2017

Relationship Between Health Care Costs and Type of Insurance

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This is to certify that the doctoral dissertation by

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Walden University
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Abstract

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by

Macey Buker

MHA, Weber State University, 2014

MAcc, Utah State University, 1995

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Health Sciences, Health Administration

Walden University

November 2017

Abstract

Continued escalation in health care expenditures in the United States has led to an unsustainable model that consumes almost 20% of GDP. Policymakers have recognized the need for industry reform and have taken action through the passage of the Affordable Care Act (ACA). The purpose of this quantitative, longitudinal study was to examine the relationship between the type of health insurance and health care costs. Mechanism theory and game theory provided the theoretical framework. The analysis of secondary data from the Healthcare Cost and Utilization Project included a sample of 1,956,790-inpatient hospital stays from 2007 to 2014. Results of one-way ANOVAs indicated that between 2% and 9% of health care costs could be attributed to type of health insurance, a statistically significant finding. Results also supported the effectiveness of the ACA in stabilizing health care costs. The average annual rate of health care cost increase was 38.6% from 2007 until 2010, decreasing to an average annual increase of 4.3% from 2011 until 2014. Results provide important information to generate positive social change for consumers, providers, and policymakers. This includes improving decisions related to health care costs, improved understanding of the costs of health care services, increased transparency, increased patient engagement, maximizing consumer utility, facilitation of reduction of waste within the industry, and increased understanding of the impact of health policy on health care costs and efficiencies within newly created health policies. Results may also improve transparency of health care costs, which allows consumers, providers, and policymakers to take specific action to reduce health care costs, resulting in a more just and sustainable health care model.

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Dedication

I dedicate my dissertation work to my family, friends, and colleagues who have supported me throughout the process. A special thanks to my wife, Leeshel, for her unwavering support and words of encouragement throughout the process.

Acknowledgments

I wish to thank my committee members who were always generous with their expertise and time. A special thanks to Dr. James Goes, my committee chair, for his never-ending support, encouragement, reading, reflection, and most of all patience in guiding me through the process.

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Chapter 1: Introduction to the Study

Health care costs continue to be a significant economic challenge in the United States. In 2013, health care costs exceeded $2.9 trillion, resulting in more than $9,255 in spending per individual, which represents approximately 17.4% of GDP (Hartman, Martin, Lassman, Catlin, & National Health Expenditure Accounts Team, 2015). This amount is expected to exceed 20% of GDP by 2020. The United States is outpacing other developed countries in health expenditures. France, the second highest country in health expenditures, spent approximately 11.6% of GDP during the same period (The World Bank, n.d.). This study focused on two important factors that influence the cost of health care services: transparency and type of insurance.

The purpose of this quantitative longitudinal study was to provide a deeper understanding of the relationship between health care costs and type of health insurance. Findings may provide the increased transparency that will allow consumers and legislators to make better decisions related to the delivery of health care services. This chapter includes the problem statement, background, and research questions for the study.

The study examined cost differences by type of insurance for a sample of DRG codes using discharge data from the National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality. A purposeful sample of the 10 most common, 10 most expensive, and 10 least expensive DRG codes from the 10 largest cities in the United States was taken from the HCUP data. Total costs for each service was reduced by the average contractual allowance for the

hospital where the services were provided. Later in this chapter, I provide additional information regarding the design of the study.

Background

Health care costs continue to be a challenge for individuals seeking access to affordable services. Health care costs in the United States exceeded 17.4% of GDP in 2013, representing an amount almost twice as high as France, the next closest country (Hartman et al., 2015). Schoen, Osborn, Squires, and Doty (2013) compared delivery of health care services in the United States to Australia, Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland, and the United Kingdom. Schoen et al. found that individuals living in the United States "were the most likely to report high out-of-pocket costs, problems paying medical bills, and forgoing care because of costs" (p. 4). High costs have been attributed to a number of factors, but Schoen et al. cited complexity as the primary reason for costs attributed to receiving health care services in the United States. Another contributing factor was the amount of waste in areas such as overtreatment, failures of care coordination, failures in execution of care processes, administrative complexity, pricing failures, fraud, and abuse that accounted for between 21% and 47% of total health care expenditures, which could have amounted to as much as $1.3 trillion (Berwick & Hackbarth, 2012).

Stabile et al. (2013) found that Canada, France, England, and Germany were able to control costs through measures that included budget constraints, reducing services, increasing payments from consumers, and altering the reimbursement model to providers. It is unlikely that similar approaches will work in the United States due to expectations of

consumers and resistance from providers and insurance companies (Stabile et al., 2013). Faden et al. (2013) found that consumers, regulators, and representatives have come to recognize the need to reform health industry practices using innovative methods that produce value-based services. The adoption of the ACA was a direct result of the recognition of a need for change and an attempt to improve health care delivery in the United States (Rosenbaum, 2011).

Provisions of the ACA focus on five major areas of health care, including increasing the number of individuals with health insurance, improving fairness, improving health care value by reducing waste, increasing access to services, and improving public health (Rosenbaum, 2011). These areas are inclusive of the primary factors related to the delivery of health care in the United States. Access, quality, and cost are often referred to as *the iron triangle* or *health care trifecta* (Dai, 2015). Despite the efforts of policymakers to curtail health care costs, costs have continued to rise (Rosenbaum, 2011). Lack of transparency and type of health insurance are two factors that could affect the cost of health care services.

Lack of Transparency

According to Barr (2014), a significant amount of research has been conducted to evaluate factors of access and quality; however, few studies have been conducted regarding the factors related to health care costs due to a continued lack of transparency with health care costs to the consumer (Jevsevar, 2015). Christensen, Floyd, and Maffett (2016) found that by making health care pricing transparent, the overall costs of health care services provided were reduced by approximately 6% without any negative

correlation with the quality of health care services provided. Health providers were able to achieve the same outcomes with less money. Muir, Alessi, and King (2013) stated that price transparency would be a primary factor in reducing health care costs. Muir et al. (2013) indicated that improved transparency for the consumer, insurance provider, and employer helped to identify barriers to reduce health care costs.

Consumers focus on the amount that is required to be paid out of their pocket rather than the full cost of the service being provided (Hibbard, Greene, Sofaer, Firminger, & Hirsh, 2012). In addition to this challenge, consumers tend to equate low price with low quality, adding additional complexity to providing information for decision-making purposes (Hibbard et al., 2012). Increasing transparency of health care costs is an essential element in reducing health care spending. "The goal of reporting cost data is to reduce waste and unnecessary care without sacrificing quality of care" (Hibbard et al., 2012, p. 560). The Centers for Medicare and Medicaid Services (CMS) recently provided information relative to the chargemaster prices of a hospital, which is similar to a manufacturer's suggested retail price, resulting in more confusion among consumers (Beck, 2014). The current study provided additional transparency related to the net cost of health care services through the elimination of the contractual allowances and adjustments given to third-party payers.

Type of Health Insurance

Another factor in health care costs stems from the type of health insurance used to pay for services. According to a study of Oregon Medicaid recipients, individuals sought out medical treatment through the most convenient method, often resulting in emergency

department visits (Taubman, Allen, Wright, Baicker, & Finkelstein, 2014). This approach can be partially attributed to the affordability of services that is determined by the third-party payer. Patients often do not consider the overall cost of services when seeking treatment. Patient co-payments and personal responsibility are the primary factors in determining the affordability of care (Levesque, Harris, & Russell, 2013). These concerns highlight the need to consider the type of insurance when evaluating the cost of health care services. Medicare and Medicaid services have been reimbursed at rates that are published and available to providers to determine whether they want to provide services at the specified rate (CMS, HHS, 2014). Although consumers rarely evaluate the reimbursement rate, the cost of services is consistent for individuals receiving health care services that use Medicare and Medicaid insurance.

Private insurance companies negotiate contractual rates with individual health care providers based on fee-for-service or capitated reimbursement models. Fee-for-service reimbursement models pay a provider each time a consumer receives services (Porter & Kaplan, 2014). This model produces incentives for a provider to see more patients and bill for the services provided. Capitated reimbursement models employ a per-member, per-month payment schedule in which an insurer pays a provider a set monthly amount for each person covered regardless of the number of services provided (Porter & Kaplan, 2014). This model produces an incentive for a provider to restrict access to services to obtain the highest amount of profit. Private insurance companies are not required to report the contractual agreements established with health providers. Information released to the consumer is limited to co-payment amounts and a list of

approved providers, which results in a consumer being focused on network providers and co-payment amounts when making a decision regarding the cost of health care services.

There has been significant growth in and shift to high-deductible health insurance plans to meet the requirements of ACA provisions (Wharam, Ross-Degnan, & Rosenthal, 2013). Wharam, Graves, and Kozhimannil (2015) found that the rate of childbirths decreased significantly due to the increase in the amount of cost-sharing responsibility with the patient. This factor highlights the increase in participation and accountability of a patient when faced with an increase in cost-sharing responsibility. Policymakers may need to adapt public policy to ensure that patients are seeking appropriate care, which will require a new model of health insurance (Wharam et al., 2015). Results of the current study provided policymakers with empirical data that allows comparison of health care costs based on the type of health insurance, which may provide an improved understanding of cost-sharing health insurance models.

Individuals who rely on self-insurance (also referred to as being uninsured) are faced with paying the chargemaster rates of a hospital, which can be more than 10 times higher than Medicare, Medicaid, and private insurance (Bai & Anderson, 2015). This disparity has resulted in an environment in which the individuals who can least afford health care services pay the highest cost.

Problem Statement

Health care costs continue to be a primary concern of policymakers, business leaders, and patients as costs continue to rise (Muir et al., 2013). In 2013, the United States spent $2.9 trillion on health care, accounting for 17.4% of GDP and averaging

approximately $9,255 per person (Hartman et al., 2015). Current data indicate that health care costs may exceed 20% of GDP by 2020 (Berwick & Hackbarth, 2012). Policymakers adopted the ACA in an attempt to reduce health care costs through provisions that increase the number of individuals with health insurance, improve health care delivery, and reduce waste (Rosenbaum, 2011). Recent studies supported the effectiveness of the ACA in increasing the number of individuals who have health insurance, which indicated movement toward the goal of universal coverage (Blumenthal, Abrams, & Nuzum, 2015; Sommers, Buchmueller, Decker, Carey, & Kronick, 2013). However, evaluating health care costs has been difficult due to the lack of price and cost transparency in the health care industry.

Transparency in the health care industry includes the ability of the consumer to easily obtain and understand the pricing of specific services to make health care decisions. Misuse of information by consumers, complex billing practices and cost-shifting, contractual confidentiality requirements, preferred provider incentives, trade secrets, and health care provider resistance all contribute to a lack of transparency (Muir et al., 2013). Sinaiko and Rosenthal (2011) defined transparency of health care costs as dissemination of the prices that a patient pays for medical care. Publishing credible information related to health care costs may increase transparency and assist in reducing overall health care costs.

Purpose

The purpose of this quantitative longitudinal study was to gain a deeper understanding of the role of health insurance in the cost of health care services. The study

was also intended to increase transparency of information related to the cost of health care services. Data from NIS HCUP were analyzed to evaluate the relationship between the type of insurance and health care costs over a 8-year period (HCUP, n.d.).

An improved understanding of the role of insurance in driving health care costs should increase transparency for not only the patient but also for policymakers. The results of the study will be disseminated through publication in a scholarly journal to increase transparency of health care costs to aid in the effort to reduce health care costs. In addition, the information regarding the relationship between health care costs and the type of health insurance may allow policymakers to determine whether additional legislation may be necessary to address health care costs. For example, legislation may be needed that requires providers to disclose the costs of health care services to potential patients.

Significance

The significance of the study resided in providing additional information that may increase the transparency of health care costs and the relationship between the type of insurance and the influence on the cost of health care services. Christensen et al. (2016) found that by making health care pricing transparent, the overall costs of health care services provided were reduced by approximately 6% without any negative correlation with the quality of health care services provided. Muir et al. (2013) stated that price transparency would be a primary factor in reducing health care costs. Muir et al. also indicated that improved transparency for the consumer, insurance provider, and employer helped to identify barriers to reduce health care costs. The current study involved three

primary goals: (a) evaluate the relationship between health care costs and type of insurance, (b) evaluate changes, if any, in this relationship over a 6-year period, and (c) determine the influence of transparency on pricing for health care services based on type of insurance.

The information resulting from this study may be used by consumers, policymakers, public health leaders, and health care organizations to better understand the relationship between health care costs and the type of health insurance with emphasis given to the change in this relationship over a 6-year period of time. I analyzed the change in costs based on the type of insurance and whether there had been a shift in the type of insurance over time. An improved understanding of these relationships may allow patients to make better choices regarding health insurance and health care services. Increased transparency may also empower patients to discuss the cost of health care services prior to purchasing from a specific provider. Policymakers may be able to better understand health care costs and may be provided with the necessary information to improve decision-making regarding health care policy, which may assist in lowering health care costs.

Nature of the Study

I conducted a quantitative longitudinal analysis using 8 years of data to evaluate the relationship between health care costs and type of insurance. A quantitative approach was the most appropriate method to better understand the factors that influence the cost of health care services (see Creswell, 2009). A qualitative approach should be used when the "research is exploratory and is useful when the researcher does not know the

important variables to examine" (Creswell, 2009, p. 18). The important variables were identified in the research questions, and the NIS HCUP data provided the information necessary to develop a better understanding of the relationship between the type of health insurance and health care costs.

Various research designs were considered for this study. An experimental design requires a control group and an experimental group in which an intervention or treatment is introduced that allows for a pretest and posttest measurement (Frankfort-Nachmias & Nachmias, 2008). The NIS HCUP data did not allow for the introduction of an intervention or treatment for two reasons. First, the data had been de-identified, which prevented a pretest and posttest for the same individual. Second, the NIS HCUP data did not allow for a control group. All individuals had been subjected to the same market conditions, including the adoption of the ACA, which prevented a comparison of two different groups based on the independent variables.

Time-series designs, including longitudinal designs, are quasi-experiments that allow a researcher to evaluate the dependent variable over a period of time (Frankfort-Nachmias & Nachmias, 2008). Longitudinal designs allow a researcher to evaluate the relationship between variables when a control group is not available (Frankfort-Nachmias & Nachmias, 2008). In the current study, the relationship between the type of insurance and cost of health care services was evaluated over a period of 8 years without the presence of a control group. In addition, the use of random selection is not required in a quasi-experiment, which allows the use of a purposeful sample. The purposeful sample in

the current study included the 10 most frequent procedures, the 10 most expensive procedures, and the 10 least expensive procedures identified in the NIS HCUP data.

Researchers using a longitudinal design control for maturation and reduce the likelihood of making invalid causal inferences (see Frankfort-Nachmias & Nachmias, 2008). However, researchers using a longitudinal design cannot control for other factors that may reduce validity and that occur over time. For example, the researcher may not take into consideration new technology that influences the cost of health care services. Other factors that may contribute to the change in health care costs over time need to be considered to reduce the likelihood of making an invalid causal inference. Supplementary data were gathered including information related to inflation and geographic location. A longitudinal design has the advantage of allowing the study to be carried out in the actual setting and does not require randomized sample selection (Frankfort-Nachmias & Nachmias, 2008). However, the longitudinal design cannot be used to provide an explanation for other potential causes of the change in the dependent variable and does not allow for manipulation (Frankfort-Nachmias & Nachmias, 2008).

Theoretical Foundation

The theoretical foundation for this study was mechanism theory combined with game theory. Mechanism theory suggests that an organization uses incentives to obtain a specific behavior, objective, or outcome from a participant (Jackson, 2014). Game theory refers to a situation in which one party has incomplete information regarding the willingness of a second party to pay a specific price to maximize personal benefits rather than follow historical reasoning (Fudenberg & Tirole, 1993). Mechanism theory is

coupled with game theory to determine whether an organization can achieve the desired result by implementing specific strategies and incentives to obtain the desired outcome (Jackson, 2014). In the case of health insurance, the U.S. government mandated universal health insurance coverage for all citizens, as identified in the provisions of the ACA (Rosenbaum, 2011). Health insurance reform and financial penalties for failure to obtain health insurance became the incentives to compel individuals to act and increase the number of citizens with health insurance (Sommers et al., 2013).

Carter et al. (2014) determined that mechanism theory could be applied to cost-effectiveness measures to prioritize health care services using quality-adjusted life years and available resources. Grennan (2014) applied game theory to health insurance pricing models and found that costs for the same services from a single provider varied by up to 79%. These two examples provide additional evidence that mechanism and game theory can support a framework to explain the complex nature of health care costs.

Complexities of decision-making can inhibit the effectiveness of a single incentive. Jackson (2014) suggested that the simplest solution becomes the implementation of a tax to achieve the desired result. The ACA established a tax for not obtaining health insurance, which becomes increasingly higher each year (Eastman & Eastman, 2013). According to mechanism design theory, the tax penalties established by the ACA should significantly influence the choice of health insurance and produce a shift in health insurance from self-pay to the most cost-effective health insurance for U.S. citizens: private health insurance.

DeSmet et al. (2014) conducted a meta-analysis of 54 studies in which game theory was applied in an effort to change health behavior. The results of the analysis indicated that a small effect size was measured in behavior that increased a healthy lifestyle (DeSmet et al., 2014). The larger the incentives and personal benefit associated with a specific behavior, the more likely that an individual would change behaviors. For example, a larger penalty for not having health insurance would increase the likelihood that an individual would obtain coverage. Zhang, Wernz, and Slonim (2015) combined mechanism theory and game theory to evaluate decisions made by health providers based on insurance company incentives and reimbursement models that resulted in a determination that the current health care model is more complicated than a two-agent principal-agent model. Zhang et al. determined that direct incentives to physicians or consumers resulted in the most efficient reimbursement model. In this example, the personal benefit derived from a change in behavior must be given directly to the individual making the change. For example, insurance companies have provided an economic incentive of not out-of-pocket costs to a patient to increase the focus on preventive medicine, such as an annual physical or diabetes monitoring, to reduce the costs of chronic diseases. Lin, Ramakrishnan, Chang, Spraragen, and Zhu (2013) found that game theory and mechanism theory could be combined using a web-based interaction to improve health behavior and patient compliance. Patients are given an economic incentive from insurance companies that included cash payments and no out-of-pocket costs to achieve improvements in behaviors that improve overall health.

Research Questions and Hypotheses

1. To what extent, if any, does the type of health insurance (public, private, or self-pay) affect the average cost of health care services?

   H_o1: Type of health insurance (public, private, or self-pay) is not related to the average cost of health care services.

   H_a1: Type of health insurance (public, private, or self-pay) is related to the average cost of health care services.

2. To what extent, if any, does transparency of health care costs affect the average cost of health care services.

   H_o2: There is not a relationship between transparency of the type of health insurance (public, private, or self-pay) and the average cost of health care services.

   H_a2: There is a relationship between transparency of the type of health insurance (public, private, or self-pay) and the average cost of health care services.

3. To what extent, if any, does the type of health insurance (public, private, or self-pay) modify the effect of transparency on the average cost of health care services? Modify the effect refers to a change in transparency based on the type of insurance. More specifically, is there a difference in the level of transparency of costs based upon the type of health insurance (public, private, or self-pay)?

   H_o3: There is not a relationship between the type of health insurance (public, private, or self-pay) and transparency of the average cost of health care services.

H_a3: There is a relationship between the type of health insurance (public, private, or self-pay) and transparency of the average cost of health care services.

Limitations

The longitudinal design in this study included a number of limitations that posed internal and external threats to validity. Internal threats included history, maturation, regression, selection, and instrumentation. External threats included the interaction of selection and treatment, the interaction of setting and treatment, and the interaction of history and treatment. Each threat presented unique challenges that required additional steps to increase the overall validity of the study. For example, the threat of history related to the time that passed during the study and the events, such as inflation, that could have influenced the cost of health care services (see Creswell, 2009). Maturation referred to changes that could have occurred over time to a specific DRG code. For example, the services in a bypass conducted in 2005 may have been different than a bypass conducted in 2009. Regression referred to the possibility that outliers were chosen and indicated a trend over time that was not reflective of the actual change in cost. For example, if a major technological advance was implemented in treating a kidney disorder and resulted in a significant decrease in the cost of the treatment during the second year of data included in the study, the overall change would have resulted in findings that should not have been generalized to all health care costs because it was an outlier.

Selection referred to the possibility that the DRG codes selected for analysis had specific characteristics that predisposed them to certain outcomes (see Creswell, 2009). For example, the 10 least expensive procedures may have been predisposed to little or no

change over time. Instrumentation referred to a change in the data collection process during the time being studied. This threat to validity was of concern due to a change in the NIS HCUP data in 2012 (HCUP, n.d.). Procedures to overcome the change in the data collection process were presented by HCUP and needed to be followed to reduce this threat to validity.

The threats to external validity prevented the results from being generalized to the larger population. Specifically, limitations are specified for population members who do not have the same characteristics or function in different settings in past or future situations. The study included results only for the DRG codes selected in specific metropolitan areas for the years specified in the data collection process. Although the study findings may not be generalizable to the larger population, the information provided should allow the reader to better understand the relationship between health care costs and type of health insurance.

Additional limitations of the current study included the lack of transparency and use of a purposeful sample. The lack of transparency for health care costs prevented an analysis of exact costs, and average amounts needed to be used. Although this limited the usability of the study, the intent was to improve transparency within the health care industry to improve the decision-making process for individuals and policymakers. The use of a purposeful sample decreased the reliability and validity related to generalizations about the cost of health care services. The limitations of the study prevented generalizability of findings to the entire population. The intent of the study was not to develop an overall understanding of health care costs but to further understand the

relationship between the type of insurance and health care costs. The study findings may be used to initiate additional conversations and research that will help to reduce health care costs in the future.

Scope and Delimitations

The scope and delimitations within the current study depended on the secondary data chosen for analysis. The data collected through NIS HCUP includes an enormous amount of data starting from 1988. The data set contains information on inpatient hospital discharges for more than seven million records for each year with more than 250 specific DRG codes (HCUP, n.d.). To make the study more manageable, the scope of analysis had to be limited.

The boundaries of the study were established by the selection of DRG codes and metropolitan areas. The study was limited to 30 DRG codes in the 10 largest metropolitan areas in the United States. The selection and analysis of the 10 most frequent, 10 most expensive, and 10 least expensive DRG codes provided an overall understanding of health care costs. This provided meaningful information to answer the research questions without overwhelming the reader with an inordinate amount of information.

In addition, the location of services in which the analysis occurred included only the 10 largest metropolitan areas in the United States. Geographic locations can create a significant variation in the cost of health care services (Teno et al., 2013). For example, the costs of delivering health care in Albuquerque, New Mexico are significantly less than New York, New York. By limiting the analysis to the 10 largest metropolitan areas, the results of the analysis provided information that could be more readily compared

between the selected locations. The selection of limited locations reduced the ability to generalize regarding health care costs to all locations, but improved the comparability between locations due to less variation in the cost of providing services in differing markets.

The final boundary of the study concerned the cost of health care services. In applying the average contractual allowance for each hospital, the resulting information provide more accurate costs for each DRG. However, use of the average allowance did not provide an exact measurement for each service that was provided. The lack of transparency in the health care industry prevented precise measurement, but the study provided improved information and may increase transparency related to reporting health care costs.

Several delimitations were present in the study through the selection of secondary data for analysis. Some of the delimitations included the reliance on information that had been self-reported from hospitals around the country, lack of information regarding the actual cost of services, limited information on the payer mix for each hospital, and lack of information regarding private insurance contractual allowances. NIS HCUP data undergo a rigorous testing and verification process that deems the information reliable; however, the accuracy of self-reported data cannot be guaranteed. Data verification included a comparison to other data collected from the National Hospital Discharge Survey and the American Hospital Association Annual Survey of Hospitals (Agency for Healthcare Research and Quality, n.d.). The result of this limitation was that the findings would not be generalizable for all health care costs. The lack of information regarding the actual

cost of health care services required the use of averages in contractual allowances. This allowed only an estimate to be made about the cost of each specific DRG code. Although the calculations for the estimated costs involved reliable information, the lack of transparency regarding actual costs prohibited generalizations about all health care costs in the United States.

Payer-mix information would have enabled more precise calculations to be made regarding the actual costs of procedures. Medicare and Medicaid reimbursement information was available. Payer-mix information would have allowed more accurate contractual allowance estimates to be made regarding private insurance reimbursement rates. Without this information, there was a larger margin of error in calculating health care costs, resulting in an inability to generalize the results of the study. Another method of overcoming this limitation included the review of contractual allowances between private insurance organizations and health providers. However, the release of this information was highly unlikely and would have resulted in an overwhelming amount of information to be analyzed.

Operational Definitions

Cost of health care services: The amount billed for services for a specific DRG code for a single inpatient stay minus the average contractual discount for a particular hospital. Patrick et al. (2012) used the amount billed by DRG code to conduct a study related to the costs of newborns with neonatal abstinence syndrome but did not adjust for the average contractual discount. The average contractual discount becomes an essential

component of evaluating health care costs to determine what amount is actually paid for the services rendered (Rollins, 2014).

Transparency of health care costs: The availability of information from a health care provider to the end consumer of the cost of a specific health care service prior to the service being rendered. The lack of transparency of cost information has continued due to the unwillingness of health care providers to release trade secrets through a website or over the phone for the costs of common procedures (Reinhardt, 2013). Transparency can be measured based on the cost of procedures for both Medicare and Medicaid insurance. CMS has predetermined rates that are available to both the provider and consumer, which should result in more consistent costs for a specific procedure across various geographic areas.

Type of health insurance: The primary contracted third-party payer that is expected to pay for the health care services being provided. Medicare and Medicaid were grouped in a category of public insurance. Private insurance included payers such as Blue Cross Blue Shield and United Healthcare. Individuals without insurance were classified as self-pay. These classifications were chosen due to common groupings in the health industry and data collection from NIS HCUP (see Capp, Rooks, Wiler, Zane, & Ginde, 2014).

Assumptions

I assumed that data associated with the selected DRG codes and type of insurance were consistent with all procedures. For example, if health care costs for an imaging procedure were related to the type of health insurance, I assumed the same relationship

would hold for open-heart surgery or knee replacement surgery. Because the sampling procedure was not random, generalizations to the larger population were not possible.

I also assumed that data from the NIS HCUP database were accurate (HCUP, n.d.). NIS HCUP data have been collected since 1988 and have involved a number of methods to validate the information reported by hospitals across the United States (HCUP, n.d.). This assumption was necessary to establish the relationship between the type of insurance and health care costs. If the data were not reliable and this assumption was not true, the relationship could not be established with any degree of reliability.

I further assumed that the cost-to-charge ratio files provided by HCUP were accurate. This information includes the average contractual discounts provided against all third-party payers to allow for a calculation to be made of actual costs, as opposed to the amount billed (HCUP, n.d.). This assumption was necessary to establish reliability in the calculation of average health care costs that would be used to determine the relationship with the type of insurance.

Summary

Health care costs present a significant economic challenge as expenditures approach 20% of GDP in the United States (Hartman et al., 2015). Individuals are more likely to voice concerns over high out-of-pocket costs, inability to pay for health care services, and not seeking care compared to many other developed countries. Factors associated with high-cost health care include the complexity of the industry, waste, lack of transparency, and type of health insurance used. The ACA was passed to reduce costs associated with health care services. Although more individuals have access to health

care services as a result of the ACA, less is known about the impact on health care costs. A review of the literature, detailed in Chapter 2, confirmed that research associated with the cost of health care has been limited due to a lack of transparency.

The purpose of the current study was to provide a deeper understanding of the relationship between the cost of health care services and the type of health insurance used over a period of 8 years. The study may provide additional transparency for consumers and legislators to make decisions related to the delivery of health care services. The longitudinal study was based on a theoretical background of mechanism theory and game theory. Mechanism theory focuses on incentives and penalties for taking a specific action while game theory focuses on personal gain.

Additional information regarding the methodology of the study is presented in Chapter 3. This includes the research design and approach, sample selection, instrumentation (NIS HCUP data), data collection and analysis procedures, and ethical concerns. A summary of findings related to each research question is presented in Chapter 4 including the procedures followed, data analysis, tables and figures of the findings, alternative interpretations, and outcomes. Chapter 5 presents implications and recommendations including an overview of the study, interpretation of the findings, implications for social change, recommendations, and a conclusion.

Chapter 2: Literature Review

As health care costs continue to increase at a rapid rate, additional information is needed to identify approaches that might be effective in reducing costs and improving the decision-making process for consumers, providers, payers, and policymakers in the United States (Muir et al., 2013). The purpose of this study was to provide information to improve transparency in the health care industry and to understand the relationship between type of insurance and health care costs, which could improve decision-making and lower the cost of health care services. Chapter 2 includes a review of the literature on health care costs, health insurance, the influence of the ACA, and other factors that influence decisions related to the purchase of health care services. The chapter contains a summary of the research problem, the purpose of the study, the literature review search strategy, and the theoretical framework that guided the study. The aspects of mechanism theory and game theory are discussed, including the origin of each theory, major propositions, previous applications, the rationale for using these theories, and how each relates to the present study.

I also present a brief historical review of the development of the health care industry and the regulations imposed by policymakers to influence the amount being spent for health care services. The discussion continues with an exploration of the current billing practices in the health care industry; the role of third-party payers, primarily insurance companies, in the billing cycle; and the role of the consumer in purchasing health care services. The chapter concludes with a summary of strengths and weaknesses

of previous studies, the rationale for variable selection and research question development in the current study, and a description of its unique contribution.

Problem Statement

Health care costs continue to be a primary concern for policymakers, business leaders, and patients as costs continue to rise (Muir et al., 2013). In 2013, the United States spent $2.9 trillion on health care, accounting for 17.4% of GDP and averaging approximately $9,255 per person (Hartman et al., 2015). Current data indicated that health care costs may exceed 20% of GDP by 2020 (Berwick & Hackbarth, 2012). Policymakers adopted the ACA in an attempt to reduce health care costs through provisions that increase the number of individuals with health insurance, improve health care delivery, and reduce waste (Rosenbaum, 2011). Recent studies supported the effectiveness of the ACA in increasing the number of individuals who have health insurance, which indicated movement toward the goal of universal coverage (Blumenthal et al., 2015; Sommers et al., 2013). However, evaluating health care costs has been difficult due to the lack of price and cost transparency in the health care industry.

Transparency in the health care industry includes the ability of the consumer to easily obtain and understand the pricing of specific services to make health care decisions. Misuse of information by consumers, complex billing practices and cost-shifting, contractual confidentiality requirements, preferred provider incentives, trade secrets, and health care provider resistance contribute to a lack of transparency (Muir et al., 2013). Sinaiko and Rosenthal (2011) defined transparency of health care costs as dissemination of the prices that a patient pays for medical care. Publishing credible

information related to health care costs may increase transparency and assist in reducing overall health care costs.

Purpose

The purpose of this quantitative longitudinal study was to provide a deeper understanding of the role of health insurance in the cost of health care services. The study was also intended to increase transparency of data related to the cost of health care services. Data from the NIS HCUP were analyzed to evaluate the relationship between the type of insurance and health care costs over a 6-year period.

An improved understanding of the role of insurance in driving health care costs should increase transparency for not only the patient but also for policymakers. The results of the study will be disseminated through publication in a scholarly journal to increase transparency of health care costs and to aid in the effort to reduce health care costs. The information regarding the relationship between health care costs and the type of health insurance may allow policymakers to determine whether additional legislation may be necessary to address health care costs. For example, legislation may be needed to require providers to disclose the costs of health care services to potential patients.

Literature Search Strategy

The search for appropriate literature included Google Scholar and library databases such as MEDLINE, PubMed, ScienceDirect, Academic Search Complete, ProQuest Central, ScienceDirect, Business Source Premier, ABI/INFORM Complete, and Wiley Online Library. Key words included *Affordable Care Act*, *bundled payments*, *capitation*, *hospital chargemaster*, *exemptions from ACA*, *fee-for-service*, *health care*

consumption, *health care costs*, *health care legislation*, *health care reform*, *health economics*, *health expenditures*, *health insurance coverage*, *health spending*, *hospital charges*, *Medicare*, *Medicaid*, *politics of health care*, *transparency*, and *third-party payers*. Various combinations of the key words were used during the search process. A summary of the search terms and results is presented in Table 1.

Theoretical Foundation

The theoretical foundation for this study was mechanism theory combined with game theory. Mechanism theory suggests that an organization uses incentives to obtain a specific behavior, objective, or outcome from a participant (Jackson, 2014). Game theory refers to a situation in which one party has incomplete information regarding the willingness of a second party to pay a specific price to maximize personal benefits rather than follow historical reasoning (Fudenberg & Tirole, 1993). Mechanism theory is coupled with game theory to determine whether an organization can achieve a desired result by implementing specific strategies and incentives to obtain a desired outcome (Jackson, 2014). In the case of health insurance, the U.S. government mandated universal health insurance coverage for all citizens, as identified in the provisions of the ACA (Rosenbaum, 2011). Health insurance reform and financial penalties for failure to obtain health insurance became the incentives to compel individuals to act and increase the number of citizens with health insurance (Sommers et al., 2013).

Table 1

Chart of Research

Key terms searched	Books	Scholarly journals	Secondary sources	Reviewed	Used
Affordable Care Act, bundled payments		17		8	1
Affordable Care Act, capitation		6		3	
Affordable Care Act, health expenditures	2	175	14	27	6
Affordable Care Act, health insurance coverage	6	209	1	16	4
Affordable Care Act, health spending	2	87	1	14	3
Affordable Care Act, hospital charges		15	3	4	
Bundled payments		174	4	12	1
Bundled payments, health expenditures		18	1	6	
Capitation reimbursement		34	1	9	2
Exemptions from the ACA		1		1	
Fee for service reimbursement		135	1	23	2
Health care consumption		401	1	17	2
Health care costs	7	25,102	623	48	2
Health care legislation		338	6	35	14
Health care reform	11	17,310	1,781	26	17
Health care reform, health care costs		1,143	73	47	5
Health care reform, health expenditures		731	46	18	3
Health care reform, third-party payers		123	12	21	7
Health care reform, transparency		92	2	8	2

(table continues)

Key terms searched	Books	Scholarly journals	Secondary sources	Reviewed	Used
Health expenditures	8	9,194	453	63	18
Health insurance coverage		2,245	9	22	24
Health spending	3	1,922	66	42	3
Health spending, transparency		10		6	
Hospital chargemaster		2		2	1
Politics of health care	2	208	7	14	2
Transparency, Medicaid		57	4	17	1
Transparency, Medicare		95	6	27	3
Total sources	41	59,844	3,115	536	123

Carter et al. (2014) determined that mechanism theory could be applied to cost-effectiveness measures to prioritize health care services using quality-adjusted life years and available resources. Grennan (2014) applied game theory to health insurance pricing models and found that costs for the same services from a single provider varied by up to 79%. These two examples provide additional evidence that mechanism and game theory can support a framework to explain the complex nature of health care costs.

Complexities of decision-making can inhibit the effectiveness of a single incentive. Jackson (2014) suggested that the simplest solution is an implementation of a tax to achieve the desired result. The ACA established a tax for not obtaining health insurance, which becomes increasingly higher each year (Eastman & Eastman, 2013). According to mechanism design theory, the tax penalties established by the ACA should significantly influence the choice of health insurance and produce a shift in health

insurance from self-pay to the most cost-effective health insurance for U.S. citizens: private health insurance.

Development of the Health Care Industry

Health care has a history that predates the creation of the United States. In 1900, the health care industry was viewed as medieval, consisting primarily of concoctions to drink or bathe. The average American spent less than $5 per year on health care services (approximately $100 today), which did not facilitate the need for medical insurance (Byrd & Clayton, 2015). Hospitals began to develop as a place for the indigent and ill to die. As information began to be collected from hospitals to evaluate health outcomes, policymakers began to recognize the need for health policy to regulate the health care industry. The Sheppard-Towner Act, passed in 1921 as P.L. 67-97, was the first major effort to develop a national health care program to improve maternal health outcomes. The program was established, after considerable lobbying by the Women's Joint Congressional Committee, and provided $1.48 million for Fiscal Year 1922 and $1.24 million for each of the next 5 years (Lemons, 1969). Funds were allocated to each state and included $5,000 outright, a $5,000 match of state funds, and the remaining amount to be allocated based on the population to provide for maternal and child health centers (Lemons, 1969).

By the late 1920s, health care services began to develop further and hospitals started to market obstetric services. Baylor University Hospital in Dallas, Texas determined that an individual could afford to pay a small monthly premium, but a large hospital bill could take up to 20 years of savings. Hospital administrators approached a

group of teachers in the Dallas area and offered to pay for hospital stays in exchange for a monthly premium of $0.50. The plan was derived from the Marine Hospital Services, which originated in the late 1700s and charged $0.20 per person on each ship that ported (Lobachev, 2013). This plan grew rapidly and eventually developed into Blue Cross as the effects of the great depression took hold across the United States (Brill, 2015).

The Social Security Act, P.L. 74-271, was passed by Congress in 1935 (Social Security Administration, 1937). The regulation was the first social insurance policy that required all states to participate and focused on what was commonly referred to as old-age insurance. The original Act lacked provisions for national health services. However, programs were included that were previously established by the Sheppard-Towner Act. The original bill provided benefits to individuals who were retired, unemployed, or deceased. All citizens of the United States were eligible to participate with the exception of agricultural and domestic workers, and the Act was funded through a required match of 50% from each individual state (Davies & Derthick, 1997). The exclusion of agricultural and domestic workers was added to induce support from the South, resulting in many individuals opposing the Act because it excluded more than 60% of the Black population from receiving benefits (Davies & Derthick, 1997). This provision was eliminated in 1950, and agricultural and domestic workers became eligible for Social Security benefits (Davies & Derthick, 1997).

World War II led to wage and price controls during the 1940s. Employers turned to benefit packages as a method to attract employees. Wage freezes and a severe shortage of available workers during World War II led to a ruling by the War Labor Board that

employers could use fringe benefits, including health insurance, to attract and retain employees. The Revenue Act of 1954, P.L. 83-591, provided further incentives for employer-sponsored health plans by making employer contributions tax exempt (Thomasson, 2000). The regulation improved access to health insurance from 48% in 1953 to more than 67% in 1958, resulting in the development of employer-sponsored health insurance in the United States (Thomasson, 2000). Prepaid group medical plans were created, and the model of employer-paid health insurance began (Fox & Kongstvedt, 2013).

The pressures of the war challenged resources to provide health care services. To encourage a correction in the number of hospital beds available, the Hill-Burton Act, also known as the Hospital Survey and Construction Act or Public Law 79-275, passed in 1946 (Brinker & Walker, 1962). The act provided grants to fund the construction of hospitals. The regulation allowed for separate but equal facilities but prohibited discrimination based on race, religion, or national origin when providing services (Brinker & Walker, 1962). In addition, hospitals were required to provide a reasonable volume of charity care. The Hill-Burton Act funded approximately 23% of all hospital construction between 1948 and 1954, which significantly increased the number of hospital beds available to 73% of the estimated need (Brinker & Walker, 1962). An amendment was adopted in 1954 that added other areas of need including diagnostic and treatment centers, chronic illness hospitals, rehabilitation facilities, and nursing homes (Brinker & Walker, 1962).

The 1950's were a decade of medical advancement. Medications became available to treat infections, glaucoma, and arthritis. Immunizations were developed to prevent childhood diseases, including polio. The first successful organ transplant was performed. Health care costs were approximately 4.5% of GDP (Alexander, 2013). Numerous legislative proposals were introduced to provide hospital insurance but all were eventually defeated. Federal responsibility for providing health care to the poor was established (Alexander, 2013). The Kerr-Mills Act was passed in 1960 as Public Law 86-778. The act provided federal funds to state programs that provided medical care to the poor over age 65 (Moore & Smith, 2005). This regulation would lay the foundation for the Medicaid program. The law included inpatient hospital services, skilled nursing facilities, physician services, outpatient hospital and clinic services, home health services, private nursing services, physical therapy dental services, laboratory and x-ray services, prescription drugs, eyeglasses, dentures, preventive services, diagnostic and screening services, and any other medical care recognized by state law (Moore & Smith, 2005).

Medicare and Medicaid became law in 1965 as part of Social Security Amendments of 1965, commonly referred to as Title XIX of Public Law 89-97, in an effort to control health care costs, provide affordable insurance for the elderly, and provide care to the poor (CMS, n.d.c). Both Medicare and Medicaid have evolved throughout history as numerous amendments by various acts have altered the legislation including the Medicare Catastrophic Coverage Act (MCCA), the Consolidated Omnibus Budget Reconciliation Act (COBRA), the Federal Budget Reconciliation Act (OBRA),

and the Medicare Prescription Drug Improvement and Modernization Act of 2003 (MMA).

Medicare was designed to provide medical coverage for individuals over the age of 65 or disabled individuals. Medicare originally included Part A and Part B. Medicare Part A provided hospital care, skilled nursing services, and home health care. Medicare Part B was an optional portion of the program designed to provide physician services for individuals that were willing to pay an additional premium.

Medicaid was established as a separate program to assist states in providing health care services, including long-term care and health insurance, for the poor (CMS, n.d.c). In 1967, amendments to the Act add optional categories of health services for individuals not receiving cash assistance, including Early and Periodic Screening and Diagnostic Testing (EPSDT). In 1972, states were required to provide benefits to any individuals receiving cash assistance from Medicare or apply the 1972 eligibility requirements for both elderly and disabled.

The increased demand for health care services created a shortage of physicians. In addition, there was a significant shift to specialty practices resulting in an increase from 55% of physicians reporting as specialists in 1960 to more than 69% in 1969 (Alexander, 2013). Congress enacted legislation to improve and expand medical education in an effort to reduce the shortage. The Federal Employees Health Benefit Plan was created in 1960 to provide health insurance coverage to federal employees (Moses, Matheson, Dorsey, George, Sadoff, & Yoshimura, 2013).

In response to a continued rise in health care costs and a shortage of physicians, policymakers enacted several new regulations. Neighborhood Health Centers were established as part of the Office of Economic Opportunity, which was created by the Economic Opportunity Act in 1964, P.L. 88-452, to provide health care services to the poor and assist communities that were identified as medically underserved (Rosen, 1971). Wage and price freezes began in 1971 restricting increases in physician and hospital charges (Blumenthal, Stremikis, & Cutler, 2013). These restrictions were lifted in 1974. Additional resources were also provided to medical schools to increase enrollment. A shift began to occur in the enrollment of women in medical school accounting for an increase from 7% of all medical students in 1970 to more than 25% in 1979 (Bailey & Goodman-Bacon, 2015).

As efforts to reduce costs began to become a priority in the 1980's, new reimbursement models were introduced. One major change was a switch to capitation reimbursement models versus fee for service. Capitation models were based on a set monthly payment per member covered. This model reduced the exploitation of health care providers encouraging unnecessary utilization of services; however, many individuals were not receiving necessary services to improve population health. Medicare also changed from a fee for service model to a DRG reimbursement model in 1983 (Santo, 2013).

Another significant regulation was Emergency Medical Treatment and Active Labor Act (EMTALA), which found roots in a health care industry practice known as patient dumping and was created when the Consolidated Omnibus Budget Reconciliation

Act, P.L. 99-272, was passed in 1986. Private hospitals would transfer uninsured patients to public hospitals without regard to the condition or stability of the patient (Zibulewsky, 2001). Industry studies showed that patients were more than twice as likely to die when transferred to another hospital (Zibulewsky, 2001). In order to facilitate compliance, the Office of the Inspector General can levy fines in the amount of $50,000 per patient for hospitals with more than 100 beds, while smaller hospitals can be fined $25,000 (Zibulewsky, 2001).

Managed care organizations continued to implement cost-saving measures due to the rapid rise of health care costs during the 1990's. The National Committee on Quality Assurance (NCQA) was established in 1990 to oversee and accredit managed care health plans (Essock, Olfson, & Hogan, 2015). Health care costs grew at more than twice the rate of inflation during the decade prompting additional efforts to pass federal health care reform. More than 16% (approximately 44 million individuals) of the U.S. population lacked health insurance, primarily due to affordability (Oliver, 2014). Coupled with the challenge of HIV/AIDS, which impacted almost 140,000 individuals with a 60% mortality rate, the health care crisis continued to accelerate (Oliver, 2014). The Vaccines for Children program was established in 1993 using federal funding to allow individual states to promote vaccination programs for children (Okonko et al., 2013). The expansion of vaccinations resulted in a significant reduction of childhood diseases and improved population health.

In 1996, the Medical Expenditure Panel Survey (MEPS) was designed to result in the ongoing collection of information and provide annual information related to health

insurance coverage, access to care, utilization of health services, and health costs (Berdahl, Friedman, McCormick, & Simpson, 2013). This was a significant improvement upon the NMCES conducted in 1977 and the NMES conducted in 1987 (Berdahl et al., 2013). The Census Bureau conducted the current population survey in 1997 and estimated that 42.4 million individuals (15.7% of the population) were without insurance (Murphy et al., 2016). The Balanced Budget Act of 1997 included a number of provisions to change health provider reimbursement methods to slow the growth in health care spending (Manchikanti, Staats, Boswell, & Hirsch, 2015).

Health Insurance Portability and Accountability Act (HIPAA) was passed in 1996 as P.L. 104-191 in an effort for individuals to maintain health coverage between jobs, restrict the use of pre-existing condition provisions by health insurers, establish standards for medical record privacy, and establish tax benefits for long-term care insurance (HIPAA of 1996). The act has generated an enormous burden of compliance and has become one of the most heavily regulated areas within the health care industry. The regulation requires that providers, health insurance companies, and financial institutions adopt standards that protect personal health information and develop practices to ensure that information is only utilized by authorized individuals for specific purposes (HIPAA of 1996). Significant financial penalties can be imposed, $100 per violation up to $25,000 per year, if the information is wrongfully disclosed to any party (HIPAA of 1996).

As part of the American Recovery and Reinvestment Act of 2009 (ARRA), P.L. 111-5, a significant amount of funding was provided to the health care industry. Approximately $155 billion was provided to assist with improvements that included

$86.8 billion for Medicaid, $25.8 billion for information technology, $25.1 billion to subsidize health insurance premiums under COBRA, $10 billion for health research, $2 billion for community health centers, $1.3 billion for construction of military hospitals, $1.1 billion to study the effectiveness of health care treatments, $1 billion for prevention and wellness, $1 billion for the Veterans Health Administration, $500 million for health care services on Indian reservations, $300 million to train workers in the National Health Service Corps, and $202 million for a temporary moratorium on specific Medicare regulations (ARRA of 2009).

During the 2000's, health care costs continued to rise at rates that were determined to be unsustainable. Medicare costs were expanding at a rate that would bankrupt the program within 20 years and private employers began to reduce health insurance benefits in an effort to maintain competitiveness (Altman & Frist, 2015). The rise of the Internet was adding to the problem as consumers became more educated and demanded expanded health care services. Medical devices and medications were being advertised directly to consumers, further driving the increase in health care costs (Mackert & Guadagno, 2013). The expansion of technology and an increase in treatment options brought about further increases in health care expenditures. The Census Bureau estimated that the number of uninsured individuals had grown to approximately 45.6 million individuals, just over 15% of the United States population (Fronstin, 2013).

A number of states and local governments began to enact legislation in an effort to achieve health care reform and reduce the number of individuals uninsured. Just a few examples included Maine, Massachusetts, Vermont, and the City of San Francisco.

Maine passed the Dirigo Health Reform Act in 2003 that created subsidized insurance coverage to individuals and small employers, expanded Medicare coverage, and created the Maine Quality Forum (Riley, 2013). Massachusetts passed legislation in 2006 requiring all individual residents to obtain health insurance and funded the plan through shared responsibility of individuals, employers, and government, which resulted in a 50% reduction of uninsured residents within two years (Girasa, 2013). In 2006, Vermont modeled the plan of Massachusetts and created Blueprint for Health, which focused on improved quality of care and management of chronic health conditions (Hong, Siegel, & Ferris, 2014). The City of San Francisco created the Healthy San Francisco program in 2006 that provided universal access to health services for residents within the city (Hutson, 2015). In addition, the city mandated a minimum amount per hour to be spent on health care for employees. This provision was challenged in court in 2008, but the Ninth Circuit Court of Appeals upheld the legislation (Hutson, 2015).

Many health care experts agreed that the industry needed to be overhauled in order to control costs and provide the services necessary to promote a healthy population. President Obama created the Office of Health Reform to provide recommendations and coordinate efforts for national health reform. On March 23, 2010 the Patient Protection and Affordable Care Act, commonly referred to as ACA or P.L. 111-148, was signed into law in an effort to provide affordable health care to all individuals within the United States, reduce overall health care spending, and provide reforms within the health care industry (Kominski, 2013). The law included provisions to reform a variety of concerns related to the delivery of health care services such as guaranteed issue health insurance,

minimum standards for health insurance policies, an individual mandate to secure health insurance, provide subsidies to individuals that could not afford health insurance coverage, expand Medicaid eligibility based upon increased income levels, provide coverage for dependents to age 26, elimination of lifetime limits on health insurance policies, providing coverage for preventive care and screenings, reduce hospital readmissions, and require employers to offer insurance coverage or be penalized (Elmendorf, 2011).

Because of the far-reaching impacts of the ACA, Vicini and Stempel (2013) recognized the legislation as the most significant law to affect the health care industry since the passing of Medicare and Medicaid programs in 1965. According to estimates from the Congressional Budget Office (CBO), the number of uninsured individuals has been reduced by 43% since the implementation of the program (Obama, 2016). Insurance policies contain standard provision across all offered plans from an organization and merely differentiate based upon out of pocket costs and deductible amounts (Buttorff, Andersen, Riggs, & Alexander, 2015). According to Heim, Hunter, Lurie, and Ramnath (2015), more than 70% of all individuals have experienced a decrease in health insurance premiums when considering tax benefits and subsidies offered since the implementation of the ACA. In addition, overall health care costs have stabilized at 17.9% of GDP and the change in overall health expenditures are at the lowest levels in more than a decade (Frean, Gruber, & Sommers, 2016). The CBO's estimate of a net deficit reduction of $200 billion from 2012 to 2021 has been revised to approximately $110 billion (Kilgour,

2016). Even with the adjusted amount of savings, the ACA is having an impact on the overall costs of health care.

Summary

The health care industry has evolved throughout history based upon societal expectations and evolution that has determined that access to basic health care services are a fundamental right. This evolution has created an industry that is extremely complex and highly regulated, and yet highly secretive. As a country, the United States is in a health care crisis in which expenditure levels cannot be sustained. The challenges of providing efficient and effective health care services at an affordable cost continue to divide policymakers on the most appropriate solutions. The legislation that has been discussed has developed the current practices within the health care industry and influenced consumers regarding purchase decisions. Unfortunately, the lack of transparency has inhibited the disclosure of pertinent information that is needed for the decision-making process. In order to correct the course of the industry, a shift in thinking, expectations, and business models must be implemented to arrive at innovative solutions to provide a balance between access, quality, and cost.

Current Industry Practices

The health care industry has developed into a complex $3.8 trillion industry (Prabhu, 2016). Social expectations and previous legislation have influenced the development of current industry practices that are unique. The inclusion of a third-party payer has created an environment that has been built upon principles of confidentiality between payer and provider and requirements for patients to utilize networks that provide

the most cost-effective care based upon contractual negotiations rather than quality outcomes. In order to more fully understand these challenges, the sections that follow, including the role of consumers, the role of third-party payers, and the role of health care service providers includes an in-depth analysis focused on the lack of transparency that leads to an overall increase in health expenditures.

Role of Consumers

The role of consumers has become more and more limited due to the current structure of the industry. Consumers are largely limited to selecting a health plan, either private or government, based upon eligibility and availability determined by criteria that cannot be controlled (Handel & Kolstad, 2015). For example, more than 53% of all individuals obtain health insurance through an employer-sponsored plan, which typically restricts the choice of the consumer to two or three options, usually from one insurance company, that varies primarily based upon deductibles and coinsurance payments (Frean et al., 2016). Although the options within the chosen health plan established the provider network, deductibles, coinsurance payments, and access to services, almost 80% of employees could not even correctly identify the proper amount of the deductible (Handel & Kolstad, 2015). The results of this study indicate that many consumers are making complex decisions based upon coinsurance amounts and the availability of a provider in the provider network of the selected health insurance plan.

In the Netherlands, the ability of a consumer to switch health insurance plans without interference led to a reduction in overall health costs (Duijmelinck, Mosca, & van de Ven, 2015). The authors noted that most consumers that made a change did so to

reduce the monthly health insurance premium, improve customer service, changing provider networks, to enhance the benefits of supplemental insurance, or obtain a welcome gift. Almost 64% of all individuals that made a change in health plans did so to achieve a lower health insurance premium (Duijmelinck et al., 2015).

Consumer driven health care is driven by reduced health care costs while improving access and quality (Hilsenrath, Eakin, & Fischer, 2015). Information regarding costs is an essential component to influence purchase decisions. Consumers are basing purchasing decisions using the best available information, the amount of coinsurance. Hilsenrath et al. (2015) found that consumer and provider behaviors varied greatly when price transparency increased. In addition, the authors noted that the increased utilization of high deductible plans and cost-sharing mechanisms increased the desire for more information (Hilsenrath et al., 2015). Consumer behavior can be influenced by appropriate models and incentives, ultimately achieving cost savings and lifestyle modification.

As health expenditures continue to rise, total health care costs are a concern to consumers and policymakers. Koijen, Philipson, and Uhlig (2016) found that several models predicted overall health expenditures to level out at approximately 34% of GDP. As consumers and policymakers continue to look for cost savings within the health care industry additional transparency, accountability, and reimbursement models must drive innovation in achieving sustainability within the industry.

Role of Third-Party Payers

Third-party payers, primarily insurance companies, have historically paid the majority of health care costs. This relationship has a direct impact on the decision-making process when a consumer purchases health care. According to Buff and Terrell (2014), patients are less likely to be concerned about the price of health care services because third-party payers (insurers) pay the majority of the cost. Cost-sharing between third-party payers and patients for hospital services was approximately 97% for the insurance company and 3% for the patient while total health care expenditures averaged 88% for third-party payers and 12% for the consumer (Herrick, 2010). Herrick provided an example of the cost of cosmetic surgery, which is not typically covered by insurance, increased 21% since 1992 while health care costs rose 98% and the Consumer Price Index for all goods increased 53% (Herrick, 2010). The involvement of third-party payers has significantly influenced consumer decisions and reduced the traditional economic relationships between a supplier and purchaser (Rice, Rice, & Wedig, 2015).

