievement (Dusseau, 1996).

Finally, while this study has focused on hospitals, future research should also evaluate the relationship between hospital utilization and cost, as well as such initiatives as outpatient treatment, disease management, drug therapies, and the use of visiting nursing capabilities to allow early discharge or even to avoid hospitalization, in order to measure the impact that these strategies may have on cost (Wadsworth, 2007).

Limitations

A limitation for this research has been the limited number of Baldrige recipients in healthcare. Although the total population of recipients is relatively small in relation to the total number of U.S. hospitals, all hospitals that were recipients of the MBNQA in healthcare from 2002 to 2010 and that had complete data were included in this study. This study also utilized administrative data. According to Foster and Chenoweth (2011), “while it is very common practice in the industry to use administrative data, it is acknowledged that such data does not contain the kind of clinically detailed information that would be ideal for risk adjustment. Therefore, any reports of associations here are not meant to imply a causal connection. In other words, I can study correlations or associations here, but cannot make conclusions related to actual cause-and-effect types of relationships.

Finally, single-case research design also presents two limitations that may have influenced this study. According to Kazdin (2011), the first limitation occurs when only one or a few subjects are used. This creates difficulties in identifying characteristics that might explain why some hospitals respond better than others or do not respond at all. The second limitation is an often-misunderstood concern or limitation that involves the extent to which the results for one or a few subjects may be generalizable. This concern did not prove to be an issue. Also, the concern reflects a misunderstanding of group research: when means are compared one has no idea within a study how many individuals responded. In addition, unless the group was randomly selected from a population, generalizing beyond the sample is a problem. Tests of generality invariably require replication (Kazdin, 2011).

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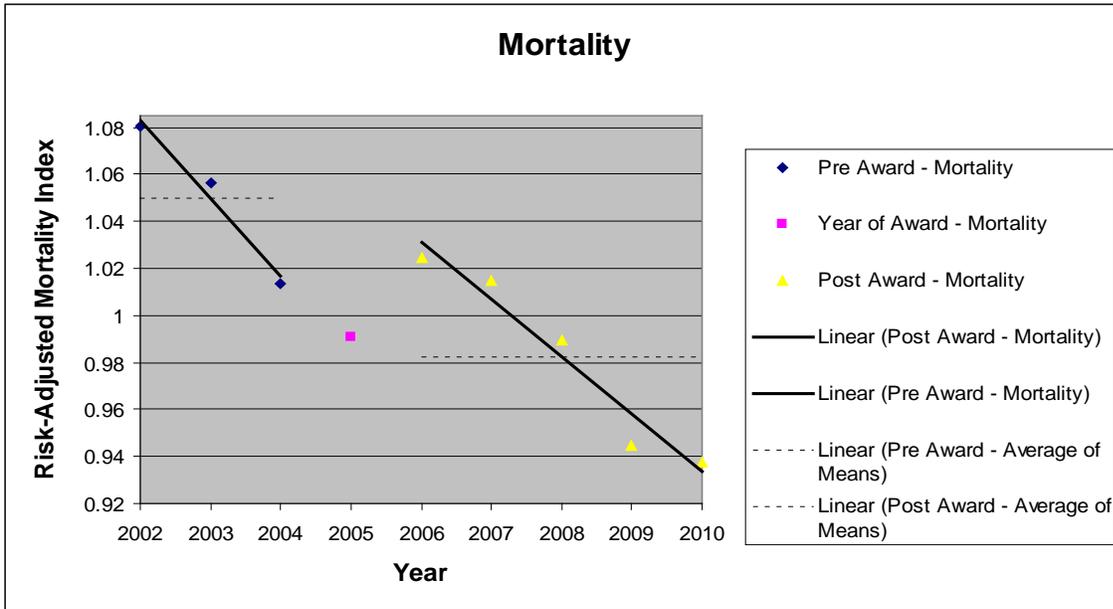
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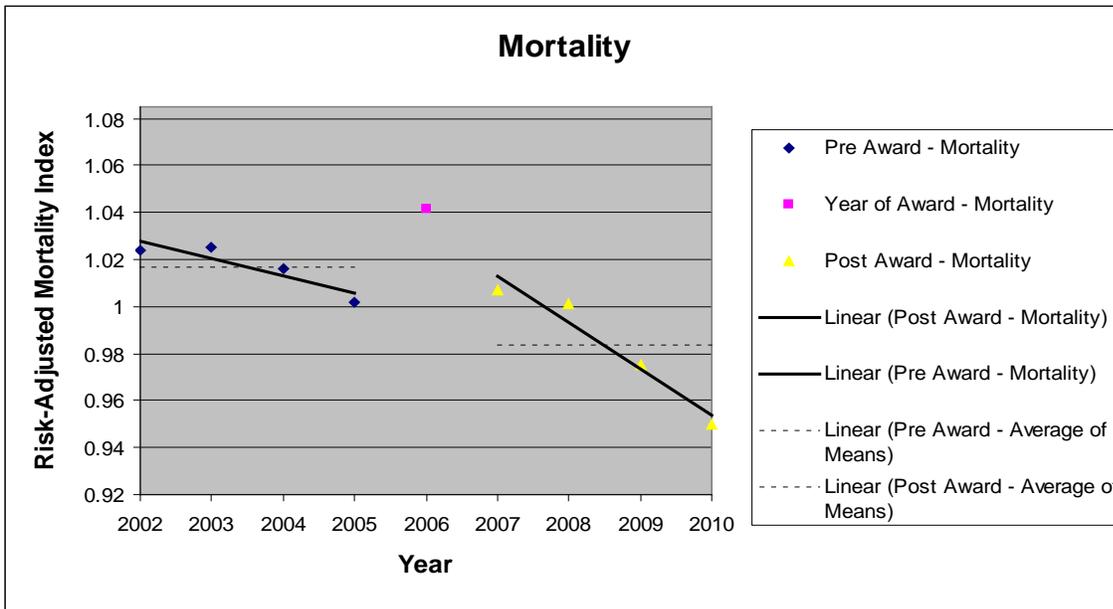
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APPENDIX A

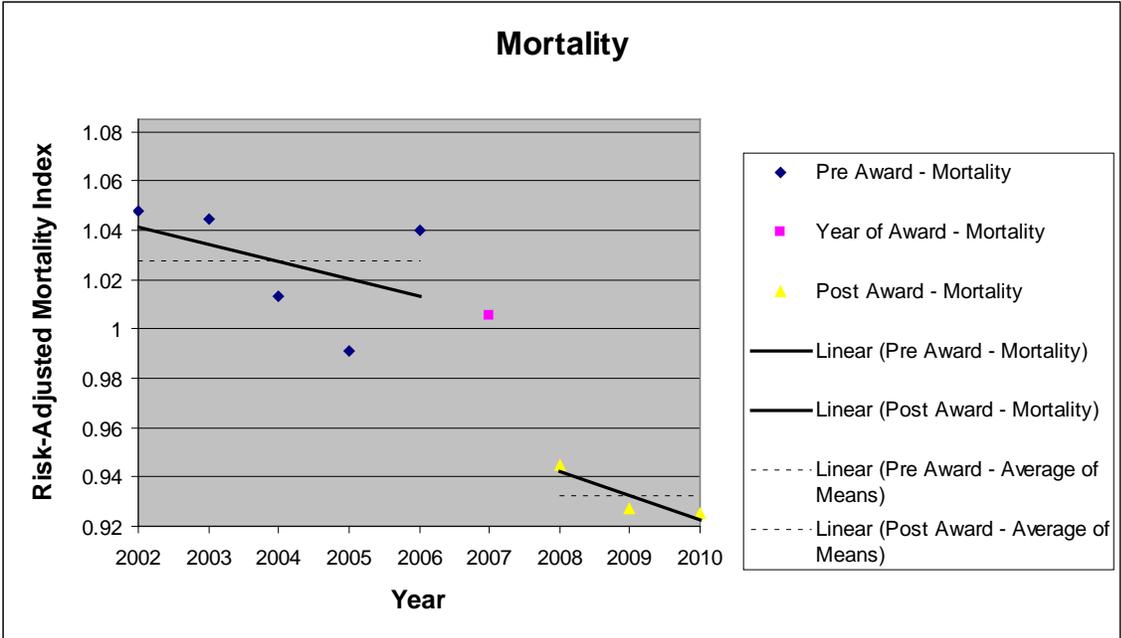
Mortality Analysis (Lower is Better)



