6-2011

Regional Variation in the Length of Hospital Stay and Insurance Coverage: A State-wide Variation in Length of Stay and Insurance Types

Samuel S. Yoon
Union College - Schenectady, NY

REGIONAL VARIATION IN THE LENGTH OF HOSPITAL STAY AND INSURANCE COVERAGE: A STATE-WIDE VARIATION IN LENGTH OF STAY AND INSURANCE TYPES

by

Samuel S. Yoon

* * * * * * * * * *

Submitted in partial fulfillment
of the requirements for
Honors in the Department of Economics

UNION COLLEGE
June, 2011

Abstract

YOON, SAMUEL S. Regional Variation in the Length of Hospital Stay and Insurance Coverage: A State-wide Variation in Length of Stay and Insurance Types Department of Economics, June 2011.

With the continuously growing healthcare expenditure, it is important to examine the causes of this phenomenon. Length of hospital stay is one possible cause. Using the panel data from 2001 – 2008 Healthcare Cost and Utilization Project, Statehealthfacts.org, Center for Disease Control and Prevention Behavioral Risk Factor Surveillance System, Almanac of Hospital Financial & Operating Indicators 2007, and Current Population Survey March Supplements, this paper utilizes regression analysis to investigate geographic variation on the length of stay, focusing on the relationship between the different insurance types and the length of stay.

As a variety of insurance types offers different reimbursement rates, hospitals may discharge patients earlier, thereby affecting the length of stay. In addition to the effect of insurance, this paper examines the effect of other factors such as demographics, lifestyle, and supply availabilities on the length of stay.

The study finds that there is a state-level variation in the length of stay and that length of stay varies depending on the percentage of people covered by different insurance types. This calls for legislation changes in some states to reduce healthcare spending.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER ONE

INTRODUCTION

A. Historic Healthcare Spending Trend

The United States has been experiencing continuous rise in healthcare spending (Martin et al., 2011). While the increase in the United States health care spending slowed in 2009 with the growth rate of 4.0 percent, the part of GDP that was spent in healthcare expenditure increased from 16.6 percent in 2008 to 17.6 percent in 2009 (Martin et al., 2011). Furthermore, compared to the other OECD countries, the United States spent too much on healthcare: while the United States used 15.3 percent of its GDP in 2004, the non-U.S. OECD countries spent less portion of GDP on healthcare expenditure, with penultimate Switzerland spending 11.6 percent (Anderson, Frogner and Reinhardt, 2007). With the soaring healthcare expenditure that takes up more and more portion of the US GDP, politicians have attempted to stop the rise with various legislatures. President Obama has recently signed the Patient Protection and Affordable Care Act (PPACA), which may provide a means to stop the continuous rise in healthcare spending. Nonetheless, since many parts of the law are not in effect yet, the effectiveness of the law as a means to reverse the rising trend cannot be evaluated.

B. Importance of Length of Hospital Stay and Possible Explanations for Regional Variation

One of the causes of the soaring healthcare expenditure is the length of hospital stay. Since the longer stay at a hospital can directly affect the healthcare expenditure, it is an important factor to consider in economics of health. Shortening the length of stay at hospitals may be one way to cut the healthcare spending. It can be found in the data from Healthcare Cost and Utilization Project (HCUP) that the mean length of hospital stay varies across the United States: while an average length of stay in 2008 was 5.6 days in New York, it was only 3.3 days in Wyoming (HCUP State Inpatient Databases, 2009). This huge difference in length of hospital stay can be explained by insurance status or insurance type of a patient. However, there may be other factors that influence length of hospital stay including age, gender, income, race, and lifestyle of patients as well as number of hospital beds and physicians. These variables may be possible explanations for the regional variations that exist across the United States.

C. Decision-making Process Regarding the Length of Hospital Stay

While length of hospital stay may be influenced by many other factors, the ultimate decision-making process is on the hand of people. Because decision to discharge a patient is of clinical and financial concerns, it is important to look at both parties. On one hand, there is one party who participates in clinical decision-making process: physicians who make 80 to

90% of decisions regarding resource allocation (Evans III, Hwang, and Nagarajan, 1995). On the other hand, there are other parties that participate in financial management policy: administrators, insurance companies, and patients (Galai et al., 2003). One study found that management policy had a dominant effect on decision to discharge over clinical consideration (Galai et al, 2003). One article states that the main driving force of decision to discharge comes from insurance companies (Edelman, 2010).

D. The Contribution and Organization of This Paper

Using the panel data from 2001 – 2008 Healthcare Cost and Utilization Project (HCUP), Statehealthfacts.org, Center for Disease Control and Prevention Behavioral Risk Factor Surveillance System (BRFSS), Almanac of Hospital Financial & Operating Indicators 2007, and Current Population Survey (CPS) March Supplements, this paper investigates possible explanations for geographic disparity in the length of hospital stay in the United States, focusing on the role that insurance might play in such variation. Since the HCUP does not provide information of individual patients residing in each state but only provide mean values for each state, the data from multiple years are needed. Moreover, Statehealthfacts.org, BRFSS, and CPS March Supplements are used to provide some of the needed variables, since the HCUP does not contain all the needed variables.

This paper finds that there is a regional variation in the length of stay after

controlling for other factors and the length of stay varies depending on the percent of people covered by different insurance types. Furthermore, this calls for legislation changes that should incorporate the effective insurance plans and reimbursement system that reduce length of stay without affecting the quality, thereby lowering the healthcare expenditure. The finding also calls for careful examination and reform on the current reimbursement system to effectively manage the length of stay for patients.

The organization of this paper is as follows. Chapter Two addresses a review of the existing literature that addresses regional variations and factors that may influence insurance coverage or length of hospital stay. Chapter Three describes and explains econometric model used to investigate possible explanations of geographic variations in length of hospital stay. Chapter Four provides a description of the data sets used in the analysis. Chapter Five presents the results of this econometric analysis, and Chapter Six provides conclusions.

CHAPTER TWO

A REVIEW OF GEOGRAPHIC VARIATIONS AND FACTORS INFLUENCING INSURANCE AND LENGTH OF HOSPITAL STAY

This Chapter provides a review of the existing literature regarding regional disparity and factors that may influence insurance coverage or length of hospital stay. In particular, this chapter reviews empirical studies on the regional variation of healthcare utilization.

A. Regional Variation on Healthcare Utilization

Healthcare professionals have already recognized the existence of disparity in healthcare utilization. However, many of them focus on racial and ethnic disparities that exist across the United States and fail to directly tackle the issues of the geographic variation. Recent studies found the focus on racial and ethnic disparities masks differences in regional variation. Chandra and Skinner (2003) found the considerable variation in the healthcare utilization by region and by race and recognized that one may confuse geographical variation with racial variation. Skinner et al. (2003) also found in their paper that the difference in knee replacement rates for black Medicare enrollees and white enrollees in one region was far below the difference in other regions. Furthermore, one study has found that African Americans and Hispanics experienced lower rates of cardiac revascularization in some parts of New York City and this phenomenon was explained not by race or ethnicity but by region (Fang and Alderman, 2003).

Many studies have tried to identify factors that may explain utilization behavior to understand geographic disparity. The geographic variation can be explained by regional patterns of racial makeup in populations and the differences in the levels of training of physicians who treat each individual population. For instance, researchers at Memorial Sloan-Kettering Cancer Center found that different sets of primary care physicians care for whites and blacks and question whether these two different sets of physicians, on average, had the same level of training. They found that primary care physicians treating the black population had a lower rate of board certification, and consequently, black population had limited access to healthcare (Bach et al., 2004).

Moreover, utilization variation can also be explained by relative demand in different regions; healthcare resources move to regions with more demand (Escarce, 1992; Escarce, 1993; Folland and Stano, 1989; Green and Becker, 1994). This can be a great explanation for some regions like Florida where utilization rates are highest in the country (Fuchs, McClellan, and Skinner, 2001). Another explanation in utilization variation is supply-related; large available resources in the region lead to higher utilization rates (Wennberg and Cooper, 1996, 1999). However, these explanations are just possible speculations, as correlations do not necessarily indicate causation.

A great number of publications dealing with the geographic variation utilize data from The Dartmouth Atlas of Health Care to explain regional differences in utilization

(Wennberg and Cooper, 1999). In one study, Fuchs, McClellan, and Skinner (2001) examined the regional differences in medical care utilization and the correlation between utilization and mortality. Using data from The Dartmouth Atlas of Health Care, they divided the United States into seven regions: North, Upper South, Deep South, Florida, West/South, Big Sky, and West. They used mortality rate, population size, and socioeconomic indexes including education level, cigarette usage, and obesity as independent variables. When they ran regression models, they found that mortality rate is a major determinant of healthcare utilization among whites aged 65–84 and greater utilization in a region is correlated with a larger population size. They also found that Florida was an exception for three reasons. First, utilization of the healthcare system among whites aged 65–84 was much higher than any other region; second, mortality was exceptionally low compared to the rest of the country; and third, the lack of the positive relation between mortality and utilization in Florida also made it an exception.

Many aspects of geographical variation in healthcare utilization may be explained by health factors including mortality rate, racial disparity, or supply and demand of healthcare resources. Unfortunately, these studies fail to address other factors that may affect regional variation in healthcare utilization such as difference in health insurance coverage. It was reported in many studies that the insurance coverage can alter healthcare utilization behavior. For instance, Hafner-Eaton (1993) found that the uninsured non-elderly were less likely than

the insured to have utilized healthcare services in the past 12 months.

B. Factors that Influence Insurance

It must also be noted that there is a regional variation in insurance coverage rate. One study found that this may be due to different state insurance programs offered by individual states; the state uninsured rate can vary from Minnesota's 8% to the high rate of 24% in Texas (Mills and Bhandari 2003). It was also reported that the Midwest and Northeast have lower proportions of uninsured than the South and West (Institute of Medicine 2002).

Because of the importance of health insurance, many analysts have tried to identify factors that may influence insurance. For instance, from one previous study (Carrasquillo, Carrasquillo, and Shea, 2000), it was found that immigration status can negatively affect the health insurance status. If one is an immigrant, it is much more likely that he or she will be uninsured. Moreover, the race can affect health insurance status. Many researchers questioned phenomenon of different rates of health insurance coverage in different racial/ethnic groups (Yoo and Kim, 2007; Flores, Abreu, and Tomany-Korman, 2006). Korean Americans were more likely to be uninsured than the white (Yoo and Kim, 2007), and Latinos are found to be the most uninsured racial/ethnic group of US children (Flores, Abreu, and Tomany-Korman, 2006).

There are obvious other factors that affect insurance status. For instance, because

many companies provide their employees health benefit, employment status can affect health insurance status. One study cites income, education and work as factors that affect health insurance coverage (Hadley, 2003).[1]

C. Factors that Influence the Length of Hospital Stay

There are many factors that may influence length of hospital stay. Yoo and Kim (2007) found that certain ethnic groups such as Korean are less likely to utilize the healthcare even if they do have health insurance. This ethnic/racial disparity in healthcare utilization behavior may affect the utilization behavior of healthcare, which will influence length of stay as well. Koreans may only visit hospital when they are really sick, and this may lengthen hospital stay of patients.

Furthermore, depending on what gender an individual is, he or she may be more or less likely to stay at a hospital for a longer period of time. The previous study found that the women are more likely to stay longer at a hospital than men (Ono et al., 2010). Moreover, the elderly may be more likely to stay at a hospital for a longer period of time since he is more likely to have health problems. In one study, elderly patients were more likely to have a longer length of stay (Polanczyk et al., 2001).

Lastly, different ways that physicians from different regions practice may affect the

[1] It must be noted that not all factors affecting health insurance status are mentioned in this sub-section. There may be other factors such as age group that affect health insurance status.

length of stay. One study found that the length of stay for myocardial infarction in Portland, Oregon was significantly shorter than Baltimore, Maryland after controlling for diagnoses and severity (List et al., 1983). They concluded that the differences were explained by physician practice pattern (List et al., 1983).

D. Insurance and Length of Hospital Stay

The importance of health insurance is not limited to utilization behavior. One study found that depending on the type of health insurance that a patient may have, it may affect the length of hospital stay of the patient; the length of stay of patients using Independent Practice Association (IPA) HMOs was found to be shorter than length of stay of those using traditional insurance program (Bradbury, Golec, and Stearns, 1991). They found that patients with IPA stayed at a hospital for a shorter period than patients with commercial insurance program, and 6 of the 10 IPAs that they studied showed significantly shorter length of stay.

