

# “The Determinants of Patient Satisfaction in the United States”

Nikhil Porecha  
The College of New Jersey  
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Dr. Donka Mirtcheva

## Abstract

Hospitals and other healthcare facilities face a problem in determining how to efficiently allocate resources to achieve optimal patient satisfaction at a relatively reasonable cost. This paper examines national data to gain insight on which variables are significant determinants of patient satisfaction. Using 2014 hospital specific patient satisfaction data from the Centers for Medicare & Medicaid Services, 2014 gross hospital revenue data from the American Hospital Directory and additional state-level data, this study ultimately **determines the characteristics of hospitals which patient’s take most into account when reflecting upon their experience within the hospital setting.**

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## I. **Introduction**

Healthcare facilities are constantly looking for ways to improve both patient care and the efficiency with which they provide healthcare solutions. Hospitals in particular face a problem in determining how to efficiently allocate resources to achieve optimal patient satisfaction at a relatively reasonable cost. In previously conducted research, patient satisfaction has been linked to several factors which had either a positive or negative influence upon survey ratings. In addition to these hospital-scale factors such as health care practitioner attentiveness, large scale factors such as overall GDP of the state or city in which the hospital is located in addition to overall healthcare revenue of the state also are factors to consider. Essentially, in identifying the prominent measures of patient satisfaction by comparing hospital specific data from each state, conclusions can be reached on how to optimize a hospital's resources to maximize patient satisfaction.

## II. **Research Question and Contribution**

Given the increased emphasis on quality of healthcare, this study addresses *the determinants of patient satisfaction in a healthcare facility* in terms of both hospital level and state level factors. In considering these factors, hospitals will be able to allocate their resources to optimize satisfaction while state healthcare legislators will be able to understand the dynamic between successful and unsuccessful healthcare providers.

The purpose of this analysis is to highlight the prominent focus upon patient satisfaction in the U.S. healthcare system by identifying hospital characteristics and amenities which patients take most into consideration when evaluating the quality of their hospital stay. This information can then be used to assist hospitals around the country in enhancing the level of patient care by determining which characteristics are most important to a patient. In comparison

to past studies of patient satisfaction which have focused upon patients in either a single hospital or region of the country, the proposed analysis will analyze hospitals throughout the United States, providing a comprehensive view of both strengths and shortcomings of healthcare providers. Additionally, the analysis will include state level variables such as GDP per capita, population, and state level hospital information which have not been researched extensively in prior studies to provide another level of depth to the study. In being able to provide information on a country-wide level, this research can potentially highlight areas of improvement within the healthcare system and in turn optimize patient satisfaction.

### III. **Literature Review**

Previous patient satisfaction studies have attempted to determine the relationship between healthcare provider characteristics and patient expectations in a healthcare setting. While each study differs in factors such as targeted population, variables considered, and methods of conducting research, the goal of identifying key variables which patients take into account most when considering the quality of healthcare received remains the same.

To begin with, Korsch et al. (1968) conducted a study on a sample of 800 patients to determine the causes of the increasing gaps in patient and doctor communication. To do so, the researchers conducted four stages of data collection beginning with a tape recorded interview during the patient's visit which provided information on the patient's perception of the communication of the doctors. Once the patient was released, the researchers scheduled a live interview to gather the patient's thoughts on the medical visit as a whole. A chart review was conducted to gather demographic information as well as the doctor's diagnosis and recommendations. Finally, a follow-up interview was conducted to gather data for the dependent variable which was a statement regarding overall satisfaction. In an effort to quantify

the data, given the researchers were working with verbal data, they converted each answer into a numerical value to process the regression in a statistical manner. After analyzing the data, the researchers concluded that patient expectations of a doctor prior to a visit as well as the doctor's communication skills were significant while variables such as the length of the interview and patient demographics were not conclusive in their relation to overall patient satisfaction (Korsch et al., 1968).