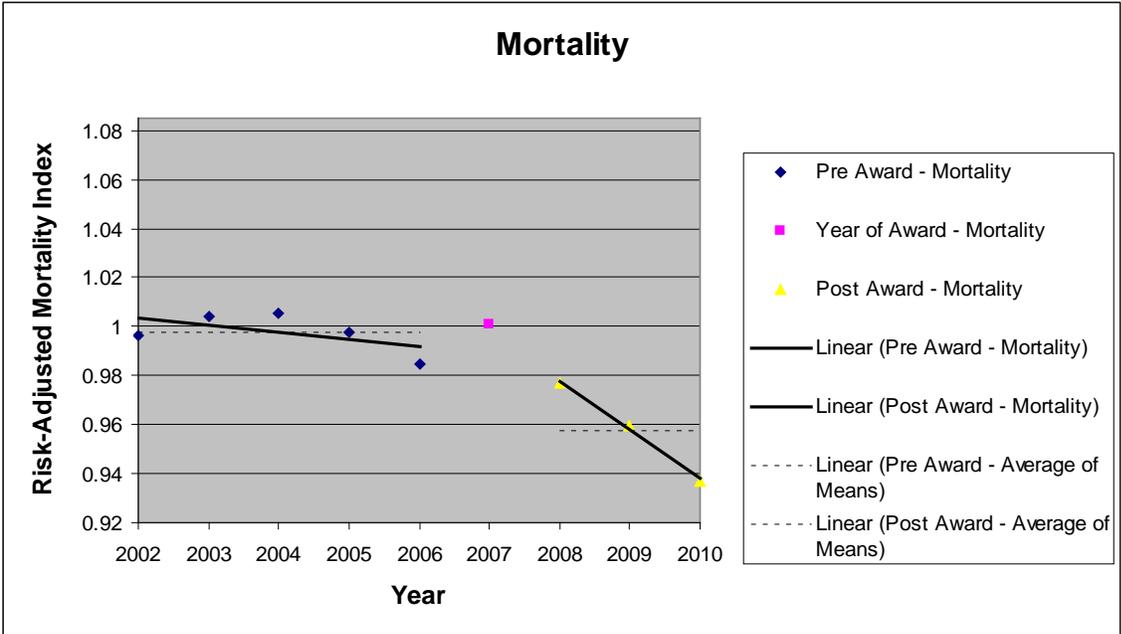
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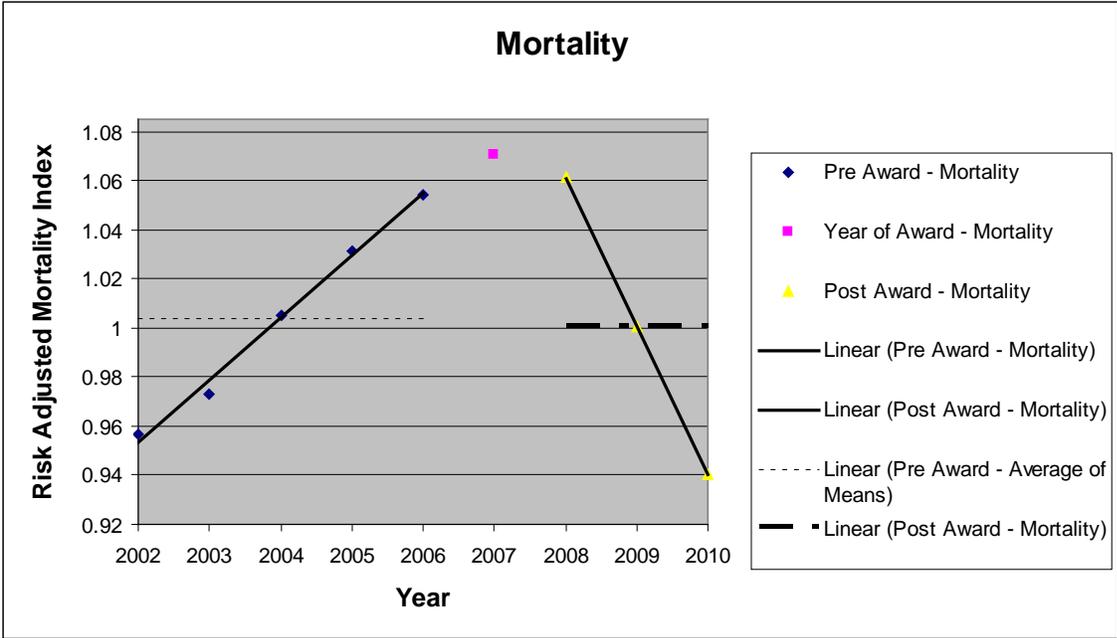
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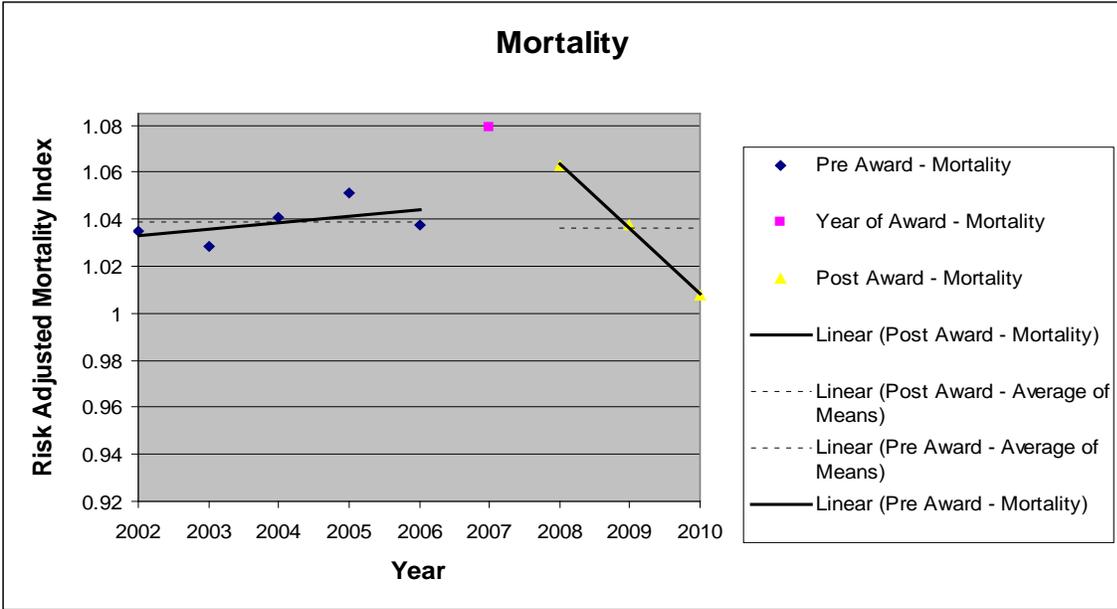
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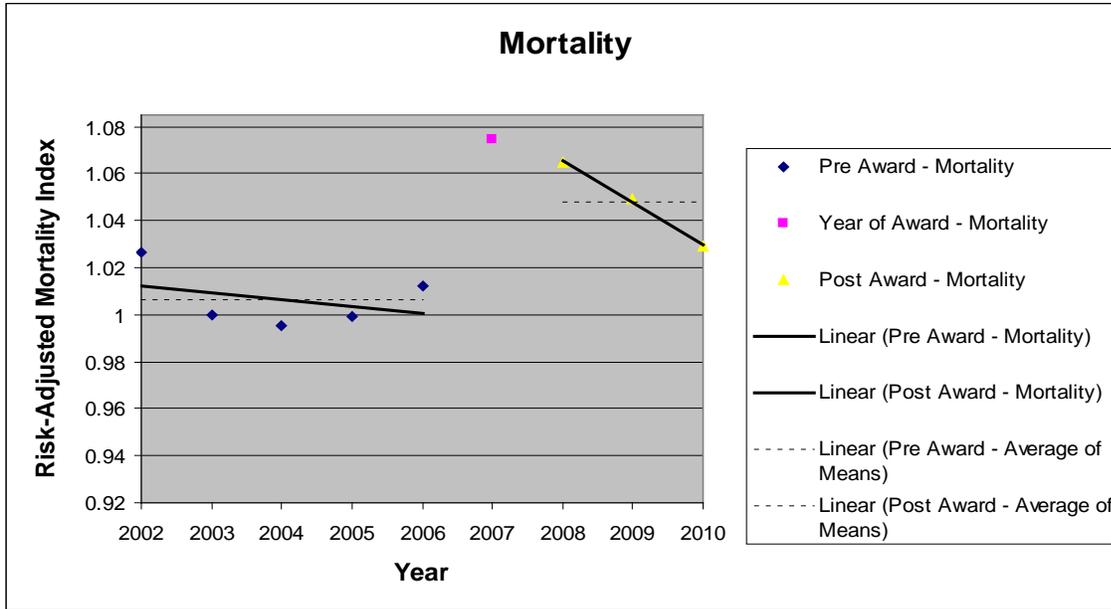
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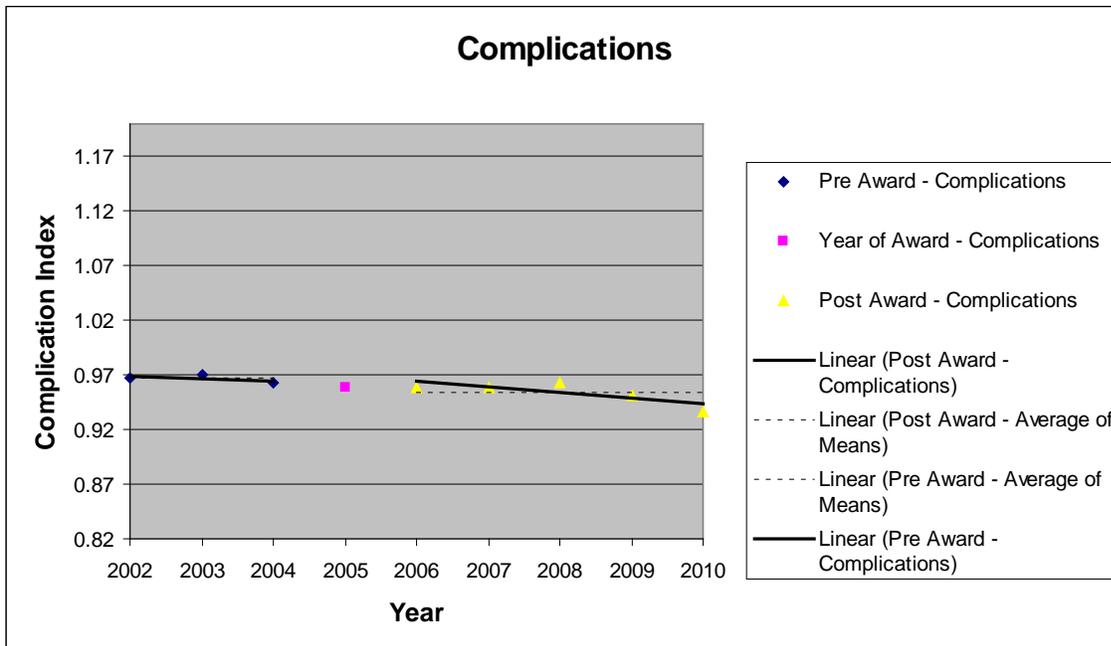


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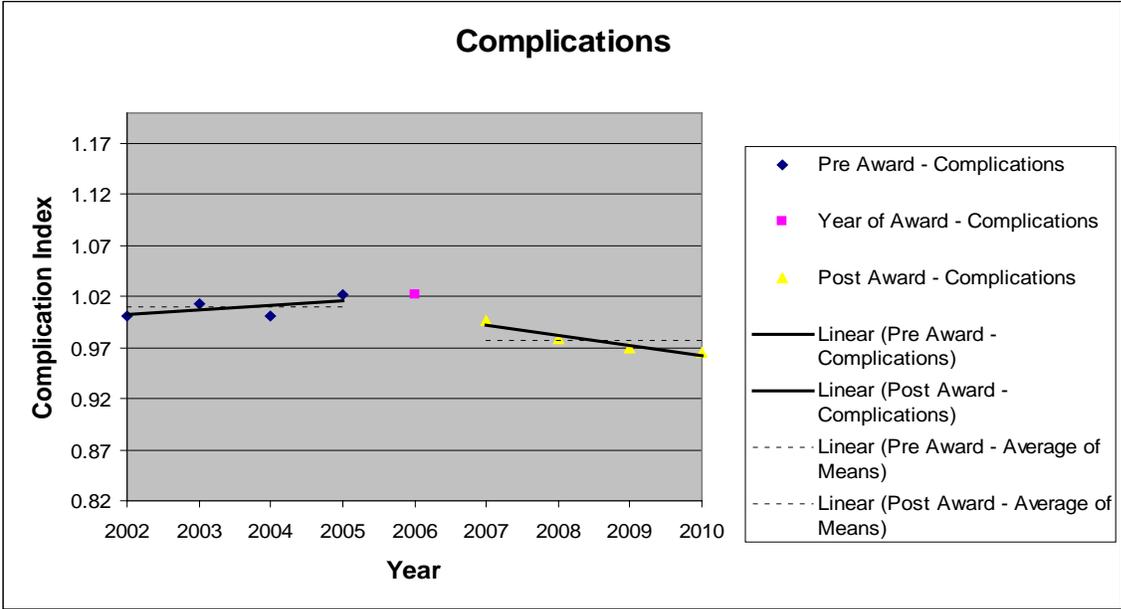


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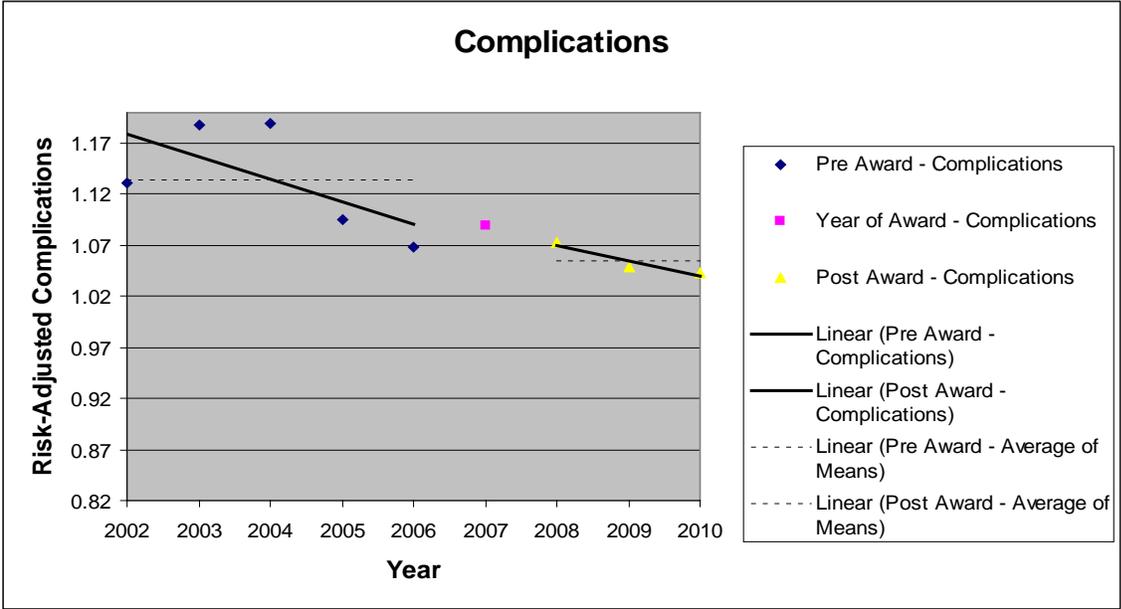
Complications Analysis (Lower is Better)



