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Provider Payment Arrangements, Provider Risk, and Their Relationship with the Cost of Health Care

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GLOSSARY OF TERMS AND ABBREVIATIONS

Abbreviations

ACA/PPACA: Patient Protection and Affordable Care Act

ACE: Acute Care Episode Demonstration

ACO: Accountable care organization

AHRQ: Agency for Healthcare Research and Quality

AMA: American Medical Association

APC: Ambulatory Payment Classification

APR-DRG: 3M™ All Patient Refined DRG (APR DRG) Classification System BPCI: Bundled Payments for Care Improvement

CABG: Coronary artery bypass graft surgery

CBO: Congressional Budget Office

CC: Complication or comorbidity

CCE: Care coordination entity

CCF: Care coordination fee

CCHG: Milliman Chronic Conditions Hierarchical Groups

CDPS: Chronic Illness and Disability Payment System

CMMI/Innovation Center: Center for Medicare and Medicaid Innovation

CMS: Centers for Medicare and Medicaid Services

CPI: Consumer price index

CPT: Current Procedural Terminology

CT: Computed tomography scan (i.e., CT scan)

DME: Durable medical equipment

DOJ: U.S. Department of Justice

DRG: Diagnosis-related group

DSH: Disproportionate share hospital

EAPG: 3M™ Enhanced Ambulatory Patient Grouping System

EHR: Electronic health record

ETG: Symmetry® Episode Treatment Group

FFS: Fee-for-service

FQHC: Federally Qualified Health Center

FTC: Federal Trade Commission

GME: Graduate medical education

GPCI: Geographic Practice Cost Index

HAC: Hospital-Acquired Condition

HCG: Milliman Health Cost Guidelines™

HCPCS: Healthcare Common Procedure Coding System

HHI: Herfindahl-Hirschman Indices

HHS: U.S. Department of Health and Human Services

HMO: Health maintenance organization

HQID: Premier Hospital Quality Incentive Demonstration

ICD: International Classification of Diseases (i.e., diagnosis codes)

IHA: Integrated Healthcare Association

IME: Indirect medical education

IP: Inpatient hospital setting

IPA: Independent practice association or independent physician association

IPAB: Independent Payment Advisory Board

IPPS: Medicare Hospital Inpatient Prospective Payment System

MAC: Medicare Administrative Contractor

MCC: Major complication or comorbidity

MCCN: Managed Care Community Network

MedPAC: Medicare Payment Advisory Commission

MEG: Medical Episode Grouper®

MLR: Medical loss ratio

MPFS: Medicare Physician Fee Schedule

MRI: Magnetic resonance imaging

MS-DRG: Medicare Severity Diagnosis-Related Group

MSSP: Medicare Shared Savings Program

NIHCR: National Institute for Health Care Reform

NPI: National Provider Identifier standard

OIG: U.S. Office of Inspector General

OMB: Office of Management and Budget

OOP: Out-of-pocket (i.e., out-of-pocket maximums)

OP: Outpatient hospital setting

OPPS: Medicare Hospital Outpatient Prospective Payment System

P4P: Pay-for-performance

PCMH: Patient-centered medical home

PCP: Primary care provider

PEL: Provider excess loss (i.e., provider stop loss)

PET: Positron emission tomography

PHO: Physician-hospital organization

PMPM: Per member per month

PPO: Preferred provider organization

QIO: Quality Improvement Organization

RBP: Reference-based pricing

ROM: Risk of mortality

RVU: Relative value unit

SGR: Sustainable growth rate

SNF: Skilled nursing facility

SOA: Society of Actuaries

SOI: Severity of illness

VBP: Value-based purchasing

Terms

Allowed charge: The maximum reimbursed amount generally set by an insurance company or health system for services billed by the provider. (It includes both the patient's responsibility and the insurer's responsibility.)

Billed charge: The total value of services charged by the provider.

Capitation: A payment model where a fixed payment—e.g., per member per month (PMPM)—is paid in advance of service delivery. This fixed payment is based on the average, or expected, costs of the population rather than on the services actually provided, which is the opposite of the fee-for-service (FFS) model.

Costs: In this report, the term "costs" is defined to mean many different things and should be interpreted by the context in which it is used.

- An actuary will use the term to mean allowable charges or unit cost, representing the actual payment made to the provider or the cost of health care to the payer.
- Providers typically use the term to represent the internal cost of providing medical services regardless of what they charge or are reimbursed (e.g., cost-to-charge ratio).
- The term is also used to mean administrative costs of implementing a system.

Disproportionate share payments (DSH): Enacted by the Consolidated Omnibus Budget Reconciliation Act (COBRA) of 1985 to financially assist hospital programs that serve individuals who can't pay for all or part of their services.

Exposure: The maximum amount of damage that may be expected if an event occurs.

Fee-for-service (FFS): A type of payment model where each service is billed and paid for separately.

Fee schedule: A master list detailing all provider and hospital allowed charges, usually by Healthcare Common Procedure Coding System (HCPCS), revenue codes, or by diagnosis-related groups (DRGs).

Gain-sharing arrangement: A type of incentive payment system where both hospitals and physicians share in potential cost savings based on predefined cost and quality target benchmarks.

Grouper: A tool used to stratify, separate and analyze claims data sets, e.g., separating claims into procedures or diagnosis groups, places of service, and/or member demographics.

Health system: A group of providers and/or services that are organized together to meet the clinical needs of a targeted population. The structures of these organizations are discussed more in Appendices C and D.

Integration, horizontal: The consolidation of competitors that provide the same types of services in the same or similar industries, usually in efforts to achieve better economies of scale by sharing resources. An example would be a joint venture or merger between two similar hospital systems.

Integration, vertical: An alliance of service providers who each produce a different market service. The alliance of these service providers results in the combined entity being able to offer an expanded and more comprehensive set of services than any one of them alone could provide. Typical examples include physician or other health care professionals aligning with health systems and hospitals to coordinate care.

Medicaid: U.S. social insurance program that provides health insurance access to low-income individuals and families, children, and those with disabilities.

Medicare: U.S. social insurance program that provides health insurance access to individuals including those 65 years of age or older, as well as younger individuals with end-stage renal disease (ESRD) or amyotrophic lateral sclerosis (ALS), and those eligible for Social Security disability.

Medicare Advantage (MA): Public/private health insurance benefit plan providing benefits that are at least as rich as standard Medicare FFS plans. While the benefit package must provide coverage for at least the same services as the standard Medicare program (i.e., Parts A and B), it does not necessarily reflect the same benefit or cost-sharing levels as the standard Medicare benefits, allowing more flexibility for beneficiaries to find plans to suit their needs at the same or extra cost. Many MA plans incorporate Medicare Part D (prescription drug coverage) into their benefits and are referred to as Medicare Advantage Prescription Drug (MAPD) plans.

National health expenditures: Total U.S. expenditures on health care, net cost of health insurance, government administrative and investment costs, and other services related to public health.

Payee: The individual or entity receiving payment as a result of services provided.

Payer: The individual or entity that pays for services provided.

Payment model: The arrangement between a payer and provider to reimburse the provider for services. Examples include FFS arrangements and capitation agreements.

Physician fee schedule: A list of services covered, along with the associated units, costs, and potential service and area adjustments used as a basis for physician payment.

Provider: A health care professional or entity that delivers services in an effort to treat or prevent illness or provide palliative care.

Randomized control study: Type of research study design where individuals are randomly selected and placed into separate groups in which each group receives a different set of treatments. Outcomes by group are measured and compared, usually against a control group in which no treatment was provided.

Reversion to the mean: A theory that stipulates that outliers or outcomes will return to historical averages in the future.

Service delivery model: The manner in which providers organize and deliver care to patients.

Shared savings: Payment model for an organization that is typically moving from FFS to capitation. A provider still gets reimbursed using a fee-for-service arrangement, but is also measured against utilization and quality benchmarks in efforts to achieve better patient outcomes.

Value-based arrangement: A payment model or contract agreement that reimburses services based on quality measures such as patient outcomes and efficiency, often at a predetermined price.

Volatility: The variability of potential outcomes.