The provisions of the ACA were aimed at increasing the role of third-party payers in providing health care services. The additional regulation has increased the cost of health care services rather than allowing the free market to encourage price sensitivity by the consumer because the cost continues to be shifted to a third-party payer (Buff & Terrell, 2014). Martin et al. (2016) reported that in 2014 health care spending increased 5.3%, fueled primarily by coverage expansions required by the ACA and the increased cost of prescription drugs. The largest increase in spending came directly from an

increase in spending within the federal government, resulting in a 2% market share from private insurance to government spending (Martin et al., 2016).

The U.S. Department of Health and Human Services (HHS) established a three-tiered approach to address the challenges associated with a continued increase in costs: 1) provide incentives for high-quality care, 2) increased coordination of care, and 3) increased information to providers and consumers to improve decision-making abilities, which have reduced Medicare spending growth to 2% per year per patient from 2010 to 2014 (Burwell, 2015). This represents a significant reduction from the overall growth in health care expenditures. Unfortunately, the areas focus established by HHS are having minimal impact on health care costs.

As the growth in health expenditures continue, consumers are becoming more educated and engaged when purchasing health services. The trend is also changing the perspective about the role of third-party payers. Consumers and policymakers are becoming more demanding about the role of a third-party payer in curbing fraud and waste. The Federal Bureau of Investigation reported that fraudulent billings to public and private insurance amounted to as much as 10% of total billings, accounting for as much as $380 billion in health care costs today (Byrd Jr, Smith, & Helms, 2015). Third-party payers are in a unique position that increases the potential for detecting and averting fraud prior to claims being paid (Byrd Jr et al., 2015). Consumers and policymakers are looking to third-party payers to increase fraud detection and prevention activities in order to reduce unnecessary costs.

Another area that is garnering the attention of consumers and policymakers is waste within the health care industry. Estimates of fraud within the health care industry range from $75 billion to almost $1 trillion in total expenditures. Doyle, Graves, and Gruber (2015) developed an analysis of consensus from numerous studies and arrived at an amount of 5% of GDP, more than 30% of all health care expenditures. The authors identified a number of factors that increased the likelihood of increased spending and poor quality outcomes including 90-day total spending, inpatient versus non-inpatient spending, and post-acute care. Third-party payers have the ability to quickly access and analyze provider data in an effort to identify key indicators of waste, which could lead to quicker interventions and reduce a significant amount of waste within the industry (Doyle et al., 2015).

Liu et al. (2015) developed a graph analysis technique that could be utilized by third-party payers to evaluate claims data and identify patterns associated with higher levels of fraud, waste, and abuse. Key indicators could provide third-party payers with essential information that would lead to deeper levels of investigation prior to paying claims, resulting in a reduction of health expenditures that could save hundreds of billions of dollars annually (Liu et al., 2015).

Type of Health Insurance

Health insurance refers to a program that protects against the cost of medical insurance. Franklin Health Assurance Company of Massachusetts was the first organization to offer accident insurance in 1850 to cover individuals working in the railroad or steamboat industries (Green, 2016). Hospitals began offering individual

coverage during the 1920's (Oberlander, 2015). Teachers in Dallas, Texas created the first employer-sponsored health insurance plan in 1929. Blue Cross was organized in the 1930's to consolidate hospital insurance plans and pool the risk to a larger group (Oberlander, 2015). Blue Shield followed shortly thereafter to provide medical insurance. Medicare and Medicaid were created in 1965 through the Kerr-Mills Act to provide hospital and medical coverage to the elderly and poor (Oberlander, 2015).

Type of health insurance organizations can be grouped into two categories including government insurance and private insurance. Approximately 84% of the U.S. population had some form of health insurance in 2010, leaving approximately 49 million Americans uninsured (Shi & Singh, 2015). Uninsured individuals are classified into a separate category referred to as self-pay. In 2010, government insurance covered approximately 31% of the population but accounted for 44% of total health care expenditures (Shi & Singh, 2015). Each category of insurance is treated slightly different, based upon the evolution of the health care industry and the demands placed upon health insurance companies.

Government insurance. Government insurance can be broken down into three payers: Medicare, Medicaid, and military insurance. In 2010, Medicare covered approximately 14.5% (approximately 45 million individuals) of the population, Medicaid covered approximately 15.9% (approximately 49 million individuals) of the population, and military insurance covered approximately 4.2% (approximately 13 million individuals) of the population (Fronstin, 2013). The totals exceed 31% of the population because a number of individuals were covered by more than one government plan.

Medicare. Medicare is a federal government health insurance program provided to individuals over 65 years of age, individuals with disabilities, and those with permanent kidney disease requiring dialysis or a transplant (ESRD) (CMS, n.d.b). The program consists of hospital insurance (Part A), medical insurance (Part B), managed care plans (Part C), and prescription drug coverage (Part D) (CMS, n.d.b).

Medicare reimbursement methodology has been derived from a long history of public policy that has evolved into primarily a fee-for-service model with set reimbursement rates for specific DRG codes with the associated costs increasing from $385 per beneficiary in 1970 to more than $12,200 per beneficiary in 2013 (Blumenthal, Davis, & Guterman, 2015). In an effort to control costs, legislation was passed in 2001 that limited the growth of expenditures to a sustainable-growth-rate formula, which has subsequently been deferred every year due to a concern over access to care (Blumenthal et al., 2015). Additional measures were adopted beginning in 2007 that provided incentives and penalties to providers to electronically report quality data and implement electronic health records (Blumenthal et al., 2015). The authors surmise that continued challenges associated with access to care, a gap in funding for long-term care services, an aging population, and responsibilities of cost-sharing measures through large copayments will continue to stress an already overburdened and underfunded program.

Medicaid. Medicaid is a joint partnership between federal and state government to provide health care services to individuals that qualify based upon income levels and available assets (CMS, n.d.a). Funding is shared based upon Federal Medical Assistance Percentages (FMAP), which are determined based upon program criteria and need (CMS,

n.d.a). The rapid growth in health care costs and an increased demand for services has propelled Medicaid expenditures beyond $475 billion (Keehan et al., 2016). A number of states are spending more than half of total state expenditures on Medicaid services (Keehan et al., 2016).

Reimbursement models for Medicaid have relied heavily upon fee-for-service structures until the last few years. More states are moving to a capitated model in order to provide access to services while controlling costs (Zuvekas & Cohen, 2016). Unfortunately, the capitation model has had limited effectiveness in controlling overall health expenditures, which have prompted a number of states to abandon the capitation model resulting in approximately 95% of all physician services in 2013 being paid through a fee-for-service reimbursement model (Zuvekas & Cohen, 2016). Patel, Presser, George, and McClellan (2016) advocate for a variety of alternative payment models to improve quality and reduce waste. For example, gastroenterological care has seen significant cost savings when utilizing bundled payments for an episode of care combined with a capitation model to treat chronic conditions (Patel et al., 2016). Similar adjustments to reimbursement models across a variety of specialties could lead to substantial cost savings while improving the quality outcomes and population health.

Military insurance. Military insurance accounts for a very small portion of total government insurance expenditures (Carman, Eibner, & Paddock, 2015). According to Sorensen, Nonzee, and Kominski (2016) military insurance covers approximately 10 million beneficiaries at an annualized cost of approximately $40 billion. The military insurance program also referred to as TRICARE, has been operating similarly to other

insurance organizations by providing access to services through a network of providers that typically includes full-time military facilities when available (Sorensen et al., 2016).

The primary advantage of the TRICARE system has been the availability of military personnel and facilities, which has led to significant cost reductions with the network. TRICARE operates more as a single payer system in areas that have military hospitals and clinics (Sorensen et al., 2016). Another example of innovation within the TRICARE system is the implementation of split benefit practices. This practice reduces the utilization of high cost, low value services by increasing the cost sharing burden of the beneficiary. Robertson, Yokum, Sheth, and Joiner (2015) found that regardless of the type or amount of the split, patients consuming high-cost, low-value services decreased from 69% to 42%, resulting in immediate savings to the third-party payer. In addition, the authors noted that there was overwhelming support (more than 70%), regardless of political affiliation, for implementing this type of benefit within Medicare and Medicaid (Robertson et al., 2015).

Private insurance. Private insurance has been modeled in various forms in the United States since as early as the 1700's when Maritime Hospital Services established a payment system for each individual arriving on a ship was provided necessary health care services in exchange for a set fee. As a major stakeholder in the health care industry, private insurance companies have an established history of assuming the risk associated with individual health and appropriately compensating health providers in exchange for a monthly premium (Cifuentes & Fernandez, 2016). Because of the reliance on private health insurance companies, policymakers were heavily influenced in developing

coverage mandates established by the ACA.

The ACA has resulted in approximately 16.9 million uninsured individuals to obtain health insurance (Carman, Eibner, & Paddock, 2015). Of the uninsured individuals that obtained coverage, almost 9.6 million achieved coverage through Medicaid. Frean et al. (2016) reported that 40% of the net gains in coverage could be attributed to private insurance, while the remaining 60% was attributed to individuals obtaining coverage through Medicaid. Approximately 16% of the U.S. population continues to remain uninsured. According to Mach (2015), many individuals have chosen not to obtain coverage due to a qualifying exemption provided by the ACA. Exemptions include religious conscience, hardship, membership in a health care sharing ministry, Indian tribe membership, incarceration, affordability, unlawful resident, coverage gap, filing threshold, and living abroad (Mach, 2015). In addition, the penalty amount continues to be substantially lower than the cost of health insurance for most individuals. The penalty has increased from $285 in 2014, $975 in 2015, and $2,085 in 2016 (Mach, 2015). Hackmann, Kolstad, and Kowalski (2015) found that the optimal penalty for not obtaining coverage was $1,461, which equaled approximately 24.9% of the cost of an individual health policy.

Although various reimbursement models have evolved within the health care industry, health insurance is used as the primary gateway for accessing services from providers (Cifuentes & Fernandez, 2016). As the primary gatekeepers, private insurance has the ability to influence individual health status. Cifuentes and Fernandez (2016) found that over 70% of health insurance coverage was directly linked to socioeconomic

indicators including earning, wages, interests, rentals, retirement income, social security income, and poverty level. The relationship links were even more pronounced at income levels below 147% of the federal poverty level (Cifuentes & Fernandez, 2016). The authors acknowledged that health care coverage is merely a reproduction of income distribution and does not equate to improved population health and development.

The role of the private sector in achieving universal health coverage has increased significantly over the last decade (McPake & Hanson, 2016). In order to achieve sustainable goals and improve health care quality measures, six primary objectives were found to be essential components of public policy including encouraging the availability of good quality and affordable services, reducing the number of unqualified and low-quality providers, optimizing the mix of public and private services, developing an increased role for private providers, increasing regulation to prevent predatory practices within the industry, ensuring that public subsidies are provided to the most vulnerable individuals within the population (McPake & Hanson, 2016).

Private health insurance companies will continue to be key stakeholders in the health care industry. In addition, as one of the most influence lobbying groups with the country, policymakers will continue to adhere to the essential provisions in obtaining universal health coverage, as determined by private insurance companies (Jacobs & Skocpol, 2015).

Role of Health Care Service Providers

The practices of health care service providers have been heavily influenced by third-party payers. Contracts with third-party payers dictate reimbursement methodology

and specify allowable services. This contractual relationship has reduced the ability of the provider to act in the best interest of the consumer. The following sections have been provided to improve the understanding of the relationship between provider, third-party payer, and consumer within the health care industry.

Reimbursement models. Payment models typically consist of four common components that include basis of payment, rate of payment, other design details, and the role of chance (Friedberg et al., 2015). Basis of payment includes a component of a service provided, a member covered for a period of time, an episode of care, or services for a specified period of time (Friedberg et al., 2015). Rate of payment can vary from a flat rate, variable rates such as relative value units (RVU), outcomes of care, and processes of care such as a diagnostic related group (DRG) (Friedberg et al., 2015). Other design details include provider requirements to be eligible to participate, the individual or organization that is to receive payment, the timing of payments, and the participation in costs directly from the consumer (Friedberg et al., 2015). Role of chance focuses on the likelihood that an individual needs health care services and is based upon a mathematical calculation, typically undertaken by an actuary (Friedberg et al., 2015). Each of these components combine to form a reimbursement model that may range from fee for service in which a provider is paid based upon the services provided to capitation in which a provider is paid a monthly fee for each member of a given plan (Brunoni, Dolinger, Walker, Wood, & Coustasse, 2015).

The reimbursement model is determined primarily by the third-party payer and health care services provider based upon a contractual agreement. Contracts provide the

requirements of providing services and the level and type of reimbursement (Mikkers & Ryan, 2016). Additional provisions direct performance, levels of responsibility, and penalties associated with the contractual relationship (Mikkers & Ryan, 2016). The consumer has no involvement in the development of contractual provisions, resulting in minimal influence on the selection or performance of a health care provider (Mikkers & Ryan, 2016). Ketelaar (2015). Found that the availability of comparative performance measures to consumers increased patient engagement, directly influenced provider selection, and improved the overall quality of care.

Chargemaster rates. The health care prices charged to consumers are determined by a number of factors. Hospitals and other providers develop a retail price list for services based upon a common set of procedure codes (Bai & Anderson, 2015). The price list is known as the chargemaster rate. This allows the provider to prepare a bill for services provided to a patient. Chargemaster rates were used to determine the rate of reimbursement for Medicare under old reimbursement models but no longer influence reimbursement from Medicare, Medicaid, or private insurance (Bai & Anderson, 2016). Chargemaster rates were used to determine the price of services for individuals that are uninsured and as a starting point for negotiation with third-party payers (Bai & Anderson, 2016). Bai and Anderson (2016) found that although these rates were no longer relevant for Medicare billings, a one-unit increase in the charge-to-cost ratio resulted in $64 higher revenue per adjusted discharge, resulting in significantly higher revenue for the hospital. Average charge ratios varied between 2.07 and 2.30 times higher for a for-profit hospital when compared to a non-profit or government hospital (Bai & Anderson, 2016).

Although chargemaster rates are required to be related to the overall cost structure within the organization, many individuals compare the structure to manufacturer suggested retail prices. Meisel, VonHoltz, and Merchant (2016) shared information regarding a viral post of a bill for a surgery. The authors noted that although there has been an increase in regulations regarding the availability of cost data, the information is based on chargemaster rates, which has little relationship to the actual cost of service.

Contractual allowances. Contractual allowances are the discount for services from the chargemaster rate to the contracted rate to be paid as established in the contract between the provider and third-party payer. Based on a review of health insurance claims between 2007 and 2011, Cooper, Craig, Gaynor, and Van Reenen (2015) found that health care costs for MRIs varied by more than 12 times across the nation, averaging more than 100% within the same region. Additionally, in geographic areas that had fewer than four hospitals, the average price of health care costs was more than 15.3% higher than monopolistic markets (Cooper et al., 2015). Unfortunately, the information being evaluated may not provide accurate information to consumers. The proposed study is focused on chargemaster rates, as opposed to the actual price of health care services.

Third-party payers have long negotiated contractual rates in order to obtain cost savings, risk management, and leverage the provisioning of health services (Rice et al., 2015). As the health care industry has evolved, the traditional functioning of market-based economic principles have not held true (Rice et al., 2015). According to the authors, the minimal amount of consumer participation in the cost of services has significantly reduced the consumer motivation to maximize utility. In an effort to

increase transparency of health costs, regulators implemented a requirement for third-party payers to provide an explanation of benefits (EOB) (Green, 2016). Green (2016) summarized the information on an EOB to include the payee, payer, patient, service performed, the fee charged, the amount the patient was responsible for paying, and any adjustments to the cost. In essence, each time a third-party payer paid a provider for services, a detailed statement was provided in which a patient could determine the discount level from the chargemaster rate and identify the amount that was actually paid for the services provided.

While the EOB improved the transparency of health expenditures, Stern (2015) found that most consumers did not have a sufficient level of health literacy to understand the information provided on the EOB. The consumer only focused on the amount that she/he was responsible for paying. Nation (2016) presented the legal perspective of chargemaster rates across the country are grossly inflated and unfair because of the reflection of a price that is meant to be discounted, not paid. The lack of understanding presents in industry reform legislation, including the ACA, as policymakers refer to provider gross charges, clearly referring to chargemaster rates (Nation, 2016). According to Nation (2016), the solution "requires price and quality transparency so that consumers can actively choose the best value in healthcare" (p. 168).

Ratanatawan, Elifnur Yay Donderici, Miller, and Morgan (2016) found that the use of an all-payer claims database providing cost and quality measures is growing rapidly. Unfortunately, many of the databases focus on either cost or quality measures,

not both resulting in assumptions being made about the quality of health care services for a low price (Ratanatawan et al., 2016).

Meisel et al. (2016) indicate that the collection of information directly from consumers may be the most effective method of solving the problem of transparency of costs within the health care industry. One challenge with this approach is the inability to verify the accuracy of the information being provided, which may continue to exacerbate the problem (Meisel et al., 2016).

Consumer information. Many consumers are unaware of the process of determining the price of health care services. The problem is being compounded by the evolution of reimbursement models being developed under the ACA and pressure on CMS to reduce overall costs of the Medicare and Medicaid programs. Jiang et al. (2016) noted that a lack of understanding regarding health care industry practices and a societal norm of not asking about the cost for services has created an environment in which patients are discouraged from becoming informed prior to receiving health care services resulting in selecting providers with a history of poor outcomes and higher readmission rates. In addition, reduced transparency and third-party payer requirements have increased the perception of consumers that there are few choices to be made when making decisions related to health care (Baier, Wysocki, Gravenstein, Cooper, Mor, & Clark, 2015). Consumers are left with few options that require a provider to be selected from a network of individuals and organizations that have established contractual arrangements with the third-party payer based upon criteria that may not align with the consumer's best interests (Jiang et al., 2016).

Complexity in the Health Care System

The current health care system has become a maze of complexity that even the most astute consumer struggles to navigate. The methods of determining the price for services is veiled behind contractual agreements, confidential arrangements, provider incentives, trade secrets, and other practices that hinder transparency for the consumer. In the rare case that a consumer is able to obtain information, the information is often misused due to the inherent complexity of the system that includes practices of cost-shifting and reimbursement models that are not understood (Piña et al., 2015). Price is just one factor needed to make an informed decision about health care services. Others factors, including access and quality, are shielded from the consumer in an effort to maintain the confidentiality of information between the health care service provider and third-party payer (Jacobs & Skocpol, 2015).

Access is largely determined by the third-party payer that has established a contractually obligated provider network. In addition, the third-party payer is typically selected by an employer based on the amount of the monthly health insurance premium charged. Ultimately, the environment for selecting a provider is largely placed outside the reach of the consumer. Even if the consumer were provided with the information necessary to make an informed decision, the consumer does not have the ability to select a provider unless the provider is part of the third-party payer approved network (Jacobs & Skocpol, 2015).

Quality measures remain largely unknown to the consumer. The emergence of information from websites, such as Hospital Compare or Leapfrog, are starting to provide

limited information regarding quality outcomes for individual providers. Leyenaar et al. (2016) suggested that quality outcome measures are a significant factor in the risk that a patient assumes when receiving health care services. Providers need to provide quality measures in order for a patient to make an informed decision. In addition, the self-reporting of quality measures has been found to significantly improve the quality of care (Höög, Lysholm, Garvare, Weinehall, & Nyström, 2016).

With the increasing use of high-deductible health plans and availability of information, health care providers must develop new strategies to attract and retain consumers (Kirby & Cameron, 2016). One comprehensive strategy that will continue to evolve as the demand for information increases in order to make decisions is the combined transparency of health care costs and quality outcomes.

Summary

A review of the literature has highlighted the continued concern related to the rapidly rising cost of health care. The history of the health care industry has increased the complexity within the third-party payer system and eroded the transparency available to the consumer, leading to a decision-making process with less than adequate information. Policymakers have implemented numerous policies, as indicated in the section outlining significant health care regulations, in an attempt to control health expenditures and influence population health. Nevertheless, costs have continued to escalate and consume an ever-increasing amount of GDP with relatively little impact on overall quality outcomes. Current industry practices continue to hold a veil of secrecy over the purchase of health care services. The involvement of third-party payers has increased the

complexity of the process and reduced transparency for consumers. Type of health insurance continues to be a reflection of socioeconomic factors in which consumer choice is predicated upon income levels. Ultimately, the consumer is faced with purchasing decisions based primarily upon the network of providers contracted with the insurance company and the associated coinsurance with each visit, leading to a lack of information related to the quality of care.

A review of the literature has provided an extensive evaluation of the rising costs within the health care industry. Numerous studies have concluded that the rise in health care costs in the United States does not correspond to common measures of health. Many other countries have been able to achieve improved outcomes with significantly smaller expenditures. A review of the literature also suggests that a lack of transparency within the industry has contributed to the increase in health expenditures. Consumers are unable to include information about the cost of services as a part of the decision-making process. The lack of transparency may provide a significant break-through in altering consumer behavior and reducing health care costs.

In addition, there is a lack of literature related to the cost of health care and type of health insurance. Type of health insurance can be a direct reflection of the socioeconomic status of an individual. Medicare and Medicaid have been extremely aggressive in reducing expenditures, resulting in pressure on providers to reduce costs and develop alternative reimbursement models. Bundled payment initiatives are forcing providers to take on an ever-expanding role in risk management within the industry. This expanded role will utilize trickle down effects in cost-sharing and risk management

initiatives among health care organizations. It is imperative that organizations understand the influence of health insurance on health costs in order to properly manage risk and implement accountability among providers.

The need to better understand the relationship between the consumer, health care services provider and third-party payer requires increased transparency and access to information. Studying the relationship between health care costs and type of health insurance may provide additional information that could increase the transparency associated with the health care industry. The following three research questions have been identified in an effort to increase transparency and promote the distribution of information that is needed for consumers to make informed decisions.

1. To what extent, if any, does the type of health insurance (public, private, or self-pay) affect the average cost of health care services?
2. To what extent, if any, does transparency of health care costs affect the average cost of health care services.
3. To what extent, if any, does the type of health insurance (public, private, or self-pay) modify the effect of transparency on the average cost of health care services? Modify the effect refers to a change in transparency based on the type of insurance. More specifically, is there a difference in the level of transparency of costs based upon the type of health insurance (public, private, or self-pay)?

The associated variables include the cost of health care as the dependent variable and the type of health insurance as the independent variable. Answering these three questions will result in increased transparency for consumers and policymakers by providing

additional information that can be utilized in supporting decisions related to health insurance coverage.

The results of this study may provide a unique contribution to the literature in several ways. First, the study may provide unique insight into the cost of health care services based on the type of insurance. This could allow consumers, policymakers, and providers to better understand the importance of insurance and the role in affecting health expenditures. Second, conducting the proposed study may provide comparative data in a number of markets that in turn could increase transparency of the cost of health services within various geographic areas, highlighting the effectiveness of a specific area in controlling health care costs. Third, the study may provide insight into the importance of transparency in influencing the cost of health care services. Although a significant amount of research has been conducted related to health care costs, this study may provide unique insight into the relationship of health insurance on costs and the importance of increased transparency within the health care industry.

The details related to the methodology that will be utilized within the proposed study are presented in Chapter 3. The chapter also includes a discussion of the sample selection, data collection, instrumentation, operational definitions, methods of data analysis, and measures for protection for ethical considerations that provide a framework to evaluate the relationship between health care costs and type of health insurance.

Chapter 3: Research Method

As health care costs continue to be a major concern for consumers, providers, payers, and policymakers in the United States, additional research is necessary to assist in identifying areas of focus for developing sustainable changes in the industry (Muir et al., 2013). The purpose of this study was to provide a better understanding of the relationship between the type of health insurance and health care costs and to increase transparency in an effort to influence the cost of health care services. This chapter includes the research methods employed to complete the study of the relationship between the type of health insurance and the cost of health care services. More specifically, the chapter includes explanations of the research design, selection of data, manipulation of the data set, analysis of the data, concerns about validity, and potential ethical dilemmas in the study. The research questions presented in Chapter 1 provide an outline of concerns related to the type of insurance, transparency, and cost of health care services. The literature review highlighted the need for additional transparency in the health care industry and the importance of accurate information during the decision-making process. The study was needed to improve transparency and assist in identifying a solution that can be implemented to create a sustainable health care system.

Research Methodology and Design

I used a quantitative longitudinal design and data from a 6-year period to evaluate the relationship between health care costs and type of insurance. A quantitative approach was identified as the most appropriate method to better understand the factors that influence the cost of health care services (see Creswell, 2009). A qualitative approach is

used when the "research is exploratory and is useful when the researcher does not know the important variables to examine" (Creswell, 2009, p. 18). The important variables were identified in the research questions, and the NIS HCUP data provided the information necessary to develop a better understanding of the relationship between the type of health insurance and health care costs.

Various research designs were considered for this study. An experimental design requires a control group and an experimental group in which an intervention or treatment is introduced that allows for a pretest and posttest measurement (Frankfort-Nachmias & Nachmias, 2008). The NIS HCUP data did not allow for the introduction of an intervention or treatment for two reasons. First, the data had been de-identified, which prevented a pretest and posttest for the same individual. Second, the NIS HCUP data did not allow for a control group. All individuals had been subjected to the same market conditions, including the adoption of the ACA, which prevented a comparison of two different groups based on the independent variables.

Time-series designs, including longitudinal designs, are quasi-experiments that allow a researcher to evaluate the dependent variable over a period of time (Frankfort-Nachmias & Nachmias, 2008). Longitudinal designs allow a researcher to evaluate the relationship between variables when a control group is not available (Frankfort-Nachmias & Nachmias, 2008). In the current study, the relationship between type of insurance and cost of health care services was evaluated over a period of 6 years without the presence of a control group. In addition, random selection was not required, which allowed for a purposeful sample in the study. The purposeful sample included the 10 most frequent

procedures, the 10 most expensive procedures, and the 10 least expensive procedures identified in the NIS HCUP data.

Researchers who use a longitudinal design control for maturation and reduce the likelihood of making invalid causal inferences (Frankfort-Nachmias & Nachmias, 2008). However, researchers using a longitudinal design cannot control for other factors that occur over time that may reduce validity. For example, researchers may not take into consideration new technology that influences the cost of health care services. Other factors that may have contributed to the change in health care costs over time needed to be considered to reduce the likelihood of making an invalid causal inference. Supplementary data were gathered including information related to inflation and geographic location.

A longitudinal research design has the advantage of allowing the study to be carried out in an actual setting and does not require randomized sample selection (Frankfort-Nachmias & Nachmias, 2008). However, the design does not allow the researcher to explain other potential causes of the change in the dependent variable and does not allow for manipulation (Frankfort-Nachmias & Nachmias, 2008). These disadvantages reduce the internal validity of the study and require additional steps be taken to ensure the reliability of the results. One step taken in the current study was an increase in sample size to increase the internal validity of the study.

Setting and Sample

This study included secondary data obtained from the HCUP (n.d.) that provides a comprehensive data set of hospital inpatient discharges for a national, regional, state, and

community level. The data set also includes an average contractual allowance that enables analysis of the net charges to a patient. The project is managed by the Agency for Healthcare Research and Quality, an agency of the U.S. Department of Health and Human Services. The data provided in the National Inpatient Sample database included both clinical and nonclinical data regarding a typical discharge. The data set had been de-identified to comply with the Health Insurance Protection and Portability Act to protect the privacy of patients, physicians, and hospitals.

Each record in the database is based on a specific hospital inpatient discharge and contains primary and secondary diagnoses and procedures (DRG) codes, patient demographic characteristics (e.g., sex, age, race, and median household income based on zip code), hospital characteristics, expected payment source (type of insurance), total charges, discharge status, length of stay, and severity and comorbidity measures (HCUP, n.d.). Although the data set provides individual level data, the HCUP requires that any reported data be aggregated with a minimum of 10 individual records; therefore, the data were aggregated using DRG codes and the type of insurance by zip code.

The longitudinal design in this study included a number of limitations, including both internal and external threats to validity. Internal threats included history, maturation, regression, selection, and instrumentation. External threats included the interaction of selection and treatment, the interaction of setting and treatment, and the interaction of history and treatment. Each threat to validity presented unique challenges that required additional steps to increase the overall validity of the study. For example, the threat of history related to the time that passed during the study and the external events, such as

inflation, that could have influenced the cost of health care services (see Creswell, 2009). Maturation referred to changes that could have occurred over time to a specific DRG code. For example, the services in a bypass procedure conducted in 2005 may have been different than a bypass procedure conducted in 2009.

Regression threat referred to the possibility that outliers were chosen and indicated a trend over time that was not reflective of the actual change in cost. For example, if a major technological advance was implemented in treating a kidney disorder and resulted in a significant decrease in the cost of the treatment during the second year of data included in the study, the overall change would have resulted in findings that should not have been generalized to all health care costs because this was an outlier event.

Selection referred to the possibility that the DRG codes selected for analysis had specific characteristics that predisposed them to certain outcomes (see Creswell, 2009). For example, the 10 least expensive procedures may have been predisposed to little or no change over time. Instrumentation referred to a change in the data collection process or instrument during the time being studied. This threat to validity was of concern due to a change in the NIS HCUP data in 2012 (HCUP, n.d.). Procedures to overcome the change in the data collection process were presented by HCUP and needed to be followed to reduce this threat to validity.

The threats to external validity prevented the results from being generalized to the larger population. Specifically, limitations were specified for population members who did not have the same characteristics or function in different settings. The study included

only the DRG codes in specific metropolitan areas for the years specified in the data collection process. Although results of this study cannot be generalized to the general population, the information provided should allow the reader to better understand the relationships between health care costs and type of health insurance.

Additional limitations of the current study included the lack of transparency and the use of a purposeful sample. The lack of transparency for health care costs prevented an analysis of exact costs, and average amounts needed to be used. Although this limited the usability of the study, the intent was to improve transparency in the health care industry to improve the decision-making process for individuals and policymakers. The use of a purposeful sample decreased the reliability and validity related to generalizations about the cost of health care services. The limitations of the study prevented generalizability to the entire population. The intent of the study was not to develop an overall understanding of health care costs, but rather to understand the relationship between the type of insurance and health care costs. The study findings may be used to initiate additional conversations and research that will help to reduce health care costs in the future.

Data Collection

Because I relied on secondary data, additional contact with human subjects was not necessary. Because human participants were included in the original data collection process, an IRB application was completed and approved; 02-20-17-0548488. Although IRB approval was required, this process was more of a formality rather than a primary concern for completing the study given the de-identified nature of the data. Additional

efforts were made to comply with NIS HCUP data use requirements for publishing information. The basic requirements included not identifying individual persons, not identifying individual hospitals, and avoiding publication of cell sizes less than or equal to 10 (HCUP, n.d.). In addition, specific citations were required in the study to properly cite the HCUP data and acknowledge NIS HCUP data partners. These requirements were reviewed by me and HCUP support staff. NIS HCUP data partners included the following states: Alaska, Arizona, Arkansas, California, Colorado, Connecticut, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

The NIS HCUP data had already been screened and tested for validity by AHRQ. This study included an analysis of the data prior to and after filtering for the 10 most populous cities in the United States. The analysis included a record count by zip code, an average amount of the total charge, and record counts by DRG code. This analysis ensured that the filtering process had not eliminated records, created data outliers, or generated additional problems with the data set.

Instrumentation and Materials

The NIS HCUP data was used as a secondary data source to conduct this study. The NIS HCUP data contains longitudinal data from 1988 through the current year (HCUP, n.d.). The data set has been developed through partnerships with hospitals across the United States in an effort to provide researchers with data that can be used to "identify, track, and analyze national trends in health care utilization, access, charges, quality, and outcomes" (HCUP, n.d., para. 1). In addition to the National Inpatient Sample, the cost-to-charge ratio files were used to calculate the average amount received for services provided for a specific DRG code. This allowed for a more accurate health care cost figure to be used when analyzing the data for this study. Because gross charges reflected some association with the cost of a procedure and could have varied greatly between health care organizations, the average net cost may improve transparency and more accurately reflect health care costs across the United States.

Data Collection and Analysis

The NIS HCUP data were obtained for data analysis. The health care data has been collected since 1988 through partnerships with providers in 47 states and the District of Columbia with Idaho, Alabama, and Delaware choosing not to participate (HCUP, n.d.). The National Inpatient Sample (NIS) is the largest publicly available database and includes more than 7 million inpatient stays annually (HCUP, n.d.).

The dataset will be filtered to include data from the 10 largest cities, by population, within the United States including New York, Los Angeles, Chicago, Houston, Philadelphia, Phoenix, San Antonio, San Diego, Dallas, and San Jose (United

States Census Bureau, n.d.). The postal zip codes associated with each city will be identified through the United States Postal Office. Data will be aggregated by city for each of the selected DRG codes and the type of insurance. Individual records will be identified for selection by comparing the hospital zip code identified on the American Hospital Association annual survey to ensure that data is aggregated based on where the service was provided and not based upon where the patient resides (HCUP, n.d.).

In order to manage the available information from the dataset, it has been determined that the data will be limited to the 10 most expensive DRG codes, the 10 least expensive DRG codes, and the 10 most frequently reported DRG codes. The identification of the DRG codes, based upon the identified selection criteria, will be made subsequent to filtering the information based upon inclusion in one of the 10 largest cities that has been previously described. Selection of the least and most expensive DRG codes will be based upon the average total charge for the service. The identification of the most frequently reported DRG codes will be made subsequent to the least and most expensive procedures. If a DRG code is selected as a most frequent procedure and has already been identified as one of the least or most expensive DRG codes, the DRG code will be replaced with the next most frequent procedure. This process will allow 30 DRG codes to remain in the analysis being conducted for the study.

Type of insurance will be limited to the availability of information with the NIS HCUP data. The data includes a field to identify the expected payer as Medicare, Medicaid, private including HMO, self-pay, no charge, and other (HCUP, n.d.). Because the NIS HCUP data include up to two expected payers for each record, the primary and

secondary payer, the study will involve only the expected primary payer to establish the type of insurance for the services provided.

Measures for Protection

As previously discussed, the longitudinal design utilized in this proposed study includes a number of limitations including both internal and external threats to validity. Various internal and external threats to validity have been identified. Each threat to validity presents unique challenges that required additional steps in order to increase the overall validity of the study. For example, the threat of history identified inflation as a factor that may have influenced the cost of health care services and maturation identified the inclusion of services in a bypass conducted in 2005 may be different than a bypass conducted in 2009.

The threats to external validity prevent the results from being generalized to the population. Specifically, limitations are specified for population members that do not have the same characteristics or function in different settings. The study will present results only for the DRG codes selected in specific metropolitan areas for the years specified in the data collection process. Although this study will not be able to be generalized to the population, the information provided should allow the reader to better understand the relationship of health care costs and type of health insurance.

Additional limitations of the proposed study include the lack of transparency and the use of a purposeful sample. The lack of transparency for health care costs will prevent an analysis of exact costs and average amounts will need to be used. Although this will limit the usability of the study, the intent is to improve transparency within the health

care industry in an effort to improve the decision-making process for individuals and policymakers. The use of a purposeful sample will decrease the reliability and validity related to generalizations about the cost of all health care services. As previously indicated, the limitations of the study prevent the ability of the results to be generalized to the entire population. The intent of the proposed study is not to develop an overall understanding of health care costs but to further understand the relationship between the type of insurance and health care costs. The proposed study may be used to initiate additional conversations and research that will help to reduce health care costs in the future.

Ethical procedures are minimal due to the utilization of de-identified secondary data. One potential issue is the possible identification of an individual in a rural area with a rare disorder or illness. The HCUP data use agreement prohibits any disclosure or reporting of information that includes fewer than 10 records (HCUP, n.d.). Because the study is focused on the 10 most populous cities within the United States, it is not expected that there will be fewer than 10 records for any reporting information. If it is determined during the selection of DRG codes that this issue exists, the DRG code will be replaced prior to analysis. For example, if it is determined that one of the most expensive DRG codes has less than 10 procedures, the next most expensive DRG code will be selected. This process will ensure that there is not a potential ethical violation within the study or a violation of the HCUP use agreement.

The results of the study will include a summary of health care costs by DRG by Type of Insurance. A separate table will be presented for each year. A separate analysis

will be conducted to determine if each city will need to be presented separately. Table 9 in Appendix A provides an example of the table to be used to provide comparative information. An additional table will provide the frequency of each DRG by location and a few descriptive statistics for each of the largest cities. Table 10 in Appendix A provides an example of the table that will be presented in the results section of the study.

Summary

This chapter included a discussion of the research methods utilized to evaluate the relationship between the type of health insurance, transparency, and the cost of health care services. The NIS HCUP data were analyzed by calculating an average amount collected for 30 DRG codes in the 10 most populous cities within the United States. The data analysis will enable a comparison to be made, by location, of the amount being charged for specific health care procedures to determine whether or not health care costs vary based on the type of insurance being utilized by the consumer. The results of the data analysis are presented in Chapter 4.

Chapter 4: Results

The continued growth in health care costs has resulted in numerous challenges related to the overall sustainability of the health care industry. Current trends have indicated that more than 20% of total GDP in the United States will be spent on health care services, accounting for more than $3 trillion in total health care expenditures (Hartman et al., 2015). Although the United States leads the world in total health care expenditures, numerous measures of health status, including quality adjusted life years, indicate that the United States ranks between 34 and 50 in various measures compared to other countries (World Health Organization, 2015). The United States has the most complex health care industry in the world due to the participation of government, third-party payers, private organizations, and individuals in making decisions related to consumer health care services. The complex nature of the health care system increases cost, reduces transparency, and inhibits the ability of individuals to make decisions based on meaningful and accurate information.

The purpose of this quantitative longitudinal study was to gain a deeper understanding of the relationship between health insurance and the cost of health care services. Numerous authors have presented studies that have addressed the cost of health care services, but few have focused on net charges as a measure of analysis. The evaluation of the cost of health care services has little meaning when using the gross charges developed by each individual provider and published in chargemaster tables. Contractual allowances can account for a significant discount and vary widely among providers. Net charges provide a more accurate reflection of the actual charges being paid

by third-party payers and consumers for specific health care services. This study included an evaluation of the net charge for specific health care services based on the expected primary payer. Primary payers included Medicare, Medicaid, private insurance, self-pay, and other third-party payers.

The results of this study provide information to consumers, providers, and policymakers to increase transparency of health care costs. Data from NIS HCUP were analyzed to evaluate the relationship between the type of insurance and health care costs over an 8-year period. The results of the study will be disseminated through publication to increase transparency of health care costs and potentially assist in reducing overall health expenditures. The information may provide additional information to aid decision-making for consumers, providers, and policymakers that may result in lower health care costs.

The research questions and hypotheses in this study focused on the relationship between health insurance and health care costs. The specific research questions and hypotheses are listed below.

1. To what extent, if any, does the type of health insurance (public, private, or self-pay) affect the average cost of health care services?

   H_o1: Type of health insurance (public, private, or self-pay) is not related to the average cost of health care services.

   H_a1: Type of health insurance (public, private, or self-pay) is related to the average cost of health care services.

2. To what extent, if any, does transparency of health care costs affect the average cost of health care services?

   H_o2: There is not a relationship between transparency of the type of health insurance (public, private, or self-pay) and the average cost of health care services.

   H_a2: There is a relationship between transparency of the type of health insurance (public, private, or self-pay) and the average cost of health care services.

3. To what extent, if any, does the type of health insurance (public, private, or self-pay) modify the effect of transparency on the average cost of health care services? Modify the effect refers to a change in transparency based on the type of insurance. More specifically, is there a difference in the level of transparency of costs based upon the type of health insurance (public, private, or self-pay)?

   H_o3: There is not a relationship between the type of health insurance (public, private, or self-pay) and transparency of the average cost of health care services.

   H_a3: There is a relationship between the type of health insurance (public, private, or self-pay) and transparency of the average cost of health care services.

This chapter includes the details related to the collection of data and the results of the data analysis. Although secondary data were used for the study, there were several deviations from the initial plan presented in Chapter 3. The details of these deviations are provided in the data collection section. The results from the data analysis included an enormous amount of information that presented significant challenges to providing meaningful information to the reader. Although the results of the analysis are presented in

this chapter, additional information is provided in Appendix B through Appendix F that provides a breakdown of the analysis by individual DRG code.

Data Collection

The data collection process from HCUP required the completion of the HCUP Data Use Training Course and completion of the HCUP Data Use Agreement. The training course consisted of a number of modules that focused on data protection, violations, and individual responsibility (HCUP, n.d.). The course took approximately 20 minutes to complete. Once the course was completed, a data use agreement had to be signed and approved by HCUP. A copy of the data use agreement can be found in Appendix G. Once these steps were completed, the data set was purchased and downloaded in an electronic format. The entire process took several days to complete.

In addition to the National Inpatient Sample (NIS) files for 2007 through 2014, HCUP provided supplemental files that included cost-to-charge ratio files, hospital market structure files, discharge-level files, hospital ownership files, and SPSS load programs. The SPSS load programs were used to load each individual NIS file into SPSS for analysis. The NIS files in SPSS were merged with the cost-to-charge ratios files using the HCUP hospital identification number. The result was an SPSS file for each year that contained the information necessary to conduct the data analysis.

Upon initial examination of the NIS HCUP files, I determined that the city information for each hospital had been removed from the NIS files for 2012, 2013, and 2014. Without this information, the analysis could not be conducted using the 10 most populous cities in the United States. The data administrator indicated that a change had

been made at the request of numerous participants to prevent disclosure of individual hospital information. All years of data contained information related to U.S. Census Bureau regions and divisions. Regions included West, Midwest, South, and Northeast. Each region was divided into multiple divisions. For example, the South region was broken into the West South Central, East South Central, and South Atlantic divisions. The primary concern in conducting the analysis by region was the variation in costs based on geographic area. For example, it was much more expensive to deliver care in Illinois compared to Kansas, both of which are included in the Midwest region. After evaluating the situation, I decided to conduct the analysis based on division. The Pacific division in the West region was selected for the analysis. The Pacific division included Alaska, Hawaii, Washington, Oregon, and California. Alaska did not participate in the NIS HCUP program during the years being evaluated, so data included Hawaii, Washington, Oregon, and California. Each SPSS file was filtered to include only records from the Pacific division.

A frequencies and descriptive table was generated for each year. The tables were loaded into Excel and a pivot table was used to summarize each of the DRG codes. To comply with HCUP data use requirements, any DRG codes that had 10 or fewer cases by payer were eliminated from the table. The remaining DRG codes were used to identify the 10 most expensive, 10 least expensive, and 10 most frequent DRG codes. Table 2 provides a list of the DRG codes that were identified to be included in the analysis. The DRG codes are sorted numerically.

Table 2

DRG Codes Selected for Analysis

Category	DRG	Description
Most Expensive	3	ECMO or tracheostomy with mv >96 hours or PDX except face, mouth and neck with major O.R. procedure
	23	Craniotomy with major device implant or acute complex CNS PDX with mcc or chemotherapy implant
	26	Craniotomy and endovascular intracranial procedures with cc
	203	Bronchitis and asthma without cc/mcc
	207	Respiratory system diagnosis with ventilator support >96 hours
	233	Coronary bypass with cardiac catheterization with mcc
	234	Coronary bypass with cardiac catheterization without mcc
	326	Stomach, esophageal and duodenal procedures with mcc
	329	Major small and large bowel procedures with mcc
	853	Infectious and parasitic diseases with o.r. procedure with mcc
Least Expensive	153	Otitis media and URI without mcc
	311	Angina pectoris
	390	G.I. obstruction without cc/mcc
	464	Wound debridement and skin graft except hand for musculoskeletal system and connective tissue disorders with cc
	639	Diabetes without cc/mcc
	690	Kidney and urinary tract infections without mcc
	775	Vaginal delivery without complicating diagnoses
	881	Depressive neuroses
	882	Neuroses except depressive
	894	Alcohol, drug abuse or dependence, left AMA
Most Frequent	313	Chest pain
	373	Major gastrointestinal disorders and peritoneal infections without cc/mcc
	391	Esophagitis, gastroenteritis and miscellaneous digestive disorders with mcc
	392	Esophagitis, gastroenteritis and miscellaneous digestive disorders without mcc
	470	Major joint replacement or reattachment of lower extremity without mcc

(table continues)

Category	DRG	Description
	603	Cellulitis without mcc
	765	Cesarean section with cc/mcc
	766	Cesarean section without cc/mcc
	871	Septicemia or severe sepsis without mv >96 hours with mcc
	885	Psychoses

SPSS was used to select all cases with a DRG code that was identified to be included in the analysis. The selected cases were saved into a new file. The final step in filtering the NIS HCUP data was to eliminate records that were not applicable to third-party payers. The data set identified the expected primary payer as shown in Table 3. The data contained records with the expected primary payer assigned as missing, invalid, or unavailable from source. These records and those that included an expected primary payer of five, no charge, were eliminated from the data because there was not an expectation of payment from a third-party payer. The number of records in each file was reduced significantly from the original data set as shown in Table 4.

Table 3

Expected Primary Payer, Uniform

Value	Value description
1	Medicare
2	Medicaid
3	Private insurance
4	Self-pay
5	No charge
6	Other
.	Missing
.A	Invalid
.B	Unavailable from source

Table 4

Number of Records in Data Files

Year	Original records	Filtered records	Records for analysis
2007	8,043,415	279,792	233,163
2008	8,158,381	284,812	240,687
2009	7,810,762	303,840	270,096
2010	7,800,441	280,846	244,099
2011	8,023,590	277,773	232,762
2012	7,296,968	270,259	245,072
2013	7,119,563	269,960	244,284
2014	7,071,762	272,826	246,627

The NIS HCUP data set is a stratified sample that includes approximately 20% of all inpatient discharges in the United States (HCUP, n.d.). Based on this estimate, there are approximately 35 to 40 million inpatient stays during any given year throughout the United States. G*Power was used to calculate an appropriate sample size. A small effect size was used with an alpha of 0.05, power of 0.95, and five groups in an effort to achieve the largest sample size possible. The resulting calculation for the sample size was 1,865.

The filtered records used in the analysis included between 232,762 and 270,096 records for each year, so the sample size was determined to be sufficient.

Baseline descriptive and demographic characteristics of the sample included gender, age, race, median household income, expected primary payer, and length of stay. Each of these characteristics is reported by year and presented in Table 5. The demographics of the sample size are not representative of the population due to the methodological choice of using select specific DRG codes. For example, two of the most frequent DRG codes selected were natural childbirth and cesarean childbirth, both specific to female patients.

Table 5

Descriptive and Demographic Characteristics

	2007	2008	2009	2010	2011	2012	2013	2014
Average age	21.07	43.13	41.78	43.24	44.69	44.07	44.50	44.87
Length of stay	2.78	4.28	4.15	4.30	4.19	4.15	4.20	4.23
Gender								
Male	29.7%	23.6%	25.3%	26.9%	26.4%	27.7%	28.0%	28.1%
Female	70.3%	76.5%	74.7%	73.1%	73.6%	72.3%	72.0%	71.9%
Race								
White	36.8%	49.6%	50.2%	48.8%	51.1%	49.8%	50.4%	50.2%
Black	4.1%	6.1%	7.2%	7.1%	7.1%	7.6%	7.4%	7.3%
Hispanic	43.5%	27.9%	30.5%	29.8%	30.5%	28.8%	28.8%	28.5%
Asian or Pacific Islander	12.5%	12.1%	8.7%	10.7%	7.9%	9.8%	10.0%	10.6%
Native American	0.2%	0.3%	1.1%	0.3%	0.6%	1.1%	0.6%	0.5%
Other	2.8%	3.9%	2.3%	3.3%	2.8%	2.8%	2.8%	3.0%
Household income								
0-$25K	18.3%	15.4%	19.2%	16.1%	17.2%	18.6%	15.4%	19.4%
$25K-$35K	25.5%	25.0%	23.1%	20.5%	21.7%	21.3%	22.5%	25.1%
$35K-$45K	26.5%	28.9%	29.9%	31.7%	29.9%	29.5%	32.3%	27.9%
Over $45K	29.7%	30.7%	27.9%	31.6%	31.2%	30.6%	29.8%	27.7%
Expected primary payer								
Medicare	7.6%	24.0%	21.7%	23.3%	26.0%	25.5%	26.3%	26.5%
Medicaid	39.4%	28.2%	36.2%	31.6%	28.5%	30.6%	30.2%	33.7%
Private	47.5%	42.0%	35.7%	35.6%	38.5%	35.1%	34.3%	34.0%
Self	3.1%	2.8%	3.3%	5.0%	3.3%	4.1%	4.1%	3.0%
Other	2.3%	3.0%	3.1%	4.4%	3.7%	4.8%	5.1%	2.8%

The final sample size represented approximately 0.7% of the total number of inpatient hospital stays for each year being evaluated. Because the sample was selected using convenience methods, the results should not be generalized to the population due to concerns related to external validity. However, the results of the study provide meaningful information drawn from a large sample size that may improve the

transparency of health care costs and could provide a foundation for additional research or policy changes to reduce overall expenditures on health care services. The dataset indicates that the complexity of an inpatient stay should also consider other covariates in evaluating the wide range of charges associated with many of the DRG codes. For example, the number of procedures performed during an inpatient stay, the number of DRG codes assigned to an individual stay, complicating conditions, and major complicating conditions are all important factors. Many of these factors can be identified within the NIS HCUP data, but are beyond the scope of this study. Numerous opportunities exist to expand upon the initial research and further identify factors that influence the cost of delivering health care services.

Results

Each of the research questions and the associated hypotheses was evaluated following completion of the ANOVA analysis. Prior to the interpretation of the results, consideration must be given to the assumptions that are associated with the use of ANOVA; the resulting statistics, confidence intervals, and effect sizes; and the appropriate posthoc analysis of tests. Each of these areas is discussed in detail prior to the reporting of the ANOVA results.

Assumptions

There are three primary assumptions that apply to an analysis of variance, the dependent variable is normally distributed in the population, the variances are the same for all populations (homogeneity of variance), and the cases represent random samples from the population (Green & Salkind, 2014). According to Field (2013), normality can

be overcome by using a large sample size and the least squares method and more robust testing of the data. Homogeneity of variance can be evaluated using Levene's test, and if the assumption is violated, one can use Welch's F to determine the significance in the variance of the means (Field, 2013). In addition, posthoc tests can be utilized to evaluate the data, if assumptions have been violated. Field (2013) recommends using the Games-Howell procedure "because of the uncertainty of knowing whether the population variances are equivalent" (p. 459).

Each year of data was evaluated for meeting the assumptions of an ANOVA analysis. A Kolmogorov-Smirnov test was used to test for normality of the dependent variable, cost of health care. The results of the test are reported in Table 101 through Table 108 in Appendix E. For 2007, the Kolmogorov-Smirnov statistic ranged from .093 to .297 and degrees of freedom ranged from 129 to 83,401, while significance remained at .000 for all DRG codes, indicating that the assumption of normality had been violated. The results of the normality test for 2008 showed similar outcomes with the Kolmogorov-Smirnov statistic ranging from 0.060 to 0.324 with degrees of freedom ranging from 441 to 70,332 while significance remained at .000 for all DRG codes. The pattern repeated in 2009 with the Kolmogorov-Smirnov statistic ranging from 0.073 to 0.266 with degrees of freedom ranging from 379 to 76,426 while significance remained at .000 for all DRG codes. The results for 2010 produced a Kolmogorov-Smirnov statistic ranging from 0.102 to 0.255 with degrees of freedom ranging from 493 to 67,455 while significance remained at .000 for all DRG codes. The results were similar in 2011 with the Kolmogorov-Smirnov statistic ranging from 0.096 to 0.293 with degrees of freedom

ranging from 400 to 61,897 while significance remained at .000 for all DRG codes. The continued in 2012 with the Kolmogorov-Smirnov statistic ranging from 0.115 to 0.302 with degrees of freedom ranging from 504 to 62,934 while significance remained at .000 for all DRG codes. For 2013, the Kolmogorov-Smirnov statistic ranged from .092 to .255 and degrees of freedom ranged from 544 to 62,516, while significance remained at .000 for all DRG codes, indicating that the assumption of normality had been violated. The results of the normality test for 2014 showed similar results with the Kolmogorov-Smirnov statistic ranging from 0.100 to 0.255 with degrees of freedom ranging from 548 to 63,548 while significance remained at .000 for all DRG codes. The results of the Kolmogorov-Smirnov test indicate that the assumption of normality for the dependent variable, cost of health care, has been violated for each year included in the study. This study relied on a large sample size to overcome the violation of normality. The sample size calculated using G*Power was 1,865. The sample utilized for this analysis was 2,033,822, which is more than one thousand times the required sample.

Levene's test was utilized to test the assumption of homogeneity of variance. The test was run for each year and for each year by DRG code. The results are reported here for the tests that were run for each year. The results for each year by DRG code are reported in Table 109 through Table 138 in Appendix F. For 2007, $F(4;233,158) = 4,114.58$, $p < .001$, indicating that the assumption of homogeneity of variance was not met. For 2008, $F(4;240,682) = 1,679.44$, $p < .001$, indicating that the assumption of homogeneity of variance was not met. For 2009, $F(4;270,091) = 2,013.85$, $p < .001$, indicating that the assumption of homogeneity of variance was not met. For 2010,

$F(4;244,094) = 1,501.06$, $p < .001$, indicating that the assumption of homogeneity of variance was not met. For 2011, $F(4;232,757) = 1,160.35$, $p < .001$, indicating that the assumption of homogeneity of variance was not met. For 2012, $F(4;245,067) = 895.39$, $p < .001$, indicating that the assumption of homogeneity of variance was not met. For 2013, $F(4;244,279) = 809.66$, $p < .001$, indicating that the assumption of homogeneity of variance was not met. For 2014, $F(4;246,622) = 590.97$, $p < .001$, indicating that the assumption of homogeneity of variance was not met. Based upon the Levene's test conducted for each year, it was determined the data does not meet the assumption of homogeneity of variance. The same conclusion can be reached through evaluation of the Levene's statistic calculated for each individual DRG code provide in Table 109 through Table 138 in Appendix F. Due to the violation of the homogeneity of variance, *Welch's F* test was used for the analysis.