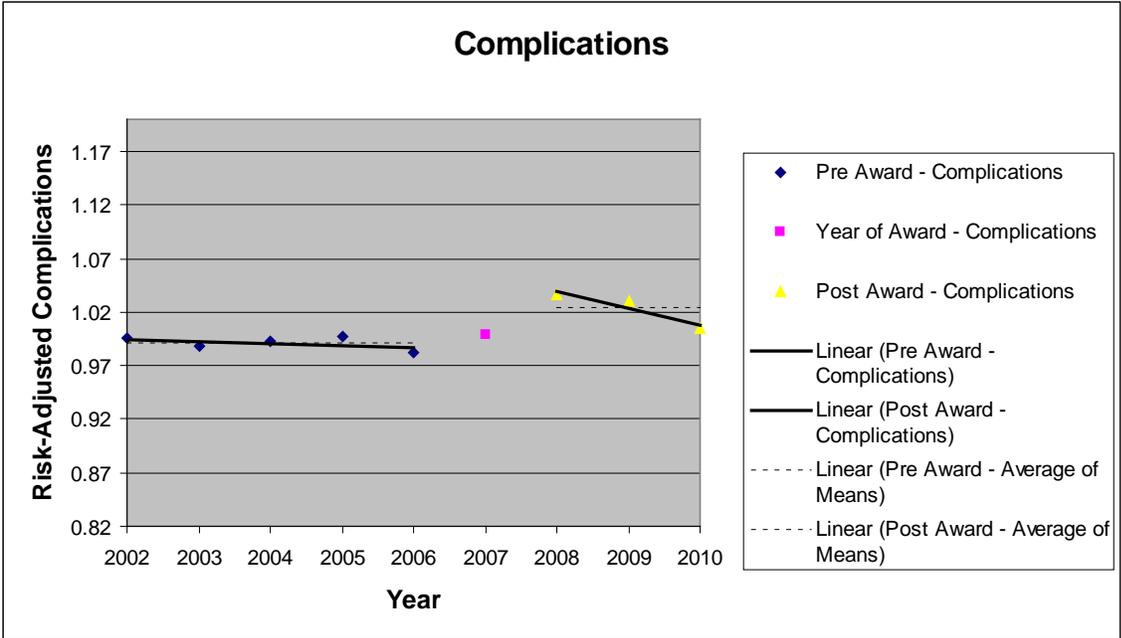
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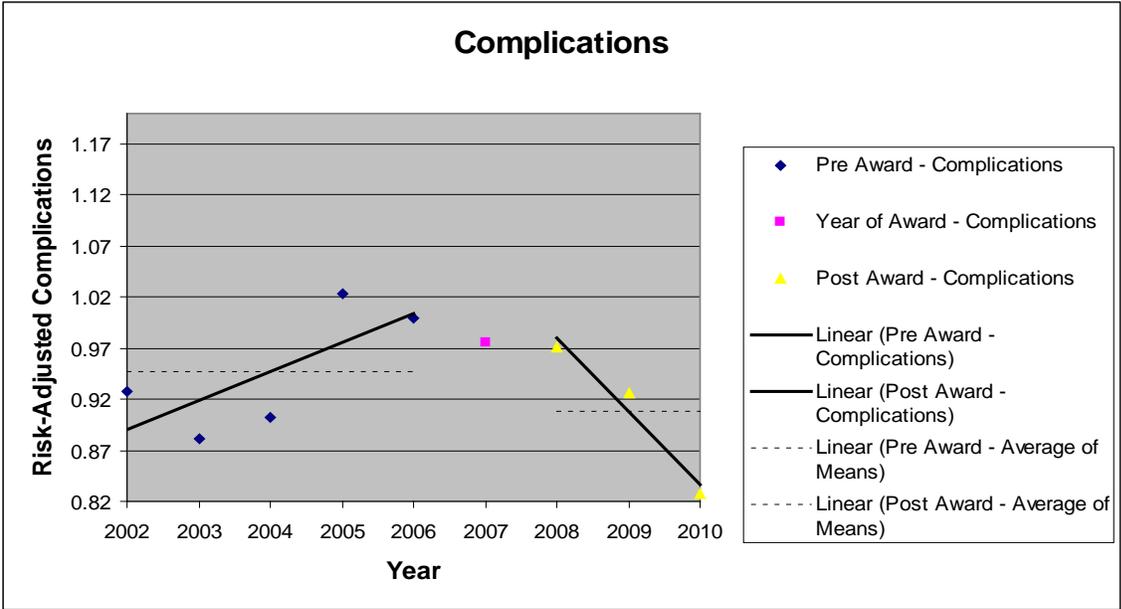
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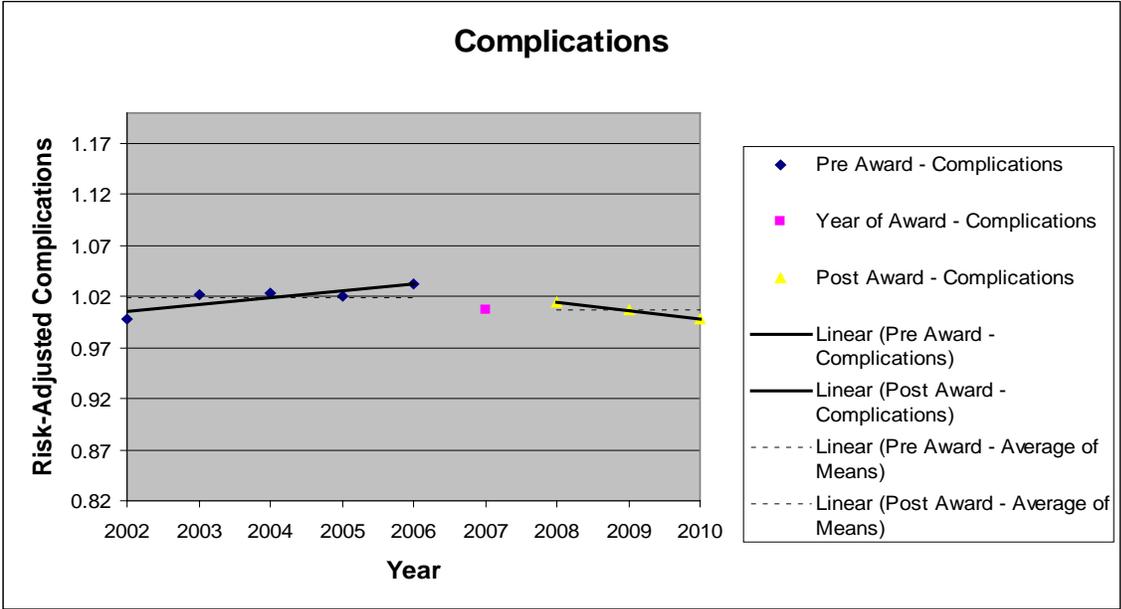
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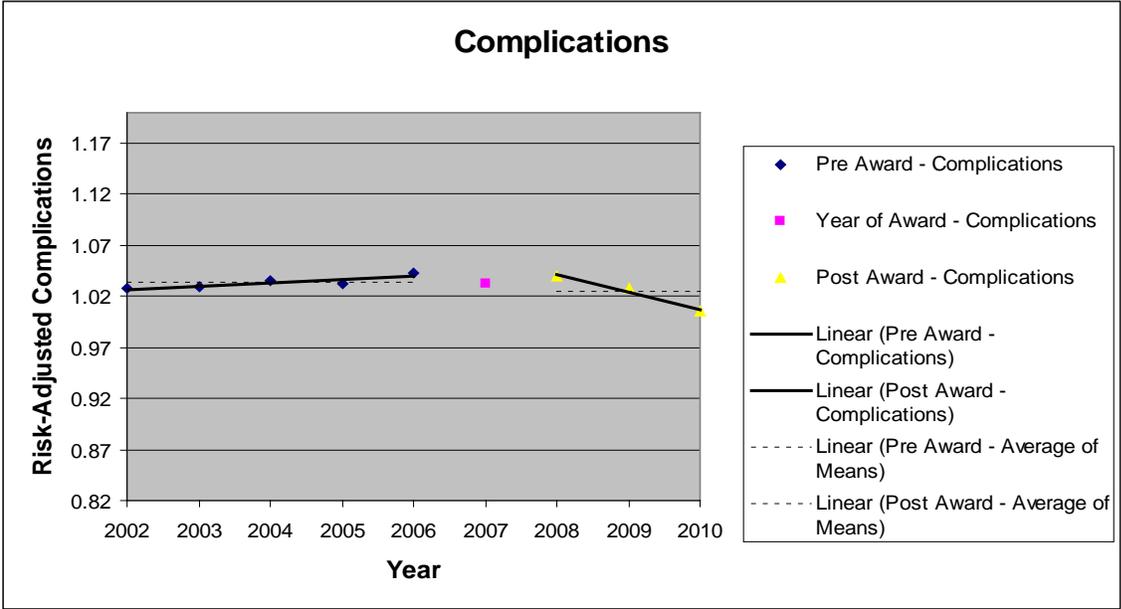
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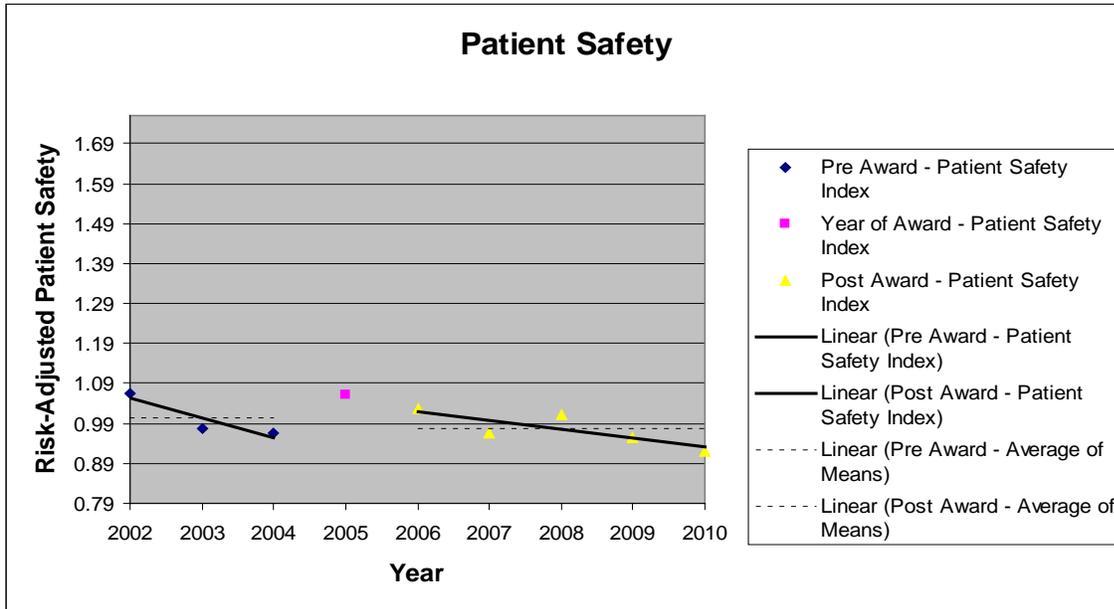


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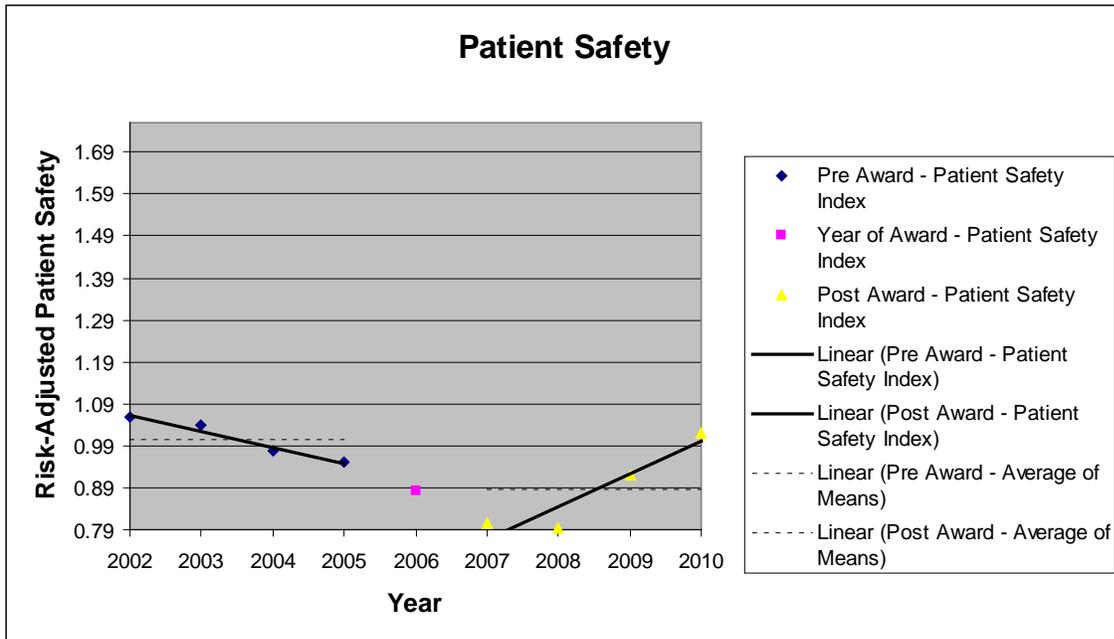