In 1988, researchers Paul D. Cleary and Barbara J. McNeil took a theoretical approach to reason that patient satisfaction is a significant indicator of quality care. Cleary and McNeil began by assessing the frequently used correlates within patient satisfaction research. To begin with, patient characteristics such as sociodemographic information are thought to be highly significant in predicting satisfaction. However, results from prior studies have shown that sociodemographic characteristics are not consistent and therefore cannot be considered a true predictor of satisfaction. Instead, research has found that pre-existing physical and psychological health conditions are more effective indicators as they are statistically shown to have a positive relation with patient satisfaction. (Cleary and McNeil, 1988) Attitudes and expectations of the patient before receiving care were also considered to be possible contributors to patient satisfaction in previous studies. Research shows that expectations do play a role in how a patient perceives the quality of care given as a patient who has low expectations is found to generally have lower satisfaction with overall care. Additionally, accessibility and continuity of care were highlighted as a potential predictor of patient satisfaction. While prior studies are inconsistent in proving that accessibility to care is important, continuity of care where the patient is consistent with their doctor and length of visits was found to be significant in terms of overall patient satisfaction. Also, both technical and interpersonal aspects of patient

care were considered to be strong indicators of patient satisfaction. Technical aspects include how the doctor is perceived and the quality of care they provide, while interpersonal aspects include doctor to patient communication, empathy and caring on the part of the doctor. Both aspects were found to have positive statistical significance in predicting patient satisfaction. Finally, outcome of treatment was shown to have statistical significance in the limited amount of studies performed upon the variable, where the patient's perceived outcome was positively associated with patient satisfaction. (Cleary and McNeil, 1988) Cleary and McNeil, in highlighting past studies on patient satisfaction, were able to locate which variables were statistically significant over the course of many regressions to eliminate weaker variables that may show inconsistencies over time or may not be related to patient satisfaction at all (Cleary and McNeil, 1988).

Jha et al. (2008) performed a study which encapsulated the entirety of the U.S. to determine how patients perceive the healthcare system. To achieve the goal of identifying key characteristics of healthcare providers which patients take into account most, the researchers compared whether the hospitals performance on the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey, which takes into account numerous variable such as communication and patient to nurse ratios, is a proper indicator of overall satisfaction and general quality of care. After regressing the data, the study showed significance in terms of the various characteristics of the hospital within the HCAHPS survey. For example, hospitals that have a higher nurse to patient ratio generally received higher HCAHPS scores which indicate higher satisfaction. Additionally, hospitals which received higher HCAHPS scores were more likely to provide higher quality care in cases such as myocardial infarction where patients were more satisfied with the outcome of treatment (Jha et al. 2008).

In a cohort study conducted from 2000 to 2007, Fenton et al. (2012) attempted to focus on the relationship between patient satisfaction and healthcare utilization, expenditures and outcome after treatment. Given a sample size of 51,946 patients, the researchers were able to use patient satisfaction as the dependent variable to assess whether it had any association to the independent variables of healthcare utilization, health care expenditures, and mortality. After analyzing and regressing the data, the researchers were able to determine that higher patient satisfaction generally meant lower odds of using the emergency room, higher probability of inpatient admission, greater total expenditures, and higher mortality. In conclusion, higher satisfaction displayed a positive association with inpatient admission, overall healthcare expenditures and increased mortality while emergency room use displayed a negative association (Fenton et al., 2012).

Hamilton et al. (2013) performed another cohort study of 4,709 patients who had just undergone total joint replacement surgery to determine the factors which affected overall satisfaction post-surgery. The researchers used patient satisfaction to serve as the dependent variable with the independent variables coming in the form various clinical outcomes, satisfaction with several aspects of surgery procedure and outcome, attitude towards further surgery, and the length of stay in the hospital. After analyzing the data collected by the cohort study, predictors of patient satisfaction were found to be meeting preoperative expectations, satisfaction with pain relief post-surgery, as well as patient reported measurement group (PROM) scores which details a patient's overall satisfaction of the outcome of the surgery. However, only meeting preoperative expectations, satisfactory pain relief, and an overall pleasant hospital experience had a large effect upon patient satisfaction, while the PROM scores were not as useful in predicting overall satisfaction (Hamilton et al., 2013).

