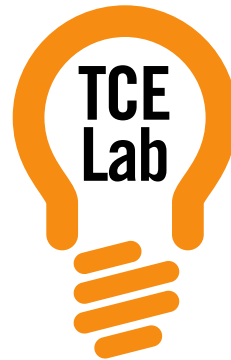


Improving the Patient Experience

Big Data Provides Big Insights about U.S. Hospitals



**Big Data.
Bright Ideas.
Loyal Customers.**

What is the state of the Patient Experience (PX) for U.S. hospitals? We analyze nationwide data on the quality of U.S. hospitals to answer this question... and more. Learn why the Patient Experience (PX) has become an important topic for U.S. Hospitals.

Prepared by:
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Fall, 2012. V1.0.

Total

The value of Big Data comes from a 360° view of what impacts your customer loyalty.

Customer

Business growth depends on linking your customer loyalty behavior to operational metrics; i.e. predictive analytics.

Experience

Focus money and time on areas where the customer's interactions have the largest impact on your brand and revenue.

Lab

Art + Science + Technology. TCELab provides business intelligence solutions to help companies measure, value and improve the health of their customer relationships.





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Why Patient Experience (PX) is Important to U.S. Hospitals

The Centers for Medicare & Medicaid Services (CMS) will be using [patient feedback about their care as part of their reimbursement plan](#) for acute care hospitals (see [Hospital Value-Based Purchasing \(VBP\) program](#)). The purpose of the VBP program is to promote better clinical outcomes for patients and improve their experience of care during hospital stays. Not surprisingly, hospitals are focusing on improving the patient experience to ensure they **receive the maximum of their incentive payments**.

The Data

The United States of America's federal government has a lot of free data. The data cover a broad range of topics, from [Energy](#) and [Education](#) to [Safety](#) and [Health](#), each including various types of data sets on a given topic. Todd Park, [United States of America's Chief Technology Officer](#), encourages developers and entrepreneurs to download these data for the purpose of building new products, services, and companies. Park emphasizes that the President of the United States has fully endorsed the idea that key datasets be made available to the public. The Obama administration [recently announced](#) their "[Big Data Research and Development Initiative](#)," in which they are committing more than \$200 million in new commitments to Big Data projects.

I downloaded several data sets from the [health.gov](#) site. Each data set contained unique metrics for thousands of US hospitals. The data sets were:

1. **Survey of Patient's Hospital Experience:** Percent of respondents who indicated top box response (e.g., "always;" overall rating of 9-10; Yes, Definitely recommend.) across seven customer experience questions and two patient loyalty questions.
2. **General Hospital Information:** Describes the hospital type and the owner.
3. **Outcome Measures:** Includes three mortality rates and three readmission rates for: heart attack, heart failure, and pneumonia
4. **Process of Care Measures:** 12 measures related to surgical care improvement
5. **Medicare Spend per Patient:** This measure shows whether Medicare spends more, less, or about the same per Medicare patient treated in a specific hospital, compared to how much Medicare spends per patient nationally.

The Value of Big Data Integration to Patient Experience Management

Analyzing each separate data set would provide insight about the metrics contained in each data set. What is the percentage of Types of hospital? What is the average patient rating across hospitals? What is the typical mortality rate across all hospitals? What is the average Medicare spending across hospitals? While the answers to these questions do provide value, the true value of [Big Data lies in understanding the relationships \(in a statistical sense\) among different variables](#). By understanding relationships among different metrics, we built predictive models that help explain the reasons behind the numbers (e.g., Are mortality rates related to patient satisfaction? Do efficient hospitals deliver better service?).



