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The Impact of Value-Based Reimbursement on Patient Care

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The Impact of Value-Based Reimbursement on Patient Care

Abstract

This paper aims to perform initial research on the impact of value-based reimbursement on the quality of patient care. I will apply descriptive and exploratory data analysis methods on patient claims data to understand the change in length of stay over time as value-based payment models became a larger proportion of reimbursement structures. I also provide descriptive evidence of the obstacles to the implementation of value-based reimbursement based on physician perspectives. Initial findings show that diagnoses related to pregnancies decreased in mean and standard deviation of length of stay, which points to increased patient quality. There may be some correlation with increased value-based reimbursement and decreased length of stay, but there is no clear pattern to draw firm conclusions and it appears as a whole that shifts in reimbursement models result in small impacts.

Keywords

Healthcare, value-based reimbursement, providers, patients, reimbursement

Disciplines

Quality Improvement

The Impact of Value-Based Reimbursement on Patient Care

By

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ABSTRACT

This paper aims to perform initial research on the impact of value-based reimbursement on the quality of patient care. I will apply descriptive and exploratory data analysis methods on patient claims data to understand the change in length of stay over time as value-based payment models became a larger proportion of reimbursement structures. I also provide descriptive evidence of the obstacles to the implementation of value-based reimbursement based on physician perspectives. Initial findings show that diagnoses related to pregnancies decreased in mean and standard deviation of length of stay, which points to increased patient quality. There may be some correlation with increased value-based reimbursement and decreased length of stay, but there is no clear pattern to draw firm conclusions and it appears as a whole that shifts in reimbursement models result in small impacts.

INTRODUCTION

Health care expenditures in the United States have been rapidly rising over the last decade to over \$3.8 Trillion in 2019, and per capita health care spend is 50 to 200 percent greater than other economically developed nations (Burke and Ryan 2014). However, despite leading the world in health care spending, the United States falls behind on numerous quality indicators such as life expectancy, disease burden, and the overall Healthcare Quality and Access Rating index (Kurani and Wager 2021). To combat this, policy makers have consistently worked to lower national health care spending and raise the quality of care provided to patients through the implementation of value-based reimbursement models: a new way to pay providers and hospital systems for the care they provide to patients (The Alliance, 2021).

The passage of the Affordable Care Act (ACA) in 2010 sparked a movement towards value-based reimbursement; specifically, through the introduction of the Medicare Shared Savings Program, a voluntary program that encourages doctors, hospitals, and other health care providers to collaborate and give coordinated high-quality care to patients (CMS, 2021). Based on 2020 data, over one-third of all national reimbursement contacts are value-based and over half of all physicians have ties to at least one accountable care organization (Healthcare Association of New York State, 2020). As value-based reimbursement continues to grow in popularity across insurance companies, it will increase pressure on providers to participate in shared savings and risks organizations. Value-based reimbursement models emphasize the quality of patient care over the quantity of care that is delivered; shifting away from the prevalent fee-for-service (FFS) model which reimburses providers on each service provided to the patient: effectively being directly linked to the number and type of services provided. On a broad level, the goal of this research is to understand the impact of value-based reimbursement models on patient care along

with providing illustrative evidence of the main obstacles to the wide-spread adoption of value-based payment models.

Understanding the impact of value-based reimbursement models on patient care will help various stakeholders in the health care industry be well adjusted to new methods of payment and be better prepared for widespread adoption. Health providers must constantly deal with patient dissatisfaction and adding a new method of reimbursement means that have to adjust their practices; along with balancing patient care while simultaneously not letting quality decrease. Value-based reimbursement models aim to give the health care system stronger cost controls and an increased focus on patient outcomes. It is important to note that the goal of value-based models is not simply payment reform, but instead a system designed to make improvements for patients through better outcomes and lowering costs. This paper aims to see if these better outcomes are being realized.

Specifically, value-based reimbursement is focused on improving health care quality, decreasing per capita costs, and increasing the focus on overall patient wellness. While my research is not focused on measuring per capita costs or patient wellness, I hope to find the impact of the implementation of value-based care on patient quality which will help policy makers and providers better understand if these new policies are making their intended impact. Along with this, I hope to provide descriptive evidence of the four main value-based models of performance-based payment, bundles, shared saving plans, and capitation along with provider perceptions of these payment models. I plan to do this through an analysis of United Health Group's patient records and claims data which I can access through The Leonard Davis Institute of Health Economics at the University of Pennsylvania, and the American Medical Group

Association's fourth annual risk survey which discusses barriers that stand in the way of a transition to value-based care, with a strong focus on provider perspectives.

In terms of research motivation, experts who could find this information useful are policy makers, insurance companies, and providers. Policy makers can use this information to understand if the reimbursement models are making an impact on their system wide goals of decreasing costs while maintaining quality. As we enter the second year of the pandemic, the healthcare system has been under an enormous amount of stress, and as normalcy comes back it could be a great time for reform of the reimbursement structures that are currently in place. Insurance companies often follow reimbursement programs that are put forth by the Center for Medicaid and Medicare Services; therefore, they are important stakeholders that are impacted by the decisions of policy makers.