Tsai et al. (2015) performed a recent study which focused on U.S. hospitals and the factors that are relevant to major surgical procedures and satisfaction post surgery. Essentially, the researchers set out to answer which structural features in a hospital correlate with higher patient satisfaction, whether efficiency in terms of length of stay is correlated with higher satisfaction scores, and whether hospitals with higher satisfaction scores overall provide an enhanced quality of care. Given a sample size of 2,953 hospitals spread throughout the U.S., the results of the regression revealed that higher satisfaction was generally associated with larger, nonprofit hospitals that were not located in rural areas. Additionally, higher satisfaction was associated with efficiency of treatment where shorter hospital stays were preferred. Mortality and readmission rates were also shown to be significant in that hospitals with higher satisfaction tended to have both lower readmission and mortality rates (Tsai et al., 2015).

Otani et al. (2015) performed a study to highlight the direct impact of pain management on patient satisfaction. The researchers mailed out a simple questionnaire which measured satisfaction with pain management as the dependent variable in addition to several interaction effects including nurse care, physician care, staff care and hospital room which served as independent variables. The regression showed that this model was statistically significant in that the management of pain plays a large role in predicting the satisfaction of the patient. Additionally, the interaction effects of physician care and staff care were also significant which showed that for patients that needed medicine for pain preferred more attention from doctors and staff workers as opposed to a patient who did not require pain medicine (Otani et al., 2015).

In reviewing the literature, gaps are seen in the lack of focus on state level factors as well as other potential factors outside of the hospital setting. This research will assist in closing gaps within the literature as it will identify various state level characteristics to determine whether

they significantly impact patient satisfaction. Additionally, the research will also address characteristics previously studied to further solidify how they affect patient satisfaction.

#### IV. **Data**

##### a. Hospital-Level Data

For this proposed study, Hospital Compare data will be used which is extracted from medicare.gov. This data set provides a comprehensive analysis of hospital level data based upon a multitude of survey questions which focus upon the hospitals cleanliness, communication of medicines, doctor and nurse communication, staff responsiveness, pain management, recommendation of hospital, and quietness. Additionally, each hospital included an overall hospital rating independent of these other variables which can effectively be considered the dependent variable of the study. Given the accessibility to this data, it can be easily used to identify each hospital along with its given measures of patient satisfaction (rated on a scale of 1-5). However, since the data set omits information on hospitals that do not provide at least 100 surveys, there will be a limit to the number of hospitals considered for each state based on the amount of surveys completed per hospital to control for hospitals which do not have a significant amount of data to contribute within the study. In eliminating these hospitals, hospitals size can be controlled for where smaller hospitals are not being forced to compete with hospital giants in terms of patient satisfaction and amenities they are able to afford. (Patient Survey [HCAHPS])

##### b. State-Level Data

In regards to the correlation between greater total expenditures and higher patient satisfaction, the American Hospital Directory provides total revenue generated on both a state

and hospital level. Additionally, this directory provides information regarding the state level hospital characteristics such as patient days, patient beds available and total discharges per state which allows the study to control for size of the state in addition to expanding upon the effect that these state level variables have on overall hospital rating (Hospital Statistics by State).

Additionally, to control for the size of each state, the population was taken from the 2010 Census to provide a more comprehensive look at the effect of these state level variables as well as the limit the correlation between size of the state and the larger amount of hospitals which could potentially have an impact upon the overall satisfaction by state (Population Estimates).

Furthermore, the Bureau of Economic Analysis provides GDP per capita by state information to provide insight on whether there is a correlation in terms of wealth and overall satisfaction (Broad Growth across states in 2014).