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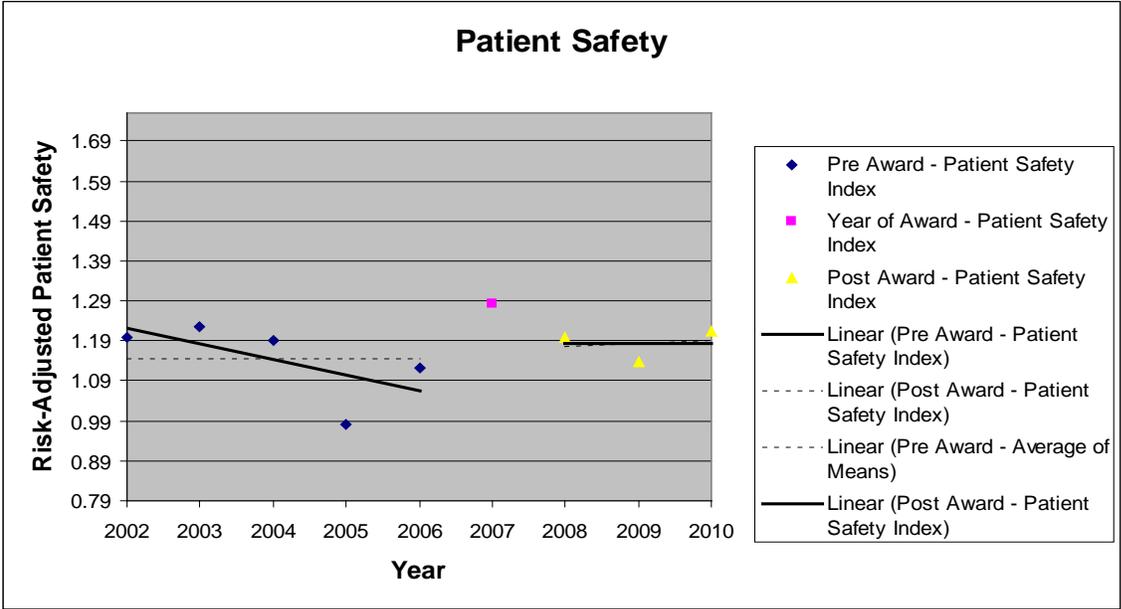
Patient Safety Index Analysis (Lower is Better)



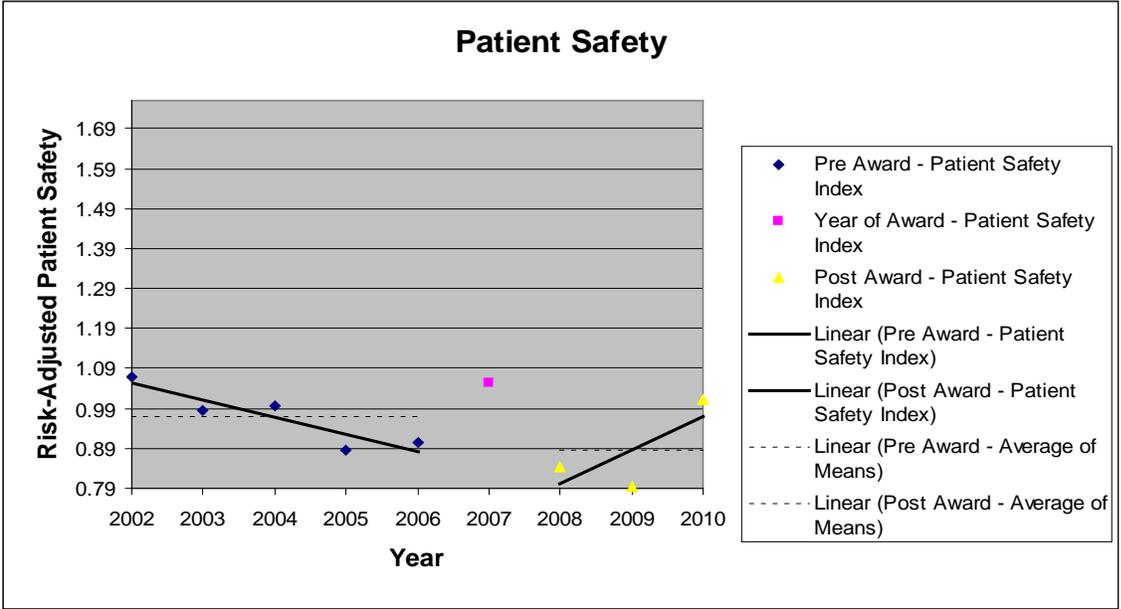
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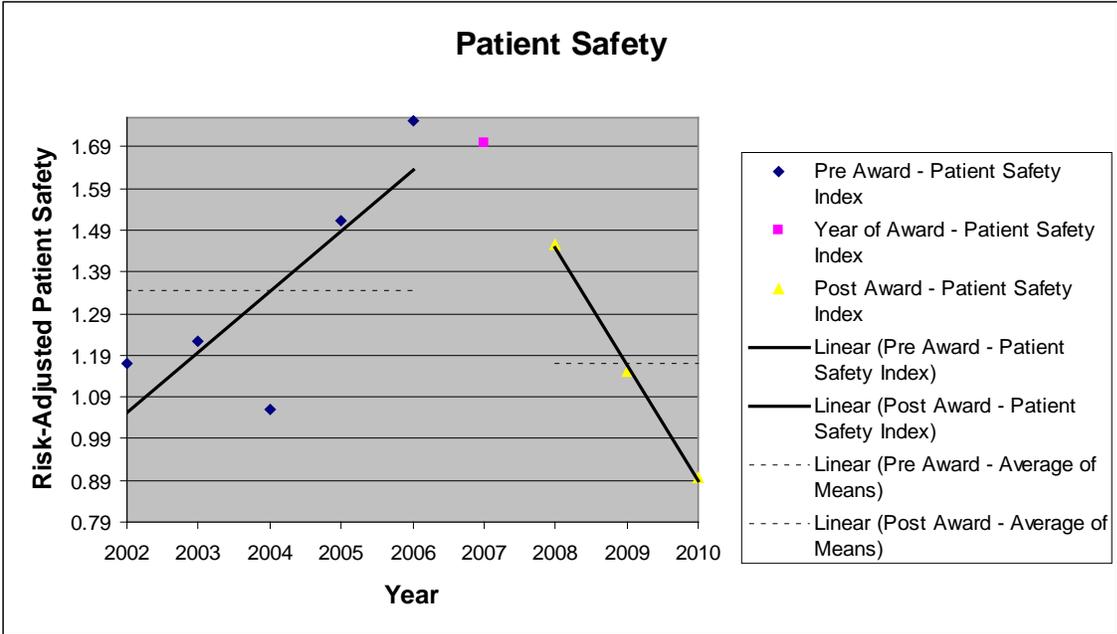
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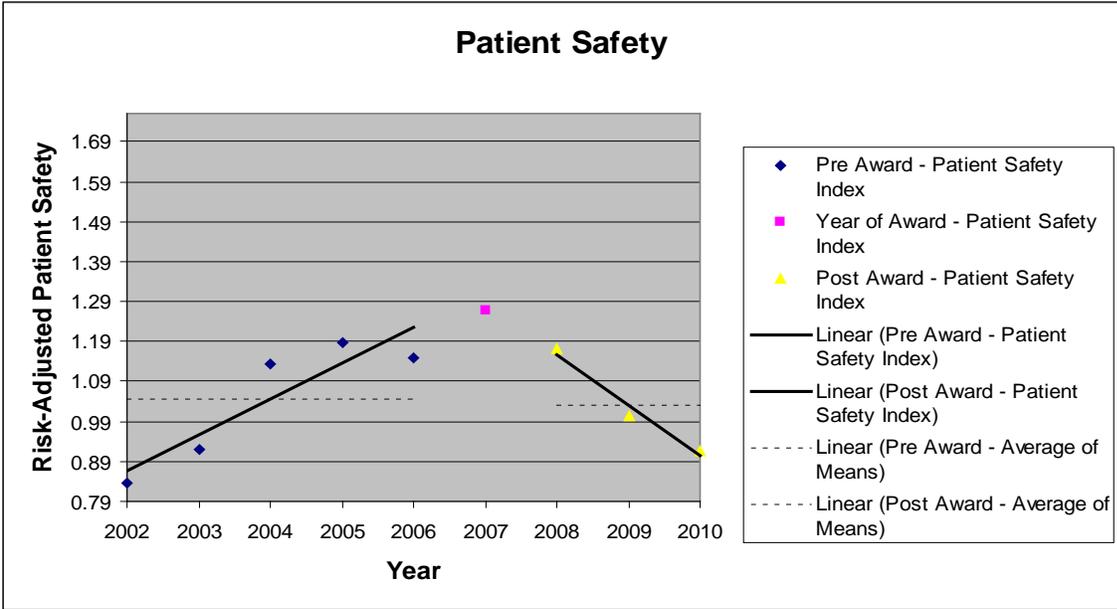
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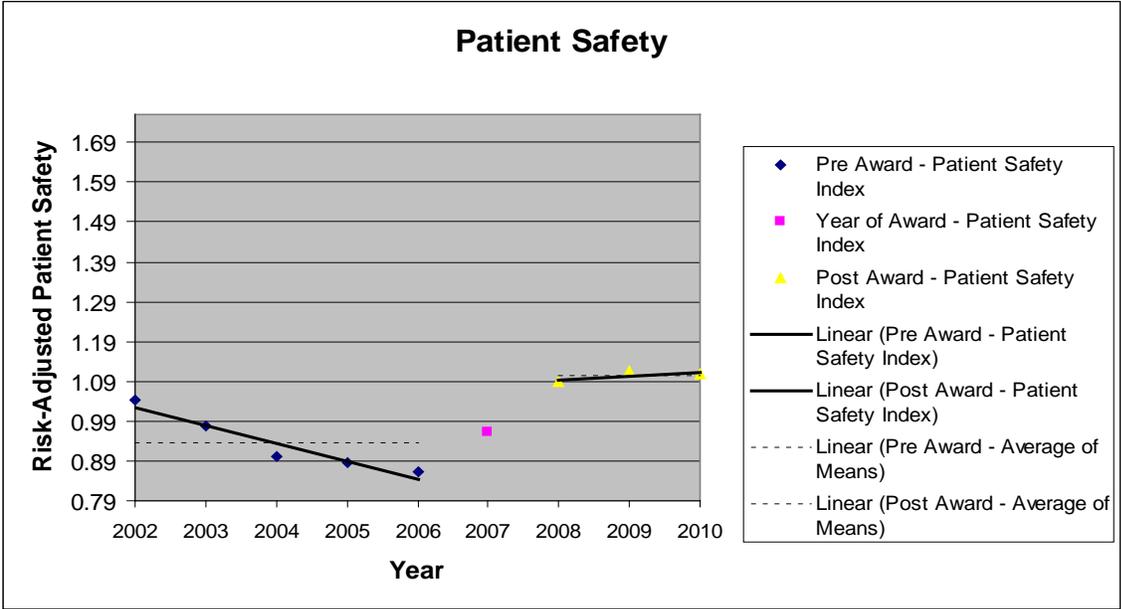
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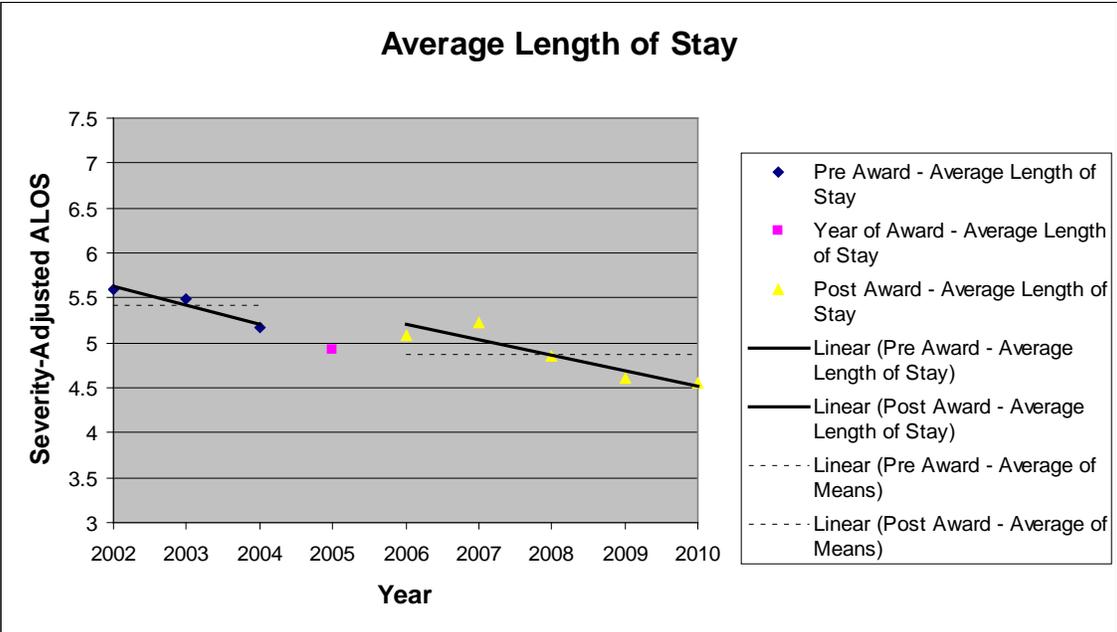