Another key category of individuals who will benefit from this research are medical providers. While providers may not have the ability to impact what reimbursement models are being implemented, they are greatly impacted by them. Even if a provider is a part of a hospital group, decreasing revenue for the hospital will be linked to provider pay. This would mean that the providers earn lowered compensation as compared to the traditional fee for service models; this decreased pay will likely be a pain point for providers, and a reason why adoption of value-based reimbursement strategies could be slow. For value-based care to be widely implemented, the benefits must outweigh the costs, and my paper hopes to understand the benefits of such policies.

BACKGROUND

Value-based reimbursement is a relatively recently introduced payment model which works to reimburse providers based on specific quality indicators, as opposed to simply providing a service to the patient. Initially, the implementation of value-based reimbursements was on specific conditions and diagnoses, but the recent expansion to a Merit-Based Incentive Payment System (MIPS) by the Center of Medicare and Medicaid Services in 2019 has made quality-based payments more prevalent. A large-scale study of value-based reimbursement models finds twelve main lessons from the implementation of such payment structures, one of which is that these new value-based payment models have had small impacts. Crook claims that without a focused effort on improving quality of care, the system-level goals will not be met. The paper calls for greater system-wide impact but fails to mention why there is currently little influence from the implementation of value-based payments; it also fails to provide examples of possible strategies to reach the desired goals (Crook, Saunders, Roiland, Higgins, McClellan, 2021). There are four key types of reimbursement structures which are most popular under the larger umbrella of value-based reimbursement: pay for performance, bundled payments, shared savings and risk organizations, and capitation.

A pay for performance structure is the most widely established and it attaches financial incentives and disincentives based on provider performance, as measured through a variety of patient quality indicators. MIPS, a Medicare program, is an example of this which determines Medicare reimbursements by adjusting the total payment reliant on four factors: quality, improvement activities, promoting interoperability, and cost. A study which examined the impact of pay-for-performance on the quality of health care found that an ongoing monitoring of incentive programs is important to understand the effectiveness of financial incentives and

unintended impacts on the quality of care (Petersen, Woodward, Urech, and Daw 2007).

However, the paper doesn't discuss how quality is affected, and because this is a somewhat subjective measure, getting the proper data to study quality of care is difficult.

A capitation-based payment model is based on paying a provider a set amount of money, either per person or per period, regardless of the number of services used by the patient. One of the most common examples of capitation-based models are coordinated care plans. The most common example of this is seen through an accountable care organization in which a group of hospitals, doctors, and clinics work together to provide care to a patient population over a set time. Their revenue is fixed, but their costs are variable based on the amount of care a patient needs; thus, it incentivizes preventive medicine avoid blow up costs.

Large scale studies of capitation-based reimbursement models in the 1990s found that capitation leads to lowered costs while also providing equal or better care to the patient (Retchin and Brown, 1990). However, the studies are unable to measure capitation as a free-standing variable and are also several years old. In the current environment of rapid organizational change, older studies can quickly become irrelevant, which require new analysis on the impact which capitation models can have (Berwick 1996). In a time with increased competition and decreased transparency between providers, capitation models may face resistance as they grow in popularity.

Bundled payments are similar to capitation payment models but instead of reimbursing per person or per day, they reimburse a set amount for specific diagnoses and conditions. A study on the impact of bundled payments on health care spending and quality finds that bundled payments lead to lowered costs for lower extremity joint replacement while maintaining quality (Agarwal, Liao, Gupta, and Navathe, 2020). However, the study also finds that because bundled

payments don't account for patient-level heterogeneity and fail to include risk stratification, they fail to make significant improvements for other conditions.

The purpose of shared savings and risk organizations is to encourage the coordination of care among a variety of providers. At the end of the year, the total reimbursement is compared to a pre-decided index, and the organization either earns a bonus if it is below the threshold, or it is forced to pay a penalty. The goal of coordinated care is to provide care at the right times along the patient journey to reach avoidance of large one-time costs from a preventable incident, for example providing regular medical screening to monitor increased blood pressure. Managed care plans were largely popular in the 1990s, but over time they have seen a decline in usage as patients prefer to have full autonomy on the providers they visit: a choice which coordinated care restricts.

While policy makers and economists agree that it is important to introduce value-based payment models in health care, an important stakeholder group disagrees. The Doctors Company, the United States' largest physician-owned medical malpractice insurance company, conducted a widespread study on over 3,400 physicians about their views on value-based reimbursement (TDCGroup 2018). In regard to their opinions towards value-based care and reimbursement, 61% believe that it will have a negative impact on their practice, 49% said that it will decrease the quality of patient care, and 63% expressed that it will negatively impact their earnings. Main points of concern are centered on the additional spending required on services and partnerships to ensure that quality metrics are being met. Including the added documentation and data collection requirements to an already paperwork heavy profession and creating an additional stressor to the already treacherous process of filing reimbursement claims. While my research is not focused on the provider side of value-based reimbursement, it will illustrate how

the implementation of value-based reimbursement models can impact the quality of patient care, and if these impacts are significant enough to outweigh the burdens. In the next section, I will discuss my proposed methodology to understand this impact.

METHODOLOGY

To understand the impact of value-based reimbursement on the quality of patient care, I reference two papers to guide my analysis. The first is a white paper by the American Group Medical Association that surveyed 75 physicians with questions related to reimbursement structure and implementation barriers of various value-based payment models. I will use this white paper to guide my discussion of the value-based payment models and add qualitative evidence on pay for performance, bundled payments, shared savings and risk organizations, and capitation. It will also help me in discussing provider feedback to value-based reimbursement, and if these new payment models have the potential to create system-wide impact.