I. EXECUTIVE SUMMARY

With the goal of more affordable medical spending, there has been continued attention to increasing the value of health care through arrangements in which health care providers and payers work together through sharing financial risk (i.e., payment reform) to better align incentives to provide quality care at more affordable prices. Although the idea of integrated delivery systems and providers taking on risk is not new, there has been a renewed focus on these value-based arrangements. It is important for stakeholders to understand the elements of these arrangements, as well as some of the practical issues and impediments that have determined their past success or failure.

- **Engaging all stakeholders is important**. To properly implement payment reform, several stakeholders are involved, including policymakers, health care attorneys, actuaries, health care providers, coding specialists, data analysts, information technology specialists, administrators, etc. ("the payment reform team"). The actuary, an expert on risk, can help the provider better understand the various risks and opportunities each type of payment model presents.

- **Payment reform is organization-specific**. All payment arrangements have the potential for adverse risk[1] as well as opportunity, depending on the circumstances. Additionally, no one payment structure is the best in all circumstances. Because risk is organization-specific and difficult to generalize, we have introduced a framework for thinking about provider risk inherent in each payment model. This framework focuses on four main risks: utilization risk, technical risk, insurance risk and performance risk. We then define eight payment models and walk through the framework for each payment model: fee-for-service, global capitation, shared savings, DRG/case rates, bundled payments, reference pricing, provider excess loss reinsurance, and pay-for-performance. To understand this general pricing process, we present 10 case studies. The case studies are not meant to be exhaustive of all of the items that need to be considered in choosing and pricing a payment model. However, the payment reform team and actuary can take the principles presented in this paper and extrapolate them to their own process.

- **Results of payment reform are decidedly mixed**. Some programs have demonstrated varying levels of success, while others have documented failures. As part of the Patient Protection and Affordable Care Act (ACA), various organizations have been established to monitor cost trends, and demonstration projects have started to test different payment models with the objective to increase value and decrease trend. The authors found that it is neither easy nor transparent to see how these organizations interact or coordinate results, even for those well-versed in U.S. health care. In addition, methods of reporting results of payment reform studies were not necessarily methodologically rigorous, which made it difficult to reach definitive conclusions on whether specific reported payment reform models were successful.

- **Success in provider payment arrangements ultimately boils down to good holistic risk management by the payment reform team**. This means that the organization must understand its exposure, volatility, probability, severity, time horizon, and correlation to the risk.

- **Organizations that succeed under payment reform have the following qualities**: (1) a highly integrated system (compared with market); (2) effective care management initiatives; (3) a more efficient health system than the rest of the market (or will get there soon); (4) select and restricted networks; (5) a collaborative relationship between the provider organization and payers to reduce costs; (6) reasonable methods to establish capitation rates, episode payments, etc.; and (7) an equitable methodology for allocating the global capitation payments or quality incentives, etc., among the individual participating providers. These are necessary attributes but not sufficient.

- **Insurance companies have an important role**. Large insurance companies have a large base of members and are more equipped to pool and reduce insurance risk. It is important for providers to take on some of this insurance risk to incentivize them to monitor patients and care more holistically.

[1] Risk is loosely defined as exposure to harm or loss.

However, when providers take over some of the insurance risk for their patients or individuals in their geographic areas (for example through shared savings arrangements and capitation), it can be difficult to get enough members to both smooth over random volatility from year to year and to spread the administrative cost of the program. As a result, providers have to be careful in taking on and monitoring this risk and can benefit from maintaining ties with health plans that may be better equipped to handle insurance risk.

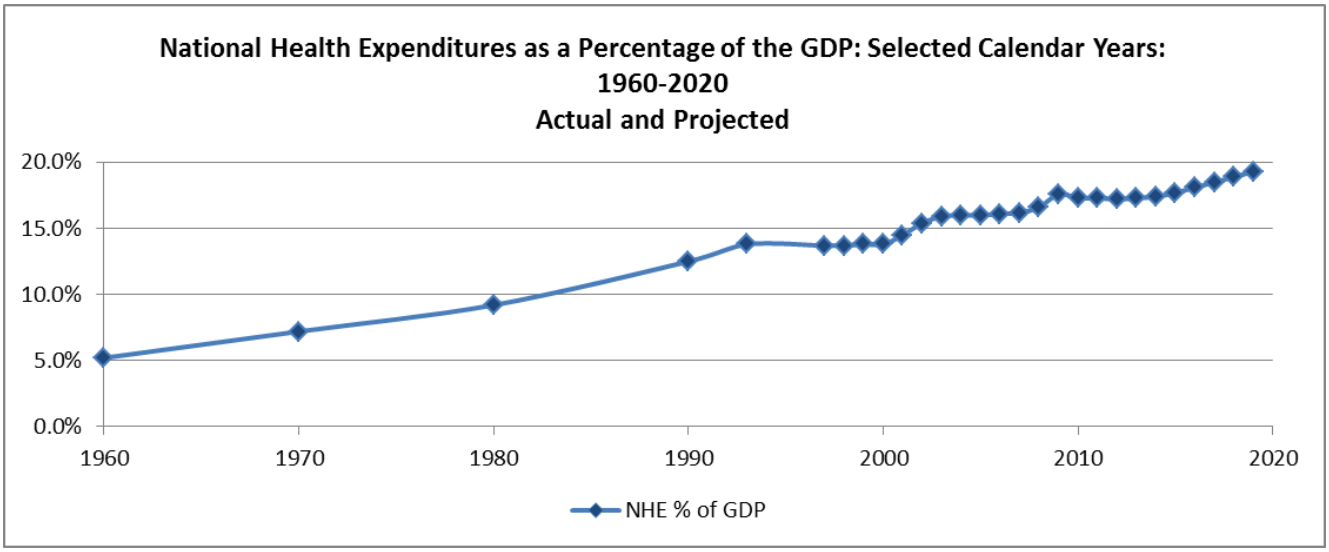
- **The mechanics and administration of payment models that incorporate provider risk have improved since the 1990s consumer backlash against them.** This is due to the following developments since then: (1) more clinical integration; (2) electronic health records and other information systems; (3) widespread use of clinical guidelines; (4) stronger health plan incentives to transition risk; (5) more refined risk adjustment methods; (6) experience from current successes and past failures; (7) political and population pressure on providers to transform the health care system—both quality and cost pressures; (8) increased transparency of provider performance reporting; and (9) organizations have evolved to be more fit to accept risk, and leaders have seen the need for their organizations to take on risk.

Despite the many roadblocks payment reform faces, it appears that increased data sharing, results of decreased total costs of care and better quality, and implementation challenges shared through literature—along with the results of actual Medicare, commercial and Medicaid programs—are propelling the momentum forward. In this paper, we have outlined the general steps and considerations for designing, implementing and measuring results of existing payment reform models. As stakeholders become more skilled at managing the practical details of these contracts, and enhance their infrastructure to collect and process meaningful quality and savings metrics for their target populations, defining the key features that hinder or help the success of payment reform models will become easier. In doing so, providers and stakeholders will refine and implement more sophisticated payment reform models to better manage costs and quality of medical care.

II. INTRODUCTION

National health expenditures are becoming an increasing percentage of the U.S. gross domestic product (GDP), as shown in Figure 1.

Figure 1: National Health Expenditures as a Percentage of the GDP: Selected Calendar Years, 1960–2020, Actual and Projected



Source: *Centers for Medicare and Medicaid Services (1)*

Even with national health expenditures as a percentage of GDP becoming relatively stable from 2009 to 2014, the average medical spend[2] for a family of four increased from $16,771 in 2009 to $23,215 in 2014. (2)

With the goal of more affordable medical spending, there has been continued attention to slowing its increase in order to make health care more affordable and to increasing the value through value-based arrangements. Although the idea of integrated delivery systems and providers taking on risk is not new, there has been a renewed focus on these value-based arrangements. It is important for stakeholders to understand all of the elements of value-based arrangements as well as some of the practical issues and impediments that have caused many of these arrangements to either fail or succeed in the past. The term "value-based arrangement" is not well-defined. Essentially, rather than a volume-based arrangement, a value-based arrangement is supposed to be the antithesis. In a value-based arrangement, a payer and a patient are seeking quality and efficiency. Part of the issue is that the parameters and the results are still not well-defined, causing the term itself to be vague. These parameters are a key part of what this paper addresses. For this paper, payment reform is the environment where more contracts move to value-based arrangements.