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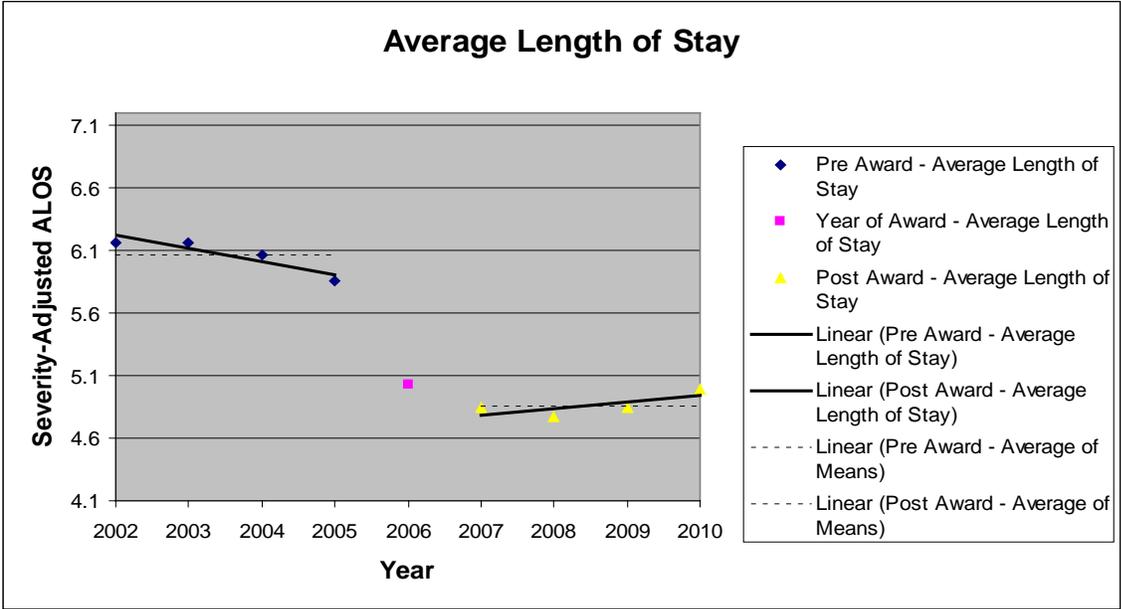
Average Length of Stay Analysis (Lower is Better)



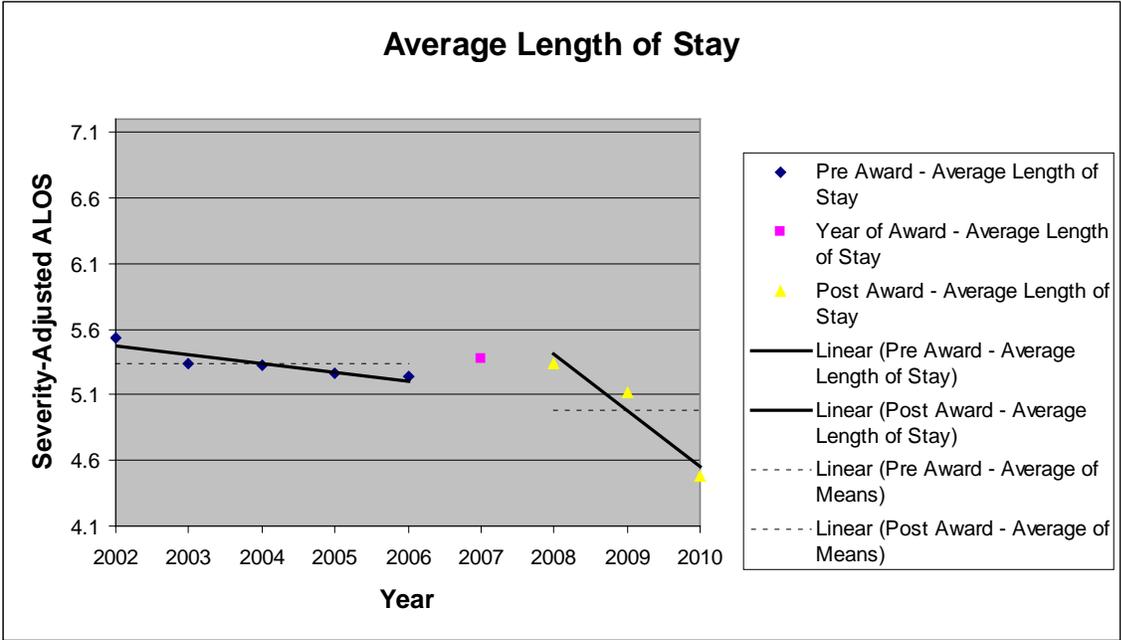
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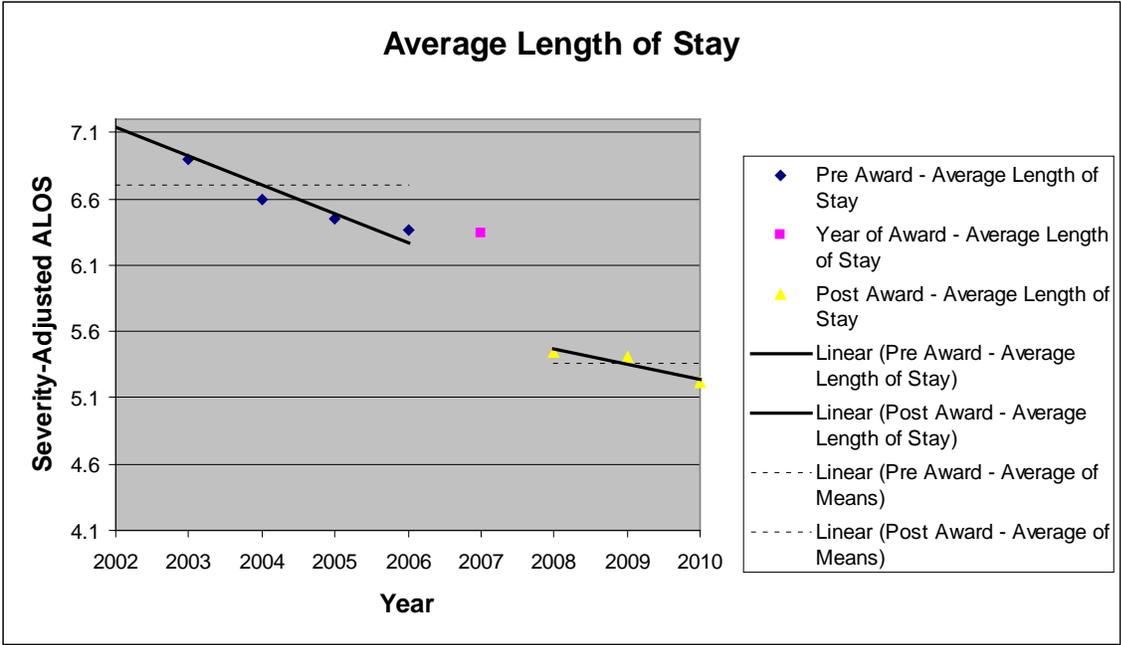
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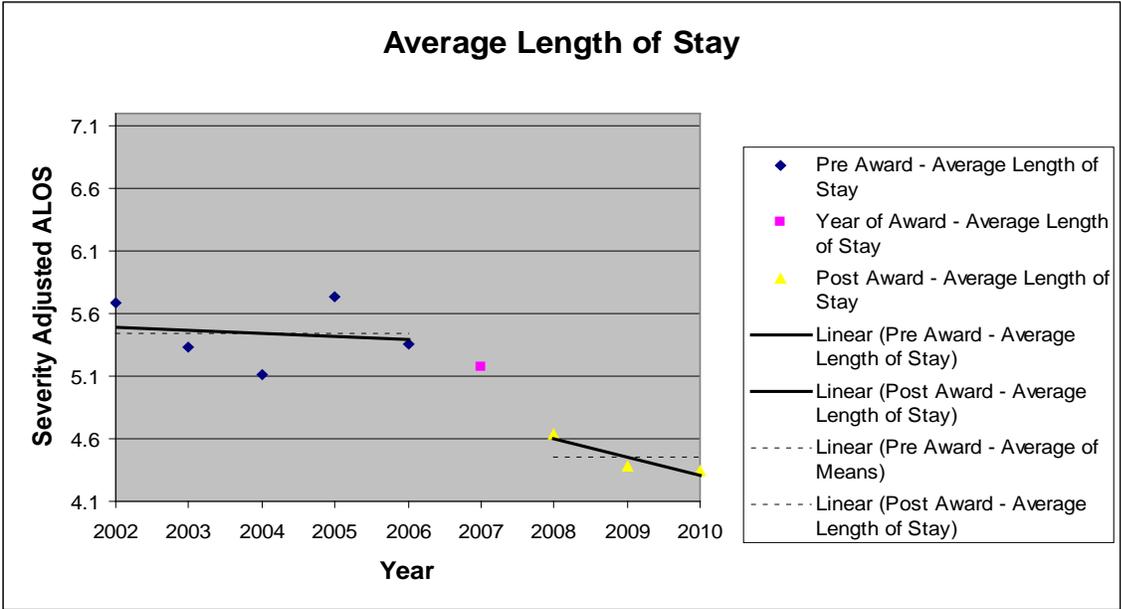
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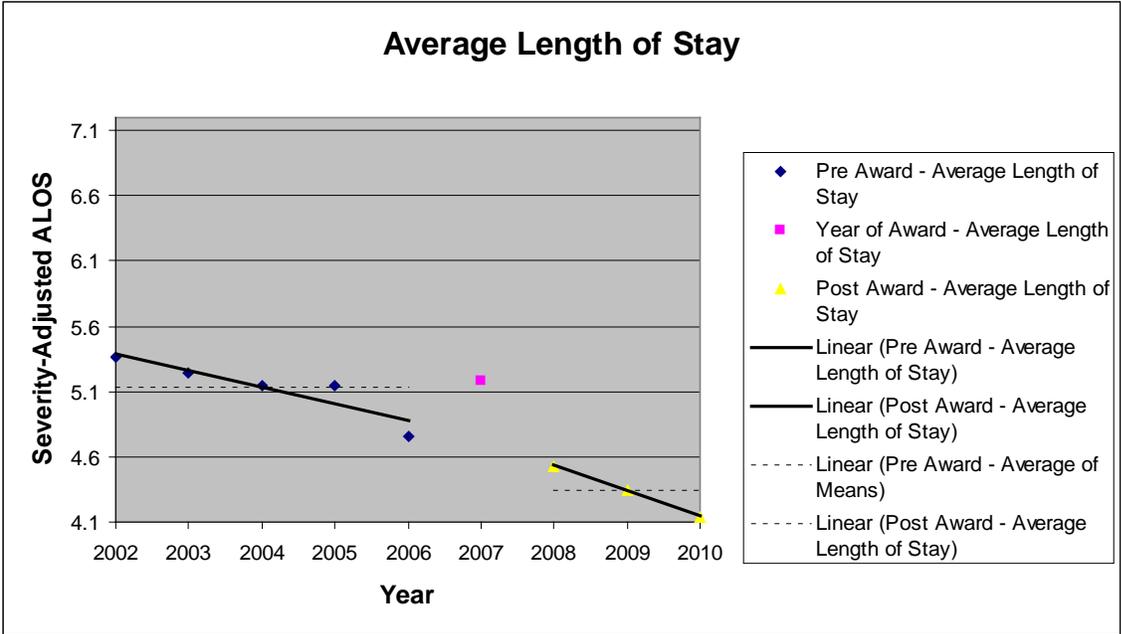
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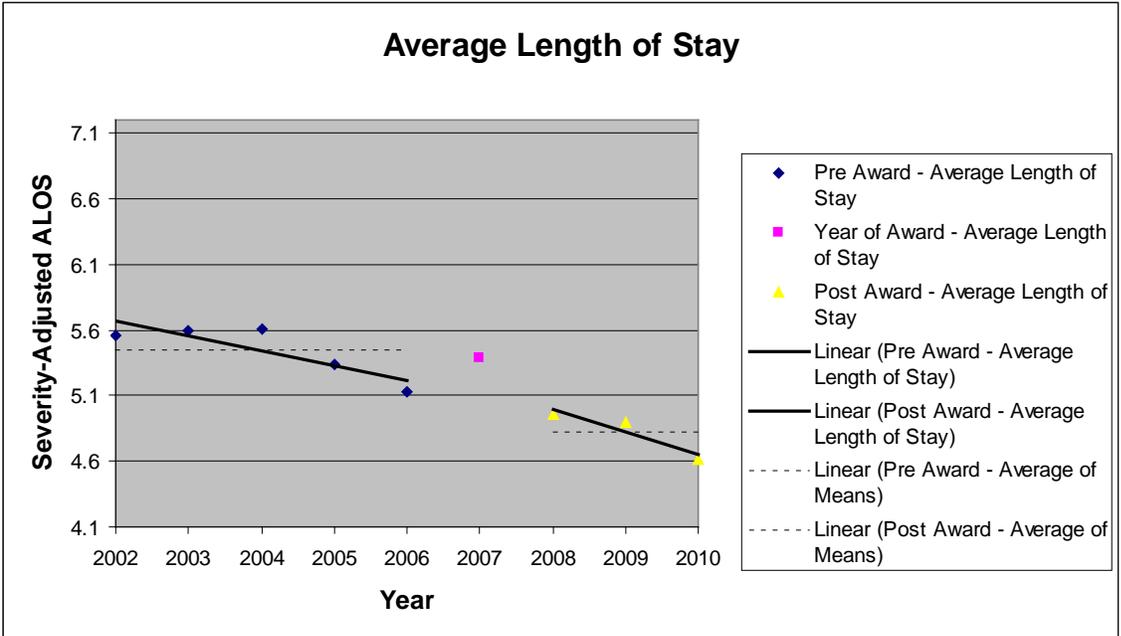
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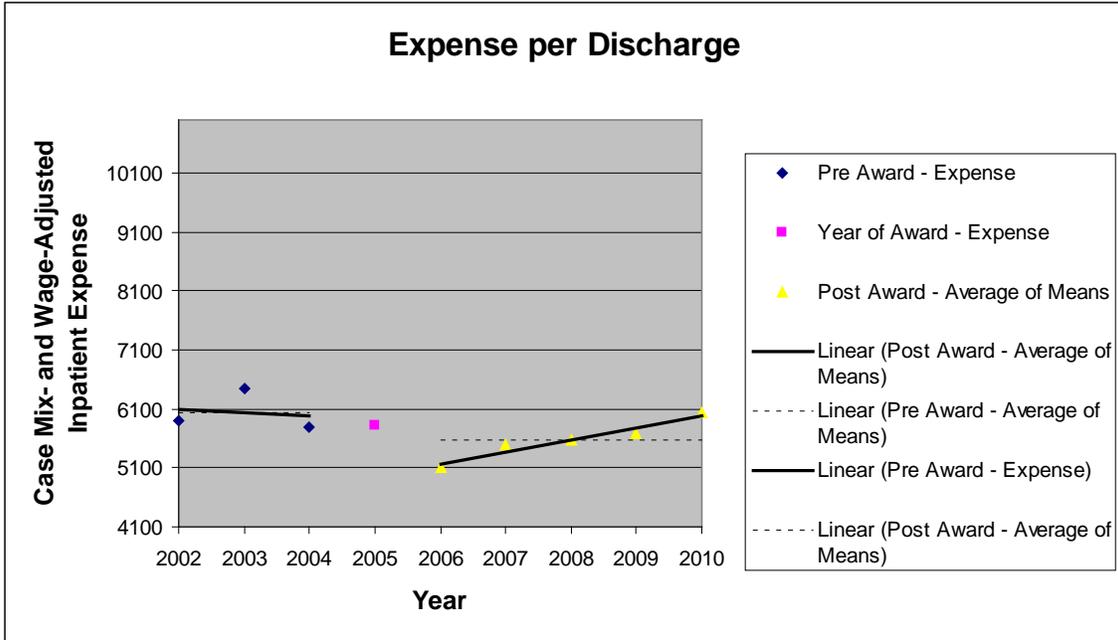