## V. **Methods**

### a. Model Creation

To be able to describe the relationship between the determinants of patient satisfaction and the dependent variable of overall hospital rating, a statistical model was formulated to be run under OLS regression standards. The model includes variables, from the original Hospital compare data set along with state level variables extracted from the American Hospital Directory dataset. The model includes the independent variable of overall hospital rating with the independent variables consisting of care transition, cleanliness, communication of medicines, discharge information, doctor communication, nurse communication, pain management, quietness, recommend of hospital, staff responsiveness, state gross patient revenue, GDP per capita, state patient days, state discharges, the amount of beds per person by state, and population of the state (Table 1).

#### b. Variable Adjustment

A number of different factors had to be controlled for when creating the model given their raw values or their meaning within the regression. To begin with, state beds and state population were initially separate variables. However, since the variable for state beds does not control for the size of the hospital and is rather raw variable, it was decided that a new variable which divided state beds by the population would be more indicative of the actual availability of hospital beds in a given state as well as insight into the capacity of hospital utilization in any given state while controlling for the size of the state. Additionally, both state gross patient revenue and population had to be divided by 1000 to rescale for the high values of the variables. This creates a cleaner data output when the model was regressed in Stata.

#### c. Check for Correlation

Next, to check for correlation between the independent variable, a Pearson test was conducted to be able to determine which variables were highly correlated and to determine which could be removed from the overall model. The Pearson model indicates that a value of between 0.1 and 0.3 indicates low correlation, a value between 0.3 and 0.5 indicates moderate correlation, and a value above 0.5 indicates strong correlation. If an independent variable has strong correlation to another variable, it will likely be removed from the overall model and potentially used as another dependent variable to determine if it is significant in that respect.

#### d. Linear Regression

OLS regression methods will be used to describe the data within Stata, with a linear regression being run to effectively describe each variable's coefficient in terms of the dependent variable overall hospital rating. In conducting this regression, the determinants of patient

satisfaction become explicit in terms of creating a clearer sense of which variables are truly significant in terms of their effect on patient satisfaction.

## VI. Results

The OLS linear regression results can be found in Table 4 within the appendix. From this it can be determined that each variable described is significant on an alpha level of 0.05 except state discharges, cleanliness, and state gross patient revenue adjusted by dividing by 1000. In regards to the variable coefficient estimates, it can be seen that they all have similar values except for recommendation of the hospital which has a coefficient of 0.579. In terms of the effect on patient satisfaction, for every 1-unit increase in recommendation of the hospital, overall hospital rating increases by 0.579. Given this large coefficient value, it is reasonable to assume that it is a strong predictor of patient satisfaction.

The results of the Pearson correlation test seen in Table 5 revealed there was moderate correlation between recommendation of the hospital and overall hospital rating which is expected considering its high coefficient value. However, in an effort to remove this by removing recommendation of hospital from the regression outright, the r-squared value decreased to 0.73 as seen in Table 5. Additionally, to adjust for the recommend variable, it was used in another linear regression as the dependent variable to determine whether it was more fitting in describing overall patient satisfaction. Table 4 indicates that this method was particularly ineffective given the r-squared value of 0.63.

From the multiple regressions run, it can be seen that the initial model (Table 4) produced the best model in terms of r-squared values as well as the amount of significant variables produced by the regression. Given it produced the best goodness of fit between the 3 models that were analyzed, it can be said that cleanliness, state discharges, and state gross patient revenue are

the only variable within the models which are not resoundingly significant in terms of p value as well as their 95% confidence interval.

## VII. Conclusions

Patient satisfaction remains the resounding indication of how well a hospital is doing in comparison to its competitors. This study provides insight upon which variables are significantly more important than other which is highly useful in a time where allocation of resources and optimization of time remain high priorities to both healthcare providers and patients. From the results of this study, it can be seen that the variables care transition, communication of medicines, discharge information, doctor communication, nurse communication, pain management, quietness, recommendation of hospital, staff responsiveness, GDP per capita, state patient days, amount of beds in relation to population (population/state beds), and population are significant in terms of predicting a patients overall satisfaction in terms of the variable overall hospital rating.