A consequence of payment reform is that the models can result in less revenue for the provider in terms of serving existing patients. In addition, the large amount of start-up and ongoing administrative costs makes these models even more expensive to providers. For payers and members, curbing trends in health care costs is desirable, leading to both lower premiums and lower member out-of-pocket (OOP) costs. However, patients, providers and insurers do not want lower medical costs to equate to lower quality and continued lack of coordination, which can lead to serious complications, readmissions, and unnecessary pain and

[2] "The total annual cost of healthcare for a typical family of four covered by an employer-sponsored preferred provider plan (PPO)." (2)

suffering for patients and their families. Finding a balance between coordination and ultimate power to set the rates in an uncompetitive fashion is a delicate act, which is due to the case-by-case approach that the U.S. Department of Justice (DOJ) uses to define horizontal and vertical integration.

Despite potential shortfalls for the provider and possible quality issues, market forces are pushing the providers toward payment reform. The transformation of Medicare and Medicaid programs (discussed more in Appendix B), the trend toward physician employment (leading to horizontal and vertical integration), and the competition resulting from exchange plans (with low-cost networks and high-performance networks[3]) have brought the need for providers to transform their organizations. In the past, providers may have shifted shortfalls in Medicare and Medicaid to higher-paying commercial payers. Now health systems are facing pressure from all of their payers, including commercial payers, to reduce the total cost of care, maintain quality, and coordinate care.

The Society of Actuaries (SOA) engaged Milliman to prepare this issue paper for public educational purposes. It is intended for a multidisciplinary audience, including: providers[4]; health insurers; health actuaries; Medicare, Medicaid and ACA policymakers; and those pursuing an actuarial career. This paper helps the multidisciplinary audience understand the actuary's role in payment reform. In addition, the paper can be used by actuaries to think about key issues when pricing their employers' and clients' own payment reforms.

To properly implement payment reform, several stakeholders are involved, including policymakers, health care attorneys, actuaries, health care providers, coding specialists, data analysts, information technology specialists, administrators, etc. ("the payment reform team"). The actuary, an expert on risk, can help the provider understand the various risks the provider is taking when selecting a payment model. The actuary also leads the pricing exercise and helps quantify the risk, calculates the correct price for the selected payment model, and helps project and model the cash flows.

The main body of the paper, at a high level, can be broken down into the following four sections:

1. The first section of this paper introduces the *risks and the various payment models*. All payment arrangements have the potential for both adverse risk as well as opportunity, depending on the circumstances. Additionally, no one payment structure is the best in all circumstances.

2. The second section first discusses general *pricing implications* to think about when pricing and modeling all payment models.

3. The second section then highlights 10 *case studies of various payment models* to further illustrate ideas from prior parts of the paper. The case studies are intended to illustrate the value that actuaries can add to projects for the stakeholders. And for the actuarial audience, the case studies illustrate what potential payment reform projects could look like.

4. The last section discusses the *best practices and key takeaways* observed for the various payment models.

Throughout the paper the reader will notice that many definitions and abbreviations are used in the payment reform environment. A "Glossary of Terms and Abbreviations" is provided above as a reference.

[3] Exchange plans can be low-cost, narrow networks or high-value networks. See the following article for more information: http://www.ahip.org/MillimanReportHPN2014/.

[4] The term "providers" is meant to be broad and include any provider or organization that provides health care services, including doctors, hospitals, C-suite, board members, management, etc.

Along with the "Glossary of Terms and Abbreviations" found above, five appendices offer further understanding of material found in the main body of the paper:

- Appendix A, "Methodology and Assumptions," includes more detail on the tables, charts and numbers presented throughout the report.

- Appendix B, "The Role of the Affordable Care Act in Payment Reform," provides further background and understanding of various reforms and fee schedules introduced by CMS and the ACA.

- Appendices C and D, "Hospital and Physician Organizations" and "Types of Other Provider Organizations," introduce the key components and some definitions of structuring these various payment arrangements. These appendices help the reader understand how provider organizations are usually structured in certain ways in order to assume the levels of risk that the organization is taking on with the payment models. Health care attorneys will usually help structure the provider organizations to fit the payment model risks that the organization is taking on.

- Lastly, Appendix E, "Data Tools," includes introductory information regarding the data tools and groupers that actuaries can rely on to properly price their payment models and understand the various risks and costs of a targeted population.

III. PAYMENT MODELS AND RISK

The payer usually pays a health system by means of a payment model. A payment model refers to the manner in which a payer reimburses providers. A service delivery model refers to the manner in which providers organize and deliver care to patients. In order for providers to have meaningful incentives to change their service delivery models, they must engage multiple payers and develop appropriate payment models. Occasionally, payment models and service delivery models will be mentioned interchangeably. "Service delivery model" refers to the approach or organization used to deliver services by providers, while "payment model" relates to how the providers are compensated for their services. Examples of service delivery models include accountable care organizations (ACOs), walk-in clinics, patient-centered medical homes (PCMHs), and telemedicine care coordination. To be effective, the payment model and the service delivery model should align properly. In addition to the payment model and the service delivery model, there is also a legal structure in place for the health system, which will be referred to as the hospital/physician organization or provider organization. More details regarding these organizations can be found in Appendices C and D.

All payment arrangements have the potential for adverse risk[5] as well as opportunity, depending on the circumstances. Additionally, no one payment structure is the best in all circumstances. For the most part, this paper discusses risk from the provider's perspective. The paper also touches on payer and beneficiary/member risk where appropriate. There are four main risks upon which the paper focuses: utilization risk, technical risk, insurance risk and performance risk. They are defined below. In addition, the paper discusses eight payment models: fee-for-service (FFS), global capitation, shared savings, diagnosis-related group (DRG)/case rates, bundled payments, reference pricing, provider excess loss (PEL) reinsurance and pay-for-performance (P4P). FFS is discussed first and represents the payers owning most of the insurance risk and the providers owning very little of the insurance risk. The authors then discuss the other extreme—global capitation, in which all of the insurance risk from FFS has now been transferred from the payer to the provider. All the other models are either a midpoint between FFS and global capitation (i.e., shared savings) or focus on a small subset of patients or services (i.e., DRG/case rates, bundled payments, reference pricing, and outliers and reinsurance). P4P can be a component of any other payment model, so this was discussed last.

The impact to the provider for each payment model on each of the four types of risk is summarized below:

Utilization risk

The impact of changes in utilization (volumes) on provider profitability depends on the relationship of payment changes to operating cost changes (variable costs). Volume-related payment changes differ among models.

Figure 2 shows some high-level observations of the provider's utilization risk for each payment model discussed in this paper. More detail is discussed below for defining the specific payment models.

[5] Risk is loosely defined as exposure to harm or loss.

Figure 2: Impact of Population Utilization Changes to Provider Profits

Payment Model	FFS *	Global Cap	Shared Savings	DRG/Case Rates		Bundled Payments		Reference Pricing	Outliers and Reinsurance	P4P
Utilized items	All	All	All	Inpatient admits	Inpatient days	Episodes**	Post-acute services, readmissions	Selected episodes	High-cost episodes	
If utilization increases	↑	↓	↔	↑	↓	↑	↓	↔	Utilization risk is shifted to reinsurer	Varies
If utilization decreases	↓	↑	↔	↓	↑	↓	↑	↔	Unaffected	Varies

** If the negotiated fee is higher than the variable cost.*

***Assuming episodes are priced appropriately.*

Technical risk

This is the risk of appropriately structuring technical elements of a contract to match population and circumstances. Models with low technical risk are easy to design, implement and monitor. For example, discounted percent of charges involves multiplying a factor by the predetermined charge to calculate the allowed amount and has low technical risk. Bundled payments require many steps to calculate the allowed amount, which includes determining the index event, allowed time periods, exclusion criteria, etc., and thus has high technical risk.

Figure 3 shows some high-level observations among the various models. More details for defining the specific payment models are discussed below.