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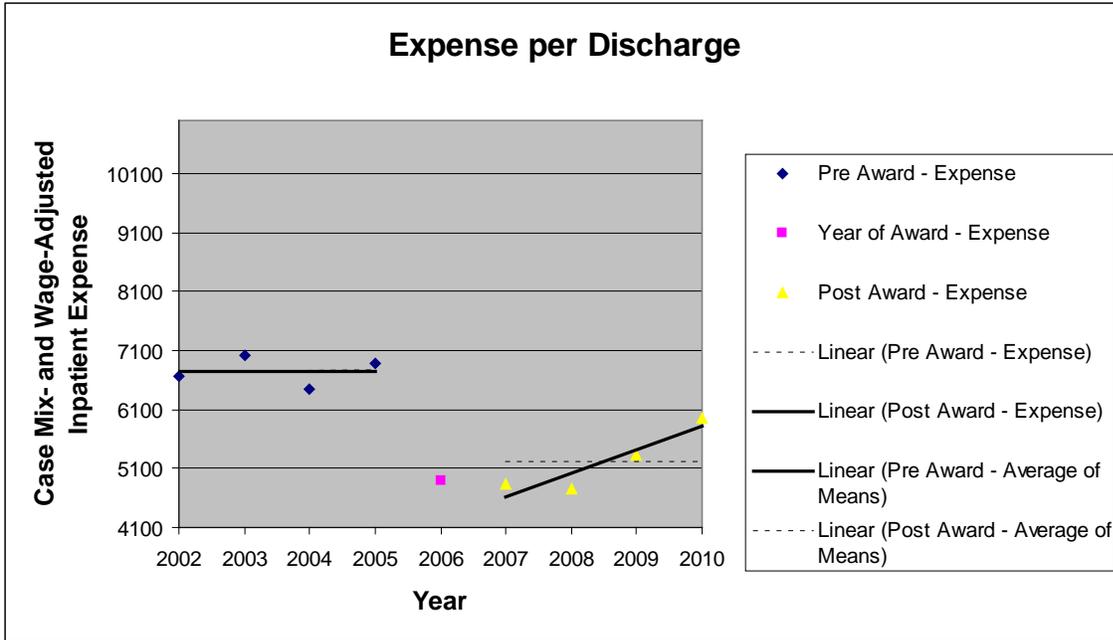


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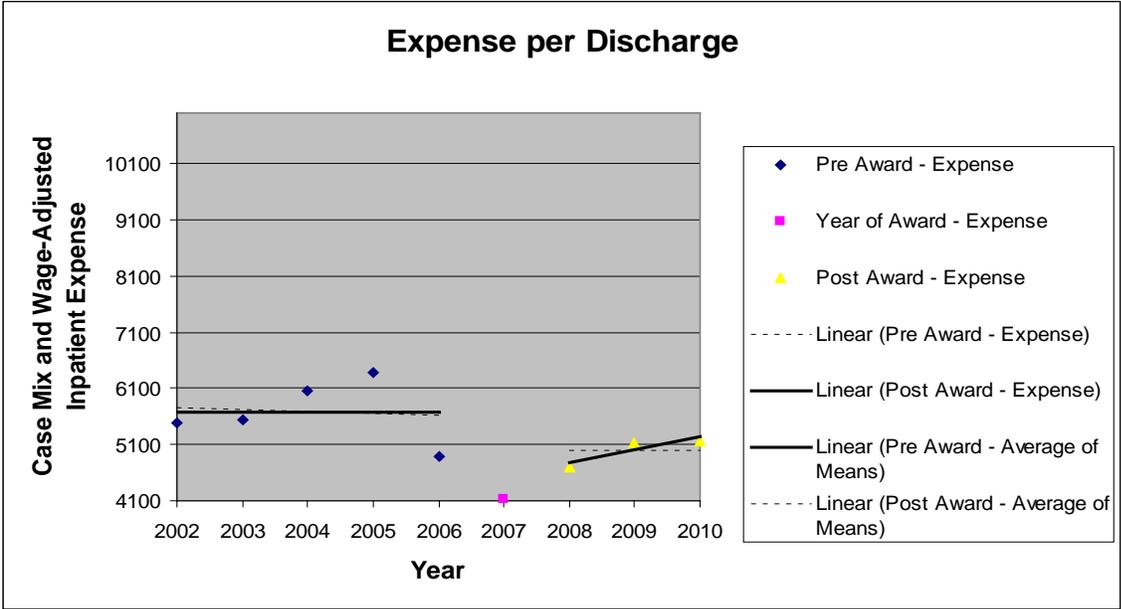
Expense Per Discharge Analysis (Lower is Better)