The second paper which I will be using to guide my methodology conducts an analysis on length of hospital stay using electronic health records to see if improvements in patient records can lead to more efficiently managed length of stays of patients (Baek et al. 2018). The paper provides a method of descriptive and explorative analysis which I apply to understand the length of stay data over time. To capture the impact of value-based reimbursement on the quality of patient care, I plan on running a similar analysis on length of stay across patient claims data provided by the United Health Group.

Data and preprocessing

Through the Leonard Davis Institute of Health Economics at the University of Pennsylvania, I have access to Optum Health Data which gives me access to the claims and medical records of over 60 million patients. Optum Health is a division of the UnitedHealth Group which provides integrated direct-to-patient care including physicians, home health, urgent care, and surgical care. The data consists of eight million hospital claims and almost three

million outpatient claims which includes true out-of-pocket costs along with a variety of care metrics. Data from quarter two of each year was extracted biannually from 2009-2019. These dates were chosen because the first year which CMS introduces the hospital value-based purchasing program was 2012 with the goal of promoting better clinical outcomes and patient experiences of care. These dates also include DRG codes which have continuity, which is crucial to the analysis of length of stay over time; prior to 2009 the DRG codes completely change and there are no cross-over codes with the rest of the data. It was also important to choose a time period before the impact of COVID, and thus 2019 was chosen. The types of variables and variable names in the data are provided below.

Patient Variables	Patient ID, Patient plan ID, Admit date, Discharge date, Place of service, Length of stay, Place of stay, Discharge status
Payment Variables	Charge amount, Coinsurance amount, Copay amount, Deductible amount, IP status, Standard cost, Standard cost year,
Service Variables	Diagnoses' 1-5, Diagnosis related group, Length of stay, Place of service, Procedure's 1-5, Provider, Type of service code,
Data Variables	ICD flag, Confinement ID, Type of service code, Year and month of data extract, Version, ICU confinement ID, ICU surgery confinement ID, Major surgery confinement ID, Maternity confinement ID, Newborn Confinement ID, LV5 type of service full code

Fig. 1: Variables available in claims dataset from Optum Health.

The first step was trying to understand which variables can be most linked to quality. This proved to be difficult given that a lot of variables were descriptive and identifying procedure codes, not necessarily in relation to patient outcome. One such variable is length of stay which can be linked to decreased risks of opportunistic infections and side effects of medication, and improvements in treatment outcomes (Baek et al. 2018). Once I decided on length of stay as my main variable, an explorative and descriptive data analysis was necessary.

Analysis Methods:

The main method of data analysis I will focus on for the Optum data is exploratory analysis. The purpose is to understand the length of stay variable, as it moves from a period where value-based reimbursement models are not implemented to a period where they begin to saturate various insurance plans. Understanding the length of stay variable includes comprehending overall performance, determining the difference across time periods and diagnoses, and analyzing the differences in distribution of length of stay distribution over time.

To understand the movement of length of stay overtime, it is important to stratify by the diagnosis related group (DRG) and see which are most prominent in each year of the data (the five highest frequency DRGs in each year were used). This trims the data so that it is workable, yet still makes it so that there are a large enough number of observations to make the analysis useful. The data exploration and analysis will be conducted on a virtual desktop and the use of Health Services Research Data Center through the use of Stata to ensure the confidentiality of data.

DATA & ANALYSIS

Optum patient claims data

For my data analysis, I use a dataset from quarter 2 of every other year between 2009 and 2019. For these years and data sets, there were an ample number of observations, and visible continuity between DRG codes. For each time period there were over 350,000 observations and over 1,000 DRG codes; it was therefore impractical to understand the length of stay with each DRG code, and I had to decide on a way to stratify by the data set.

Running some initial analyses on the data, I found that the top five most frequent DRG codes contributed to over 20% of total observations, which was still over 60,000 observations in each data set. This was a large enough number of observations to justify a strong sample size, and I decided to look at the five most frequent DRG codes in the datasets of each year as a stratification filter. The DRG codes for each year of observations are provided below.

Year of sample	Five most frequent DRG codes
2019	795, 470, 807, 871, 291
2017	795, 470, 775, 871, 291
2015	795, 470, 775, 885, 945
2013	795, 470, 775, 885, 945
2011	795, 470, 775, 885, 766
2009	795, 470, 775, 885, 766

Fig. 2: Top five most frequent DRG codes from 2009 to 2019.

Next, I attempt to understand the uniqueness of the DRG codes in each year and understand what the codes mean in a medical setting. Knowing the definition of the codes will help later in analysis of my results. There are a total of nine unique codes in the data, and the translation of the codes into actual diagnoses is provided below.

DRG code	Description
795	Normal Newborn
470	Major hip and knee joint replacement
775	Vaginal delivery without complicating diagnosis
885	Psychoses
871	Severe sepsis without MV>96 hours with MCC
291	Heart failure and shock with MCC
945	Rehabilitation with CC/MCC
766	Postpartum and post abortion diagnoses without OR procedures
807	Vaginal delivery without sterilization or D&C without CC/MCC

Fig. 3: Description of DRG codes that are in the datasets.