Many other studies have examined the relationship between insurance and the length of hospital stay. One study found that children with government insurance had a longer length of hospitalization after liver transportation (Bucuvalas, Zeng, and Anand, 2004). Brasel et al. (2007) found that on average, Medicaid patients stayed at a hospital significantly longer than patients with commercial insurance, uninsured patients or Medicare patients. Fisher et al. (2001) also found that Medicare patients tend to have longer stay and the uninsured patients

tend to have the shortest stay.

Previous studies focused on racial disparity, regional variation on healthcare insurance and utilization, factors influencing length of stay, or regional variation of length of stay. While this paper investigates the factors influencing the length of hospital stay, this paper focuses on the state-level regional variation and the role that the insurance plays on the length of hospital stay.

CHAPTER THREE

ESTIMATING THE LENGTH OF HOSPITAL STAY IN DIFFERENT STATES

This chapter describes and explains econometric model used in this analysis.

A. Econometric Model

In order to examine the geographic effect on length of stay at a hospital, this study uses the following econometric model:

Model I: Mean length of stay at a hospital = β_0 + $\beta_1$percent health insurance type + $\beta_2$percent education level + $\beta_3$percent race + $\beta_4$percent poverty + $\beta_5$percent married + $\beta_6$percent metropolitan statistical area + $\beta_7$percent gender + $\beta_8$percent immigrant + $\beta_9$percent age group + β_{10}percent employment + β_{11}number of physicians available + β_{12}income level of state + β_{13}number of hospitals bed available + β_{14}percent smoker + β_{15}percent drinker + β_{16}percent obese + β_{17}year + β_{18}state of residence + ε

Model II: Median length of stay at a hospital = β_0 + $\beta_1$percent health insurance type + $\beta_2$percent education level + $\beta_3$percent race + $\beta_4$percent poverty + $\beta_5$percent married + $\beta_6$percent metropolitan statistical area + $\beta_7$percent gender + $\beta_8$percent immigrant + $\beta_9$percent age group + β_{10}percent employment + β_{11}number of physicians available + β_{12}income level of state + β_{13}number of hospitals bed available + β_{14}percent smoker + β_{15}percent drinker + β_{16}CMI + β_{17}percent obese + β_{18}year + β_{19}state of residence + ε

where ε is a stochastic disturbance term.

Dependent Variables	
Mean length of hospital stay	Mean length of hospital stay in each state
Median length of hospital stay	Median length of hospital stay in each state
Independent Variables	
Percent Health Insurance Type (reference group: percent uninsured)	
Percent Insured	Percent of the insured
Percent Medicare	Percent of people covered by Medicare
Percent Private	Percent of people covered by private insurance

Percent Employer	Percent of people covered by employment-based insurance
Percent Medicaid	Percent of people covered by Medicaid
Percent Other Ins	Percent of people covered by some other insurance
Percent Education Level (reference group: percent of people with less than high school education)	
Percent High School Graduate	Percent of people whose highest degree is high school degree
Percent Some College	Percent of people whose highest degree is college but not earned bachelor's degree
Percent College Higher	Percent of people whose highest degree is college degree or higher
Percent Race (reference group: percent white)	
Percent Black	Percent of Black in the state
Percent Hispanic	Percent of Hispanic in the state
Percent Asian	Percent of Asians in the state
Percent Other Race	Percent of races other than White, Black, Hispanic, or Asian in the state
Percent Poverty	Percent of people under the federal poverty level
Percent Married	Percent of married people in the state
Metropolitan Statistical Area (reference group: percent of people living in non MSA)	
Percent MSA	Percent of people living in metropolitan area in the state
Percent MSA unidentified	Percent of people whose MSA is unidentifiable
Percent Female	Percent of female in the state
Percent immigrant	Percent of immigrants in the state
Age (reference group: percent age under 18)	
Percent between 18 and 35	Percent of people between age 18 (inclusive) and 35 (exclusive)
Percent between 35 and 50	Percent of people between age 35 and 50
Percent between 50 and 65	Percent of people between age 50 and 65
Percent 65 and over	Percent of people age 65 and over
Employment Status (reference group: percent of people not in labor force)	
Percent Employed	Percent of the employed in the state

Percent Unemployed	Percent of the unemployed in the state
Number of Hospital Beds Available	Number of hospital bed per 1,000 residents
Income Level of State	Average income level in the state in 2008 dollar in $1000 (2007 was the base year for second set of regression)
Number of Physicians Available	Number of hospital-based physicians per 1,000 residents
Percent Smoker	Percent of smokers in the state
Percent Drinker	Percent of heavy drinkers in the state (An average of more than 2 drinks per day for men, and more than 1 drink per day for women)
Obesity (reference group: percent of people who are neither overweight nor obese)	
Percent overweight	Percent of people whose BMI is between 25 (inclusive) and 30 (exclusive)
Percent obese	Percent of people whose BMI is 30 and over
Year[2] (reference group: 2001)	
2002; 2003; 2004; 2005; 2006; 2007; 2008	Dummy variable that indicates year
33 Dummy variables for each state[3] (reference group: Maine)	
Arizona; Arkansas; California; Colorado; Florida; Hawaii; Iowa; Kansas; Kentucky; Maryland; Massachusetts; Michigan; Minnesota; Missouri; Nebraska; Nevada; New Hampshire; New Jersey; New York; North Carolina; Oklahoma; Oregon; Rhode Island; South Carolina; Tennessee; Texas; Utah; Vermont; Washington; West Virginia; Wisconsin; Wyoming	Dummy variable that indicates residence of state (1 if the region is the corresponding state; 0 otherwise)
CMI	Case Mix Index for each state

Length of stay at a hospital may be influenced by several variables. The focus of this study is the health insurance type. As the previous study indicates, the person with one insurance type may stay at a hospital longer than the other with a different insurance type

[2] Second set of regression in table 3 and 4 includes years 2004 to 2007 with 2003 as a reference year.

[3] Second set of regression in table 3 and 4 includes all 50 states with Maine as reference state.

(Bradbury, Golec, and Stearns, 1991). Moreover, if the person does not have health insurance, he may only go to the hospital when he gets really sick, resulting in longer hospital stay for patients. Hence, health insurance coverage and the insurance type can affect the length of stay at a hospital.

Education level may also affect length of hospital stay because of different lifestyles that may be correlated with the different education levels. Because the less educated may be more likely to expose themselves to dangers, they may be more likely to stay at a hospital for a longer period of time.

Immigrants and different races have different healthcare utilization patterns which may influence length of stay at a hospital. From previous studies, immigrants and certain ethnic groups exhibited different patterns of insurance coverage and some groups such as Koreans were less likely to utilize healthcare services even if they were insured (Carrasquillo, Carrasquillo, and Shea, 2000; Yoo and Kim, 2007; Flores, Abreu, and Tomany-Korman, 2006). If these groups are less likely to utilize healthcare services, this difference in utilization pattern may affect the length of hospital stay.

In addition, if the person is very poor, he may not have access to healthcare. Due to limited access, the poor may only be able to use the hospital at certain times. Moreover, they may not want to stay at a hospital as they do not have the means to pay for the cost. Hence, poverty may affect the length of stay.

Married couples may affect length of stay as they each have someone to care for when the other is hospitalized. Furthermore, depending on the residential environment of patients, the utilization pattern of healthcare may vary. People who live in a metropolitan area may have a better transportation system that allows them to have better access to care. Similarly, people who live far from the hospital, or people who live in rural areas, may not have adequate access to care due to a poor transportation system.

Depending on gender, the individual may be more or less likely to stay at a hospital for a longer period of time. The previous study found that women are more likely to stay longer at a hospital than men (Ono et al., 2010). Moreover, the elderly may be more likely to stay at a hospital for a longer period of time since they are more likely to have health problems. In one study, elderly patients were more likely to have a longer length of stay (Polanczyk et al., 2001). It may also be true that the more money the state has, the mean length of stay may be longer.

Employment status can also affect length of stay as the workers who are hospitalized have to take days off; some workers have incentives to ask for early discharge in order to make up for their lost income. On the other hand, there may be workers who want to stay at a hospital for a longer period of time as the companies pay for the hospital fee and compensate for foregone income. Hence, employment status can affect length of hospital stay.

In addition, hospitals may need to discharge the patient if there is a lack of hospital

beds available, and more hospital beds may correlate with a longer hospital stay. Similarly, if there are more physicians available in a hospital, the state may be able to shorten the length of stay for patients by using physicians in a more effective manner.

Income level of state can also affect the length of hospital stay. It may be true that it is more expensive to live in rich states. Hospitals may need to charge more in richer states as well. Different hospitalization costs can affect utilization behavior of patients, which will affect the length of hospital stay.

In order to control for lifestyle, the smoking and drinking variables can be examined. Obesity can be used to indicate general health status of people in the state. Moreover, the Center for Medicare and Medicaid releases data on case mix index (CMI), which is an average diagnosis-related group (DRG) weight for all hospitals' Medicare group. CMI can be used to control for the severity of patients.

In order to control for state-level variation in length of state, state dummy variables are included. Finally, year dummy variables are included in the model to adjust for any yearly change in the length of stay at a national level.

The econometric models capture the decision-making process as different variables are the indicative of each entity. Health insurance variables represent the insurance company as a decision-making entity; poverty is indicative of patient's financial ability; case mix index is indicative of patients' condition, which will affect physicians' clinical decision; and supply-

side factors such as physician availability and hospital bed availability would involve the administrator's participation in the decision-making process.

B. Estimation Methods

Because the data are pulled from multiple years, this paper estimates the econometric model using panel data analysis with fixed effects regression. By including each state as a dummy variable, the average differences across states in any predictors can be controlled. This model will provide a method to control for any influential variables omitted in the model, which show up as a coefficient for each state variable. Hence, the paper can determine whether these values are significant or insignificant, and determine whether the regional variations exist even after controlling for all other factors.

CHAPTER FOUR

SELECTING THE SAMPLE FROM MULTIPLE DATA SOURCES

This chapter provides a description of the Healthcare Cost and Utilization Project (HCUP), Statehealthfacts.org, Current Population Survey (CPS) March Supplement, Center for Disease Control and Prevention Behavioral Risk Factor Surveillance System (BRFSS), and the Almanac of Hospital Financial & Operating Indicators 2007. It also presents the descriptive statistics for the data set used in this analysis.

A. Overview of the 2001 – 2008 Healthcare Cost and Utilization Project

The first set of data used in this study comes from 2001 - 2008 HCUP. Since 1988, the HCUP collected a set of longitudinal hospital care data in the United States; the data include all-payer, encounter-level information. The HCUP has a comprehensive data on the inpatient data and emergency department data at both state and nation levels. The data that this study is interested in is the State Inpatient Database (SID). This set of data contains the state inpatient discharge information and the mean length of stay for each state as well as percent of discharge, mean charges, percent died, percent male, and mean age from 33 participating states. Among them, the mean length of stay for each state will be considered the dependent variable.

B. Overview of the 2001 – 2008 Statehealthfacts.org

As a project of the Henry J. Kaiser Family Foundation, Statehealthfacts.org provides over 700 health data for all 50 states. The Kaiser Family Foundation is a non-profit organization that focuses on health care issues in the United States. Despite its name, the Foundation is not related to Kaiser Permanente or Kaiser Industries. This study extracts the one of the supply variable from this source – the number of hospital bed available, by state. Each year's dataset was aggregated to form a panel data.

C. Overview of the 2001 – 2008 Current Population Survey March Supplement

For more than 50 years, the CPS performed monthly survey of about 50,000 households. Conducted by the Bureau of Labor Statistics and Census Bureau, the CPS is primarily used to characterize the U.S. labor force. The samples from the CPS provide a good estimate for the nation as a whole. Because the CPS is a primarily used to study the characteristics of U.S. labor force, the CPS has many variables related to the labor economics. These variables include but are not limited to the following: employment information, earnings, state of residence, and demographic characteristics including age, sex, race, and education.

The CPS March Supplement adds questions regarding health insurance variable in the questionnaire, which will be the key independent variable on which this paper is focusing.

The data from CPS have helped policymakers and legislators plan and evaluate nation's economic situation as well as the government programs. In addition to the insurance variable, several other independent variables can be extracted from this data. These variables include race, education, immigration, and marital status.

D. Overview of Center for Disease Control and Prevention Behavioral Risk Factor Surveillance System (BRFSS)

Established in 1984 by the Center for Disease Control and Prevention, the BRFSS collects state-wide information on health risk behaviors, preventive health practices, and health care access via telephone survey. The BRFSS provides information on behavioral risk factors such as obesity rate, tobacco use and alcohol consumption, by state. The study uses these health variables to control for lifestyle and health risk factors.