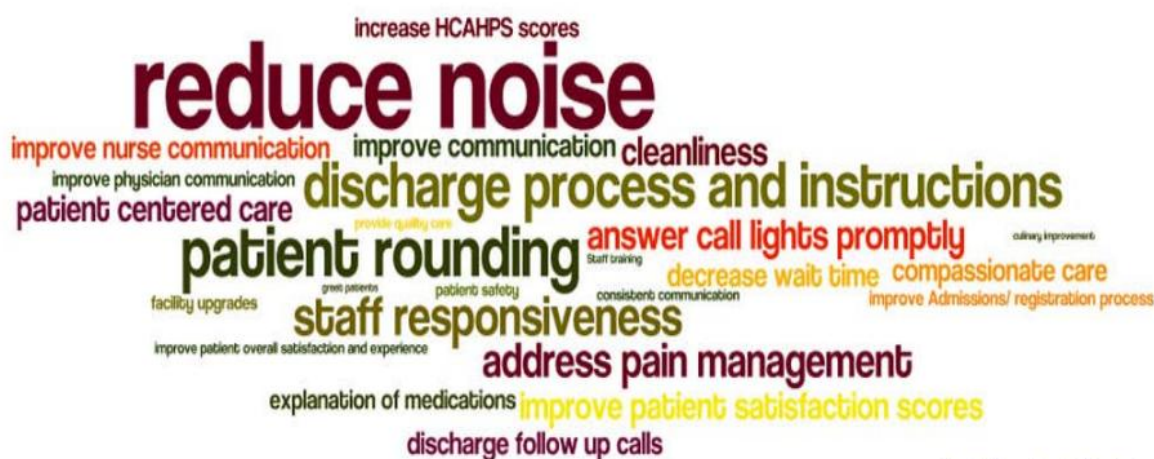
To understand the relationships among different variables, I merged the five data sets together into one Big Data set; so, in the basic form, this super data set included 4610 hospitals on which I had all the metrics from each data set, including patient satisfaction, mortality rate, and Medicare spend. Using this Big Data set, I was able to examine how the variables are related to each other, building predictive models of patient satisfaction/loyalty ratings. The analyses of these different metrics may help hospitals understand how to deliver a better patient experience through [customer experience management](#) practices.

Key Findings

1. Where Hospitals Receive the Greatest ROI on their Patient Experience Improvement Initiatives

Patient feedback for US hospitals is currently being collected using a survey known as [HCAHPS](#) (**Hospital Consumer Assessment of Healthcare Providers and Systems**). HCAHPS (pronounced "H-caps") is a national, standardized survey of hospital patients and was developed by a partnership of public and private organizations. The development of HCAHPS was funded by the Federal government, specifically the [Centers for Medicare & Medicaid Services](#) (CMS) and the [Agency for Healthcare Research and Quality](#) (AHRQ). HCAHPS was created to publicly report the patient's perspective of hospital care.

What are your organization's top three priorities for improving the "Patient Experience?"