Given that there are only nine unique codes out of a possible thirty, it is clear that there will be commonality between diagnoses year over year. This is crucial so that the length of stay over time for these codes will be comparable. The diagnoses which are present in all years are DRG codes 795 and 470. Additionally, DRG code 775 is in five of the datasets (all but 2019) which will add to my analysis. In discussing the impact of the implementation of value-based reimbursement, these are the DRG codes I will focus on, as they provide two samples from prior first implementation and at least two samples after initial implementation of value-based models.

Once I stratified on the DRG codes to use for each of the datasets, I proceeded to examine the mean length of stays for each of the three codes over time. The mean length of stays for DRG code 795 are shown below.

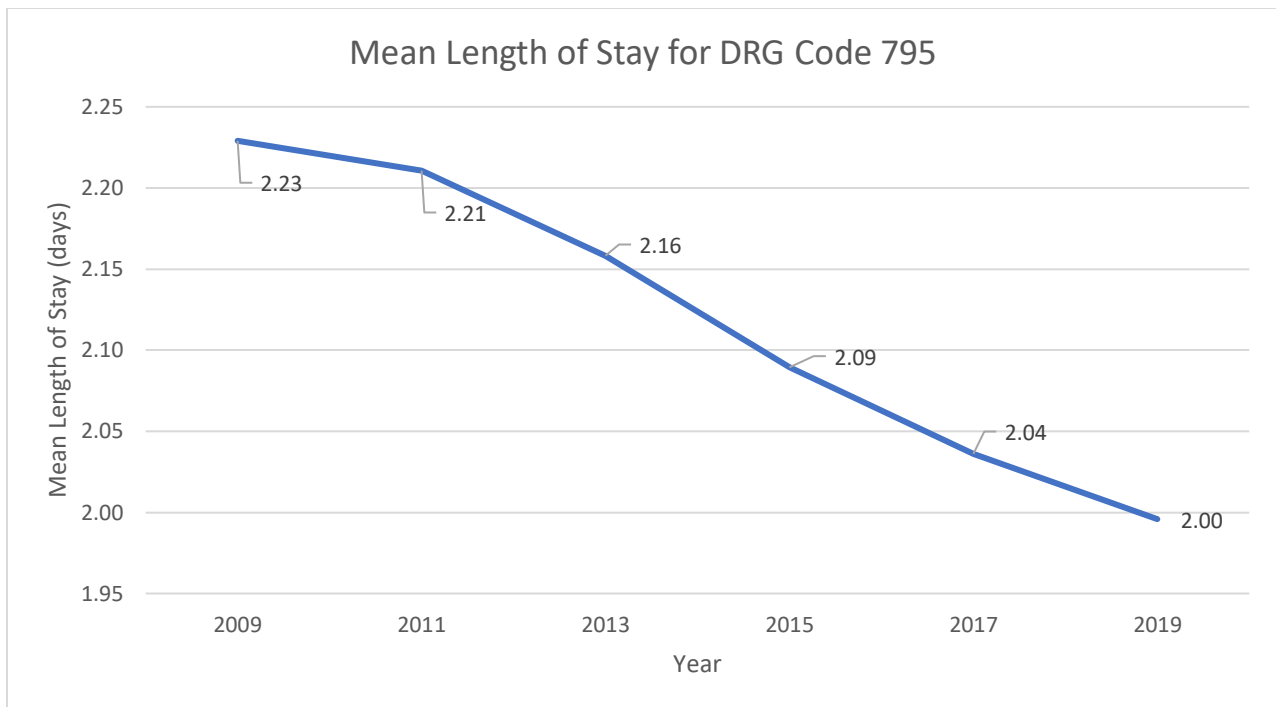


Fig. 4: Mean length of stay for DRG code 795, in days.

It was interesting to see that the length of stay decreases over time and goes from a mean of 2.23 days to 2.00 days. Similar to the decrease we see with DRG code 795, DRG code 470 decreases from a mean of 3.32 days to 2.60 days. The graph is shown below.