E. Overview of the Almanac of Hospital Financial & Operating Indicators 2007

Released by Ingenix Press, the Almanac of Hospital Financial & Operating Indicators 2007 provides a variety of hospital benchmarking resources including more than 70 financial ratios and operating indicators for hospitals. The study extracted state-wide data on the median length of hospital stay and Case Mix Index (CMI) for years 2003 to 2007 from this source.

F. Selection of the Sample and Descriptive Statistics

The sample used in this study contains 234 total observations from HCUP and 254 total observations using data from the Almanac of Hospital Financial & Operating Indicators 2007. Table 1 (pg. 44) shows descriptive statistics for HCUP data and Table 2 (pg. 47) shows descriptive statistics for the Almanac of Hospital Financial & Operating Indicators 2007.

Both datasets show that there is variation in length of stay among states. For HCUP data, the average value for the mean length of stay is 4.480 days, with the minimum value 3.340 days and the maximum value 6.0 days. For the Almanac of Hospital Financial & Operating Indicators 2007, on the other hand, the average value for the median length of stay is 4.455 days, with minimum of 3.41 days and maximum of 6.79 days. Because these two data sources contain information from different years and states, these values cannot be directly compared. Hence, the data that contain information from the same states and same years are created to compare these two values. Table 3 (pg. 50) shows that after years and states are matched in the datasets, the difference in the mean value decreases. While the average value for the mean length of stay is 4.48 days with 3.63 minimum days and 5.8 maximum days, the average value for median length of stay is 4.41 days with 3.41 minimum days and 6.38 maximum days. The spread is greater in median length of stay than in mean length of stay, with a standard deviation of 0.527 and 0.439 respectively. When the

correlation between these two variables is taken, the correlation coefficient comes out to be 0.699, which indicates that these two values are somewhat correlated. The differences between these two variables – mean and median length of stay – probably emerged as a result of the different sources and inherent differences in mean and median.

Other important variables include different health insurance types. Table 1 (pg. 44) indicates 86.6% of insurance coverage from year 2001 to 2008 in 33 states participating in HCUP. In these states, there is an average of 14.2% residents using Medicare, 12.6% using Medicaid, 61.8% using employment-based insurance, 9.7% using privately purchased insurance, and 4.9% using other forms of insurance. It should be noted that these values are calculated at the state-level and not at the individual-level. These values are the averages of the percent insured in each state without taking the different population sizes in each state into consideration. Table 2 (pg. 47) indicates that this number is lower, with 85.9% of insurance coverage from year 2003 to 2007. There is an average of 14.0% using Medicare, 12.7% using Medicaid, 60.9% using employment-based insurance, 9.7% using privately purchased insurance, and 5.7% using other forms of insurance.

Lastly, there seem to be sampling errors in CPS data since the maximum value for MSA is 1 in all the tables. This does not make sense since no state is completely metropolitan.

CHAPTER FIVE

ESTIMATION RESULTS: QUANTIFYING THE EFFECT OF DIFFERENT INSURANCE TYPES ON LENGTH OF HOSPITAL STAY

This chapter presents the results of the regression analysis. It is divided into three sub-sections. The first sub-section discusses the effect of different types of insurance on length of hospital stay. The second sub-section discusses the effect of other variables on length of hospital stay while the third sub-section discusses the state-level regional variation.

A. The Effect of Different Insurance Types on Length of Stay

For each of the models, regression 1, which includes the demographic variables and the insured variable without state and year dummies, is presented first. Regression 2 includes all the demographic variables and insurance categories. Regression 3 includes all the demographic variables and the insured variable with year and state dummies. Regression 4 adds year and state dummy variables to variables included in regression 2. Estimates for regressions that use mean length of stay as dependent variables are presented in Table 4 (pg. 53).

Regression 1 does not include distinct insurance types, but rather includes an insured category that describes the percent of people covered. This value is not significant, indicating that it is not insurance coverage, but insurance type that may affect the length of hospital stay. As different insurance types have different effects – some shortening the length while others

elongate the length – the insurance coverage including all the insurance types may not affect the length of stay.

The result of regression 2 indicates that as the percent of people covered by Medicaid increases by 1 point, the mean length of hospital stay increases significantly on average by 0.02782 days, controlling for other factors. Furthermore, regression 2 indicates that controlling for other factors, as the percent of people covered by privately purchased insurance increases by 1 point, the mean length of hospital stay decreases significantly on average by 0.04267 days.

While the percent of people covered by Medicaid and privately purchased insurance changes the mean length of hospital stay in regression 2, it is important to note that it may not accurately measure the effect of different insurance types since these values do not take into account yearly variation and state-wide variation. Indeed, when state and year dummy variables are included to control for these variations, these values become insignificant.

Regression 3, like regression 1, only includes the insured category that describes the percent of people covered. Insurance coverage is significant at 10% alpha level, decreasing the length of hospital stay by 0.01259 days controlling for other variables. However, this needs to be evaluated more carefully since not all insurance types decrease the length of hospital stay. When the insurance coverage variable is broken down into components in regression 4, some of the components become significant. Regression 4 indicates that

controlling for other factors, as the percent of people covered by Medicare or other forms of insurance increases by 1 point, the mean length of hospital stay decreases significantly on average by 0.04327 days and 0.02721 days respectively.

That the increase in the percent of people covered by Medicare shortens the mean length of hospital stay is a direct contradiction to the findings of Fisher et al. (2001). They found that Medicare patients tend to have longer hospital stay. However, it is important to examine this finding more carefully. Because the elderly are mainly Medicare patients, it may be important to look at these two results together; these two groups are highly correlated, with a correlation coefficient of 0.9227. While the increase in Medicare population by 1 percentage point decreases the mean length of hospital stay on average by 0.04327 days, 1 percentage point increase in those aged over 65 significantly increases the mean length of stay by 0.05795 days. When these two values are added, the net effect is an increase in the mean length of hospital stay. Hence, it is not possible to make an accurate conclusion from these results.

Finally, the increase in the percent of people covered by other forms of insurance decreases the mean length of hospital stay. The other forms of insurance include military health care, Indian Health Service, CHAMPUS, and other forms of government sponsored health insurance plans. These types of government sponsored health insurance plans tend to provide lower reimbursement rates than private insurance plans. For instance, one study

found that Medicare and Medicaid provide a lower reimbursement than private payers, resulting in the need for cost shifting (Dobson, DeVanzo, and Sen, 2006). In fact, private insurance companies had 17% more than the expense that hospitals are spending, whereas Medicare and Medicaid paid only 87% and 77% of hospitals' expenses (Dobson, DeVanzo, and Sen, 2006). It seems that people who use other forms of insurance are the victims of cost shifting; hospitals seem to try to discharge them earlier than the uninsured.

When the median length of stay is used as dependent variables and case mix index is included as independent variables, the regressions show different results. Estimates for regressions that use median length of stay as dependent variables are presented in Table 5 (pg. 57). The result from regression 1 indicates that insurance coverage is significant at 10% alpha level, increasing the length of hospital stay by 0.02244 days controlling for other variables. However, the result from regression 3 indicates that percent insured does not affect the median length of stay, contradicting the results from regression 1. Hence, this needs to be analyzed more carefully. When different insurance types are included in regression 2, the employment-based insurance variable becomes significant. Regression 2 indicates that controlling for other factors, as the percent of people covered by employment-based insurance increases by 1 point, the median length of hospital stay also increases on average by 0.03457 days. However, because this value does not control for yearly variation and state-wide variation, it does not accurately measure the effect of different insurance types on the

length of stay. When the state and year dummy variables are included in regression 4, the result indicates that all insurance variables are insignificant.

The differences in these two models may be explained by the inclusion of case mix index. However, it cannot be easily compared since these two datasets have different states and years. Hence, the regressions that use data with the same states and years are run to explain the differences. Moreover, in all these regressions, the case mix index variables are included as independent variables. Estimates for regressions that use the mean length of stay as dependent variables are presented in Table 6 (pg. 62) and estimates for regressions that use the median length of stay as dependent variables are presented in Table 7 (pg. 66).

As in the previous models, the estimates for regressions 1 and 3 have insignificant coefficients for the insured variable. As presented in column 2 of Table 6 (pg. 62), the result from regression 2 of the model that uses the mean length of stay as the dependent variable indicates that controlling for other factors, as the percent of people covered by Medicaid increases by 1 point, the mean length of hospital stay increases significantly on average by 0.02079 days. Furthermore, the result from regression 2 indicates that as the percent of people covered by other forms of insurance increases by 1 point, the mean length of hospital stay decreases 0.02874 days at 10% alpha level. The result from regression 4 indicates that as the percent of people covered by other forms of insurance increases by 1 point, the mean length of hospital stay decreases significantly on average by 0.02073 days.

On the other hand, the regression using median length of stay as dependent variables shows different results as presented in Table 7 (pg. 66). The result of regression 2 indicates that controlling for other factors, as the percent of people covered by employment-based insurance increases by 1 point, the median length of hospital stay increases by 0.03263 days. At 10% alpha level, as the percent of people covered by Medicare increases by 1 point, the median length of hospital stay increases by 0.1208 days and as the percent of people covered by the private insurance increases by 1 point, the median length of hospital stay decreases 0.04975 days; no insurance variable in regression 4 is significant. From these results, it is reasonable to conclude that the reason for the dissimilarities in the results is an inherent difference in the data. Because mean is the average point whereas median is the 50^{th} percentile point, they have slight distinctions. Because of these differences, the results differ for these two variables.

B. The Effect of Other Variables on Length of Stay

The models capture other interesting independent variables that significantly affect the mean and median length of hospital stay. For instance, holding other variables constant, the increase in the percent of the black population increases the length of hospital stay according to Column 4 of Table 4 (pg. 53); a 1 percentage point increase in the black population increases the mean length of stay by 0.04381 days. This phenomenon may be due

to a correlation between the black population and certain race-specific diseases; diabetes and end-state renal disease are more prevalent in the black population (Cowie et al., 1989).

Furthermore, holding other variables constant, the increase in the percent of the Hispanic and Asian populations decreases the length of hospital stay according to Column 3 and 4 of Table 5 (pg. 57); a 1 percentage point increase in the Hispanic population decreases the mean length of stay by 0.02842 days and 0.02871 days respectively and a 1 percentage point increase in the Asian population decreases the mean length of stay by 0.03845 day and 0.03834 day respectively. The increase in percent of the Hispanic and Asian populations with the decreased length of stay does not make much sense. They are two racial/ethnic groups that are likely to be uninsured (Yoo and Kim, 2007; Flores, Abreu, and Tomany-Korman, 2006). This decrease may be due to their attitude toward hospitals. Yoo and Kim (2007) found that Koreans have different utilization pattern; Koreans are less likely to utilize healthcare even if they are insured. It may be true that this difference in utilization pattern emerges as a result of culture – simply put, it could be the case that Hispanics and Asians do not like the hospital settings – they do not want to go to the hospital much, and even if they have to go to the hospital, they want to be discharged quickly. Consequently, as the percent of the Hispanic and Asian populations increases, the length of hospital stay decreases.

Regression 3 of Table 5 shows that controlling for other variables, as the percent of employed increases by 1 point, the median length of stay decreases by 0.02484 days. This

may be due to the workers' tendency to be discharged quickly since an additional day at the hospital means their lost wage. Interestingly, the unemployed variable has a similar effect on the length of stay. Regression 4 of Table 4 (pg. 53) shows that as the percent of the unemployed increases by 1 point, the mean length of stay decreases by 0.03831 days. Except for government aid, the unemployed usually do not have regular income. This means that they do not have the means to pay for the hospital charge. Because of this, they may be more likely to voluntarily ask for discharge or be asked to be discharged.

Furthermore, after controlling for other factors, as the number of physicians per 1,000 residents increases by 1, the median length of hospital stay decreases by 0.0231 days on average. Since there are more physicians in the state, patients may have reduced wait-time for operations and receive effective treatment, and consequently have a shorter length of stay on average. On the other hand, according to column 3 and 4 of Table 4, holding other factors constant, an increase in the number of hospital beds increases the mean length of stay; when the number of hospital beds per 1,000 residents increases by 1, the mean length of stay increases by 0.209 days and 0.236 days respectively. This is best explained by the supply-side. More hospital beds mean that there are more patients in the area. More hospital beds also mean that there is no need to discharge patients quickly to receive another patient.