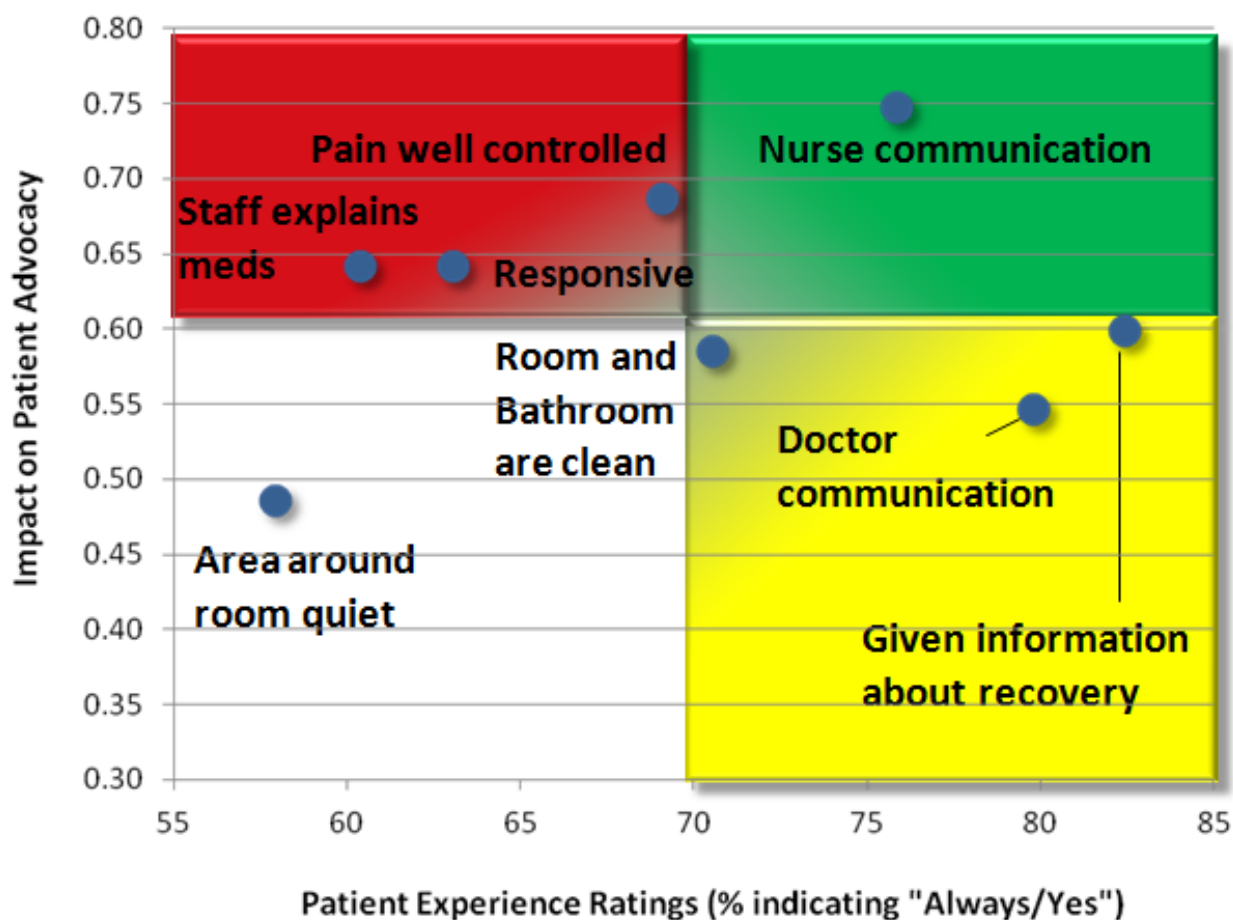


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From the Presentation: The State of Patient Experience in American Hospitals - April 13, 2011
http://www.theberylinstitute.org/resource/resmgr/Benchmarking_Study/2011_PE_Benchmarking.pdf



Figure 1. State of Patient Experience in American Hospitals. Figure is from a 2011 study by The Beryl Institute and Catalyst Healthcare Research.



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Figure 2. Patient Loyalty Driver Matrix for Acute Care Hospitals. To maximize ROI on improvement efforts, consider focusing on PX dimensions in upper left quadrant (these have room for improvement and are highly linked to patient loyalty).

The survey asks a random sample of recently discharged patients about important aspects of their inpatient hospital experience. The data set includes patient survey results for over 3800 US hospitals on ten measures of patients' perspectives of care.

Hospitals might be focusing on the wrong areas to improve patient loyalty. Other [researchers found that hospitals' top 3 priorities to improve the patient experience](#) are focused on 1) reducing noise, 2) improving patient rounding and 3) the improving the discharge process and instructions (see Figure 1).



The analysis of the HCAHPS data shows that hospitals will likely receive [greater return on their improvement investment \(ROI\) if they focus on improving the patient experience](#) around:

1. **Staff explains medicines before dispensing**
2. **Staff responsiveness**
3. **Pain management**

While "area around room quiet" is the lowest rated PX dimension, it also has the weakest relationship with patient loyalty. Consequently, improving this PX area will have a relatively small impact on improving patient loyalty, especially when other PX areas are highly linked to patient loyalty like **pain management** and remain unchanged.

As an industry, these three patient experience areas appear as key drivers of patient loyalty; that is, each has much room for improvement and has a relatively big impact on patient advocacy.