When comparing these results to prior studies mentioned previously, it can be seen that the expected hospital level characteristics such as doctor and nurse communication and the efficiency of a patients stay can have significant positive impact upon the patient's perception of their overall stay in the healthcare setting. Given similar assumptions and controls within this study to prior studies, it is interesting to see how the hospital level variable in addition to the added state level variables interact and create a relatively good model in terms of its effectiveness in predicting overall patient satisfaction.

There are a number of limitations to address within this study that are very important. First, the unavailability of census 2014 population data lead to the usage of 2010 population data which could potentially skew the overall population variable. While this could lead to

inaccuracies in terms of the significance of the variable, there is rarely a significant increase or decrease in population during the span of four years save for a potential natural disaster.

Additionally, the correlation between variables such as recommendation of the hospital and the dependent variable of overall hospital rating is concerning in terms of its effect upon the accuracy of the predictors of patient satisfaction.

Patient satisfaction will continue to be an interesting dynamic with hospitals searching for ways to increase overall satisfaction without sacrificing excessive resources in doing so.

However, this study also illuminates state level variables which hospitals must be aware of when determining potential locations of new healthcare facilities. Given this information, patient satisfaction has the potential to be optimized even further with healthcare providers utilizing this knowledge upon the significant predictors of patient satisfaction to their benefit and molding facilities to cater to the patient's needs while retaining basic hospital necessities. Although this study remains far from perfect in terms of its overall explanation of patient satisfaction, it can be used as a basis for future studies on patient satisfaction as well as a reference for ideas on areas to focus upon to potentially maximize patient satisfaction.

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VIII. Appendix**Table 1:**

| Variable Name                       | Description  | Source                      |
|-------------------------------------|--|-----------------------------|
| Overall Hospital Rating (Dependent) | The patients overall satisfaction score based on their personal experience within the hospital   | Hospital Compare            |
| Hospital Cleanliness                | The patient's overall satisfaction with how clean the hospital environment throughout the duration of their stay                                       | Hospital Compare            |
| Doctor and Nurse Communication      | Overall transparency with treatment plans and methods of treating the patient  | Hospital Compare            |
| Staff Responsiveness                | Total amount of time it takes for a staff member other than the doctor or nurse to respond to a patient request  | Hospital Compare            |
| Pain Management                     | Effectiveness of the prescribed treatment plan upon the patient with expectedly higher satisfaction with lower amounts of pain reported and vice versa | Hospital Compare            |
| Quietness                           | Environment of the hospital outside of visiting hours where patients are allowed to rest with minimum distraction                                      | Hospital Compare            |
| State Gross Patient Revenue         | Total amount of money in which patients are spending on healthcare in a given hospital per state   | American Hospital Directory |
| Communication about Medicines       | The effectiveness in which a doctor or nurse communicates about which medicines they are giving.   | Hospital Compare            |
| Care Transition                     | The effectiveness in which a patient is moved between hospital units and their residence   | Hospital Compare            |

|                       |  |                             |
|-----------------------|--|-----------------------------|
| Discharge Information | The knowledge with which the patient is left with when being discharged              | Hospital Compare            |
| GDP per capita        | The gross domestic product per person per state                                      | BEA                         |
| Population            | The total population of a state.   | Census                      |
| State patient days    | The amount of days patients have spent in a healthcare setting in a particular state | American Hospital Directory |
| Staff Responsiveness  | The responsiveness of a healthcare providers staff and their attentiveness           | Hospital Compare            |
| State Beds            | The amount of beds a given state has   | American Hospital Directory |
| State Discharges      | The amount of discharges a states has (2014)   | American Hospital Directory |
| Population/State Beds | The amount of people per beds available to control for state size                    | N/A                         |
|                       |  |                             |