Lastly, the overweight variable seems to have a significant role in the length of hospital stay. Columns 3 and 4 of Table 4 and 5 indicate that holding other factors constant,

an increase in the percent of overweight people increases the length of hospital stay. Regressions 3 and 4 of Table 4 indicate that controlling for other variables, the increase in the percent of the overweight population by 1 point increases the length of hospital stay by 0.0240 days and 0.0235 days respectively; regressions 3 and 4 of Table 5 indicates that the increase in the percent of the overweight population by 1 point increases the length of stay 0.0268 days and 0.0243 days respectively. Interestingly, the increase in the obese population does not affect the length of stay. This may be due to the fact that the obese population is more correlated with severity of illness than the overweight population; the correlation coefficient between obesity and case mix index was -0.207 whereas overweight and case mix index had a correlation coefficient of -0.0282. Since case mix index is already accounted for, with a higher correlation, obesity may not have a significant effect on the length of stay.

C. The Regional Variation

The model captures state-level regional variation in the length of hospital stay. Column 3 and 4 of Table 4 (pg. 53) and 5 (pg. 57) show the existing variation. According to Table 4, people from Rhode Island, New York, and Hawaii are hospitalized for a significantly longer period of time than people from Maine on average. Regression 3 of Table 4 shows that people from Rhode Island, New York, and Hawaii are likely to stay at a hospital for a significantly longer period of time than people from Maine – 0.547 days, 0.802 days, and

1.362 days longer on average respectively; regression 4 indicates that people from Rhode Island and Hawaii stay at a hospital longer than people from Maine – 0.468 days and 1.327 days longer on average respectively.

Table 4 also shows that holding other variables constant, people from Wisconsin, Minnesota, Iowa, Nebraska, Kansas, Maryland, West Virginia, Kentucky, Tennessee, Arkansas, and Wyoming are likely to stay at a hospital for a significantly shorter period of time than people from Maine on average. For instance, regression 3 shows that holding other variables constant, people from Wisconsin and Wyoming (and many other states) have a shorter mean length of stay than people from Maine on average – 0.418 days and 1.445 days respectively. Similarly, regression 4 shows that controlling for other factors, people from Tennessee, Arkansas, and Wyoming (and many other states) are likely to stay at a hospital for a significantly shorter period of time than people from Maine on average – 0.630 days, 0.750 days, and 1.433 days shorter respectively.

On the other hand, Table 5 shows different results. Controlling for other factors, people from New Hampshire, Vermont, Rhode Island, New York, Iowa, North Dakota, South Dakota, Nebraska, Kansas, Montana, Wyoming, California and Hawaii are likely to stay at a hospital for a significantly longer than people from Maine on average. For instance, regression 3 shows that people from New York, Wyoming, and Hawaii (and many other states) had a significantly longer length of stay – 1.159 days, 0.459 days, and 3.090 days

longer respectively. Similarly, regression 4 shows that people from Rhode Island, New York, California and Hawaii had a longer length of stay –0.679 days, 1.345 days, 1.199 days, and 3.441 days longer respectively.

Holding other variables constant, people from Alabama and Oregon are hospitalized for a significantly shorter period of time than people from Maine on average –1.336 days and 0.686 days shorter respectively in regression 3. No state had a significantly shorter median length of stay than Maine in regression 4. This difference in results can cause a detrimental policy failure when taken lightly. There are numerous states that are on direct contradiction: Table 4 (pg. 53) presents Iowa, Nebraska, Kansas, and Wyoming as states that correlate with shorter length of stay whereas these states are presented as states that correlate with longer length of stay in Table 5 (pg. 57). In order to examine it in more detail, the descriptive statistics and regressions that use data with the same states and same years need to be examined.

Table 3 (pg. 50) shows descriptive statistics for compiled data using the same states and years. It shows that the average value for the mean length of stay is 4.48 days and the average value for median length of stay is 4.41 days. These values are not much different from the descriptive statistics for the original data. For HCUP data, the average value for the mean length of stay is 4.480 days as shown in Table 1 (pg. 44); for data from the Almanac of Hospital Financial & Operating Indicators 2007, the average value for the median length of

stay is 4.455 days as shown in Table 2 (pg. 47).

Table 6 (pg. 62) and 7 (pg. 66) show the regressions that use data including the same states and same years. According to Table 6, which displays result of regressions that use the mean length of stay as dependent variables, people from New Hampshire, Massachusetts, Rhode Island, New York, New Jersey, and California are likely to be hospitalized for a longer period of time than people from Maine. On the other hand, people from Wisconsin, Minnesota, Iowa, Nebraska, and Kansas are likely to stay at a hospital for a shorter period of time than people from Maine. Compare this to Table 7 (pg. 66), which displays results of regressions that use the median length of stay as dependent variables. People from Rhode Island, New York, Kansas and Hawaii are likely to stay at a hospital for a longer period of time than people from Maine. There is no state that has a significantly shorter median length of hospital stay than Maine.

Kansas in Table 6 is marked as the state that has a significantly shorter mean length of stay while Kansas in Table 7 is marked as the state that has a significantly longer median length of stay. This can only be explained by the different sources from which these variables are extracted and intrinsic differences in mean and median. However, some conclusions can be drawn from this result. For instance, Rhode Island, New York, and Hawaii are commonly shown as the states with a significantly longer length of stay. This indicates that these states need to look into their legislation that addresses reimbursement mechanism and physician

supply and make amendment as to effectively shorten their length of stay without reducing the quality. As different insurance plans receive different reimbursement rates –which can ultimately affect the length of stay – from hospital, the legislators can pass legislation that can effectively evaluate these rates without negatively affecting quality. Furthermore, since the number of physician available can shorten length of stay, the state can look to increase physician supply through legislation. Legislators can also launch campaigns for healthy diets, as overweight is correlated with a longer length of hospital stay.

Lastly, it needs to be noted that some states such as Massachusetts have undergone healthcare reform during the period covered in the study. It has mainly increased the percent of the insured in the state by mandating the state to subsidize a part of its money to insure the state's residents (Holahan and Blumberg, 2006). The legislation and the subsequent change in the percent of the insured is captured in the model through the insured variable and insurance category variables – the newly insured people are categorized under other forms of insurance. While the fixed effect model cannot address the direct effect of these legislatures, the effect of the legislation is still incorporated in the model.

CHAPTER SIX

CONCLUSIONS

A. Summary of the Findings

Using the panel data from 2001 – 2008 HCUP, Statehealthfacts.org, BRFSS, Almanac of Hospital Financial & Operating Indicators 2007, and CPS March Supplements, this paper utilizes regression analysis to investigate state-level variation on the length of hospital stay. Unlike previous studies that focused on racial disparity, regional variation on healthcare insurance and utilization, factors influencing the length of stay, or regional variation of the length of stay, this paper focuses on the state-level regional variation and the role that insurance plays on the length of hospital stay.

The study finds that the state-level variation in the length of hospital stay is evident. The state-level variation in the length of hospital stay suggests that some states have a higher healthcare cost than other states due to the longer length of stay. Moreover, the insurance variable plays a great role in determining the length of hospital stay. Depending on what type of insurance plan an individual uses, the length of hospital stay may vary.

B. Limitation of Study

While the study finds that different states may have different mean or median length of stay, the discrepancy between two sources makes it impossible to elicit a concrete conclusion. Furthermore, the study was unable to incorporate case mix index (CMI) for

HCUP data, which would control for the severity of illnesses for years 2001 to 2008. The CMI was available for certain years, but not all years from 2001 to 2008. Furthermore, because the data compiled were state-level variable, regression analysis at an individual level was not available. This is a serious drawback, as it does not allow a careful examination of legislative changes.

C. Policy Implications

To reduce the mean length of hospital stay, thereby lowering the cost of healthcare in some of the states such as Rhode Island, New York, and Hawaii, state legislators need to examine the legislation of those states that have shorter hospital stay to understand why they have a shorter length of stay on average. This legislative reform, however, should only follow after concrete evidence indicating that these states have longer length of hospital stay than other states is found.

In order to decrease the length of stay, state legislators can take various measures. For instance, because different insurance plan with different reimbursement rates affect the length of stay, the legislators need to examine the effect of these insurance plans and their reimbursement rates. The state can also look into increasing physician supply through legislation. Furthermore, the legislators may want to launch a campaign program to encourage healthy diet and healthy lifestyle, as the decrease in the percent of people suffering

from overweight significantly decrease the length hospital stay on average. Finally, the legislators should look into ways to promote regular checkups and preventive cares, as they may be one way to shorten the length of stay and reduce healthcare expenditure.

D. Suggestions for Future Research

The study finds that different ethnic and racial groups have different patterns of healthcare use. It may be useful to examine the effect of different ethnic and racial groups on the healthcare utilization behavior. For instance, it may be true that patients of certain ethnicity are likely to go to physicians of the same ethnicity. If healthcare utilization patterns of different groups are known, legislators can try to change the utilization behavior by making an appropriate legislation.

Bibliography

Almanac of Hospital Financial & Operating Indicators 2007. *Ingenix Release.*

Anderson, G.F., Frogner, B.K., and Reinhadt, U.E. (2007). Health Spending In OECD Countries In 2004: An Update. *Health Affairs*, 26, no. 5, 1481-1489.

Bach, P., et al. (2004). Primary Care Physicians Who Treat Blacks and Whites. *New England Journal of Medicine, 351, no. 6*, 575–584.

Bradbury, R.C., Golec, J.H., and Stearns, F.E. (1991). Comparing hospital length of stay in independent practice association HMOs and traditional insurance programs. *Inquiry, 28*, 87-93.

Brasel, K.J., Lim, H.J., Nirula, R., and Weigelt, J.A. (2007). Length of Stay: An Appropriate Quality Measure? *Archives of Surgery*, 142, no. 5, 461-466.

Bucuvalas, J.C., Zeng, L., and Anand, R. (2004). Predictors of length of stay for pediatric liver transplant recipients. *Liver Transplantation*, 10, no. 8, 1011-1017.

Carrasquillo, O., Carrasquillo, A.I., and Shea, S. (2000). Health insurance coverage of immigrants living in the United States: differences by citizenship status and country of origin. *American Journal of Public Health*, 90, 917-923.

Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2008

Chandra, A. and Skinner, J. (2003). Geography and Racial Health Disparities. *National Bureau of Economic Research, Working Paper no. 9513.*

Cowie, C.C., et al. (1989). Disparities in Incidence of Diabetic End-Stage Renal Disease According to Race and Type of Diabetes. *New England Journal of Medicine*, 321, 1074-1079.

Dobson, A., DaVanzo, J., and Sen, N. (2006). The Cost-Shift Payment 'Hydraulic': Foundation, History, And Implications. *Health Affairs, 25*, 1, 22-33.

Edelman, S. (2010). Community Advisory Board: Duration of hospital stay is about the bottom line. *The Fayetteville Observer*.

Escarce, J. (1992). Explaining the association between surgeon supply and utilization. *Inquiry, 29*, 403-15.

Escarce, J. (1993). Medicare patients. use of overpriced procedures before and after the Omnibus Budget Reconciliation Act of 1987. *American Journal of Public Health, 83*, 349-55.

Evans III, J.H., Hwang, Y., and Nagarajan, N. (1995). Physicians' Response to Length-of-Stay Profiling. *Medical Care*, 33, no. 11, 1106 – 1119.

Fang, J. and Alderman, M.H. (2003). Is Geography Destiny for Patients in New York with Myocardial Infarction? *American Journal of Medicine, 115,* no. 6, 452–453.

Fisher, W.H., et al. (2001). Insurance Status and Length of Stay for Involuntarily Hospitalized Patients. *The Journal of Behavioral Health Services & Research* 28, no. 3, 334-346.

Flores, G., Abreu, M., and Tomany-Korman, S.C. (2006) Why Are Latinos the Most Uninsured Racial/Ethnic Group of US Children? A Community-Based Study of Risk Factors for and Consequences of Being an Uninsured Latino Child *Pediatrics,* 118, 730-740.

Folland, S, and Stano, M. (1989). Sources of small area variation in the use of medical care. *Journal of Health Economics,* 8, 85-107.

Fuchs, V.R., McClellan, M, and Skinner, J. (2001). Area Differences in Utilization of Medical Care and Mortality among U.S. Elderly. *National Bureau of Economic Research, Working Paper no. 8628.*

Galai, N., et al. (2003). Is discharge policy a balanced decision between clinical considerations and hospital ownership policy? The CABG example. *The Journal of Thoracic and Cardiovascular Surgery*, 126, 1018-1025.

Green, L.A., and Becker, M. P. (1994). Physician decision making and variation in hospital admission rates for suspected acute cardiac myocardial infarction. A tale of two towns. *Medical Care,* 32, 1086-97.