There are a few more points we can conclude based on the analyses:

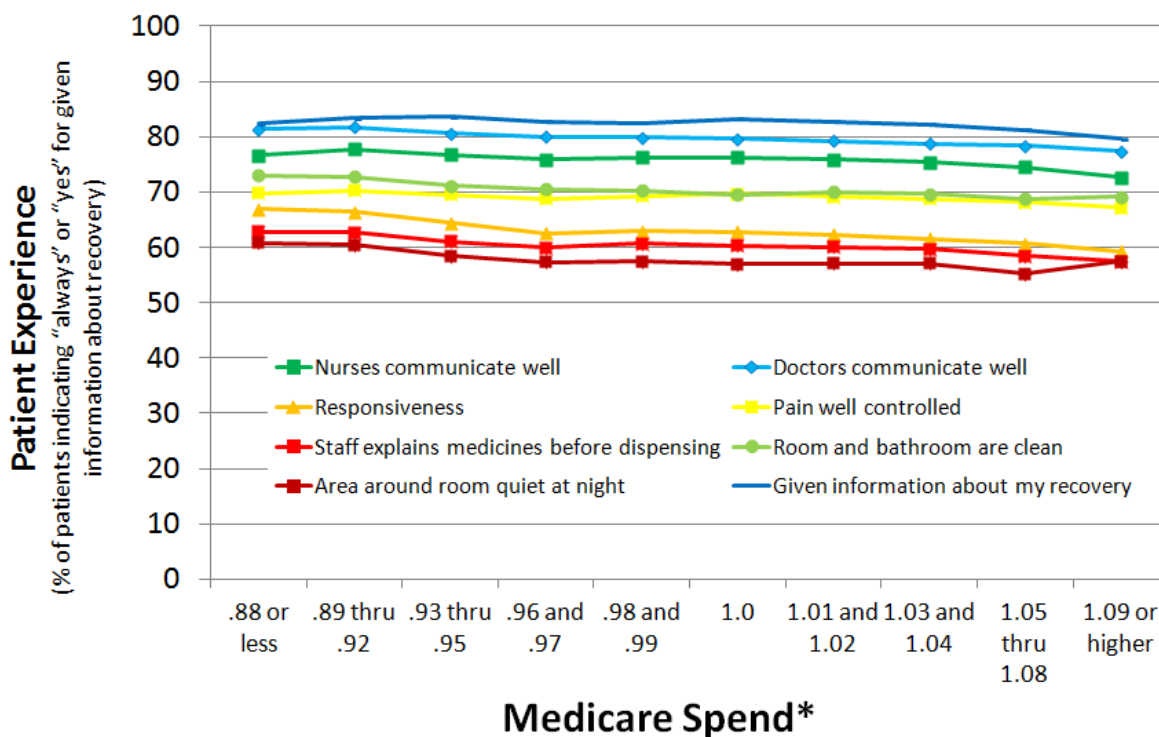
1. **The biggest driver of patient advocacy is the patients' perception of the quality of nurses' communication effectiveness.** Because nurses are likely involved with most of the day-to-day dealings with patient care, their performance impacts many different facets of the patient experience (e.g., Responsiveness, staff explains med). Including nurses as key part of a PX program will improve its success.
2. **The quality of doctor communication is the second lowest driver of patient advocacy.** While doctor communication quality is still important to patient advocacy ($r = .56$ with patient advocacy), it is less important than other patient experience areas like cleanliness of the patients' rooms, responsiveness (getting help when needed), and getting information about their home recovery. Doctors' involvement might be perceived as less important to the patients simply because the patients have less exposure to doctors, especially when compared to the patient's exposure to nurses.
3. **Patient Advocacy Index (PAI) appears to be a reliable, valid metric of patient loyalty.** This two-item scale has high reliability and is related logically to other patient experience metrics. While the PAI is a good metric of patient advocacy, the hospital industry might consider examining other types of ways that patients can demonstrate their loyalty toward their hospital. In my research, I have found that there are [three general types of customer loyalty \(e.g., advocacy, purchasing and retention\)](#), each responsible for different types of business outcomes. Perhaps hospitals need to expand their idea regarding patient loyalty and develop measures that reliably tap different ways patients can show their loyalty towards hospitals.

So, how can hospitals improve the patient experience? More importantly, how much will it cost? First, let us turn to understanding how medical spending impacts the patient experience.