**Table 2:**

| <b>Variable</b>              | <b>Mean</b> | <b>Std. Dev</b> |
|------------------------------|-------------|-----------------|
| overall hospital rating      | 3.09983     | 1.09257         |
| care transition              | 3.009898    | 0.998819        |
| cleanliness                  | 2.957862    | 0.930502        |
| communication about medicine | 2.769231    | 0.898481        |
| discharge information        | 3.27517     | 0.913092        |
| doctor communication         | 3.258484    | 1.041398        |
| nurse communication          | 3.422511    | 1.006734        |
| pain management              | 3.402715    | 0.854398        |
| quietness                    | 3.074943    | 1.135656        |
| recommend hospital           | 3.240102    | 0.942048        |
| staff responsiveness         | 3.146776    | 1.0028          |
| GDP per capita               | 48210.77    | 9241.597        |
| state patient discharges     | 28014.58    | 22448.91        |
| state patient days           | 1156310     | 923847.2        |
| population                   | 11657.71    | 10168.51        |
| population per bed           | 2.198719    | 0.44193         |
| state gross patient revenue  | 108927.6    | 99528.66        |

Table 3:

|              | overall~g | caretr~s | clean    | comm     | discha~e | doctor~m | nursecom |          |
|--------------|-----------|----------|----------|----------|----------|----------|----------|----------|
| overallrat~g | 1.0000    |          |          |          |          |          |          |          |
| caretrans    | 0.7895    | 1.0000   |          |          |          |          |          |          |
| clean        | 0.5715    | 0.5803   | 1.0000   |          |          |          |          |          |
| comm         | 0.6825    | 0.6746   | 0.5849   | 1.0000   |          |          |          |          |
| discharge    | 0.5628    | 0.6115   | 0.3886   | 0.5688   | 1.0000   |          |          |          |
| doctorcomm   | 0.6508    | 0.6372   | 0.4912   | 0.6418   | 0.4610   | 1.0000   |          |          |
| nursecomm    | 0.7566    | 0.7551   | 0.6456   | 0.7283   | 0.5545   | 0.6786   | 1.0000   |          |
| painmanage   | 0.7060    | 0.6954   | 0.5576   | 0.6425   | 0.5073   | 0.5986   | 0.7608   |          |
| quiet        | 0.5703    | 0.4941   | 0.4458   | 0.5304   | 0.3113   | 0.5926   | 0.5253   |          |
| reccomend    | 0.8502    | 0.7659   | 0.5027   | 0.5999   | 0.5296   | 0.5414   | 0.6706   |          |
| staffrespond | 0.6871    | 0.6877   | 0.6551   | 0.7111   | 0.5571   | 0.6409   | 0.8016   |          |
| gdppp        | -0.1110   | -0.0900  | -0.0422  | -0.1053  | -0.0524  | -0.1710  | -0.1268  |          |
| stpatientd~s | -0.1740   | -0.2384  | -0.1481  | -0.2211  | -0.2635  | -0.2884  | -0.2638  |          |
| stdischarges | -0.1713   | -0.2361  | -0.1470  | -0.2193  | -0.2566  | -0.2962  | -0.2611  |          |
| popbed       | 0.1214    | 0.1394   | 0.1283   | 0.1449   | 0.1815   | 0.0363   | 0.0405   |          |
| stgpr_1000   | -0.1618   | -0.2296  | -0.1381  | -0.2110  | -0.2539  | -0.2930  | -0.2634  |          |
| pop_1000     | -0.1479   | -0.2186  | -0.1311  | -0.1989  | -0.2374  | -0.2773  | -0.2594  |          |
|              |           | painma~e | quiet    | reccom~d | staffr~d | gdppp    | stpati~s | stdisc~s |
| painmanage   | 1.0000    |          |          |          |          |          |          |          |
| quiet        | 0.4663    | 1.0000   |          |          |          |          |          |          |
| reccomend    | 0.6432    | 0.4340   | 1.0000   |          |          |          |          |          |
| staffrespond | 0.6990    | 0.5358   | 0.5873   | 1.0000   |          |          |          |          |
| gdppp        | -0.0834   | -0.2932  | -0.0359  | -0.1368  | 1.0000   |          |          |          |
| stpatientd~s | -0.1759   | -0.2854  | -0.1289  | -0.2747  | 0.3117   | 1.0000   |          |          |
| stdischarges | -0.1747   | -0.2870  | -0.1254  | -0.2692  | 0.2957   | 0.9958   | 1.0000   |          |
| popbed       | 0.0972    | -0.0335  | 0.1366   | 0.1458   | 0.0695   | -0.1587  | -0.1502  |          |
| stgpr_1000   | -0.1685   | -0.3037  | -0.1161  | -0.2642  | 0.2837   | 0.9821   | 0.9853   |          |
| pop_1000     | -0.1564   | -0.2938  | -0.1044  | -0.2560  | 0.3292   | 0.9753   | 0.9738   |          |
|              |           | popbed   | stg~1000 | pop_1000 |          |          |          |          |
| popbed       | 1.0000    |          |          |          |          |          |          |          |
| stgpr_1000   | -0.0658   | 1.0000   |          |          |          |          |          |          |
| pop_1000     | 0.0028    | 0.9852   | 1.0000   |          |          |          |          |          |