The third assumption requires a random sampling of the populations. Because the dataset is a stratified sample of inpatient stays during a given year and the dataset has been filtered to a convenience sample of a specific geographic location and further limited based upon data use requirements, this assumption is deemed to have been violated. Field (2013) recommends conducting the analysis using a multilevel linear model that assumes hierarchical data relationships when the assumption of independence is violated. Using a multilevel linear model may or may not overcome the assumption of independence (Field, 2013). For purposes of this study, the inability of the results to be extrapolated to the entire population will be a limitation of the analysis and an area that will require additional research in the future.

In evaluating the primary assumptions related to this ANOVA analysis, e.g. the dependent variable is normally distributed in the population, the variances are the same for all populations (homogeneity of variance), and the cases represent random samples from the population, all were found to be violated. Although additional testing can provide additional validity to the final analysis, including using a larger sample size, the violation of the assumptions prevent the results of the ANOVA from being generalized to the population of all inpatient hospital stays. The analysis does provide an improved understanding of the relationship between the type of health insurance and the cost of services; however, the results must be approached with a full understanding that the final analysis is limited to the dataset being analyzed.

ANOVA Analysis

A one-way analysis of variance was conducted to evaluate the relationship between the type of health insurance and the cost of health care services for 30 DRG codes. The dependent variable, cost of health care services, was based upon the gross charges for an individual hospital inpatient stay for each DRG reduced by the average cost-to-charge ratio for the hospital providing the services. The independent variable was the type of health insurance that included Medicare, Medicaid, private insurance, self-pay, and other third-party payers. The ANOVA was conducted for each year from 2007 thru 2014. Table 6 lists the descriptive information for the dependent variable for each year analyzed. See Table 11 through Table 40 in Appendix B for the means and standard deviations for each of the individual DRG codes analyzed.

Table 6

Means and Standard Deviations of Health Care Costs by Payer

Year	Payer	*n*	Mean	*SD*
2007	Medicare	18,403	14,005.73	22,048.07
	Medicaid	99,935	2,658.17	6,729.05
	Private insurance	102,757	3,348.10	7,931.65
	Self-Pay	6,738	3,514.49	10,534.43
	Other payer	5,330	5,382.49	13,232.49
2008	Medicare	58,889	16,204.83	24,984.78
	Medicaid	77,698	7,090.30	17,852.31
	Private insurance	88,315	7,871.92	16,094.59
	Self-Pay	7,355	7,550.81	16,786.41
	Other payer	8,430	11,955.22	24,868.95
2009	Medicare	59,197	16,469.35	24,813.27
	Medicaid	101,391	6,848.26	15,746.15
	Private insurance	92,753	8,851.70	18,618.25
	Self-Pay	8,989	8,104.88	15,950.60
	Other payer	7,766	11,235.04	22,047.85
2010	Medicare	56,327	17,453.86	24,668.42
	Medicaid	83,491	7,624.26	18,236.98
	Private insurance	80,848	9,094.83	17,671.21
	Self-Pay	13,124	7,810.67	16,998.73
	Other payer	10,309	10,875.57	23,507.87
2011	Medicare	60,271	17,137.87	26,215.53
	Medicaid	75,896	7,873.89	20,657.61
	Private insurance	78,250	8,637.07	18,085.29
	Self-Pay	8,346	9,286.26	14,547.25
	Other payer	9,999	11,315.91	21,421.98
2012	Medicare	61,896	18,160.39	29,177.55
	Medicaid	81,341	8,519.54	23,677.03
	Private insurance	78,312	10,084.56	22,222.75
	Self-Pay	10,652	8,692.74	18,095.24
	Other payer	12,871	12,252.92	29,964.02
2013	Medicare	63,584	18,590.79	29,397.48
	Medicaid	80,056	8,863.37	24,732.20
	Private insurance	76,150	10,322.48	22,935.25
	Self-Pay	10,722	8,496.02	16,134.12
	Other payer	13,772	12,653.11	31,965.63
2014	Medicare	64,499	18,727.00	27,987.69
	Medicaid	90,113	9,693.74	25,124.59
	Private insurance	76,552	10,633.02	25,227.39
	Self-Pay	7,816	7,862.21	18,846.39
	Other payer	7,647	14,937.41	42,126.27

Table 7 provides the results of the ANOVA for 2007 thru 2014. Table 41 through Table 70 in Appendix B provide the results of the ANOVA for 2007 thru 2014 for each of the individual DRG codes. Because of the violation of the assumption of homogeneity, *Welch's F statistic* is reported for the results of the ANOVA. Table 7 includes the *F statistic* for comparative purposes. The one-way ANOVA of the cost of health services based upon the type of insurance revealed a statistically significant main effect in 2007 using a 95% confidence interval, *Welch's F*(4; 20,652.27) = 1,200.36, $p <$. 0001. The estimated omega squared (ω^2=0.09) indicated that approximately 9% of the total variation in the average cost of health care services can be attributed to the type of insurance.

In 2008, the one-way ANOVA of the cost of health services based upon the type of insurance revealed a statistically significant main effect, *Welch's F*(4; 30,530.68) = 1,588.53, $p < 0.001$. The estimated omega squared (ω^2=0.03) indicated that approximately 3% of the total variation in the average cost of health care services can be attributed to the type of insurance. A similar pattern resulted for 2009, *Welch's F*(4; 32,472.94) = 1,830.93, $p < 0.001$, and 2010, *Welch's F*(4; 44,376.35) = 1,732.06, $p <$ 0.001. The estimated omega squared was the same for all three of these years.

There was a statistically significant main effect in 2011 for the one-way ANOVA of the cost of health services based on the type of insurance, *Welch's F*(4; 36,615.33) = 1,440.84, $p < 0.001$. Results for 2012, *Welch's F*(4; 45,997.92) = 1,236.17, $p < 0.001$, 2013, *Welch's F*(4; 48,572.31) = 1,293.37, $p < 0.001$, and 2014, *Welch's F*(4; 30,697.05) = 1,280.74, $p < 0.001$, also indicated a statistically significant main effect while the

estimated omega squared (ω^2=0.02) indicated that approximately 2% of the total variation in the average cost of health care services can be attributed to the type of insurance.

Table 7

One-Way Analysis of Variance of Health Care Costs by Type of Insurance

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	2.077E+12	5.193E+11	5,601.088	0.000
	Within groups	233,158	2.162E+13	9.271E+07		
	Total	233,162	2.369E+13			
2008	Between groups	4	3.391E+12	8.477E+11	2,225.369	0.000
	Within groups	240,682	9.168E+13	3.809E+08		
	Total	240,686	9.508E+13			
2009	Between groups	4	3.642E+12	9.104E+11	2,463.926	0.000
	Within groups	270,091	9.980E+13	3.695E+08		
	Total	270,095	1.034E+14			
2010	Between groups	4	3.670E+12	9.175E+11	2,314.145	0.000
	Within groups	244,094	9.678E+13	3.965E+08		
	Total	244,098	1.004E+14			
2011	Between groups	4	3.457E+12	8.644E+11	1,902.390	0.000
	Within groups	232,757	1.058E+14	4.544E+08		
	Total	232,761	1.092E+14			
2012	Between groups	4	3.710E+12	9.276E+11	1,495.435	0.000
	Within groups	245,067	1.520E+14	6.203E+08		
	Total	245,071	1.557E+14			
2013	Between groups	4	3.901E+12	9.752E+11	1,481.174	0.000
	Within groups	244,279	1.608E+14	6.584E+08		
	Total	244,283	1.647E+14			
2014	Between groups	4	3.690E+12	9.226E+11	1,319.295	0.000
	Within groups	246,622	1.725E+14	6.993E+08		
	Total	246,626	1.762E+14			

Post Hoc Analysis of Statistical Tests

Post hoc comparisons, using the Games-Howell post hoc procedure, were conducted to determine which pairs of the five groups of insurance means differed significantly. These results are provided in Table 8 and indicate that, in most cases, the cost of health services varied significantly by type of health insurance. The effect sizes for each of the mean differences have been included in Table 8 when the difference is statistically significant.

Results

The results of the ANOVA indicate there was a statistically significant relationship between the type of health insurance and the cost of health care services. Thus, the null hypothesis, type of health insurance (public, private, or self-pay) is not related to the average cost of health care services, should be rejected and the alternative hypothesis should be accepted for the first research question. Type of health insurance (public, private, or self-pay) is related to the average cost of health care services.

Further analysis of the relationship between health care costs and type of insurance produced several items of interest. Figure 4.1 depicts the relationship between the cost of health care services based upon the type of health insurance from 2007 thru 2014. The data suggest that Medicare supports the highest level of reimbursement rates, followed by other payers, private insurance, self-pay, and Medicaid. Historically, providers have claimed that rates of reimbursement were highest from self-pay, followed by other payers, private insurance, Medicare, and Medicaid respectively. Reimbursement by payer is discussed in more detail later in the chapter.

Table 8

Post Hoc Results for Health Care Costs by Payer

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	14,005.73	--				
	2. Medicaid	2,658.17	11,347.56* (0.70)	--			
	3. Private insurance	3,348.10	10,657.63* (0.64)	-689.93* (-0.09)	--		
	4. Self-Pay	3,514.49	10,491.24* (0.61)	-856.32* (-0.10)	-166.39	--	
	5. Other payers	5,382.49	8,623.23* (0.47)	- 2,724.33* (-0.26)	- 2,034.39* (-0.02)	- 1,868.01* (-0.16)	--
2008	1 Medicare	16,204.83	--				
	2 Medicaid	7,090.30	9,114.53* (0.42)	--			
	3 Private insurance	7,871.92	8,332.91* (0.40)	-781.62* (-0.05)	--		
	4 Self-Pay	7,550.81	8,654.02* (0.41)	-460.51	321.11	--	
	5 Other payer	11,955.22	4,249.61* (0.17)	- 4,864.92* (-0.22)	- 4,083.30* (-0.19)	- 4,404.41* (-0.21)	--
2009	1. Medicare	16,469.35	--				
	2. Medicaid	6,848.26	9,621.09* (0.46)	--			
	3. Private insurance	8,851.70	7,617.64* (0.35)	- 2,003.45* (-0.12)	--		
	4. Self-Pay	8,104.88	8,364.47* (0.40)	- 1,256.62* (-0.08)	746.83* (0.04)	--	
	5. Other payer	11,235.04	5,234.31* (0.22)	- 4,386.78* (-0.23)	- 2,383.34* (-0.12)	- 3,130.16* (-0.16)	--
2010	6. Medicare	17,453.86	--				
	7. Medicaid	7,624.26	9,829.60* (0.45)	--			
	8. Private insurance	9,094.83	8,359.03* (0.39)	- 1,470.57* (-0.08)	--		
	9. Self-Pay	7,810.67	9,643.19* (0.46)	-186.41	1,284.16* (0.07)	--	
	10. Other payer	10,875.57	6,578.29* (0.27)	- 3,251.31* (-0.15)	- 1,780.74* (-0.09)	- 3,064.90* (-0.15)	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2011	1. Medicare	17,137.87	--				
	2. Medicaid	7,873.89	9,263.99* (0.39)	--			
	3. Private insurance	8,637.07	8,500.81* (0.38)	-763.18* (-0.04)	--		
	4. Self-Pay	9,286.26	7,851.62* (0.37)	-1,412.37* (-0.08)	-649.19* (-0.04)	--	
	5. Other payer	11,315.91	5,821.97* (0.24)	-3,442.02* (-0.16)	-2,678.84* (-0.14)	-2,029.65* (-0.11)	--
2012	1. Medicare	18,160.39	--				
	2. Medicaid	8,519.54	9,640.85* (0.36)	--			
	3. Private insurance	10,084.56	8,075.83* (0.31)	-1,565.02* (-0.07)	--		
	4. Self-Pay	8,692.74	9,467.65* (0.39)	-173.20	1,391.82* (0.07)	--	
	5. Other payer	12,252.92	5,907.47* (0.20)	-3,733.38* (-0.14)	-2,168.36* (-0.08)	-3,560.18* (-0.14)	--
2013	1. Medicare	18,590.79	--				
	2. Medicaid	8,863.37	9,727.42* (0.36)	--			
	3. Private insurance	10,322.48	8,268.31* (0.31)	-1,459.11* (-0.06)	--		
	4. Self-Pay	8,496.02	10,094.77* (0.43)	367.35	1,826.46* (0.09)	--	
	5. Other payer	12,653.11	5,937.68* (0.19)	-3,789.74* (-0.13)	-2,330.63* (-0.08)	-4,157.09* (-0.16)	--
2014	1. Medicare	18,727.00	--				
	2. Medicaid	9,693.74	9,033.26* (0.34)	--			
	3. Private insurance	10,633.02	8,093.98* (0.30)	-939.28* (-0.04)	--		
	4. Self-Pay	7,862.21	10,864.79* (0.46)	1,831.53* (0.08)	2,770.82* (0.12)	--	
	5. Other payer	14,937.41	3,789.59* (0.11)	-5,243.67* (-0.15)	-4,304.38* (-0.12)	-7,075.20* (-0.22)	

*p<.001, **p<.05

The data also indicate a significant increase in the cost of health care services from 2007 to 2008 with some stabilization of prices over the next six years. According to a number of sources including The Henry J. Kaiser Family Foundation (2007) and Blendon, R. J., Altman, D. E., Deane, C., Benson, J. M., Brodie, M., and Buhr, T. (2008), much of this increase can be attributed to the uncertain political environment surrounding the future of the health care industry. Both political parties had presented proposals to reform the health care industry to address the rapidly increasing costs associated with high utilization rates, an increase in chronic conditions, and a need to improve outcomes. Both proposals included government involvement in price setting based upon current reimbursement rates. The authors speculate that health care organizations increased costs in order to offset a potential reduction in rates that would be implemented by future health care legislation. The data support this conclusion with the price stabilization that occurred over the next eight years.

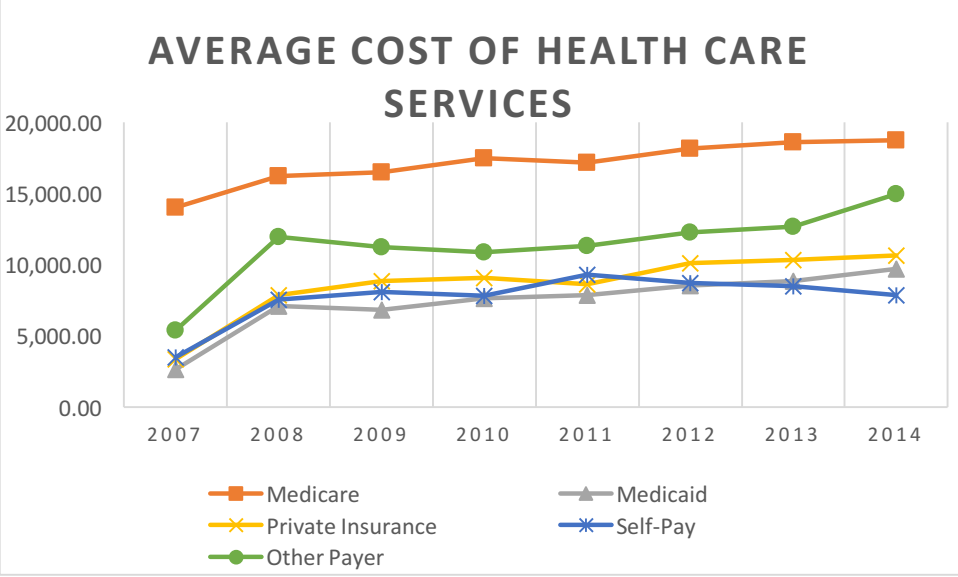

Figure 1. Average cost of health care services.

Although this figure is representative of the averages of the 30 DRG codes being analyzed, an evaluation of an individual DRG suggests a much different result. Figure 4.2 depicts the relationship discussed above for DRG 3, the most expensive health care service being analyzed for this study. The data show the same pattern in the increase from 2007 to 2008, but indicate more stabilization in self-pay costs while Medicaid and other payers experienced disproportionate increases in costs. It is important to look at individual DRG's in order to more accurately evaluate the relationship between the cost of health care services and the type of insurance. In order to better understand the relationship between the type of insurance and the cost of health care services, a ranking of one to five was determined for each DRG to determine how often an insurance type paid the most for health care services. In evaluating individual DRG codes, other payers paid the most for health care services 40% of the time and averaged a ranking of 2.3, Medicare paid the most for health care services 33.3% of the time and averaged a ranking of 2.5, Medicaid paid the most for health care services 20.0% of the time and averaged a ranking of 2.6, Self-Pay paid the most for health care services 6.7% of the time and averaged a ranking of 4.0, while private insurance did not pay the most for health care services for any DRG code and averaged a ranking of 3.5.

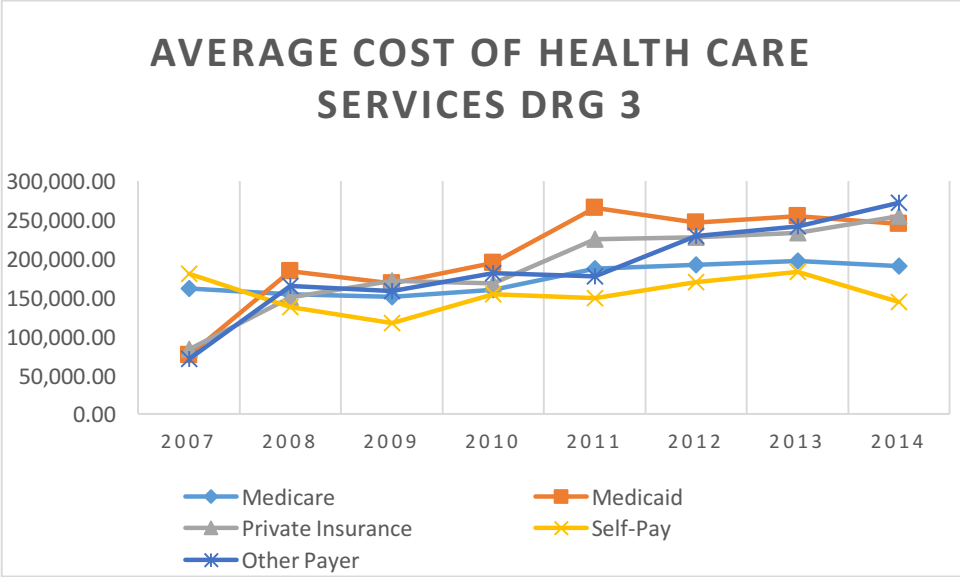

Figure 2. Average cost of health care services DRG 3.

The second research question posed whether or not there was a relationship between transparency of the type of health insurance and the average cost of health care services. The previous discussion identified the difference between the type of insurance and the cost of health care services. Based upon the transparency of costs, including the publicly available information for Medicare and Medicaid pricing, one would surmise that the average cost of health care services would be highest for Self-Pay, followed respectively by other payers, private insurance, Medicare, and Medicaid. However, when evaluating this information more fully, and considering the information from the perspective of the provider, a different conclusion is supported. Providers have established rates for reimbursement from Medicare and Medicaid. The reimbursement from CMS was much more certain than from other payers, which would indicate more confidence in billing practices and ultimately, less willingness to negotiate actual payment amounts. In addition, due to the perceived low reimbursement rates, many of the

inpatient records associated with Medicare and Medicaid indicated a greater number of additional DRG's and complicating factors. This may indicate that providers are more conscious of the need to document cases more thoroughly to obtain reimbursement for the services provided. This issue requires additional research to determine whether or not this should be factored into the overall analysis of health care costs.

The additional types of insurance provide more uncertainty for the third-party payer. For example, private insurance has higher rates of audit and denial of claims due to poor documentation or other contractual obligations. Self-pay customers may or may not have the ability to pay, making reimbursement uncertain. When evaluating the data from the perspective of the provider, the overall results do support the positive effect of transparency on the type of insurance and the cost of health care services. Based upon the existence of a statistically significant relationship, the null hypothesis of no relationship between transparency of the type of health insurance (public, private, or self-pay) and the average cost of health care services should be rejected and the alternative hypothesis accepted. Additional research needs to be conducted to evaluate the specific impact of transparency on the cost of health care services. Specific research should evaluate the use of Medicare and Medicaid reimbursement rates in negotiating reimbursement rated by private insurers. Additional consideration should be made regarding the availability of reimbursement information for self-pay customers and the impact on agreed upon prices.

The final research question related to whether or not the type of health insurance modified the effect of transparency on the average cost of health care services. The results of the analysis indicate there was a change in the level of transparency, based on

the type of health insurance, that influences the cost of health care services. The ANOVA results indicated the level of transparency was statistically related to the average cost of health care services, based on the type of insurance. This would indicate that the null hypothesis (there is not a relationship between the type of health insurance (public, private, or self-pay) and transparency of the average cost of health care services) should be rejected, and the alternative hypothesis should be accepted.

Summary

This quantitative, longitudinal study was conducted to develop a better understanding of the relationship between the type of health insurance and the cost of health care services. The study involved data analysis for 30 DRG codes from a sampling of inpatient hospital stays in Hawaii, California, Oregon, and Washington that occurred between 2007 and 2014. A one-way ANOVA was conducted to evaluate the relationship between the type of health insurance and the cost of health care services. The overall analysis indicated there was a statistically significant relationship between the type of health insurance and the cost of health care services. Although the analysis shows a statistically significant relationship, deeper analysis of individual DRG codes provides meaningful information that should be considered when evaluating the relationship between the cost of health care services and type of health insurance. The number of inpatient stays and the cost variation among DRG codes can present concerns related to internal validity. Evaluation of individual DRG codes allows more precise analysis of the relationship to be considered. This information is presented in Appendix A through Appendix E.

The results of the analysis indicated that the null hypothesis for each of the three research questions should be rejected. The rejected null hypotheses are as follows:

- Type of health insurance (public, private, or self-pay) is not related to the average cost of health care services.
- There is not a relationship between transparency of the type of health insurance (public, private, or self-pay) and the average cost of health care services.
- There is not a relationship between the type of health insurance (public, private, or self-pay) and transparency of the average cost of health care services.

In addition to providing meaningful information related to the relationship between the cost of health care services and type of health insurance, the analysis provided meaningful information regarding the effectiveness of the ACA in stabilizing health care costs and reimbursement rates of various payer types. Other payers paid the highest for health care services followed by Medicare, Medicaid, and self-pay, while private insurance consistently paid the least amount for health care services.

Chapter 5 will include an interpretation of the findings, summarize limitations and delimitations of the study, include recommendations for additional research and future actions, and summarize the implications of the study. The chapter will conclude with the implications for positive social change.

Chapter 5: Conclusions and Recommendations

Increasing health care costs continue to pose a significant challenge to individuals in accessing health care services in the United States. Schoen et al. (2013) found that individuals living in the United States were more likely to forego necessary services due to costs than individuals living in Australia, Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland, and the United Kingdom. Expenditures for health care services in the United States exceeded 17.4% of GDP in 2013 and are expected to exceed 20% by 2020 (Hartman et al., 2015). Although waste accounts for as much as 47% of total expenditures (Berwick & Hackbarth, 2012), the primary factor for high costs in the United States is the complexity of the health care industry (Schoen et al., 2013).

Substantial research has been conducted to evaluate access to health care services and quality of care received by patients (Barr, 2014). The trifecta model indicates that the third influence on health care is cost (Dai, 2015). Little research has been conducted to evaluate the underlying influences that impact health care costs. Jevsevar (2015) cited a lack of transparency as a major factor that inhibited studies regarding health care costs.

This quantitative longitudinal study was conducted to evaluate two factors that may play a significant role in the cost of health care services: type of health insurance and lack of transparency in the health care industry. The NIS HCUP data set was used to conduct an evaluation of the net charges for specific DRG codes to determine the impact of the type of health insurance on the costs of health care services. After eliminating DRG codes that could not be reported due to data use agreement terms, 30 DRG codes

were selected for evaluation. The DRG codes selected included the 10 most frequently used codes, the 10 most expensive codes, and the 10 least expensive codes. Total charges were reduced to net charges based on the average contractual allowances provided in the cost-to-charge supplementary files. A comparison of the net charges was conducted over an 8-year period, 2007 through 2014, based on the expected primary payer (the type of health insurance) that included Medicare, Medicaid, private insurance, self-pay, and other payers. The time period evaluated included pre and post implementation of the ACA. This allowed an evaluation to be made regarding the overall effectiveness of the policy in increasing the number of individuals covered by health insurance and reducing health care costs (Rosenbaum, 2011). In addition, the impact of transparency on the cost of health care services and type of insurance was included to evaluate the potential influence that additional information might have had on decision-making capabilities for patients, providers, and payers.

The results of this study provided insight into the role of health insurance on health care costs but did not include findings that could be generalized to all health care costs. Due to the sample selection methodology employed in the study, the results may not be representative of all DRG codes or inpatient hospital stays. Specific concerns related to methodology and generalizability of the results are discussed in the limitations section. This chapter also includes a review of the findings and a discussion of the conclusions that were drawn from the data analysis. In addition, I provide recommendations for further research, practice, and policy, and discuss implications for positive social change.

Interpretation of the Findings

This study focused on three research questions and six hypotheses. The primary focus of the study involved the relationship between health insurance and the cost of health care services and the influence of transparency on overall expenditures. The results of this study led to all three null hypotheses being rejected. Each research question is answered in more detail later in this chapter.

The process of conducting the analysis provided some surprising yet useful information related to the costs of health care services. Four items that were of particular interest were chargemaster rates, reimbursement rates based on the type of insurance, a significant price increase in 2008 and 2011, and the influence of the ACA on overall costs of health care services. Each of these four items is discussed in more detail.

Chargemaster Rates

Significant variation among providers in chargemaster rates is common in the health care industry. An analysis of chargemaster rates for DRG 3 in 2014 showed a range of $106.00 to $4,948,490.00 with a mean of $51,603.25 and standard deviation of $115,296.44. The analysis for net charges indicated a range of $24.38 to $1,874,121.70 with a mean of $12,452.25 and standard deviation of $26,725.89. Although the information regarding net charges showed that the gap in the variation among prices being charged to individual consumers decreased when evaluating the actual cost of services, there was still little consistency within the industry regarding how much to bill an individual consumer. This fact can be confirmed by the large standard deviation associated with each type of insurance and DRG code presented in Appendix B.

The analysis confirmed the need to provide meaningful information to consumers and policymakers to aid in the decision-making process. The amount collected for specific health care services provides information that may allow consumers to compare prices and quality measures to aid in the decision regarding the value provided by a specific provider. The results of this study also confirmed the need for additional transparency related to cost of health care services to provide consumers with the information necessary to make an informed decision.

Reimbursement Rates

Experts in the health care industry have commonly discussed the need to improve reimbursement rates for government health insurance programs, specifically Medicare and Medicaid. Barr (2016) discussed the perceptions of reimbursement rates for health insurance companies and reported that private insurance reimburses providers at the highest rate, followed by other payers, Medicare, and Medicaid. Self-pay is associated with the highest level of payment for services but also has the highest amount of bad debt associated with the rate of collection (Barr, 2016).

The results of the analysis indicated some surprising information related to the reimbursement rates associated with health insurance. Although Medicare and Medicaid are commonly cited as having the lowest reimbursement rate for DRG codes, the current analysis indicated that self-pay reimbursement rates were consistently the lowest of all payers. According to the ranking of health insurance reimbursement rates, other payers paid the highest amount followed by Medicare, Medicaid, and private insurance.

The most surprising information was that private insurance paid the lowest rate for health care services. The common perception of Medicaid paying the lowest reimbursement rates of all payers led to the creation of disproportionate share payments to compensate providers that experienced a high Medicaid payer mix for low reimbursement rates (Barr, 2016). The results of the current study directly contradicted this information and indicated that private insurance and self-pay commonly pay the lowest rates for services. The results highlighted the need for policymakers to have additional transparency and accurate information to develop policies that are consistent with the facts. Without this information, policymakers support policy decisions that add to the waste and inefficiencies in the health care industry that exceed more than one trillion dollars (Berwick & Hackbarth, 2012).

Price Increases

Another surprising element appeared in the longitudinal analysis of the data. When evaluating individual DRG codes, I found unusually large price increases in 2008 and 2011. The price increase from 2007 to 2008 can be largely attributed to the uncertain political environment surrounding the health care industry (Blendon et al., 2008; Henry J. Kaiser Family Foundation, 2007). Americans had grown frustrated with the cost of health care services and wanted reform that addressed poor quality (Henry J. Kaiser Family Foundation, 2007). Health care organizations, including health insurance companies, wanted increased accountability to address chronic health conditions and poor choices related to healthy behavior (Henry J. Kaiser Family Foundation, 2007).

To attract support during the presidential election, both major political parties presented proposals that included significant reforms in the health care industry. Both proposals included government involvement in setting prices and increased regulation over health insurance companies. Due to the uncertainty related to future pricing in the health care industry, many individuals speculated that health care organizations increased prices so that any future reduction imposed by regulation would have minimal impact on organizational performance and profitability (Blendon et al., 2008).

Price increases from 2010 to 2011 can be attributed to the specific provisions of the ACA including the requirement that preexisting conditions be covered, individuals cannot be denied health insurance, removal of lifetime limits on health insurance policies, mandated coverage of preventive services, and mandated medical loss ratios of 80% for small groups and 85% for large groups (Barr, 2016; Patient Protection and Affordable Care Act). The increased regulation on health insurance companies provided an opportunity for health service providers to increase costs of services due to favorable market conditions, including an increase in the number of individuals being insured.

The primary purpose of this study was not to identify specific factors that influenced increases in health care costs. The focus was limited to the relationship between the cost of health care services and type of health insurance over a period of 8 years. Results of the analysis indicate additional research should be conducted to evaluate specific factors that influence total health care expenditures.

Influence of the ACA

A primary goal of the ACA is a reduction in the overall cost of health care in the United States. The results of the current study indicated some price stabilization after the implementation of the ACA. The average increase in the cost of health care services between 2007 and 2010 was approximately 38.6%. After the implementation of the ACA, the average increase in the cost of health care services between 2011 and 2014 was approximately 4.3%. Although this reduction in cost increase might be attributed to a number of factors, the increase in the number of individuals with health insurance, due to the requirements of the ACA, appears to have had an impact on the overall stability of prices on health care expenditures from 2010 through 2014.

Another goal of the ACA was to reduce the number of individuals who did not have health coverage. The number of individuals reported as self-pay should have decreased through the implementation period. In 2007, self-pay individuals accounted for approximately 3.1% of the inpatient stays included in the analysis. The number increased to approximately 5.0% in 2010 and decreased to approximately 3.0% in 2014. Overall, the percentage of individuals without insurance remained about the same, indicating that the ACA did not achieve the goal of reducing the number of individuals not covered by insurance. There were several interesting trends in the number of individuals being covered by insurance. The percentage covered by Medicare increased from approximately 7.6% in 2007 to approximately 26.5% in 2014. This may be attributed to the growth in the number of baby boomers reaching retirement age and becoming eligible for Medicare. Those covered by Medicaid decreased from approximately 39.4% in 2007

to approximate 33.7% in 2014. This trend seemed to contradict efforts to expand Medicaid coverage by most states and increase federal participation in funding. Individuals covered by private insurance decreased from approximate 47.5% in 2007 to approximately 34.0% in 2014. Again, this was a surprising trend considering the efforts to expand insurance coverage through the ACA. Some of this decline may be attributed to individuals reaching retirement age and switching to Medicare, but this would not account for the entire amount of the decrease.

Mechanism theory and game theory were combined to develop the underlying theoretical framework for evaluating the relationship between type of health insurance and the cost of health care services. The longitudinal analysis supported the notion that underlying incentives and penalties of the ACA are having the desired effect. The number of uninsured individuals in the United States has been reduced, and the increasing cost of health care has been slowed. Although there are still significant improvements that must be made to ensure the sustainability of the health care industry, the current system supports modifications, not abandonment. To continue to see benefits associated from mechanism and game theory, additional information must be made available to consumers and should be coupled with additional incentives to encourage compliance and improve behaviors that increase population health.

Research Questions

The study involved a longitudinal analysis of the relationship between health care costs and type of health insurance. The evaluation included an analysis of 30 DRG codes selected from the NIS HCUP for services provided in the Pacific division. DRG codes

were selected after eliminating codes that could not be reported due to groupings smaller than 10. DRG codes included the 10 most frequently used codes, the 10 most expensive codes, and the 10 least expensive codes. Type of insurance was determined from the primary expected payer for each inpatient stay and included Medicare, Medicaid, private insurance, self-pay, and other payers.

Research Question 1: To what extent, if any, does the type of health insurance (public, private, or self-pay) affect the average cost of health care services? The analysis of the effect of the type of insurance on the cost of health care services produced a statistically significant relationship for each of the 8 years included in the study. Depending on the year evaluated, the type of health insurance affected the average cost of health care services between approximately 2% and 9%. In 2007, prior to a large increase in health care prices, the estimated amount of variation in health care costs that could be attributed to the type of insurance was approximately 9%. The estimated impact fell to approximately 3% in 2008, 2009, and 2010. The variation fell to approximately 2% in 2011, another year that had a significant price increase, and remained steady through 2014.

Although there was a statistically significant relationship between health care costs and type of insurance, the variation in cost that can be attributed to the type of insurance was relatively small. An inpatient hospital stay can be extremely complex and vary greatly from patient to patient. For example, two patients that have a hospital stay for a knee replacement might have completely different medical needs. One might be an obese elderly patient with a chronic condition, such as diabetes, that needed a joint

replaced while the second patient might be a young adult that sustained a serious injury in a car accident. Both patients would be listed under the same DRG code, but receive very different treatments. Future research needs to evaluate the complexity of each inpatient stay and include a comprehensive analysis of more similar cases.

Reimbursement rates for Medicare and Medicaid are established prior to the beginning of the federal and state fiscal years in which services are provided. According to Gaughn (2016), Medicare contractual adjustments averaged 72.84% for the Pacific region while Medicaid contractual adjustments averaged 68.71%. This study relied upon the average contractual adjustment rates across all payers. Future research should compare the estimated reimbursement rate to the actual reimbursement rate established and published by Medicare and Medicaid. This would allow a more detailed analysis to be conducted on the relationship between the type of insurance and the cost of health care services.

Actual reimbursement amounts for private insurance and other payers can vary significantly due to the negotiated contractual rates established between the provider and payer. Contractual allowances for managed care averaged approximately 56.94% and approximately 42.54% for commercial insurance for the Pacific region (Gaughan, 2016). The lower average contractual allowances presented by Gaughn (2016) vary from the findings of this study. The results of the study indicate that the contractual allowances for private insurance are higher than Medicare and Medicaid because private insurance reimbursement averages the lowest of all third-party payers.

Gaughn (2016) reported an average contractual allowance of approximately 70.35% for all payers. The average contractual allowances for the sample analyzed in this study averaged approximately 72.7%. The variation may be attributed to the method of selection utilized to identify the DRG codes to be used in the analysis. Additional research needs to be conducted to evaluate the contractual allowance adjustments that need to be made in order to evaluate the actual cost of health care services.

Overall, the results of the study indicate a statistically significant relationship between the type of health insurance and cost of health care services that, from 2011 to 2014, accounted for approximately 2% of the variation in total cost. Contractual allowances play a significant role in determining the cost of health care services. Unfortunately, this area has become an extremely complex and a less than transparent process that inhibits consumers and policymakers from having access to the information necessary to make well-informed decisions. The effect of transparency on health care costs is associated with the remaining research questions.

Research Question 2: To what extent, if any, does transparency of health care costs affect the average cost of health care services? Transparency of health care costs was found to have an effect on the average cost of health care services. Nonetheless, transparency continues to be a significant obstacle when conducting research on health care costs. Transparency can take on a multitude of perspectives depending on whether the evaluation considers the point of view of the patient, health care provider, or third-party payer. Each perspective should be considered when discussing the posed research question.

Patient perspective. Patients and providers do not understand the cost of health care services prior to making a decision related to treatment. Patients did not evaluate the cost of health care services because of the limited financial impact to the patient. In one example, Bearak, Finer, Jerman, and Kavanaugh (2016) found that the variation in pricing to the patient for hormonal intrauterine devices in the first quarter of 2012 ranged from $20 to $844, depending on the cost-sharing agreement with the third-party payer. Most patients only considered the amount of the copayment when making the decision regarding services and ignored the total cost incurred by the third-party payer. This was consistent with a study undertaken to evaluate the communications about health care costs between patients and providers. According to Ubel et al. (2016), many discussions about treatment plans center around the possibilities of disease and outcomes, but most providers do not discuss the financial implications of treatments due to a lack of information and complexities of the billing process. The authors did find that patients with high-deductible health plans and an expectation of large out-of-pocket costs were more likely to discuss health care costs and seek out less costly treatment alternatives.

In essence, transparency can influence the cost of health care services when a patient makes a decision regarding the utilization of health care services and two conditions exist. First, the patient must have personal accountability for the decision being made regarding the services. In the examples provided, patients were more likely to discuss the cost of health care services if the patient had a high-deductible health plan and was expected to have to pay for a portion of the services out-of-pocket. An understanding of the actual cost of health care services being paid by the individual initiated a change in

behavior that included inquiry and understanding of the services being provided and the necessity of treatment. Second, providers must be able to provide information regarding the quality of treatment options and alternatives that are less expensive. Patients rely on health professionals for education and information about treatments that are effective, achieve quality outcomes, and save money. Merely providing information about costs of a particular service will improve the decision-making process (Alonso-Coello et al., 2016), but does not go far enough in providing the information needed to make a well-informed decision.

Health care provider perspective. Health care providers have not been taught about the cost of health care services. Providers have been taught to identify, diagnose, and treat injuries and disease in a manner that protects the health care organization from further liability. Discussions related to best practices and cost are a relatively new development within the industry that are being considered due to the increased understanding that the current health care industry in the United States cannot be sustained (Golden, Hager, Gould, Mathioudakis, & Pronovost, 2017). As providers develop a better understanding of the cost of health care services related to the various third-party payers, more and more discussions with patients will involve the cost of health care services and the necessity of treatment options. The use of best practices will also aid in the reduction of waste within the health care industry, which accounts for as much as one-third of total expenditures (Doyle, Graves, & Gruber, 2017).

Providers will be able to influence health care costs through an increase in transparency through two primary methods that include reduction of waste and

identifying more cost-effective treatment plans. A reduction of waste includes the elimination of unnecessary treatments and services. Many of these services are performed due to the request of patients or in an effort to reduce the future liability of the health care organization. Medical malpractice reform is an essential component of freeing up providers to practice medicine without the unnecessary threat of legal action. Pai, Kennedy, and Hahn (2016) found that 1 in 14 physicians face a malpractice suit in 2011. Schaffer, Jena, Seabury, Singh, Chalasani, and Kachalia (2017) evaluated medical malpractice claims from 2009 to 2014. During this time period, 280,368 claims were paid at an average amount of $329,565. This amounted to approximately $15,399,913,320 per year in settled malpractice claims. This does not include legal costs or other costs associated with claims being filed. Although there are times when a provider must be held responsible for inappropriate behavior, malpractice reform needs to be addressed if providers are going to be enabled to practice medicine in a manner that contributes to overall expenditure reduction.

The second method of contributing to a reduction of costs relates to the identification of more cost-effective methods of treatment. As previously discussed, because providers have not been active participants in the discussions related to the cost of health care services, the costs associated with many treatment options are not considered when developing a treatment plan (Ubel et al., 2016). According to Busack, Christopher, and Fox (2016), physicians lack the training necessary to provide financial counseling to assist patients in navigating the financial challenges within the health care system that accounts for the majority of bankruptcies in the United States. Physicians

need to be given the information that is necessary to facilitate an effective treatment plan that considers the financial implications to the patient so that an informed decision can be agreed upon by the patient and provider.

Third-party payer perspective. Third-party payers are most influenced by the available information related to the cost of health care services. Pricing for health care services is typically based upon reimbursement levels established for Medicare and Medicaid. Medicare and Medicaid establish published rates for reimbursement prior to the start of the fiscal year in which services are to be provided. Rates for Medicare are determined by CMS, which oversees both Medicare and Medicaid programs. Medicaid rates can be adjusted by individual states in order to ensure providers are willing to provide services to Medicaid eligible patients, but Federal Medical Assistance Percentage (FMAP) does not apply to the modified reimbursement rate. Because of this program regulation, most states adopt the reimbursement rates for Medicaid that are recommended by CMS. Rates are attributed to a combination of prior year reimbursement levels, cost reporting information from providers, and targeted reform initiatives. The reimbursement rates focus on historical data that has been verified through a variety of methods and processes, including financial audits. In addition, the rates take into consideration RVUs, established by the American Medical Association Relative Value Scale Update Committee, that determines the amount of time that a physician spends in order to provide a specific service (Haddad, 2017).

Private insurance companies and other payers have the benefit of knowing the reimbursement rates established by CMS when negotiating contracts with health care

providers. Although there is a general perception that private insurance reimburses at the highest rates, the results of this study indicated that private insurance reimbursement rates ranked the lowest of all third-party payers, with only self-pay reimbursement rates accounting for lower reimbursement rates. On average, private insurance reimbursement rates were approximately 28.1% lower than Medicare, Medicaid, and other payers. This was very surprising, considering that type of insurance accounted for approximately 2% of the total variation in health care costs. Future research needs to consider other possible factors that might influence this variation; however, according to the results of the analysis conducted during this study, transparency plays a significant role in the cost of health services.

Research Question 3: To what extent, if any, does the type of health insurance (public, private, or self-pay) modify the effect of transparency on the average cost of health care services? Modify the effect refers to a change in transparency based upon the type of insurance. More specifically, is there a difference in the level of transparency of costs based on the type of health insurance (public, private, or self-pay)? Type of health insurance is directly related to transparency of costs. The most significant effect of transparency on health care costs relies upon the party that is responsible for the majority of the costs. In the current environment, the third-party payer is the party that holds the majority of the responsibility for paying for health care services. Economic behavior dictates that the purchaser will try to maximize utility. In the case of purchasing health care services, the third-party payer tries to purchase the minimum amount of goods or services to meet the contractual

obligations established in the health insurance policy for the smallest amount possible. The more transparency the third-party payer has regarding the available supply of services and the cost of producing the services, the more likely that the third-party payer has to establish utility.

Medicare and Medicaid are known, within the health care industry, as the price setters. CMS is required by law to publish reimbursement rates by DRG code (Bowling, Newman, White, & Wood, 2017). According to the authors, this information is publicly available but is rarely accessed by consumers due to the limited personal accountability and responsibility of the patient. Providers are required to document the medical necessity of services within the patient health record. Recent trends in the recapture of provider fees through the Recovery Audit Contractor (RAC) program has resulted in behavior changes that have improved documentation and increased billing codes that support more complex cases and treatment plans (Lee, Abbey, Heim, & Abbey, 2016). This process may likely be a factor that might account for higher reimbursement rates for Medicare and Medicaid inpatient stays.

Providers are not able to negotiate the rates for services provided for CMS recipients. The provider either chooses to accept or not accept the established rates. Anderson, Glasheen, Anoff, Pierce, Lane, and Jones (2016) found that approximately 48.3% of hospital revenue was associated with Medicare and approximately 23.2% of hospital revenue was associated with Medicaid, accounting for a total of approximately 71.5% of total hospital revenue across the United States. Most hospitals would cease to exist if opting to not accept Medicare and Medicaid patients. CMS is well aware of its

market share and the ability to dictate reimbursement rates and implement industry reform (Anderson et al., 2016).

Although private insurance covers approximately 66% of the population within the United States (Mossialos, Wenzl, Osborn, & Anderson, 2016), hospital revenue attributed to private insurance is approximately 23.2% (Anderson et al., 2016). Competition for market share for private insurance companies is one of the most fiercely competitive markets in the country. Combined with the fact that private insurance has the benefit of utilizing published CMS reimbursement rates when negotiating contracts with health care organizations, private insurance companies are able to maintain some of the lowest reimbursement rates of all third-party payers. This position is supported by the analysis conducted in this study.

One additional factor that may account for some of the variation in lower costs for private insurance is related-party transactions. A related party transaction is defined as a business arrangement between two parties that are joined by a special relationship prior to the deal (Kohlbeck & Mayhew, 2016). An example of a related party that could impact this study is an insurance company owned or operated by an integrated health care system, such as Kaiser Permanente. The purpose of this study is not to evaluate or determine whether this type of relationship is good or bad, it is merely mentioned as an area of future research that may impact the cost of health care services.

Limitations of the Study

A number of the limitations and delimitations of the study that were discussed in Chapter 1 were presented in the actual analysis. Limitations included both internal and

external threats to validity. Threats to internal validity included factors such as history, maturation, regression, selection, and instrumentation. External threats to validity included the interaction of selection and treatment, the interaction of setting and treatment, and the interaction of history and treatment. Delimitations included the selection of DRG codes to be included in the analysis, the geographic focus of the study, and the utilization of average contractual allowances in calculating net health care costs. Other limitations of the study included an inability to evaluate the complexity of each individual inpatient stay, variation in cost based upon the setting of the service (rural vs. urban), and consideration of other covariates, such as related party transactions, that might influence the cost of health care services. Each limitation and delimitation are discussed in more detail in the sections that follow.

Threats to Validity

Threats to validity can be broken down into two categories, internal threats and external threats. Internal threats identified for this study included history, maturation, regression, selection, and instrumentation. External threats identified in this study included the interaction of selection and treatment, the interaction of setting and treatment, and the interaction of history and treatment. Each factor is discussed more fully below with the potential implications of the results of the study and any overall concern that the user should be aware of when considering the results of the study.

Historical threats that influence the cost of health care services included inflation. From 2007 to 2014, the cumulative rate of inflation was 14.2%, averaging approximately 1.78% per year (United States Department of Labor, n.d.). In other words, a service that

cost $10 in 2007 would cost $11.42 in 2014 due solely to the rate of inflation. An adjustment can be made to the total cost of health care services to reflect the increase that can be attributed to inflation. Overall, the adjustment will not have an impact on the relationship between the type of insurance and health care costs.

Due to specific provisions of health care reform mandated by the ACA, CMS revised a number of policies related to billing policies and procedures. The revised regulations resulted in a reduction in reimbursement rates to correspond more closely to fee-for-service costs (Hartman et al., 2015). The changes in CMS reimbursement rates are followed closely by the private sector. While the reduction in reimbursement rates will influence the longitudinal analysis, the evaluation between the type of insurance and health care costs will not be impacted for any given year.

Regression, the possibility that outliers were selected in the sample, was a significant challenge within the sample selection. The concern related to the selection of outliers became more important because the data lacked normality. As discussed in Chapter 4, a Kolmogorov-Smirnov test was used to test for normality of the dependent variable, cost of health care. The results of the test, reported in Table 101 through Table 108 in Appendix E, indicated that the assumption of normality had been violated. Even though additional robust procedures were conducted to minimize threats to validity, such as the calculation of *Welch's F*, an increased sample size, and post hoc procedures that included the *Games-Howell* test, the violation of regression limits the ability of the results of the study to be generalized to all health care costs.

Sample selection can raise concerns that the data is predisposed to specific characteristics that lead to certain outcomes. The process of sample selection, as described in Chapter 4, increased the likelihood that violation had occurred for this measure of internal validity. Because of limitations with the data, specifically not being able to report on a group smaller than 10, the selection of DRG codes may not be representative of all health care costs. For example, three of the selected DRG codes, 775 - vaginal delivery without complications, 765 - cesarean section with complications, and 766 - cesarean section without complications, resulted in a sample selection of approximately 70% female and 30% male inpatient hospital stays. This is not reflective of the overall number of inpatient hospital stays to be approximately 57% female and 43% male. The difference in gender was just one example that suggested that the sample should not be generalized to the overall population.

The discussion in chapter 1 indicated the change in data collection procedures implemented by NIS HCUP in 2011. The data restructuring in the present study required a number of changes in methodology, including a change from reviewing the 10 largest metropolitan cities in the United States to reviewing the Pacific region. Although the same methodology was applied to each year included in the study, some variation in the analysis may have occurred due to the change in data collection procedures. An overall determination cannot be made regarding the impact on the results of the longitudinal analysis instrumentation; however, the results of the relationship between the type of insurance and health care costs from year to year appear to be unaffected by the instrumentation change.

Previous discussions regarding threats to external validity included the lack of transparency and use of a purposeful sample. The lack of transparency of health care costs resulted in estimates being used, as expected. In a number of cases, contractual allowances were not available for individual hospitals and an estimate for a region had to be used to calculate the net health care charge. The use of estimates will limit the generalizability of the study and present opportunities for future research to be conducted that may provide more precise measures. The expected use of a purposeful sample presented another limitation in generalizing the results of this study to the larger population. In addition, the data use agreement prevented the reporting of any information in groups smaller than 10. This required further adjustments to be made in the sample selection process. In short, although the results of this study provide a foundation for understanding the relationship between the type of insurance and cost of health care services, the results should not be generalized to the population due to concerns regarding external validity.

Additional challenges arose when testing the assumptions associated with a one-way ANOVA, including normality of data, homogeneity of data, and a random sample selection. Although additional robust procedures were undertaken to reduce the threats to validity, the failure of the study to meet these assumptions provide further concerns about the ability of the study to be generalized to the population or make other assumptions regarding health care costs.

Delimitations

Chapter 1 identified potential delimitations that may be present in this study. As expected, the following delimitations were present in the study, the selection of DRG codes to be included in the analysis, the geographic focus of the study, and the utilization of average contractual allowances in calculating net health care costs.

The selection of the DRG codes was more of a concern than originally anticipated. The data use agreement for HCUP prohibited the reporting of any information in cells smaller than 10. This meant that any DRG codes that included fewer than 10 inpatient stays for a specific type of payer had to be excluded from the analysis. Although there was a sufficient number of DRG codes to select from, the sample selection process further limited the ability of the results to be applied to a larger population.

The initial design of the study included a selection of inpatient hospital stays from the 10 largest metropolitan areas in the United States. Because of a change in the reporting of information made by NIS HCUP in 2011, the zip code of a hospital could not be identified. The revised dataset allowed hospitals to be identified by census region. The change in the dataset presented a further, unintended delimitation that required a revision in methodology. The inclusion of inpatient stays for a census region presents an additional concern related to health care costs. Health care services in a rural setting can vary greatly from a large metropolitan area. For example, inpatient stays evaluated in the study included such disparate locations as Enterprise, Oregon and San Francisco,

California. These two markets are very different and pricing for health care services would vary due to the setting.

Although there was an expectation that average contractual allowances would need to be used in the study, the use of average contractual allowances presented in an unexpected manner in the study. While most organizations reported an average contractual allowance for the organization, some did not report this information to NIS HCUP. When this information was not reported, NIS HCUP calculated an average contractual allowance for similar hospitals in the census region. As indicated in chapter 1, the lack of transparency of actual costs prohibits generalizations to be made regarding health care costs throughout the country.

Other Limitations

A number of other limitations of this study should be noted. Although there are numerous limitations, the most significant included a failure to evaluate the complexity of each individual inpatient stay, variation in cost based upon the setting of the service (rural vs. urban), and consideration of other covariates, such as related party transactions, that might influence the cost of health care services.

This study relied on the DRG code that was in effect upon discharge. Each inpatient stay could have as many as 15 different DRG codes that were associated with treatment. The scope of this study did not include an evaluation of the complexity of the inpatient stay. The complexity of each stay may account for the large standard deviation calculation in many of the DRG codes. While the results of this study provide a foundation for evaluating the relationship between the type of health insurance and cost

of health care services, additional research should be conducted to account for the complexity of an individual stay.

The setting in which health care services are provided can play a significant role in the overall cost of treatment (Zhang, Mason, Boyd, Sikich, & Baranek, 2016). The inability to segregate the NIS HCUP data by setting prevented a more precise comparison of health care costs. Information was available in the NIS HCUP data that provided a wage adjustment ratio that would enable the identification of less expensive settings for receiving care but may or may not be related to the amount charged for health care services.

Related party transactions were not identified as a concern in the development of this study. However, upon evaluating the results that indicated private insurance reimbursement rates were the lowest among the third-party payers. Additional focus was given to potential factors that might help explain this variation. According to Jacobson (2016), more and more providers are offering provider-sponsored health plans. This is being done in an effort to capture market share and control a larger portion of the revenue stream within the health care industry. It is beyond the scope of this study to evaluate the relationship of provider-sponsored health plans and reimbursement rates to providers, but this is a factor that needs to be considered when conducting future research.

Recommendations

The results of this study provide a foundation for understanding the relationship between the type of health insurance and health care costs. Based on the results of the study, recommendations have been developed to offer insight into future research,

industry practice for consumers, providers, and third-party payers, and health policy for policy makers. Each is discussed in more detail below.

Future Research

Additional research needs to be conducted that can further explain the results of the study and reduce the limitations associated with the research. Future research needs to include an evaluation of inpatient stays with similar levels of complexity, comparison of services in similar settings, identification of actual contractual allowances instead of averages, and the inclusion of other potential covariates.

First, the dataset includes additional DRG codes associated with each inpatient stay and complicating factors. Two patients could be listed under the same DRG code, but receive very different treatments. Future research needs to evaluate the complexity of each inpatient stay and include a comprehensive analysis of more similar cases. Health care costs should be evaluated based upon a comparison of similar conditions and factors, which could lead to less variance in the cost of health care services. An evaluation of specific DRG codes could be conducted that included matching complications and other DRG codes associated with the stay. This would provide a comparison that would be more representative of patients that received similar services.

Second, consideration should be given to the cost of providing service in a specific area. The NIS HCUP data includes a wage adjustment factor that could provide additional information regarding the underlying costs of providing care and may factor into the overall cost of health care services. A future study should include an evaluation of costs by location as a condition of the variance in the cost of services.

Third, future studies should include the actual contractual allowance based upon the type of insurance. The present study relied upon the average contractual adjustment rates across all payers. The contractual allowance could be determined for Medicare and Medicaid by comparing the NIS HCUP data to the actual reimbursement rate established and published by Medicare and Medicaid. Additional research would be required to determine the actual contractual allowance for private insurance, self-pay, and other payers. A sampling of explanation of benefits and other hospital records might provide the necessary information. In addition, voluntary participation in a survey from specific hospitals across the country might provide sufficient detail to include a more robust analysis of the net charges for health care costs.