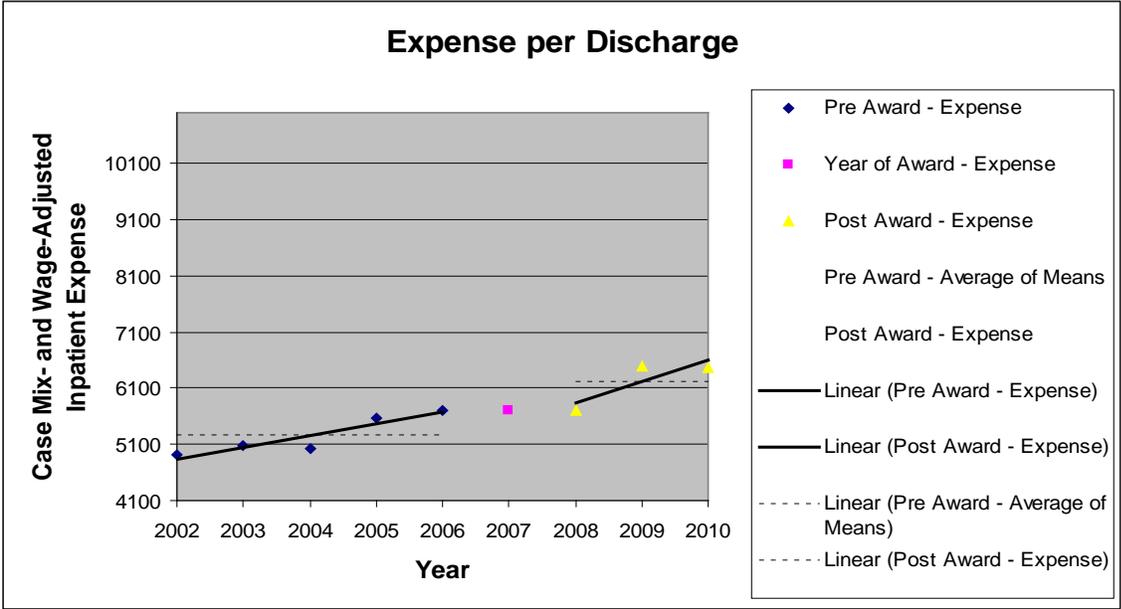
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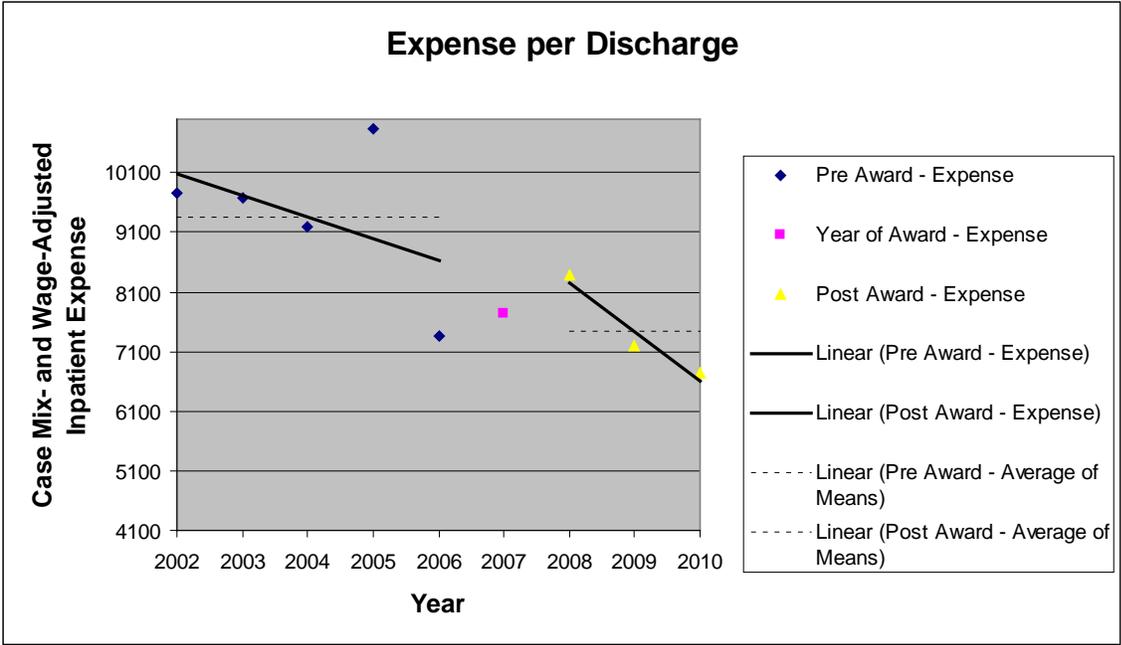
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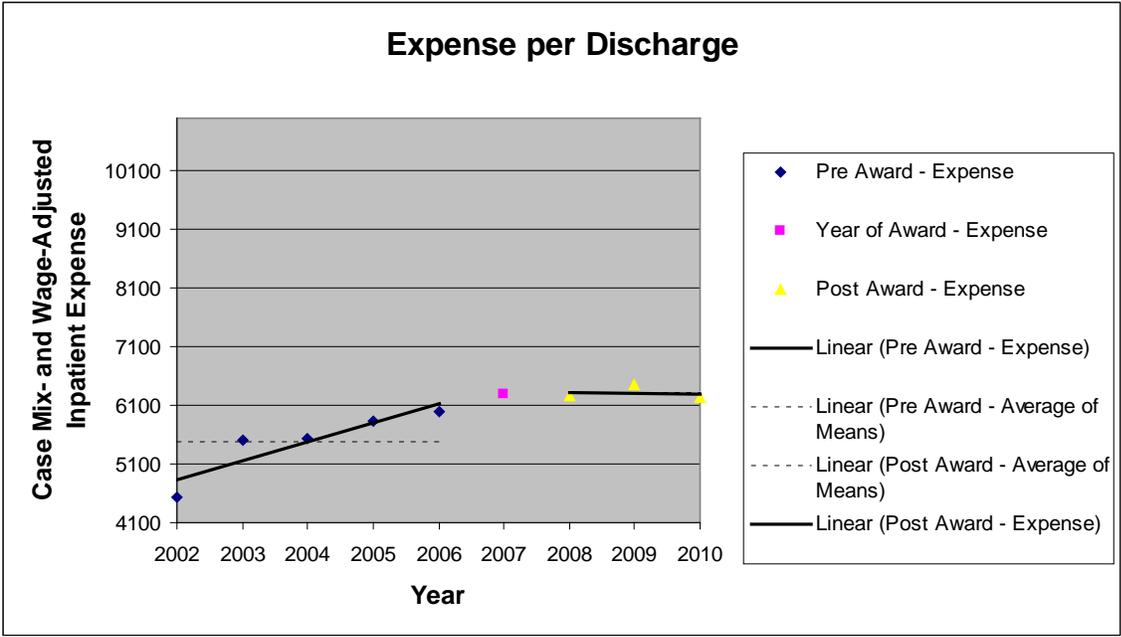
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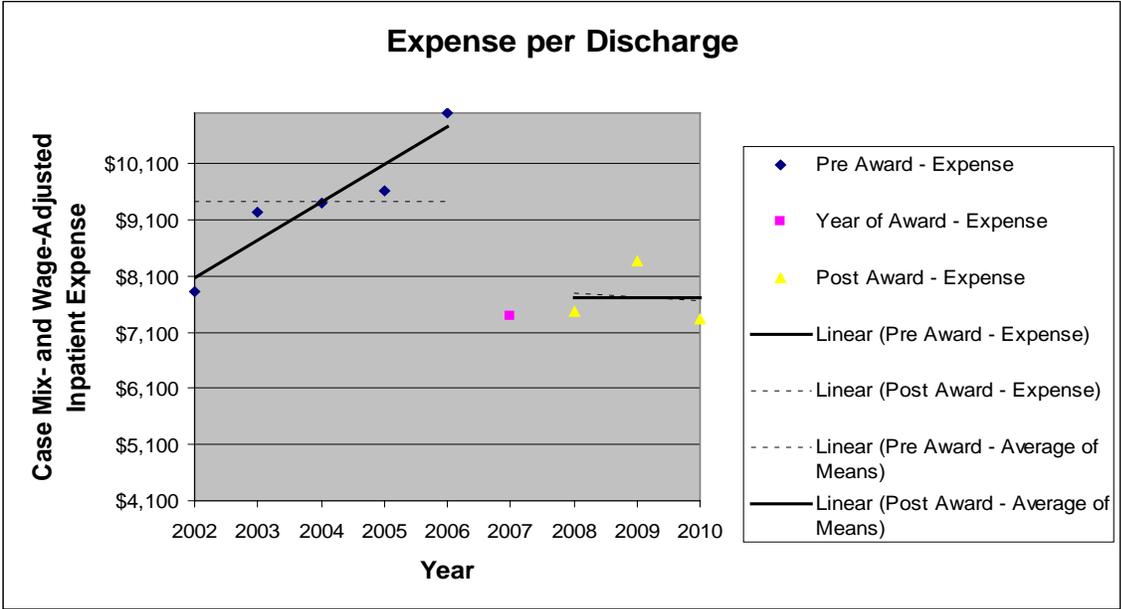
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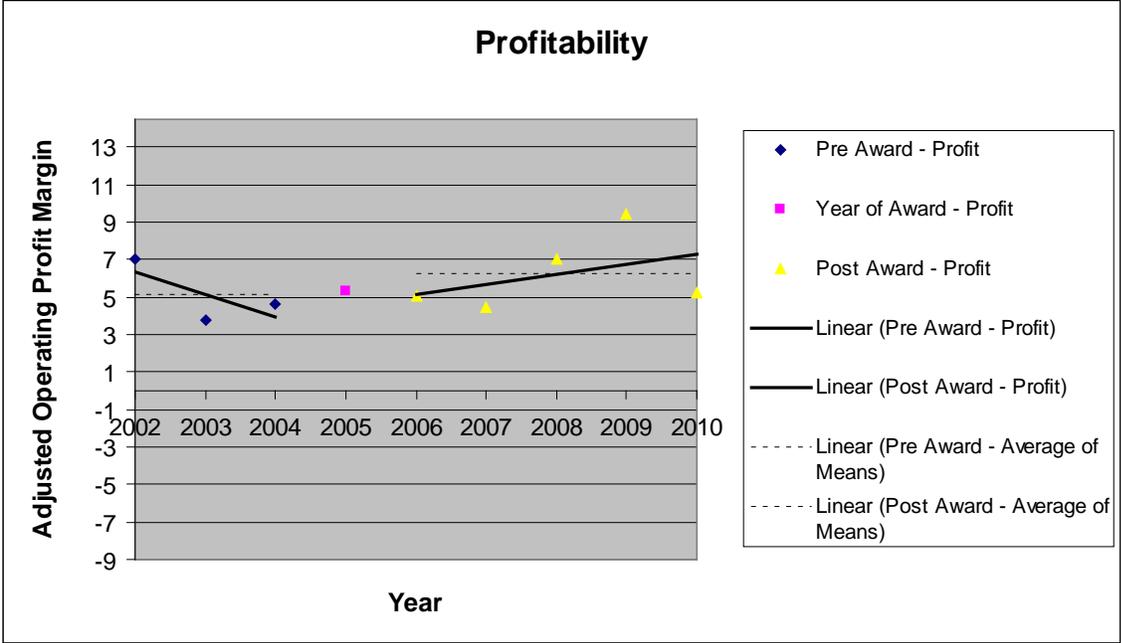


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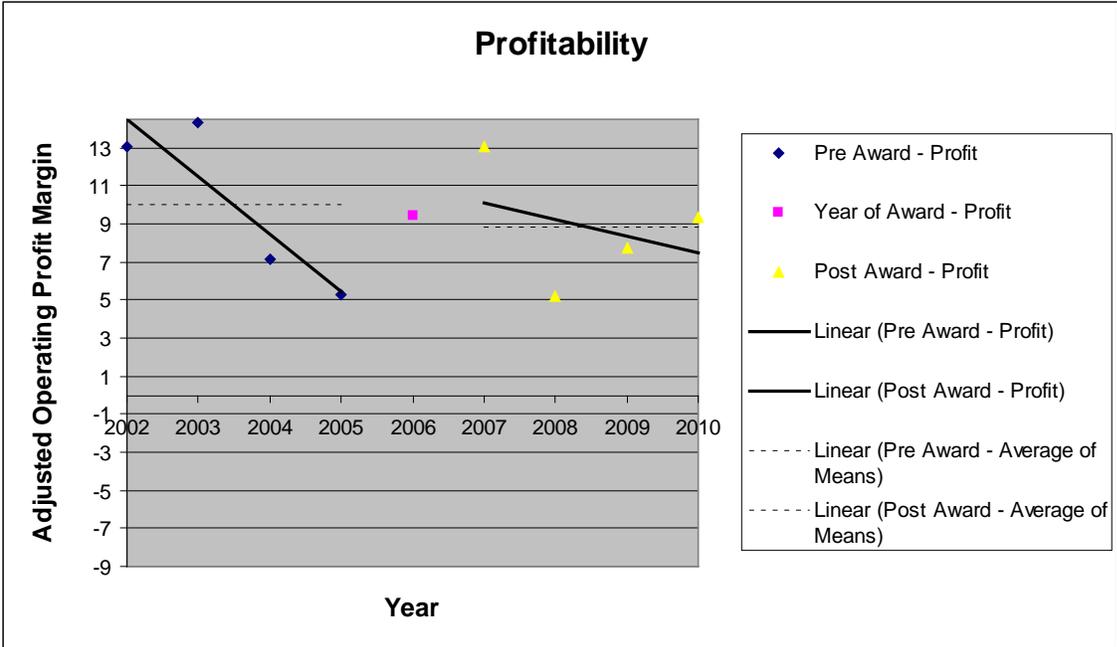