Hadley, J. (2003). Sicker and Poorer – The Consequences of Being Uninsured: A Review of the Research on the Relationship between Health Insurance, Medical Care Use, Health, Work, and Income. *Medical Care Research and Review*, 60, no. 2, 3S – 75S

Hafner-Eaton, C. (1993). Physician Utilization Disparities Between the Uninsured and Insured: Comparisons of the Chronically Ill, Acutely Ill, and Well Nonelderly Populations. *The Journal of the American Medical Association 269*, 6, 787 – 792.

HCUP State Inpatient Databases (SID). (2009) *Healthcare Cost and Utilization Project* (*HCUP*). Agency for Healthcare Research and Quality, Rockville, MD.

Holahan, J. and Blumberg, L. (2006). Massachusetts Health Care Reform: A Look At The Issues. *Health Affairs: pg.* W432-W443.

Institute of Medicine. (2002). Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care. *The National Academies Press*.

The Kaiser Family Foundation statehealthfacts.org. Data Source: 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008 AHA Annual Survey Copyright 2010 by Health Forum LLC, an affiliate of the American Hospital Association, special data request, 2010 & Population data from Annual Population Estimates by State, U.S. Census Bureau. Provider and Service Use, "Beds."

List, N.D. et al., (1983). A Cross-National Study of Differences in Length of Stay of Patients with Cardiac Diagnoses. *Medical Care*, 21, no. 5, 519-530.

Martin, A., et al. (2011). Recession Contributes To Slowest Annual Rate Of Increase In Health Spending In Five Decades. *Health affairs*, 30, no.1, 11-22.

Mills, R. and Bhandari, S. (2003). Health Insurance Coverage in the United States: 2002. *U.S. Census Bureau*.

Ono, T., et al. (2010) Predictors of length of stay in a ward for demented elderly: gender differences. *Psychogeriatrics*, 10, 153–159.

Polanczyk, C.A., et al. (2001) Impact of Age on Perioperative Complications and Length of Stay in Patients Undergoing Noncardiac Surgery. *Annals of Internal Medicine*, 134, 637-643.

Skinner, J., et al. (2003). Racial, Ethnic, and Geographic Disparities in Rates of Knee Arthroplasty among Medicare Patients. *New England Journal of Medicine 349, 14*, 1350–1359.

U.S. Dept. of Commerce. (2009). *Current population survey, March 2009*. Technical documentation. Washington, DC: US Department of Commerce, Economic and Statistics Administration, Bureau of the Census.

Wennberg, J.E. and Cooper, M.M.. (1996). The Dartmouth atlas of health care in the United States. *American Health Association Press*.

Wennberg, J.E. and Cooper, M.M. (1999). The quality of medical care in the United States: a report on the Medicare Program. The Dartmouth atlas of health care in the United States. *American Health Association Press*.

Yoo, G. J. and Kim, B.W. (2007). Korean immigrants and health care access: Implications for the uninsured and underinsured. *Inequalities and Disparities in Health Care and Health: Concerns of Patients, Providers and Insurers: Research in the Sociology of Health Care*, 25, 77-94.

Table 1. Descriptive statistics for observations with HCUP data

Variables	Mean	Std. Dev.	Min.	Max.
Mean length of stay (day)	4.480	0.459	3.340	6.0
Percent insured	0.866	0.036	0.748	0.946
Percent uninsured	0.134	0.036	0.054	0.252
Percent Medicare	0.142	0.023	0.080	0.205
Percent Medicaid	0.126	0.034	0.053	0.211
Percent other insurance	0.049	0.023	0.011	0.149
Percent employment-based insurance	0.618	0.053	0.495	0.735
Percent private purchased insurance	0.097	0.024	0.050	0.175
Percent less than high school degree	0.350	0.032	0.282	0.430
Percent high school degree	0.243	0.035	0.166	0.360
Percent some college degree	0.214	0.026	0.162	0.279
Percent college degree or higher	0.193	0.039	0.108	0.314
Percent White	0.750	0.162	0.156	0.973
Percent Black	0.081	0.073	0.0020	0.296
Percent Hispanic	0.096	0.091	0.0040	0.409
Percent Asian	0.043	0.080	0.00073	0.702
Percent other race	0.030	0.048	0.0020	0.328
Percent below federal poverty level	0.117	0.027	0.0542	0.181
Percent above federal poverty level	0.883	0.027	0.819	0.946
Percent married	0.416	0.025	0.354	0.469
Percent Metropolitan Statistical Area	0.580	0.261	0.745	1
Percent MSA unidentified	0.011	0.040	0	0.249
Percent male	0.492	0.007	0.472	0.515
Percent female	0.508	0.007	0.485	0.528
Percent US citizen	0.907	0.066	0.722	0.996
Percent immigrant	0.093	0.066	0.004	0.278
Percent age over 18	0.247	0.020	0.208	0.327
Percent age between 18 and 35	0.229	0.017	0.195	0.298
Percent age between 35 and 50	0.221	0.016	0.166	0.268
Percent age between 50 and 65	0.178	0.019	0.120	0.238
Percent age over 65	0.125	0.018	0.074	0.169
Percent employed	0.490	0.035	0.391	0.576
Percent unemployed	0.031	0.009	0.014	0.081
Percent not in labor force	0.479	0.033	0.393	0.577
Physician per 1,000 residents	2.908	1.334	0.365	9.448
State income in $1,000 (2008dollar)	27.45	3.215	20.57	35.85

Hospital beds per 1,000 residents	2.773	0.728	1.7	4.8
Percent smoker	20.89	3.861	9.2	32.6
Percent heavy drinker	5.222	1.462	2	8.7
Percent overweight with BMI 25 to 29.9	36.667	1.168	33	40.6
Percent obese with BMI over 30	23.609	3.493	14.9	31.9
Year 2001	0.107	0.310	0	1
Year 2002	0.115	0.320	0	1
Year 2003	0.120	0.325	0	1
Year 2004	0.115	0.320	0	1
Year 2005	0.128	0.335	0	1
Year 2006	0.132	0.340	0	1
Year 2007	0.141	0.349	0	1
Year 2008	0.141	0.349	0	1
Maine	0.026	0.158	0	1
New Hampshire	0.026	0.158	0	1
Vermont	0.034	0.182	0	1
Massachusetts	0.034	0.182	0	1
Rhode Island	0.030	0.171	0	1
New York	0.034	0.182	0	1
New Jersey	0.034	0.182	0	1
Michigan	0.034	0.182	0	1
Wisconsin	0.034	0.182	0	1
Minnesota	0.034	0.182	0	1
Iowa	0.034	0.182	0	1
Missouri	0.034	0.182	0	1
Nebraska	0.034	0.182	0	1
Kansas	0.034	0.182	0	1
Maryland	0.017	0.130	0	1
West Virginia	0.034	0.182	0	1
North Carolina	0.034	0.182	0	1
South Carolina	0.034	0.182	0	1
Florida	0.034	0.182	0	1
Kentucky	0.034	0.182	0	1
Tennessee	0.034	0.182	0	1
Arkansas	0.021	0.145	0	1
Oklahoma	0.017	0.130	0	1
Texas	0.009	0.092	0	1
Wyoming	0.009	0.092	0	1

Colorado	0.034	0.182	0	1
Arizona	0.034	0.182	0	1
Utah	0.034	0.182	0	1
Nevada	0.030	0.171	0	1
Washington	0.034	0.182	0	1
Oregon	0.034	0.182	0	1
California	0.034	0.182	0	1
Hawaii	0.030	0.171	0	1
Number of Observations		234		

Note: The dataset is compiled from HCUP, Statehealthfacts.org, BRFSS, and CPS March Supplements.

Table 2. Descriptive Statistics for observations with data from the Almanac of Hospital Financial & Operating Indicators 2007.

Variables	Mean	Std. Dev.	Min.	Max.
Median length of stay (day)	4.455	0.600	3.41	6.79
Percent insured	0.859	0.038	0.748	0.946
Percent uninsured	0.141	0.038	0.054	0.252
Percent Medicare	0.140	0.021	0.074	0.199
Percent Medicaid	0.127	0.035	0.053	0.220
Percent other insurance	0.057	0.038	0.011	0.253
Percent employment-based insurance	0.609	0.056	0.479	0.735
Percent private purchased insurance	0.097	0.028	0.047	0.194
Percent less than high school degree	0.352	0.034	0.288	0.448
Percent high school degree	0.245	0.035	0.154	0.360
Percent some college degree	0.212	0.029	0.131	0.278
Percent college degree or higher	0.191	0.045	0.108	0.386
Percent White	0.733	0.160	0.171	0.958
Percent Black	0.109	0.113	0.0010	0.576
Percent Hispanic	0.091	0.096	0.0040	0.452
Percent Asian	0.032	0.055	0.00073	0.472
Percent other race	0.035	0.047	0.0044	0.320
Percent below federal poverty level	0.121	0.031	0.0542	0.228
Percent above federal poverty level	0.879	0.031	0.772	0.946
Percent married	0.411	0.036	0.206	0.474
Percent Metropolitan Statistical Area	0.724	0.192	0.254	1
Percent MSA unidentified	0.010	0.039	0	0.249
Percent male	0.491	0.0080	0.466	0.514
Percent female	0.509	0.0080	0.486	0.534
Percent US citizen	0.919	0.0597	0.722	0.996
Percent immigrant	0.081	0.0597	0.004	0.278
Percent age over 18	0.248	0.0194	0.193	0.326
Percent age between 18 and 35	0.230	0.0176	0.192	0.308
Percent age between 35 and 50	0.220	0.0157	0.172	0.259
Percent age between 50 and 65	0.180	0.0166	0.128	0.238
Percent age over 65	0.122	0.0173	0.059	0.169
Percent employed	0.493	0.0323	0.400	0.571
Percent unemployed	0.027	0.0060	0.012	0.047
Percent not in labor force	0.480	0.0315	0.407	0.572
Physician per 1,000 residents	2.723	1.339	0.295	9.448

State income in $1,000 (2008dollar)	26.426	3.657	19.701	39.637
Hospital beds per 1,000 residents	2.985	1.001	1.7	6.2
Percent smoker	21.106	3.281	9.8	30.8
Percent heavy drinker	5.127	1.262	2	8.6
Case Mix Index	1.083	0.091	1	1.32
Percent overweight with BMI 25 to 29.9	36.599	1.310	31.9	40.4
Percent obese with BMI over 30	24.287	3.163	16	32.6
Year 2003	0.201	0.401	0	1
Year 2004	0.197	0.398	0	1
Year 2005	0.201	0.401	0	1
Year 2006	0.201	0.401	0	1
Year 2007	0.201	0.401	0	1
Maine	0.0197	0.139	0	1
New Hampshire	0.0197	0.139	0	1
Vermont	0.0197	0.139	0	1
Massachusetts	0.0197	0.139	0	1
Rhode Island	0.0197	0.139	0	1
Connecticut	0.0197	0.139	0	1
New York	0.0197	0.139	0	1
New Jersey	0.0197	0.139	0	1
Pennsylvania	0.0197	0.139	0	1
Ohio	0.0197	0.139	0	1
Indiana	0.0197	0.139	0	1
Illinois	0.0197	0.139	0	1
Michigan	0.0197	0.139	0	1
Wisconsin	0.0197	0.139	0	1
Minnesota	0.0197	0.139	0	1
Iowa	0.0197	0.139	0	1
Missouri	0.0197	0.139	0	1
North Dakota	0.0197	0.139	0	1
South Dakota	0.0197	0.139	0	1
Nebraska	0.0197	0.139	0	1
Kansas	0.0197	0.139	0	1
Delaware	0.0197	0.139	0	1
Maryland	0.0197	0.139	0	1
Washington DC	0.0197	0.139	0	1
Virginia	0.0197	0.139	0	1
West Virginia	0.0197	0.139	0	1

North Carolina	0.0197	0.139	0	1
South Carolina	0.0197	0.139	0	1
Georgia	0.0197	0.139	0	1
Florida	0.0197	0.139	0	1
Kentucky	0.0197	0.139	0	1
Tennessee	0.0197	0.139	0	1
Alabama	0.0197	0.139	0	1
Mississippi	0.0197	0.139	0	1
Arkansas	0.0197	0.139	0	1
Louisiana	0.0197	0.139	0	1
Oklahoma	0.0197	0.139	0	1
Texas	0.0197	0.139	0	1
Montana	0.0197	0.139	0	1
Idaho	0.0197	0.139	0	1
Wyoming	0.0197	0.139	0	1
Colorado	0.0197	0.139	0	1
New Mexico	0.0197	0.139	0	1
Arizona	0.0197	0.139	0	1
Utah	0.0197	0.139	0	1
Nevada	0.0197	0.139	0	1
Washington	0.0197	0.139	0	1
Oregon	0.0197	0.139	0	1
California	0.0197	0.139	0	1
Alaska	0.0197	0.139	0	1
Hawaii	0.0157	0.125	0	1
Number of Observations		254		

Note: The dataset is compiled from the Almanac of Hospital Financial & Operating Indicators 2007, Statehealthfacts.org, BRFSS, and CPS March Supplements.