Although this type of study would be a significant undertaking, the resulting information would provide a significant amount of information that would benefit all stakeholders in making informed health care decisions. The lower average contractual allowances presented by Gaughn (2016) vary from the findings of this study. The results of the study indicated that the contractual allowances for private insurance are higher than Medicare and Medicaid because private insurance reimbursement averages the lowest of all third-party payers.

Lastly, although this study did not evaluate factors that might influence increases or variances other than the type of insurance, one might surmise that promises of health care reform made during the presidential election campaign of 2007 and the ACA influenced providers to increase prices in anticipation of additional oversight and health

care industry reform. In essence, an element of increasing prices while the option was on the table could have resulted in an increase in overall health expenditures.

Industry Practice

Each of the major stakeholder groups impacted by the cost of health care, consumers, providers, and third-party payers, can benefit from the research conducted in this study. All three major groups of stakeholders are tasked with making decisions regarding a very complicated industry with emotional implications. The more factual data that is available when undertaking major decisions, the more likely that emotional factors will be reduced and empirical evidence will guide the decision-making process.

Consumers can benefit by understanding that the cost of health care services can and should impact health care related decisions. Although the impact of high costs is not fully understood by the consumer due to the role of the third-party payer, the consumer has the ultimate responsibility for determining whether or not health care services are performed. Ultimate responsibility and accountability come in the form of paying for services, whether in the form of health care premiums or direct payments to providers. As a society, we have grown accustomed to ignoring the relevant discussion related to the cost of the services that are recommended by the health care professional. Health care professionals have largely ignored the cost component of health care because consumers have not included this factor in the decision-making process. The trend of moving towards high-deductible health plans, which requires more cost-sharing responsibility from the consumer, has increased consumer demand for information regarding costs for health care services. As consumers, we must continue to advance our knowledge

regarding the financial aspects of health care in order to evaluate more cost-effective treatment methods and reduce total health care expenditures. In addition, as health care cost information becomes more transparent, more informed decisions can be made regarding the appropriateness of treatment and the quality of services being provided. These factors influence consumer behavior in other major service industries and must become part of the decision-making process if we are to influence purchasing behavior in the health care industry.

Providers need to understand the role of health insurance in the setting of health care prices in order to provide information regarding treatment options to patients. The complexity of the health care industry, coupled with a defensive medicine practice model, has led to an industry that spends almost $1 trillion per year in waste. If we were to reduce our GDP spending by one-third, we would spend approximately 13% to 14%, which is still far above other countries, but more reasonable that current spending levels. Consumers rely on the expertise of health care providers to develop treatment plans that are appropriate. It is often assumed that treatment plans have considered not only outcomes but the cost of treatment. In most situations, health care professionals are not even aware of how much a service costs or how much the patient will be responsible for paying. More and more health care organizations are discussing payment responsibilities before providing services in order to establish expectations. We cannot expect a clinician to understand all aspects of health care, including costs. It is essential that an integrated care team that includes a clinician and financial specialist work together to develop a comprehensive treatment plan that considers less costly alternatives.

Providers need to also find methods that ensure consistency in billing for similar services. It is not uncommon for contractual discounts to be in place for volume discounts in other industries. Two individuals receiving the same services should be charged the same amount. As health care costs become more transparent, it will be an essential component of business practices to ensure that there is consistency in billing practices. Without this consistency, providers will be subject to discrimination claims, price fixing, and other unfair business practices that will increase the potential for litigation. Although there is some variation in specific services received by an individual, the industry shift to bundled billing rates will eliminate the ability of an organization to differentiate between services provided among patients. Altering billing practices to achieve consistency will allow an organization to be well positioned for trends that are occurring within the industry.

Third-party payers are in the strongest position to benefit from the results of this study. Current industry practice allows third-party payers to negotiate contractual allowances that allow health insurance premiums to remain at the lowest level possible. The results of this study indicate that private insurance is achieving the lowest health care costs of all third-party payers. The information in this study could be utilized to evaluate specific DRG codes and compare the third-party payers negotiated rates with the average being paid by other private insurance carriers. Because the ACA mandates a cost claim ratio of 80% that must be maintained by all private insurance providers, a comparative analysis may provide beneficial information that would allow the negotiation of lower reimbursement rates.

Health Policy

Policymakers can benefit from the results of this study in a number of ways including a better understanding of health care costs, the impact of the type of insurance on reimbursement rates, and the effectiveness of the ACA in meeting targeted objectives. These benefits have the ability to guide future health policy in achieving key objectives to improve the health care industry. In addition, policymakers are able to use the results of the study to make informed decisions about the necessity of additional health care reform.

The results of this study provide policymakers with empirical evidence regarding health care costs based on the type of health insurance. This is important because historically, most decisions have been based upon chargemaster rates, which are not an accurate reflection of health care costs. Decisions regarding health policy can now be focused on data that reflects more precise information. Although, as discussed in the limitations, caution needs to be taken when utilizing the results of this study, the information provides

One of the surprising outcomes of this study was the reimbursement levels of Medicare and Medicaid compared to private insurance. Policymakers are continually being pressured to increase reimbursement levels in order to compensate providers at a competitive rate. According to the data, private insurance reimbursement rates are significantly lower than Medicare and Medicaid. Policymakers need to obtain additional evidence to support or refute this finding. If the finding can be generalized, future health care policy may need to address the overall reimbursement rates provided by CMS programs and prohibit private insurance contractual allowances from dropping below this

level. This type of provision would prevent cost shifting from private insurance companies to public programs, eliminating an unintended use of taxpayer funds.

Policymakers can evaluate the effectiveness of the ACA in achieving key objectives including reducing the number of individuals not covered by health insurance and reducing overall health care costs. Although the ACA mandated coverage for all individuals and there was an increase in the number of individuals covered by health insurance, there was not a significant change in those individuals relying upon self-pay for hospital inpatient stays. In 2007, approximately 2.9% of the sample expected was expected to be self-paid. In 2014, this number increased slightly to 3.2%. This is an important finding because it establishes that individuals continue to forego health insurance even though it is available.

Another notable result indicates that more individuals are relying upon public insurance. In 2007, approximately 47% of the inpatient claims evaluated in this study were expected to be paid by Medicare and Medicaid compared to 47.5% of the claims expected to be paid by private insurance. In 2014, after implementation of the ACA, the number of claims expected to be paid by Medicare and Medicaid increased to approximately 60.2% compared to 34.0% for private insurance. The shift highlights the increased reliance upon public health insurance programs. In reviewing the original goals and objectives of the ACA, policymakers expected that private insurance would take on an increased role. This unintended consequence needs to be evaluated and understood further in order to determine future actions.

An additional factor that should be considered by policymakers is the effectiveness of the ACA in stabilizing health care costs. As previously discussed, between 2007 and 2010, health care costs increased approximately 38.6% per year. Between 2011 and 2014, the average increase in health care costs declined to approximately 4.3% per year. After accounting for inflation, the average increase in health care costs was less than 3%. As the political discussion ramps up for repealing the ACA, policymakers need to take note of the improvements being made and should consider modifications to the current policy, as opposed to a complete repeal of the legislation. The facts surrounding the effectiveness of the policy indicate improvement. While additional changes must be made to increase sustainability, the path has improved significantly.

Policymakers should also take note of the impact that transparency has on the cost of health care services. As future health policy is contemplated, increasing transparency should become a primary goal in order to facilitate an improved decision-making process. Rather than making decisions or changes based upon perceptions, policymakers can utilize empirical evidence to support key provisions of policy changes. In addition, removing the cloud of secrecy that envelopes the health care industry will allow consumers and providers to make more informed decisions as cost-sharing and personal accountability shift to the patient.

Implications for Positive Social Change

The results of this study highlight several key aspects that may result in positive social change. The initial implications for positive social changes included a better

understanding of the relationship of health care costs and type of health insurance over a period of time that included the implementation of the ACA. The results of this study may provide some useful insight for consumers, providers, and policymakers.

First, consumers will continue to experience an increase in personal accountability for health care decisions. This will come in the form of higher cost-sharing agreements and incentives or penalties associated with lifestyle behavior choices. For example, we have already seen an increase in health insurance premiums for tobacco users, increased premiums for individuals with obesity and diabetes conditions are likely to follow. Increased engagement, including discussions about the financial implications of treatment plans, we help minimize costs and maximize utility for consumers.

Second, providers must become aware of the financial implications of treatment plans. Although the health care system is complex, providers have an obligation to help consumers make informed decisions. Reforms in reimbursement models, such as the shift from fee-for-service to bundled payment initiatives, will help reinforce the importance of reducing costs for the provider to maintain profitability. Additional reform is necessary to continue to reduce the amount of unnecessary costs within the industry. Reforms, including litigation reform, increased penalties for fraud and abuse, and utilization of best practices, can all help to reduce the approximately $1 trillion annual spending on waste.

Third, policymakers need to understand the effectiveness of health policy in achieving key objectives in order to determine whether or not additional reform is necessary. The results of this study indicate that health care costs have stabilized, but additional changes are still needed. Although more individuals are covered by insurance,

the number of individuals paying for services out-of-pocket has remained relatively stable. A larger concern is the increase in the number of individuals that are relying on Medicare and Medicaid. CMS is reimbursed at rates that are almost one-third higher than private insurance. Additional reform needs to address the reliance upon public programs and reduce the reimbursement rates to levels comparable to the private industry to ensure that the programs are sustainable.

The improved understanding of this relationship should provide patients, providers, and policymakers with key data that may improve decision-making related to health care due to increased transparency and reduced cost of health care services. Each group of stakeholders must now take the information that has been provided and take action. Consumers and providers must become more engaged in discussions related to the financial impact of treatment plans and alternatives. Policymakers must become more educated and be willing to stand up to special interest groups and make difficult choices that will continue to reform the health care industry in a manner that will increase access and quality while continuing to address the cost of care.

Summary

The continued escalation in health care expenditures within the United States has led to an unsustainable model that consumes more than $3 trillion annually, amounting to almost 20% of GDP (Hartman et al., 2015). Between 21% and 47% of total health care expenditures can be attributed to overtreatment, failure to coordinate care, industry complexity, and fraud and abuse (Berwick & Hackbarth, 2012). Policymakers have recognized the need for industry reform and have taken action through the passage of the

ACA, aimed at improving access by providing health insurance coverage, increasing quality of care through innovative reimbursement methods, and reducing costs (Rosenbaum, 2011).

Decision-making processes for consumers, providers, and policymakers are inhibited due to the lack of transparency of financial information within the industry and the role of third-party payers. Consumers tend to focus on cost-sharing responsibility, rather than total health care cost, and equate low cost to low quality (Hibbard et al., 2012). Providers focus treatment plans on consumer directives and defensive medicine practices to reduce potential liability with little attention given to the cost of services. This is partly due to the complexity of the numerous third-party payer plans and the lack of engagement from patients related to financial concerns. Policymakers derive information from personal interaction with the health care industry. In addition, information that is available tends to be limited to the perspective of the stakeholder seeking specific action from the legislative representative. For example, providers focus on low reimbursement rates of Medicaid when asking for increased budgets to cover higher rates for services. Empirical evidence is not readily available from disinterested third-parties.

The purpose of this quantitative, longitudinal study was to provide empirical evidence regarding the relationship of the type of health insurance and health care costs. The results of the study may provide increased transparency of health care costs that can be used to increase engagement between the patient, provider, and policymaker in the decision-making process. In addition, the results may provide some insight into the

effectiveness of recent health policy, including the ACA, in meeting core objectives and measures. The significance of the study lies in the reduced health care costs associated with increased transparency noted by Muir et al. (2013) and the need for increased transparency to remove barriers that inhibited a reduction in health care costs. The primary goals of the study were to evaluate the relationship between health care costs and type of insurance, evaluate the changes in this relationship during the implementation period of the ACA, and to determine the influence of transparency on the cost of health care services.

The literature review provided background information related to the development of billing practices within the health care industry. Current industry practices shield consumers and providers from key information that can influence decisions related to health care costs. As more and more third-party payers modify cost-sharing models to ask for more participation from the consumer and add personal accountability for unhealthy lifestyle behavior choices, consumers will demand higher levels of engagement and information regarding treatment plans and cost of health care services before decisions are finalized. Mechanism theory coupled with game theory provided a realistic lens in which to evaluate this changing relationship. Incentives being applied by third-party payers include the increased responsibility for costs being borne by the consumer, incentive payments for wellness program participation, and reduction in premiums for meeting specific health related goals. Although consumers and providers do not have all the information needed to make decisions, there is a growing trend to consumer demands being met in patient-centered care models.

This study utilized secondary data from NIS HCUP that provided a sampling of inpatient hospital stays. The dataset has been in existence since 1998 and continues to be collected on an annual basis. The analysis included an evaluation of data from 2007 to 2014, in order to include the implementation of the ACA. The sample selection included 30 DRG codes from the Pacific division, including inpatient stays from Alaska, California, Hawaii, Oregon, and Washington. DRG codes were limited to inpatient stays that had a minimum of 10 occurrences for each type of insurance in order to comply with the HCUP data use agreement. The sample selection and methodology utilized for this study resulted in a number of limitations and delimitations, which prevent the results from being generalized to the population.

A one-way ANOVA was conducted to evaluate the relationship between the type of insurance and health care costs. The results of the analysis indicate that each of the three null hypotheses should be rejected, as there is evidence of a statistically significant relationship between type of insurance and health care costs and transparency influences this relationship. The results of the study indicate that between 2% and 9% of health care costs can be attributed to the type of health insurance. Variation of health care costs can be evaluated more precisely when considering individual DRG codes. This information can be found in Appendix A thru Appendix E.

The analysis also provided some significant information regarding the effectiveness of the ACA in meeting key objectives. Although there was not a significant reduction in the number of individuals paying for services out-of-pocket, there was an increase in the percentage of individuals relying upon public insurance, specifically

Medicare and Medicaid, to provide access to health care services. Health care rates stabilized after implementation of ACA. The average rate of increases were approximately 38.6% between 2007 and 2010 and decreased to approximately 4.3% between 2011 and 2014. One additional item to note was that the reimbursement rates of payers varied from common perception. Other payers paid the highest for health care services followed by Medicare, Medicaid, and self-pay, while private insurance consistently paid the least amount for health care services.

The results of the study may provide a foundation for consumers, providers, and policymakers to increase engagement regarding the financial implications associated with health care decisions. As individuals participate in higher levels of cost-sharing arrangements, information regarding health care costs can become an important aspect of the decision-making process. Providers will be required to understand the costs associated with developing a treatment plan and engage with patients about the appropriateness of health care services. Policymakers can use this information to better understand the effectiveness of health policy and continue to formulate regulations that will achieve the desired objectives in increasing access to care while reducing the overall expenditures related to health care services.

Conclusion

Expenditures related to health care costs will soon surpass 20% of total GDP within the United States. Approximately one-third of this spending is represented by unnecessary services brought about by overtreatment, failure to coordinate care, industry complexity, and fraud and abuse. An increased understanding of financial implications

related to health care spending is an essential component of industry reform. Consumers, providers, and policymakers must develop a better understanding of health care costs and methods that can be undertaken to reduce overall expenditures to a sustainable level. Increased understanding must be developed from empirical evidence, rather than perceptions or misunderstood practices that have been developed over many years.

There is a statistically significant relationship between the type of health insurance and health care costs that account for between two and nine percent of the total cost of health care. Even more important are two conclusions that can be drawn from the results of this study, health care costs have stabilized since the implementation of the ACA and private insurance is benefiting from reimbursement rates that are approximately 28% lower than Medicare and Medicaid payments. These two findings highlight the fact that although health policy is achieving some key objectives, additional regulation reform is needed.

Self-pay reimbursement rates indicate a willingness of health care providers to negotiate lower fees for services being provided. Educated consumers can benefit from this information by negotiating the portion of cost-sharing that has been shifted to the patient through the use of high-deductible health plans. Knowledge regarding the net amount being charged to other consumers can provide additional information that will allow consumers to make a well-informed decision regarding treatment plans being recommended by providers and maximize the value received.

Providers will now be in a position to evaluate the cost-effectiveness of treatment options when discussing alternatives with consumers. Previously, financial considerations

have not been regularly evaluated when determining the appropriate services that a consumer needs. By making health care costs part of the discussion, providers can guide consumers in the decision-making process and help reduce the amount being spent on waste.

Although improvements have been made, more needs to be done to improve the sustainability of the industry. As we look for methods to improve access, quality, and reduce costs, stakeholders must identify innovative methods to approach solutions within the industry. Stakeholders must work together to increase transparency and improve the sustainability of the health care industry. Individual patients, providers, and policymakers must take a new approach to the decision-making process and engage in discussions that include the financial implications of health care services. This process must be collaborative, inclusive, and free of emotion, all of which require improved access to information. This study provides the foundation for transparent information that is an essential ingredient to achieve success. Traditional perceptions must be set aside and we must work together to find solutions if we are to continue to increase access to care, improve quality outcomes, and reduce health care costs.

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Appendix A: Results Sample Tables

Table 9

Sample Table DRG Code and Description by Year

DRG code	Description	Type of insurance				
		Medicare	Medicaid	Commercial	Self-pay	No charge

Table 10

Sample Table DRG Code and Description by Location

City	Payer	Frequency	Range	Mean	Median	Mode	Standard deviation	Variance
Chicago	Medicare							
	Medicaid							
	Commercial							
	Self-Pay							
	No Charge							
San Jose	Medicare							
	Medicaid							
	Commercial							
	Self-Pay							
	No Charge							

Appendix B: Means and Standard Deviations of Health Care Costs

Table 11

Means and Standard Deviations of Health Care Costs - DRG 3

Year	Payer	*n*	Mean	*SD*
2007	Medicare	118	161,645.54	85,805.02
	Medicaid	163	75,713.29	86,304.98
	Private insurance	163	83,439.11	94,586.76
	Self-Pay	12	180,362.65	101,711.31
	Other payer	26	70,910.31	72,995.17
2008	Medicare	615	154,148.33	79,746.37
	Medicaid	281	184,079.71	104,608.34
	Private insurance	406	149,944.85	82,792.80
	Self-Pay	50	137,745.76	75,877.05
	Other payer	82	165,016.78	87,415.88
2009	Medicare	575	150,744.60	82,067.77
	Medicaid	320	167,880.90	94,550.09
	Private insurance	424	171,339.99	101,289.32
	Self-Pay	52	116,945.86	62,807.57
	Other payer	68	158,426.08	90,128.84
2010	Medicare	414	159,768.10	88,705.26
	Medicaid	267	194,307.36	114,499.56
	Private insurance	307	168,175.46	105,230.11
	Self-Pay	48	153,783.26	112,648.30
	Other payer	71	181,323.17	98,016.36
2011	Medicare	400	186,789.99	130,551.57
	Medicaid	179	265,795.32	180,785.13
	Private insurance	180	224,728.37	185,263.63
	Self-Pay	17	149,004.25	82,414.07
	Other payer	42	176,966.78	126,835.41
2012	Medicare	447	192,309.45	149,019.05
	Medicaid	288	246,206.00	197,217.41
	Private insurance	305	227,139.08	165,932.99
	Self-Pay	41	169,894.36	81,571.82
	Other payer	68	228,993.50	170,557.82
2013	Medicare	445	197,310.19	147,318.93
	Medicaid	294	254,363.22	199,891.62
	Private insurance	289	233,578.83	190,877.77
	Self-Pay	24	183,052.39	119,709.66
	Other payer	62	241,192.78	212,654.86
2014	Medicare	412	190,033.66	141,247.07
	Medicaid	346	244,768.73	167,989.18
	Private insurance	279	254,794.12	229,078.80
	Self-Pay	21	144,063.02	94,944.78
	Other payer	61	271,958.84	229,903.15

Table 12

Means and Standard Deviations of Health Care Costs - DRG 23

Year	Payer	*n*	Mean	*SD*
2007	Medicare	520	9,831.84	17,660.55
	Medicaid	129	10,744.77	18,680.04
	Private insurance	169	11,378.55	17,857.06
	Self-Pay	35	16,120.40	18,569.73
	Other payer	37	15,613.55	25,744.47
2008	Medicare	189	55,547.21	34,531.38
	Medicaid	78	62,952.32	46,441.61
	Private insurance	133	54,000.19	34,499.68
	Self-Pay	24	51,715.89	28,346.04
	Other payer	17	54,314.85	27,207.47
2009	Medicare	229	57,214.64	35,353.05
	Medicaid	81	72,135.28	68,963.63
	Private insurance	171	54,193.48	32,413.21
	Self-Pay	24	45,461.49	31,839.81
	Other payer	24	43,496.88	27,900.65
2010	Medicare	269	56,181.99	32,491.73
	Medicaid	112	83,336.58	63,666.74
	Private insurance	199	67,484.82	46,003.34
	Self-Pay	40	73,016.15	64,945.66
	Other payer	37	69,441.97	48,100.30
2011	Medicare	173	57,246.03	34,565.09
	Medicaid	75	111,647.08	117,398.57
	Private insurance	121	54,785.15	39,543.05
	Self-Pay	20	74,662.64	63,707.84
	Other payer	11	97,699.84	71,771.39
2012	Medicare	212	60,392.65	46,390.75
	Medicaid	80	94,572.84	97,247.47
	Private insurance	141	68,957.71	44,714.67
	Self-Pay	35	53,326.50	40,294.04
	Other payer	36	67,402.86	44,233.88
2013	Medicare	251	60,202.18	38,295.00
	Medicaid	99	74,634.24	75,108.57
	Private insurance	136	66,471.78	42,503.80
	Self-Pay	30	51,698.46	39,476.62
	Other payer	28	50,696.32	38,040.00
2014	Medicare	252	59,139.12	43,654.41
	Medicaid	151	87,955.27	72,003.51
	Private insurance	136	81,034.41	67,356.19
	Self-Pay	17	58,231.29	33,885.92
	Other payer	24	75,054.94	61,043.49

Table 13

Means and Standard Deviations of Health Care Costs - DRG 26

Year	Payer	*n*	Mean	*SD*
2007	Medicare	82	25,837.87	18,224.14
	Medicaid	466	6,268.47	10,679.57
	Private insurance	555	9,365.54	13,495.55
	Self-Pay	33	8,849.53	13,737.00
	Other payer	75	5,981.05	7,067.26
2008	Medicare	437	27,457.30	15,036.63
	Medicaid	193	38,333.50	34,131.48
	Private insurance	569	31,995.06	22,752.67
	Self-Pay	29	28,964.30	12,786.04
	Other payer	74	35,122.85	21,595.71
2009	Medicare	504	26,270.42	14,140.70
	Medicaid	225	38,228.28	34,952.08
	Private insurance	656	29,041.38	17,542.66
	Self-Pay	47	33,407.27	24,646.67
	Other payer	43	25,804.18	12,338.18
2010	Medicare	404	29,046.89	16,755.69
	Medicaid	202	39,854.89	29,485.42
	Private insurance	514	35,675.87	23,558.05
	Self-Pay	54	34,562.35	22,276.05
	Other payer	78	50,774.00	50,541.94
2011	Medicare	298	30,958.42	18,254.43
	Medicaid	90	44,948.10	31,115.85
	Private insurance	265	29,248.62	16,438.91
	Self-Pay	20	29,424.74	13,056.04
	Other payer	32	42,755.97	35,072.13
2012	Medicare	330	32,299.98	22,760.92
	Medicaid	157	44,064.61	41,122.03
	Private insurance	361	36,042.20	27,239.29
	Self-Pay	38	41,513.39	20,956.57
	Other payer	56	52,803.50	47,073.79
2013	Medicare	305	35,486.03	20,551.25
	Medicaid	163	42,109.51	29,496.52
	Private insurance	347	36,671.16	29,843.88
	Self-Pay	31	39,009.74	19,555.23
	Other payer	57	50,319.90	34,797.39
2014	Medicare	303	33,262.49	18,452.16
	Medicaid	195	46,716.54	44,233.77
	Private insurance	339	38,868.70	25,868.57
	Self-Pay	21	42,626.95	22,339.63
	Other payer	45	39,005.76	34,312.68

Table 14

Means and Standard Deviations of Health Care Costs - DRG 153

Year	Payer	*n*	Mean	*SD*
2007	Medicare	99	6,979.55	4,124.84
	Medicaid	257	3,863.48	4,060.14
	Private insurance	352	5,362.17	4,564.25
	Self-Pay	38	4,730.63	3,122.10
	Other payer	23	6,374.93	5,044.51
2008	Medicare	309	5,661.88	3,880.74
	Medicaid	671	3,995.80	3,465.13
	Private insurance	672	3,837.21	3,288.61
	Self-Pay	104	4,127.63	2,631.45
	Other payer	66	5,083.18	3,678.20
2009	Medicare	328	6,583.83	4,646.85
	Medicaid	1,415	4,418.33	4,771.56
	Private insurance	1,155	4,759.95	4,853.71
	Self-Pay	188	4,705.88	3,813.02
	Other payer	116	5,808.43	5,739.79
2010	Medicare	196	7,158.62	5,611.25
	Medicaid	924	4,476.35	3,743.02
	Private insurance	696	4,516.01	3,923.98
	Self-Pay	106	5,309.50	3,980.89
	Other payer	106	6,041.40	3,913.35
2011	Medicare	260	6,197.26	4,278.72
	Medicaid	528	4,073.05	3,416.33
	Private insurance	481	4,091.58	3,095.20
	Self-Pay	93	4,933.17	4,126.34
	Other payer	65	6,177.09	6,859.66
2012	Medicare	288	7,370.77	4,556.61
	Medicaid	882	5,030.67	5,715.06
	Private insurance	615	5,334.94	4,435.01
	Self-Pay	104	5,266.77	6,415.84
	Other payer	113	5,981.20	4,633.71
2013	Medicare	418	7,950.91	8,131.92
	Medicaid	920	5,007.41	5,805.11
	Private insurance	662	5,304.25	6,112.59
	Self-Pay	112	4,751.36	2,646.36
	Other payer	146	5,543.89	5,518.41
2014	Medicare	297	7,510.01	4,850.55
	Medicaid	1,003	5,188.87	4,887.46
	Private insurance	588	5,704.44	6,038.33
	Self-Pay	67	6,570.08	5,086.95
	Other payer	73	8,637.11	18,763.83

Table 15

Means and Standard Deviations of Health Care Costs - DRG 203

Year	Payer	*n*	Mean	*SD*
2007	Medicare	894	10,417.50	12,550.78
	Medicaid	771	5,930.26	8,088.47
	Private insurance	877	7,223.19	9,979.50
	Self-Pay	126	4,722.11	4,185.85
	Other payer	84	7,866.52	9,208.71
2008	Medicare	678	6,015.24	3,791.70
	Medicaid	1,883	4,287.50	3,427.84
	Private insurance	1,542	4,052.31	3,104.62
	Self-Pay	196	4,234.96	3,032.72
	Other payer	174	5,397.76	3,819.06
2009	Medicare	657	5,936.19	3,988.17
	Medicaid	4,119	3,793.82	2,770.23
	Private insurance	2,143	4,082.75	2,966.63
	Self-Pay	375	4,274.63	2,662.11
	Other payer	240	4,892.58	3,347.08
2010	Medicare	470	6,420.63	4,498.23
	Medicaid	3,383	4,792.48	3,831.54
	Private insurance	1,789	4,726.06	3,548.47
	Self-Pay	262	4,704.53	2,904.51
	Other payer	269	5,399.98	3,582.75
2011	Medicare	506	6,218.98	3,945.95
	Medicaid	1,882	4,068.08	2,882.81
	Private insurance	1,061	4,111.51	3,072.30
	Self-Pay	244	4,856.30	2,971.64
	Other payer	171	5,677.03	3,264.26
2012	Medicare	472	6,834.71	4,449.55
	Medicaid	2,920	5,097.54	5,068.56
	Private insurance	1,543	5,007.60	4,295.18
	Self-Pay	283	5,324.89	4,318.02
	Other payer	271	5,933.28	4,867.93
2013	Medicare	464	6,732.49	4,197.97
	Medicaid	2,778	5,269.64	4,432.61
	Private insurance	1,308	5,150.36	4,036.10
	Self-Pay	252	4,931.86	2,995.65
	Other payer	213	6,061.90	5,722.36
2014	Medicare	370	6,992.63	4,096.87
	Medicaid	2,582	5,209.18	3,807.63
	Private insurance	1,142	5,355.12	4,324.68
	Self-Pay	129	4,845.90	3,051.16
	Other payer	124	6,195.84	6,022.08

Table 16

Means and Standard Deviations of Health Care Costs - DRG 207

Year	Payer	*n*	Mean	*SD*
2007	Medicare	1,148	21,443.64	28,459.94
	Medicaid	311	21,581.04	29,643.19
	Private insurance	476	16,160.69	23,569.38
	Self-Pay	68	11,620.38	15,115.73
	Other payer	67	21,357.17	24,930.69
2008	Medicare	1,276	52,442.44	38,136.81
	Medicaid	518	58,384.84	51,653.02
	Private insurance	361	57,259.39	44,376.54
	Self-Pay	49	37,610.05	16,762.65
	Other payer	87	60,952.61	55,292.66
2009	Medicare	1,284	54,205.15	37,580.00
	Medicaid	615	54,874.64	45,440.76
	Private insurance	462	69,841.15	55,438.21
	Self-Pay	70	58,072.86	39,627.25
	Other payer	57	52,206.94	27,940.16
2010	Medicare	1,186	60,949.79	44,502.79
	Medicaid	543	64,256.16	52,605.92
	Private insurance	311	62,081.71	55,578.87
	Self-Pay	33	52,111.50	30,721.06
	Other payer	71	65,554.97	42,337.93
2011	Medicare	845	54,583.52	36,325.21
	Medicaid	318	62,140.72	54,889.26
	Private insurance	188	62,583.09	40,867.16
	Self-Pay	27	53,937.33	24,655.13
	Other payer	41	68,152.58	56,647.09
2012	Medicare	940	57,760.98	42,973.93
	Medicaid	425	67,653.43	67,668.52
	Private insurance	274	66,418.22	59,243.25
	Self-Pay	42	41,846.29	18,563.51
	Other payer	68	70,740.72	64,570.39
2013	Medicare	884	60,357.06	54,207.19
	Medicaid	428	70,579.83	64,232.11
	Private insurance	234	67,220.20	55,380.62
	Self-Pay	47	60,028.88	39,093.73
	Other payer	87	94,304.83	138,397.52
2014	Medicare	826	62,056.36	55,399.82
	Medicaid	471	80,504.21	86,867.81
	Private insurance	234	71,816.44	65,873.09
	Self-Pay	29	67,396.66	64,360.78
	Other payer	61	105,675.78	123,144.48

Table 17

Means and Standard Deviations of Health Care Costs - DRG 233

Year	Payer	*n*	Mean	*SD*
2007	Medicare	434	25,693.92	27,483.20
	Medicaid	41	28,639.67	23,434.98
	Private insurance	194	28,215.81	23,435.04
	Self-Pay	11	42,910.13	39,384.14
	Other payer	33	24,363.73	22,914.06
2008	Medicare	349	69,050.57	37,599.10
	Medicaid	67	66,639.31	27,348.26
	Private insurance	119	59,526.04	22,077.02
	Self-Pay	22	52,012.23	11,858.66
	Other payer	31	66,665.47	21,877.08
2009	Medicare	447	66,213.54	32,131.82
	Medicaid	80	62,455.53	37,211.92
	Private insurance	208	61,697.55	24,944.60
	Self-Pay	44	70,124.60	46,697.05
	Other payer	19	68,145.87	24,500.13
2010	Medicare	370	67,020.07	32,491.71
	Medicaid	70	64,406.50	27,290.22
	Private insurance	202	61,822.79	24,576.69
	Self-Pay	29	66,368.10	24,043.44
	Other payer	20	66,188.66	22,877.92
2011	Medicare	369	73,961.36	39,892.32
	Medicaid	79	75,750.27	44,099.86
	Private insurance	148	69,137.15	29,932.01
	Self-Pay	27	67,918.55	25,665.53
	Other payer	23	84,178.78	38,473.54
2012	Medicare	342	79,186.25	42,469.65
	Medicaid	71	74,707.61	33,867.60
	Private insurance	146	66,504.96	24,883.56
	Self-Pay	33	69,744.29	38,830.07
	Other payer	34	72,429.78	22,411.61
2013	Medicare	363	76,484.08	43,712.02
	Medicaid	73	77,212.08	34,404.89
	Private insurance	136	72,055.48	34,370.26
	Self-Pay	35	66,633.42	25,150.12
	Other payer	39	87,285.76	42,992.99
2014	Medicare	381	77,700.51	38,002.87
	Medicaid	118	70,965.34	29,739.82
	Private insurance	149	68,074.98	28,072.66
	Self-Pay	13	71,930.59	15,692.76
	Other payer	19	69,434.28	21,171.59

Table 18

Means and Standard Deviations of Health Care Costs - DRG 234

Year	Payer	*n*	Mean	*SD*
2007	Medicare	322	24,535.26	19,017.84
	Medicaid	61	22,952.22	16,993.78
	Private insurance	323	23,654.72	16,364.31
	Self-Pay	15	22,375.14	17,862.71
	Other payer	62	18,353.50	14,046.92
2008	Medicare	525	47,121.18	13,957.05
	Medicaid	123	44,429.78	12,103.38
	Private insurance	364	44,084.83	13,734.47
	Self-Pay	30	45,635.44	11,706.16
	Other payer	43	50,596.13	14,794.72
2009	Medicare	659	43,674.45	13,721.43
	Medicaid	101	47,522.26	13,989.83
	Private insurance	493	44,259.02	12,263.67
	Self-Pay	39	49,527.72	15,386.75
	Other payer	37	47,576.94	11,897.27
2010	Medicare	415	49,590.66	14,200.17
	Medicaid	102	51,339.24	17,149.07
	Private insurance	403	46,361.31	12,008.38
	Self-Pay	39	50,230.45	14,155.80
	Other payer	39	46,935.86	20,163.54
2011	Medicare	437	48,792.92	14,317.21
	Medicaid	106	49,811.65	13,633.99
	Private insurance	337	48,084.90	13,458.71
	Self-Pay	37	49,893.26	12,335.12
	Other payer	49	53,917.60	17,274.61
2012	Medicare	487	51,709.71	18,248.93
	Medicaid	88	57,522.99	20,274.75
	Private insurance	342	52,415.92	18,571.10
	Self-Pay	37	56,359.24	24,336.32
	Other payer	63	57,654.99	23,266.66
2013	Medicare	474	53,896.61	16,644.93
	Medicaid	83	55,363.73	17,911.99
	Private insurance	311	51,060.91	16,605.41
	Self-Pay	43	56,622.98	19,280.38
	Other payer	64	52,731.11	12,199.42
2014	Medicare	469	53,157.36	16,392.73
	Medicaid	150	59,061.05	20,173.45
	Private insurance	311	51,798.12	16,154.25
	Self-Pay	14	49,707.12	18,924.92
	Other payer	22	55,983.49	22,245.85

Table 19

Means and Standard Deviations of Health Care Costs - DRG 311

Year	Payer	*n*	Mean	*SD*
2007	Medicare	283	5,239.53	2,956.96
	Medicaid	72	5,618.46	3,268.51
	Private insurance	303	5,359.01	2,950.64
	Self-Pay	37	5,129.31	2,403.27
	Other payer	19	5,330.96	2,438.73
2008	Medicare	593	5,309.10	3,248.63
	Medicaid	196	5,783.66	4,359.10
	Private insurance	399	4,555.01	2,318.42
	Self-Pay	75	4,525.50	2,880.41
	Other payer	57	6,869.48	4,732.36
2009	Medicare	490	5,006.37	3,107.29
	Medicaid	197	4,552.02	2,526.28
	Private insurance	312	4,421.29	2,392.34
	Self-Pay	74	4,977.07	2,973.85
	Other payer	53	5,196.29	2,683.26
2010	Medicare	443	5,315.89	3,140.12
	Medicaid	252	5,100.70	5,373.33
	Private insurance	295	4,565.18	2,536.59
	Self-Pay	84	4,716.03	3,132.01
	Other payer	101	5,834.21	3,467.22
2011	Medicare	458	5,865.69	3,775.21
	Medicaid	214	5,714.89	3,024.86
	Private insurance	210	4,925.92	2,418.49
	Self-Pay	48	5,299.68	3,482.82
	Other payer	67	6,626.49	3,426.72
2012	Medicare	400	6,528.66	5,761.77
	Medicaid	207	5,372.19	3,025.05
	Private insurance	173	5,330.54	2,812.71
	Self-Pay	59	4,861.28	2,783.25
	Other payer	88	7,012.23	8,190.34
2013	Medicare	320	6,027.33	3,568.71
	Medicaid	171	5,298.48	3,633.05
	Private insurance	177	5,336.69	2,888.08
	Self-Pay	45	5,248.47	4,213.14
	Other payer	81	6,080.90	3,896.49
2014	Medicare	297	6,427.67	3,761.79
	Medicaid	254	5,953.74	3,663.63
	Private insurance	142	6,338.64	4,262.56
	Self-Pay	24	7,600.42	9,754.64
	Other payer	25	5,046.34	2,944.20

Table 20

Means and Standard Deviations of Health Care Costs - DRG 313

Year	Payer	*n*	Mean	*SD*
2007	Medicare	1,365	4,739.49	2,702.07
	Medicaid	642	4,724.02	2,657.14
	Private insurance	1,319	3,966.06	2,096.62
	Self-Pay	257	4,372.50	2,266.25
	Other payer	162	4,477.68	2,413.51
2008	Medicare	4,605	5,294.20	3,345.30
	Medicaid	2,196	5,044.35	2,912.74
	Private insurance	3,944	4,257.26	2,203.78
	Self-Pay	782	4,656.74	2,921.99
	Other payer	716	5,385.56	3,015.74
2009	Medicare	4,797	5,064.16	3,200.32
	Medicaid	2,874	4,750.93	3,147.08
	Private insurance	3,872	4,532.19	2,372.44
	Self-Pay	1,086	4,397.22	2,509.58
	Other payer	872	4,422.35	2,464.50
2010	Medicare	4,132	5,392.59	3,038.38
	Medicaid	2,669	5,178.26	2,966.00
	Private insurance	3,190	4,680.10	2,444.48
	Self-Pay	1,098	4,755.68	2,890.87
	Other payer	969	4,837.50	2,881.14
2011	Medicare	4,071	5,401.27	2,998.89
	Medicaid	2,729	5,199.40	2,794.57
	Private insurance	2,480	4,810.13	2,470.61
	Self-Pay	792	5,021.49	2,953.64
	Other payer	699	5,360.30	2,620.90
2012	Medicare	3,698	5,925.95	3,569.94
	Medicaid	2,705	5,408.52	3,558.29
	Private insurance	2,506	5,035.29	2,928.39
	Self-Pay	945	4,821.41	2,761.66
	Other payer	1,009	5,077.90	2,925.10
2013	Medicare	3,068	5,850.96	3,341.23
	Medicaid	2,228	5,451.52	3,252.09
	Private insurance	1,838	5,110.58	2,904.76
	Self-Pay	654	5,371.23	3,670.66
	Other payer	880	5,365.56	2,862.85
2014	Medicare	2,605	6,344.61	4,046.48
	Medicaid	2,793	5,661.02	3,442.25
	Private insurance	1,543	5,409.89	2,705.30
	Self-Pay	309	5,389.18	3,836.01
	Other payer	292	5,859.51	3,870.86

Table 21

Means and Standard Deviations of Health Care Costs - DRG 326

Year	Payer	*n*	Mean	*SD*
2007	Medicare	148	37,894.38	45,722.82
	Medicaid	28	39,592.36	47,758.59
	Private insurance	87	42,861.02	55,138.29
	Self-Pay	14	26,311.71	48,411.28
	Other payer	13	33,208.48	47,660.01
2008	Medicare	332	53,397.77	40,235.11
	Medicaid	113	59,478.60	65,836.34
	Private insurance	175	53,532.42	51,073.39
	Self-Pay	28	33,199.28	36,850.81
	Other payer	39	73,535.59	84,472.10
2009	Medicare	380	57,681.73	47,186.76
	Medicaid	127	63,439.93	68,335.41
	Private insurance	238	54,745.35	54,281.74
	Self-Pay	38	33,567.33	28,982.43
	Other payer	40	63,062.72	63,227.91
2010	Medicare	324	52,939.55	35,339.70
	Medicaid	120	53,007.33	50,239.41
	Private insurance	185	53,816.54	49,233.70
	Self-Pay	36	44,707.65	34,100.05
	Other payer	44	68,581.07	59,655.58
2011	Medicare	301	62,807.97	67,633.08
	Medicaid	97	67,226.04	73,511.10
	Private insurance	141	50,739.59	49,370.17
	Self-Pay	31	26,457.25	13,599.33
	Other payer	31	59,733.49	60,478.86
2012	Medicare	311	58,206.12	49,085.40
	Medicaid	113	66,133.37	82,197.77
	Private insurance	176	54,427.78	52,613.73
	Self-Pay	28	43,225.45	36,207.46
	Other payer	45	71,876.13	111,562.99
2013	Medicare	328	59,892.88	53,274.76
	Medicaid	120	64,769.48	73,575.67
	Private insurance	171	53,336.64	47,785.06
	Self-Pay	37	50,410.28	37,985.97
	Other payer	46	52,344.95	45,322.30
2014	Medicare	305	63,089.38	62,069.78
	Medicaid	159	65,669.06	101,234.87
	Private insurance	191	56,072.80	55,828.63
	Self-Pay	17	95,116.40	246,979.46
	Other payer	25	43,790.07	25,877.27

Table 22

Means and Standard Deviations of Health Care Costs - DRG 329

Year	Payer	*n*	Mean	*SD*
2007	Medicare	340	47,077.70	40,974.99
	Medicaid	56	44,473.61	30,244.43
	Private insurance	206	41,007.55	40,109.39
	Self-Pay	14	23,643.89	13,130.33
	Other payer	17	84,901.33	95,817.34
2008	Medicare	1,313	49,637.39	38,512.12
	Medicaid	268	68,184.72	72,335.67
	Private insurance	632	44,496.80	42,386.06
	Self-Pay	78	38,810.36	51,149.57
	Other payer	88	46,626.67	44,849.59
2009	Medicare	1,201	46,137.68	35,915.16
	Medicaid	274	55,960.96	54,933.08
	Private insurance	744	46,056.43	49,691.34
	Self-Pay	86	36,395.07	30,574.85
	Other payer	80	41,989.78	39,545.74
2010	Medicare	1,128	50,386.11	34,886.90
	Medicaid	232	62,258.47	65,526.82
	Private insurance	582	42,902.53	36,999.18
	Self-Pay	80	33,939.77	19,577.03
	Other payer	72	55,625.04	58,162.05
2011	Medicare	1,180	50,650.72	40,927.03
	Medicaid	211	62,085.07	62,752.05
	Private insurance	590	42,101.51	31,783.96
	Self-Pay	63	35,067.10	22,689.91
	Other payer	76	47,618.41	39,332.54
2012	Medicare	1,144	55,902.42	50,662.78
	Medicaid	253	65,824.06	71,255.95
	Private insurance	542	47,798.33	42,371.00
	Self-Pay	80	45,180.60	66,913.96
	Other payer	95	52,626.74	50,581.50
2013	Medicare	1,140	53,107.02	46,351.97
	Medicaid	241	70,986.20	82,072.21
	Private insurance	488	46,692.29	44,854.21
	Self-Pay	89	42,453.17	36,112.70
	Other payer	132	59,025.89	112,726.12
2014	Medicare	1,089	50,439.18	38,872.08
	Medicaid	370	63,088.31	69,812.39
	Private insurance	520	49,657.69	59,316.58
	Self-Pay	23	37,384.67	29,852.90
	Other payer	52	94,290.52	160,665.50

Table 23

Means and Standard Deviations of Health Care Costs - DRG 373

Year	Payer	*n*	Mean	*SD*
2007	Medicare	340	4,180.83	2,896.48
	Medicaid	29,370	2,801.81	1,414.44
	Private insurance	28,602	2,951.07	1,555.61
	Self-Pay	1,492	2,562.59	1,243.99
	Other payer	1,242	2,884.60	1,046.61
2008	Medicare	239	7,769.80	5,373.77
	Medicaid	120	7,676.02	5,606.24
	Private insurance	254	7,006.99	4,753.93
	Self-Pay	32	6,307.54	4,051.44
	Other payer	31	11,043.72	7,149.32
2009	Medicare	272	7,570.88	5,609.97
	Medicaid	215	7,333.25	5,027.65
	Private insurance	353	7,167.22	5,452.69
	Self-Pay	48	8,382.48	7,375.29
	Other payer	34	7,876.71	4,989.48
2010	Medicare	241	7,919.68	4,732.90
	Medicaid	153	9,592.27	7,996.58
	Private insurance	309	7,781.00	4,542.77
	Self-Pay	57	8,503.99	5,367.34
	Other payer	51	9,576.95	6,213.57
2011	Medicare	255	8,009.95	4,601.47
	Medicaid	135	7,531.65	5,605.62
	Private insurance	256	6,549.66	4,262.31
	Self-Pay	42	9,316.13	5,022.60
	Other payer	58	9,749.37	5,669.76
2012	Medicare	240	8,785.95	5,382.46
	Medicaid	189	8,507.31	6,344.12
	Private insurance	304	7,580.75	4,808.68
	Self-Pay	51	7,926.30	3,712.99
	Other payer	54	7,871.79	6,835.06
2013	Medicare	225	8,854.93	6,152.70
	Medicaid	182	8,468.20	5,848.73
	Private insurance	298	7,610.35	4,627.96
	Self-Pay	45	7,774.26	3,934.65
	Other payer	57	8,164.64	6,834.30
2014	Medicare	216	8,408.65	4,993.77
	Medicaid	253	9,493.86	10,057.09
	Private insurance	247	7,830.87	5,403.94
	Self-Pay	24	8,393.79	5,008.31
	Other payer	18	7,788.31	5,447.11

Table 24

Means and Standard Deviations of Health Care Costs - DRG 390

Year	Payer	*n*	Mean	*SD*
2007	Medicare	402	5,541.66	3,878.75
	Medicaid	6,166	1,929.27	3,253.31
	Private insurance	7,545	1,719.20	2,669.40
	Self-Pay	387	2,036.12	3,438.79
	Other payer	345	3,718.56	7,977.19
2008	Medicare	1,282	6,038.61	3,949.30
	Medicaid	336	5,357.53	3,425.79
	Private insurance	982	5,147.44	3,219.94
	Self-Pay	96	5,243.27	2,676.01
	Other payer	109	6,066.38	3,607.03
2009	Medicare	1,274	5,824.50	3,521.22
	Medicaid	426	5,433.02	4,843.93
	Private insurance	1,079	5,261.32	3,411.69
	Self-Pay	134	5,769.13	4,562.88
	Other payer	118	6,546.73	4,987.80
2010	Medicare	1,026	6,495.67	3,459.73
	Medicaid	429	5,563.24	3,221.25
	Private insurance	934	5,769.89	5,267.53
	Self-Pay	143	6,069.19	3,961.45
	Other payer	107	6,589.39	4,219.01
2011	Medicare	1,252	6,238.54	3,956.55
	Medicaid	351	5,947.80	3,815.47
	Private insurance	935	5,443.70	3,219.94
	Self-Pay	136	5,788.15	3,731.77
	Other payer	138	7,258.79	4,975.41
2012	Medicare	1,197	6,508.16	3,924.44
	Medicaid	438	5,559.33	3,278.65
	Private insurance	977	5,856.12	4,145.60
	Self-Pay	153	5,511.73	2,847.64
	Other payer	147	6,313.89	4,376.81
2013	Medicare	1,168	6,481.25	4,588.68
	Medicaid	440	5,949.48	4,371.35
	Private insurance	922	5,716.64	3,459.75
	Self-Pay	132	5,741.99	3,130.22
	Other payer	173	6,352.89	3,774.47
2014	Medicare	1,115	6,588.11	3,684.88
	Medicaid	578	5,983.33	4,011.82
	Private insurance	883	5,823.45	3,518.95
	Self-Pay	88	5,430.23	2,973.67
	Other payer	83	6,160.26	4,364.66

Table 25

Means and Standard Deviations of Health Care Costs - DRG 391

Year	Payer	*n*	Mean	*SD*
2007	Medicare	411	7,622.10	12,164.68
	Medicaid	40,843	827.57	834.08
	Private insurance	38,393	907.51	840.11
	Self-Pay	2,202	801.12	1,033.65
	Other payer	1,552	1,020.27	1,323.92
2008	Medicare	1,166	9,437.50	7,837.28
	Medicaid	443	9,809.22	12,299.48
	Private insurance	447	9,326.66	9,323.22
	Self-Pay	69	8,223.36	8,694.78
	Other payer	84	8,383.39	6,460.90
2009	Medicare	1,512	10,064.00	10,476.67
	Medicaid	584	9,735.99	11,166.25
	Private insurance	626	9,526.53	11,154.48
	Self-Pay	105	7,629.92	5,742.86
	Other payer	78	8,384.02	5,322.37
2010	Medicare	1,582	10,653.61	10,088.88
	Medicaid	581	10,103.62	12,547.56
	Private insurance	605	10,323.12	10,512.83
	Self-Pay	154	8,977.88	8,369.82
	Other payer	116	11,749.73	14,964.39
2011	Medicare	1,296	10,915.60	10,788.87
	Medicaid	431	10,372.62	11,710.50
	Private insurance	399	10,507.19	9,196.80
	Self-Pay	83	8,990.70	6,436.03
	Other payer	66	8,372.14	6,183.63
2012	Medicare	1,282	11,555.54	11,794.17
	Medicaid	475	10,054.92	10,962.71
	Private insurance	486	11,987.09	19,208.32
	Self-Pay	82	9,109.36	7,117.34
	Other payer	105	12,523.74	20,185.82
2013	Medicare	1,310	11,762.95	12,386.27
	Medicaid	490	11,405.29	15,824.55
	Private insurance	434	12,685.22	20,702.62
	Self-Pay	95	9,101.05	6,945.19
	Other payer	141	11,882.64	16,564.66
2014	Medicare	1,352	11,337.35	10,126.68
	Medicaid	689	11,994.86	17,844.83
	Private insurance	442	11,485.00	12,334.00
	Self-Pay	49	9,835.66	9,004.37
	Other payer	58	14,907.45	27,267.39

Table 26

Means and Standard Deviations of Health Care Costs - DRG 392

Year	Payer	*n*	Mean	*SD*
2007	Medicare	1,524	6,683.52	7,089.74
	Medicaid	811	5,298.77	8,150.61
	Private insurance	1,700	5,631.40	5,707.54
	Self-Pay	204	5,539.75	3,737.74
	Other payer	152	6,547.80	6,882.37
2008	Medicare	5,161	6,586.20	4,993.89
	Medicaid	2,844	5,772.96	5,249.07
	Private insurance	5,073	5,264.94	3,919.90
	Self-Pay	666	5,611.18	3,589.10
	Other payer	632	6,694.42	5,015.22
2009	Medicare	5,400	6,411.16	4,618.62
	Medicaid	4,219	5,263.36	5,765.46
	Private insurance	5,653	5,594.45	4,564.70
	Self-Pay	1,006	5,513.44	3,506.51
	Other payer	702	6,050.89	4,335.90
2010	Medicare	5,067	7,163.68	4,755.27
	Medicaid	3,598	5,985.16	5,730.35
	Private insurance	5,223	6,310.53	4,848.19
	Self-Pay	1,006	6,179.72	4,274.19
	Other payer	777	7,019.83	6,322.17
2011	Medicare	5,852	6,971.82	4,432.87
	Medicaid	3,313	6,035.12	6,171.11
	Private insurance	4,648	6,055.06	4,087.27
	Self-Pay	906	5,970.19	3,560.15
	Other payer	839	6,972.20	4,725.97
2012	Medicare	5,813	7,746.96	6,010.37
	Medicaid	3,713	6,234.87	5,602.90
	Private insurance	4,845	6,862.77	5,761.02
	Self-Pay	972	6,433.01	4,654.57
	Other payer	1,032	7,309.27	9,037.63
2013	Medicare	5,345	7,728.24	5,247.06
	Medicaid	3,707	6,336.86	6,345.30
	Private insurance	4,334	6,829.09	5,863.66
	Self-Pay	856	6,455.08	4,391.39
	Other payer	1,007	7,520.28	7,993.53
2014	Medicare	4,963	7,849.29	5,484.39
	Medicaid	4,718	6,678.13	5,703.75
	Private insurance	4,009	7,023.06	6,923.33
	Self-Pay	447	6,440.23	4,239.78
	Other payer	451	7,699.77	6,542.23

Table 27

Means and Standard Deviations of Health Care Costs - DRG 464

Year	Payer	*n*	Mean	*SD*
2007	Medicare	252	6,614.80	8,333.03
	Medicaid	99	7,296.21	14,754.39
	Private insurance	229	7,350.71	11,005.73
	Self-Pay	32	6,804.94	8,534.10
	Other payer	56	9,862.69	12,889.18
2008	Medicare	149	23,880.90	22,012.98
	Medicaid	70	37,865.54	32,890.57
	Private insurance	145	29,426.86	25,472.56
	Self-Pay	24	23,644.55	27,528.24
	Other payer	80	34,897.95	25,079.30
2009	Medicare	168	24,464.02	19,291.17
	Medicaid	76	34,424.60	29,280.23
	Private insurance	127	31,444.40	30,494.22
	Self-Pay	25	26,027.34	23,567.18
	Other payer	58	33,302.89	32,425.33
2010	Medicare	173	29,507.13	22,518.75
	Medicaid	84	34,145.09	40,121.51
	Private insurance	131	32,544.09	31,179.02
	Self-Pay	40	36,323.82	25,591.67
	Other payer	65	45,729.77	45,275.38
2011	Medicare	205	30,234.98	25,982.03
	Medicaid	43	57,588.24	75,809.99
	Private insurance	121	33,952.81	37,362.11
	Self-Pay	17	42,898.18	42,288.58
	Other payer	40	52,162.43	55,743.42
2012	Medicare	225	31,613.93	26,970.45
	Medicaid	90	46,810.04	59,222.97
	Private insurance	120	36,745.69	35,100.70
	Self-Pay	35	42,848.12	49,717.10
	Other payer	68	48,697.65	41,917.64
2013	Medicare	239	33,058.50	28,983.06
	Medicaid	100	40,487.82	44,878.77
	Private insurance	112	33,599.18	24,674.65
	Self-Pay	25	25,926.69	23,694.75
	Other payer	73	34,771.79	34,456.72
2014	Medicare	222	31,218.95	19,341.26
	Medicaid	139	35,248.85	31,052.05
	Private insurance	135	34,922.78	27,242.93
	Self-Pay	17	41,746.72	53,116.50
	Other payer	35	44,374.11	29,448.34