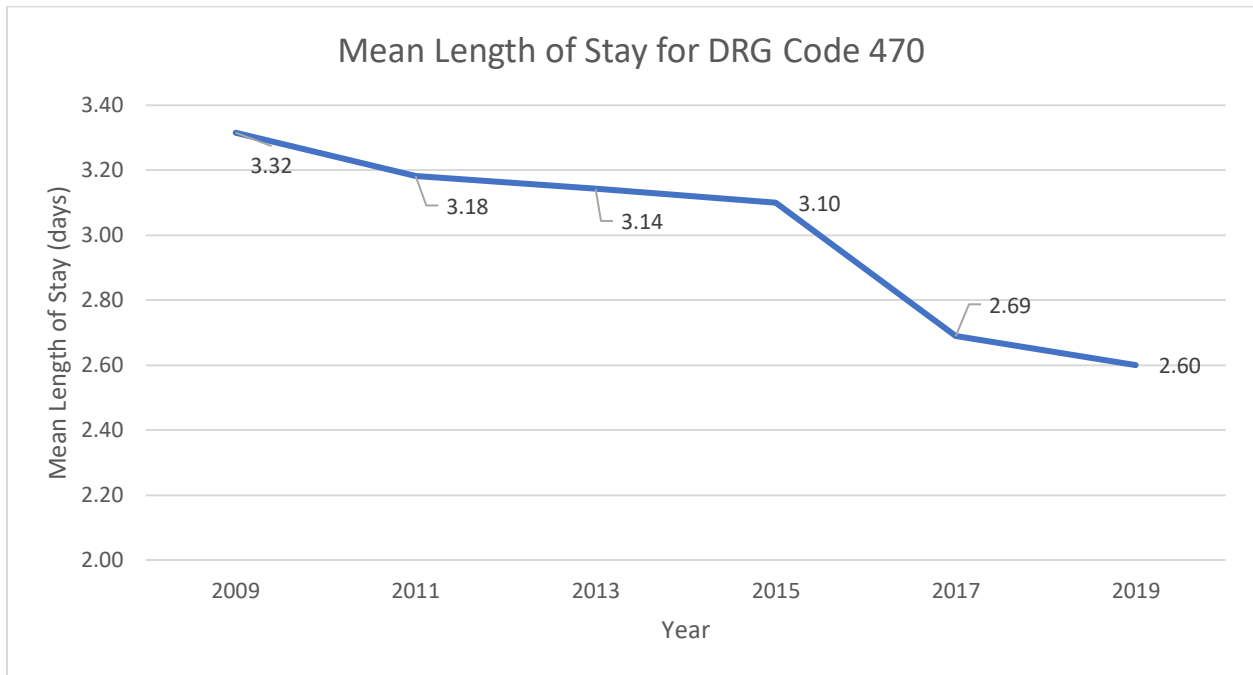


Fig. 5: Mean length of stay for DRG code 470, in days.

In comparison with DRG codes 795 and 470, DRG code 775 shows no clear trend in its movement. As we have seen in other studies, one of the main lessons learned from the implementation of value-based reimbursement is that they have had generally small impacts and simply changing reimbursement structure does not necessarily force providers to increase the quality of patient care (Crook, Saunders, Roiland, Higgins, and McClellan, 2021). The graph for DRG code 775 is shown below.

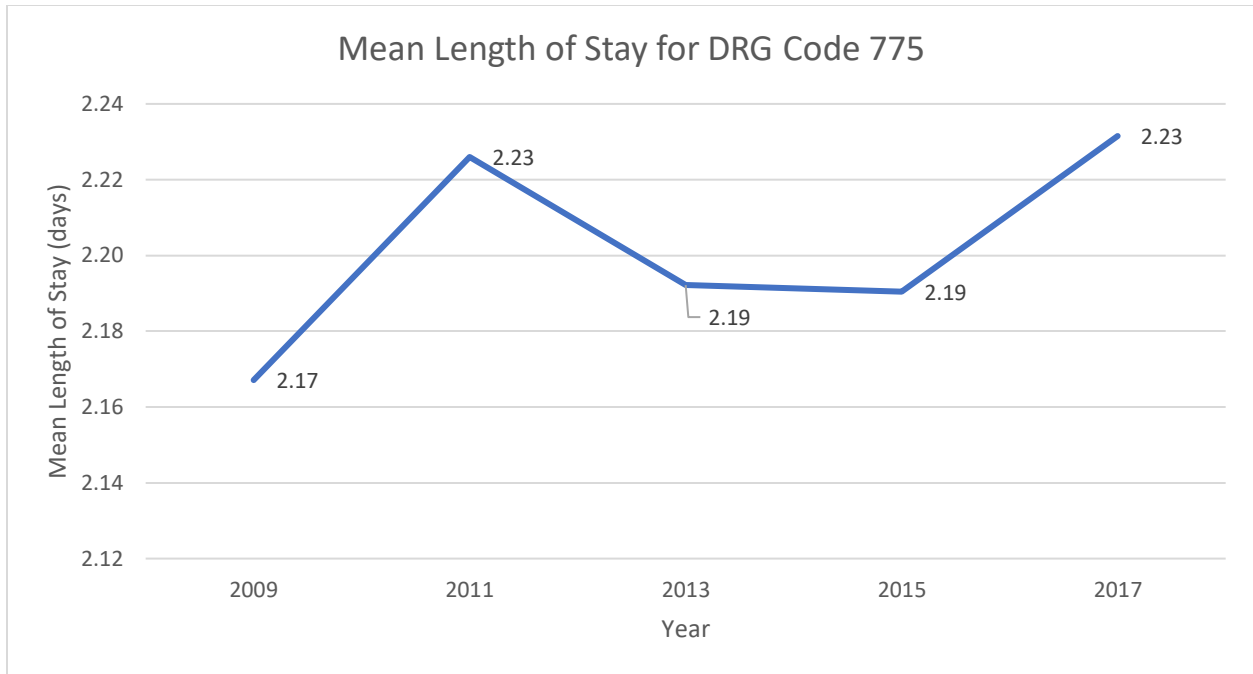


Fig. 6: Mean length of stay for DRG code 775, in days.

Looking at the time series of means alone is not enough to understand the impact of value-based reimbursement models. The density of distribution for the length of stays is also important in understanding patient quality. In effect, if the spread of length of stays gets more compact it could mean that reimbursement model changes are helping to standardize the quality of care on specific metrics. The following graphs show the standard deviation of the same DRG codes over time which displays how much of the data is clustered around the mean.

