

The Impact of Health Information Technology on Demand for Inpatient Services

Principal Investigator:	Barrette, Eric, M.A.
Organization:	University of Minnesota, Twin Cities
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Summary: The influence of health information technology (IT) on where consumers decide to receive hospital inpatient services is largely unknown. These decisions can affect the cost and quality of those services as well as the market power of hospitals. This project examined the role of health IT on inpatient health care service demand. This demand analysis complements existing supply-side analyses to provide more complete and dynamic estimates of the impact that health IT has on health care markets. It allows policymakers and the health care industry to make better decisions regarding optimal health IT adoption and implementation strategies.

The analysis required information about hospitals' characteristics and information technology as well as patients' characteristics and hospital choices from 1999 through 2006. Data needed to perform this analysis came from several sources. Hospital characteristics data were obtained from the American Hospital Association (AHA) annual survey. This database contains information on hospitals' physical and organizational characteristics such as location, number of full-time physicians, and number of beds. The AHA database was linked with the Health Information and Management Systems Society Analytics Database. This dataset contains detailed historical information on the health IT software, hardware, and infrastructure installed in the surveyed hospitals. Three types of health IT were evaluated: electronic medical records, computerized physician order entry, and picture archiving systems. Inpatient Medicare claims data were the source of patient-level characteristics and hospital choices.

The demand for hospital inpatient services was estimated using standard econometric choice models that included patient characteristics, hospital characteristics, and observed patient choices. A hospital's decision to implement health IT was considered a treatment or policy intervention, and the change in the total number of patients using the hospital was the outcome of interest. A discrete choice model was estimated using patient-level data to predict the probabilities of patients choosing each hospital in their choice set. The parameter estimates from these models show how health IT affects a patient's likely hospital choice. An aggregate level model was employed in situations where the data set was too large to estimate at an individual patient level.

Specific Aims:

- Measure the effect of hospital adoption of health IT on the demand for inpatient care. **(Achieved)**
- Estimate the impact of health IT by type of inpatient service. **(Achieved)**
- Evaluate the effect of changes in patient hospital choices using consumer surplus as a welfare

measure. **(Achieved)**

2011 Activities: Model specifications were tested during this period to estimate the magnitude of the variables in the model. The impact of each of the variables was determined by the size and significance of the model parameter estimates. The project evaluated changes in patient hospital choices using consumer surplus as a welfare measure, and measured the effect of hospital adoption of health IT on the demand for inpatient care. A 6-month no-cost extension period was used to complete the data analysis. The project was completed by the end of 2011.

Preliminary Impact and Findings: The impact of health IT was small, if any, because it was not found to affect large numbers of patients' choices or have a large impact on overall hospital demand. The picture archiving systems variables and interaction terms in both the market level and individual choice models are jointly significant and expected consumer surplus is positive. Effects of the other technologies on demand were not significant. Although the value of health IT is positive, health IT's effect on market share may not be enough to justify the financial investments.

Target Population: Elderly*, Medicare

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to improve health care decision making through the use of integrated data and knowledge management.

Business Goal: Knowledge Creation

** This target population is one of AHRQ's priority populations.*