Table 28

Means and Standard Deviations of Health Care Costs - DRG 470

Year	Payer	*n*	Mean	*SD*
2007	Medicare	3,022	17,551.38	6,402.08
	Medicaid	215	17,061.46	12,164.33
	Private insurance	2,436	16,855.09	7,654.38
	Self-Pay	54	10,290.49	7,151.93
	Other payer	245	18,646.68	14,990.36
2008	Medicare	10,835	17,995.41	6,316.39
	Medicaid	745	19,405.39	7,209.95
	Private insurance	6,695	17,134.51	5,744.09
	Self-Pay	62	17,668.77	6,344.14
	Other payer	877	18,349.97	6,705.02
2009	Medicare	11,492	17,231.27	7,121.42
	Medicaid	856	17,897.27	8,180.58
	Private insurance	7,379	17,263.88	7,241.14
	Self-Pay	87	17,571.62	8,192.95
	Other payer	899	18,201.70	7,346.73
2010	Medicare	10,447	18,463.13	6,644.49
	Medicaid	618	20,043.67	7,759.10
	Private insurance	7,101	17,820.25	6,210.46
	Self-Pay	124	18,933.66	12,457.11
	Other payer	740	18,784.86	7,016.20
2011	Medicare	11,521	19,553.97	7,749.82
	Medicaid	717	22,724.38	12,737.43
	Private insurance	6,731	18,778.59	7,277.08
	Self-Pay	63	21,672.31	8,688.20
	Other payer	986	20,944.92	8,644.91
2012	Medicare	12,176	20,532.09	8,539.52
	Medicaid	807	21,513.43	13,594.68
	Private insurance	7,465	20,239.42	8,510.50
	Self-Pay	127	23,934.79	11,496.58
	Other payer	1,111	21,114.42	8,699.77
2013	Medicare	12,951	20,274.96	7,627.14
	Medicaid	864	21,038.60	8,080.97
	Private insurance	7,670	19,919.34	7,348.25
	Self-Pay	107	21,641.53	11,219.93
	Other payer	1,254	20,371.49	8,019.75
2014	Medicare	13,591	19,928.23	7,411.82
	Medicaid	1,415	20,775.56	9,230.32
	Private insurance	7,931	19,336.02	7,327.10
	Self-Pay	97	20,652.05	7,171.82
	Other payer	1,090	19,874.34	7,786.97

Table 29

Means and Standard Deviations of Health Care Costs - DRG 603

Year	Payer	*n*	Mean	*SD*
2007	Medicare	854	6,583.32	4,666.71
	Medicaid	569	6,149.31	5,038.28
	Private insurance	733	5,314.12	4,209.38
	Self-Pay	263	5,340.74	3,741.79
	Other payer	163	6,263.02	4,713.40
2008	Medicare	3,265	6,895.86	4,971.84
	Medicaid	2,019	6,493.14	4,981.77
	Private insurance	2,524	5,571.68	4,331.05
	Self-Pay	794	5,922.04	4,428.26
	Other payer	842	7,075.15	6,471.32
2009	Medicare	3,359	6,766.12	5,271.40
	Medicaid	2,945	6,069.46	4,746.78
	Private insurance	2,615	5,697.35	4,262.26
	Self-Pay	1,209	6,082.64	4,922.12
	Other payer	657	6,392.88	4,553.48
2010	Medicare	3,223	7,654.54	5,570.14
	Medicaid	2,794	6,906.28	6,359.32
	Private insurance	2,492	6,141.25	4,332.02
	Self-Pay	1,227	6,555.31	4,292.96
	Other payer	909	7,726.49	5,402.38
2011	Medicare	3,626	7,651.56	5,609.43
	Medicaid	2,607	7,188.41	6,223.30
	Private insurance	2,143	6,356.68	4,726.57
	Self-Pay	1,036	6,589.44	4,637.60
	Other payer	950	7,865.07	6,500.15
2012	Medicare	3,632	7,938.43	5,605.35
	Medicaid	2,671	7,233.82	6,049.90
	Private insurance	2,335	6,875.54	7,460.89
	Self-Pay	1,149	6,718.66	4,800.97
	Other payer	1,059	7,641.05	5,868.09
2013	Medicare	3,489	8,179.49	7,816.57
	Medicaid	2,639	7,226.09	6,062.37
	Private insurance	2,062	6,740.54	5,378.41
	Self-Pay	1,150	6,862.61	5,166.31
	Other payer	1,133	7,909.61	6,631.88
2014	Medicare	3,512	8,121.84	6,491.08
	Medicaid	4,189	7,457.98	6,075.83
	Private insurance	2,054	7,065.77	5,237.62
	Self-Pay	460	6,722.86	5,058.78
	Other payer	391	8,471.12	9,397.29

Table 30

Means and Standard Deviations of Health Care Costs - DRG 639

Year	Payer	*n*	Mean	*SD*
2007	Medicare	178	4,692.95	3,270.26
	Medicaid	232	4,499.15	2,815.19
	Private insurance	266	4,423.95	3,119.18
	Self-Pay	100	4,619.14	2,365.32
	Other payer	61	5,848.33	4,256.47
2008	Medicare	736	4,687.78	3,254.27
	Medicaid	778	5,275.04	3,826.20
	Private insurance	891	4,640.31	2,992.11
	Self-Pay	313	5,192.18	3,177.84
	Other payer	245	6,575.47	5,160.23
2009	Medicare	633	4,838.01	4,852.28
	Medicaid	1,030	5,118.35	3,246.14
	Private insurance	957	5,007.75	3,223.81
	Self-Pay	460	5,220.27	3,033.71
	Other payer	247	5,448.21	3,269.08
2010	Medicare	481	5,271.74	3,588.43
	Medicaid	752	5,685.40	4,664.83
	Private insurance	781	5,290.94	3,327.77
	Self-Pay	390	5,602.40	3,400.78
	Other payer	378	6,332.81	3,543.74
2011	Medicare	506	5,504.64	3,617.59
	Medicaid	802	5,561.08	3,643.90
	Private insurance	598	4,962.45	3,429.51
	Self-Pay	276	5,939.64	3,326.17
	Other payer	226	6,718.08	4,258.34
2012	Medicare	491	5,808.46	4,871.15
	Medicaid	863	6,697.29	4,545.43
	Private insurance	722	6,180.95	4,126.30
	Self-Pay	332	6,074.95	3,192.82
	Other payer	390	6,832.67	4,604.26
2013	Medicare	449	6,096.69	4,076.21
	Medicaid	876	6,542.03	4,013.32
	Private insurance	681	6,413.87	3,817.70
	Self-Pay	282	6,512.69	4,202.78
	Other payer	393	6,711.97	4,040.29
2014	Medicare	372	6,385.44	4,946.38
	Medicaid	1,226	6,505.93	4,555.44
	Private insurance	618	6,451.82	4,400.26
	Self-Pay	123	5,314.67	2,979.53
	Other payer	150	7,108.26	5,464.11

Table 31

Means and Standard Deviations of Health Care Costs - DRG 690

Year	Payer	*n*	Mean	*SD*
2007	Medicare	1,403	6,331.84	4,210.12
	Medicaid	452	5,490.98	4,616.95
	Private insurance	509	4,985.48	3,767.21
	Self-Pay	87	4,452.66	2,704.56
	Other payer	63	4,802.42	3,110.13
2008	Medicare	5,134	6,687.05	5,014.54
	Medicaid	1,627	6,144.27	5,121.72
	Private insurance	1,726	5,461.68	4,032.01
	Self-Pay	263	5,428.39	2,976.93
	Other payer	196	7,276.05	6,554.08
2009	Medicare	4,952	6,409.46	4,352.41
	Medicaid	2,561	5,473.16	4,319.40
	Private insurance	1,909	5,576.50	4,011.45
	Self-Pay	393	5,115.77	2,780.39
	Other payer	256	7,231.75	7,744.44
2010	Medicare	4,531	7,334.94	5,510.00
	Medicaid	2,011	6,181.30	5,180.21
	Private insurance	1,637	6,074.20	4,333.60
	Self-Pay	335	6,353.62	3,449.46
	Other payer	272	7,637.08	5,968.03
2011	Medicare	4,990	7,047.67	4,927.64
	Medicaid	1,686	6,394.50	6,341.41
	Private insurance	1,380	5,918.46	4,174.88
	Self-Pay	320	5,956.17	3,699.21
	Other payer	232	7,552.00	4,817.02
2012	Medicare	4,964	7,682.58	5,711.76
	Medicaid	2,032	6,634.01	5,405.66
	Private insurance	1,468	6,814.94	7,279.90
	Self-Pay	338	6,256.92	3,991.97
	Other payer	324	7,118.00	10,657.41
2013	Medicare	4,631	7,664.95	5,188.94
	Medicaid	1,930	6,623.61	5,681.81
	Private insurance	1,243	6,719.44	4,877.76
	Self-Pay	310	6,344.09	4,280.91
	Other payer	353	7,728.83	8,034.80
2014	Medicare	4,264	7,625.65	5,046.64
	Medicaid	2,238	6,761.13	5,481.81
	Private insurance	1,267	6,916.59	6,884.68
	Self-Pay	169	6,272.37	4,434.32
	Other payer	164	7,796.57	7,854.21

Table 32

Means and Standard Deviations of Health Care Costs - DRG 765

Year	Payer	*n*	Mean	*SD*
2007	Medicare	15	5,997.45	2,499.56
	Medicaid	1,534	7,221.76	7,302.54
	Private insurance	1,625	7,089.64	5,540.07
	Self-Pay	76	7,356.42	12,008.88
	Other payer	42	6,797.69	3,049.08
2008	Medicare	86	11,472.48	13,948.85
	Medicaid	5,508	8,322.97	7,152.79
	Private insurance	5,753	8,221.47	7,725.36
	Self-Pay	187	6,346.58	3,737.84
	Other payer	226	9,458.65	11,138.60
2009	Medicare	83	10,456.55	10,653.27
	Medicaid	6,378	9,252.47	9,046.17
	Private insurance	5,954	9,393.78	9,724.71
	Self-Pay	173	8,444.53	8,295.05
	Other payer	172	9,237.50	12,219.20
2010	Medicare	70	9,507.03	11,436.87
	Medicaid	5,938	8,878.01	8,495.27
	Private insurance	5,596	9,375.80	10,245.47
	Self-Pay	236	7,571.18	7,396.09
	Other payer	344	8,302.80	5,894.39
2011	Medicare	91	10,424.68	11,920.49
	Medicaid	5,324	8,792.18	9,132.25
	Private insurance	5,837	8,970.83	8,170.53
	Self-Pay	94	8,192.98	8,295.95
	Other payer	188	8,236.29	7,513.46
2012	Medicare	104	10,728.09	6,995.61
	Medicaid	6,059	9,666.11	9,366.74
	Private insurance	5,525	9,976.38	9,627.15
	Self-Pay	226	8,811.79	6,849.35
	Other payer	297	10,167.57	9,682.87
2013	Medicare	94	12,636.50	10,550.71
	Medicaid	6,043	9,955.24	8,245.33
	Private insurance	5,666	10,343.82	10,581.94
	Self-Pay	317	8,360.26	5,429.10
	Other payer	320	9,648.63	6,358.04
2014	Medicare	118	11,644.77	9,718.01
	Medicaid	6,283	10,261.75	10,374.02
	Private insurance	5,787	10,524.18	11,443.35
	Self-Pay	366	8,718.71	5,821.43
	Other payer	325	10,068.26	6,488.64

Table 33

Means and Standard Deviations of Health Care Costs - DRG 766

Year	Payer	*n*	Mean	*SD*
2007	Medicare	25	4,998.50	1,531.18
	Medicaid	4,109	4,988.42	1,874.12
	Private insurance	4,164	5,242.43	1,987.89
	Self-Pay	203	4,293.08	1,492.51
	Other payer	101	5,452.68	1,584.54
2008	Medicare	94	5,848.77	2,777.59
	Medicaid	13,667	5,705.92	2,997.06
	Private insurance	13,432	5,643.88	2,661.36
	Self-Pay	504	4,613.20	1,554.44
	Other payer	414	5,894.38	3,610.39
2009	Medicare	90	6,491.16	2,492.05
	Medicaid	15,422	6,041.54	2,987.68
	Private insurance	14,129	6,030.47	3,203.21
	Self-Pay	393	5,701.81	2,135.65
	Other payer	383	5,852.10	3,133.79
2010	Medicare	53	7,407.76	3,752.06
	Medicaid	12,421	6,163.20	2,593.06
	Private insurance	10,551	6,509.61	3,108.44
	Self-Pay	646	5,968.96	1,897.75
	Other payer	643	5,895.39	2,732.38
2011	Medicare	53	7,195.69	3,008.51
	Medicaid	11,577	6,344.46	3,246.24
	Private insurance	11,616	6,164.18	2,986.29
	Self-Pay	296	5,295.28	2,459.90
	Other payer	454	5,886.73	2,642.29
2012	Medicare	80	6,688.74	2,781.81
	Medicaid	11,628	6,744.44	3,364.34
	Private insurance	10,783	7,090.99	3,881.69
	Self-Pay	699	5,975.90	2,660.90
	Other payer	554	6,946.85	3,364.53
2013	Medicare	88	8,158.47	4,088.50
	Medicaid	11,223	6,887.26	3,583.92
	Private insurance	10,411	7,287.34	3,827.04
	Self-Pay	1,024	5,925.41	2,747.73
	Other payer	602	7,190.74	2,933.43
2014	Medicare	96	7,754.17	2,669.86
	Medicaid	10,716	7,179.99	4,047.71
	Private insurance	10,201	7,485.54	4,135.17
	Self-Pay	1,295	6,422.42	2,849.93
	Other payer	584	7,161.52	3,276.38

Table 34

Means and Standard Deviations of Health Care Costs - DRG 775

Year	Payer	*n*	Mean	*SD*
2007	Medicare	66	3,298.14	1,088.13
	Medicaid	10,169	2,885.77	1,476.84
	Private insurance	9,341	3,003.58	1,569.14
	Self-Pay	540	2,626.92	1,284.17
	Other payer	249	3,197.80	1,245.58
2008	Medicare	248	3,627.41	1,732.87
	Medicaid	35,127	3,305.68	1,955.89
	Private insurance	32,201	3,408.07	1,886.95
	Self-Pay	1,554	2,867.27	1,286.33
	Other payer	1,202	3,284.72	2,180.12
2009	Medicare	174	3,786.01	1,829.76
	Medicaid	40,573	3,547.94	2,124.72
	Private insurance	33,505	3,691.22	2,500.39
	Self-Pay	1,146	3,310.02	1,849.58
	Other payer	1,028	3,451.52	3,890.53
2010	Medicare	128	4,260.45	2,490.02
	Medicaid	35,287	3,527.25	1,928.29
	Private insurance	28,604	3,800.63	2,674.76
	Self-Pay	1,549	2,985.69	1,372.75
	Other payer	1,887	3,387.80	3,303.42
2011	Medicare	53	7,195.69	3,008.51
	Medicaid	11,577	6,344.46	3,246.24
	Private insurance	11,616	6,164.18	2,986.29
	Self-Pay	296	5,295.28	2,459.90
	Other payer	454	5,886.73	2,642.29
2012	Medicare	206	4,698.21	3,984.21
	Medicaid	31,620	3,987.52	2,297.53
	Private insurance	27,792	4,233.15	2,788.77
	Self-Pay	1,760	3,575.65	1,915.04
	Other payer	1,556	3,987.40	1,922.52
2013	Medicare	253	4,673.00	2,998.91
	Medicaid	30,983	4,090.82	2,288.54
	Private insurance	27,415	4,337.05	2,522.66
	Self-Pay	2,037	3,526.14	1,917.30
	Other payer	1,828	4,234.31	2,256.17
2014	Medicare	246	4,759.34	2,026.07
	Medicaid	30,687	4,206.63	2,482.94
	Private insurance	28,405	4,420.33	2,741.29
	Self-Pay	2,442	3,742.50	3,244.48
	Other payer	1,768	4,323.84	2,279.09

Table 35

Means and Standard Deviations of Health Care Costs - DRG 853

Year	Payer	*n*	Mean	*SD*
2007	Medicare	279	48,368.12	39,199.57
	Medicaid	93	60,402.74	51,064.12
	Private insurance	86	46,775.84	41,436.07
	Self-Pay	15	47,309.73	28,459.15
	Other payer	10	46,770.85	35,210.78
2008	Medicare	1,255	47,906.72	45,715.62
	Medicaid	325	63,229.88	68,694.53
	Private insurance	361	54,179.58	55,468.43
	Self-Pay	59	44,054.22	32,532.32
	Other payer	80	60,085.82	54,465.97
2009	Medicare	1,466	50,751.37	42,642.90
	Medicaid	406	64,455.98	61,015.01
	Private insurance	459	54,853.56	50,396.16
	Self-Pay	80	43,576.49	37,890.98
	Other payer	86	53,085.97	41,012.76
2010	Medicare	1,492	49,915.41	41,776.74
	Medicaid	419	66,571.89	60,108.25
	Private insurance	444	57,163.74	55,199.35
	Self-Pay	105	60,236.41	55,558.58
	Other payer	103	52,659.39	38,083.05
2011	Medicare	1,608	49,934.97	41,954.98
	Medicaid	429	60,481.14	52,108.30
	Private insurance	472	58,710.10	49,345.99
	Self-Pay	118	43,214.04	29,339.43
	Other payer	96	56,946.20	43,430.66
2012	Medicare	1,629	54,747.50	53,433.66
	Medicaid	554	63,446.46	55,381.90
	Private insurance	510	56,266.62	64,187.51
	Self-Pay	117	48,043.58	44,445.98
	Other payer	129	83,283.00	118,565.87
2013	Medicare	1,852	55,438.95	51,724.23
	Medicaid	585	64,273.79	67,019.24
	Private insurance	561	56,600.66	55,084.63
	Self-Pay	158	39,719.76	30,561.92
	Other payer	195	60,736.82	52,810.84
2014	Medicare	2,079	51,176.76	48,071.64
	Medicaid	919	61,504.77	65,583.77
	Private insurance	725	52,741.85	48,569.00
	Self-Pay	89	42,870.78	45,519.21
	Other payer	101	67,495.37	121,331.18

Table 36

Means and Standard Deviations of Health Care Costs - DRG 871

Year	Payer	*n*	Mean	*SD*
2007	Medicare	2,006	16,698.77	15,046.42
	Medicaid	348	20,057.35	20,477.15
	Private insurance	434	17,575.94	18,204.78
	Self-Pay	45	17,440.93	15,561.43
	Other payer	56	17,448.49	13,372.91
2008	Medicare	9,871	16,171.39	14,341.06
	Medicaid	1,685	19,703.84	19,358.60
	Private insurance	1,946	16,350.25	16,928.04
	Self-Pay	265	15,533.19	12,993.31
	Other payer	279	20,689.82	21,020.82
2009	Medicare	10,048	17,402.51	15,018.01
	Medicaid	2,033	19,763.85	21,365.67
	Private insurance	2,272	18,160.02	17,341.47
	Self-Pay	371	16,379.24	12,568.82
	Other payer	271	19,539.08	17,872.16
2010	Medicare	11,088	18,244.54	16,217.01
	Medicaid	2,179	21,174.59	21,130.03
	Private insurance	2,259	17,697.60	16,775.97
	Self-Pay	361	18,751.85	15,312.14
	Other payer	338	20,772.46	17,985.14
2011	Medicare	11,644	17,826.31	14,433.11
	Medicaid	2,147	21,481.79	20,364.24
	Private insurance	1,994	18,179.69	16,441.63
	Self-Pay	409	18,400.23	15,442.00
	Other payer	308	20,915.45	18,301.79
2012	Medicare	12,976	18,349.62	16,613.55
	Medicaid	2,510	21,750.17	22,557.99
	Private insurance	2,394	18,685.79	17,612.76
	Self-Pay	540	17,389.43	14,096.64
	Other payer	561	21,661.72	20,343.77
2013	Medicare	15,033	17,873.38	16,234.83
	Medicaid	2,881	21,055.23	26,650.67
	Private insurance	2,923	18,824.76	20,496.72
	Self-Pay	585	17,261.96	15,018.83
	Other payer	754	22,038.99	32,550.33
2014	Medicare	17,087	18,030.59	17,462.65
	Medicaid	4,414	20,449.24	19,922.21
	Private insurance	3,306	18,439.82	18,871.72
	Self-Pay	378	16,258.58	14,372.01
	Other payer	493	20,484.95	19,174.31

Table 37

Means and Standard Deviations of Health Care Costs - DRG 881

Year	Payer	*n*	Mean	*SD*
2007	Medicare	50	6,755.86	11,619.40
	Medicaid	77	3,416.64	2,854.50
	Private insurance	138	3,533.03	2,467.60
	Self-Pay	26	2,108.79	852.94
	Other payer	73	2,154.35	1,943.56
2008	Medicare	221	6,246.59	9,119.23
	Medicaid	417	4,972.45	13,564.15
	Private insurance	798	3,118.64	2,777.09
	Self-Pay	128	2,603.66	2,164.86
	Other payer	213	3,042.00	2,463.85
2009	Medicare	248	5,064.29	3,891.62
	Medicaid	755	3,765.12	4,308.63
	Private insurance	771	4,762.69	4,384.96
	Self-Pay	143	3,266.92	3,133.30
	Other payer	153	3,804.73	2,675.16
2010	Medicare	331	6,008.17	5,470.49
	Medicaid	599	4,301.44	4,444.31
	Private insurance	480	4,124.78	6,863.71
	Self-Pay	646	3,000.40	3,435.06
	Other payer	246	3,290.05	3,347.31
2011	Medicare	199	7,339.11	10,363.01
	Medicaid	494	5,421.09	7,479.23
	Private insurance	612	3,832.14	3,022.47
	Self-Pay	275	5,694.50	4,031.54
	Other payer	319	3,993.66	3,016.26
2012	Medicare	250	6,019.02	5,101.32
	Medicaid	517	4,655.30	6,352.17
	Private insurance	544	4,364.13	4,888.03
	Self-Pay	277	4,498.15	16,629.82
	Other payer	335	3,860.78	4,324.33
2013	Medicare	232	6,450.17	4,881.25
	Medicaid	511	5,122.21	5,271.12
	Private insurance	482	4,672.95	4,621.47
	Self-Pay	263	3,013.07	2,387.44
	Other payer	317	4,711.38	8,214.67
2014	Medicare	215	6,535.76	7,769.04
	Medicaid	828	4,378.05	4,854.57
	Private insurance	418	4,589.53	4,217.58
	Self-Pay	111	3,441.73	2,753.98
	Other payer	105	4,686.87	4,637.53

Table 38

Means and Standard Deviations of Health Care Costs - DRG 882

Year	Payer	*n*	Mean	*SD*
2007	Medicare	12	8,716.04	8,931.26
	Medicaid	37	4,015.00	2,853.31
	Private insurance	49	4,020.70	2,929.20
	Self-Pay	18	2,727.52	1,857.51
	Other payer	13	4,743.86	4,594.20
2008	Medicare	80	5,256.55	6,787.40
	Medicaid	174	4,441.71	3,054.64
	Private insurance	306	3,461.51	4,696.17
	Self-Pay	62	3,482.68	3,391.75
	Other payer	54	4,322.43	2,849.05
2009	Medicare	52	4,860.22	3,564.38
	Medicaid	107	5,627.86	11,424.70
	Private insurance	155	4,678.79	4,061.98
	Self-Pay	18	2,702.66	2,382.78
	Other payer	47	3,798.84	2,318.81
2010	Medicare	116	5,617.67	4,550.13
	Medicaid	180	5,410.58	4,901.50
	Private insurance	183	4,097.27	3,617.37
	Self-Pay	168	2,654.73	2,577.39
	Other payer	114	2,651.81	3,421.52
2011	Medicare	89	6,637.20	10,432.41
	Medicaid	143	6,349.00	12,400.16
	Private insurance	109	4,907.88	4,719.47
	Self-Pay	79	5,734.02	5,332.76
	Other payer	122	5,884.87	11,896.73
2012	Medicare	88	6,912.06	6,938.17
	Medicaid	193	6,261.64	9,607.35
	Private insurance	174	5,174.59	7,577.00
	Self-Pay	65	4,051.97	3,067.81
	Other payer	122	6,312.73	11,941.09
2013	Medicare	95	7,014.61	4,687.53
	Medicaid	158	5,187.01	4,756.75
	Private insurance	166	4,896.16	5,013.62
	Self-Pay	70	2,780.50	2,515.43
	Other payer	87	4,325.85	4,134.71
2014	Medicare	93	6,085.02	5,256.72
	Medicaid	275	5,366.46	7,359.76
	Private insurance	173	5,031.34	6,865.47
	Self-Pay	34	3,931.54	5,976.30
	Other payer	51	8,675.61	14,185.04

Table 39

Means and Standard Deviations of Health Care Costs - DRG 885

Year	Payer	*n*	Mean	*SD*
2007	Medicare	1,779	7,429.50	7,950.56
	Medicaid	1,791	5,249.71	5,964.45
	Private insurance	1,377	6,610.61	6,627.96
	Self-Pay	251	4,216.02	3,375.85
	Other payer	278	4,809.29	6,327.66
2008	Medicare	7,698	8,718.73	9,300.37
	Medicaid	5,122	6,598.91	8,829.36
	Private insurance	5,089	5,362.00	6,639.97
	Self-Pay	627	4,166.05	4,411.46
	Other payer	1,324	5,613.86	6,384.11
2009	Medicare	6,351	8,133.93	9,442.48
	Medicaid	12,274	5,668.09	7,722.64
	Private insurance	3,828	7,629.82	8,647.58
	Self-Pay	943	3,618.24	2,861.06
	Other payer	876	7,544.39	9,358.69
2010	Medicare	6,387	10,582.18	11,971.19
	Medicaid	6,474	8,035.24	12,327.28
	Private insurance	4,570	7,183.64	8,454.87
	Self-Pay	3,876	5,501.44	8,350.37
	Other payer	1,271	5,627.55	8,159.22
2011	Medicare	7,527	10,894.72	12,595.89
	Medicaid	7,671	9,464.30	14,236.35
	Private insurance	5,615	7,183.89	7,392.34
	Self-Pay	1,683	11,066.67	11,011.67
	Other payer	2,397	8,686.58	13,881.52
2012	Medicare	7,343	9,097.67	10,944.16
	Medicaid	8,664	6,939.55	10,924.21
	Private insurance	4,481	7,132.95	9,314.18
	Self-Pay	1,862	5,360.25	6,581.02
	Other payer	2,992	7,048.83	10,168.62
2013	Medicare	7,542	9,865.89	13,938.95
	Medicaid	8,708	7,252.22	10,884.65
	Private insurance	4,433	7,446.58	9,340.38
	Self-Pay	1,709	5,255.50	5,850.12
	Other payer	3,157	7,367.10	9,687.87
2014	Medicare	7,235	10,570.79	13,372.93
	Medicaid	11,679	7,105.23	11,154.25
	Private insurance	4,185	6,988.76	8,469.86
	Self-Pay	875	5,121.64	5,416.72
	Other payer	920	9,636.03	15,980.87

Table 40

Means and Standard Deviations of Health Care Costs - DRG 894

Year	Payer	*n*	Mean	*SD*
2007	Medicare	32	3,174.32	1,612.64
	Medicaid	23	3,376.36	2,650.42
	Private insurance	106	2,540.47	3,064.04
	Self-Pay	83	2,842.16	2,081.69
	Other payer	11	5,303.04	4,906.90
2008	Medicare	148	2,990.90	3,698.25
	Medicaid	104	5,671.38	7,096.26
	Private insurance	376	2,224.68	2,830.34
	Self-Pay	183	4,057.76	4,957.90
	Other payer	68	6,658.80	15,795.24
2009	Medicare	72	3,932.47	3,329.51
	Medicaid	103	4,266.51	5,456.84
	Private insurance	104	2,871.32	2,057.56
	Self-Pay	132	4,086.32	3,721.70
	Other payer	52	3,655.83	2,566.38
2010	Medicare	140	4,750.27	6,485.37
	Medicaid	98	5,509.97	4,184.17
	Private insurance	275	2,393.77	2,091.07
	Self-Pay	152	5,382.78	5,352.49
	Other payer	71	5,409.33	5,324.96
2011	Medicare	140	4,068.87	3,200.20
	Medicaid	107	6,293.13	6,113.07
	Private insurance	251	3,400.69	3,285.69
	Self-Pay	268	3,454.87	3,838.45
	Other payer	63	7,210.73	9,418.04
2012	Medicare	129	4,957.64	5,112.84
	Medicaid	129	4,680.34	3,966.65
	Private insurance	263	3,213.38	5,903.92
	Self-Pay	142	5,049.40	5,859.58
	Other payer	89	4,749.55	3,512.95
2013	Medicare	128	4,715.54	6,468.44
	Medicaid	138	5,895.21	10,659.19
	Private insurance	240	3,545.97	5,994.83
	Self-Pay	158	4,967.00	4,213.75
	Other payer	93	5,904.73	4,710.37
2014	Medicare	117	4,421.90	3,278.18
	Medicaid	275	6,863.13	8,181.66
	Private insurance	192	3,583.29	3,571.50
	Self-Pay	68	5,888.09	6,175.14
	Other payer	37	4,663.58	5,738.32

Appendix C: One-Way Analysis of Variance of Health Care Costs

Table 41

One-Way ANOVA of Health Care Costs - DRG 3

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	6.874E+11	1.718E+11	21.774	0.000
	Within groups	477	3.764E+12	7.892E+09		
	Total	481	4.452E+12			
2008	Between groups	4	2.500E+11	6.251E+10	8.391	0.000
	Within groups	1,429	1.065E+13	7.450E+09		
	Total	1,433	1.090E+13			
2009	Between groups	4	2.201E+11	5.503E+10	6.686	0.000
	Within groups	1,434	1.180E+13	8.231E+09		
	Total	1,438	1.202E+13			
2010	Between groups	4	2.212E+11	5.529E+10	5.348	0.000
	Within groups	1,102	1.139E+13	1.034E+10		
	Total	1,106	1.162E+13			
2011	Between groups	4	9.198E+11	2.299E+11	9.572	0.000
	Within groups	813	1.953E+13	2.402E+10		
	Total	817	2.045E+13			
2012	Between groups	4	6.499E+11	1.625E+11	5.872	0.000
	Within groups	1,144	3.165E+13	2.767E+10		
	Total	1,148	3.230E+13			
2013	Between groups	4	6.731E+11	1.683E+11	5.344	0.000
	Within groups	1,109	3.492E+13	3.149E+10		
	Total	1,113	3.560E+13			
2014	Between groups	4	1.155E+12	2.889E+11	8.969	0.000
	Within groups	1,114	3.588E+13	3.220E+10		
	Total	1,118	3.703E+13			

Table 42

One-Way ANOVA of Health Care Costs - DRG 23

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	2.390E+09	5.974E+08	1.788	0.129
	Within groups	885	2.957E+11	3.341E+08		
	Total	889	2.981E+11			
2008	Between groups	4	4.822E+09	1.205E+09	0.910	0.458
	Within groups	436	5.777E+11	1.325E+09		
	Total	440	5.825E+11			
2009	Between groups	4	2.741E+10	6.853E+09	4.056	0.003
	Within groups	524	8.853E+11	1.689E+09		
	Total	528	9.127E+11			
2010	Between groups	4	6.244E+10	1.561E+10	7.271	0.000
	Within groups	652	1.400E+12	2.147E+09		
	Total	656	1.462E+12			
2011	Between groups	4	1.944E+11	4.861E+10	12.453	0.000
	Within groups	395	1.542E+12	3.903E+09		
	Total	399	1.736E+12			
2012	Between groups	4	7.641E+10	1.910E+10	5.940	0.000
	Within groups	499	1.605E+12	3.216E+09		
	Total	503	1.681E+12			
2013	Between groups	4	2.497E+10	6.243E+09	2.697	0.030
	Within groups	539	1.248E+12	2.315E+09		
	Total	543	1.273E+12			
2014	Between groups	4	9.457E+10	2.364E+10	6.892	0.000
	Within groups	575	1.973E+12	3.431E+09		
	Total	579	2.067E+12			

Table 43

One-Way ANOVA of Health Care Costs - DRG 26

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	2.748E+10	6.870E+09	43.473	0.000
	Within groups	1,206	1.906E+11	1.580E+08		
	Total	1,210	2.180E+11			
2008	Between groups	4	1.745E+10	4.363E+09	8.640	0.000
	Within groups	1,297	6.549E+11	5.049E+08		
	Total	1,301	6.724E+11			
2009	Between groups	4	2.384E+10	5.960E+09	14.358	0.000
	Within groups	1,470	6.101E+11	4.151E+08		
	Total	1,474	6.340E+11			
2010	Between groups	4	3.872E+10	9.680E+09	15.172	0.000
	Within groups	1,247	7.956E+11	6.380E+08		
	Total	1,251	8.343E+11			
2011	Between groups	4	2.100E+10	5.251E+09	12.341	0.000
	Within groups	700	2.979E+11	4.255E+08		
	Total	704	3.189E+11			
2012	Between groups	4	3.014E+10	7.535E+09	8.410	0.000
	Within groups	937	8.395E+11	8.959E+08		
	Total	941	8.696E+11			
2013	Between groups	4	1.394E+10	3.486E+09	4.766	0.001
	Within groups	898	6.568E+11	7.314E+08		
	Total	902	6.707E+11			
2014	Between groups	4	2.182E+10	5.456E+09	6.359	0.000
	Within groups	898	7.704E+11	8.579E+08		
	Total	902	7.922E+11			

Table 44

One-Way ANOVA of Health Care Costs - DRG 153

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	8.087E+08	2.022E+08	10.939	0.000
	Within groups	764	1.412E+10	1.848E+07		
	Total	768	1.493E+10			
2008	Between groups	4	8.207E+08	2.052E+08	17.313	0.000
	Within groups	1,817	2.153E+10	1.185E+07		
	Total	1,821	2.235E+10			
2009	Between groups	4	1.368E+09	3.421E+08	14.992	0.000
	Within groups	3,197	7.295E+10	2.282E+07		
	Total	3,201	7.432E+10			
2010	Between groups	4	1.423E+09	3.557E+08	21.777	0.000
	Within groups	2,023	3.304E+10	1.633E+07		
	Total	2,027	3.447E+10			
2011	Between groups	4	1.106E+09	2.764E+08	19.588	0.000
	Within groups	1,422	2.007E+10	1.411E+07		
	Total	1,426	2.117E+10			
2012	Between groups	4	1.249E+09	3.123E+08	11.669	0.000
	Within groups	1,997	5.346E+10	2.677E+07		
	Total	2,001	5.470E+10			
2013	Between groups	4	2.764E+09	6.909E+08	17.603	0.000
	Within groups	2,253	8.844E+10	3.925E+07		
	Total	2,257	9.120E+10			
2014	Between groups	4	1.871E+09	4.678E+08	11.924	0.000
	Within groups	2,023	7.936E+10	3.923E+07		
	Total	2,027	8.123E+10			

Table 45

One-Way ANOVA of Health Care Costs - DRG 203

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	1.031E+10	2.577E+09	24.617	0.000
	Within groups	2,747	2.875E+11	1.047E+08		
	Total	2,751	2.978E+11			
2008	Between groups	4	2.104E+09	5.261E+08	46.075	0.000
	Within groups	4,468	5.102E+10	1.142E+07		
	Total	4,472	5.312E+10			
2009	Between groups	4	2.761E+09	6.901E+08	78.471	0.000
	Within groups	7,529	6.622E+10	8.795E+06		
	Total	7,533	6.898E+10			
2010	Between groups	4	1.255E+09	3.137E+08	22.165	0.000
	Within groups	6,168	8.730E+10	1.415E+07		
	Total	6,172	8.855E+10			
2011	Between groups	4	2.273E+09	5.683E+08	58.545	0.000
	Within groups	3,859	3.746E+10	9.707E+06		
	Total	3,863	3.973E+10			
2012	Between groups	4	1.469E+09	3.672E+08	16.184	0.000
	Within groups	5,484	1.244E+11	2.269E+07		
	Total	5,488	1.259E+11			
2013	Between groups	4	1.101E+09	2.752E+08	14.790	0.000
	Within groups	5,010	9.321E+10	1.860E+07		
	Total	5,014	9.431E+10			
2014	Between groups	4	1.152E+09	2.879E+08	17.707	0.000
	Within groups	4,342	7.061E+10	1.626E+07		
	Total	4,346	7.176E+10			

Table 46

One-Way ANOVA of Health Care Costs - DRG 207

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	1.507E+10	3.768E+09	5.114	0.000
	Within groups	2,065	1.522E+12	7.369E+08		
	Total	2,069	1.537E+12			
2008	Between groups	4	3.356E+10	8.391E+09	4.546	0.001
	Within groups	2,286	4.219E+12	1.846E+09		
	Total	2,290	4.253E+12			
2009	Between groups	4	9.010E+10	2.252E+10	12.031	0.000
	Within groups	2,483	4.649E+12	1.872E+09		
	Total	2,487	4.739E+12			
2010	Between groups	4	8.196E+09	2.049E+09	0.884	0.473
	Within groups	2,139	4.960E+12	2.319E+09		
	Total	2,143	4.968E+12			
2011	Between groups	4	2.382E+10	5.956E+09	3.335	0.010
	Within groups	1,414	2.525E+12	1.786E+09		
	Total	1,418	2.549E+12			
2012	Between groups	4	5.786E+10	1.446E+10	5.119	0.000
	Within groups	1,744	4.927E+12	2.825E+09		
	Total	1,748	4.985E+12			
2013	Between groups	4	1.087E+11	2.717E+10	6.703	0.000
	Within groups	1,675	6.788E+12	4.053E+09		
	Total	1,679	6.897E+12			
2014	Between groups	4	1.822E+11	4.555E+10	9.069	0.000
	Within groups	1,616	8.116E+12	5.022E+09		
	Total	1,620	8.298E+12			

Table 47

One-Way ANOVA of Health Care Costs - DRG 233

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	4.108E+09	1.027E+09	1.492	0.203
	Within groups	708	4.873E+11	6.883E+08		
	Total	712	4.914E+11			
2008	Between groups	4	1.258E+10	3.144E+09	2.975	0.019
	Within groups	583	6.162E+11	1.057E+09		
	Total	587	6.287E+11			
2009	Between groups	4	4.783E+09	1.196E+09	1.181	0.318
	Within groups	793	8.032E+11	1.013E+09		
	Total	797	8.080E+11			
2010	Between groups	4	3.633E+09	9.082E+08	1.059	0.376
	Within groups	686	5.885E+11	8.578E+08		
	Total	690	5.921E+11			
2011	Between groups	4	6.696E+09	1.674E+09	1.168	0.324
	Within groups	641	9.187E+11	1.433E+09		
	Total	645	9.254E+11			
2012	Between groups	4	1.766E+10	4.415E+09	3.226	0.012
	Within groups	621	8.499E+11	1.369E+09		
	Total	625	8.676E+11			
2013	Between groups	4	1.031E+10	2.577E+09	1.606	0.171
	Within groups	641	1.028E+12	1.604E+09		
	Total	645	1.038E+12			
2014	Between groups	4	1.198E+10	2.996E+09	2.592	0.036
	Within groups	675	7.799E+11	1.155E+09		
	Total	679	7.919E+11			

Table 48

One-Way ANOVA of Health Care Costs - DRG 234

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	2.032E+09	5.080E+08	1.674	0.154
	Within groups	778	2.362E+11	3.035E+08		
	Total	782	2.382E+11			
2008	Between groups	4	3.198E+09	7.996E+08	4.284	0.002
	Within groups	1,080	2.016E+11	1.867E+08		
	Total	1,084	2.048E+11			
2009	Between groups	4	2.735E+09	6.837E+08	3.909	0.004
	Within groups	1,324	2.315E+11	1.749E+08		
	Total	1,328	2.343E+11			
2010	Between groups	4	3.359E+09	8.396E+08	4.293	0.002
	Within groups	993	1.942E+11	1.956E+08		
	Total	997	1.976E+11			
2011	Between groups	4	1.584E+09	3.959E+08	2.007	0.091
	Within groups	961	1.896E+11	1.972E+08		
	Total	965	1.911E+11			
2012	Between groups	4	4.510E+09	1.128E+09	3.083	0.015
	Within groups	1,012	3.701E+11	3.657E+08		
	Total	1,016	3.746E+11			
2013	Between groups	4	2.558E+09	6.395E+08	2.316	0.056
	Within groups	970	2.678E+11	2.761E+08		
	Total	974	2.704E+11			
2014	Between groups	4	5.910E+09	1.477E+09	5.029	0.001
	Within groups	961	2.823E+11	2.938E+08		
	Total	965	2.883E+11			

Table 49

One-Way ANOVA of Health Care Costs - DRG 311

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	1.004E+07	2.509E+06	0.288	0.886
	Within groups	709	6.168E+09	8.700E+06		
	Total	713	6.179E+09			
2008	Between groups	4	4.319E+08	1.080E+08	10.172	0.000
	Within groups	1,315	1.396E+10	1.062E+07		
	Total	1,319	1.439E+10			
2009	Between groups	4	8.748E+07	2.187E+07	2.795	0.025
	Within groups	1,121	8.772E+09	7.825E+06		
	Total	1,125	8.860E+09			
2010	Between groups	4	1.715E+08	4.288E+07	3.234	0.012
	Within groups	1,170	1.551E+10	1.326E+07		
	Total	1,174	1.568E+10			
2011	Between groups	4	2.020E+08	5.050E+07	4.542	0.001
	Within groups	992	1.103E+10	1.112E+07		
	Total	996	1.123E+10			
2012	Between groups	4	4.374E+08	1.094E+08	4.427	0.002
	Within groups	922	2.278E+10	2.470E+07		
	Total	926	2.321E+10			
2013	Between groups	4	1.058E+08	2.644E+07	2.135	0.075
	Within groups	789	9.770E+09	1.238E+07		
	Total	793	9.876E+09			
2014	Between groups	4	1.127E+08	2.817E+07	1.655	0.159
	Within groups	737	1.254E+10	1.702E+07		
	Total	741	1.266E+10			

Table 50

One-Way ANOVA of Health Care Costs - DRG 313

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	4.714E+08	1.178E+08	19.561	0.000
	Within groups	3,740	2.253E+10	6.024E+06		
	Total	3,744	2.300E+10			
2008	Between groups	4	2.601E+09	6.502E+08	77.657	0.000
	Within groups	12,238	1.025E+11	8.373E+06		
	Total	12,242	1.051E+11			
2009	Between groups	4	8.859E+08	2.215E+08	26.811	0.000
	Within groups	13,496	1.115E+11	8.261E+06		
	Total	13,500	1.124E+11			
2010	Between groups	4	1.104E+09	2.760E+08	33.992	0.000
	Within groups	12,053	9.787E+10	8.120E+06		
	Total	12,057	9.897E+10			
2011	Between groups	4	5.821E+08	1.455E+08	18.490	0.000
	Within groups	10,766	8.473E+10	7.871E+06		
	Total	10,770	8.532E+10			
2012	Between groups	4	1.774E+09	4.436E+08	40.593	0.000
	Within groups	10,858	1.187E+11	1.093E+07		
	Total	10,862	1.204E+11			
2013	Between groups	4	6.883E+08	1.721E+08	16.694	0.000
	Within groups	8,663	8.929E+10	1.031E+07		
	Total	8,667	8.998E+10			
2014	Between groups	4	1.101E+09	2.753E+08	21.635	0.000
	Within groups	7,537	9.590E+10	1.272E+07		
	Total	7,541	9.700E+10			

Table 51

One-Way ANOVA of Health Care Costs - DRG 326

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	4.163E+09	1.041E+09	0.431	0.786
	Within groups	285	6.881E+11	2.414E+09		
	Total	289	6.922E+11			
2008	Between groups	4	3.016E+10	7.540E+09	2.884	0.022
	Within groups	682	1.783E+12	2.614E+09		
	Total	686	1.813E+12			
2009	Between groups	4	2.898E+10	7.244E+09	2.557	0.038
	Within groups	818	2.318E+12	2.833E+09		
	Total	822	2.347E+12			
2010	Between groups	4	1.290E+10	3.225E+09	1.690	0.150
	Within groups	704	1.343E+12	1.908E+09		
	Total	708	1.356E+12			
2011	Between groups	4	5.333E+10	1.333E+10	3.385	0.009
	Within groups	596	2.348E+12	3.939E+09		
	Total	600	2.401E+12			
2012	Between groups	4	2.404E+10	6.009E+09	1.561	0.183
	Within groups	668	2.571E+12	3.849E+09		
	Total	672	2.595E+12			
2013	Between groups	4	1.398E+10	3.496E+09	1.158	0.328
	Within groups	697	2.105E+12	3.020E+09		
	Total	701	2.119E+12			
2014	Between groups	4	3.613E+10	9.032E+09	1.429	0.223
	Within groups	692	4.375E+12	6.322E+09		
	Total	696	4.411E+12			

Table 52

One-Way ANOVA of Health Care Costs - DRG 329

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	3.813E+10	9.533E+09	5.450	0.000
	Within groups	628	1.098E+12	1.749E+09		
	Total	632	1.137E+12			
2008	Between groups	4	1.187E+11	2.967E+10	14.513	0.000
	Within groups	2,374	4.853E+12	2.044E+09		
	Total	2,378	4.972E+12			
2009	Between groups	4	3.509E+10	8.772E+09	4.735	0.001
	Within groups	2,380	4.409E+12	1.853E+09		
	Total	2,384	4.444E+12			
2010	Between groups	4	8.583E+10	2.146E+10	13.071	0.000
	Within groups	2,089	3.429E+12	1.642E+09		
	Total	2,093	3.515E+12			
2011	Between groups	4	7.974E+10	1.993E+10	11.894	0.000
	Within groups	2,115	3.545E+12	1.676E+09		
	Total	2,119	3.625E+12			
2012	Between groups	4	6.631E+10	1.658E+10	6.050	0.000
	Within groups	2,109	5.779E+12	2.740E+09		
	Total	2,113	5.845E+12			
2013	Between groups	4	1.114E+11	2.784E+10	8.507	0.000
	Within groups	2,085	6.823E+12	3.272E+09		
	Total	2,089	6.934E+12			
2014	Between groups	4	1.444E+11	3.610E+10	11.199	0.000
	Within groups	2,049	6.605E+12	3.223E+09		
	Total	2,053	6.749E+12			

Table 53

One-Way ANOVA of Health Care Costs - DRG 373

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	1.048E+09	2.621E+08	118.959	0.000
	Within groups	61,041	1.345E+11	2.203E+06		
	Total	61,045	1.355E+11			
2008	Between groups	4	5.161E+08	1.290E+08	4.712	0.001
	Within groups	671	1.837E+10	2.738E+07		
	Total	675	1.889E+10			
2009	Between groups	4	8.189E+07	2.047E+07	0.676	0.609
	Within groups	917	2.778E+10	3.030E+07		
	Total	921	2.786E+10			
2010	Between groups	4	4.585E+08	1.146E+08	3.696	0.005
	Within groups	806	2.500E+10	3.101E+07		
	Total	810	2.545E+10			
2011	Between groups	4	7.168E+08	1.792E+08	7.771	0.000
	Within groups	741	1.709E+10	2.306E+07		
	Total	745	1.780E+10			
2012	Between groups	4	2.259E+08	5.648E+07	1.908	0.107
	Within groups	833	2.466E+10	2.961E+07		
	Total	837	2.489E+10			
2013	Between groups	4	2.214E+08	5.536E+07	1.825	0.122
	Within groups	802	2.433E+10	3.034E+07		
	Total	806	2.455E+10			
2014	Between groups	4	3.682E+08	9.206E+07	1.772	0.132
	Within groups	753	3.912E+10	5.195E+07		
	Total	757	3.948E+10			

Table 54

One-Way ANOVA of Health Care Costs - DRG 390

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	6.669E+09	1.667E+09	163.322	0.000
	Within groups	14,840	1.515E+11	1.021E+07		
	Total	14,844	1.582E+11			
2008	Between groups	4	5.024E+08	1.256E+08	9.724	0.000
	Within groups	2,800	3.617E+10	1.292E+07		
	Total	2,804	3.667E+10			
2009	Between groups	4	3.094E+08	7.734E+07	5.321	0.000
	Within groups	3,026	4.398E+10	1.454E+07		
	Total	3,030	4.429E+10			
2010	Between groups	4	4.091E+08	1.023E+08	5.766	0.000
	Within groups	2,634	4.671E+10	1.773E+07		
	Total	2,638	4.712E+10			
2011	Between groups	4	5.831E+08	1.458E+08	10.325	0.000
	Within groups	2,807	3.963E+10	1.412E+07		
	Total	2,811	4.022E+10			
2012	Between groups	4	4.445E+08	1.111E+08	7.356	0.000
	Within groups	2,907	4.392E+10	1.511E+07		
	Total	2,911	4.436E+10			
2013	Between groups	4	3.430E+08	8.576E+07	5.086	0.000
	Within groups	2,830	4.772E+10	1.686E+07		
	Total	2,834	4.806E+10			
2014	Between groups	4	3.692E+08	9.230E+07	6.719	0.000
	Within groups	2,742	3.767E+10	1.374E+07		
	Total	2,746	3.804E+10			

Table 55

One-Way ANOVA of Health Care Costs - DRG 391

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	1.883E+10	4.708E+09	3,238.132	0.000
	Within groups	83,396	1.213E+11	1.454E+06		
	Total	83,400	1.401E+11			
2008	Between groups	4	2.603E+08	6.507E+07	0.772	0.543
	Within groups	2,204	1.858E+11	8.430E+07		
	Total	2,208	1.861E+11			
2009	Between groups	4	7.979E+08	1.995E+08	1.797	0.127
	Within groups	2,900	3.219E+11	1.110E+08		
	Total	2,904	3.227E+11			
2010	Between groups	4	6.744E+08	1.686E+08	1.439	0.219
	Within groups	3,033	3.555E+11	1.172E+08		
	Total	3,037	3.561E+11			
2011	Between groups	4	6.973E+08	1.743E+08	1.588	0.175
	Within groups	2,270	2.493E+11	1.098E+08		
	Total	2,274	2.499E+11			
2012	Between groups	4	1.600E+09	4.000E+08	2.106	0.078
	Within groups	2,425	4.606E+11	1.899E+08		
	Total	2,429	4.622E+11			
2013	Between groups	4	1.107E+09	2.767E+08	1.236	0.293
	Within groups	2,465	5.518E+11	2.239E+08		
	Total	2,469	5.529E+11			
2014	Between groups	4	9.932E+08	2.483E+08	1.363	0.244
	Within groups	2,585	4.710E+11	1.822E+08		
	Total	2,589	4.720E+11			

Table 56

One-Way ANOVA of Health Care Costs - DRG 392

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	1.424E+09	3.561E+08	7.981	0.000
	Within groups	4,386	1.957E+11	4.462E+07		
	Total	4,390	1.971E+11			
2008	Between groups	4	4.971E+09	1.243E+09	57.731	0.000
	Within groups	14,371	3.094E+11	2.153E+07		
	Total	14,375	3.144E+11			
2009	Between groups	4	3.594E+09	8.986E+08	38.260	0.000
	Within groups	16,975	3.987E+11	2.349E+07		
	Total	16,979	4.023E+11			
2010	Between groups	4	3.663E+09	9.158E+08	35.441	0.000
	Within groups	15,666	4.048E+11	2.584E+07		
	Total	15,670	4.085E+11			
2011	Between groups	4	3.325E+09	8.311E+08	37.048	0.000
	Within groups	15,553	3.489E+11	2.243E+07		
	Total	15,557	3.522E+11			
2012	Between groups	4	5.897E+09	1.474E+09	40.733	0.000
	Within groups	16,370	5.925E+11	3.619E+07		
	Total	16,374	5.984E+11			
2013	Between groups	4	5.081E+09	1.270E+09	36.808	0.000
	Within groups	15,244	5.261E+11	3.451E+07		
	Total	15,248	5.312E+11			
2014	Between groups	4	3.873E+09	9.683E+08	27.046	0.000
	Within groups	14,583	5.221E+11	3.580E+07		
	Total	14,587	5.260E+11			

Table 57

One-Way ANOVA of Health Care Costs - DRG 464

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	4.928E+08	1.232E+08	1.050	0.380
	Within groups	663	7.777E+10	1.173E+08		
	Total	667	7.827E+10			
2008	Between groups	4	1.276E+10	3.189E+09	4.811	0.001
	Within groups	463	3.069E+11	6.629E+08		
	Total	467	3.197E+11			
2009	Between groups	4	7.706E+09	1.926E+09	2.730	0.029
	Within groups	449	3.169E+11	7.057E+08		
	Total	453	3.246E+11			
2010	Between groups	4	1.291E+10	3.228E+09	3.126	0.015
	Within groups	488	5.039E+11	1.033E+09		
	Total	492	5.168E+11			
2011	Between groups	4	3.846E+10	9.614E+09	5.812	0.000
	Within groups	421	6.964E+11	1.654E+09		
	Total	425	7.349E+11			
2012	Between groups	4	2.494E+10	6.234E+09	4.035	0.003
	Within groups	533	8.235E+11	1.545E+09		
	Total	537	8.484E+11			
2013	Between groups	4	6.013E+09	1.503E+09	1.445	0.218
	Within groups	544	5.659E+11	1.040E+09		
	Total	548	5.719E+11			
2014	Between groups	4	6.779E+09	1.695E+09	2.361	0.052
	Within groups	543	3.898E+11	7.179E+08		
	Total	547	3.966E+11			