In finance, it is common to use standard deviation as a measure of risk in volatility of asset pricing and the spread of asset prices compared to their average; a lower standard deviation often means that prices are calm, and investments come with low risk. Similarly, from a patient perspective, it would mean that lower standard deviation of length of stays for a particular treatment could mean decreased patient risk which would lead to an increased quality of care (Beers 2022). The standard deviation of length of stay is a measure of riskiness for patient

outcomes. For example, if a medical procedure has a standard deviation of 2 days it would be less risky than a procedure which has a standard deviation of 15 days. The graph of the standard deviation for code 795 is shown below.

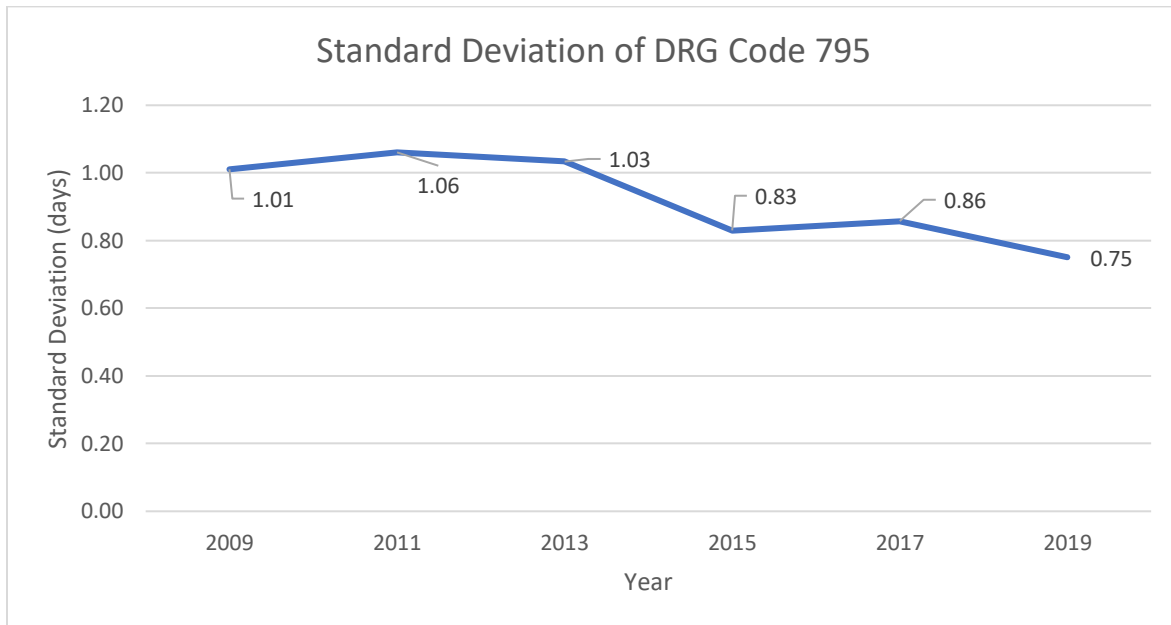


Fig. 7: Standard deviation of length of stay for DRG code 795, in days.

The standard deviation of DRG code 795 decreases from 1.01 days to 0.75 days, which can point to a better standard and quality of care. Knowing the DRG Code 795 is normal newborn, this lowered standard deviation can point to decreased risk with pregnancies and that maternal care is becoming better. Alternatively, the standard deviation of DRG code 470 does not follow a specific pattern and is in fact increasing over the time period. The graph is shown below.