Table 3. Descriptive statistics for observations with data matching HCUP and the Almanac of Hospital Financial & Operating Indicators 2007.

Variables	Mean	Std. Dev.	Min.	Max.
Mean length of stay (day)	4.48	0.439	3.63	5.8
Median length of stay (day)	4.41	0.527	3.41	6.38
Percent insured	0.864	0.0347	0.788	0.946
Percent uninsured	0.136	0.0347	0.0535	0.212
Percent Medicare	0.141	0.0210	0.0804	0.199
Percent Medicaid	0.126	0.0350	0.0530	0.211
Percent other insurance	0.0484	0.0232	0.0110	0.149
Percent employment-based insurance	0.6168	0.0527	0.514	0.735
Percent private purchased insurance	0.0964	0.0231	0.0505	0.164
Percent less than high school degree	0.348	0.0310	0.288	0.412
Percent high school degree	0.243	0.0356	0.166	0.360
Percent some college degree	0.214	0.0255	0.162	0.267
Percent college degree or higher	0.194	0.0399	0.108	0.314
Percent White	0.749	0.157	0.171	0.957
Percent Black	0.0825	0.0739	0.0060	0.296
Percent Hispanic	0.0946	0.0872	0.0039	0.370
Percent Asian	0.0410	0.0699	0.000729	0.472
Percent other race	0.0325	0.0492	0.00735	0.320
Percent below federal poverty level	0.116	0.0270	0.0542	0.180
Percent above federal poverty level	0.884	0.0270	0.820	0.946
Percent married	0.416	0.0249	0.354	0.465
Percent Metropolitan Statistical Area	0.751	0.176	0.273	1
Percent MSA unidentified	0.0130	0.0445	0	0.249
Percent male	0.492	0.00717	0.475	0.511
Percent female	0.508	0.00717	0.489	0.525
Percent US citizen	0.906	0.0668	0.722	0.996
Percent immigrant	0.0939	0.0668	0.00432	0.278
Percent age over 18	0.246	0.0188	0.210	0.326
Percent age between 18 and 35	0.229	0.0164	0.199	0.298
Percent age between 35 and 50	0.221	0.0149	0.172	0.250
Percent age between 50 and 65	0.180	0.0172	0.128	0.238
Percent age over 65	0.124	0.0162	0.0743	0.169
Percent employed	0.494	0.0323	0.400	0.556
Percent unemployed	0.0270	0.00564	0.0135	0.0464
Percent not in labor force	0.479	0.0315	0.417	0.572

Physician per 1,000 residents	2.93	1.40	0.661	9.45
State income in $1,000 (2008dollar)	26.7	3.12	20.1	34.5
Hospital beds per 1,000 residents	2.73	0.710	1.7	4.3
Percent smoker	20.7	3.67	9.8	30.8
Percent heavy drinker	5.14	1.47	2	8.6
Case Mix Index	1.09	0.0948	1	1.31
Percent overweight with BMI 25 to 29.9	36.6	1.19	33	40.4
Percent obese with BMI over 30	23.9	3.24	16	31
Year 2003	0.190	0.394	0	1
Year 2004	0.184	0.389	0	1
Year 2005	0.204	0.404	0	1
Year 2006	0.211	0.409	0	1
Year 2007	0.211	0.409	0	1
Maine	0.0204	0.142	0	1
New Hampshire	0.0340	0.182	0	1
Vermont	0.0340	0.182	0	1
Massachusetts	0.0340	0.182	0	1
Rhode Island	0.0340	0.182	0	1
New York	0.0340	0.182	0	1
New Jersey	0.0340	0.182	0	1
Michigan	0.0340	0.182	0	1
Wisconsin	0.0340	0.182	0	1
Minnesota	0.0340	0.182	0	1
Iowa	0.0340	0.182	0	1
Missouri	0.0340	0.182	0	1
Nebraska	0.0340	0.182	0	1
Kansas	0.0340	0.182	0	1
Maryland	0.0204	0.142	0	1
West Virginia	0.0340	0.182	0	1
North Carolina	0.0340	0.182	0	1
South Carolina	0.0340	0.182	0	1
Florida	0.0340	0.182	0	1
Kentucky	0.0340	0.182	0	1
Tennessee	0.0340	0.182	0	1
Arkansas	0.0272	0.163	0	1
Oklahoma	0.0204	0.141	0	1
Colorado	0.0340	0.182	0	1
Arizona	0.0340	0.182	0	1

Utah	0.0340	0.182	0	1
Nevada	0.0340	0.182	0	1
Washington	0.0340	0.182	0	1
Oregon	0.0340	0.182	0	1
California	0.0340	0.182	0	1
Hawaii	0.0272	0.163	0	1
Number of Observations		147		

Note: The dataset is compiled from HCUP, Almanac of Hospital Financial & Operating Indicators 2007, Statehealthfacts.org, BRFSS, and CPS March Supplements.

Table 4. Estimates for regressions that use mean length of stay as dependent variables.

	(1)	(2)	(3)	(4)
VARIABLES	Mean length of stay (days)			
Percent insured	0.533	-	-1.259*	-
	(0.962)		(0.643)	
Percent Medicare	-	-0.278	-	-4.327**
		(3.393)		(1.809)
Percent Medicaid	-	2.782***	-	-0.324
		(0.755)		(0.581)
Percent other insurance	-	-1.619	-	-2.721***
		(1.089)		(0.820)
Percent employment-based insurance	-	-0.112	-	0.317
		(0.779)		(0.529)
Percent private purchased insurance	-	-4.267***	-	-1.179
		(1.165)		(0.778)
Percent high school degree	0.0405	-0.535	-1.657	-1.196
	(1.601)	(1.552)	(1.217)	(1.182)
Percent some college degree	-7.472***	-4.976***	-2.719**	-2.217*
	(1.440)	(1.470)	(1.307)	(1.272)
Percent college degree or higher	1.234	2.053	-2.439*	-2.513*
	(1.521)	(1.451)	(1.301)	(1.288)
Percent Black	0.291	0.571*	3.502*	4.381**
	(0.365)	(0.340)	(1.896)	(1.880)
Percent Hispanic	-1.523**	-1.191**	-0.184	-0.440
	(0.603)	(0.553)	(0.902)	(0.876)
Percent Asian	0.815**	1.072***	-0.467	-0.400
	(0.368)	(0.354)	(1.030)	(1.009)
Percent other race	1.570***	1.876***	-0.461	-0.871
	(0.490)	(0.526)	(1.018)	(1.005)
Percent below federal poverty level	1.573	-0.221	-0.100	-0.215
	(1.402)	(1.511)	(0.730)	(0.771)
Percent married	-0.0281	1.430	0.954	0.925
	(1.199)	(1.188)	(0.763)	(0.744)
Percent Metropolitan Statistical Area	0.222	0.395**	-0.245	-0.260
	(0.171)	(0.164)	(0.288)	(0.285)
Percent MSA unidentified	1.170**	1.302***	0.00793	-0.0881
	(0.476)	(0.450)	(0.291)	(0.287)
Percent female	11.71***	10.24***	-0.000634	-1.390
	(3.658)	(3.473)	(1.863)	(1.807)

	4.805***	4.035***	0.0560	0.477
Percent immigrant	(0.783)	(0.782)	(1.097)	(1.078)
	2.083	-0.990	0.738	1.862
Percent age between 18 and 35	(2.893)	(2.911)	(2.021)	(2.013)
	5.983***	3.137	2.574	2.717
Percent age between 35 and 50	(2.276)	(2.363)	(1.948)	(1.915)
	2.053	-1.122	1.746	3.163
Percent age between 50 and 65	(2.141)	(2.394)	(1.934)	(1.938)
	1.392	2.625	1.132	5.795**
Percent age over 65	(2.255)	(4.201)	(1.768)	(2.395)
	2.009*	3.656***	0.383	-0.920
Percent employed	(1.158)	(1.283)	(0.917)	(1.012)
	1.725	3.265	-2.836	-3.831**
Percent unemployed	(2.210)	(2.182)	(1.760)	(1.774)
	-4.92e-05	-0.0101	-0.00422	0.000173
Physician per 1,000 residents	(0.0143)	(0.0136)	(0.00703)	(0.00688)
	-0.0436***	-0.0482***	0.0129	0.00922
State income in $1,000 (2008dollar)	(0.0158)	(0.0157)	(0.0104)	(0.0101)
	0.131***	0.181***	0.209**	0.236***
Hospital beds per 1,000 residents	(0.0394)	(0.0372)	(0.0920)	(0.0897)
	0.0148	0.0243***	0.0110	0.0115
Percent smoker	(0.00896)	(0.00891)	(0.00772)	(0.00747)
	0.0219	0.00738	-0.00928	-0.00289
Percent heavy drinker	(0.0199)	(0.0185)	(0.0125)	(0.0123)
	-0.0131	0.00138	0.0240***	0.0235***
Percent overweight with BMI 25 to 29.9	(0.0159)	(0.0152)	(0.00830)	(0.00800)
	0.0210***	0.0137*	0.0121	0.0135
Percent obese with BMI over 30	(0.00800)	(0.00762)	(0.00897)	(0.00869)
			0.0337	0.0554
Year 2002	-	-	(0.0339)	(0.0342)
			0.0347	0.0621
Year 2003	-	-	(0.0407)	(0.0407)
			0.0350	0.0619
Year 2004	-	-	(0.0493)	(0.0492)
			0.0366	0.0612
Year 2005	-	-	(0.0613)	(0.0604)
			0.0103	0.0396
Year 2006	-	-	(0.0720)	(0.0712)
			0.0555	0.0644
Year 2007	-	-	(0.0842)	(0.0833)

			0.145	0.160
Year 2008	-	-	(0.103)	(0.102)
			0.120	0.0191
New Hampshire	-	-	(0.119)	(0.127)
			0.0894	0.0672
Vermont	-	-	(0.107)	(0.109)
			0.465*	0.257
Massachusetts	-	-	(0.237)	(0.238)
			0.547**	0.468**
Rhode Island	-	-	(0.213)	(0.208)
			0.802**	0.531
New York	-	-	(0.374)	(0.367)
			0.151	-0.0916
New Jersey	-	-	(0.355)	(0.352)
			-0.226	-0.527*
Michigan	-	-	(0.274)	(0.280)
			-0.418***	-0.566***
Wisconsin	-	-	(0.143)	(0.150)
			-0.595***	-0.723***
Minnesota	-	-	(0.151)	(0.153)
			-0.366**	-0.434***
Iowa	-	-	(0.141)	(0.146)
			-0.197	-0.325
Missouri	-	-	(0.232)	(0.234)
			-0.700***	-0.696***
Nebraska	-	-	(0.218)	(0.215)
			-0.624***	-0.631***
Kansas	-	-	(0.188)	(0.187)
			-1.109*	-1.394**
Maryland	-	-	(0.562)	(0.558)
			-0.432**	-0.564***
West Virginia	-	-	(0.197)	(0.196)
			-0.614	-0.699*
North Carolina	-	-	(0.405)	(0.402)
			-0.665	-0.856
South Carolina	-	-	(0.525)	(0.522)
			-0.333	-0.397
Florida	-	-	(0.371)	(0.362)
			-0.654***	-0.687***
Kentucky	-	-	(0.187)	(0.188)

			-0.518	-0.630**
Tennessee	-	-	(0.325)	(0.319)
			-0.699**	-0.750**
Arkansas	-	-	(0.318)	(0.313)
			-0.125	0.114
Oklahoma	-	-	(0.224)	(0.224)
			-0.165	-0.0701
Texas	-	-	(0.416)	(0.405)
			-1.445***	-1.433***
Wyoming	-	-	(0.212)	(0.213)
			-0.300	-0.197
Colorado	-	-	(0.253)	(0.250)
			-0.262	-0.194
Arizona	-	-	(0.291)	(0.286)
			-0.274	-0.337
Utah	-	-	(0.253)	(0.249)
			-0.148	-0.244
Nevada	-	-	(0.277)	(0.274)
			-0.188	-0.144
Washington	-	-	(0.198)	(0.196)
			-0.258	-0.249
Oregon	-	-	(0.169)	(0.171)
			0.268	0.247
California	-	-	(0.378)	(0.369)
			1.362**	1.327**
Hawaii	-	-	(0.671)	(0.651)
	-4.324*	-3.522	3.172*	2.810*
Constant	(2.608)	(2.555)	(1.616)	(1.547)
Observations	234	234	234	234
R-squared	0.798	0.826	0.972	0.975

Note: The standard errors are presented in parentheses. The values in the table represent the coefficients for each independent variable. The dataset is compiled from HCUP, Statehealthfacts.org, BRFSS, and CPS March Supplements.