Figure 3: Level of Technical Risk Attributed to Each Payment Arrangement

Payment Model	FFS	Global Cap	Shared Savings	DRG/Case Rates	Bundled Payments	Reference Pricing	Outliers and Reinsurance	P4P
Risk level	Low	High	High	Low-Medium	High	High	High	High

Insurance risk

This type of risk is related to the normal variation in demand for medical services[6] over time and differences in utilization within segments of insured populations. When providers and payers consider the level of risk (or risk spectrum) for the different payment arrangements, they are usually referring to the amount of insurance risk in the model.

Some examples that may cause insurance risk include:

- Age/gender/acuity differences
- Number of high-cost cases vs. average
- Year-to-year variation in patient demand for services
- Proportion that has zero claims in a year.

[6] Utilization risk refers to how the payment model is affected by the known changes in utilization. For example, low utilization is bad for providers in an FFS environment. Variation in demand refers to the fact that these future utilization trends can be unknown. For example, the population has a healthier year than the data experience, so utilization goes down.

All models are exposed to one or more elements of insurance risk. Insurance risk can be mitigated through larger population size, risk-adjusting population cost targets, stop-loss provisions, risk corridors, and carving out services prone to high cost variation.

Figure 4 shows some high-level observations among the various models. More details will be discussed when defining the specific payment models below.

Figure 4: Level of Insurance Risk Attributed to Each Payment Arrangement

Payment Model	FFS	Global Cap	Shared Savings	DRG/Case Rates	Bundled Payments	Reference Pricing	Outliers and Reinsurance	P4P
Risk level	Low	High	High-Medium	Low	Medium	Medium	Transferred to reinsurer	N/A

The presence or absence of incidence risk, the rate of occurrence of a medical claim in the provider's population, will also dictate the number of members that are required to stabilize the risk. Capitation has high incidence risk and needs a much larger number of members than bundled payments, where the providers take on risk for surgeries they are already performing.

For any payment model, an actuary can quantify insurance risk to help the payment reform team understand the level of risk inherent in the contract. Once the payment reform team understands the level of risk, it can choose which elements it wants to incorporate in the contract to help mitigate insurance risk. For example, the volatility of claims under a payment model can be modeled using Monte Carlo simulations. The many techniques used to model and quantify insurance risk are outside the scope of this paper as they are often highly technical in nature and require modifications and assumptions specific to each payment arrangement.

In general, large insurance companies have a large base of members and are better equipped than health care providers to pool this risk and eliminate some insurance risk. When providers take over some of the insurance risk for their patients or individuals in their geographic area (for example, through shared savings arrangements and capitation), it becomes increasingly difficult to get an adequate membership level to smooth over random volatility from year to year. Quantifying this insurance risk for the provider helps them understand how this can impact their financials.

Performance risk

Performance risk relates to inefficiency, suboptimal quality, and high cost of care. Elements of reducing performance risk can include attainment of care efficiency gains and quality targets, and reduction of operating costs resulting from efficient work. For example, in the Medicare Shared Savings Program (MSSP) the ability to earn a bonus is dependent on both the MSSP's ability to reduce utilization as well as meet quality targets.

In addition, fraud, waste and abuse inherent in the health care system can contribute to performance risk.

Performance risk not only varies by payment model, but also within payment models. It is highly dependent on how the contract is written.

Introduction to payment models

This paper discusses the following payment models and their risks below:

- FFS
- Global capitation
- Shared savings
- DRG/case rates
- Bundled payments
- Reference pricing
- PEL reinsurance
- P4P.

Fee-for-service

An FFS arrangement has historically been the most common payment arrangement and continues to be so in today's market. In this type of arrangement, providers are paid by a payer for each service they give either through a percent-of-charges reimbursement or a fee schedule.

A provider is financially incentivized to provide patients with a lot of services rather than the best or most efficient services, while the payer is interested in containing costs.

It should be noted that use of an FFS payment method does not mean that providers can charge whatever they wish. The amount providers receive from the payers for given services under an FFS model can vary significantly from what the providers consider their billed charge levels. The "allowed charge" (the amount of reimbursement providers accept for a service) is generally significantly discounted from the billed charge on either a percentage basis or a set discounted fee schedule. A provider rarely receives a billed or master charge level (the nominal rate that the provider bills the payer for a given service) from a payer for a service. In commercial insurance, the final allowed amount is the result of provider/payer negotiations, or providers are paid "usual, customary and reasonable" charges based on the services rendered and their geographic areas in cases where they do not have an agreement with a payer.

For FFS arrangements, the following risks should be considered:

- **Utilization risk:** Figure 2 shows that as utilization increases in an FFS environment provider profit increases, and as utilization decreases provider profit decreases. But this statement is dependent on the relationship between the negotiated fees versus the variable costs (costs of paying services). In the commercial FFS environment, because the negotiated fees are typically higher than the variable costs, this relationship holds true. In a Medicare or Medicaid environment, where variable costs might be higher than the negotiated fees, increases in Medicare or Medicaid FFS may hurt provider profit because the providers may already be providing these services at a loss.

- **Technical risk:** FFS technical risk is considered low because it may be easy to implement, design and monitor. There is usually one fee associated with each HCPCS/CPT code. Nonspecific codes or codes for new technologies and new drugs can bring in more technical risk as they can be more difficult for claims departments to monitor. Updating the price list each year can also be complex.

- **Insurance risk:** The FFS model is not focused on the health of the population and therefore it is not at risk for the year-to-year variation of a specified population in a given year. Providers are only responsible for patients coming through their doors. Patients who use more expensive and frequent services will have a positive impact on the provider profits. In the case of providers with patients who are using less expensive services in a given year, their profits will be negatively impacted. This brings some insurance risk.

- **Performance risk:** FFS can introduce performance risk if the claims administrators do not carefully monitor nonspecific codes. In addition, if there are no quality metrics tied to an FFS contract, there

may be quality and performance risk exposure for the patient and the health insurer, but not the provider. Providers could choose clinically equivalent procedures that are more expensive, which brings performance risk to the payer.

Global capitation

In this model, providers are paid a capitation (or fixed) rate for each member they agree to service. The payment is based on the average costs of the population rather than the provided services. In global capitation, the provider is financially responsible for all of the care that the patient receives. For partial capitation or contact capitation, this might be limited to a more specific range of services.

For global capitation arrangements, the following risks should be considered:

- **Utilization risk:** In the capitation model, utilization changes have the opposite impact of an FFS model. For providers, their profit increases with decreasing utilization and decreases with increasing utilization.

- **Technical risk:** Technical risk for global capitation is quite high. Typically the organization will receive one fee for all of the services provided; therefore, there will need to be complex structures in place to allocate the money among various physicians and other providers. The provider will also be responsible for paying claims. In addition, capitation arrangements may involve the provider setting up incurred but not reported (IBNR) reserves.

- **Insurance risk:** The provider takes on risk when the actual costs of the members they agree to service are higher than the average that was negotiated in the capitated rate. These costs are not related to quality or performance, but related to the underlying demographics of the population having a higher claims cost than the average. A capitated provider must also attract an adequate number of members to spread out fixed costs and smooth out random variation.

- **Performance risk:** The provider is at high risk in capitation models because of taking on the financial responsibility for all of the care that the patient receives.

Shared savings

A shared savings arrangement is usually a transitional arrangement for an organization that is moving from FFS to capitation. Typically, in a shared savings arrangement, a provider still gets reimbursed using an FFS arrangement. However, providers are measured against a benchmark[7] and expected to reduce their utilization. They are then paid a percentage of the savings they have created (i.e., the difference between the benchmark and the current utilization level). Usually, there is some performance metric tied to these savings, and providers will only receive the bonus if they meet certain quality targets. The two main types of arrangements are a one-sided model, where the organization will share in the savings only, and a two-sided model, where the organization will share in both the savings and losses. Providers will usually start with upside only and gradually increase their downside risks.

- **Utilization risk:** Because of the complexity of shared savings contracts, utilization risk is hard to generalize.

- **Technical risk:** In shared savings arrangements the providers are typically still paid on an FFS basis, and there is not the same level of infrastructure needed to pay claims. However, distributing savings or losses among providers may still be technically complex. Calculation of the benchmark, reconciliation of the savings, measurement of the agreed-upon quality measures, and auditing the

[7] The calculation of the benchmark is usually a point of negotiation during the initial setup of the contract. Usually the calculation of the benchmark is based on historical allowed charges. But the members included in the average, the time periods, etc., are all points that need to be discussed in negotiation.

agreed-upon attribution method can bring a substantial amount of technical risk for the payer and the provider (if the provider wishes to validate and audit the payer's calculation).

