Evaluating the impact of HIT resources on Patient Welfare: Evidence for the ARRA

Evan S. Thomas
Mark Showalter
showalter@byu.edu

Follow this and additional works at: https://scholarsarchive.byu.edu/fhssconference_studentpub

Part of the Economics Commons

The Annual Mary Lou Fulton Mentored Research Conference showcases some of the best student research from the College of Family, Home, and Social Sciences. The mentored learning program encourages undergraduate students to participate in hands-on and practical research under the direction of a faculty member. Students create these posters as an aide in presenting the results of their research to the public, faculty, and their peers.

BYU ScholarsArchive Citation
FHSS Mentored Research Conference. 48.
https://scholarsarchive.byu.edu/fhssconference_studentpub/48

This is brought to you for free and open access by the Family, Home, and Social Sciences at BYU ScholarsArchive. It has been accepted for inclusion in FHSS Mentored Research Conference by an authorized administrator of BYU ScholarsArchive. For more information, please contact scholarsarchive@byu.edu, ellen_amatangelo@byu.edu.
Motivation: Many feel that Healthcare Information Technology (HIT) is the silver bullet that will transform the healthcare industry in the United States. Proponents hold that by correctly designing and implementing the right computer resources, healthcare providers will be able to cut costs and improve the delivery of patient care. Although the body of research is quite robust, little research has been performed regarding the effects of HIT resources on patient welfare.

Abstract: Using differentiating, OLS, and probit modeling techniques, demograpic and performance information for more than 1,000 U.S. hospitals was used to test whether Electronic Medical Record (EMR) usage had any effect on both outcomes and processes of patient care. The findings showed that EMR did not have a significant impact on patient mortality rates, 30-day readmission rates, or clinical procedures in treating patients suffering from Acute Myocardial Infarctions (AMI). Additional research into the correlation between EMR usage and average Medicare reimbursement rates found that healthcare facilities using an EMR received lower reimbursements on average than those using a paper-based record-keeping system.

Why? With issues ranging from controlling insurance availability and coverage to managing healthcare infrastructure and costs, healthcare is an intersectional topic of national debate today. Much of the publicized arguments, such as the healthcare reform that recently passed in Congress, have centered on how to restructure the reimbursement system in order to contain costs. In the "Healthcare Quality Report", Mitchell addressed the "win" state of healthcare and insurance in the United States at that time by proposing that cost increases are permissible so long as patient welfare is increasing roughly in tandem with costs. Thus, the rejection of fee-for-service, as in our state and part of related research since then has sought to measure the relationship between money spent by patients and insurance companies on healthcare and the subsequent quality.

However, many feel technological resources can also help healthcare providers to cut costs—by automating complex, repetitive processes while improving quality of care. For this reason, billions of dollars in financial incentives are also available, through the American Reinvestment and Recovery Act (ARRA), to hospitals that implement state-of-the-art technology in a meaningful way.

Proponents hold that by correctly designing and implementing the right computer resources, HIT resources do have a significant impact on patient welfare. If, on the other hand, the government feels that EMR adoption offers significant benefits to the healthcare economy as a whole, then their subsidy is intended to accomplish such results.

Study Design: Two types of modeling were used in order to examine the first hypothesis. A standard OLS regression examined every hospital, while a second type of regression examined each specific disease. Two resources were likely the reason the mortality rate goes down. Furthermore, the results show that the probability of a decrease in mortality rate was predicted using the same independent variables. Moreover, it remains to be seen whether, in order to address the effects of HIT resources on quality of patient care, CMS data was combined with demographic information from the American Hospital Association (AHA) guide. The data set consists of hospitals, as described in the EMR overall. If HIT resources affected the way that hospitals treat patients in a significant way, the effects would show up for 'paper'.

Aspirin upon arriving, Aspirin at discharge, Beta blockers at discharge, Fibronolytic medication within 30 minutes of arriving. In order to explore this, 8 process-of-care measures describing what percentage of heart attack patients received ACE inhibitors, Aspirin at discharge, Beta blockers at discharge, Thrombolytic medication within 30 minutes of arriving, PCI within 30 minutes of arriving, and omission counseling were examined. Each of the 8 treatments was modeled separately to capture the potential effects of HIT on their usage or on in-hospital mortality. The findings shed light on the notion that HIT systems help hospitals to be more effective.

Findings: Outcome of Care Measures: The results from the various outcome of care regressions retain all of the intuitive characteristics from the data set. Hospital reimbursement trends for 'paper' and 'EMR' are similar. The average mortality rate across all hospitals in the sample is higher in the north and the south than it is in the west. Nonetheless, the regression output in figure 1 is clear that the average mortality rate for acute myocardial infarction is higher in the north and the south than it is in the west. However, the results from the Outcome-of-Care measures do not provide evidence that we can reject the null hypothesis that HIT resources do have a significant impact on patient welfare. In addition, there were no statistically significant differences between hospitals using EMR systems and those with an hospital reimbursement system. The regression predicting 30-day readmission rates provided similar outcomes, as did the probit regression predicting the probability of a hospital decreasing their mortality rate.

Process of Care Measures: The average Medicare reimbursement rates for a variety of medical procedures. Given the limited space, this research only considers the 8 medical procedures. Only eight of the procedures were used in a standard OLS regression. They were used to predict the number of days a patient was readmitted to a hospital for a treatment. In addition, it is clear that the probability of a hospital decreasing their mortality rate.

Reimbursement Rates: The results from the various outcome of care regressions retain all of the intuitive characteristics from the data set. Hospital reimbursement trends for 'paper' and 'EMR' are similar. The average mortality rate across all hospitals in the sample is higher in the north and the south than it is in the west. However, the results from the Outcome-of-Care measures do not provide evidence that we can reject the null hypothesis that HIT resources do have a significant impact on patient welfare. In addition, there were no statistically significant differences between hospitals using EMR systems and those with an hospital reimbursement system. The regression predicting 30-day readmission rates provided similar outcomes, as did the probit regression predicting the probability of a hospital decreasing their mortality rate.

Healthcare providers implementing EMRs re- ceive less per Medicare reimbursement on average.

Reimbursement Rates: Healthcare providers implementing EMRs receive less per Medicare reimbursement on average. Given the limited space, this research only considers the 8 medical procedures. Only eight of the procedures were used in a standard OLS regression. They were used to predict the number of days a patient was readmitted to a hospital for a treatment. In addition, it is clear that the probability of a hospital decreasing their mortality rate.

If this is the case, then the government should be clear that the aims of the subsidy are not improvement of patient welfare, but cost containment. Although this is a much harder sale politically, the findings from this research show it to be the truth.