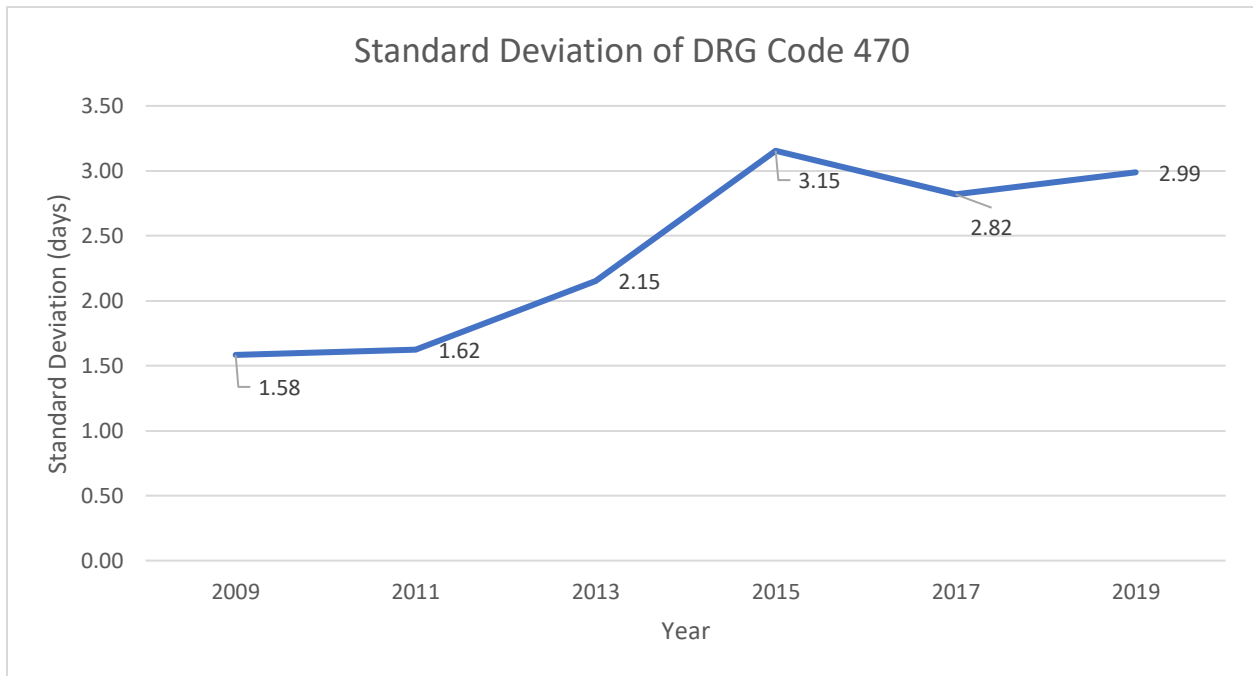


Fig. 8: Standard deviation of length of stay for DRG code 470, in days.

While the standard deviation of major hip and knee joint replacements are increasing over the time period from 1.58 to 2.99, it is important to note that the prevalence of hip and knee joint replacements are also rapidly increasing. Hip and knee replacements are expected to see a growth of over 40% over the next decade in all age groups for both male and females (Singh, Yu, Chen, and Cleveland, 2019). The increased number of surgeries can help explain the increased standard deviation as significantly more procedures are occurring. The standard deviation of DRG code 775 featured a spike in 2011, but then decreased significantly by 2019; the graph is shown below.

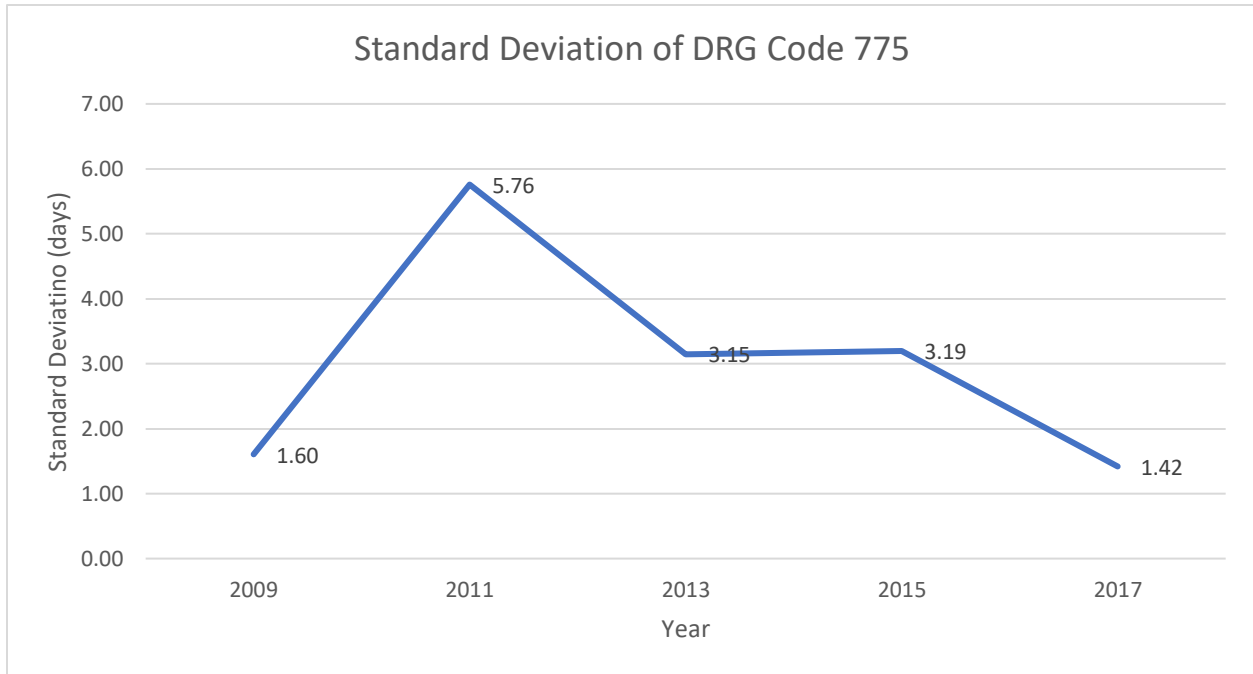


Fig. 9: Standard deviation of length of stay for DRG code 775, in days.

In addition to looking at the standard deviations over time, it is also noteworthy to look at the max length of stays that are in each of these DRG codes over time. The table for this is below.

DRG Code	2009	2011	2013	2015	2017	2019
795	87	86	95	34	47	14
470	29	29	52	74	100	94
775	146	722	366	368	67	N/A

Fig. 10: Maximum length of stays for DRG codes 795, 470, and 775, in days.

It is interesting to note that DRG code 795 and 775, both related to pregnancies, significantly decreased in max stay, while the max for hip and knee joint replacements increased. Next, I attempt to discuss the changing reimbursement landscape with qualitative measures through a survey conducted by the American Medical Group Association and simultaneously provide analysis of the impediments limiting the adoption of value-based reimbursement from a physician perspective.

AMGA's Fourth Annual Risk Survey:

As value-based reimbursement models continue to become a larger part of insurance reimbursement structures, there are significant obstacles that exist from a provider perspective. These can be categorized as either external or internal and refer to whether obstacles stem from the payors or are within the providers own infrastructure (AMGA, 2019).