- **Insurance risk:** The underlying health claims costs of members can be more than the calculated benchmark costs required to obtain shared savings, which is just due to year-to-year variation. In addition, the underlying demographic mix of the provider's member population could change, or claims costs could increase because of the introduction of more complex and costly procedures.

- **Performance risk:** The bonus is usually contingent on the fact that the provider meets performance benchmarks. In addition, there is significant risk that care management efficiencies can be achieved and the benchmark can be met. The performance risk can be high for two-sided arrangements, but minimal or nonexistent for one-sided models.

DRG/case rates

Diagnosis-related groups (DRGs) combine all of the hospital services related to a single medical or surgical *inpatient* admission. The idea is that the hospital is paid a single price, or a case rate, for an admission rather than paid a price per day for an inpatient stay (aka per diem rate) or for every single service provided during that stay. This payment method shifts the length-of-stay risk to the provider, while the payer retains the admission rate risk. These arrangements often have outlier case adjustments, for which the payer will share in the length-of-stay risk beyond a certain point or for a specified condition. This model is used by CMS to pay a hospital for its services for a Medicare patient and is commonly used by commercial payers. Many state Medicaid programs use DRG-type payment for inpatient reimbursement.

- **Utilization risk:** For admission rates, the utilization risk is similar to an FFS environment. For length of stay, the provider is incentivized to reduce the length of stay for a hospitalization and replace it with another admission (if latent demand is sufficient to replace volume lost to utilization declines).[8] If the length of stay gets too long, the provider has to pay out additional variable costs without any additional reimbursement.

- **Technical risk:** Because DRGs have been around for a while and there are two established groupers, the MS-DRG and the APR-DRG (discussed more in Appendix E), technical risk is low to medium for DRG/case rates.

- **Insurance risk:** The provider is at risk for members who have higher-than-average inpatient lengths of stay because the provider is reimbursed at a single rate for the entire admission. However, this does not contain incidence risk.

- **Performance risk:** The hospital has to be cautious of discharging patients too early as the risk of readmissions may increase (which carries financial penalties from Medicare).

To guard against both utilization and performance risk, providers may get paid an outlier per diem rate if the inpatient admission exceeds a stipulated number of days.

Bundled payments

Bundled payments are a method of payment for an episode of care with the goal of delivering higher quality, more coordination, and lower cost of care. This will usually start with a specific DRG or group of DRGs, or a surgery, and extend to include a specific time frame after the inpatient discharge (typically 30, 60 or 90 days). Bundled payments are also used for an outpatient episode of care—for example, oncology chemotherapy bundled payment. The idea of a bundled payment is to incentivize the provider to manage the entire episode of care such as the post-acute care after a patient is discharged from an inpatient hospitalization.

[8] This is discussed in more detail in the MSSP case study below.

- **Utilization risk:** Utilization risk can be separated into the number of episodes and the number of services given during the episode. When the number of episodes increases, provider profits can increase. The provider will also need to decrease medically unnecessary or preventable services such as readmissions during an episode in order to make a profit.

- **Technical risk:** Bundled payment technical risk is quite high. Choosing conditions, defining conditions, analyzing the conditions, standardizing treatment, coordinating care, and partnering with post-acute providers bring with them a lot of technical risk. Gain-sharing between the physicians and hospitals also involves technical risk.

- **Insurance risk:** The provider is at risk for members who have higher allowed costs than the average episode, have complicated cases, or are at risk for readmissions. However, by definition all patients in this model have claims and thus the underlying claims distribution may be flatter than all claims for a commercial self-insured population (for example). Thus, bundled payments may have lower claims volatility than the underlying volatility of claims for the total cost of care for an entire population. And, therefore, a provider may be limiting its risk exposure by choosing to contract for a few bundled payments rather than entering into a global capitation contract.

- **Performance risk:** A successful bundled payment strategy requires consistent messaging from physicians, discharge planning, and proper communication between the patients and the discharge providers after the hospital discharge. If the gain-sharing is based on quality outcomes, that also involves performance risk.

Reference pricing

In reference pricing, the employer or its health plan stipulates a benefit limit (i.e., reference price) for a specific surgery, medical procedure or service, or medical device. The patient must pay the difference between the "allowed charge" and the "reference price" set by the health plan. For example, if a patient chooses a provider whose allowed charge is more than the reference price for a specified service, the health plan will pay up to the reference price while the patient will pay the excess. This shifts some of the financial risk to the patient as items subject to reference pricing are usually not counted toward the out-of-pocket (OOP) maximum. In the marketplace examples that exist, this is usually a tool used by an employer, so there is still an allowed charge negotiated by the health plan or its third-party administrator (TPA) that can be used to compare to the reference price.

- **Utilization risk:** Members will be less likely to use provider services as their OOP share increases.

- **Technical risk:** The largest technical risk for the payer and the provider is educating the policyholder on the reference price. Communicating the complexities of reference pricing may be difficult for the provider and the payer.

- **Insurance risk:** The reference price will most likely be calculated as an average of the historical cost of the patients. If patients are more complex or higher than the average, the patient will pay the difference, thus shifting a lot of the insurance risk away from both the insurer and the provider.

- **Performance risk:** If patients do not understand reference pricing fully and/or are charged high amounts for procedures they may be unhappy with both their providers and their insurers. In both bundled payments and reference pricing, the burden of inefficiency is shifted either to providers or to patients (insured members), thereby capping payer exposure.

Provider excess loss reinsurance

PEL—i.e., provider stop loss—is insurance designed to protect the health care provider from high-cost outliers. Reinsurance exists to help mitigate the insurance risk for the provider and shift it to the reinsurer, and is generally paired with one of the payment models listed above. In some cases, such as FFS, there is less risk for high-cost outliers.

PEL policies are purchased by providers that are accepting financial risk for the cost of health care services. Most commonly, the risk is transferred to the providers through the payment of capitation by a primary insurer or risk taker. PEL policies are generally filed and treated as primary insurance because they are covering entities (provider groups, hospitals) that are not licensed risk takers. Though a PEL policy could be structured similarly to more typical stop-loss products (such as employer stop loss), it will look much different than a typical stop-loss policy because of the design of the underlying capitation.

PEL policies also bring a lot of risks to the reinsurers, which are quite complex and are outside the scope of the paper. Risks to the provider include:

- **Utilization risk:** PEL policies, by their nature, are developed to protect the health system against increases in utilization from high-cost outliers while shifting some of this risk to the insurer or reinsurer. This lowers utilization risk for the health system while increasing risk for the reinsurer. Utilization risk will also depend on the structure of the policy.

- **Technical risk:** Technical risk will vary with the structure of the stop-loss contract. The most common PEL policies are a coinsurance arrangement that has low technical risk. Less common PEL policy structures such as swing premiums, aggregate specific deductibles and experience refunds will have more complicated technical risk.

- **Insurance risk:** The provider faces increasing risk as the underlying population tends to be more costly on average. The risks are mitigated as outlier costs surpass the PEL limit, but the provider still faces insurance risk for higher-than-average unexpected costs that fall below the limit.

- **Performance risk:** PEL policies can be quite complex and introduce performance risk, but that is highly dependent on the structure of the policy and outside the scope of this paper.

Pay-for-performance

Any payment arrangement can include a pay-for-performance (P4P) aspect. P4P adjusts the payment arrangement to include incentives for higher quality of care and in some cases disincentives for lower quality. For example, the Medicare Hospital Value-Based Purchasing (VBP) program is an FFS payment arrangement with a P4P element. The MSSP is a shared savings arrangement that varies the bonus based on quality metrics (another P4P element).

Adding a P4P element adds performance risk onto any payment arrangement, although there can be other elements of performance risk that are inherent in the payment arrangement without P4P. In addition, P4P adds an element of technical risk to the arrangement because deciding on quality metrics and actually measuring them is not a simple task.