Table 58

One-Way ANOVA of Health Care Costs - DRG 470

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	3.753E+09	9.382E+08	15.739	0.000
	Within groups	5,967	3.557E+11	5.961E+07		
	Total	5,971	3.594E+11			
2008	Between groups	4	5.542E+09	1.385E+09	36.278	0.000
	Within groups	19,209	7.336E+11	3.819E+07		
	Total	19,213	7.392E+11			
2009	Between groups	4	1.103E+09	2.757E+08	5.280	0.000
	Within groups	20,708	1.081E+12	5.221E+07		
	Total	20,712	1.082E+12			
2010	Between groups	4	4.013E+09	1.003E+09	23.063	0.000
	Within groups	19,025	8.276E+11	4.350E+07		
	Total	19,029	8.317E+11			
2011	Between groups	4	1.334E+10	3.335E+09	53.708	0.000
	Within groups	20,013	1.243E+12	6.210E+07		
	Total	20,017	1.256E+12			
2012	Between groups	4	3.259E+09	8.148E+08	10.527	0.000
	Within groups	21,681	1.678E+12	7.740E+07		
	Total	21,685	1.681E+12			
2013	Between groups	4	1.543E+09	3.859E+08	6.688	0.000
	Within groups	22,841	1.318E+12	5.769E+07		
	Total	22,845	1.319E+12			
2014	Between groups	4	3.348E+09	8.369E+08	14.801	0.000
	Within groups	24,119	1.364E+12	5.654E+07		
	Total	24,123	1.367E+12			

Table 59

One-Way ANOVA of Health Care Costs - DRG 603

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	7.727E+08	1.932E+08	9.352	0.000
	Within groups	2,577	5.323E+10	2.066E+07		
	Total	2,581	5.401E+10			
2008	Between groups	4	3.116E+09	7.791E+08	32.132	0.000
	Within groups	9,439	2.289E+11	2.425E+07		
	Total	9,443	2.320E+11			
2009	Between groups	4	1.825E+09	4.563E+08	19.676	0.000
	Within groups	10,780	2.500E+11	2.319E+07		
	Total	10,784	2.518E+11			
2010	Between groups	4	3.963E+09	9.906E+08	34.138	0.000
	Within groups	10,640	3.088E+11	2.902E+07		
	Total	10,644	3.127E+11			
2011	Between groups	4	3.066E+09	7.666E+08	24.414	0.000
	Within groups	10,357	3.252E+11	3.140E+07		
	Total	10,361	3.283E+11			
2012	Between groups	4	2.359E+09	5.896E+08	15.798	0.000
	Within groups	10,841	4.046E+11	3.732E+07		
	Total	10,845	4.070E+11			
2013	Between groups	4	3.652E+09	9.130E+08	21.233	0.000
	Within groups	10,468	4.501E+11	4.300E+07		
	Total	10,472	4.538E+11			
2014	Between groups	4	2.277E+09	5.693E+08	14.900	0.000
	Within groups	10,601	4.050E+11	3.821E+07		
	Total	10,605	4.073E+11			

Table 60

One-Way ANOVA of Health Care Costs - DRG 639

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	1.065E+08	2.663E+07	2.790	0.025
	Within groups	832	7.943E+09	9.547E+06		
	Total	836	8.049E+09			
2008	Between groups	4	8.615E+08	2.154E+08	17.323	0.000
	Within groups	2,958	3.677E+10	1.243E+07		
	Total	2,962	3.764E+10			
2009	Between groups	4	8.589E+07	2.147E+07	1.678	0.152
	Within groups	3,322	4.251E+10	1.280E+07		
	Total	3,326	4.260E+10			
2010	Between groups	4	3.337E+08	8.343E+07	5.736	0.000
	Within groups	2,777	4.039E+10	1.455E+07		
	Total	2,781	4.073E+10			
2011	Between groups	4	5.578E+08	1.395E+08	10.676	0.000
	Within groups	2,403	3.139E+10	1.306E+07		
	Total	2,407	3.195E+10			
2012	Between groups	4	3.847E+08	9.617E+07	5.036	0.000
	Within groups	2,793	5.333E+10	1.910E+07		
	Total	2,797	5.372E+10			
2013	Between groups	4	9.231E+07	2.308E+07	1.443	0.217
	Within groups	2,676	4.281E+10	1.600E+07		
	Total	2,680	4.290E+10			
2014	Between groups	4	2.289E+08	5.723E+07	2.735	0.027
	Within groups	2,484	5.198E+10	2.092E+07		
	Total	2,488	5.221E+10			

Table 61

One-Way ANOVA of Health Care Costs - DRG 690

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	9.983E+08	2.496E+08	14.595	0.000
	Within groups	2,509	4.290E+10	1.710E+07		
	Total	2,513	4.390E+10			
2008	Between groups	4	2.401E+09	6.003E+08	25.502	0.000
	Within groups	8,941	2.105E+11	2.354E+07		
	Total	8,945	2.129E+11			
2009	Between groups	4	2.577E+09	6.441E+08	34.021	0.000
	Within groups	10,066	1.906E+11	1.893E+07		
	Total	10,070	1.932E+11			
2010	Between groups	4	3.186E+09	7.964E+08	29.654	0.000
	Within groups	8,781	2.358E+11	2.686E+07		
	Total	8,785	2.390E+11			
2011	Between groups	4	1.948E+09	4.869E+08	18.814	0.000
	Within groups	8,603	2.227E+11	2.588E+07		
	Total	8,607	2.246E+11			
2012	Between groups	4	2.315E+09	5.788E+08	15.478	0.000
	Within groups	9,121	3.411E+11	3.739E+07		
	Total	9,125	3.434E+11			
2013	Between groups	4	2.239E+09	5.599E+08	19.347	0.000
	Within groups	8,462	2.449E+11	2.894E+07		
	Total	8,466	2.471E+11			
2014	Between groups	4	1.488E+09	3.720E+08	12.088	0.000
	Within groups	8,097	2.492E+11	3.077E+07		
	Total	8,101	2.506E+11			

Table 62

One-Way ANOVA of Health Care Costs - DRG 765

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	4.219E+07	1.055E+07	0.243	0.914
	Within groups	3,287	1.429E+11	4.347E+07		
	Total	3,291	1.429E+11			
2008	Between groups	4	1.919E+09	4.797E+08	8.390	0.000
	Within groups	11,755	6.721E+11	5.717E+07		
	Total	11,759	6.740E+11			
2009	Between groups	4	3.022E+08	7.554E+07	0.852	0.492
	Within groups	12,755	1.131E+12	8.871E+07		
	Total	12,759	1.132E+12			
2010	Between groups	4	1.488E+09	3.720E+08	4.317	0.002
	Within groups	12,179	1.050E+12	8.618E+07		
	Total	12,183	1.051E+12			
2011	Between groups	4	4.286E+08	1.071E+08	1.431	0.221
	Within groups	11,529	8.633E+11	7.488E+07		
	Total	11,533	8.637E+11			
2012	Between groups	4	6.292E+08	1.573E+08	1.767	0.133
	Within groups	12,206	1.087E+12	8.904E+07		
	Total	12,210	1.087E+12			
2013	Between groups	4	2.093E+09	5.232E+08	6.037	0.000
	Within groups	12,435	1.078E+12	8.667E+07		
	Total	12,439	1.080E+12			
2014	Between groups	4	1.422E+09	3.554E+08	3.111	0.014
	Within groups	12,874	1.471E+12	1.142E+08		
	Total	12,878	1.472E+12			

Table 63

One-Way ANOVA of Health Care Costs - DRG 766

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	2.806E+08	7.015E+07	19.064	0.000
	Within groups	8,597	3.164E+10	3.680E+06		
	Total	8,601	3.192E+10			
2008	Between groups	4	6.107E+08	1.527E+08	19.054	0.000
	Within groups	28,106	2.252E+11	8.012E+06		
	Total	28,110	2.258E+11			
2009	Between groups	4	7.562E+07	1.891E+07	1.992	0.093
	Within groups	30,412	2.887E+11	9.493E+06		
	Total	30,416	2.888E+11			
2010	Between groups	4	9.367E+08	2.342E+08	29.450	0.000
	Within groups	24,309	1.933E+11	7.952E+06		
	Total	24,313	1.942E+11			
2011	Between groups	4	5.622E+08	1.405E+08	14.598	0.000
	Within groups	23,991	2.310E+11	9.628E+06		
	Total	23,995	2.316E+11			
2012	Between groups	4	1.270E+09	3.175E+08	24.643	0.000
	Within groups	23,739	3.059E+11	1.288E+07		
	Total	23,743	3.071E+11			
2013	Between groups	4	2.294E+09	5.736E+08	43.057	0.000
	Within groups	23,343	3.110E+11	1.332E+07		
	Total	23,347	3.133E+11			
2014	Between groups	4	1.520E+09	3.799E+08	23.667	0.000
	Within groups	22,887	3.674E+11	1.605E+07		
	Total	22,891	3.689E+11			

Table 64

One-Way ANOVA of Health Care Costs - DRG 775

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	1.455E+08	3.638E+07	15.922	0.000
	Within groups	20,360	4.652E+10	2.285E+06		
	Total	20,364	4.667E+10			
2008	Between groups	4	5.611E+08	1.403E+08	38.229	0.000
	Within groups	70,327	2.580E+11	3.669E+06		
	Total	70,331	2.586E+11			
2009	Between groups	4	5.107E+08	1.277E+08	23.642	0.000
	Within groups	76,421	4.127E+11	5.400E+06		
	Total	76,425	4.132E+11			
2010	Between groups	4	2.010E+09	5.024E+08	94.105	0.000
	Within groups	67,450	3.601E+11	5.339E+06		
	Total	67,454	3.621E+11			
2011	Between groups	4	6.895E+08	1.724E+08	40.292	0.000
	Within groups	61,892	2.648E+11	4.278E+06		
	Total	61,896	2.655E+11			
2012	Between groups	4	1.459E+09	3.648E+08	57.607	0.000
	Within groups	62,929	3.985E+11	6.332E+06		
	Total	62,933	4.000E+11			
2013	Between groups	4	1.857E+09	4.643E+08	81.584	0.000
	Within groups	62,511	3.558E+11	5.691E+06		
	Total	62,515	3.576E+11			
2014	Between groups	4	1.484E+09	3.710E+08	53.760	0.000
	Within groups	63,543	4.385E+11	6.901E+06		
	Total	63,547	4.400E+11			

Table 65

One-Way ANOVA of Health Care Costs - DRG 853

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	1.186E+10	2.965E+09	1.696	0.150
	Within groups	478	8.355E+11	1.748E+09		
	Total	482	8.474E+11			
2008	Between groups	4	7.255E+10	1.814E+10	6.778	0.000
	Within groups	2,075	5.553E+12	2.676E+09		
	Total	2,079	5.626E+12			
2009	Between groups	4	6.853E+10	1.713E+10	7.635	0.000
	Within groups	2,492	5.591E+12	2.244E+09		
	Total	2,496	5.660E+12			
2010	Between groups	4	9.936E+10	2.484E+10	10.713	0.000
	Within groups	2,558	5.931E+12	2.319E+09		
	Total	2,562	6.031E+12			
2011	Between groups	4	6.729E+10	1.682E+10	8.439	0.000
	Within groups	2,718	5.418E+12	1.993E+09		
	Total	2,722	5.485E+12			
2012	Between groups	4	1.289E+11	3.222E+10	9.028	0.000
	Within groups	2,934	1.047E+13	3.569E+09		
	Total	2,938	1.060E+13			
2013	Between groups	4	8.524E+10	2.131E+10	7.157	0.000
	Within groups	3,346	9.962E+12	2.977E+09		
	Total	3,350	1.005E+13			
2014	Between groups	4	9.884E+10	2.471E+10	7.972	0.000
	Within groups	3,908	1.211E+13	3.100E+09		
	Total	3,912	1.221E+13			

Table 66

One-Way ANOVA of Health Care Costs - DRG 871

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	3.402E+09	8.504E+08	3.213	0.012
	Within groups	2,884	7.634E+11	2.647E+08		
	Total	2,888	7.668E+11			
2008	Between groups	4	2.300E+10	5.751E+09	23.848	0.000
	Within groups	14,041	3.386E+12	2.411E+08		
	Total	14,045	3.409E+12			
2009	Between groups	4	1.125E+10	2.813E+09	10.487	0.000
	Within groups	14,990	4.021E+12	2.683E+08		
	Total	14,994	4.032E+12			
2010	Between groups	4	1.928E+10	4.819E+09	16.571	0.000
	Within groups	16,220	4.717E+12	2.908E+08		
	Total	16,224	4.736E+12			
2011	Between groups	4	2.626E+10	6.566E+09	26.718	0.000
	Within groups	16,497	4.054E+12	2.458E+08		
	Total	16,501	4.081E+12			
2012	Between groups	4	2.994E+10	7.485E+09	23.914	0.000
	Within groups	18,976	5.939E+12	3.130E+08		
	Total	18,980	5.969E+12			
2013	Between groups	4	3.533E+10	8.833E+09	23.985	0.000
	Within groups	22,171	8.165E+12	3.683E+08		
	Total	22,175	8.200E+12			
2014	Between groups	4	2.438E+10	6.095E+09	18.633	0.000
	Within groups	25,673	8.398E+12	3.271E+08		
	Total	25,677	8.422E+12			

Table 67

One-Way ANOVA of Health Care Costs - DRG 881

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	7.113E+08	1.778E+08	7.637	0.000
	Within groups	359	8.359E+09	2.328E+07		
	Total	363	9.070E+09			
2008	Between groups	4	2.556E+09	6.389E+08	11.006	0.000
	Within groups	1,772	1.029E+11	5.805E+07		
	Total	1,776	1.054E+11			
2009	Between groups	4	7.129E+08	1.782E+08	10.508	0.000
	Within groups	2,065	3.503E+10	1.696E+07		
	Total	2,069	3.574E+10			
2010	Between groups	4	2.163E+09	5.408E+08	22.746	0.000
	Within groups	2,297	5.461E+10	2.377E+07		
	Total	2,301	5.677E+10			
2011	Between groups	4	2.451E+09	6.128E+08	18.791	0.000
	Within groups	1,894	6.177E+10	3.261E+07		
	Total	1,898	6.422E+10			
2012	Between groups	4	7.210E+08	1.802E+08	2.814	0.024
	Within groups	1,918	1.228E+11	6.405E+07		
	Total	1,922	1.236E+11			
2013	Between groups	4	1.535E+09	3.837E+08	13.089	0.000
	Within groups	1,800	5.276E+10	2.931E+07		
	Total	1,804	5.430E+10			
2014	Between groups	4	9.892E+08	2.473E+08	9.639	0.000
	Within groups	1,672	4.289E+10	2.565E+07		
	Total	1,676	4.388E+10			

Table 68

One-Way ANOVA of Health Care Costs - DRG 882

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	2.876E+08	7.190E+07	4.707	0.001
	Within groups	124	1.894E+09	1.528E+07		
	Total	128	2.182E+09			
2008	Between groups	4	2.712E+08	6.780E+07	3.469	0.008
	Within groups	671	1.311E+10	1.954E+07		
	Total	675	1.338E+10			
2009	Between groups	4	2.017E+08	5.043E+07	1.086	0.363
	Within groups	374	1.737E+10	4.644E+07		
	Total	378	1.757E+10			
2010	Between groups	4	1.166E+09	2.916E+08	19.177	0.000
	Within groups	756	1.150E+10	1.521E+07		
	Total	760	1.266E+10			
2011	Between groups	4	1.866E+08	4.665E+07	0.471	0.757
	Within groups	537	5.316E+10	9.900E+07		
	Total	541	5.335E+10			
2012	Between groups	4	4.476E+08	1.119E+08	1.434	0.221
	Within groups	637	4.970E+10	7.802E+07		
	Total	641	5.015E+10			
2013	Between groups	4	7.771E+08	1.943E+08	9.504	0.000
	Within groups	571	1.167E+10	2.044E+07		
	Total	575	1.245E+10			
2014	Between groups	4	6.694E+08	1.674E+08	2.829	0.024
	Within groups	621	3.673E+10	5.915E+07		
	Total	625	3.740E+10			

Table 69

One-Way ANOVA of Health Care Costs - DRG 885

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	6.059E+09	1.515E+09	33.091	0.000
	Within groups	5,471	2.505E+11	4.578E+07		
	Total	5,475	2.565E+11			
2008	Between groups	4	4.477E+10	1.119E+10	163.946	0.000
	Within groups	19,855	1.355E+12	6.827E+07		
	Total	19,859	1.400E+12			
2009	Between groups	4	3.883E+10	9.706E+09	141.157	0.000
	Within groups	24,267	1.669E+12	6.876E+07		
	Total	24,271	1.707E+12			
2010	Between groups	4	7.699E+10	1.925E+10	168.382	0.000
	Within groups	22,573	2.580E+12	1.143E+08		
	Total	22,577	2.657E+12			
2011	Between groups	4	5.031E+10	1.258E+10	84.130	0.000
	Within groups	24,888	3.721E+12	1.495E+08		
	Total	24,892	3.771E+12			
2012	Between groups	4	3.120E+10	7.801E+09	73.426	0.000
	Within groups	25,337	2.692E+12	1.062E+08		
	Total	25,341	2.723E+12			
2013	Between groups	4	4.652E+10	1.163E+10	91.754	0.000
	Within groups	25,544	3.238E+12	1.268E+08		
	Total	25,548	3.285E+12			
2014	Between groups	4	7.082E+10	1.770E+10	133.243	0.000
	Within groups	24,889	3.307E+12	1.329E+08		
	Total	24,893	3.378E+12			

Table 70

One-Way ANOVA of Health Care Costs - DRG 894

Year	Source	*df*	*SS*	*MS*	*F*	*p*
2007	Between groups	4	8.509E+07	2.127E+07	2.927	0.022
	Within groups	250	1.817E+09	7.268E+06		
	Total	254	1.902E+09			
2008	Between groups	4	1.876E+09	4.689E+08	13.055	0.000
	Within groups	874	3.139E+10	3.592E+07		
	Total	878	3.327E+10			
2009	Between groups	4	1.251E+08	3.128E+07	2.235	0.064
	Within groups	458	6.411E+09	1.400E+07		
	Total	462	6.536E+09			
2010	Between groups	4	1.423E+09	3.558E+08	17.279	0.000
	Within groups	731	1.505E+10	2.059E+07		
	Total	735	1.648E+10			
2011	Between groups	4	1.351E+09	3.378E+08	15.892	0.000
	Within groups	824	1.752E+10	2.126E+07		
	Total	828	1.887E+10			
2012	Between groups	4	4.827E+08	1.207E+08	4.414	0.002
	Within groups	747	2.042E+10	2.734E+07		
	Total	751	2.090E+10			
2013	Between groups	4	6.605E+08	1.651E+08	3.620	0.006
	Within groups	752	3.430E+10	4.561E+07		
	Total	756	3.496E+10			
2014	Between groups	4	1.366E+09	3.416E+08	9.067	0.000
	Within groups	684	2.576E+10	3.767E+07		
	Total	688	2.713E+10			

Appendix D: Post Hoc Results for Health Care Costs

Table 71

Post Hoc Results for Health Care Costs - DRG 3

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	161,645.54	--				
	2.	Medicaid	75,713.29	85,932.25* (1.00)	--			
	3.	Private insurance	83,439.11	78,206.43* (0.87)	-7,725.81	--		
	4.	Self-Pay	180,362.65	-18,717.11 (-0.20)	-104,649.36** (-1.11)	-96,923.55** (-0.99)	--	
	5.	Other payer	70,910.31	90,735.23* (1.14)	4,802.98	12,528.79	109,452.34** (1.24)	--
2008	1.	Medicare	154,148.33	--				
	2.	Medicaid	184,079.71	-29,931.37* (-0.32)	--			
	3.	Private insurance	149,944.85	4,203.48	34,134.86* (0.36)	--		
	4.	Self-Pay	137,745.76	16,402.57	46,333.95** (0.51)	12,199.09	--	
	5.	Other payer	165,016.78	-10,868.45	19,062.93	-15,071.93	-27,271.02	--
2009	1.	Medicare	150,744.60	--				
	2.	Medicaid	167,880.90	-17,136.30	--			
	3.	Private insurance	171,339.99	-20,595.39** (-0.22)	-3,459.09	--		
	4.	Self-Pay	116,945.86	33,798.74** (0.46)	50,935.04* (0.63)	54,394.13* (0.65)	--	
	5.	Other payer	158,426.08	-7,681.48	9,454.82	12,913.91	-41,480.22** (-0.53)	--
2010	1.	Medicare	159,768.10	--				
	2.	Medicaid	194,307.36	-34,539.26* (-0.34)	--			
	3.	Private insurance	168,175.46	-8,407.36	26,131.90** (0.24)	--		
	4.	Self-Pay	153,783.26	5,984.84	40,524.10	14,392.20	--	
	5.	Other payer	181,323.17	-21,555.07	12,984.19	-13,147.71	-27,539.91	--

(table continues)

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2011	1.	Medicare	186,789.99	--				
	2.	Medicaid	265,795.32	-79,005.33* (-0.50)	--			
	3.	Private insurance	224,728.37	-37,938.38	41,066.95	--		
	4.	Self-Pay	149,004.25	37,785.74	116,791.07* (0.83)	75,724.12** (0.53)	--	
	5.	Other payer	176,966.78	9,823.21	88,828.53** (0.57)	47,761.58	-27,962.53	--
2012	1.	Medicare	192,309.45	--				
	2.	Medicaid	246,206.00	-53,896.55* (-0.31)	--			
	3.	Private insurance	227,139.08	-34,829.63** (-0.22)	19,066.92	--		
	4.	Self-Pay	169,894.36	22,415.09	76,311.63* (0.51)	57,244.72** (0.44)	--	
	5.	Other payer	228,993.50	-36,684.04	17,212.50	-1,854.41	-59,099.13	--
2013	1.	Medicare	197,310.19	--				
	2.	Medicaid	254,363.22	-57,053.03* (-0.32)	--			
	3.	Private insurance	233,578.83	-36,268.64** (-0.21)	20,784.39	--		
	4.	Self-Pay	183,052.39	14,257.80	71,310.83	50,526.44	--	
	5.	Other payer	241,192.78	-43,882.59	13,170.44	-7,613.95	-58,140.39	--
2014	1.	Medicare	190,033.66	--				
	2.	Medicaid	244,768.73	-54,735.07* (-0.35)	--			
	3.	Private insurance	254,794.12	-64,760.47* (-0.34)	-10,025.39	--		
	4.	Self-Pay	144,063.02	45,970.64	100,705.71* (0.74)	110,731.10* (0.63)	--	
	5.	Other payer	271,958.84	-81,925.18	-27,190.11	-17,164.72	-127,895.82** (-0.73)	--

*p<.001, **p<.05

Table 72

Post Hoc Results for Health Care Costs - DRG 23

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	9,831.84	--				
	2.	Medicaid	10,744.77	-912.92	--			
	3.	Private insurance	11,378.55	-1,546.70	-633.78	--		
	4.	Self-Pay	16,120.40	-6,288.56	-5,375.63	-4,741.85	--	
	5.	Other payer	15,613.55	-5,781.70	-4,868.78	-4,235.00	506.85	--
2008	1.	Medicare	55,547.21	--				
	2.	Medicaid	62,952.32	-7,405.11	--			
	3.	Private insurance	54,000.19	1,547.02	8,952.13	--		
	4.	Self-Pay	51,715.89	3,831.32	11,236.43	2,284.30	--	
	5.	Other payer	54,314.85	1,232.36	8,637.47	-314.66	-2,598.96	--
2009	1.	Medicare	57,214.64	--				
	2.	Medicaid	72,135.28	-14,920.64	--			
	3.	Private insurance	54,193.48	3,021.15	17,941.80	--		
	4.	Self-Pay	45,461.49	11,753.15	26,673.79	8,731.99	--	
	5.	Other payer	43,496.88	13,717.76	28,638.41** (0.54)	10,696.61	1,964.62	--
2010	1.	Medicare	56,181.99	--				
	2.	Medicaid	83,336.58	-27,154.60* (-0.54)	--			
	3.	Private insurance	67,484.82	-11,302.83* (-0.28)	15,851.77	--		
	4.	Self-Pay	73,016.15	-16,834.16	10,320.44	-5,531.33	--	
	5.	Other payer	69,441.97	-13,259.98	13,894.61	-1,957.15	3,574.18	--
2011	1.	Medicare	57,246.03	--				
	2.	Medicaid	111,647.08	-54,401.04** (-0.63)	--			
	3.	Private insurance	54,785.15	2,460.88	56,861.93* (0.65)	--		
	4.	Self-Pay	74,662.64	-17,416.61	36,984.44	-19,877.49	--	
	5.	Other payer	97,699.84	-40,453.81	13,947.24	-42,914.69	-23,037.20	--
2012	1.	Medicare	60,392.65	--				
	2.	Medicaid	94,572.84	-34,180.19** (-0.45)	--			
	3.	Private insurance	68,957.71	-8,565.07	25,615.13	--		
	4.	Self-Pay	53,326.50	7,066.15	41,246.34** (0.55)	15,631.22	--	
	5.	Other payer	67,402.86	-7,010.22	27,169.98	1,554.85	-14,076.36	--

(table continues)

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2013	1.	Medicare	60,202.18	--				
	2.	Medicaid	74,634.24	-14,432.06	--			
	3.	Private insurance	66,471.78	-6,269.60	8,162.46	--		
	4.	Self-Pay	51,698.46	8,503.72	22,935.78	14,773.32	--	
	5.	Other payer	50,696.32	9,505.86	23,937.92	15,775.46	1,002.14	--
2014	1.	Medicare	59,139.12	--				
	2.	Medicaid	87,955.27	-28,816.15* (-0.48)	--			
	3.	Private insurance	81,034.41	-21,895.29** (-0.39)	6,920.86	--		
	4.	Self-Pay	58,231.29	907.83	29,723.98** (0.53)	22,803.12	--	
	5.	Other payer	75,054.94	-15,915.82	12,900.33	5,979.47	-16,823.65	--

*p<.001, **p<.05

Table 73

Post Hoc Results for Health Care Costs - DRG 26

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	25,837.87	--				
	2. Medicaid	6,268.47	19,569.39* (1.31)	--			
	3. Private insurance	9,365.54	16,472.33* (1.03)	-3,097.06* (-0.25)	--		
	4. Self-Pay	8,849.53	16,988.34* (1.05)	-2,581.06	516.00	--	
	5. Other payer	5,981.05	19,856.82* (1.44)	287.42	3,384.49** (0.31)	2,868.48	--
2008	1. Medicare	27,457.30	--				
	2. Medicaid	38,333.50	-10,876.20* (-0.41)	--			
	3. Private insurance	31,995.06	-4,537.76* (-0.24)	6,338.44	--		
	4. Self-Pay	28,964.30	-1,507.00	9,369.20	3,030.76	--	
	5. Other payer	35,122.85	-7,665.55** (-0.41)	3,210.65	-3,127.79	-6,158.55	--
2009	1. Medicare	26,270.42	--				
	2. Medicaid	38,228.28	-11,957.86* (-0.45)	--			
	3. Private insurance	29,041.38	-2,770.96** (-0.17)	9,186.90** (0.33)	--		
	4. Self-Pay	33,407.27	-7,136.85	4,821.01	-4,365.89	--	
	5. Other payer	25,804.18	466.24	12,424.10* (0.47)	3,237.20	7,603.09	--
2010	1. Medicare	29,046.89	--				
	2. Medicaid	39,854.89	-10,808.00* (-0.45)	--			
	3. Private insurance	35,675.87	-6,628.99* (-0.32)	4,179.02	--		
	4. Self-Pay	34,562.35	-5,515.46	5,292.55	1,113.53	--	
	5. Other payer	50,774.00	-21,727.12** (-0.58)	-10,919.11	-15,098.13	-16,211.66	--
2011	1. Medicare	30,958.42	--				
	2. Medicaid	44,948.10	-13,989.68* (-0.55)	--			
	3. Private insurance	29,248.62	1,709.79	15,699.48* (0.63)	--		
	4. Self-Pay	29,424.74	1,533.68	15,523.36** (0.65)	-176.12	--	
	5. Other payer	42,755.97	-11,797.55	2,192.13	-13,507.34	-13,331.22	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2012	1. Medicare	32,299.98	--				
	2. Medicaid	44,064.61	-11,764.62** (-0.35)	--			
	3. Private insurance	36,042.20	-3,742.21	8,022.41	--		
	4. Self-Pay	41,513.39	-9,213.40	2,551.22	-5,471.19	--	
	5. Other payer	52,803.50	-20,503.51** (-0.55)	-8,738.89	-16,761.30	-11,290.11	--
2013	1. Medicare	35,486.03	--				
	2. Medicaid	42,109.51	-6,623.48	--			
	3. Private insurance	36,671.16	-1,185.13	5,438.35	--		
	4. Self-Pay	39,009.74	-3,523.71	3,099.77	-2,338.58	--	
	5. Other payer	50,319.90	-14,833.86** (-0.52)	-8,210.38	-13,648.74	-11,310.15	--
2014	1. Medicare	33,262.49	--				
	2. Medicaid	46,716.54	-13,454.05* (-0.40)	--			
	3. Private insurance	38,868.70	-5,606.21** (-0.25)	7,847.84	--		
	4. Self-Pay	42,626.95	-9,364.46	4,089.59	-3,758.25	--	
	5. Other payer	39,005.76	-5,743.27	7,710.79	-137.06	3,621.19	--

*p<.001, **p<.05

Table 74

Post Hoc Results for Health Care Costs - DRG 153

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	6,979.55	--				
	2.	Medicaid	3,863.48	3,116.07* (0.76)	--			
	3.	Private insurance	5,362.17	1,617.38** (0.37)	-1,498.69* (-0.35)	--		
	4.	Self-Pay	4,730.63	2,248.91** (0.61)	-867.15	631.54	--	
	5.	Other payer	6,374.93	604.61	-2,511.45	-1,012.76	-1,644.30	--
2008	1.	Medicare	5,661.88	--				
	2.	Medicaid	3,995.80	1,666.08* (0.45)	--			
	3.	Private insurance	3,837.21	1,824.67* (0.51)	158.59	--		
	4.	Self-Pay	4,127.63	1,534.26* (0.46)	-131.82	-290.42	--	
	5.	Other payer	5,083.18	578.70	-1,087.38	-1,245.97	-955.55	--
2009	1.	Medicare	6,583.83	--				
	2.	Medicaid	4,418.33	2,165.49* (0.46)	--			
	3.	Private insurance	4,759.95	1,823.88* (0.38)	-341.61	--		
	4.	Self-Pay	4,705.88	1,877.94* (0.44)	-287.55	54.07	--	
	5.	Other payer	5,808.43	775.40	-1,390.09	-1,048.48	-1,102.54	--
2010	1.	Medicare	7,158.62	--				
	2.	Medicaid	4,476.35	2,682.27* (0.56)	--			
	3.	Private insurance	4,516.01	2,642.61* (0.55)	-39.66	--		
	4.	Self-Pay	5,309.50	1,849.12** (0.38)	-833.15	-793.50	--	
	5.	Other payer	6,041.40	1,117.22	-1,565.05* (-0.41)	-1,525.39** (-0.39)	-731.90	--
2011	1.	Medicare	6,197.26	--				
	2.	Medicaid	4,073.05	2,124.21* (0.55)	--			
	3.	Private insurance	4,091.58	2,105.68* (0.56)	-18.53	--		
	4.	Self-Pay	4,933.17	1,264.10	-860.11	-841.58	--	
	5.	Other payer	6,177.09	20.17	-2,104.04	-2,085.51	-1,243.92	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2012	1. Medicare	7,370.77	--				
	2. Medicaid	5,030.67	2,340.10* (0.45)	--			
	3. Private insurance	5,334.94	2,035.83* (0.45)	-304.27	--		
	4. Self-Pay	5,266.77	2,104.00** (0.38)	-236.10	68.17	--	
	5. Other payer	5,981.20	1,389.57	-950.53	-646.26	-714.43	--
2013	1. Medicare	7,950.91	--				
	2. Medicaid	5,007.41	2,943.50* (0.42)	--			
	3. Private insurance	5,304.25	2,646.65* (0.37)	-296.85	--		
	4. Self-Pay	4,751.36	3,199.55* (0.53)	256.04	552.89	--	
	5. Other payer	5,543.89	2,407.02* (0.35)	-536.49	-239.64	-792.53	--
2014	1. Medicare	7,510.01	--				
	2. Medicaid	5,188.87	2,321.14* (0.48)	--			
	3. Private insurance	5,704.44	1,805.57* (0.33)	-515.56	--		
	4. Self-Pay	6,570.08	939.93	-1,381.20	-865.64	--	
	5. Other payer	8,637.11	-1,127.10	-3,448.24	-2,932.67	-2,067.03	--

*p<.001, **p<.05

Table 75

Post Hoc Results for Health Care Costs - DRG 203

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	10,417.50	--				
	2.	Medicaid	5,930.26	4,487.23* (0.43)	--			
	3.	Private insurance	7,223.19	3,194.30* (0.28)	-1,292.93** (-0.14)	--		
	4.	Self-Pay	4,722.11	5,695.39* (0.61)	1,208.15	2,501.09* (0.33)	--	
	5.	Other payer	7,866.52	2,550.97	-1,936.26	-643.33	-3,144.41** (-0.44)	--
2008	1.	Medicare	6,015.24	--				
	2.	Medicaid	4,287.50	1,727.74* (0.48)	--			
	3.	Private insurance	4,052.31	1,962.93* (0.57)	235.19	--		
	4.	Self-Pay	4,234.96	1,780.28* (0.52)	52.54	-182.65	--	
	5.	Other payer	5,397.76	617.48	-1,110.26** (-0.31)	-1,345.45* (-0.39)	-1,162.80** (-0.34)	--
2009	1.	Medicare	5,936.19	--				
	2.	Medicaid	3,793.82	2,142.37* (0.62)	--			
	3.	Private insurance	4,082.75	1,853.44* (0.53)	-288.93** (-0.10)	--		
	4.	Self-Pay	4,274.63	1,661.55* (0.49)	-480.81** (-0.18)	-191.88	--	
	5.	Other payer	4,892.58	1,043.61* (0.28)	-1,098.76* (-0.36)	-809.83** (-0.26)	-617.94	--
2010	1.	Medicare	6,420.63	--				
	2.	Medicaid	4,792.48	1,628.14* (0.39)	--			
	3.	Private insurance	4,726.06	1,694.57* (0.42)	66.42	--		
	4.	Self-Pay	4,704.53	1,716.10* (0.45)	87.95	21.53	--	
	5.	Other payer	5,399.98	1,020.65** (0.25)	-607.49	-673.92** (-0.19)	-695.45	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2011	1. Medicare	6,218.98	--				
	2. Medicaid	4,068.08	2,150.90* (0.62)	--			
	3. Private insurance	4,111.51	2,107.47* (0.60)	-43.42	--		
	4. Self-Pay	4,856.30	1,362.67* (0.39)	-788.22* (-0.27)	-744.80** (-0.25)	--	
	5. Other payer	5,677.03	541.95	-1,608.94* (-0.52)	-1,565.52* (-0.49)	-820.72	--
2012	1. Medicare	6,834.71	--				
	2. Medicaid	5,097.54	1,737.18* (0.36)	--			
	3. Private insurance	5,007.60	1,827.11* (0.42)	89.93	--		
	4. Self-Pay	5,324.89	1,509.82* (0.34)	-227.36	-317.29	--	
	5. Other payer	5,933.28	901.43	-835.74	-925.68** (-0.20)	-608.39	--
2013	1. Medicare	6,732.49	--				
	2. Medicaid	5,269.64	1,462.85* (0.34)	--			
	3. Private insurance	5,150.36	1,582.13* (0.38)	119.28	--		
	4. Self-Pay	4,931.86	1,800.63* (0.49)	337.78	218.50	--	
	5. Other payer	6,061.90	670.59	-792.26	-911.54	-1,130.04	--
2014	1. Medicare	6,992.63	--				
	2. Medicaid	5,209.18	1,783.45* (0.45)	--			
	3. Private insurance	5,355.12	1,637.51* (0.39)	-145.94	--		
	4. Self-Pay	4,845.90	2,146.73* (0.59)	363.28	509.22	--	
	5. Other payer	6,195.84	796.79	-986.66	-840.72	-1,349.95	--

*p<.001, **p<.05

Table 76

Post Hoc Results for Health Care Costs - DRG 207

Year	Type of insurance		Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	21,443.64	--				
	2.	Medicaid	21,581.04	-137.41	--			
	3.	Private insurance	16,160.69	5,282.94* (0.20)	5,420.35** (0.20)	--		
	4.	Self-Pay	11,620.38	9,823.25* (0.43)	9,960.66* (0.42)	4,540.31	--	
	5.	Other payer	21,357.17	86.46	223.87	-5,196.48	-9,736.79	--
2008	1.	Medicare	52,442.44	--				
	2.	Medicaid	58,384.84	-5,942.40	--			
	3.	Private insurance	57,259.39	-4,816.95	1,125.45	--		
	4.	Self-Pay	37,610.05	14,832.39* (0.50)	20,774.78* (0.54)	19,649.34* (0.59)	--	
	5.	Other payer	60,952.61	-8,510.17	-2,567.77	-3,693.22	-23,342.56** (-0.57)	--
2009	1.	Medicare	54,205.15	--				
	2.	Medicaid	54,874.64	-669.49	--			
	3.	Private insurance	69,841.15	-15,636.00* (-0.33)	-14,966.51* (-0.30)	--		
	4.	Self-Pay	58,072.86	-3,867.70	-3,198.21	11,768.29	--	
	5.	Other payer	52,206.94	1,998.22	2,667.70	17,634.21* (0.40)	5,865.92	--
2010	1.	Medicare	60,949.79	--				
	2.	Medicaid	64,256.16	-3,306.37	--			
	3.	Private insurance	62,081.71	-1,131.92	2,174.45	--		
	4.	Self-Pay	52,111.50	8,838.29	12,144.66	9,970.21	--	
	5.	Other payer	65,554.97	-4,605.18	-1,298.81	-3,473.26	-13,443.47	--
2011	1.	Medicare	54,583.52	--				
	2.	Medicaid	62,140.72	-7,557.20	--			
	3.	Private insurance	62,583.09	-7,999.57	-442.37	--		
	4.	Self-Pay	53,937.33	646.19	8,203.38	8,645.76	--	
	5.	Other payer	68,152.58	-13,569.06	-6,011.87	-5,569.49	-14,215.25	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2012	1. Medicare	57,760.98	--				
	2. Medicaid	67,653.43	-9,892.45** (-0.17)	--			
	3. Private insurance	66,418.22	-8,657.24	1,235.20	--		
	4. Self-Pay	41,846.29	15,914.69* (0.48)	25,807.14* (0.52)	24,571.93* (0.56)	--	
	5. Other payer	70,740.72	-12,979.74	-3,087.29	-4,322.50	-28,894.43** (-0.61)	--
2013	1. Medicare	60,357.06	--				
	2. Medicaid	70,579.83	-10,222.78** (-0.17)	--			
	3. Private insurance	67,220.20	-6,863.15	3,359.63	--		
	4. Self-Pay	60,028.88	328.17	10,550.95	7,191.32	--	
	5. Other payer	94,304.83	-33,947.77	-23,724.99	-27,084.63	-34,275.94	--
2014	1. Medicare	62,056.36	--				
	2. Medicaid	80,504.21	-18,447.85* (-0.25)	--			
	3. Private insurance	71,816.44	-9,760.08	8,687.77	--		
	4. Self-Pay	67,396.66	-5,340.30	13,107.55	4,419.78	--	
	5. Other payer	105,675.78	-43,619.42	-25,171.57	-33,859.34	-38,279.12	--

*p<.001, **p<.05

Table 77

Post Hoc Results for Health Care Costs - DRG 233

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	25,693.92	--				
	2.	Medicaid	28,639.67	-2,945.75	--			
	3.	Private insurance	28,215.81	-2,521.89	423.86	--		
	4.	Self-Pay	42,910.13	-17,216.21	-14,270.46	-14,694.32	--	
	5.	Other payer	24,363.73	1,330.19	4,275.94	3,852.08	18,546.40	--
2008	1.	Medicare	69,050.57	--				
	2.	Medicaid	66,639.31	2,411.26	--			
	3.	Private insurance	59,526.04	9,524.52** (0.31)	7,113.26	--		
	4.	Self-Pay	52,012.23	17,038.34* (0.61)	14,627.08** (0.69)	7,513.82	--	
	5.	Other payer	66,665.47	2,385.09	-26.17	-7,139.43	-14,653.25** (-0.83)	--
2009	1.	Medicare	66,213.54	--				
	2.	Medicaid	62,455.53	3,758.01	--			
	3.	Private insurance	61,697.55	4,516.00	757.98	--		
	4.	Self-Pay	70,124.60	-3,911.06	-7,669.07	-8,427.06	--	
	5.	Other payer	68,145.87	-1,932.33	-5,690.34	-6,448.33	1,978.73	--
2010	1.	Medicare	67,020.07	--				
	2.	Medicaid	64,406.50	2,613.57	--			
	3.	Private insurance	61,822.79	5,197.28	2,583.71	--		
	4.	Self-Pay	66,368.10	651.97	-1,961.60	-4,545.31	--	
	5.	Other payer	66,188.66	831.41	-1,782.17	-4,365.87	179.44	--
2011	1.	Medicare	73,961.36	--				
	2.	Medicaid	75,750.27	-1,788.91	--			
	3.	Private insurance	69,137.15	4,824.21	6,613.13	--		
	4.	Self-Pay	67,918.55	6,042.81	7,831.72	1,218.60	--	
	5.	Other payer	84,178.78	-10,217.42	-8,428.50	-15,041.63	-16,260.23	--
2012	1.	Medicare	79,186.25	--				
	2.	Medicaid	74,707.61	4,478.64	--			
	3.	Private insurance	66,504.96	12,681.30* (0.36)	8,202.66	--		
	4.	Self-Pay	69,744.29	9,441.96	4,963.32	-3,239.34	--	
	5.	Other payer	72,429.78	6,756.47	2,277.83	-5,924.83	-2,685.49	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2013	1. Medicare	76,484.08	--				
	2. Medicaid	77,212.08	-728.00	--			
	3. Private insurance	72,055.48	4,428.60	5,156.60	--		
	4. Self-Pay	66,633.42	9,850.66	10,578.66	5,422.06	--	
	5. Other payer	87,285.76	-10,801.68	-10,073.67	-15,230.28	-20,652.33	--
2014	1. Medicare	77,700.51	--				
	2. Medicaid	70,965.34	6,735.17	--			
	3. Private insurance	68,074.98	9,625.53** (0.29)	2,890.36	--		
	4. Self-Pay	71,930.59	5,769.92	-965.25	-3,855.61	--	
	5. Other payer	69,434.28	8,266.23	1,531.06	-1,359.30	2,496.31	--

*p<.001, **p<.05

Table 78

Post Hoc Results for Health Care Costs - DRG 234

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	24,535.26	--				
	2. Medicaid	22,952.22	1,583.04	--			
	3. Private insurance	23,654.72	880.54	-702.49	--		
	4. Self-Pay	22,375.14	2,160.12	577.08	1,279.57	--	
	5. Other payer	18,353.50	6,181.76** (0.037)	4,598.72	5,301.21	4,021.64	--
2008	1. Medicare	47,121.18	--				
	2. Medicaid	44,429.78	2,691.40	--			
	3. Private insurance	44,084.83	3,036.34** (0.22)	344.95	--		
	4. Self-Pay	45,635.44	1,485.73	-1,205.66	-1,550.61	--	
	5. Other payer	50,596.13	-3,474.95	-6,166.35	-6,511.30	-4,960.69	--
2009	1. Medicare	43,674.45	--				
	2. Medicaid	47,522.26	-3,847.81	--			
	3. Private insurance	44,259.02	-584.57	3,263.24	--		
	4. Self-Pay	49,527.72	-5,853.27	-2,005.46	-5,268.70	--	
	5. Other payer	47,576.94	-3,902.50	-54.68	-3,317.93	1,950.77	--
2010	1. Medicare	49,590.66	--				
	2. Medicaid	51,339.24	-1,748.58	--			
	3. Private insurance	46,361.31	3,229.35** (0.25)	4,977.93	--		
	4. Self-Pay	50,230.45	-639.79	1,108.80	-3,869.13	--	
	5. Other payer	46,935.86	2,654.80	4,403.38	-574.55	3,294.59	--
2011	1. Medicare	48,792.92	--				
	2. Medicaid	49,811.65	-1,018.72	--			
	3. Private insurance	48,084.90	708.03	1,726.75	--		
	4. Self-Pay	49,893.26	-1,100.34	-81.62	-1,808.37	--	
	5. Other payer	53,917.60	-5,124.68	-4,105.96	-5,832.70	-4,024.34	--
2012	1. Medicare	51,709.71	--				
	2. Medicaid	57,522.99	-5,813.28	--			
	3. Private insurance	52,415.92	-706.21	5,107.07	--		
	4. Self-Pay	56,359.24	-4,649.53	1,163.75	-3,943.32	--	
	5. Other payer	57,654.99	-5,945.28	-132.00	-5,239.07	-1,295.75	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2013	1. Medicare	53,896.61	--				
	2. Medicaid	55,363.73	-1,467.12	--			
	3. Private insurance	51,060.91	2,835.69	4,302.82	--		
	4. Self-Pay	56,622.98	-2,726.37	-1,259.25	-5,562.06	--	
	5. Other payer	52,731.11	1,165.50	2,632.63	-1,670.19	3,891.87	--
2014	1. Medicare	53,157.36	--				
	2. Medicaid	59,061.05	-5,903.69** (-0.32)	--			
	3. Private insurance	51,798.12	1,359.24	7,262.94* (0.40)	--		
	4. Self-Pay	49,707.12	3,450.24	9,353.93	2,091.00	--	
	5. Other payer	55,983.49	-2,826.13	3,077.56	-4,185.38	-6,276.37	--

*p<.001, **p<.05

Table 79

Post Hoc Results for Health Care Costs - DRG 311

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	5,239.53	--				
	2.	Medicaid	5,618.46	-378.94	--			
	3.	Private insurance	5,359.01	-119.48	259.46	--		
	4.	Self-Pay	5,129.31	110.22	489.16	229.70	--	
	5.	Other payer	5,330.96	-91.43	287.50	28.05	-201.65	--
2008	1.	Medicare	5,309.10	--				
	2.	Medicaid	5,783.66	-474.56	--			
	3.	Private insurance	4,555.01	754.09* (0.27)	1,228.65** (0.35)	--		
	4.	Self-Pay	4,525.50	783.60	1,258.16** (0.34)	29.51	--	
	5.	Other payer	6,869.48	-1,560.38	-1,085.81	-2,314.46** (-0.62)	-2,343.97** (-0.60)	--
2009	1.	Medicare	5,006.37	--				
	2.	Medicaid	4,552.02	454.35	--			
	3.	Private insurance	4,421.29	585.08** (0.21)	130.73	--		
	4.	Self-Pay	4,977.07	29.30	-425.05	-555.78	--	
	5.	Other payer	5,196.29	-189.92	-644.27	-775.00	-219.22	--
2010	1.	Medicare	5,315.89	--				
	2.	Medicaid	5,100.70	215.20	--			
	3.	Private insurance	4,565.18	750.72** (0.26)	535.52	--		
	4.	Self-Pay	4,716.03	599.87	384.67	-150.85	--	
	5.	Other payer	5,834.21	-518.32	-733.51	-1,269.03** (-0.42)	-1,118.18	--
2011	1.	Medicare	5,865.69	--				
	2.	Medicaid	5,714.89	150.80	--			
	3.	Private insurance	4,925.92	939.77* (0.30)	788.97** (0.29)	--		
	4.	Self-Pay	5,299.68	566.01	415.21	-373.76	--	
	5.	Other payer	6,626.49	-760.80	-911.60	-1,700.57** (-0.57)	-1,326.81	--
2012	1.	Medicare	6,528.66	--				
	2.	Medicaid	5,372.19	1,156.46** (0.25)	--			
	3.	Private insurance	5,330.54	1,198.12** (0.26)	41.65	--		
	4.	Self-Pay	4,861.28	1,667.38** (0.37)	510.92	469.27	--	
	5.	Other payer	7,012.23	-483.57	-1,640.04	-1,681.69	-2,150.96	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2013	1. Medicare	6,027.33	--				
	2. Medicaid	5,298.48	728.85	--			
	3. Private insurance	5,336.69	690.64	-38.21	--		
	4. Self-Pay	5,248.47	778.87	50.02	88.22	--	
	5. Other payer	6,080.90	-53.57	-782.42	-744.21	-832.43	--
2014	1. Medicare	6,427.67	--				
	2. Medicaid	5,953.74	473.93	--			
	3. Private insurance	6,338.64	89.03	-384.90	--		
	4. Self-Pay	7,600.42	-1,172.75	-1,646.68	-1,261.78	--	
	5. Other payer	5,046.34	1,381.34	907.40	1,292.30	2,554.09	--

*p<.001, **p<.05

Table 80

Post Hoc Results for Health Care Costs - DRG 313

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	4,739.49	--				
	2. Medicaid	4,724.02	15.48	--			
	3. Private insurance	3,966.06	773.44* (0.32)	757.96* (0.32)	--		
	4. Self-Pay	4,372.50	367.00	351.52	-406.44	--	
	5. Other payer	4,477.68	261.82	246.34	-511.62	-105.18	--
2008	1. Medicare	5,294.20	--				
	2. Medicaid	5,044.35	249.85**	--			
	3. Private insurance	4,257.26	1,036.94*	787.09*	--		
	4. Self-Pay	4,656.74	637.46*	387.61**	-399.48**	--	
	5. Other payer	5,385.56	-91.37	-341.22	-1,128.31*	-728.83*	--
2009	1. Medicare	5,064.16	--				
	2. Medicaid	4,750.93	313.23* (0.10)	--			
	3. Private insurance	4,532.19	531.97* (0.19)	218.74** (0.08)	--		
	4. Self-Pay	4,397.22	666.94* (0.23)	353.71** (0.12)	134.97	--	
	5. Other payer	4,422.35	641.81* (0.22)	328.58** (0.12)	109.84	-25.13	--
2010	1. Medicare	5,392.59	--				
	2. Medicaid	5,178.26	214.33** (0.07)	--			
	3. Private insurance	4,680.10	712.49* (0.26)	498.15* (0.18)	--		
	4. Self-Pay	4,755.68	636.91* (0.21)	422.58* (0.14)	-75.57	--	
	5. Other payer	4,837.50	555.09* (0.19)	340.75** (0.12)	-157.40	-81.83	--
2011	1. Medicare	5,401.27	--				
	2. Medicaid	5,199.40	201.87** (0.07)	--			
	3. Private insurance	4,810.13	591.14* (0.22)	389.27* (0.15)	--		
	4. Self-Pay	5,021.49	379.78** (0.13)	177.91	-211.36	--	
	5. Other payer	5,360.30	40.97	-160.90	-550.17* (-0.22)	-338.81	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2012	1. Medicare	5,925.95	--				
	2. Medicaid	5,408.52	517.44* (0.15)	--			
	3. Private insurance	5,035.29	890.66* (0.27)	373.22* (0.11)	--		
	4. Self-Pay	4,821.41	1,104.54* (0.35)	587.11* (0.18)	213.89	--	
	5. Other payer	5,077.90	848.05* (0.26)	330.61** (0.10)	-42.61	-256.50	--
2013	1. Medicare	5,850.96	--				
	2. Medicaid	5,451.52	399.44* (0.12)	--			
	3. Private insurance	5,110.58	740.38* (0.24)	340.94** (0.11)	--		
	4. Self-Pay	5,371.23	479.72** (0.14)	80.28	-260.66	--	
	5. Other payer	5,365.56	485.39* (0.16)	85.95	-254.99	5.67	--
2014	1. Medicare	6,344.61	--				
	2. Medicaid	5,661.02	683.59* (0.18)	--			
	3. Private insurance	5,409.89	934.72* (0.27)	251.13	--		
	4. Self-Pay	5,389.18	955.43* (0.24)	271.84	20.71	--	
	5. Other payer	5,859.51	485.10	-198.49	-449.61	-470.32	--

*p<.001, **p<.05

Table 81

Post Hoc Results for Health Care Costs - DRG 326

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	37,894.38	--				
	2.	Medicaid	39,592.36	-1,697.99	--			
	3.	Private insurance	42,861.02	-4,966.64	-3,268.66	--		
	4.	Self-Pay	26,311.71	11,582.67	13,280.65	16,549.31	--	
	5.	Other payer	33,208.48	4,685.90	6,383.88	9,652.54	-6,896.77	--
2008	1.	Medicare	53,397.77	--				
	2.	Medicaid	59,478.60	-6,080.83	--			
	3.	Private insurance	53,532.42	-134.65	5,946.18	--		
	4.	Self-Pay	33,199.28	20,198.49	26,279.32** (0.49)	20,333.14	--	
	5.	Other payer	73,535.59	-20,137.82	-14,057.00	-20,003.17	-40,336.31	--
2009	1.	Medicare	57,681.73	--				
	2.	Medicaid	63,439.93	-5,758.20	--			
	3.	Private insurance	54,745.35	2,936.39	8,694.59	--		
	4.	Self-Pay	33,567.33	24,114.41* (0.62)	29,872.61* (0.57)	21,178.02** (0.49)	--	
	5.	Other payer	63,062.72	-5,380.99	377.21	-8,317.38	-29,495.40	--
2010	1.	Medicare	52,939.55	--				
	2.	Medicaid	53,007.33	-67.78	--			
	3.	Private insurance	53,816.54	-876.99	-809.21	--		
	4.	Self-Pay	44,707.65	8,231.90	8,299.68	9,108.89	--	
	5.	Other payer	68,581.07	-15,641.52	-15,573.74	-14,764.53	-23,873.42	--
2011	1.	Medicare	62,807.97	--				
	2.	Medicaid	67,226.04	-4,418.07	--			
	3.	Private insurance	50,739.59	12,068.38	16,486.45	--		
	4.	Self-Pay	26,457.25	36,350.72* (0.75)	40,768.79* (0.77)	24,282.34* (0.67)	--	
	5.	Other payer	59,733.49	3,074.48	7,492.54	-8,993.90	-33,276.24** (-0.76)	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2012	1. Medicare	58,206.12	--				
	2. Medicaid	66,133.37	-7,927.25	--			
	3. Private insurance	54,427.78	3,778.34	11,705.59	--		
	4. Self-Pay	43,225.45	14,980.67	22,907.93	11,202.34	--	
	5. Other payer	71,876.13	-13,670.01	-5,742.76	-17,448.35	-28,650.69	--
2013	1. Medicare	59,892.88	--				
	2. Medicaid	64,769.48	-4,876.60	--			
	3. Private insurance	53,336.64	6,556.23	11,432.83	--		
	4. Self-Pay	50,410.28	9,482.60	14,359.20	2,926.37	--	
	5. Other payer	52,344.95	7,547.93	12,424.53	991.70	-1,934.67	--
2014	1. Medicare	63,089.38	--				
	2. Medicaid	65,669.06	-2,579.68	--			
	3. Private insurance	56,072.80	7,016.59	9,596.26	--		
	4. Self-Pay	95,116.40	-32,027.02	-29,447.34	-39,043.61	--	
	5. Other payer	43,790.07	19,299.31** (0.41)	21,878.99	12,282.72	51,326.33	--