*Statistically significant at the 0.10 level.

**Statistically significant at the 0.05 level.

***Statistically significant at the 0.01 level.

Table 5. Estimates for regressions that use median length of stay as dependent variables.

	(1)	(2)	(3)	(4)
VARIABLES	Median length of stay (days)			
Percent insured	2.244*		-0.793	
	(1.327)	-	(0.858)	-
		-1.778		0.737
Percent Medicare	-	(5.327)	-	(2.650)
		-0.0600		0.901
Percent Medicaid	-	(1.174)	-	(0.899)
		0.870		1.520
Percent other insurance	-	(1.507)	-	(1.230)
		3.457***		0.0982
Percent employment-based insurance	-	(1.157)	-	(0.748)
		-1.599		-0.880
Percent private purchased insurance	-	(1.899)	-	(1.113)
	-5.475**	-7.211***	-0.557	-0.626
Percent high school degree	(2.242)	(2.274)	(1.516)	(1.531)
	-8.933***	-9.126***	-1.587	-1.353
Percent some college degree	(2.091)	(2.124)	(1.679)	(1.721)
	1.939	1.175	0.251	0.0691
Percent college degree or higher	(2.484)	(2.485)	(1.723)	(1.743)
	0.503	0.415	4.361*	4.115
Percent Black	(0.525)	(0.512)	(2.503)	(2.532)
	0.478	0.330	-2.842**	-2.871**
Percent Hispanic	(0.600)	(0.594)	(1.339)	(1.391)
	1.193	0.423	-3.845**	-3.834**
Percent Asian	(1.027)	(1.130)	(1.712)	(1.724)
	4.094***	4.230***	1.118	-0.0673
Percent other race	(1.069)	(1.626)	(1.561)	(1.728)
	-7.310***	-4.809**	0.173	0.141
Percent below federal poverty level	(1.963)	(2.113)	(0.975)	(1.029)
	0.551	0.706	-0.851	-1.023
Percent married	(1.682)	(1.671)	(0.995)	(1.014)
	0.276	0.0854	0.545*	0.462
Percent Metropolitan Statistical Area	(0.250)	(0.280)	(0.325)	(0.332)
	3.688***	3.553***	-0.752*	-0.689
Percent MSA unidentified	(0.752)	(0.747)	(0.448)	(0.454)
	9.017	7.502	-1.059	-0.758
Percent female	(5.706)	(5.766)	(3.132)	(3.182)

	3.675***	4.158***	0.471	0.402
Percent immigrant	(1.256)	(1.275)	(1.757)	(1.799)
	0.997	2.775	2.540	2.286
Percent age between 18 and 35	(3.885)	(4.084)	(2.976)	(3.016)
	5.861*	8.010**	3.138	3.179
Percent age between 35 and 50	(3.430)	(3.673)	(3.030)	(3.072)
	6.219**	8.120**	4.199	4.260
Percent age between 50 and 65	(3.109)	(3.506)	(3.331)	(3.381)
	5.120*	10.95*	3.157	3.300
Percent age over 65	(3.055)	(6.502)	(3.166)	(4.028)
	1.886	1.836	-2.484**	-1.827
Percent employed	(1.738)	(2.001)	(1.193)	(1.309)
	5.087	5.886	-0.814	0.701
Percent unemployed	(5.167)	(5.262)	(2.802)	(2.886)
	-0.0363*	-0.0339	-0.0231**	-0.0202*
Physician per 1,000 residents	(0.0206)	(0.0209)	(0.0102)	(0.0103)
	-0.108***	-0.120***	0.0125	0.0111
State income in $1,000 (2008dollar)	(0.0209)	(0.0209)	(0.0131)	(0.0134)
	0.497***	0.532***	-0.160	-0.135
Hospital beds per 1,000 residents	(0.0401)	(0.0460)	(0.106)	(0.108)
	-0.00412	-0.0155	0.00324	0.00548
Percent smoker	(0.0145)	(0.0148)	(0.0105)	(0.0108)
	0.0503*	0.0546**	0.00958	0.0118
Percent heavy drinker	(0.0269)	(0.0269)	(0.0185)	(0.0185)
	-0.149	-0.152	-0.170	-0.283
Case Mix Index	(0.406)	(0.404)	(0.342)	(0.351)
	0.0539**	0.0521**	0.0268**	0.0243**
Percent overweight with BMI 25 to 29.9	(0.0238)	(0.0242)	(0.0116)	(0.0118)
	0.0219*	0.0203	0.0123	0.00968
Percent obese with BMI over 30	(0.0131)	(0.0130)	(0.0120)	(0.0121)
			-0.0284	-0.0321
Year 2004	-	-	(0.0337)	(0.0345)
			-0.0679	-0.0697
Year 2005	-	-	(0.0515)	(0.0522)
			-0.0781	-0.0633
Year 2006	-	-	(0.0638)	(0.0652)
			-0.0656	-0.0619
Year 2007	-	-	(0.0793)	(0.0815)
			0.359**	0.523**
New Hampshire	-	-	(0.161)	(0.202)

			0.394**	0.410***
Vermont	-	-	(0.152)	(0.153)
			0.0379	0.205
Massachusetts	-	-	(0.307)	(0.327)
			0.540*	0.679**
Rhode Island	-	-	(0.283)	(0.294)
			-0.147	0.0857
Connecticut	-	-	(0.357)	(0.381)
			1.159**	1.345***
New York	-	-	(0.466)	(0.487)
			0.470	0.812
New Jersey	-	-	(0.470)	(0.507)
			0.00532	0.186
Pennsylvania	-	-	(0.279)	(0.296)
			-0.483	-0.313
Ohio	-	-	(0.305)	(0.327)
			-0.188	0.00154
Indiana	-	-	(0.258)	(0.280)
			-0.345	-0.0639
Illinois	-	-	(0.432)	(0.463)
			-0.636*	-0.449
Michigan	-	-	(0.370)	(0.395)
			-0.346	-0.196
Wisconsin	-	-	(0.212)	(0.234)
			-0.207	-0.0375
Minnesota	-	-	(0.241)	(0.263)
			0.741***	0.854***
Iowa	-	-	(0.186)	(0.202)
			-0.221	-0.0468
Missouri	-	-	(0.306)	(0.319)
			3.129***	3.218***
North Dakota	-	-	(0.351)	(0.366)
			1.525***	1.595***
South Dakota	-	-	(0.367)	(0.380)
			0.959***	1.099***
Nebraska	-	-	(0.285)	(0.300)
			1.364***	1.531***
Kansas	-	-	(0.274)	(0.292)
			-0.261	-0.0740
Delaware	-	-	(0.495)	(0.516)

			-1.343*	-1.021
Maryland	-	-	(0.741)	(0.766)
			-0.667	-0.500
Washington DC	-	-	(1.452)	(1.471)
			-0.596	-0.380
Virginia	-	-	(0.513)	(0.532)
			0.186	0.257
West Virginia	-	-	(0.251)	(0.256)
			-0.665	-0.427
North Carolina	-	-	(0.540)	(0.554)
			-0.826	-0.631
South Carolina	-	-	(0.715)	(0.726)
			-0.975	-0.693
Georgia	-	-	(0.745)	(0.762)
			0.0973	0.382
Florida	-	-	(0.482)	(0.494)
			-0.144	-0.0621
Kentucky	-	-	(0.249)	(0.256)
			-0.681	-0.550
Tennessee	-	-	(0.424)	(0.430)
			-1.336**	-1.131*
Alabama	-	-	(0.641)	(0.657)
			-0.542	-0.382
Mississippi	-	-	(0.915)	(0.924)
			-0.507	-0.358
Arkansas	-	-	(0.401)	(0.406)
			-0.297	-0.0429
Louisiana	-	-	(0.795)	(0.808)
			-0.0823	0.136
Oklahoma	-	-	(0.327)	(0.333)
			0.600	0.932
Texas	-	-	(0.590)	(0.623)
			0.621***	0.711***
Montana	-	-	(0.238)	(0.252)
			-0.0732	0.158
Idaho	-	-	(0.262)	(0.286)
			0.459**	0.539**
Wyoming	-	-	(0.226)	(0.245)
			0.346	0.626
Colorado	-	-	(0.390)	(0.425)

			0.526	0.723
New Mexico	-	-	(0.591)	(0.623)
			0.122	0.400
Arizona	-	-	(0.471)	(0.496)
			0.340	0.669
Utah	-	-	(0.452)	(0.485)
			0.584	0.865*
Nevada	-	-	(0.412)	(0.446)
			-0.464	-0.256
Washington	-	-	(0.295)	(0.315)
			-0.686***	-0.406
Oregon	-	-	(0.250)	(0.278)
			0.845	1.199**
California	-	-	(0.568)	(0.600)
			-0.527	-0.442
Alaska	-	-	(0.400)	(0.416)
			3.090***	3.441***
Hawaii	-	-	(0.848)	(0.877)
	-4.740	-4.779	3.661	2.393
Constant	(4.050)	(4.058)	(3.201)	(3.190)
Observations	254	254	254	254
R-squared	0.705	0.721	0.972	0.973

Note: The standard errors are presented in parentheses. The values in the table represent the coefficients for each independent variable. The dataset is compiled from the Almanac of Hospital Financial & Operating Indicators 2007, Statehealthfacts.org, BRFSS, and CPS March Supplements.

*Statistically significant at the 0.10 level.

**Statistically significant at the 0.05 level.

***Statistically significant at the 0.01 level.

Table 6. Estimates for regressions with a matching number of observations that use mean length of stay as dependent variables.

	(1)	(2)	(3)	(4)
VARIABLES	Mean length of stay (days)			
	1.626		-0.899	
Percent insured	(1.179)	-	(0.583)	-
		1.217		-0.400
Percent Medicare	-	(4.536)	-	(2.017)
		2.079**		-0.615
Percent Medicaid	-	(0.919)	-	(0.560)
		-2.874*		-2.073**
Percent other insurance	-	(1.677)	-	(0.848)
		0.0459		-0.208
Percent employment-based insurance	-	(1.047)	-	(0.530)
		-3.187*		-1.262
Percent private purchased insurance	-	(1.884)	-	(0.835)
	-0.833	-1.463	1.886*	1.572
Percent high school degree	(2.025)	(2.093)	(1.115)	(1.117)
	-6.455***	-4.776**	0.624	0.510
Percent some college degree	(1.846)	(1.936)	(1.247)	(1.241)
	0.878	0.629	1.236	0.690
Percent college degree or higher	(2.157)	(2.109)	(1.254)	(1.295)
	0.571	0.924**	0.965	1.843
Percent Black	(0.466)	(0.459)	(2.491)	(2.498)
	-1.476*	-1.372*	0.284	0.327
Percent Hispanic	(0.747)	(0.744)	(1.018)	(1.029)
	-1.364	-1.512	-1.826	-2.235**
Percent Asian	(0.921)	(0.974)	(1.110)	(1.110)
	3.840***	4.998***	2.082	2.445*
Percent other race	(1.064)	(1.428)	(1.294)	(1.316)
	-1.091	-2.182	0.331	0.333
Percent below federal poverty level	(1.664)	(1.819)	(0.650)	(0.676)
	0.613	1.430	0.366	0.606
Percent married	(1.463)	(1.491)	(0.727)	(0.738)
	0.0733	0.179	-0.0515	-0.0519
Percent Metropolitan Statistical Area	(0.224)	(0.224)	(0.298)	(0.318)
	1.361**	1.269**	0.0184	-0.101
Percent MSA unidentified	(0.603)	(0.594)	(0.285)	(0.290)
	12.58**	13.64**	0.416	0.00626
Percent female	(5.418)	(5.314)	(2.221)	(2.247)