2. A Good Patient Experience Does Not Start with Medical Spending

Medicare tracks how much they spend on each patient with Medicare who is admitted to a hospital compared to the amount Medicare spends per hospital patient nationally. Also known as "Medicare



* Also known as "Medicare Spending per Beneficiary", this measure shows information about how much Medicare spends on each person with Medicare who is admitted to a hospital compared to the amount Medicare spends per hospital patient nationally.



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Note: Data are from HCAHPS patient survey data from Q3 2010 through Q2 2011. For more information on the data, go here: <https://explore.data.gov/Health-and-Nutrition/CMS-Federated-Datasets/r2ab-jrvf>

Figure 3. Patient Experience Ratings by Medicare Spending per Beneficiary

Spending per Beneficiary (MSPB)", this measure assesses the cost of care. By measuring cost of care with this measure, CMS hopes to increase the transparency of care for consumers and recognize hospitals that are involved in the provision of high-quality care at lower cost to Medicare.

We found that [hospitals with lower medical spend per patient are able to deliver a comparable patient experience to hospitals with greater medical spend per patient](#). As you can see in Figure 3, the results show that hospitals who spend less

Customer Feedback Program Component	Adoption Rate		
	Loyalty Leaders	Loyalty Laggards	Δ in Adoption Rate
Strategy/Governance	89%	71%	18%
Business Process Integration	86%	59%	27%
Method	72%	60%	12%
Reporting	70%	60%	10%
Applied Research	80%	51%	31%



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From the book, Beyond the Ultimate Question

Figure 4. Adoption Rates of Customer Feedback Program Practices of Loyalty Leaders and Loyalty Laggards



on medical services compared to other hospitals that spend more on medical services receive comparable marks on their patient experience and patient loyalty scores.

One possible approach to understand patient experience/loyalty differences across hospitals is to understand how hospitals build their patient experience (PX) programs. How mature is their PX program? Do they even have a PX program? In other industries, we know that [loyalty leading companies](#) structure their customer experience programs differently than loyalty lagging companies (see Figure 4). Specifically, loyalty leaders: 1) have top executive support of the customer program, 2) communicate all aspects of the program throughout the company and 3) integrate their customer feedback with other business data for deep dive customer research. I suspect these same processes (or something similar) will be necessary features of a successful PX program (e.g., high patient loyalty and patient experience) in the hospital setting.

3. Patient Experience and Patient Advocacy are weakly related to Process of Care and Health Outcomes

In addition to PX metrics, hospitals are tracking other types of quality metrics about their performance. We looked at two types: 1) Process of Care and 2) Health Outcomes. Process of Care measures are used to gauge how well an entity provides care to its patients. Measures are based on scientific evidence and can reflect guidelines, standards of care, or practice parameters. A quality measure converts medical information from patient records into a rate or percentage that allows facilities to assess their performance.

HCAHPS - Patient Experience Ratings

	Hospital 30-Day Death Rates from Heart Attack	Hospital 30-Day Death Rates from Heart Failure	Hospital 30-Day Death Rates from Pneumonia	Hospital 30-Day Readmission Rates from Heart Attack	Hospital 30-Day Readmission Rates from Heart Failure	Hospital 30-Day Readmission Rates from Pneumonia	Process of Care
Patient Advocacy Index	-0.12**	0.04*	-0.12**	-0.20**	-0.28**	-0.20**	0.17**
Nurses communicate well	.01	0.12**	-.01	-0.13**	-0.16**	-0.12**	0.04*
Doctors communicate well	0.10**	0.14**	0.04*	-0.09**	-0.05**	-0.08**	-0.10**
Responsiveness	.06**	0.15**	.03	-0.13**	-0.16**	-0.16**	-0.06**
Pain well controlled	.03	0.10**	-.01	-0.14**	-0.15**	-0.14**	.01
Staff explains medicines	0.06**	0.12**	.02	-0.12**	-0.13**	-0.12**	.01
Room and bathroom are clean	.04	0.11**	.00	-0.14**	-0.12**	-0.13**	-0.05**
Area around room quiet at night	0.16**	0.08**	0.05**	-0.05*	-.01	-0.04*	-0.10**
Given information about my recovery	-.03	0.12**	-.02	-0.20**	-0.27**	-0.21**	0.23**