*p<.001, **p<.05

Table 82

Post Hoc Results for Health Care Costs - DRG 329

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	47,077.70	--				
	2.	Medicaid	44,473.61	2,604.09	--			
	3.	Private insurance	41,007.55	6,070.15	3,466.06	--		
	4.	Self-Pay	23,643.89	23,433.81* (0.77)	20,829.72** (0.89)	17,363.66** (0.58)	--	
	5.	Other payer	84,901.33	-37,823.63	-40,427.72	-43,893.78	-61,257.44	--
2008	1.	Medicare	49,637.39	--				
	2.	Medicaid	68,184.72	-18,547.33* (-0.32)	--			
	3.	Private insurance	44,496.80	5,140.60	23,687.92* (0.40)	--		
	4.	Self-Pay	38,810.36	10,827.03	29,374.36	5,686.43	--	
	5.	Other payer	46,626.67	3,010.72	21,558.05	-2,129.87	-7,816.31	--
2009	1.	Medicare	46,137.68	--				
	2.	Medicaid	55,960.96	-9,823.28** (-0.21)	--			
	3.	Private insurance	46,056.43	81.25	9,904.53	--		
	4.	Self-Pay	36,395.07	9,742.61** (0.29)	19,565.90* (0.44)	9,661.36	--	
	5.	Other payer	41,989.78	4,147.91	13,971.19	4,066.66	-5,594.71	--
2010	1.	Medicare	50,386.11	--				
	2.	Medicaid	62,258.47	-11,872.36	--			
	3.	Private insurance	42,902.53	7,483.59* (0.21)	19,355.94* (0.36)	--		
	4.	Self-Pay	33,939.77	16,446.34* (0.58)	28,318.69* (0.59)	8,962.75** (0.30)	--	
	5.	Other payer	55,625.04	-5,238.93	6,633.43	-12,722.52	-21,685.27** (-0.50)	--
2011	1.	Medicare	50,650.72	--				
	2.	Medicaid	62,085.07	-11,434.35	--			
	3.	Private insurance	42,101.51	8,549.21* (0.23)	19,983.56* (0.40)	--		
	4.	Self-Pay	35,067.10	15,583.62* (0.47)	27,017.97* (0.57)	7,034.41	--	
	5.	Other payer	47,618.41	3,032.31	14,466.66	-5,516.90	-12,551.32	--

(table continues)

Year	Type of insurance		Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2012	1.	Medicare	55,902.42	--				
	2.	Medicaid	65,824.06	-9,921.64	--			
	3.	Private insurance	47,798.33	8,104.08** (0.17)	18,025.72** (0.31)	--		
	4.	Self-Pay	45,180.60	10,721.81	20,643.46	2,617.73	--	
	5.	Other payer	52,626.74	3,275.67	13,197.31	-4,828.41	-7,446.14	--
2013	1.	Medicare	53,107.02	--				
	2.	Medicaid	70,986.20	-17,879.18** (-0.27)	--			
	3.	Private insurance	46,692.29	6,414.73	24,293.91* (0.37)	--		
	4.	Self-Pay	42,453.17	10,653.85	28,533.03* (0.45)	4,239.12	--	
	5.	Other payer	59,025.89	-5,918.87	11,960.31	-12,333.60	-16,572.72	--
2014	1.	Medicare	50,439.18	--				
	2.	Medicaid	63,088.31	-12,649.13** (-0.22)	--			
	3.	Private insurance	49,657.69	781.49	13,430.62** (0.21)	--		
	4.	Self-Pay	37,384.67	13,054.51	25,703.65** (0.48)	12,273.02	--	
	5.	Other payer	94,290.52	-43,851.34	-31,202.20	-44,632.83	-56,905.85	--

*p<.001, **p<.05

Table 83

Post Hoc Results for Health Care Costs - DRG 373

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	4,180.83	--				
	2.	Medicaid	2,801.81	1,379.02* (0.61)	--			
	3.	Private insurance	2,951.07	1,229.76* (0.53)	-149.26* (-0.10)	--		
	4.	Self-Pay	2,562.59	1,618.24* (0.73)	239.22* (0.18)	388.48* (0.28)	--	
	5.	Other payer	2,884.60	1,296.23* (0.60)	-82.79	66.47	-322.01* (-0.28)	--
2008	1.	Medicare	7,769.80	--				
	2.	Medicaid	7,676.02	93.78	--			
	3.	Private insurance	7,006.99	762.80	669.03	--		
	4.	Self-Pay	6,307.54	1,462.26	1,368.48	699.46	--	
	5.	Other payer	11,043.72	-3,273.92	-3,367.70	-4,036.72** (-0.66)	-4,736.18** (-0.82)	--
2009	1.	Medicare	7,570.88	--				
	2.	Medicaid	7,333.25	237.63	--			
	3.	Private insurance	7,167.22	403.66	166.03	--		
	4.	Self-Pay	8,382.48	-811.60	-1,049.23	-1,215.26	--	
	5.	Other payer	7,876.71	-305.83	-543.46	-709.49	505.77	--
2010	1.	Medicare	7,919.68	--				
	2.	Medicaid	9,592.27	-1,672.59	--			
	3.	Private insurance	7,781.00	138.68	1,811.27	--		
	4.	Self-Pay	8,503.99	-584.31	1,088.28	-722.98	--	
	5.	Other payer	9,576.95	-1,657.27	15.32	-1,795.95	-1,072.97	--
2011	1.	Medicare	8,009.95	--				
	2.	Medicaid	7,531.65	478.30	--			
	3.	Private insurance	6,549.66	1,460.29** (0.33)	981.99	--		
	4.	Self-Pay	9,316.13	-1,306.18	-1,784.48	-2,766.47** (-0.59)	--	
	5.	Other payer	9,749.37	-1,739.42	-2,217.72	-3,199.71* (-0.64)	-433.24	--

(table continues)

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2012	1.	Medicare	8,785.95	--				
	2.	Medicaid	8,507.31	278.63	--			
	3.	Private insurance	7,580.75	1,205.20	926.57	--		
	4.	Self-Pay	7,926.30	859.65	581.01	-345.55	--	
	5.	Other payer	7,871.79	914.16	635.53	-291.04	54.51	--
2013	1.	Medicare	8,854.93	--				
	2.	Medicaid	8,468.20	386.74	--			
	3.	Private insurance	7,610.35	1,244.58	857.84	--		
	4.	Self-Pay	7,774.26	1,080.67	693.93	-163.91	--	
	5.	Other payer	8,164.64	690.29	303.56	-554.29	-390.38	--
2014	1.	Medicare	8,408.65	--				
	2.	Medicaid	9,493.86	-1,085.21	--			
	3.	Private insurance	7,830.87	577.78	1,662.99	--		
	4.	Self-Pay	8,393.79	14.86	1,100.07	-562.91	--	
	5.	Other payer	7,788.31	620.34	1,705.55	42.57	605.48	--

*p<.001, **p<.05

Table 84

Post Hoc Results for Health Care Costs - DRG 390

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	5,541.66	--				
	2. Medicaid	1,929.27	3,612.39* (1.01)	--			
	3. Private insurance	1,719.20	3,822.46* (1.15)	210.07* (0.07)	--		
	4. Self-Pay	2,036.12	3,505.54* (0.96)	-106.85	-316.92	--	
	5. Other payer	3,718.56	1,823.10* (0.29)	-1,789.29* (-0.29)	-1,999.36* (-0.34)	-1,682.44** (-0.27)	--
2008	1. Medicare	6,038.61	--				
	2. Medicaid	5,357.53	681.08** (0.18)	--			
	3. Private insurance	5,147.44	891.17* (0.25)	210.09	--		
	4. Self-Pay	5,243.27	795.34	114.26	-95.83	--	
	5. Other payer	6,066.38	-27.77	-708.85	-918.94	-823.11	--
2009	1. Medicare	5,824.50	--				
	2. Medicaid	5,433.02	391.48	--			
	3. Private insurance	5,261.32	563.18* (0.16)	171.70	--		
	4. Self-Pay	5,769.13	55.38	-336.11	-507.80	--	
	5. Other payer	6,546.73	-722.23	-1,113.71	-1,285.41	-777.60	--
2010	1. Medicare	6,495.67	--				
	2. Medicaid	5,563.24	932.43* (0.28)	--			
	3. Private insurance	5,769.89	725.78** (0.16)	-206.65	--		
	4. Self-Pay	6,069.19	426.48	-505.95	-299.30	--	
	5. Other payer	6,589.39	-93.71	-1,026.15	-819.50	-520.19	--
2011	1. Medicare	6,238.54	--				
	2. Medicaid	5,947.80	290.74	--			
	3. Private insurance	5,443.70	794.84* (0.22)	504.10	--		
	4. Self-Pay	5,788.15	450.39	159.65	-344.45	--	
	5. Other payer	7,258.79	-1,020.25	-1,310.99** (-0.30)	-1,815.09* (-0.43)	-1,470.64** (-0.33)	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2012	1. Medicare	6,508.16	--				
	2. Medicaid	5,559.33	948.84* (0.26)	--			
	3. Private insurance	5,856.12	652.04** (0.16)	-296.80	--		
	4. Self-Pay	5,511.73	996.43* (0.29)	47.59	344.39	--	
	5. Other payer	6,313.89	194.27	-754.57	-457.77	-802.16	--
2013	1. Medicare	6,481.25	--				
	2. Medicaid	5,949.48	531.77	--			
	3. Private insurance	5,716.64	764.61* (0.19)	232.83	--		
	4. Self-Pay	5,741.99	739.26	207.49	-25.35	--	
	5. Other payer	6,352.89	128.36	-403.41	-636.24	-610.90	--
2014	1. Medicare	6,588.11	--				
	2. Medicaid	5,983.33	604.78** (0.16)	--			
	3. Private insurance	5,823.45	764.66* (0.21)	159.89	--		
	4. Self-Pay	5,430.23	1,157.88** (0.35)	553.10	393.21	--	
	5. Other payer	6,160.26	427.85	-176.93	-336.82	-730.03	--

*p<.001, **p<.05

Table 85

Post Hoc Results for Health Care Costs - DRG 391

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	7,622.10	--				
	2. Medicaid	827.57	6,794.53* (0.79)	--			
	3. Private insurance	907.51	6,714.59* (0.78)	-79.94* (-0.10)	--		
	4. Self-Pay	801.12	6,820.98* (0.79)	26.45	106.39* (0.11)	--	
	5. Other payer	1,020.27	6,601.83* (0.76)	-192.70* (-0.17)	-112.76** (-0.10)	-219.15* (-0.18)	--
2008	1. Medicare	9,437.50	--				
	2. Medicaid	9,809.22	-371.72	--			
	3. Private insurance	9,326.66	110.84	482.56	--		
	4. Self-Pay	8,223.36	1,214.14	1,585.86	1,103.30	--	
	5. Other payer	8,383.39	1,054.12	1,425.83	943.27	-160.02	--
2009	1. Medicare	10,064.00	--				
	2. Medicaid	9,735.99	328.01	--			
	3. Private insurance	9,526.53	537.47	209.46	--		
	4. Self-Pay	7,629.92	2,434.08* (0.29)	2,106.08** (0.24)	1,896.62	--	
	5. Other payer	8,384.02	1,679.99	1,351.98	1,142.52	-754.10	--
2010	1. Medicare	10,653.61	--				
	2. Medicaid	10,103.62	549.99	--			
	3. Private insurance	10,323.12	330.49	-219.50	--		
	4. Self-Pay	8,977.88	1,675.73	1,125.74	1,345.24	--	
	5. Other payer	11,749.73	-1,096.12	-1,646.11	-1,426.61	-2,771.85	--
2011	1. Medicare	10,915.60	--				
	2. Medicaid	10,372.62	542.99	--			
	3. Private insurance	10,507.19	408.41	-134.57	--		
	4. Self-Pay	8,990.70	1,924.90	1,381.91	1,516.48	--	
	5. Other payer	8,372.14	2,543.46** (0.29)	2,000.48	2,135.05	618.57	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2012	1. Medicare	11,555.54	--				
	2. Medicaid	10,054.92	1,500.62	--			
	3. Private insurance	11,987.09	-431.55	-1,932.17	--		
	4. Self-Pay	9,109.36	2,446.18** (0.25)	945.56	2,877.73	--	
	5. Other payer	12,523.74	-968.20	-2,468.82	-536.65	-3,414.38	--
2013	1. Medicare	11,762.95	--				
	2. Medicaid	11,405.29	357.66	--			
	3. Private insurance	12,685.22	-922.27	-1,279.93	--		
	4. Self-Pay	9,101.05	2,661.90** (0.27)	2,304.24	3,584.17** (0.23)	--	
	5. Other payer	11,882.64	-119.69	-477.35	802.58	-2,781.59	--
2014	1. Medicare	11,337.35	--				
	2. Medicaid	11,994.86	-657.51	--			
	3. Private insurance	11,485.00	-147.65	509.86	--		
	4. Self-Pay	9,835.66	1,501.70	2,159.20	1,649.34	--	
	5. Other payer	14,907.45	-3,570.09	-2,912.58	-3,422.45	-5,071.79	--

*p<.001, **p<.05

Table 86

Post Hoc Results for Health Care Costs - DRG 392

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	6,683.52	--				
	2. Medicaid	5,298.77	1,384.74* (0.18)	--			
	3. Private insurance	5,631.40	1,052.12* (0.16)	-332.63	--		
	4. Self-Pay	5,539.75	1,143.76** (0.20)	-240.98	91.65	--	
	5. Other payer	6,547.80	135.72	-1,249.03	-916.40	-1,008.05	--
2008	1. Medicare	6,586.20	--				
	2. Medicaid	5,772.96	813.25* (0.16)	--			
	3. Private insurance	5,264.94	1,321.27* (0.29)	508.02* (0.11)	--		
	4. Self-Pay	5,611.18	975.03* (0.22)	161.78	-346.24	--	
	5. Other payer	6,694.42	-108.21	-921.46* (-0.18)	-1,429.48* (-0.32)	-1,083.24* (-0.25)	--
2009	1. Medicare	6,411.16	--				
	2. Medicaid	5,263.36	1,147.80* (0.22)	--			
	3. Private insurance	5,594.45	816.71* (0.18)	-331.09** (-0.06)	--		
	4. Self-Pay	5,513.44	897.72* (0.22)	-250.08	81.01	--	
	5. Other payer	6,050.89	360.27	-787.53* (-0.15)	-456.44	-537.45	--
2010	1. Medicare	7,163.68	--				
	2. Medicaid	5,985.16	1,178.52* (0.22)	--			
	3. Private insurance	6,310.53	853.15* (0.18)	-325.37** (-0.06)	--		
	4. Self-Pay	6,179.72	983.95* (0.22)	-194.56	130.80	--	
	5. Other payer	7,019.83	143.85	-1,034.67* (-0.17)	-709.30** (-0.13)	-840.11** (-0.16)	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2011	1. Medicare	6,971.82	--				
	2. Medicaid	6,035.12	936.70* (0.17)	--			
	3. Private insurance	6,055.06	916.76* (0.22)	-19.94	--		
	4. Self-Pay	5,970.19	1,001.63* (0.25)	64.93	84.87	--	
	5. Other payer	6,972.20	-0.38	-937.08* (-0.17)	-917.14* (-0.21)	-1,002.01* (-0.24)	--
2012	1. Medicare	7,746.96	--				
	2. Medicaid	6,234.87	1,512.09* (0.26)	--			
	3. Private insurance	6,862.77	884.19* (0.15)	-627.90* (-0.11)	--		
	4. Self-Pay	6,433.01	1,313.96* (0.24)	-198.14	429.76	--	
	5. Other payer	7,309.27	437.69	-1,074.40** (-0.14)	-446.50	-876.27** (-0.12)	--
2013	1. Medicare	7,728.24	--				
	2. Medicaid	6,336.86	1,391.38* (0.24)	--			
	3. Private insurance	6,829.09	899.15* (0.16)	-492.23** (-0.08)	--		
	4. Self-Pay	6,455.08	1,273.16* (0.26)	-118.22	374.01	--	
	5. Other payer	7,520.28	207.96	-1,183.42* (-0.16)	-691.19	-1,065.20** (-0.17)	--
2014	1. Medicare	7,849.29	--				
	2. Medicaid	6,678.13	1,171.16* (0.21)	--			
	3. Private insurance	7,023.06	826.23* (0.13)	-344.92	--		
	4. Self-Pay	6,440.23	1,409.06* (0.29)	237.90	582.83	--	
	5. Other payer	7,699.77	149.52	-1,021.64** (-0.17)	-676.71	-1,259.54** (-0.23)	--

*p<.001, **p<.05

Table 87

Post Hoc Results for Health Care Costs - DRG 464

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	6,614.80	--				
	2. Medicaid	7,296.21	-681.41	--			
	3. Private insurance	7,350.71	-735.91	-54.50	--		
	4. Self-Pay	6,804.94	-190.15	491.26	545.76	--	
	5. Other payer	9,862.69	-3,247.89	-2,566.48	-2,511.98	-3,057.74	--
2008	1. Medicare	23,880.90	--				
	2. Medicaid	37,865.54	-13,984.64** (-0.50)	--			
	3. Private insurance	29,426.86	-5,545.96	8,438.68	--		
	4. Self-Pay	23,644.55	236.35	14,220.99	5,782.31	--	
	5. Other payer	34,897.95	-11,017.05** (-0.47)	2,967.59	-5,471.10	-11,253.40	--
2009	1. Medicare	24,464.02	--				
	2. Medicaid	34,424.60	-9,960.58	--			
	3. Private insurance	31,444.40	-6,980.38	2,980.20	--		
	4. Self-Pay	26,027.34	-1,563.32	8,397.26	5,417.06	--	
	5. Other payer	33,302.89	-8,838.87	1,121.71	-1,858.49	-7,275.55	--
2010	1. Medicare	29,507.13	--				
	2. Medicaid	34,145.09	-4,637.96	--			
	3. Private insurance	32,544.09	-3,036.96	1,601.00	--		
	4. Self-Pay	36,323.82	-6,816.69	-2,178.73	-3,779.73	--	
	5. Other payer	45,729.77	-16,222.63	-11,584.68	-13,185.67	-9,405.94	--
2011	1. Medicare	30,234.98	--				
	2. Medicaid	57,588.24	-27,353.26	--			
	3. Private insurance	33,952.81	-3,717.84	23,635.42	--		
	4. Self-Pay	42,898.18	-12,663.20	14,690.06	-8,945.36	--	
	5. Other payer	52,162.43	-21,927.45	5,425.81	-18,209.62	-9,264.25	--
2012	1. Medicare	31,613.93	--				
	2. Medicaid	46,810.04	-15,196.11	--			
	3. Private insurance	36,745.69	-5,131.76	10,064.35	--		
	4. Self-Pay	42,848.12	-11,234.19	3,961.92	-6,102.43	--	
	5. Other payer	48,697.65	-17,083.72** (-0.48)	-1,887.61	-11,951.96	-5,849.53	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2013	1. Medicare	33,058.50	--				
	2. Medicaid	40,487.82	-7,429.31	--			
	3. Private insurance	33,599.18	-540.67	6,888.64	--		
	4. Self-Pay	25,926.69	7,131.82	14,561.13	7,672.49	--	
	5. Other payer	34,771.79	-1,713.28	5,716.03	-1,172.61	-8,845.10	--
2014	1. Medicare	31,218.95	--				
	2. Medicaid	35,248.85	-4,029.90	--			
	3. Private insurance	34,922.78	-3,703.82	326.08	--		
	4. Self-Pay	41,746.72	-10,527.76	-6,497.87	-6,823.94	--	
	5. Other payer	44,374.11	-13,155.15	-9,125.25	-9,451.33	-2,627.39	--

*p<.001, **p<.05

Table 88

Post Hoc Results for Health Care Costs - DRG 470

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	17,551.38	--				
	2. Medicaid	17,061.46	489.92	--			
	3. Private insurance	16,855.09	696.30* (0.10)	206.38	--		
	4. Self-Pay	10,290.49	7,260.89* (1.07)	6,770.98* (0.68)	6,564.60* (0.89)	--	
	5. Other payer	18,646.68	-1,095.30	-1,585.22	-1,791.59	-8,356.19* (-0.71)	--
2008	1. Medicare	17,995.41	--				
	2. Medicaid	19,405.39	-1,409.98* (-0.21)	--			
	3. Private insurance	17,134.51	860.90* (0.14)	2,270.88* (0.35)	--		
	4. Self-Pay	17,668.77	326.64	1,736.61	-534.26	--	
	5. Other payer	18,349.97	-354.55	1,055.42** (0.15)	-1,215.46* (-0.19)	-681.19	--
2009	1. Medicare	17,231.27	--				
	2. Medicaid	17,897.27	-666.01	--			
	3. Private insurance	17,263.88	-32.61	633.39	--		
	4. Self-Pay	17,571.62	-340.35	325.65	-307.74	--	
	5. Other payer	18,201.70	-970.43* (-0.13)	-304.43	-937.82** (-0.13)	-630.08	--
2010	1. Medicare	18,463.13	--				
	2. Medicaid	20,043.67	-1,580.54* (-0.22)	--			
	3. Private insurance	17,820.25	642.89* (0.10)	2,223.42* (0.32)	--		
	4. Self-Pay	18,933.66	-470.52	1,110.01	-1,113.41	--	
	5. Other payer	18,784.86	-321.72	1,258.81** (0.17)	-964.61** (-0.15)	148.80	--
2011	1. Medicare	19,553.97	--				
	2. Medicaid	22,724.38	-3,170.41* (-0.30)	--			
	3. Private insurance	18,778.59	775.38* (0.10)	3,945.79* (0.38)	--		
	4. Self-Pay	21,672.31	-2,118.34	1,052.07	-2,893.72	--	
	5. Other payer	20,944.92	-1,390.95* (-0.17)	1,779.45** (0.16)	-2,166.34* (-0.27)	727.38	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2012	1. Medicare	20,532.09	--				
	2. Medicaid	21,513.43	-981.33	--			
	3. Private insurance	20,239.42	292.67	1,274.00	--		
	4. Self-Pay	23,934.79	-3,402.70** (-0.34)	-2,421.37	-3,695.37** (-0.37)	--	
	5. Other payer	21,114.42	-582.33	399.00	-875.00** (-0.10)	2,820.37	--
2013	1. Medicare	20,274.96	--				
	2. Medicaid	21,038.60	-763.64	--			
	3. Private insurance	19,919.34	355.63** (0.05)	1,119.27* (0.14)	--		
	4. Self-Pay	21,641.53	-1,366.57	-602.92	-1,722.19	--	
	5. Other payer	20,371.49	-96.53	667.11	-452.15	1,270.04	--
2014	1. Medicare	19,928.23	--				
	2. Medicaid	20,775.56	-847.33** (-0.10)	--			
	3. Private insurance	19,336.02	592.21* (0.08)	1,439.54* (0.17)	--		
	4. Self-Pay	20,652.05	-723.82	123.51	-1,316.02	--	
	5. Other payer	19,874.34	53.89	901.22	-538.32	777.71	--

*p<.001, **p<.05

Table 89

Post Hoc Results for Health Care Costs - DRG 603

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	6,583.32	--				
	2. Medicaid	6,149.31	434.02	--			
	3. Private insurance	5,314.12	1,269.20* (0.29)	835.19** (0.18)	--		
	4. Self-Pay	5,340.74	1,242.58* (0.29)	808.57	-26.62	--	
	5. Other payer	6,263.02	320.30	-113.71	-948.90	-922.28	--
2008	1. Medicare	6,895.86	--				
	2. Medicaid	6,493.14	402.72** (0.08)	--			
	3. Private insurance	5,571.68	1,324.19* (0.28)	921.46* (0.20)	--		
	4. Self-Pay	5,922.04	973.82* (0.21)	571.10** (0.12)	-350.37	--	
	5. Other payer	7,075.15	-179.29	-582.01	-1,503.47* (-0.27)	-1,153.11* (-0.21)	--
2009	1. Medicare	6,766.12	--				
	2. Medicaid	6,069.46	696.66* (0.14)	--			
	3. Private insurance	5,697.35	1,068.77* (0.22)	372.11** (0.08)	--		
	4. Self-Pay	6,082.64	683.49* (0.13)	-13.17	-385.28	--	
	5. Other payer	6,392.88	373.24	-323.41	-695.53** (--0.16)	-310.24	--
2010	1. Medicare	7,654.54	--				
	2. Medicaid	6,906.28	748.26* (0.13)	--			
	3. Private insurance	6,141.25	1,513.29* (0.30)	765.03* (0.14)	--		
	4. Self-Pay	6,555.31	1,099.23* (0.22)	350.97	-414.06** (-0.10)	--	
	5. Other payer	7,726.49	-71.95	-820.21* (-0.14)	-1,585.24* (-0.32)	-1,171.18* (-0.24)	--
2011	1. Medicare	7,651.56	--				
	2. Medicaid	7,188.41	463.15** (0.08)	--			
	3. Private insurance	6,356.68	1,294.88* (0.25)	831.73* (0.15)	--		
	4. Self-Pay	6,589.44	1,062.13* (0.21)	598.98** (0.11)	-232.75	--	
	5. Other payer	7,865.07	-213.51	-676.66 (-0.11)	-1,508.39* (-0.27)	-1,275.64* (-0.23)	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2012	1. Medicare	7,938.43	--				
	2. Medicaid	7,233.82	704.61* (0.12)	--			
	3. Private insurance	6,875.54	1,062.89* (0.16)	358.28	--		
	4. Self-Pay	6,718.66	1,219.77* (0.23)	515.16** (0.09)	156.88	--	
	5. Other payer	7,641.05	297.38	-407.23	-765.51** (-0.11)	-922.39* (-0.17)	--
2013	1. Medicare	8,179.49	--				
	2. Medicaid	7,226.09	953.40* (0.14)	--			
	3. Private insurance	6,740.54	1,438.95* (0.21)	485.55** (0.08)	--		
	4. Self-Pay	6,862.61	1,316.89* (0.20)	363.49	-122.06	--	
	5. Other payer	7,909.61	269.88	-683.52** (-0.11)	-1,169.07* (-0.19)	-1,047.00* (-0.18)	--
2014	1. Medicare	8,121.84	--				
	2. Medicaid	7,457.98	663.86* (0.11)	--			
	3. Private insurance	7,065.77	1,056.06* (0.18)	392.21	--		
	4. Self-Pay	6,722.86	1,398.98* (0.24)	735.12** (0.13)	342.92	--	
	5. Other payer	8,471.12	-349.28	-1,013.14	-1,405.34** (-0.18)	-1,748.26** (-0.23)	--

*p<.001, **p<.05

Table 90

Post Hoc Results for Health Care Costs - DRG 639

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	4,692.95	--				
	2.	Medicaid	4,499.15	193.81	--			
	3.	Private insurance	4,423.95	269.00	75.19	--		
	4.	Self-Pay	4,619.14	73.81	-120.00	-195.19	--	
	5.	Other payer	5,848.33	-1,155.37	-1,349.18	-1,424.38	-1,229.18	--
2008	1.	Medicare	4,687.78	--				
	2.	Medicaid	5,275.04	-587.26** (-0.17)	--			
	3.	Private insurance	4,640.31	47.47	634.73** (0.18)	--		
	4.	Self-Pay	5,192.18	-504.40	82.86	-551.87	--	
	5.	Other payer	6,575.47	-1,887.69* (-0.44)	-1,300.43** (-0.29)	-1,935.16* (-0.46)	-1,383.29** (-0.32)	--
2009	1.	Medicare	4,838.01	--				
	2.	Medicaid	5,118.35	-280.34	--			
	3.	Private insurance	5,007.75	-169.74	110.60	--		
	4.	Self-Pay	5,220.27	-382.26	-101.93	-212.52	--	
	5.	Other payer	5,448.21	-610.20	-329.86	-440.46	-227.94	--
2010	1.	Medicare	5,271.74	--				
	2.	Medicaid	5,685.40	-413.67	--			
	3.	Private insurance	5,290.94	-19.20	394.46	--		
	4.	Self-Pay	5,602.40	-330.66	83.01	-311.46	--	
	5.	Other payer	6,332.81	-1,061.07* (-0.30)	-647.40	-1,041.87* (-0.30)	-730.41** (-0.21)	--
2011	1.	Medicare	5,504.64	--				
	2.	Medicaid	5,561.08	-56.45	--			
	3.	Private insurance	4,962.45	542.19	598.64** (0.17)	--		
	4.	Self-Pay	5,939.64	-435.00	-378.55	-977.19* (-0.29)	--	
	5.	Other payer	6,718.08	-1,213.45** (-0.31)	-1,157.00** (-0.45)	-1,755.64* (-0.45)	-778.45	--

(table continues)

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2012	1.	Medicare	5,808.46	--				
	2.	Medicaid	6,697.29	-888.83** (-0.19)	--			
	3.	Private insurance	6,180.95	-372.49	516.34	--		
	4.	Self-Pay	6,074.95	-266.49	622.34	106.00	--	
	5.	Other payer	6,832.67	-1,024.21** (-0.22)	-135.38	-651.72	-757.72	--
2013	1.	Medicare	6,096.69	--				
	2.	Medicaid	6,542.03	-445.34	--			
	3.	Private insurance	6,413.87	-317.18	128.16	--		
	4.	Self-Pay	6,512.69	-415.99	29.34	-98.81	--	
	5.	Other payer	6,711.97	-615.28	-169.94	-298.10	-199.29	--
2014	1.	Medicare	6,385.44	--				
	2.	Medicaid	6,505.93	-120.49	--			
	3.	Private insurance	6,451.82	-66.38	54.11	--		
	4.	Self-Pay	5,314.67	1,070.78** (0.26)	1,191.27* (0.31)	1,137.15** (0.30)	--	
	5.	Other payer	7,108.26	-722.82	-602.33	-656.44	-1,793.60** (-0.41)	--

*p<.001, **p<.05

Table 91

Post Hoc Results for Health Care Costs - DRG 690

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	6,331.84	--				
	2. Medicaid	5,490.98	840.87** (0.19)	--			
	3. Private insurance	4,985.48	1,346.36* (0.24)	505.50	--		
	4. Self-Pay	4,452.66	1,879.18* (0.53)	1,038.31** (0.27)	532.82	--	
	5. Other payer	4,802.42	1,529.42** (0.41)	688.56	183.06	-349.76	--
2008	1. Medicare	6,687.05	--				
	2. Medicaid	6,144.27	542.78** (0.11)	--			
	3. Private insurance	5,461.68	1,225.38* (0.27)	682.59* (0.15)	--		
	4. Self-Pay	5,428.39	1,258.66* (0.31)	715.87** (0.17)	33.28	--	
	5. Other payer	7,276.05	-589.00	-1,131.78	-1,814.38** (-0.33)	-1,847.66** (-0.36)	--
2009	1. Medicare	6,409.46	--				
	2. Medicaid	5,473.16	936.29* (0.22)	--			
	3. Private insurance	5,576.50	832.96* (0.20)	-103.34	--		
	4. Self-Pay	5,115.77	1,293.69* (0.35)	357.40	460.74** (0.13)	--	
	5. Other payer	7,231.75	-822.29	-1,758.58** (-0.28)	-1,655.24** (-0.27)	-2,115.98* (-0.36)	--
2010	1. Medicare	7,334.94	--				
	2. Medicaid	6,181.30	1,153.64* (0.22)	--			
	3. Private insurance	6,074.20	1,260.74* (0.25)	107.10	--		
	4. Self-Pay	6,353.62	981.32* (0.21)	-172.32	-279.42	--	
	5. Other payer	7,637.08	-302.14	-1,455.78* (-0.26)	-1,562.88* (-0.30)	-1,283.46** (-0.26)	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2011	1. Medicare	7,047.67	--				
	2. Medicaid	6,394.50	653.17* (0.12)	--			
	3. Private insurance	5,918.46	1,129.21* (0.25)	476.04	--		
	4. Self-Pay	5,956.17	1,091.50* (0.25)	438.33	-37.71	--	
	5. Other payer	7,552.00	-504.33	-1,157.50** (-0.21)	-1,633.55* (-0.36)	-1,595.84* (-0.37)	--
2012	1. Medicare	7,682.58	--				
	2. Medicaid	6,634.01	1,048.57* (0.19)	--			
	3. Private insurance	6,814.94	867.64* (0.13)	-180.93	--		
	4. Self-Pay	6,256.92	1,425.66* (0.29)	377.09	558.02	--	
	5. Other payer	7,118.00	564.58	-483.99	-303.06	-861.08	--
2013	1. Medicare	7,664.95	--				
	2. Medicaid	6,623.61	1,041.34* (0.19)	--			
	3. Private insurance	6,719.44	945.52* (0.19)	-95.82	--		
	4. Self-Pay	6,344.09	1,320.86* (0.28)	279.52	375.35	--	
	5. Other payer	7,728.83	-63.88	-1,105.22	-1,009.40	-1,384.74** (-0.22)	--
2014	1. Medicare	7,625.65	--				
	2. Medicaid	6,761.13	864.52* (0.16)	--			
	3. Private insurance	6,916.59	709.06** (0.12)	-155.46	--		
	4. Self-Pay	6,272.37	1,353.27* (0.28)	488.75	644.21	--	
	5. Other payer	7,796.57	-170.92	-1,035.44	-879.98	-1,524.19	--

*p<.001, **p<.05

Table 92

Post Hoc Results for Health Care Costs - DRG 765

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	5,997.45	--				
	2.	Medicaid	7,221.76	-1,224.31	--			
	3.	Private insurance	7,089.64	-1,092.19	132.12	--		
	4.	Self-Pay	7,356.42	-1,358.97	-134.66	-266.78	--	
	5.	Other payer	6,797.69	-800.24	424.06	291.95	558.73	--
2008	1.	Medicare	11,472.48	--				
	2.	Medicaid	8,322.97	3,149.51	--			
	3.	Private insurance	8,221.47	3,251.02	101.50	--		
	4.	Self-Pay	6,346.58	5,125.90** (0.50)	1,976.39* (0.35)	1,874.89* (0.31)	--	
	5.	Other payer	9,458.65	2,013.83	-1,135.69	-1,237.19	-3,112.08* (-0.37)	--
2009	1.	Medicare	10,456.55	--				
	2.	Medicaid	9,252.47	1,204.08	--			
	3.	Private insurance	9,393.78	1,062.77	-141.31	--		
	4.	Self-Pay	8,444.53	2,012.02	807.93	949.24	--	
	5.	Other payer	9,237.50	1,219.05	14.97	156.28	-792.96	--
2010	1.	Medicare	9,507.03	--				
	2.	Medicaid	8,878.01	629.03	--			
	3.	Private insurance	9,375.80	131.23	-497.80** (-0.05)	--		
	4.	Self-Pay	7,571.18	1,935.86	1,306.83	1,804.63** (0.20)	--	
	5.	Other payer	8,302.80	1,204.23	575.20	1,073.00** (0.13)	-731.63	--
2011	1.	Medicare	10,424.68	--				
	2.	Medicaid	8,792.18	1,632.50	--			
	3.	Private insurance	8,970.83	1,453.85	-178.65	--		
	4.	Self-Pay	8,192.98	2,231.70	599.20	777.84	--	
	5.	Other payer	8,236.29	2,188.39	555.90	734.54	-43.30	--
2012	1.	Medicare	10,728.09	--				
	2.	Medicaid	9,666.11	1,061.98	--			
	3.	Private insurance	9,976.38	751.70	-310.28	--		
	4.	Self-Pay	8,811.79	1,916.30	854.32	1,164.59	--	
	5.	Other payer	10,167.57	560.52	-501.46	-191.18	-1,355.78	--

(table continues)

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2013	1.	Medicare	12,636.50	--				
	2.	Medicaid	9,955.24	2,681.26	--			
	3.	Private insurance	10,343.82	2,292.68	-388.58	--		
	4.	Self-Pay	8,360.26	4,276.24** (0.51)	1,594.98* (0.23)	1,983.56* (0.24)	--	
	5.	Other payer	9,648.63	2,987.87	306.61	695.20	-1,288.37** (-0.22)	--
2014	1.	Medicare	11,644.77	--				
	2.	Medicaid	10,261.75	1,383.02	--			
	3.	Private insurance	10,524.18	1,120.59	-262.43	--		
	4.	Self-Pay	8,718.71	2,926.06** (0.37)	1,543.05* (0.18)	1,805.47* (0.20)	--	
	5.	Other payer	10,068.26	1,576.51	193.50	455.92	-1,349.55** (-0.22)	--

*p<.001, **p<.05

Table 93

Post Hoc Results for Health Care Costs - DRG 766

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	4,998.50	--				
	2. Medicaid	4,988.42	10.08	--			
	3. Private insurance	5,242.43	-243.93	-254.00* (-0.13)	--		
	4. Self-Pay	4,293.08	705.42	695.34* (0.41)	949.34* (0.54)	--	
	5. Other payer	5,452.68	-454.18	-464.26** (-0.27)	-210.26	-1,159.60* (-0.75)	--
2008	1. Medicare	5,848.77	--				
	2. Medicaid	5,705.92	142.85	--			
	3. Private insurance	5,643.88	204.89	62.04	--		
	4. Self-Pay	4,613.20	1,235.57* (0.55)	1,092.72* (0.46)	1,030.68* (0.47)	--	
	5. Other payer	5,894.38	-45.61	-188.45	-250.50	-1,281.17* (-0.46)	--
2009	1. Medicare	6,491.16	--				
	2. Medicaid	6,041.54	449.62	--			
	3. Private insurance	6,030.47	460.69	11.07	--		
	4. Self-Pay	5,701.81	789.36** (0.34)	339.74** (0.13)	328.67** (0.12)	--	
	5. Other payer	5,852.10	639.06	189.44	178.37	-150.29	--
2010	1. Medicare	7,407.76	--				
	2. Medicaid	6,163.20	1,244.56	--			
	3. Private insurance	6,509.61	898.15	-346.41* (-0.12)	--		
	4. Self-Pay	5,968.96	1,438.80	194.24	540.65* (0.21)	--	
	5. Other payer	5,895.39	1,512.37** (0.46)	267.81	614.22* (0.21)	73.57	--
2011	1. Medicare	7,195.69	--				
	2. Medicaid	6,344.46	851.23	--			
	3. Private insurance	6,164.18	1,031.51	180.28* (0.06)	--		
	4. Self-Pay	5,295.28	1,900.40* (0.69)	1,049.17* (0.36)	868.90* (0.32)	--	
	5. Other payer	5,886.73	1,308.96** (0.46)	457.73** (0.15)	277.45	-591.45** (-0.23)	--

(table continues)

Year	Type of insurance	Mean	Mean differences

				(Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2012	1.	Medicare	6,688.74	--				
	2.	Medicaid	6,744.44	-55.70	--			
	3.	Private insurance	7,090.99	-402.24	-346.54* (-0.10)	--		
	4.	Self-Pay	5,975.90	712.84	768.54* (0.25)	1,115.09* (0.34)	--	
	5.	Other payer	6,946.85	-258.10	-202.40	144.14	-970.95* (-0.32)	--
2013	1.	Medicare	8,158.47	--				
	2.	Medicaid	6,887.26	1,271.21** (0.33)	--			
	3.	Private insurance	7,287.34	871.13	-400.08* (-0.11)	--		
	4.	Self-Pay	5,925.41	2,233.07* (0.64)	961.85* (0.30)	1,361.93* (0.41)	--	
	5.	Other payer	7,190.74	967.73	-303.48	96.60	-1,265.34* (-0.45)	--
2014	1.	Medicare	7,754.17	--				
	2.	Medicaid	7,179.99	574.18	--			
	3.	Private insurance	7,485.54	268.64	-305.55* (-0.07)	--		
	4.	Self-Pay	6,422.42	1,331.75* (0.48)	757.57* (0.22)	1,063.11* (0.30)	--	
	5.	Other payer	7,161.52	592.65	18.47	324.02	-739.09* (-0.24)	--

*p<.001, **p<.05

Table 94

Post Hoc Results for Health Care Costs - DRG 775

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	3,298.14	--				
	2. Medicaid	2,885.77	412.37** (0.32)	--			
	3. Private insurance	3,003.58	294.57	-117.80* (-0.08)	--		
	4. Self-Pay	2,626.92	671.23* (0.56)	258.85* (0.19)	376.66* (0.26)	--	
	5. Other payer	3,197.80	100.34	-312.03* (-0.23)	-194.23	-570.88* (-0.45)	--
2008	1. Medicare	3,627.41	--				
	2. Medicaid	3,305.68	321.73** (0.17)	--			
	3. Private insurance	3,408.07	219.34	-102.39* (-0.05)	--		
	4. Self-Pay	2,867.27	760.15* (0.50)	438.41* (0.26)	540.80* (0.33)	--	
	5. Other payer	3,284.72	342.69	20.96	123.35	-417.46* (-0.23)	--
2009	1. Medicare	3,786.01	--				
	2. Medicaid	3,547.94	238.07	--			
	3. Private insurance	3,691.22	94.79	-143.28* (-0.06)	--		
	4. Self-Pay	3,310.02	475.99** (0.26)	237.92* (0.12)	381.20* (0.17)	--	
	5. Other payer	3,451.52	334.50	96.43	239.71	-141.49	--
2010	1. Medicare	4,260.45	--				
	2. Medicaid	3,527.25	733.20** (0.33)	--			
	3. Private insurance	3,800.63	459.82	-273.38* (-0.12)	--		
	4. Self-Pay	2,985.69	1,274.75* (0.63)	541.56* (0.32)	814.94* (0.38)	--	
	5. Other payer	3,387.80	872.64** (0.30)	139.45	412.83* (0.14)	-402.11* (-0.16)	--
2011	1. Medicare	3,627.51	--				
	2. Medicaid	3,572.89	54.63	--			
	3. Private insurance	3,711.94	-84.43	-139.06* (-0.07)	--		
	4. Self-Pay	3,044.47	583.05** (0.35)	528.42* (0.28)	667.48* (0.36)	--	
	5. Other payer	3,321.16	306.36	251.73* (0.14)	390.79* (0.22)	-276.69* (-0.18)	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2012	1. Medicare	4,698.21	--				
	2. Medicaid	3,987.52	710.69	--			
	3. Private insurance	4,233.15	465.05	-245.64* (-0.10)	--		
	4. Self-Pay	3,575.65	1,122.56* (0.36)	411.87* (0.19)	657.50* (0.27)	--	
	5. Other payer	3,987.40	710.81	0.12	245.75* (0.10)	-411.75* (-0.21)	--
2013	1. Medicare	4,673.00	--				
	2. Medicaid	4,090.82	582.18** (0.22)	--			
	3. Private insurance	4,337.05	335.96	-246.22* (-0.10)	--		
	4. Self-Pay	3,526.14	1,146.86* (0.46)	564.68* (0.27)	810.91* (0.36)	--	
	5. Other payer	4,234.31	438.69	-143.49	102.74	-708.17* (-0.34)	--
2014	1. Medicare	4,759.34	--				
	2. Medicaid	4,206.63	552.71* (0.24)	--			
	3. Private insurance	4,420.33	339.01	-213.70* (-0.08)	--		
	4. Self-Pay	3,742.50	1,016.84* (0.38)	464.13* (0.16)	677.83* (0.23)	--	
	5. Other payer	4,323.84	435.50** (0.20)	-117.22	96.48	-581.34* (-0.21)	--

*p<.001, **p<.05

Table 95

Post Hoc Results for Health Care Costs - DRG 853

Year	Type of insurance		Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	48,368.12	--				
	2.	Medicaid	60,402.74	-12,034.62	--			
	3.	Private insurance	46,775.84	1,592.28	13,626.90	--		
	4.	Self-Pay	47,309.73	1,058.39	13,093.01	-533.89	--	
	5.	Other payer	46,770.85	1,597.27	13,631.89	4.99	538.88	--
2008	1.	Medicare	47,906.72	--				
	2.	Medicaid	63,229.88	-15,323.15** (-0.26)	--			
	3.	Private insurance	54,179.58	-6,272.85	9,050.30	--		
	4.	Self-Pay	44,054.22	3,852.50	19,175.65** (0.36)	10,125.35	--	
	5.	Other payer	60,085.82	-12,179.09	3,144.06	-5,906.24	-16,031.59	--
2009	1.	Medicare	50,751.37	--				
	2.	Medicaid	64,455.98	-13,704.61* (-0.26)	--			
	3.	Private insurance	54,853.56	-4,102.19	9,602.42	--		
	4.	Self-Pay	43,576.49	7,174.89	20,879.49* (0.41)	11,277.07	--	
	5.	Other payer	53,085.97	-2,334.59	11,370.01	1,767.59	-9,509.48	--
2010	1.	Medicare	49,915.41	--				
	2.	Medicaid	66,571.89	-16,656.48* (-0.32)	--			
	3.	Private insurance	57,163.74	-7,248.32	9,408.16	--		
	4.	Self-Pay	60,236.41	-10,321.00	6,335.48	-3,072.67	--	
	5.	Other payer	52,659.39	-2,743.98	13,912.50** (0.28)	4,504.35	7,577.02	--
2011	1.	Medicare	49,934.97	--				
	2.	Medicaid	60,481.14	-10,546.17* (-0.22)	--			
	3.	Private insurance	58,710.10	-8,775.13** (-0.19)	1,771.04	--		
	4.	Self-Pay	43,214.04	6,720.92	17,267.10* (0.41)	15,496.06* (0.38)	--	
	5.	Other payer	56,946.20	-7,011.23	3,534.94	1,763.91	-13,732.15	--

(table continues)

Year	Type of insurance		Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2012	1.	Medicare	54,747.50	--				
	2.	Medicaid	63,446.46	-8,698.96** (-0.16)	--			
	3.	Private insurance	56,266.62	-1,519.12	7,179.84	--		
	4.	Self-Pay	48,043.58	6,703.91	15,402.87* (0.31)	8,223.03	--	
	5.	Other payer	83,283.00	-28,535.50	-19,836.54	-27,016.38	-35,239.42** (-0.39)	--
2013	1.	Medicare	55,438.95	--				
	2.	Medicaid	64,273.79	-8,834.84** (-0.15)	--			
	3.	Private insurance	56,600.66	-1,161.71	7,673.13	--		
	4.	Self-Pay	39,719.76	15,719.20* (0.37)	24,554.04* (0.47)	16,880.90* (0.38)	--	
	5.	Other payer	60,736.82	-5,297.86	3,536.98	-4,136.16	-21,017.06 (-0.49)	--
2014	1.	Medicare	51,176.76	--				
	2.	Medicaid	61,504.77	-10,328.01* (-0.18)	--			
	3.	Private insurance	52,741.85	-1,565.09	8,762.91** (0.15)	--		
	4.	Self-Pay	42,870.78	8,305.98	18,633.99** (0.33)	9,871.08	--	
	5.	Other payer	67,495.37	-16,318.61	-5,990.61	-14,753.52	-24,624.59	--

*p<.001, **p<.05

Table 96

Post Hoc Results for Health Care Costs - DRG 871

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2007	1.	Medicare	16,698.77	--				
	2.	Medicaid	20,057.35	-3,358.57** (-0.19)	--			
	3.	Private insurance	17,575.94	-877.17	2,481.40	--		
	4.	Self-Pay	17,440.93	-742.16	2,616.41	135.01	--	
	5.	Other payer	17,448.49	-749.72	2,608.85	127.45	-7.56	--
2008	1.	Medicare	16,171.39	--				
	2.	Medicaid	19,703.84	-3,532.46* (-0.21)	--			
	3.	Private insurance	16,350.25	-178.86	3,353.60* (0.18)	--		
	4.	Self-Pay	15,533.19	638.20	4,170.65* (0.25)	817.06	--	
	5.	Other payer	20,689.82	-4,518.43** (-0.25)	-985.97	-4,339.57** (-0.23)	-5,156.63** (-0.30)	--
2009	1.	Medicare	17,402.51	--				
	2.	Medicaid	19,763.85	-2,361.33* (-0.13)	--			
	3.	Private insurance	18,160.02	-757.51	1,603.83	--		
	4.	Self-Pay	16,379.24	1,023.28	3,384.61* (0.19)	1,780.78	--	
	5.	Other payer	19,539.08	-2,136.57	224.76	-1,379.06	-3,159.85	--
2010	1.	Medicare	18,244.54	--				
	2.	Medicaid	21,174.59	-2,930.05* (-0.16)	--			
	3.	Private insurance	17,697.60	546.94	3,477.00* (0.18)	--		
	4.	Self-Pay	18,751.85	-507.31	2,422.75	-1,054.25	--	
	5.	Other payer	20,772.46	-2,527.93	402.13	-3,074.87** (-0.18)	-2,020.62	--

(table continues)

Year		Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
				1	2	3	4	5
2011	1.	Medicare	17,826.31	--				
	2.	Medicaid	21,481.79	-3,655.48* (-0.21)	--			
	3.	Private insurance	18,179.69	-353.39	3,302.09* (0.18)	--		
	4.	Self-Pay	18,400.23	-573.92	3,081.56** (0.17)	-220.53	--	
	5.	Other payer	20,915.45	-3,089.15** (-0.19)	566.33	-2,735.76	-2,515.23	--
2012	1.	Medicare	18,349.62	--				
	2.	Medicaid	21,750.17	-3,400.54* (-0.17)	--			
	3.	Private insurance	18,685.79	-336.17	3,064.37* (0.15)	--		
	4.	Self-Pay	17,389.43	960.19	4,360.74* (0.23)	1,296.36	--	
	5.	Other payer	21,661.72	-3,312.09* (-0.18)	88.45	-2,975.92** (-0.16)	-4,272.29* (-0.24)	--
2013	1.	Medicare	17,873.38	--				
	2.	Medicaid	21,055.23	-3,181.85* (-0.14)	--			
	3.	Private insurance	18,824.76	-951.38	2,230.47** (0.09)	--		
	4.	Self-Pay	17,261.96	611.42	3,793.27* (0.18)	1,562.80	--	
	5.	Other payer	22,038.99	-4,165.61** (-0.16)	-983.76	-3,214.23	-4,777.03** (-0.19)	--
2014	1.	Medicare	18,030.59	--				
	2.	Medicaid	20,449.24	-2,418.64* (-0.13)	--			
	3.	Private insurance	18,439.82	-409.23	2,009.42* (0.10)	--		
	4.	Self-Pay	16,258.58	1,772.01	4,190.65* (0.24)	2,181.24** (0.13)	--	
	5.	Other payer	20,484.95	-2,454.36	-35.72	-2,045.13** (-0.11)	-4,226.37** (-0.25)	--

*p<.001, **p<.05

Table 97

Post Hoc Results for Health Care Costs - DRG 881

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	6,755.86	--				
	2. Medicaid	3,416.64	3,339.22	--			
	3. Private insurance	3,533.03	3,222.83	-116.39	--		
	4. Self-Pay	2,108.79	4,647.07** (0.56)	1,307.85** (0.62)	1,424.24* (0.77)	--	
	5. Other payer	2,154.35	4,601.52	1,262.30** (0.52)	1,378.69* (0.62)	-45.55	--
2008	1. Medicare	6,246.59	--				
	2. Medicaid	4,972.45	1,274.14	--			
	3. Private insurance	3,118.64	3,127.95* (0.46)	1,853.81** (0.19)	--		
	4. Self-Pay	2,603.66	3,642.93* (0.55)	2,368.79** (0.24)	514.98	--	
	5. Other payer	3,042.00	3,204.59* (0.48)	1,930.45** (0.20)	76.64	-438.34	--
2009	1. Medicare	5,064.29	--				
	2. Medicaid	3,765.12	1,299.16* (0.32)	--			
	3. Private insurance	4,762.69	301.59	-997.57* (-0.23)	--		
	4. Self-Pay	3,266.92	1,797.36* (0.51)	498.20	1,495.77* (0.39)	--	
	5. Other payer	3,804.73	1,259.56* (0.38)	-39.60	957.97** (0.26)	-537.80	--
2010	1. Medicare	6,008.17	--				
	2. Medicaid	4,301.44	1,706.73* (0.34)	--			
	3. Private insurance	4,124.78	1,883.39* (0.30)	176.66	--		
	4. Self-Pay	3,000.40	3,007.78* (0.66)	1,301.05* (0.33)	1,124.39** (0.21)	--	
	5. Other payer	3,290.05	2,718.13* (0.60)	1,011.39** (0.26)	834.74	-289.65	--
2011	1. Medicare	7,339.11	--				
	2. Medicaid	5,421.09	1,918.02	--			
	3. Private insurance	3,832.14	3,506.97* (0.46)	1,588.95* (0.28)	--		
	4. Self-Pay	5,694.50	1,644.62	-273.41	-1,862.35* (-0.52)	--	
	5. Other payer	3,993.66	3,345.45* (0.44)	1,427.43** (0.25)	-161.52	1,700.84* (0.48)	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2012	1. Medicare	6,019.02	--				
	2. Medicaid	4,655.30	1,363.71** (0.24)	--			
	3. Private insurance	4,364.13	1,654.89* (0.33)	291.18	--		
	4. Self-Pay	4,498.15	1,520.87	157.16	-134.02	--	
	5. Other payer	3,860.78	2,158.24* (0.46)	794.53	503.35	637.37	--
2013	1. Medicare	6,450.17	--				
	2. Medicaid	5,122.21	1,327.96** (0.26)	--			
	3. Private insurance	4,672.95	1,777.22* (0.37)	449.26	--		
	4. Self-Pay	3,013.07	3,437.10* (0.89)	2,109.14* (0.52)	1,659.88* (0.45)	--	
	5. Other payer	4,711.38	1,738.79** (0.26)	410.83	-38.43	-1,698.31** (-0.28)	--
2014	1. Medicare	6,535.76	--				
	2. Medicaid	4,378.05	2,157.71* (0.33)	--			
	3. Private insurance	4,589.53	1,946.22** (0.31)	-211.48	--		
	4. Self-Pay	3,441.73	3,094.03* (0.53)	936.33** (0.24)	1,147.81** (0.32)	--	
	5. Other payer	4,686.87	1,848.89	-308.82	-97.34	-1,245.15	--