	6.030***	5.612***	-1.678	-1.358
Percent immigrant	(1.127)	(1.166)	(1.198)	(1.232)
	3.527	2.925	-1.860	-1.527
Percent age between 18 and 35	(3.815)	(4.074)	(2.082)	(2.107)
	7.060**	6.227*	-2.356	-2.431
Percent age between 35 and 50	(3.075)	(3.350)	(2.190)	(2.200)
	4.796*	2.859	-2.477	-1.768
Percent age between 50 and 65	(2.628)	(3.266)	(2.313)	(2.376)
	1.676	2.462	-3.379	-2.093
Percent age over 65	(3.050)	(5.573)	(2.170)	(2.795)
	1.021	2.320	-0.586	-0.788
Percent employed	(1.536)	(1.823)	(0.843)	(1.034)
	4.716	5.470	-0.189	-1.115
Percent unemployed	(4.622)	(4.935)	(2.128)	(2.350)
	0.00236	-0.00784	0.00157	0.00160
Physician per 1,000 residents	(0.0165)	(0.0168)	(0.00665)	(0.00668)
	-0.0569**	-0.0483*	0.0157	0.0217**
State income in $1,000 (2008dollar)	(0.0236)	(0.0244)	(0.0102)	(0.0108)
	0.438	-0.0192	-0.474**	-0.500*
Hospital beds per 1,000 residents	(0.364)	(0.386)	(0.231)	(0.251)
	0.204***	0.254***	0.291***	0.327***
Percent smoker	(0.0506)	(0.0525)	(0.109)	(0.109)
	0.0221*	0.0197	0.00556	0.00229
Percent heavy drinker	(0.0128)	(0.0135)	(0.00728)	(0.00749)
	0.0361	0.0204	-0.00407	-0.00670
Case Mix Index	(0.0242)	(0.0244)	(0.0122)	(0.0121)
	-0.0263	-0.0142	0.0116	0.0118
Percent overweight with BMI 25 to 29.9	(0.0198)	(0.0196)	(0.00713)	(0.00717)
	0.0116	0.00354	-0.0155*	-0.0150*
Percent obese with BMI over 30	(0.0112)	(0.0112)	(0.00877)	(0.00873)
			0.00581	0.00508
Year 2004	-	-	(0.0242)	(0.0244)
			0.0499	0.0379
Year 2005	-	-	(0.0360)	(0.0365)
			0.0502	0.0281
Year 2006	-	-	(0.0471)	(0.0488)
			0.0858	0.0623
Year 2007	-	-	(0.0576)	(0.0594)
			0.235**	0.125
New Hampshire	-	-	(0.118)	(0.131)

			0.0782	0.0649
Vermont	-	-	(0.111)	(0.114)
			0.561**	0.389
Massachusetts	-	-	(0.216)	(0.236)
			0.923***	0.813***
Rhode Island	-	-	(0.203)	(0.212)
			1.371***	1.132***
New York	-	-	(0.395)	(0.407)
			0.766**	0.488
New Jersey	-	-	(0.378)	(0.398)
			0.135	-0.0834
Michigan	-	-	(0.327)	(0.339)
			-0.377**	-0.494***
Wisconsin	-	-	(0.156)	(0.165)
			-0.602***	-0.736***
Minnesota	-	-	(0.163)	(0.172)
			-0.317**	-0.408**
Iowa	-	-	(0.156)	(0.167)
			0.0997	-0.0563
Missouri	-	-	(0.277)	(0.284)
			-0.708***	-0.793***
Nebraska	-	-	(0.242)	(0.247)
			-0.665***	-0.746***
Kansas	-	-	(0.214)	(0.218)
			-0.147	-0.452
Maryland	-	-	(0.692)	(0.699)
			-0.216	-0.350
West Virginia	-	-	(0.228)	(0.239)
			0.117	-0.0592
North Carolina	-	-	(0.510)	(0.515)
			0.281	0.0608
South Carolina	-	-	(0.698)	(0.701)
			0.405	0.232
Florida	-	-	(0.405)	(0.413)
			-0.230	-0.315
Kentucky	-	-	(0.237)	(0.248)
			0.0621	-0.0884
Tennessee	-	-	(0.408)	(0.411)
			-0.161	-0.291
Arkansas	-	-	(0.405)	(0.408)

			-0.278	-0.222
Oklahoma	-	-	(0.252)	(0.250)
			-0.427	-0.433
Colorado	-	-	(0.269)	(0.278)
			-0.127	-0.178
Arizona	-	-	(0.311)	(0.317)
			-0.535*	-0.574*
Utah	-	-	(0.303)	(0.311)
			0.172	0.0692
Nevada	-	-	(0.297)	(0.311)
			-0.112	-0.105
Washington	-	-	(0.221)	(0.229)
			-0.175	-0.188
Oregon	-	-	(0.185)	(0.197)
			0.883**	0.793*
California	-	-	(0.390)	(0.401)
			1.236*	1.255*
Hawaii	-	-	(0.649)	(0.642)
	-6.205	-5.880	5.266**	4.921**
Constant	(3.816)	(3.875)	(2.184)	(2.204)
Observations	147	147	147	147
R-squared	0.827	0.841	0.990	0.990

Note: The standard errors are presented in parentheses. The values in the table represent the coefficients for each independent variable. The dataset is compiled from HCUP, Statehealthfacts.org, BRFSS, and CPS March Supplements.

*Statistically significant at the 0.10 level.

**Statistically significant at the 0.05 level.

***Statistically significant at the 0.01 level.

Table 7. Estimates for regressions with a matching number of observations that use median length of stay as dependent variables.

	(1)	(2)	(3)	(4)
VARIABLES	Median length of stay (days)			
	0.432		-0.556	
Percent insured	(1.842)	-	(1.288)	-
		12.08*		0.133
Percent Medicare	-	(6.869)	-	(4.468)
		-1.087		0.528
Percent Medicaid	-	(1.390)	-	(1.256)
		3.160		1.397
Percent other insurance	-	(2.517)	-	(1.869)
		3.263**		1.094
Percent employment-based insurance	-	(1.583)	-	(1.160)
		-4.975*		-1.266
Percent private purchased insurance	-	(2.815)	-	(1.821)
	2.738	-0.797	-1.710	-1.680
Percent high school degree	(3.232)	(3.216)	(2.420)	(2.469)
	-3.619	-4.539	-0.663	-0.308
Percent some college degree	(2.962)	(2.944)	(2.718)	(2.784)
	5.224	3.827	-1.238	-1.248
Percent college degree or higher	(3.394)	(3.211)	(2.849)	(3.013)
	0.419	0.770	-2.089	-1.960
Percent Black	(0.706)	(0.679)	(4.526)	(4.640)
	0.0195	1.105	-2.505	-1.641
Percent Hispanic	(1.192)	(1.139)	(2.193)	(2.262)
	-0.196	-0.705	-6.957***	-6.770***
Percent Asian	(1.434)	(1.467)	(2.488)	(2.561)
	4.489***	4.281**	1.210	0.690
Percent other race	(1.652)	(2.148)	(2.710)	(2.841)
	-5.172*	-0.457	1.676	2.404
Percent below federal poverty level	(2.616)	(2.748)	(1.434)	(1.525)
	-4.376*	-2.021	-0.702	-0.460
Percent married	(2.290)	(2.226)	(1.489)	(1.535)
	-0.307	-0.469	0.538	0.201
Percent Metropolitan Statistical Area	(0.351)	(0.336)	(0.639)	(0.683)
	1.354	1.516*	-1.276**	-1.149*
Percent MSA unidentified	(0.946)	(0.894)	(0.583)	(0.605)
	11.45	11.84	0.735	1.160
Percent female	(8.429)	(7.919)	(4.815)	(4.995)

	4.093**	4.622***	-0.630	-0.908
Percent immigrant	(1.762)	(1.754)	(2.577)	(2.714)
	-0.467	0.366	4.453	4.111
Percent age between 18 and 35	(5.917)	(6.090)	(4.473)	(4.619)
	-1.500	-0.105	2.920	3.105
Percent age between 35 and 50	(4.830)	(5.036)	(4.724)	(4.841)
	0.665	0.368	3.141	2.669
Percent age between 50 and 65	(4.122)	(4.923)	(4.973)	(5.252)
	-3.675	-7.268	2.880	3.459
Percent age over 65	(4.834)	(8.514)	(4.728)	(6.331)
	-0.294	3.383	-1.509	-1.479
Percent employed	(2.412)	(2.724)	(1.840)	(2.274)
	2.292	9.131	-4.421	-4.324
Percent unemployed	(7.251)	(7.418)	(4.538)	(5.127)
	-0.0483*	-0.0610**	-0.0207	-0.0213
Physician per 1,000 residents	(0.0266)	(0.0259)	(0.0149)	(0.0153)
	-0.0502	-0.0627*	0.0430*	0.0459*
State income in $1,000 (2008dollar)	(0.0360)	(0.0363)	(0.0222)	(0.0239)
	0.524***	0.563***	-0.0685	-0.0419
Hospital beds per 1,000 residents	(0.0802)	(0.0803)	(0.233)	(0.240)
	-0.000316	-0.0321	-0.00158	-0.00317
Percent smoker	(0.0201)	(0.0207)	(0.0157)	(0.0165)
	0.0448	0.0562	0.00691	0.00469
Percent heavy drinker	(0.0384)	(0.0373)	(0.0262)	(0.0265)
	-0.0644	-0.453	-0.520	-0.610
Case Mix Index	(0.588)	(0.598)	(0.492)	(0.537)
	0.0302	0.0212	0.0285*	0.0287*
Percent overweight with BMI 25 to 29.9	(0.0306)	(0.0290)	(0.0151)	(0.0155)
	-0.0184	-0.0241	-0.00715	-0.00486
Percent obese with BMI over 30	(0.0178)	(0.0173)	(0.0189)	(0.0192)
			-0.0543	-0.0655
Year 2004	-	-	(0.0518)	(0.0533)
			-0.0476	-0.0625
Year 2005	-	-	(0.0769)	(0.0792)
			-0.0656	-0.0692
Year 2006	-	-	(0.101)	(0.106)
			0.00463	-0.00751
Year 2007	-	-	(0.124)	(0.130)
			0.300	0.325
New Hampshire	-	-	(0.253)	(0.289)

			0.371	0.356
Vermont	-	-	(0.240)	(0.253)
			0.397	0.497
Massachusetts	-	-	(0.468)	(0.519)
			0.887**	1.005**
Rhode Island	-	-	(0.434)	(0.468)
			2.257***	2.300***
New York	-	-	(0.778)	(0.840)
			1.525*	1.646*
New Jersey	-	-	(0.769)	(0.847)
			0.335	0.380
Michigan	-	-	(0.613)	(0.666)
			-0.149	-0.0812
Wisconsin	-	-	(0.321)	(0.352)
			-0.212	-0.147
Minnesota	-	-	(0.344)	(0.373)
			0.603*	0.604*
Iowa	-	-	(0.326)	(0.355)
			0.377	0.494
Missouri	-	-	(0.516)	(0.547)
			0.861*	0.877*
Nebraska	-	-	(0.506)	(0.527)
			1.427***	1.463***
Kansas	-	-	(0.444)	(0.460)
			0.553	0.661
Maryland	-	-	(1.292)	(1.357)
			0.452	0.445
West Virginia	-	-	(0.469)	(0.502)
			0.652	0.746
North Carolina	-	-	(0.928)	(0.963)
			1.068	1.130
South Carolina	-	-	(1.248)	(1.285)
			1.109	1.285
Florida	-	-	(0.797)	(0.852)
			0.248	0.212
Kentucky	-	-	(0.444)	(0.468)
			0.313	0.382
Tennessee	-	-	(0.734)	(0.764)
			0.445	0.540
Arkansas	-	-	(0.731)	(0.758)

			0.203	0.250
Oklahoma	-	-	(0.534)	(0.541)
			0.299	0.408
Colorado	-	-	(0.575)	(0.602)
			0.242	0.292
Arizona	-	-	(0.667)	(0.695)
			0.195	0.322
Utah	-	-	(0.656)	(0.684)
			1.188*	1.258*
Nevada	-	-	(0.637)	(0.685)
			-0.242	-0.111
Washington	-	-	(0.472)	(0.496)
			-0.547	-0.345
Oregon	-	-	(0.395)	(0.428)
			1.553*	1.673*
California	-	-	(0.835)	(0.877)
			4.379***	4.399***
Hawaii	-	-	(1.410)	(1.426)
	-0.527	-4.090	2.176	0.601
Constant	(5.953)	(5.768)	(4.768)	(4.876)
Observations	147	147	147	147
R-squared	0.705	0.751	0.967	0.968

Note: The standard errors are presented in parentheses. The values in the table represent the coefficients for each independent variable. The dataset is compiled from the Almanac of Hospital Financial & Operating Indicators 2007, Statehealthfacts.org, BRFSS, and CPS March Supplements.

*Statistically significant at the 0.10 level.

**Statistically significant at the 0.05 level.

***Statistically significant at the 0.01 level.