* p < .05; ** p < .01

Note: Data are from HCAHPS patient survey data from Q3 2010 through Q2 2011, the latest publicly available patient survey data from HCAHPS. Data were downloaded between June 1 through June 10, 2012. For more information on the data, go here: <https://explore.data.gov/Health-and-Nutrition/CMS-Federated-Datasets/r2ab-jrvf>

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Table 1. Correlations of PX metrics with Health Outcome and Process of Care Metrics for US Hospitals (acute care hospitals only).

Health Outcome measures tell us what happened after patients received hospital care. We used two general types of outcome measures: 1) 30-day Mortality Rate and 2) 30-day Readmission Rate. The 30-

day risk-standardized mortality and 30-day risk-standardized readmission measures for heart attack, heart failure, and pneumonia are produced from Medicare claims and enrollment data using sophisticated statistical modeling techniques that adjust for patient-level risk factors and account for the clustering of patients within hospitals.

We found that satisfaction with the **patient experience and patient loyalty are only weakly related to these other hospital metrics** (see Table 1), suggesting that [improvements in the patient experience](#) will have moderate impact on other hospital measures (health outcomes, process of care).

4. Healthcare Consumers Can Use Interactive Maps to Select the Best Hospital

The wealth of the hospital data does not end with hospitals. We created three (3) interactive maps to help healthcare consumers understand the quality of their hospitals with respect to three metrics: 1) Patient Experience, 2) Health Outcomes and 3) Process of Care. When evaluating hospitals, consumers look to both objective metrics of hospital performance (e.g., health outcomes and process of care) as well as the softer metrics (e.g., the patient experience). Here we provide you with three useful maps. You might be interested to see where you stack up against other US hospitals: 1) [Map of US hospitals on patient satisfaction](#) (see Figure 5), 2) [Map of US hospitals on health outcomes](#), and 3) [Map of US hospitals on process of care](#). Take a look at each to know how your hospital performs.