*p<.001, **p<.05

Table 98

Post Hoc Results for Health Care Costs - DRG 882

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	8,716.04	--				
	2. Medicaid	4,015.00	4,701.04	--			
	3. Private insurance	4,020.70	4,695.34	-5.70	--		
	4. Self-Pay	2,727.52	5,988.52	1,287.48	1,293.18	--	
	5. Other payer	4,743.86	3,972.18	-728.85	-723.16	-2,016.33	--
2008	1. Medicare	5,256.55	--				
	2. Medicaid	4,441.71	814.84	--			
	3. Private insurance	3,461.51	1,795.03	980.20** (0.25)	--		
	4. Self-Pay	3,482.68	1,773.87	959.03	-21.16	--	
	5. Other payer	4,322.43	934.12	119.28	-860.91	-839.75	--
2009	1. Medicare	4,860.22	--				
	2. Medicaid	5,627.86	-767.64	--			
	3. Private insurance	4,678.79	181.43	949.07	--		
	4. Self-Pay	2,702.66	2,157.56** (0.71)	2,925.20	1,976.13** (0.59)	--	
	5. Other payer	3,798.84	1,061.38	1,829.02	879.95	-1,096.18	--
2010	1. Medicare	5,617.67	--				
	2. Medicaid	5,410.58	207.09	--			
	3. Private insurance	4,097.27	1,520.40** (0.37)	1,313.32** (0.30)	--		
	4. Self-Pay	2,654.73	2,962.94* (0.80)	2,755.85* (0.70)	1,442.54* (0.46)	--	
	5. Other payer	2,651.81	2,965.86* (0.74)	2,758.77* (0.65)	1,445.45** (0.41)	2.92	--
2011	1. Medicare	6,637.20	--				
	2. Medicaid	6,349.00	288.21	--			
	3. Private insurance	4,907.88	1,729.32	1,441.12	--		
	4. Self-Pay	5,734.02	903.18	614.98	-826.14	--	
	5. Other payer	5,884.87	752.34	464.13	-976.99	-150.85	--
2012	1. Medicare	6,912.06	--				
	2. Medicaid	6,261.64	650.41	--			
	3. Private insurance	5,174.59	1,737.46	1,087.05	--		
	4. Self-Pay	4,051.97	2,860.09** (0.53)	2,209.67** (0.31)	1,122.62	--	
	5. Other payer	6,312.73	599.33	-51.08	-1,138.13	-2,260.75	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2013	1. Medicare	7,014.61	--				
	2. Medicaid	5,187.01	1,827.60** (0.39)	--			
	3. Private insurance	4,896.16	2,118.46** (0.44)	290.86	--		
	4. Self-Pay	2,780.50	4,234.12* (1.13)	2,406.52* (0.63)	2,115.66* (0.53)	--	
	5. Other payer	4,325.85	2,688.76* (0.61)	861.16	570.30	-1,545.36** (-0.45)	--
2014	1. Medicare	6,085.02	--				
	2. Medicaid	5,366.46	718.56	--			
	3. Private insurance	5,031.34	1,053.68	335.12	--		
	4. Self-Pay	3,931.54	2,153.47	1,434.91	1,099.80	--	
	5. Other payer	8,675.61	-2,590.59	-3,309.15	-3,644.27	-4,744.07	--

*p<.001, **p<.05

Table 99

Post Hoc Results for Health Care Costs - DRG 885

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	7,429.50	--				
	2. Medicaid	5,249.71	2,179.79* (0.31)	--			
	3. Private insurance	6,610.61	818.90** (0.11)	-1,360.90* (-0.22)	--		
	4. Self-Pay	4,216.02	3,213.48* (0.53)	1,033.69* (0.21)	2,394.58* (0.46)	--	
	5. Other payer	4,809.29	2,620.21* (0.36)	440.42	1,801.31* (0.28)	-593.27	--
2008	1. Medicare	8,718.73	--				
	2. Medicaid	6,598.91	2,119.81* (0.23)	--			
	3. Private insurance	5,362.00	3,356.73* (0.42)	1,236.92* (0.16)	--		
	4. Self-Pay	4,166.05	4,552.67* (0.63)	2,432.86* (0.35)	1,195.94* (0.21)	--	
	5. Other payer	5,613.86	3,104.87* (0.39)	985.06* (0.13)	-251.86	-1,447.80* (-0.26)	--
2009	1. Medicare	8,133.93	--				
	2. Medicaid	5,668.09	2,465.84* (0.29)	--			
	3. Private insurance	7,629.82	504.11** (0.06)	-1,961.73* (-0.24)	--		
	4. Self-Pay	3,618.24	4,515.69* (0.65)	2,049.85* (0.35)	4,011.58* (0.62)	--	
	5. Other payer	7,544.39	589.54	-1,876.29* (-0.22)	85.43	-3,926.14* (-0.57)	--
2010	1. Medicare	10,582.18	--				
	2. Medicaid	8,035.24	2,546.93* (0.21)	--			
	3. Private insurance	7,183.64	3,398.54* (0.33)	851.60* (0.08)	--		
	4. Self-Pay	5,501.44	5,080.73* (0.49)	2,533.80* (0.24)	1,682.20* (0.20)	--	
	5. Other payer	5,627.55	4,954.62* (0.48)	2,407.69* (0.23)	1,556.09* (0.19)	-126.11	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2011	1. Medicare	10,894.72	--				
	2. Medicaid	9,464.30	1,430.42* (0.11)	--			
	3. Private insurance	7,183.89	3,710.82* (0.36)	2,280.41* (0.20)	--		
	4. Self-Pay	11,066.67	-171.96	-1,602.37* (-0.13)	-3,882.78* (-0.41)	--	
	5. Other payer	8,686.58	2,208.14* (0.17)	777.72	-1,502.69* (-0.14)	2,380.09* (0.19)	--
2012	1. Medicare	9,097.67	--				
	2. Medicaid	6,939.55	2,158.12* (0.20)	--			
	3. Private insurance	7,132.95	1,964.72* (0.19)	-193.40	--		
	4. Self-Pay	5,360.25	3,737.42* (0.41)	1,579.30* (0.18)	1,772.70* (0.22)	--	
	5. Other payer	7,048.83	2,048.84* (0.19)	-109.28	84.12	-1,688.58* (-0.20)	--
2013	1. Medicare	9,865.89	--				
	2. Medicaid	7,252.22	2,613.67* (0.21)	--			
	3. Private insurance	7,446.58	2,419.31* (0.20)	-194.37	--		
	4. Self-Pay	5,255.50	4,610.39* (0.43)	1,996.72* (0.23)	2,191.08* (0.28)	--	
	5. Other payer	7,367.10	2,498.79* (0.21)	-114.89	79.48	-2,111.60* (-0.26)	--
2014	1. Medicare	10,570.79	--				
	2. Medicaid	7,105.23	3,465.56* (0.28)	--			
	3. Private insurance	6,988.76	3,582.03* (0.32)	116.47	--		
	4. Self-Pay	5,121.64	5,449.16* (0.52)	1,983.59* (0.23)	1,867.13* (0.26)	--	
	5. Other payer	9,636.03	934.77	-2,530.80* (-0.18)	-2,647.26* (-0.21)	-4,514.39* (-0.38)	--

*p<.001, **p<.05

Table 100

Post Hoc Results for Health Care Costs - DRG 894

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2007	1. Medicare	3,174.32	--				
	2. Medicaid	3,376.36	-202.04	--			
	3. Private insurance	2,540.47	633.84	835.89	--		
	4. Self-Pay	2,842.16	332.15	534.20	-301.69	--	
	5. Other payer	5,303.04	-2,128.73	-1,926.68	-2,762.57	-2,460.88	--
2008	1. Medicare	2,990.90	--				
	2. Medicaid	5,671.38	-2,680.48** (-0.47)	--			
	3. Private insurance	2,224.68	766.23	3,446.71* (0.64)	--		
	4. Self-Pay	4,057.76	-1,066.86	1,613.63	-1,833.08* (-0.45)	--	
	5. Other payer	6,658.80	-3,667.90	-987.42	-4,434.13	-2,601.04	--
2009	1. Medicare	3,932.47	--				
	2. Medicaid	4,266.51	-334.04	--			
	3. Private insurance	2,871.32	1,061.15	1,395.19	--		
	4. Self-Pay	4,086.32	-153.85	180.19	-1,215.00** (-0.40)	--	
	5. Other payer	3,655.83	276.65	610.68	-784.50	430.49	--
2010	1. Medicare	4,750.27	--				
	2. Medicaid	5,509.97	-759.71	--			
	3. Private insurance	2,393.77	2,356.50* (0.49)	3,116.21* (0.94)	--		
	4. Self-Pay	5,382.78	-632.52	127.19	-2,989.02* (-0.74)	--	
	5. Other payer	5,409.33	-659.06	100.64	-3,015.56* (-0.75)	-26.55	--
2011	1. Medicare	4,068.87	--				
	2. Medicaid	6,293.13	-2,224.25** (-0.46)	--			
	3. Private insurance	3,400.69	668.18	2,892.44* (0.59)	--		
	4. Self-Pay	3,454.87	614.01	2,838.26* (0.56)	-54.18	--	
	5. Other payer	7,210.73	-3,141.85	-917.60	-3,810.04** (-0.54)	-3,755.86** (-0.52)	--

(table continues)

Year	Type of insurance	Mean	Mean differences (Effect sizes are indicated in parentheses)				
			1	2	3	4	5
2012	1. Medicare	4,957.64	--				
	2. Medicaid	4,680.34	277.30	--			
	3. Private insurance	3,213.38	1,744.26** (0.32)	1,466.96** (0.29)	--		
	4. Self-Pay	5,049.40	-91.76	-369.06	-1,836.02** (-0.31)	--	
	5. Other payer	4,749.55	208.09	-69.21	-1,536.17** (-0.32)	299.85	--
2013	1. Medicare	4,715.54	--				
	2. Medicaid	5,895.21	-1,179.66	--			
	3. Private insurance	3,545.97	1,169.57	2,349.24	--		
	4. Self-Pay	4,967.00	-251.46	928.21	-1,421.03** (-0.27)	--	
	5. Other payer	5,904.73	-1,189.19	-9.52	-2,358.76** (-0.44)	-937.73	--
2014	1. Medicare	4,421.90	--				
	2. Medicaid	6,863.13	-2,441.23* (-0.39)	--			
	3. Private insurance	3,583.29	838.60	3,279.84* (0.52)	--		
	4. Self-Pay	5,888.09	-1,466.19	975.04	-2,304.80** (-0.46)	--	
	5. Other payer	4,663.58	-241.68	2,199.55	-1,080.29	1,224.51	--

*p<.001, **p<.05

Appendix E: Kolmogorov-Smirnova Tests of Normality

Table 101

Kolmogorov-Smirnova Tests of Normality - 2007

DRG	Statistic	df	Sig.
3	0.154	482	.000
23	0.297	890	.000
26	0.264	1,211	.000
153	0.158	769	.000
203	0.244	2,752	.000
207	0.241	2,070	.000
233	0.206	713	.000
234	0.155	783	.000
311	0.093	714	.000
313	0.113	3,745	.000
326	0.217	290	.000
329	0.190	633	.000
373	0.127	61,046	.000
390	0.297	14,845	.000
391	0.294	83,401	.000
392	0.213	4,391	.000
464	0.265	668	.000
470	0.129	5,972	.000
603	0.149	2,582	.000
639	0.131	837	.000
690	0.135	2,514	.000
765	0.239	3,292	.000
766	0.098	8,602	.000
775	0.122	20,365	.000
853	0.171	483	.000
871	0.168	2,889	.000
881	0.263	3,64	.000
882	0.206	129	.000
885	0.199	5,476	.000
894	0.170	255	.000

Table 102

Kolmogorov-Smirnova Tests of Normality - 2008

DRG	Statistic	df	Sig.
3	0.084	1,434	.000
23	0.117	441	.000
26	0.159	1,302	.000
153	0.151	1,822	.000
203	0.132	4,473	.000
207	0.158	2,291	.000
233	0.165	588	.000
234	0.060	1,085	.000
311	0.139	1,320	.000
313	0.108	12,243	.000
326	0.188	687	.000
329	0.179	2,379	.000
373	0.148	676	.000
390	0.132	2,805	.000
391	0.187	2,209	.000
392	0.145	14,376	.000
464	0.179	468	.000
470	0.106	19,214	.000
603	0.143	9,444	.000
639	0.132	2,963	.000
690	0.149	8,946	.000
765	0.236	11,760	.000
766	0.139	28,111	.000
775	0.125	70,332	.000
853	0.188	2,080	.000
871	0.163	14,046	.000
881	0.324	1,777	.000
882	0.208	676	.000
885	0.216	19,860	.000
894	0.304	879	.000

Table 103

Kolmogorov-Smirnova Tests of Normality - 2009

DRG	Statistic	df	Sig.
3	0.096	1,439	.000
23	0.116	529	.000
26	0.143	1,475	.000
153	0.189	3,202	.000
203	0.149	7,534	.000
207	0.158	2,488	.000
233	0.156	798	.000
234	0.073	1,329	.000
311	0.126	1,126	.000
313	0.121	13,501	.000
326	0.167	823	.000
329	0.182	2,385	.000
373	0.153	922	.000
390	0.150	3,031	.000
391	0.204	2,905	.000
392	0.148	16,980	.000
464	0.171	454	.000
470	0.129	20,713	.000
603	0.140	10,785	.000
639	0.117	3,327	.000
690	0.139	10,071	.000
765	0.243	12,760	.000
766	0.139	30,417	.000
775	0.149	76,426	.000
853	0.166	2,497	.000
871	0.162	14,995	.000
881	0.185	2,070	.000
882	0.266	379	.000
885	0.236	24,272	.000
894	0.185	463	.000

Table 104

Kolmogorov-Smirnova Tests of Normality - 2010

DRG	Statistic	df	Sig.
3	0.117	1,107	.000
23	0.145	657	.000
26	0.153	1,252	.000
153	0.163	2,028	.000
203	0.148	6,173	.000
207	0.152	2,144	.000
233	0.150	691	.000
234	0.102	998	.000
311	0.150	1,175	.000
313	0.105	12,058	.000
326	0.141	709	.000
329	0.161	2,094	.000
373	0.118	811	.000
390	0.141	2,639	.000
391	0.206	3,038	.000
392	0.147	15,671	.000
464	0.174	493	.000
470	0.119	19,030	.000
603	0.139	10,645	.000
639	0.131	2,782	.000
690	0.147	8,786	.000
765	0.255	12,184	.000
766	0.117	24,314	.000
775	0.147	67,455	.000
853	0.167	2,563	.000
871	0.163	16,225	.000
881	0.232	2,302	.000
882	0.187	761	.000
885	0.242	22,578	.000
894	0.203	736	.000

Table 105

Kolmogorov-Smirnova Tests of Normality - 2011

DRG	Statistic	df	Sig.
3	0.156	818	.000
23	0.212	400	.000
26	0.152	705	.000
153	0.154	1,427	.000
203	0.140	3,864	.000
207	0.150	1,419	.000
233	0.148	646	.000
234	0.096	966	.000
311	0.136	997	.000
313	0.111	10,771	.000
326	0.206	601	.000
329	0.173	2,120	.000
373	0.121	746	.000
390	0.136	2,812	.000
391	0.195	2,275	.000
392	0.133	15,558	.000
464	0.228	426	.000
470	0.112	20,018	.000
603	0.144	10,362	.000
639	0.120	2,408	.000
690	0.145	8,608	.000
765	0.236	11,534	.000
766	0.126	23,996	.000
775	0.122	61,897	.000
853	0.157	2,723	.000
871	0.149	16,502	.000
881	0.223	1,899	.000
882	0.293	542	.000
885	0.236	24,893	.000
894	0.212	829	.000

Table 106

Kolmogorov-Smirnova Tests of Normality - 2012

DRG	Statistic	df	Sig.
3	0.153	1,149	.000
23	0.154	504	.000
26	0.164	942	.000
153	0.177	2,002	.000
203	0.177	5,489	.000
207	0.174	1,749	.000
233	0.148	626	.000
234	0.115	1,017	.000
311	0.180	927	.000
313	0.118	10,863	.000
326	0.196	673	.000
329	0.187	2,114	.000
373	0.117	838	.000
390	0.133	2,912	.000
391	0.236	2,430	.000
392	0.156	16,375	.000
464	0.198	538	.000
470	0.122	21,686	.000
603	0.154	10,846	.000
639	0.137	2,798	.000
690	0.163	9,126	.000
765	0.228	12,211	.000
766	0.115	23,744	.000
775	0.130	62,934	.000
853	0.195	2,939	.000
871	0.167	18,981	.000
881	0.302	1,923	.000
882	0.270	642	.000
885	0.247	25,342	.000
894	0.224	752	.000

Table 107

Kolmogorov-Smirnova Tests of Normality - 2013

DRG	Statistic	df	Sig.
3	0.154	1,114	.000
23	0.139	544	.000
26	0.155	903	.000
153	0.218	2,258	.000
203	0.151	5,015	.000
207	0.186	1,680	.000
233	0.153	646	.000
234	0.092	975	.000
311	0.120	794	.000
313	0.113	8,668	.000
326	0.177	702	.000
329	0.214	2,090	.000
373	0.125	807	.000
390	0.134	2,835	.000
391	0.245	2,470	.000
392	0.154	15,249	.000
464	0.168	549	.000
470	0.097	22,846	.000
603	0.169	10,473	.000
639	0.111	2,681	.000
690	0.145	8,467	.000
765	0.211	12,440	.000
766	0.115	23,348	.000
775	0.115	62,516	.000
853	0.178	3,351	.000
871	0.193	22,176	.000
881	0.213	1,805	.000
882	0.170	576	.000
885	0.254	25,549	.000
894	0.255	757	.000

Table 108

Kolmogorov-Smirnova Tests of Normality - 2014

DRG	Statistic	df	Sig.
3	0.147	1,119	.000
23	0.161	580	.000
26	0.166	903	.000
153	0.213	2,028	.000
203	0.144	4,347	.000
207	0.203	1,621	.000
233	0.137	680	.000
234	0.100	966	.000
311	0.126	742	.000
313	0.119	7,542	.000
326	0.241	697	.000
329	0.216	2,054	.000
373	0.177	758	.000
390	0.128	2,747	.000
391	0.224	2,590	.000
392	0.153	14,588	.000
464	0.153	548	.000
470	0.104	24,124	.000
603	0.150	10,606	.000
639	0.136	2,489	.000
690	0.145	8,102	.000
765	0.235	12,879	.000
766	0.117	22,892	.000
775	0.128	63,548	.000
853	0.194	3,913	.000
871	0.180	25,678	.000
881	0.205	1,677	.000
882	0.255	626	.000
885	0.255	24,894	.000
894	0.211	689	.000

Appendix F: Homogeneity of Variance and Robust Test of Equality of Means

Table 109

Homogeneity of Variance and Test of Equality of Means - DRG 3

	Year	Statistic	df1	df2	Sig.
Levene	2014	7.218	4	1,114	.000
	2013	4.540	4	1,109	.001
	2012	6.802	4	1,144	.000
	2011	9.641	4	813	.000
	2010	3.885	4	1,102	.004
	2009	4.394	4	1,434	.002
	2008	2.993	4	1,429	.018
	2007	0.531	4	477	.713
Welch	2014	11.706	4	122.827	.000
	2013	5.695	4	133.313	.000
	2012	7.380	4	213.311	.000
	2011	9.524	4	94.324	.000
	2010	4.837	4	214.095	.001
	2009	9.225	4	232.189	.000
	2008	6.555	4	234.396	.000
	2007	21.842	4	60.652	.000

Table 110

Homogeneity of Variance and Test of Equality of Means - DRG 23

	Year	Statistic	df1	df2	Sig.
Levene	2014	5.743	4	575	.000
	2013	5.129	4	539	.000
	2012	10.242	4	499	.000
	2011	20.487	4	395	.000
	2010	13.800	4	652	.000
	2009	3.771	4	524	.005
	2008	1.768	4	436	.134
	2007	3.369	4	885	.010
Welch	2014	6.913	4	75.485	.000
	2013	2.277	4	104.335	.066
	2012	3.336	4	124.646	.012
	2011	5.097	4	48.157	.002
	2010	6.404	4	130.434	.000
	2009	2.991	4	87.860	.023
	2008	0.662	4	74.715	.621
	2007	1.429	4	125.196	.228

Table 111

Homogeneity of Variance and Test of Equality of Means - DRG 26

	Year	Statistic	df1	df2	Sig.
Levene	2014	9.705	4	898	.000
	2013	4.331	4	898	.002
	2012	9.012	4	937	.000
	2011	16.449	4	700	.000
	2010	19.834	4	1,247	.000
	2009	28.371	4	1,470	.000
	2008	16.793	4	1,297	.000
	2007	11.612	4	1,206	.000
Welch	2014	5.970	4	105.933	.000
	2013	3.719	4	149.976	.006
	2012	5.970	4	164.607	.000
	2011	6.093	4	88.023	.000
	2010	12.303	4	224.255	.000
	2009	8.080	4	168.069	.000
	2008	8.045	4	157.628	.000
	2007	25.299	4	152.141	.000

Table 112

Homogeneity of Variance and Test of Equality of Means - DRG 153

	Year	Statistic	df1	df2	Sig.
Levene	2014	8.926	4	2,023	.000
	2013	7.031	4	2,253	.000
	2012	0.812	4	1,997	.518
	2011	5.412	4	1,422	.000
	2010	9.127	4	2,023	.000
	2009	4.593	4	3,197	.001
	2008	4.797	4	1,817	.001
	2007	6.115	4	764	.000
Welch	2014	13.846	4	254.339	.000
	2013	12.911	4	542.583	.000
	2012	13.789	4	392.590	.000
	2011	15.237	4	271.258	.000
	2010	14.209	4	353.099	.000
	2009	15.206	4	508.362	.000
	2008	14.465	4	307.181	.000
	2007	11.566	4	104.975	.000

Table 113

Homogeneity of Variance and Test of Equality of Means - DRG 203

	Year	Statistic	df1	df2	Sig.
Levene	2014	7.781	4	4,342	.000
	2013	3.826	4	5,010	.004
	2012	1.607	4	5,484	.170
	2011	13.247	4	3,859	.000
	2010	4.691	4	6,168	.001
	2009	31.373	4	7,529	.000
	2008	5.992	4	4,468	.000
	2007	10.136	4	2,747	.000
Welch	2014	17.120	4	447.715	.000
	2013	15.618	4	800.634	.000
	2012	18.090	4	928.752	.000
	2011	43.173	4	707.003	.000
	2010	16.684	4	893.294	.000
	2009	49.849	4	996.599	.000
	2008	39.028	4	688.845	.000
	2007	29.101	4	435.976	.000

Table 114

Homogeneity of Variance and Test of Equality of Means - DRG 207

	Year	Statistic	df1	df2	Sig.
Levene	2014	13.943	4	1,616	.000
	2013	12.662	4	1,675	.000
	2012	13.399	4	1,744	.000
	2011	5.883	4	1,414	.000
	2010	4.593	4	2,139	.001
	2009	15.782	4	2,483	.000
	2008	10.089	4	2,286	.000
	2007	5.935	4	2,065	.000
Welch	2014	6.218	4	143.797	.000
	2013	3.441	4	225.611	.009
	2012	12.021	4	216.197	.000
	2011	2.925	4	121.547	.024
	2010	1.342	4	173.646	.256
	2009	8.268	4	244.915	.000
	2008	12.768	4	257.851	.000
	2007	8.569	4	265.934	.000

Table 115

Homogeneity of Variance and Test of Equality of Means - DRG 233

	Year	Statistic	df1	df2	Sig.
Levene	2014	2.726	4	675	.029
	2013	1.643	4	641	.162
	2012	5.103	4	621	.000
	2011	1.243	4	641	.291
	2010	1.385	4	686	.238
	2009	2.188	4	793	.069
	2008	4.141	4	583	.003
	2007	0.838	4	708	.501
Welch	2014	2.790	4	61.621	.034
	2013	2.152	4	129.766	.078
	2012	4.280	4	118.256	.003
	2011	1.407	4	89.318	.238
	2010	1.193	4	84.962	.320
	2009	1.270	4	91.655	.288
	2008	7.998	4	104.648	.000
	2007	0.934	4	53.035	.452

Table 116

Homogeneity of Variance and Test of Equality of Means - DRG 234

	Year	Statistic	df1	df2	Sig.
Levene	2014	2.582	4	961	.036
	2013	3.275	4	970	.011
	2012	2.514	4	1,012	.040
	2011	2.187	4	961	.069
	2010	5.128	4	993	.000
	2009	0.551	4	1,324	.698
	2008	1.465	4	1,080	.211
	2007	4.393	4	778	.002
Welch	2014	3.822	4	62.147	.008
	2013	2.123	4	169.042	.080
	2012	2.513	4	151.023	.044
	2011	1.505	4	148.197	.203
	2010	4.347	4	133.066	.002
	2009	3.422	4	131.216	.011
	2008	4.058	4	128.962	.004
	2007	2.259	4	81.513	.070

Table 117

Homogeneity of Variance and Test of Equality of Means - DRG 311

	Year	Statistic	df1	df2	Sig.
Levene	2014	3.351	4	737	.010
	2013	1.808	4	789	.125
	2012	6.490	4	922	.000
	2011	4.146	4	992	.002
	2010	2.013	4	1,170	.091
	2009	3.440	4	1,121	.008
	2008	12.244	4	1,315	.000
	2007	0.867	4	709	.483
Welch	2014	1.628	4	90.984	.174
	2013	2.143	4	203.269	.077
	2012	4.893	4	259.508	.001
	2011	6.085	4	205.580	.000
	2010	4.914	4	327.005	.001
	2009	3.001	4	227.863	.019
	2008	9.170	4	228.487	.000
	2007	0.268	4	89.460	.898

Table 118

Homogeneity of Variance and Test of Equality of Means - DRG 313

	Year	Statistic	df1	df2	Sig.
Levene	2014	18.003	4	7,537	.000
	2013	13.768	4	8,663	.000
	2012	21.269	4	10,858	.000
	2011	18.032	4	10,766	.000
	2010	22.641	4	12,053	.000
	2009	29.976	4	13,496	.000
	2008	46.925	4	12,238	.000
	2007	12.962	4	3,740	.000
Welch	2014	21.326	4	1,154.661	.000
	2013	17.410	4	2,717.057	.000
	2012	42.273	4	3,668.738	.000
	2011	20.575	4	2,797.007	.000
	2010	36.016	4	3,739.346	.000
	2009	27.194	4	3,686.394	.000
	2008	92.928	4	2,736.784	.000
	2007	21.385	4	741.853	.000

Table 119

Homogeneity of Variance and Test of Equality of Means - DRG 326

	Year	Statistic	df1	df2	Sig.
Levene	2014	6.311	4	692	.000
	2013	4.018	4	697	.003
	2012	2.574	4	668	.037
	2011	3.262	4	596	.012
	2010	6.239	4	704	.000
	2009	3.211	4	818	.013
	2008	8.545	4	682	.000
	2007	0.794	4	285	.530
Welch	2014	2.694	4	81.278	.037
	2013	1.210	4	153.494	.309
	2012	1.677	4	124.980	.159
	2011	21.563	4	145.023	.000
	2010	1.277	4	139.672	.282
	2009	6.032	4	147.935	.000
	2008	2.834	4	115.127	.028
	2007	0.390	4	43.581	.815

Table 120

Homogeneity of Variance and Test of Equality of Means - DRG 329

	Year	Statistic	df1	df2	Sig.
Levene	2014	32.569	4	2,049	.000
	2013	15.783	4	2,085	.000
	2012	8.198	4	2,109	.000
	2011	14.932	4	2,115	.000
	2010	17.403	4	2,089	.000
	2009	10.120	4	2,380	.000
	2008	31.288	4	2,374	.000
	2007	10.285	4	628	.000
Welch	2014	4.954	4	120.572	.001
	2013	6.640	4	360.308	.000
	2012	5.256	4	303.572	.000
	2011	13.021	4	254.601	.000
	2010	16.748	4	280.584	.000
	2009	4.554	4	304.075	.001
	2008	7.335	4	289.580	.000
	2007	8.765	4	60.494	.000

Table 121

Homogeneity of Variance and Test of Equality of Means - DRG 373

	Year	Statistic	df1	df2	Sig.
Levene	2014	3.765	4	753	.005
	2013	1.735	4	802	.140
	2012	3.376	4	833	.009
	2011	3.693	4	741	.005
	2010	8.889	4	806	.000
	2009	0.646	4	917	.630
	2008	2.563	4	671	.037
	2007	73.268	4	61,041	.000
Welch	2014	1.388	4	78.957	.246
	2013	1.906	4	189.082	.111
	2012	2.077	4	199.185	.085
	2011	7.533	4	172.243	.000
	2010	2.573	4	188.946	.039
	2009	0.516	4	150.071	.724
	2008	3.327	4	116.464	.013
	2007	76.014	4	1,847.060	.000

Table 122

Homogeneity of Variance and Test of Equality of Means - DRG 390

	Year	Statistic	df1	df2	Sig.
Levene	2014	4.397	4	2,742	.002
	2013	2.931	4	2,830	.020
	2012	2.645	4	2,907	.032
	2011	8.586	4	2,807	.000
	2010	0.453	4	2,634	.770
	2009	6.277	4	3,026	.000
	2008	5.497	4	2,800	.000
	2007	82.247	4	14,840	.000
Welch	2014	7.335	4	332.621	.000
	2013	5.328	4	567.069	.000
	2012	8.520	4	569.488	.000
	2011	9.514	4	483.664	.000
	2010	7.564	4	458.314	.000
	2009	5.128	4	448.819	.000
	2008	9.819	4	383.576	.000
	2007	101.224	4	1,014.393	.000

Table 123

Homogeneity of Variance and Test of Equality of Means - DRG 391

	Year	Statistic	df1	df2	Sig.
Levene	2014	6.330	4	2,585	.000
	2013	2.552	4	2,465	.037
	2012	4.302	4	2,425	.002
	2011	2.014	4	2,270	.090
	2010	1.712	4	3,033	.145
	2009	4.365	4	2,900	.002
	2008	2.982	4	2,204	.018
	2007	2,764.925	4	83,396	.000
Welch	2014	0.811	4	201.217	.519
	2013	3.316	4	442.033	.011
	2012	3.491	4	356.437	.008
	2011	3.500	4	298.721	.008
	2010	1.680	4	488.669	.153
	2009	4.778	4	384.294	.001
	2008	0.944	4	287.713	.439
	2007	84.165	4	2,269.164	.000

Table 124

Homogeneity of Variance and Test of Equality of Means - DRG 392

	Year	Statistic	df1	df2	Sig.
Levene	2014	3.800	4	14,583	.004
	2013	8.194	4	15,244	.000
	2012	7.268	4	16,370	.000
	2011	6.751	4	15,553	.000
	2010	4.818	4	15,666	.001
	2009	8.880	4	16,975	.000
	2008	24.137	4	14,371	.000
	2007	2.136	4	4,386	.074
Welch	2014	32.125	4	1,803.768	.000
	2013	40.152	4	3,551.085	.000
	2012	44.256	4	3,813.917	.000
	2011	41.507	4	3,361.174	.000
	2010	35.912	4	3,345.568	.000
	2009	37.796	4	3,319.858	.000
	2008	61.060	4	2,512.793	.000
	2007	7.485	4	696.765	.000

Table 125

Homogeneity of Variance and Test of Equality of Means - DRG 464

	Year	Statistic	df1	df2	Sig.
Levene	2014	6.181	4	543	.000
	2013	4.292	4	544	.002
	2012	6.696	4	533	.000
	2011	18.670	4	421	.000
	2010	5.532	4	488	.000
	2009	6.027	4	449	.000
	2008	5.524	4	463	.000
	2007	2.764	4	663	.027
Welch	2014	2.183	4	80.352	.078
	2013	1.264	4	130.074	.287
	2012	3.833	4	141.859	.005
	2011	3.028	4	71.178	.023
	2010	2.349	4	157.115	.057
	2009	3.070	4	115.901	.019
	2008	4.519	4	120.155	.002
	2007	0.882	4	141.322	.476

Table 126

Homogeneity of Variance and Test of Equality of Means - DRG 470

	Year	Statistic	df1	df2	Sig.
Levene	2014	12.546	4	24,119	.000
	2013	11.511	4	22,841	.000
	2012	11.038	4	21,681	.000
	2011	40.542	4	20,013	.000
	2010	19.994	4	19,025	.000
	2009	7.881	4	20,708	.000
	2008	15.822	4	19,209	.000
	2007	16.558	4	5,967	.000
Welch	2014	13.066	4	672.778	.000
	2013	5.969	4	710.000	.000
	2012	7.096	4	802.398	.000
	2011	34.294	4	434.290	.000
	2010	20.555	4	728.484	.000
	2009	4.844	4	582.111	.001
	2008	34.463	4	427.938	.000
	2007	16.510	4	292.624	.000

Table 127

Homogeneity of Variance and Test of Equality of Means - DRG 603

	Year	Statistic	df1	df2	Sig.
Levene	2014	8.437	4	10,601	.000
	2013	7.952	4	10,468	.000
	2012	5.546	4	10,841	.000
	2011	10.320	4	10,357	.000
	2010	18.606	4	10,640	.000
	2009	6.801	4	10,780	.000
	2008	11.904	4	9,439	.000
	2007	3.241	4	2,577	.012
Welch	2014	15.356	4	1,627.693	.000
	2013	21.159	4	4,040.416	.000
	2012	17.987	4	3,939.376	.000
	2011	28.499	4	3,540.227	.000
	2010	40.946	4	3,801.775	.000
	2009	19.563	4	3,169.619	.000
	2008	34.763	4	2,925.208	.000
	2007	10.159	4	749.066	.000

Table 128

Homogeneity of Variance and Test of Equality of Means - DRG 639

	Year	Statistic	df1	df2	Sig.
Levene	2014	2.272	4	2,484	.059
	2013	1.192	4	2,676	.312
	2012	4.236	4	2,793	.002
	2011	6.382	4	2,403	.000
	2010	3.451	4	2,777	.008
	2009	1.095	4	3,322	.357
	2008	16.135	4	2,958	.000
	2007	4.315	4	832	.002
Welch	2014	4.850	4	504.069	.001
	2013	1.398	4	1,045.668	.233
	2012	4.734	4	1,179.763	.001
	2011	9.526	4	858.890	.000
	2010	6.686	4	1,210.530	.000
	2009	1.544	4	1,118.797	.187
	2008	11.410	4	964.439	.000
	2007	1.616	4	267.160	.170

Table 129

Homogeneity of Variance and Test of Equality of Means - DRG 690

	Year	Statistic	df1	df2	Sig.
Levene	2014	2.936	4	8,097	.019
	2013	6.890	4	8,462	.000
	2012	2.929	4	9,121	.020
	2011	5.629	4	8,603	.000
	2010	9.800	4	8,781	.000
	2009	15.197	4	10,066	.000
	2008	10.174	4	8,941	.000
	2007	3.167	4	2,509	.013
Welch	2014	13.209	4	638.149	.000
	2013	20.660	4	1,219.399	.000
	2012	20.134	4	1,245.986	.000
	2011	24.179	4	1,029.060	.000
	2010	31.084	4	1,180.292	.000
	2009	35.966	4	1,212.844	.000
	2008	32.290	4	879.101	.000
	2007	18.518	4	288.925	.000

Table 130

Homogeneity of Variance and Test of Equality of Means - DRG 765

	Year	Statistic	df1	df2	Sig.
Levene	2014	3.417	4	12,874	.008
	2013	6.073	4	12,435	.000
	2012	1.282	4	12,206	.274
	2011	1.745	4	11,529	.137
	2010	4.458	4	12,179	.001
	2009	1.569	4	12,755	.180
	2008	15.216	4	11,755	.000
	2007	1.418	4	3,287	.225
Welch	2014	7.785	4	593.738	.000
	2013	10.403	4	489.765	.000
	2012	2.503	4	473.894	.042
	2011	1.184	4	298.415	.318
	2010	5.585	4	379.914	.000
	2009	0.882	4	339.986	.475
	2008	13.708	4	382.196	.000
	2007	0.923	4	77.526	.455

Table 131

Homogeneity of Variance and Test of Equality of Means - DRG 766

	Year	Statistic	df1	df2	Sig.
Levene	2014	11.402	4	22,887	.000
	2013	28.260	4	23,343	.000
	2012	21.820	4	23,739	.000
	2011	10.049	4	23,991	.000
	2010	26.069	4	24,309	.000
	2009	9.699	4	30,412	.000
	2008	52.737	4	28,106	.000
	2007	4.540	4	8,597	.001
Welch	2014	37.010	4	634.640	.000
	2013	58.743	4	577.298	.000
	2012	32.118	4	513.503	.000
	2011	18.809	4	325.948	.000
	2010	29.060	4	362.017	.000
	2009	3.438	4	495.479	.009
	2008	56.449	4	537.923	.000
	2007	24.579	4	143.711	.000

Table 132

Homogeneity of Variance and Test of Equality of Means - DRG 775

	Year	Statistic	df1	df2	Sig.
Levene	2014	18.390	4	63,543	.000
	2013	34.418	4	62,511	.000
	2012	22.559	4	62,929	.000
	2011	11.043	4	61,892	.000
	2010	34.283	4	67,450	.000
	2009	41.970	4	76,421	.000
	2008	46.575	4	70,327	.000
	2007	2.687	4	20,360	.030
Welch	2014	45.424	4	1,611.349	.000
	2013	98.679	4	1,624.203	.000
	2012	64.461	4	1,333.897	.000
	2011	58.313	4	771.804	.000
	2010	131.257	4	892.275	.000
	2009	24.958	4	1,058.923	.000
	2008	67.229	4	1,474.428	.000
	2007	19.560	4	383.403	.000

Table 133

Homogeneity of Variance and Test of Equality of Means - DRG 853

	Year	Statistic	df1	df2	Sig.
Levene	2014	14.325	4	3,908	.000
	2013	12.079	4	3,346	.000
	2012	12.525	4	2,934	.000
	2011	13.351	4	2,718	.000
	2010	18.702	4	2,558	.000
	2009	11.180	4	2,492	.000
	2008	11.586	4	2,075	.000
	2007	2.459	4	478	.045
Welch	2014	6.035	4	357.961	.000
	2013	13.333	4	659.756	.000
	2012	5.299	4	444.583	.000
	2011	8.902	4	393.137	.000
	2010	8.396	4	371.135	.000
	2009	5.835	4	307.800	.000
	2008	5.318	4	251.904	.000
	2007	1.193	4	43.285	.328

Table 134

Homogeneity of Variance and Test of Equality of Means - DRG 871

	Year	Statistic	df1	df2	Sig.
Levene	2014	28.671	4	25,673	.000
	2013	35.567	4	22,171	.000
	2012	31.236	4	18,976	.000
	2011	29.824	4	16,497	.000
	2010	25.815	4	16,220	.000
	2009	21.603	4	14,990	.000
	2008	24.244	4	14,041	.000
	2007	4.192	4	2,884	.002
Welch	2014	17.120	4	1,630.802	.000
	2013	13.628	4	2,297.481	.000
	2012	17.033	4	1,961.552	.000
	2011	17.571	4	1,266.774	.000
	2010	12.054	4	1,287.933	.000
	2009	7.837	4	1,166.572	.000
	2008	15.971	4	994.725	.000
	2007	2.234	4	183.806	.067

Table 135

Homogeneity of Variance and Test of Equality of Means - DRG 881

	Year	Statistic	df1	df2	Sig.
Levene	2014	11.151	4	1,672	.000
	2013	9.983	4	1,800	.000
	2012	2.174	4	1,918	.070
	2011	20.835	4	1,894	.000
	2010	12.663	4	2,297	.000
	2009	5.346	4	2,065	.000
	2008	11.133	4	1,772	.000
	2007	9.434	4	359	.000
Welch	2014	7.693	4	390.032	.000
	2013	33.950	4	790.094	.000
	2012	7.519	4	802.065	.000
	2011	19.694	4	696.615	.000
	2010	25.499	4	931.537	.000
	2009	12.099	4	547.670	.000
	2008	10.244	4	516.942	.000
	2007	11.014	4	139.963	.000

Table 136

Homogeneity of Variance and Test of Equality of Means - DRG 882

	Year	Statistic	df1	df2	Sig.
Levene	2014	4.382	4	621	.002
	2013	5.400	4	571	.000
	2012	2.312	4	637	.056
	2011	1.056	4	537	.378
	2010	6.267	4	756	.000
	2009	3.282	4	374	.012
	2008	3.154	4	671	.014
	2007	9.785	4	124	.000
Welch	2014	1.690	4	143.137	.156
	2013	15.990	4	257.289	.000
	2012	4.390	4	285.493	.002
	2011	0.923	4	251.877	.451
	2010	20.420	4	344.640	.000
	2009	3.461	4	99.245	.011
	2008	3.073	4	190.335	.018
	2007	2.471	4	36.930	.061

Table 137

Homogeneity of Variance and Test of Equality of Means - DRG 885

	Year	Statistic	df1	df2	Sig.
Levene	2014	94.656	4	24,889	.000
	2013	61.365	4	25,544	.000
	2012	39.748	4	25,337	.000
	2011	96.552	4	24,888	.000
	2010	146.662	4	22,573	.000
	2009	129.851	4	24,267	.000
	2008	117.692	4	19,855	.000
	2007	23.137	4	5,471	.000
Welch	2014	149.005	4	3,686.595	.000
	2013	116.387	4	8,870.925	.000
	2012	92.899	4	8,719.115	.000
	2011	140.984	4	7,222.703	.000
	2010	182.635	4	7,133.104	.000
	2009	285.302	4	3,949.661	.000
	2008	196.469	4	3,633.558	.000
	2007	43.079	4	1,125.301	.000

Table 138

Homogeneity of Variance and Test of Equality of Means - DRG 894

	Year	Statistic	df1	df2	Sig.
Levene	2014	10.903	4	684	.000
	2013	2.557	4	752	.038
	2012	2.492	4	747	.042
	2011	12.087	4	824	.000
	2010	13.533	4	731	.000
	2009	2.881	4	458	.022
	2008	15.220	4	874	.000
	2007	2.182	4	250	.072
Welch	2014	9.627	4	168.504	.000
	2013	4.295	4	323.920	.002
	2012	3.821	4	328.597	.005
	2011	8.143	4	251.958	.000
	2010	28.064	4	229.567	.000
	2009	4.016	4	194.121	.004
	2008	11.827	4	240.061	.000
	2007	1.396	4	48.652	.249

Appendix G: HCUP Data Use Agreement

DATA USE AGREEMENT for the Nationwide Databases from the Healthcare Cost and Utilization Project Agency for Healthcare Research and Quality

This Data Use Agreement ("Agreement") governs the disclosure and use of data in the HCUP Nationwide Databases from the Healthcare Cost and Utilization Project (HCUP) which are maintained by the Center for Delivery, Organization, and Markets (CDOM) within the Agency for Healthcare Research and Quality (AHRQ). The HCUP Nationwide databases include the National (Nationwide) Inpatient Sample (NIS), Kids' Inpatient Database (KID), Nationwide Emergency Department Sample (NEDS), and Nationwide Readmissions Database (NRD). Any person ("the data recipient") seeking permission from AHRQ to access HCUP Nationwide Databases must sign and submit this Agreement to AHRQ or its agent, and complete the online Data Use Agreement Training Course at http://www.hcup-us.ahrq.gov, as a precondition to the granting of such permission.

Section 944(c) of the Public Health Service Act (42 U.S.C. 299c-3(c)) ("the AHRQ Confidentiality Statute"), requires that data collected by AHRQ that identify individuals or establishments be used only for the purpose for which they were supplied. Pursuant to this Agreement, data released to AHRQ for the HCUP Databases are subject to the data standards and protections established by the Health Insurance Portability and Accountability Act of 1996 (HIPAA) (P.L. 104-191) and implementing regulations ("the Privacy Rule"). Accordingly, HCUP Databases may only be released in "limited data set" form, as that term is defined by the Privacy Rule, 45 C.F.R. § 164.514(e). HCUP data may only be used by the data recipient for research which may include analysis and aggregate statistical reporting. AHRQ classifies HCUP data as protected health information under the HIPAA Privacy Rule, 45 C.F.R. § 160.103. By executing this Agreement, the data recipient understands and affirms that HCUP data may only be used for the prescribed purposes, and consistent with the following standards:

No Identification of Persons–The AHRQ Confidentiality Statute prohibits the use of HCUP data to identify any person (including but not limited to patients, physicians, and other health care providers). The use of HCUP Databases to identify any person constitutes a violation of this Agreement and may constitute a violation of the AHRQ Confidentiality Statute and the HIPAA Privacy Rule. This Agreement prohibits data recipients from releasing, disclosing, publishing, or presenting any individually identifying information obtained under its terms. AHRQ omits from the data set all direct identifiers that are required to be excluded from limited data sets as consistent with the HIPAA Privacy Rule. AHRQ and the data recipient(s) acknowledge that it may be possible for a data recipient, through deliberate technical analysis of the data sets and with outside information, to attempt to ascertain the identity of particular persons. Risk of individual identification of persons is increased when observations (i.e., individual discharge records) in any given cell of tabulated data is less than or equal to 10. This Agreement expressly prohibits any attempt to identify individuals, including by the use of vulnerability analysis or penetration testing. In addition, methods that could be used to identify individuals directly or indirectly shall not be disclosed, released, or published. Data recipients shall not attempt to contact individuals for any purpose whatsoever, including verifying information supplied in the data set. Any questions about the data must be referred exclusively to AHRQ. By executing this Agreement, the data recipient understands and agrees that actual and considerable harm will ensue if he or she attempts to identify individuals. The data recipient also understands and agrees that actual and considerable harm will ensue if he or she intentionally or negligently discloses, releases, or publishes information that identifies individuals or can be used to identify individuals.

Use of Establishment Identifiers–The AHRQ Confidentiality Statute prohibits the use of HCUP data to identify establishments unless the individual establishment has consented. Permission is obtained from the HCUP data sources (i.e., state data organizations, hospital associations, and data consortia) to use the identification of hospital establishments (when such identification appears in the data sets) for research, analysis, and aggregate statistical reporting. This may include linking institutional information from outside data sets for these purposes. Such purpose does *not* include the use of information in the data sets concerning

individual establishments for commercial or competitive purposes involving those individual establishments, or to determine the rights, benefits, or privileges of establishments. Data recipients are prohibited from identifying establishments directly or by inference in disseminated material. In addition, users of the data are prohibited from contacting establishments for the purpose of verifying information supplied in the data set. Any questions about the data must be referred exclusively to AHRQ. Misuse of identifiable HCUP data about hospitals or any other establishment constitutes a violation of this Agreement and may constitute a violation of the AHRQ Confidentiality Statute.

The undersigned data recipients provide the following affirmations concerning HCUP data:

Protection of Individuals

- I will not release or disclose, and will take all necessary and reasonable precautions to prohibit others from releasing or disclosing, any information that directly or indirectly identifies persons. This includes attempts to identify individuals through the use of vulnerability analysis or penetration testing. I acknowledge that the release or disclosure of information where the number of observations (i.e., individual discharge records) in any given cell of tabulated data is *less than or equal to 10* can increase the risk for identification of persons. I will consider this risk and avoid publication of cell sizes less than or equal to 10.

- I will not attempt to link, and will prohibit others from attempting to link, the discharge records of persons in the data set with individually identifiable records from any other source.

- I will not attempt to use and will take all necessary and reasonable precautions to prohibit others from using the data set to contact any persons in the data for any purpose.

Protection of Establishments

- I will not publish or report, through any medium, data that could identify individual establishments directly or by inference.

- When the identities of establishments are not provided in the data sets, I will not attempt to use and will take all necessary and reasonable precautions to prohibit others from using the data set to learn the identity of any establishment.

- In accordance with the AHRQ Confidentiality Statute, I will not use and will take all necessary and reasonable precautions to prohibit others from using the data set concerning individual establishments: (1) for commercial or competitive purposes involving those individual establishments; or (2) to determine the rights, benefits, or privileges of individual establishments.

- I will not contact and will take all necessary and reasonable precautions to prohibit others from contacting establishments identified in the data set to question, verify, or discuss data in the HCUP databases.

- I acknowledge that the HCUP NIS, KID, and NRD may contain data elements from proprietary restricted computer software (3M™ APR DRGs, OptumInsight APS-DRGs, and Truven Health Analytics Disease Staging) supplied by private vendors to AHRQ for the sole purpose of supporting research and analysis with the HCUP NIS, KID, and NRD. While I may freely use these data elements in my research work using the HCUP NIS, KID, and NRD I agree that I will not use and will prohibit others from using these proprietary data elements for any commercial purpose. In addition, I will enter into a separate agreement with the appropriate organization or firm for the right to use such proprietary data elements for commercial purposes. In particular, I agree not to disassemble, decompile, or otherwise reverse-engineer the proprietary software, and I will prohibit others from doing so.

Limitations on the Disclosure of Data and Safeguards

- I, the undersigned data recipient, acknowledge and affirm that I am personally responsible for compliance with the terms of this Agreement, to the exclusion of any other party, regardless of such party's role in sponsoring or funding the research that is the subject of this Agreement.

- I will not release or disclose, and will prohibit others from releasing or disclosing, the data set or any part to any person who is not an employee, member, or contractor of the organization (specified below), except with the express written approval of AHRQ. I acknowledge that when releasing or disclosing the data set or any part to others in my organization, I retain full responsibility for the privacy and security of the data and will prohibit others from further release or disclosure of the data.

- I will not redistribute HCUP data by posting on any Website or other publically-accessible online repository.

- I will require others employed in my organization who will use or will have access to HCUP data to become authorized users of the data set by signing a copy of this data use agreement and completing the online Data Use Agreement Training Course at http://www.hcup-us.ahrq.gov. Before granting any individual access to the data set, I will submit the signed data use agreements to the address at the end of this Agreement.

- I will ensure that the data are kept in a secured environment and that only authorized users will have access to the data.

- I will not use or disclose and I will prohibit others from using or disclosing the data set, or any part thereof, except for research, analysis, and aggregate statistical reporting, and only as permitted by this Agreement.

- I acknowledge and affirm that interpretations, conclusions, and/or opinions that I reach as a result of my analyses of the data sets are my interpretations, conclusions, and/or opinions, and do not constitute the findings, policies, or recommendations of the U.S. Government, the U.S. Department of Health and Human Services, or AHRQ.

- I will indemnify, defend, and hold harmless AHRQ and the data organizations that provide data to AHRQ for HCUP from any or all claims and losses accruing to any person, organizations, or other legal entity as a result of violation of this agreement. This provision applies only to the extent permitted by Federal and State law.

- I agree to acknowledge in all reports based on these data that the source of the data is the "National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality." Substitute "Nationwide Inpatient Sample (NIS)" (if using data prior to 2012), "Kids' Inpatient Database (KID)," "Nationwide Emergency Department Sample (NEDS)," or "Nationwide Readmissions Database (NRD)" as appropriate.

- I agree to report the violation or apparent violation of any term of this Agreement to AHRQ without unreasonable delay and in no case later than 30 calendar days of becoming aware of the violation or apparent violation.

Terms, Breach, and Compliance

Any violation of the terms of this Agreement shall be grounds for immediate termination of this Agreement. AHRQ shall determine whether a data recipient has violated any term of the Agreement. AHRQ shall determine what actions, if any, are necessary to remedy a violation of this Agreement, and the data recipient(s) shall comply with pertinent instructions from AHRQ. Actions taken by AHRQ may include but not be limited to providing notice of the termination or violation to affected parties and prohibiting data recipient(s) from accessing HCUP data in the future.

In the event AHRQ terminates this Agreement due to a violation, or finds the data recipient(s) to be in violation of this Agreement, AHRQ may direct that the undersigned data recipient(s) immediately return all copies of the HCUP Nationwide Databases to AHRQ or its designee without refund of purchase fees.

Acknowledgment

I understand that this Agreement is requested by the United States Agency for Healthcare Research and Quality to ensure compliance with the AHRQ Confidentiality Statute. My signature indicates that I understand the terms of this Agreement and that I agree to comply with its terms. I understand that a violation of the AHRQ Confidentiality Statute may be subject to a civil penalty of up to $10,000 under 42 U.S.C. 299c-3(d), and that deliberately making a false statement about this or any matter within the jurisdiction of any department or agency of the Federal Government violates 18 U.S.C. § 1001 and is punishable by a fine of up to $10,000 or up to five years in prison. Violators of this Agreement may also be subject to penalties under state confidentiality statutes that apply to these data for particular states.

Signed: _____ Date: 11-27-2016

Print or Type Name: Macey Buker

Title: Student

Organization: Walden University

Address: 1319 N 2090 W

Address: _____

City: Clinton State: UT ZIP Code: 84015

Phone: 801-599-7732 Fax: _____

E-mail: macey.buker@waldenu.edu

The information above is maintained by AHRQ only for the purpose of enforcement of this Agreement.

Note to Purchaser: Shipment of the requested data product will only be made to the person who signs this Agreement, unless special arrangements that safeguard the data are made with AHRQ or its agent.

Submission Information

Please send signed HCUP Data Use Agreements and proof of online training to:

HCUP Central Distributor
Social & Scientific Systems, Inc.
8757 Georgia Avenue, 12th Floor
Silver Spring, MD 20910
E-mail: HCUPDistributor@AHRQ.gov
Fax: (866) 792-5313

CERTIFICATE OF COMPLETION

Awarded To

Macey Buker

For Successfully Completing

HCUP DATA USE AGREEMENT TRAINING

On

11/26/2016

YOUR CERTIFICATION CODE IS:

HCUP-348J31IVU

DEPARTMENT OF HEALTH & HUMAN SERVICES • USA

AHRQ

Agency for Healthcare Research and Quality

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H·CUP

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