**Table 4:**

N=3536

Adjusted R-Squared: 0.8241

| overallrating | Coef.     | Std. Err. | t     | P> t  | [95% Conf. Interval] |           |
|---------------|-----------|-----------|-------|-------|----------------------|-----------|
| caretrans     | .117472   | .0150286  | 7.82  | 0.000 | .0880063             | .1469376  |
| clean         | .0105869  | .0117508  | 0.90  | 0.368 | -.0124521            | .0336259  |
| comm          | .0399426  | .0143972  | 2.77  | 0.006 | .0117148             | .0681703  |
| discharge     | .0442061  | .0115241  | 3.84  | 0.000 | .0216115             | .0668008  |
| doctorcomm    | .0677268  | .0116439  | 5.82  | 0.000 | .0448974             | .0905563  |
| nursecomm     | .1292628  | .0165994  | 7.79  | 0.000 | .0967173             | .1618082  |
| painmanage    | .0709103  | .015077   | 4.70  | 0.000 | .0413499             | .1004708  |
| quiet         | .1297786  | .0094592  | 13.72 | 0.000 | .1112325             | .1483247  |
| reccomend     | .5781016  | .0134717  | 42.91 | 0.000 | .5516884             | .6045148  |
| staffrespond  | .0351918  | .0147013  | 2.39  | 0.017 | .0063678             | .0640157  |
| gdppp         | -2.45e-06 | 9.66e-07  | -2.54 | 0.011 | -4.35e-06            | -5.58e-07 |
| stpatientdays | -8.80e-06 | 4.34e-06  | -2.03 | 0.043 | -.0000173            | -2.92e-07 |
| stdischarges  | -7.77e-08 | 1.05e-07  | -0.74 | 0.461 | -2.84e-07            | 1.29e-07  |
| popbed        | -.0504842 | .0263911  | -1.91 | 0.056 | -.1022276            | .0012591  |
| pop_1000      | .0000249  | 5.98e-06  | 4.17  | 0.000 | .0000132             | .0000366  |
| stgpr_10000   | 7.24e-06  | 6.40e-06  | 1.13  | 0.258 | -5.31e-06            | .0000198  |
| _cons         | -.6313201 | .0862356  | -7.32 | 0.000 | -.800397             | -.4622432 |