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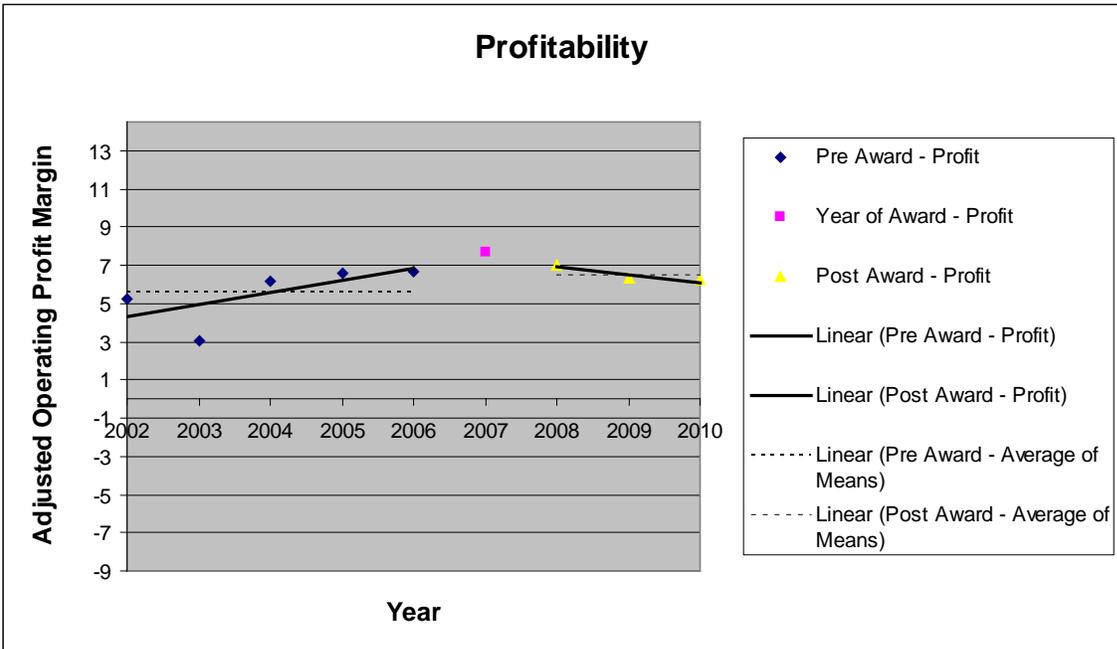
Profitability Analysis (Higher is Better)



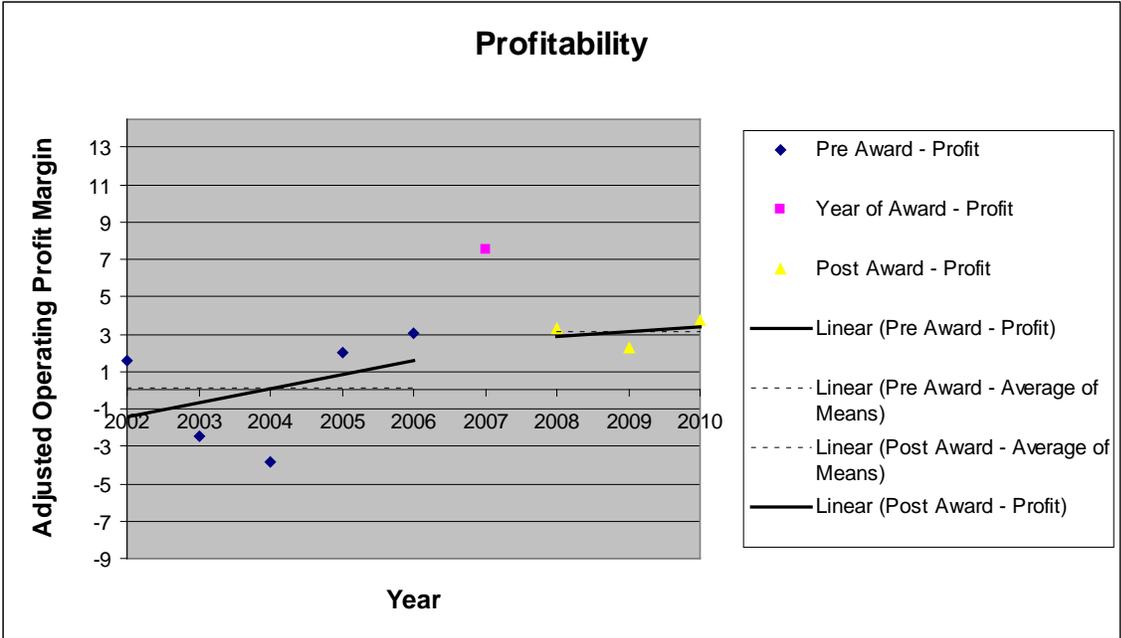
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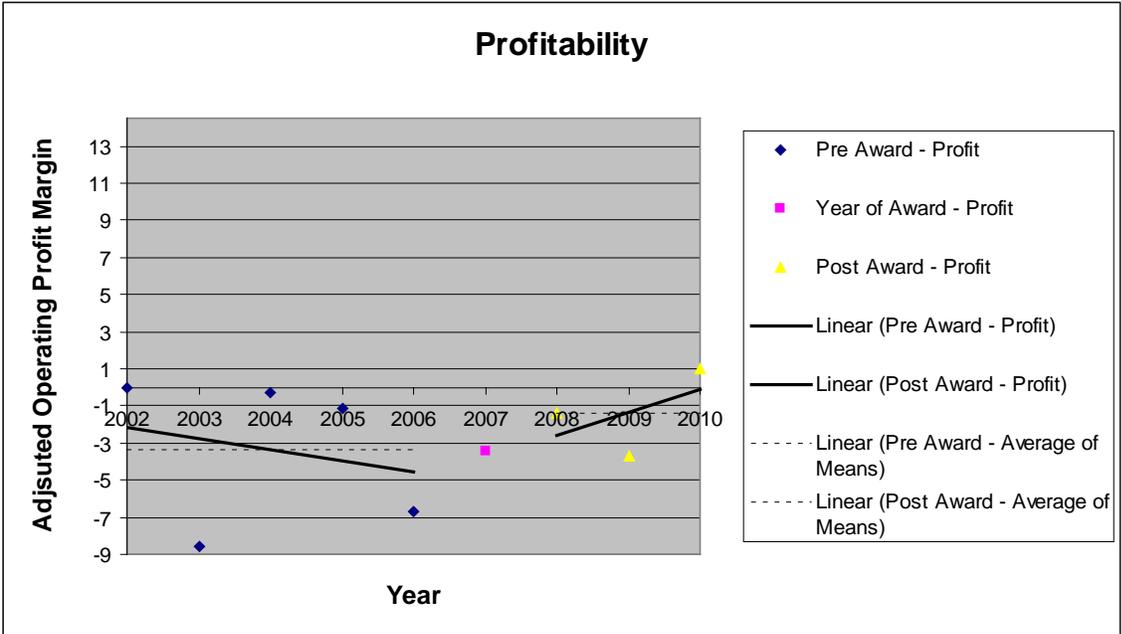
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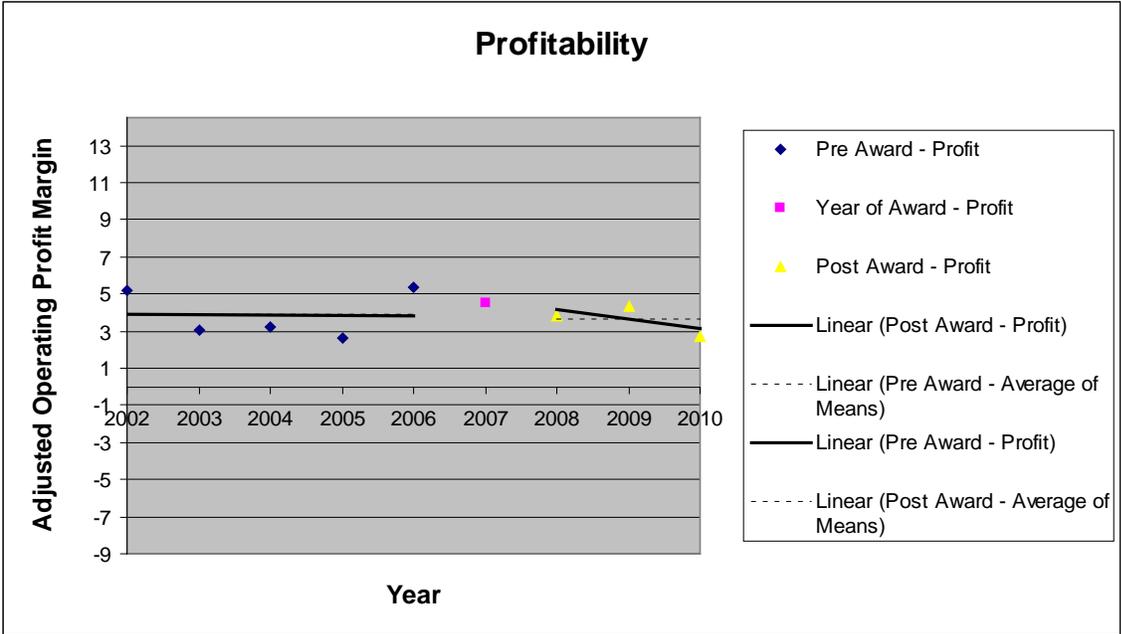
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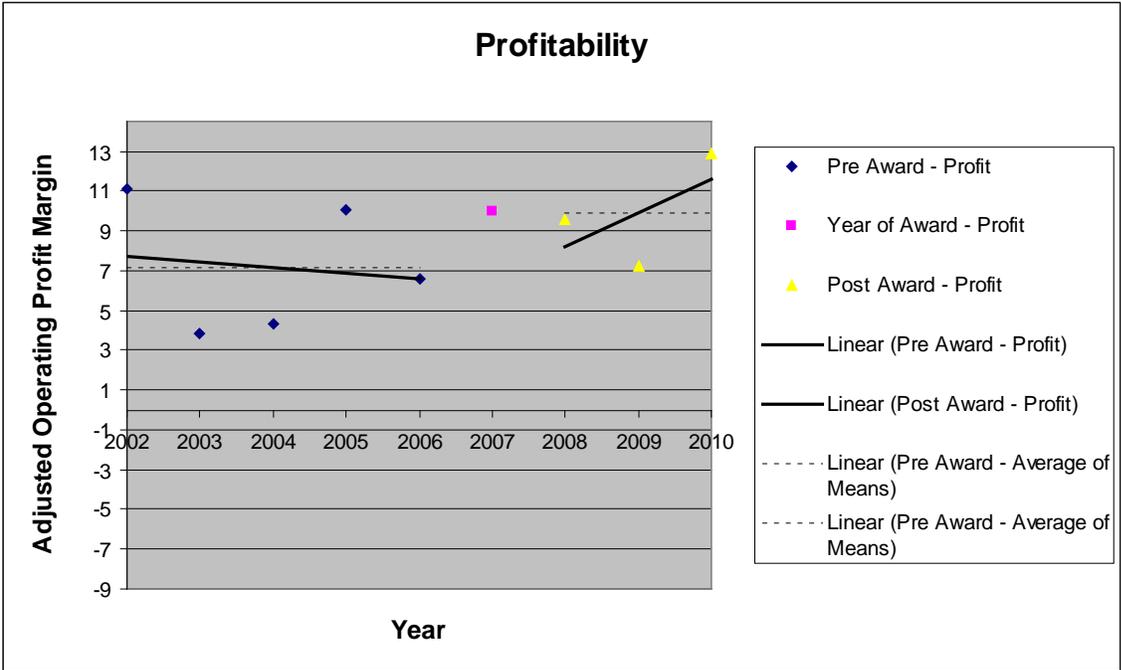
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Change in Level: Positive (Coded: 1)
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 Change in Trend: Yes (Coded: 1)



Change in Level: Negative (Coded: -1)
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 Change in Trend: No (Coded: 0)



Change in Level: Positive (Coded: 1)
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 Change in Trend: Yes (Coded: 1)