The idea of P4P is not unique to health care. P4P is also used in areas such as executive compensation, teacher and school performance, and job training. Empirical evidence that P4P actually works in any of these areas is weak. In addition, experimental psychology suggests that there is a limited role for financial incentives to change behaviors. (3) This is an evolving area with a lot of research done on P4P both inside and outside the health care arena. Although this will ultimately play a large role in the success of payment models, exploring this research is outside the scope of this paper.

IV. POPULATION PRICING IMPLICATIONS

General pricing process

Various risks and payment models are defined above. To choose the appropriate payment, the payer and the health system need to consider their exposures to the four risks discussed above as well as any additional risks brought to their organizations. At this point an actuary can be brought in to lead the pricing process, help quantify some of the risk where possible, calculate the price[9] for the appropriate model, and project and model cash flows. Reviewing the information provided by the actuary will help the payment reform team decide which payment model is right for its target population.

A potential service delivery model will usually target a specific population because service delivery models are not a one-size-fits-all approach. For example, a walk-in clinic might be most appropriate for a healthy millennial while a team-based medical home works for a more complex patient. Dementia patients, substance abuse patients, Parkinson's disease patients, etc., will need to have access to behavioral health providers as part of the service delivery model. To understand the target population's total medical cost of care, actuaries rely on claims data.

- For a Medicare population, the CMS 5% sample is a good starting point.[10]
- For commercial and Medicaid data, a health system will reach out to its partnering payers.
- According to the All Payers Claims Database (APCD) Council,[11] a handful of states have already created all-payer claims databases. (4) The APCD can be limited in its level of detail and may in some cases only be allowed for actuaries that are working for state Medicaid and other agencies.
- If the payer is considering the pricing implications of a payment model, it will use its internal data.

Once the claims data is obtained, the payer population (commercial, Medicare or Medicaid) will need to be winnowed down further to determine the target subpopulation. For example, the service delivery model may only target children or a specific disease set. At this point, the actuary should work with a clinician and a coding specialist to determine how to best subset this population from the data source. If claims data is lacking some relevant clinical information, the actuary and clinician may have to develop additional assumptions and proxies.

Once the data is refined to the target population, the actuary attempts to understand what services the population currently utilizes, how much its total costs of care are, what types of providers are used, etc. The actuary does this by creating summaries with per member per month (PMPM) claims costs, utilization, and average unit cost by key services provided.

The actuary needs to understand how reimbursement or utilization has changed over the historical period and potentially adjust for these items to create a consistent baseline. In addition to the information available from the claims data, the actuary collaborates with physicians and/or other clinicians to understand different treatment patterns for the various populations as well as services that they might receive that are not currently reimbursable, which thus would not show up in the claims data. Although claims data has many merits, it is also lacking in some areas. Clinicians and other stakeholders can help fill in the picture.

After the target population has been selected and reviewed, the organization can revisit the service delivery model to make sure it is appropriate for the population. Ultimately, the goal of the service delivery model is

[9] The price would vary by payment model; some examples could include: capitation rate, the episode price, the reference price, the DRG schedule, etc.
[10] This CMS 5% sample is a data set containing medical claims and membership information for traditional Medicare plans but not Medicare Advantage plans.
[11] The APCD Council manages the APCD medical claims database systems, along with assisting and implementing initiatives in efforts to improve health outcome goals for participating states.

to produce better outcomes for the population and generate decreasing health care trends (aka savings). Additionally, the model will need assumptions[12] regarding how the intervention can reduce total cost of care and how long it will take. Typically savings assumptions are developed by key service areas (i.e., inpatient, outpatient, pharmacy, primary care physicians, etc.), as some cost categories may decrease with the intervention and some may go up. Overall, to be considered a success, the composite of all of the services should create a decreasing trend for the particular payment model.

Once the potential target population and service delivery system is decided upon, selecting a payment model can require several rounds of consideration of different models. Ultimately, the pool of payment models is finite, as described in the section above. This might lead the organization (with the guidance of the actuary and the payment reform team) to conclude that there is no feasible payment model that will suit its goals and needs. From here, the organizational decision-makers have a few routes from which to choose.

- They can opt for one of the proposed payment models that best suits their needs based on the existing target population and service delivery model.
- They can start with a fresh target population and/or service delivery model that can be utilized to develop a new payment model.
- In other cases, they may continue with the status quo and hope that this choice will continue to be appropriate for the market.

An actuary then steps in and uses all of the assumptions above to create a financial projection of the payment model to demonstrate the financial strength and stability to operate the service delivery model. To assist these projections, the provider organization or payer should define a revenue target, strive for revenue neutrality, or demonstrate a desired return on investment over a predefined period. It is important to determine the operational budget for creating the intervention. Although the organization will have to spend money on an analysis to save money, the idea is to create a positive return on investment. In addition, the actuary will need to know what the projected enrollment for the targeted population would be over the predefined period. The actuary also needs to understand what potential cost and utilization trends could be, absent intervention.

Quality

Demonstrating quality is also a key component of provider payment reform.

Performance measures have been developed that address each of the domains of quality, as defined by the Agency for Healthcare Research and Quality (AHRQ), which are:

- **Access to care:** Whether a patient can readily obtain needed services, such as primary care.
- **Structure of care:** Whether care is provided by appropriate providers, including how they communicate and their use of up-to-date technology.
- **Process of care:** Whether services, such as prevention and screening, have been provided to appropriate member subpopulations.
- **Outcome of care:** Whether treatment has been effective, such as blood sugar control in diabetes.
- **Experience of care:** Whether patients are satisfied with the care that they have received. (5)

[12] Although the savings will ultimately be a result of the service delivery model and payment model, during the feasibility portion of the project the actuary must assume a level of savings to test the feasibility.

Measures of access to care include the number and geographic distribution of providers, both professionals and institutions. Structure of care measures may include assessment of referral policies and procedures, along with use of electronic health records. Process of care measures include hospital readmission rates. Outcome of care measures generally deal with intermediate outcomes, such as what percentage of patients with diabetes meet blood sugar targets, rather than long-term outcomes such as mortality rates. The experience of care is generally measured by surveys. (6)

A performance measurement set will need to include measures for a variety of clinical conditions, providers, and settings of care. There are numerous measures available that are well-developed and validated, and for which benchmarks and targets are available.[13]

Although quality is a key component of payment reform, it usually requires a range of expertise. The actuary must engage and work with the provider and other clinicians to find relevant measures to include in the payment reform model. Because some quality component is typically included in the final payment model, an actuary should understand the details of the performance measure, such as the data source and the analysis algorithm, to understand the true feasibility of the payment model. In turn, the actuary can help the provider payment reform team pick quality measures that have enough credibility and help the provider diversify its portfolio and help mitigate its performance risk. In addition, the actuary can create sensitivity tests (e.g., no quality benchmarks are attained; half of the quality benchmarks are attained; all of the quality benchmarks are attained) to help the provider, health system or payer understand the sensitivity of the payment model to quality measures.

Other considerations when modeling payments and cash flows

For the actuary, there are several factors to consider when modeling the payments and cash flows for the program:

- What are the types of unintended behaviors that may occur that are due to incentives created by the payment model, and how may they jeopardize anticipated savings?
- What other factors would jeopardize achievement of forecasted results?
- How will results achieved during the model test be replicated?
- Will the structure and the dimensions of the payment model change over time?
- Will there be a phased-in approach?
- How will the payment model promote continuous improvement of the service delivery model and adapt accordingly?
- What key factors, including other delivery and payment reforms, may affect this progression?

In addition to thinking about these key questions, it is useful to compare the existing payment model to the proposed payment model. To model the existing cash flows, the actuary will need to review the existing contracts between the health system and the payer to determine the appropriate allowed amounts. These contracts can also be used to check for the reasonability of the data. It will also help the actuary understand the reasonability of the individual elements in the proposed payment model.

Case studies

Introduction

[13] For more information, please see: http://www.qualityforum.org/Home.aspx.

Through the following case studies, this paper examines some, but not all, of the payment models, pricing considerations, and risks discussed above. Every organization is unique, but the case studies demonstrate practical approaches for modeling the various payment methods. Unless otherwise sourced, all case studies are based on generalized data and do not reflect actual client work.