**Table 5:**

N=3536

Adjusted R-Squared: 0.73

| overallrating | Coef.     | Std. Err. | t     | P> t  | [95% Conf. Interval] |           |
|---------------|-----------|-----------|-------|-------|----------------------|-----------|
| caretrans     | .117472   | .0150286  | 7.82  | 0.000 | .0880063             | .1469376  |
| clean         | .0105869  | .0117508  | 0.90  | 0.368 | -.0124521            | .0336259  |
| comm          | .0399426  | .0143972  | 2.77  | 0.006 | .0117148             | .0681703  |
| discharge     | .0442061  | .0115241  | 3.84  | 0.000 | .0216115             | .0668008  |
| doctorcomm    | .0677268  | .0116439  | 5.82  | 0.000 | .0448974             | .0905563  |
| nursecomm     | .1292628  | .0165994  | 7.79  | 0.000 | .0967173             | .1618082  |
| painmanage    | .0709103  | .015077   | 4.70  | 0.000 | .0413499             | .1004708  |
| quiet         | .1297786  | .0094592  | 13.72 | 0.000 | .1112325             | .1483247  |
| reccomend     | .5781016  | .0134717  | 42.91 | 0.000 | .5516884             | .6045148  |
| staffrespond  | .0351918  | .0147013  | 2.39  | 0.017 | .0063678             | .0640157  |
| gdppp         | -2.45e-06 | 9.66e-07  | -2.54 | 0.011 | -4.35e-06            | -5.58e-07 |
| stpatientdays | -8.80e-06 | 4.34e-06  | -2.03 | 0.043 | -.0000173            | -2.92e-07 |
| stdischarges  | -7.77e-08 | 1.05e-07  | -0.74 | 0.461 | -2.84e-07            | 1.29e-07  |
| popbed        | -.0504842 | .0263911  | -1.91 | 0.056 | -.1022276            | .0012591  |
| stgpr_1000    | 7.24e-07  | 6.40e-07  | 1.13  | 0.258 | -5.31e-07            | 1.98e-06  |
| pop_1000      | .0000249  | 5.98e-06  | 4.17  | 0.000 | .0000132             | .0000366  |
| _cons         | -.6313201 | .0862356  | -7.32 | 0.000 | -.800397             | -.4622432 |

Table 6:

| reccomend     | Coef.     | Std. Err. | t     | P> t  | [95% Conf. Interval] |           |
|---------------|-----------|-----------|-------|-------|----------------------|-----------|
| caretrans     | .4856031  | .016928   | 28.69 | 0.000 | .4524135             | .5187926  |
| clean         | .0005342  | .0147018  | 0.04  | 0.971 | -.0282908            | .0293591  |
| comm          | .0437169  | .0179978  | 2.43  | 0.015 | .0084296             | .0790041  |
| discharge     | .0711276  | .0143683  | 4.95  | 0.000 | .0429565             | .0992987  |
| doctorcomm    | .0072817  | .0145676  | 0.50  | 0.617 | -.02128              | .0358435  |
| nursecomm     | .1431693  | .0206275  | 6.94  | 0.000 | .1027263             | .1836123  |
| painmanage    | .1472029  | .0186995  | 7.87  | 0.000 | .11054               | .1838658  |
| quiet         | .0545442  | .011799   | 4.62  | 0.000 | .0314106             | .0776778  |
| staffrespond  | -.0661354 | .0183596  | -3.60 | 0.000 | -.1021319            | -.030139  |
| gdppp         | 3.90e-06  | 1.21e-06  | 3.23  | 0.001 | 1.53e-06             | 6.26e-06  |
| stpatientdays | -.0000115 | 5.42e-06  | -2.12 | 0.034 | -.0000221            | -8.71e-07 |
| stdischarges  | 1.46e-07  | 1.32e-07  | 1.10  | 0.270 | -1.13e-07            | 4.04e-07  |
| popbed        | .0539641  | .0330063  | 1.63  | 0.102 | -.0107494            | .1186776  |
| stgpr_1000    | 1.58e-06  | 8.00e-07  | 1.97  | 0.049 | 7.83e-09             | 3.15e-06  |
| pop_1000      | 4.50e-06  | 7.48e-06  | 0.60  | 0.548 | -.0000102            | .0000192  |
| _cons         | .0719052  | .1078859  | 0.67  | 0.505 | -.1396199            | .2834304  |