Significant external factors include lack of transparent costs from other providers, ineffective data sharing processes, and ineffective attribution methodologies. Because more than half of all value-based reimbursement technologies are shared savings and/or risks, it is important for providers to have access to all patient and provider information from those that are also in the same accountable care organization. Without transparent costs from other providers, it would be hard to for a physician to join a shared savings organization because part of the appeal is that you are able to lower costs. Without this transparency of information, this brings a lot of uncertainty to a provider's income.

Internal factors are those which providers can control themselves to help prepare themselves for a shift to value-based reimbursement. From 2015 to 2018, providers have made significant progress in their preparation, but there are a few key steps that are yet to be taken.

The largest hurdles include lack of capital to support a risk infrastructure, insufficient health IT analytics, and decreased physician compensation. To properly support value-based reimbursement models physicians need to be able to handle decreased compensation which requires support capital for the possible downturn. Additionally, to know if care is being delivered in accordance with quality standards it is important to be sure of your internal health metrics and make sure that you are measuring the right data points: something which practices and providers have to be prepared for.

Even with significant internal infrastructure improvements, over 62% of providers say that they need more than a year of a shared savings model before they can participate in shared risks as well. Simply put, before a provider is willing to take on any downside risk, they want to see how a new care organization would perform given a shared patient panel and metrics. The way care is delivered in a coordinated care organization varies greatly from a fee for service structure. There are key capital-intensive infrastructure changes that must occur for organizations to be properly equipped to handle value-based reimbursement plans. These changes include developing new roles and responsibilities for management to oversee the care delivery processes, large investments in IT, and a strong focus on developing programs for high-cost patients with a reliance on preventative care to avoid blowup costs from risky patients.

DISCUSSION

There are some limitations to this study that must be addressed. First, the basis of my length of stay analysis is that value-based reimbursement has been increasingly implemented over time beginning in 2012. Thus, the data points from 2013-2019 are those with value-based reimbursement, and the data sets from before are without. This assumption was required due to the lack of patient insurance plan identification of if a patient had value-based reimbursement or not. While there were a large number of variables in the dataset, there were not many that had to do with the quality of patient care: the goal of this study. Because of this, I had to assume that the length of stay for a patient, which is tied to reduced risk of infection, is a proxy for quality of care (Baek et al. 2018). However, using length of stay as my data point for quality-of-care poses measurement error where what I'm assessing is different than the true value that I'm looking for. This assumption leads to limitations in my analysis but was necessary to complete my project and use the data.

Challenges with using the length of stay include the confounding variables of capitation-based payment models and medicine getting better. Further analysis of the data could find that length of stay is being impacted due to the advancement of medicine, and not necessarily as a result of value-based care. The largest and most consistent decreases in mean and variability in length of stay were seen with DRG code 795, which is normal newborn. This can be alternatively explained by saying that hospitals and providers had access to new technology which made pregnancies safer and more efficient, thus patients can be discharged after a shorter stay in the hospital. Another explanation could be the use of capitation models for reimbursement, which provides payment for all services given to a patient during a hospital visit under a specific diagnosis. Because a hospital receives the same reimbursement regardless of length of stay of a

patient, the provider may be pressured to discharge the patient sooner than they actually may be ready in order to save resources. In a DRG based reimbursement system, the revenue is fixed regardless of the number of services are provided; however, the costs are highly variable and directly linked to length of stay and number of services provided. This puts enormous pressure on a hospital system to make sure that the revenues stay higher than the costs so that they are still making a profit. To further my study, I would request access to additional patient data which included if they were readmitted because they were discharged too quickly, along with additional post-discharge data.

Despite these limitations, this study analyzed the length of stay of patients under a stratified sample of DRG codes to understand the impact of value-based reimbursement on patient quality of care. Additionally, the white paper by the AMGA provides information on provider and hospital views of risk tolerance and obstacles that may hamper the transition to value-based reimbursement.

CONCLUSION

Value-based reimbursement models are those which tie provider pay to quality of care delivered, rewarding providers who delivery high quality care and penalizing those who do not. To measure the impact of these models, I studied the length of stay for patients with diagnoses relating to pregnancy and hip and knee joint replacement from 2009 to 2019 by utilizing exploratory analysis on patient claims data provided by Optum Health. This data was provided to me through the Leonard Davis Institute of Health Economics. My analysis finds that there are not significant impacts on length of stay through the growing implementation of value-based reimbursement. This agrees with the findings of other studies which also found small impacts in patient quality through a result of value-based reimbursement (Crook, Saunders, Roiland, Higgins, McClellan, 2021). However, there are interesting patterns to note in the variation of length of stay statistics in claims relating to pregnancies. DRG code 795 and 775 display a decreasing mean length of stay and smaller standard deviations which point to a more standardized system of care to account for higher quality; but there are confounding variables of improved medicine and capitation-based payment models which can also lead to variations in length of stay.

Future research would require additional data including patient quality metrics, reimbursement structures that each patient is insured by, and post-hospitalization data on patients to understand if they are prematurely discharged. This would provide a greater overview on how various reimbursement models impact patient quality of care on a larger scale. Although initial research shows little impact on length of stay, additional research may provide further insight into how growing value-based reimbursement models impact patient care, and help policymakers better understand the influence of their policies on the healthcare system.

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