Below is a brief description of the 10 case studies and some key takeaways from each of them:

1. **Fee-for-service:** The FFS case study illustrates the importance of understanding Medicare reimbursement (discussed in more detail in Appendix B). Medicare reimbursement is frequently used as a benchmark and a baseline for commercial contracts. This case study also shows some of the technical risk related to FFS contracts.

2. **Medicare Shared Savings Program (MSSP):** The MSSP case study is the first of four accountable care organization (ACO) case studies, and introduces key concepts that are relevant to all ACO contracts (e.g., varying bonus, level of utilization management, timing of savings, and membership).

3. **Pioneer ACO Model:** While the MSSP was introduced through the Patient Protection and Affordable Care Act (ACA) and follows legislation, the Pioneer program was tested through the Innovation Center and can use more flexible criteria to test risk models that work. The broad concepts brought up in the MSSP case study would still apply to the Pioneer model. Thus, the Pioneer case study examines some of the initial results from the program released by CMS.

4. **Commercial ACO contracts:** Most of the financial considerations discussed in the MSSP case study are relevant to commercial contracts. Therefore, this case study is limited to the complexities of bringing the concept from the Medicare market to the commercial market. This includes the complexity of negotiating certain elements of a contract (which would be specified in the Medicare market). In addition, commercial ACOs may have credibility issues, because there can be at least a handful of different payers in the under-65 market, which the Medicare market would not have. The hospital admission rates are also far lower for commercial populations compared to Medicare populations.

5. **Illinois' care coordination entities:** Most of the financial considerations brought up in the MSSP case study are relevant to Medicaid contracts. Therefore, this case study covers just the complexities of bringing the concept from the Medicare market to the Medicaid market.

6. **Commercial DRG contracts:** This case study examines some of the contractual elements found in DRG contracts and the purpose these elements serve.

7. **Bundled Payments for Care Improvement (BPCI):** The bundled payment case study introduces the origins of the BPCI program, discusses some general steps to price bundled payments, looks at the results of one organization's data, and shows similar findings from another organization's report of results.

8. **Reference pricing:** The reference pricing case study illustrates the concept of reference pricing in more detail with an illustrative example. The case study then goes on to discuss California Public Employees' Retirement System (CalPERS) results with implementing this concept.

9. **P4P:** The P4P case study examines the literature on the Premier Hospital Quality Incentive Demonstration (HQID) and Hospital Quality Alliance (HQA) and goes into more detail on the technical and performance risks of this payment model. The literature also suggests some possible design elements.

10. **Patient-centered medical home for complex patients:** In the patient-centered medical home (PCMH) case study, we introduce the general framework for the PCMH and then discuss a case where we assessed the feasibility of a PCMH for complex patients.

Through these examples, enumerated above, this paper either discusses specific results from proprietary data sets and/or various selected qualitative resources, depending on the data available. All of the models are complex. Looking at illustrative results referenced above will help all stakeholders think about the many moving parts.

Fee-for-service

Providers using the FFS model typically want to know how they benchmark to the Medicare fee schedule. Even if the commercial fee schedule does not follow the Medicare schedule exactly, the carrier will probably like to know how it deviates from Medicare fee levels for different services. In this case study, the commercial carrier wished to see how its physician fee schedule benchmarked to the Medicare fee schedule. Although FFS is considered to have low technical risk compared with other payment models, this case study illustrates the amount of the technical complexity involved in an FFS contract. It also illustrates some performance risk.

To reprice the data to Medicare, the provider had to provide the following key fields:

- Place of service
- Current Procedural Terminology (CPT) or Healthcare Common Procedure Coding System (HCPCS) code
- Modifier code
- Allowed amount
- Paid amount
- Provider ZIP code
- Service date
- Unit count[14]
- Claim ID.

Although there can be some complications in the fee schedule (e.g., sequestration[15]), the basics for benchmarking to Medicare are as follows:

Medicare weights are determined based on a combination of relative value units (RVUs) and a Geographic Practice Cost Index (GPCI). RVUs are categorized by CPT codes and GPCIs are based on geographical areas.

There are three components for each RVU:

1. Work/practice cost (w)
2. Facility/cost of living (f)
3. Malpractice (m).

Taking the sum product of the GPCI and the RVU for the three components and multiplying by the conversion factor (35.8 in 2014) determines the final Medicare allowed amount.

[14] Service categories such as drugs, some physical therapy, and anesthesia require units.
[15] Sequestration limits government spending on many things, including reducing Medicare spending by a fixed 2 percent. The issue is much more complicated, but outside the scope of this paper.

Medicare allowed amount = $(GPCI_w * RVU_w + GPCI_f * RVU_f + GPCI_m * RVU_m) * \text{conversion factor}$.

Prior to the sustainable growth rate (SGR) fix, April 16, 2015, the conversion factor was ultimately determined by the decision on the SGR, as discussed in the ACA section in Appendix B. The GPCIs are determined by the provider ZIP code and help capture price variation for different localities. Some services are not reimbursed by Medicare, but CMS still develops RVUs for them. In other cases, the local Medicare Administrative Contractor (MAC) will reimburse the service, and the RVUs will not be included on the CMS fee schedule (as they are carrier-priced),[16] making them more difficult to reprice. Some items that are included in the carrier-priced category are new technology, nonspecific codes, new drugs, etc. In addition to these items, Medicare has some services that are modified from the calculation described above. Although a professional surgeon and an assistant surgeon may use the same HCPCS code, a modifier to the payment calculated above will determine the ultimate payment rate. An assistant surgeon will use modifier 80 (per CMS definition).

Further considerations should be made for items such as sequestration. The 2 percent federally mandated sequester adjustment reduces the allowed charge but does not change the value shown on the fee schedule. For example, under the pre-sequestration environment, if the fee schedule stated a charge of $100, reimbursement would be $100. Post-sequestration, though, the fee schedule will still be set at $100, but the reimbursement will be $98 ($100 * 2% reduction).

Place of service indicates which of the two fees to use. Typically the RVU for services provided at a facility—for example, hospital inpatient (IP), outpatient (OP), emergency room (ER), ambulance, ambulatory service centers, and more—is much lower than the RVU for a service in a non-facility setting (for example, pharmacies, home, office, assisted living facilities, federally qualified health centers, and more).[17] This is because Medicare receives two bills for services done in a facility (the facility piece and the professional piece). These are just the basics of how the Medicare fee schedule works; more detail is available on the CMS website. (7) For example, anesthesia is handled differently, and will not be covered in this case study. The Medicare fee schedule gives a separate non-facility and facility fee for each HCPCS code.

Using insured and market-specific claims data is important because the weighting of services for a commercial population will be much different than for a Medicare population. Looking at the results by HCPCS code might be too detailed, so the organization may wish to look at the results by general category. Figure 5 shows the results of this exercise for our case study.

[16] For more information on this and to see the Physician Fee Schedule, see the CMS website at http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/index.html.

[17] CMS has separate payment formulas and definitions for facility and non-facility fees. CMS' website provides a summary of these differences here: http://www.cms.gov/apps/physician-fee-schedule/documentation.aspx.