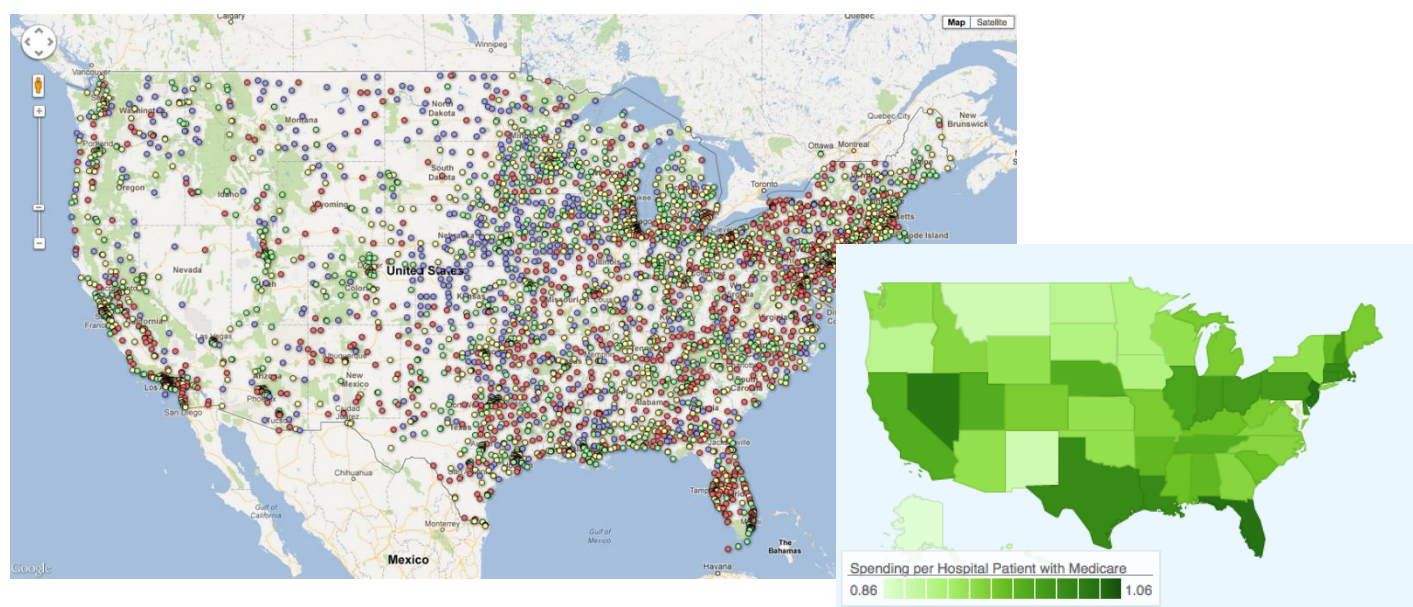


Figure 5. Interactive Map of US Hospitals and their Patient Experience Ratings. Click map image to go to online interactive map. Inset is map of Medicare spending per patient by state

Summary

Patient experience (PX) does not occur in a vacuum. The value of the insights we obtained from combining many different data sources was much greater than the value of insights we gained from focusing on any single data source by itself. By integrating these diverse datasets and applying predictive



analytics across their different metrics, we uncovered insights about how hospitals can improve their operations to improve the patient experience and increase patient loyalty.

Hospitals are Missing the Mark

Hospitals' improvement priorities do not seem to match up with what patients want. Hospital executives' top priorities for improving the patient experience are: 1) Reduce Noise, 2) Patient Rounding and 3) Discharge Process and Instructions. Patients, however, say they are least satisfied with the following areas: 1) Area around room quiet, 2) Staff explains medicines before dispensing and 3) Staff responsiveness.

Build your PX Program around your Patients

Hospital executives are tasked with improving the patient experience. Their priorities are driven by short-term monetary metrics (e.g., CMS reimbursement) and long-term hospital growth metrics (e.g., patient loyalty). Hospital executives can use their hospital's PX survey data (e.g., HCAHPS) to help priorities PX improvement opportunities to maximize both metrics to optimize the ROI of their decision.

Understanding the structure of your PX program will help you better understand the necessary ingredients you need to improve the patient experience. In fact, [many hospitals](#) receive very low marks on their patient experience ratings (HCAHPS ratings), suggesting they will be penalized on their Medicare payments. Is your PX program following best practices? How are you improving your HCAHPS score? Answers to these questions could greatly improve your hospital's performance. Additionally, answers would help the healthcare industry overall by identifying and sharing best practices across all hospitals that would remove inefficiencies in healthcare delivery while improving patient satisfaction with their care.

Health Outcomes, Process of Care and the Patient Experience

Hospitals are tracking different types of quality metrics, metrics being used to evaluate each hospital's performance. Three different metrics for US hospitals were examined to understand how well they are related to each other (there are many other metrics on which hospitals can be compared). Results show that the **patient experience and patient loyalty are only weakly related to other hospital metrics**, suggesting that [improving the patient experience](#) will have little impact on other hospital measures (health outcomes, process of care).

Consumers

As healthcare consumers become savvier, they are using a multitude of criteria when evaluating their healthcare providers, including patient experience ratings. What kind of experience are you providing your patients? Do you know where you need to invest to improve the customer experience and increase patient loyalty? Hospitals that can answer these questions will likely outperform their counterparts who do not.



About TCELab

We are a team with a passion, vision and insatiable curiosity for improving how you collect, synthesize and analyze business data to help improve the customer experience, increase customer loyalty and maximize business growth. We are fascinated by data. We are fascinated by technology. We are fascinated by people.

TCE means Total Customer Experience. TCE reflects our approach to help you address customer experience management (CEM) issues by exploring a 360 degree view of the customer, from their interactions with the company, the employees, and business partners to their perceptions about their experience with different customer touch points. Employing customer-centric data models and statistical analyses, we take your big data, organize it, and extract the business value to help you build a customer-centric company.