Figure 5 Professional Claims by Code Range/Type Dates of Service: January 2013 to December 2013 All Places of Service	
Core CPT Categories	**% of Medicare**
00000–09999 Anesthesia	714%
10021–69990 Surgery	246%
70010–79999 Radiology	246%
80047–89398 Pathology and Laboratory	253%
99201–99607 Evaluation and Management	129%
Core CPT Subtotal:	174%
HCPCS Level II Categories	
Transportation (Axxxx)	127%
Enteral & Parenteral (Bxxxx)	133%
Outpatient PPS (Cxxxx)	
Dental (Dxxxx)	
Durable Medical Equipment (Exxxx)	115%
Temporary (Gxxxx)	179%
Alcohol and Drug (Hxxxx)	
Infusion Drugs (Jxxxx)	155%
Temporary (Kxxxx)	85%
Orthotic (Lxxxx)	94%
Pathology & Laboratory (Pxxxx)	102%
Temporary (Qxxxx)	169%
Temporary (Sxxxx)	
Medicaid (Txxxx)	
Vision/Hearing (Vxxxx)	145%
Category II (xxxxF)	
Category III (xxxxT)	
Miscellaneous	
Subtotal:	136%
10021–69990 Surgery—Breakout	
10021–10022 General Surgery	155%
10040–19499 Integumentary System	183%
20000–29999 Musculoskeletal System	240%
30000–32999 Respiratory System	261%
33010–37799 Cardiovascular (CV) System	302%
38100–38999 Hemic/Lymphatic	187%
39000–39599 Mediastinum	207%
40490–49999 Digestive	388%
50010–53899 Urinary System	393%
54000–55920 Male Genital System	221%
56405–58999 Female Genital System	244%
59000–59899 Maternity Care/Delivery	145%
60000–60699 Endocrine System	279%
61000–64999 Nervous System	328%
65091–68899 Eye and Ocular Adnexa	279%
69000–69979 Auditory System	227%
69990–69990 Operating Microscope	243%
Surgery CPT Code Subtotal:	258%

It appears that Medicare does not cover services for the codes indicated above that have blank entries. For example, we tested the results on the 5% Medicare sample to confirm that all of the allowed amounts for CPT Category II codes ("xxxxF") were zero.[18] We also tested these codes on our commercial database. These codes are developed for performance metrics. Developing fees for these codes should be based on whether an organization wants reimbursement for performance metrics or not. CPT Category III codes ("xxxxT") are usually priced by a Medicare carrier, if it chooses, because they represent new and experimental services with limited data availability and thus there is no RVU for these fees either.

The general finding in this case study was that the organization was not paying different fees by facility or non-facility place of service, and thus there were fewer rigors around how the carrier was paying its providers than how Medicare pays providers. However, changing the fee schedule around would create winners and losers with the current health plan, which involves more than an actuarial decision to change the payment model and the different fees.

Medicare Shared Savings Program (MSSP)

The next four case studies focus on varying themes of ACOs. Per the CMS website, "ACOs are groups of doctors, hospitals, and other health care providers, who come together voluntarily to give coordinated high quality care to the Medicare patients they serve." (8) MSSP is part of the ACA and has a strict definition for the accompanying payment model that goes along with the ACO. The Pioneer program was launched by the Innovation Center to address gaps with MSSP. In addition, various commercial and Medicaid payers are testing variations on these programs. This case study is based off of an analysis originally commissioned by University HealthSystem Consortium (UHC). (9)

In general, the expected financial impacts of ACOs on a health care system are quite complex. ACOs are intended to produce savings for the Medicare system or the appropriate payer by reducing unnecessary care and duplication, redirecting care to cost-efficient providers, and preventing medical errors. Therefore the perceived success or failure of the ACO from the provider's perspective may be different than from Medicare's perspective. The MSSP case studies illustrate the financial impacts using the MSSP financial rules. The issues that are brought up during this case study are not unique to the MSSP. Because of this, the Pioneer ACO Model, commercial ACO contracts, and Illinois care coordination entities case studies only emphasize additional considerations for their specific environments and do not repeat a lot of the issues brought up in the MSSP case study.

In the MSSP, in return for reducing their revenue (or the revenue of other providers whose services are reduced), the providers receive a share of savings (revenue reductions). MSSP has both a one-sided model, where the ACO only shares in gains, and a two-sided model, where the organization shares in both gains and losses. The one-sided model can earn up to 50 percent of savings based on quality performance, whereas the two-sided model can earn up to 60 percent of savings based on the quality performance.

From the perspective of providers, they might be able to offset some of the revenue reduction by reducing their direct expenses (internal expenses of providing care). However, they will incur additional administrative expenses with regard to the ACO. Administrative expenses include technology, staff and physician incentive programs, which are necessary for an ACO to be successful. In terms of savings to the Medicare program, up to 60 percent is returned to the ACO in the form of bonuses from CMS. This requires that the ACO meet its quality standards.

[18] Category II codes typically include evaluation, management and performance services. The American Medical Association provides a list of all Category II and Category III codes here: http://www.ama-assn.org/ama/pub/physician-resources/solutions-managing-your-practice/coding-billing-insurance/cpt/about-cpt.page.

The basic financial equation for a provider used in this case study is:

Net gain/loss =
- Revenue reductions
+ Bonus/share of revenue reductions
- Start-up costs of the ACO
- Administrative costs of operating the ACO
+ Reduction in direct expenses.

The net financial impact to the provider is difficult to estimate on the back of an envelope because it has to account for all of the items above, as well as others not listed. Figure 6 presents an illustration of the calculation of the net gain to the ACO.

Figure 6
Annual Financial Impact of ACO
Illustrative Scenario
Average Annual Results Over Initial Three-Year Period
($ millions)

	Current	ACO	$ Change	% Change
Revenue				
Inpatient/skilled nursing facility (SNF)	$105.7	$95.3	($10.4)	-9.8%
Outpatient	$36.3	$32.0	($4.3)	-11.8%
Physician	$67.6	$62.2	($5.4)	-8.0%
Other	$29.9	$30.9	$1.0	3.3%
Total patient revenue	$239.5	$220.4	($19.1)	-8.0%
Bonus		$11.5	$11.5	n/a
Start-up expenses amortized over three years		($1.7)	($1.7)	n/a
Ongoing administration		($2.8)	($2.8)	n/a
Reduction in direct expenses		$13.1	$13.1[19]	n/a
Gain/loss			$0.9	n/a
Non-physician-hospital-organization (PHO) providers' share of above revenue reduction			$1.5[20]	
Gain/loss PHO only			$2.4	n/a

In this example, the net effect of the ACO program is a $0.9 million gain per year for the first three years (a three-year span was chosen because that is the length of the MSSP program after an ACO establishes the contract). SNFs and, to a lesser extent, other providers, will also have reduced revenue as part of utilization management. We assume that the ACO providers will not share in the revenue reductions of these other providers unless they own a SNF, but will receive the bonus from the management initiatives. As a result, we remove the revenue reductions to other providers from the bottom line and show a gain of $2.4 million per year. We have not modeled results after the first three years, as it is difficult to predict what CMS will do after the initial contract period.

[19] We have assumed that inpatient care is reimbursed using DRGs; there are some savings in direct expenses that are due to reductions in length of stay, which are not offset by revenue declines. That is why 13.1 / 19.1 is greater than 50 percent.
[20] Includes skilled nursing facilities, home health care, ambulance, durable medical equipment (DME) and supplies, and prosthetics. See Figure 19 in Appendix A.

The gains primarily result from two sources:

1. We have assumed that half of the revenue loss is offset by reductions in direct expenses, and the bonus is 60 percent of the revenue loss. There is effectively a 10 percent gain from utilization savings.

2. We have assumed that inpatient care is reimbursed using DRGs; there are some savings in direct expenses that are due to reductions in length of stay, which are not offset by revenue declines.

In order to achieve the results above, several things have to go right:

- The utilization savings are aggressive, and will require a substantial commitment by the providers.

- The full bonus must be received, meaning that not only cost but quality targets need to be met.

- The full amount of direct expenses must quickly be cut (or the lost services/patient days must be quickly replaced by new patients).

Based on our general observations, it can be difficult to meet quality targets and replace lost patient days. Therefore, these results may be optimistic. In addition, it is common to pay "profit-sharing" bonuses to physicians as incentives to manage care. These profit-sharing payments can reduce the relative gain to other parties in the ACO.

About half of the savings in our illustrative scenario are from reductions in inpatient admissions. The table in Figure 7 shows some of the metrics that illustrate the source of the savings.

Figure 7
Annual Source of Savings
Illustrative Scenario: Aggressive Practices
(Utilization per 1,000)

	Current	ACO	% Change
Inpatient admits	316.0	281.1	-11%
Inpatient days	1,786.0	1,518.0	-15%
Surgical admits	96.6	82.1	-15%
Major diagnostic studies*	2,854.6	2,713.1	-5%
Physician visits**	11,245.6	12,236.7	9%
LTACH/SNF***	1,555.5	1,309.8	-16%

** Includes radiology (CT, MRI, PET) and cardiovascular for outpatient facility.*
*** Includes inpatient visits and office visits.*
**** Long-term acute care hospital (LTACH).*

In Figure 7, physician visits go up, but overall physician revenue goes down in Figure 6, which is due to lower-cost items such as e-consults, e-visits and a referral management program.

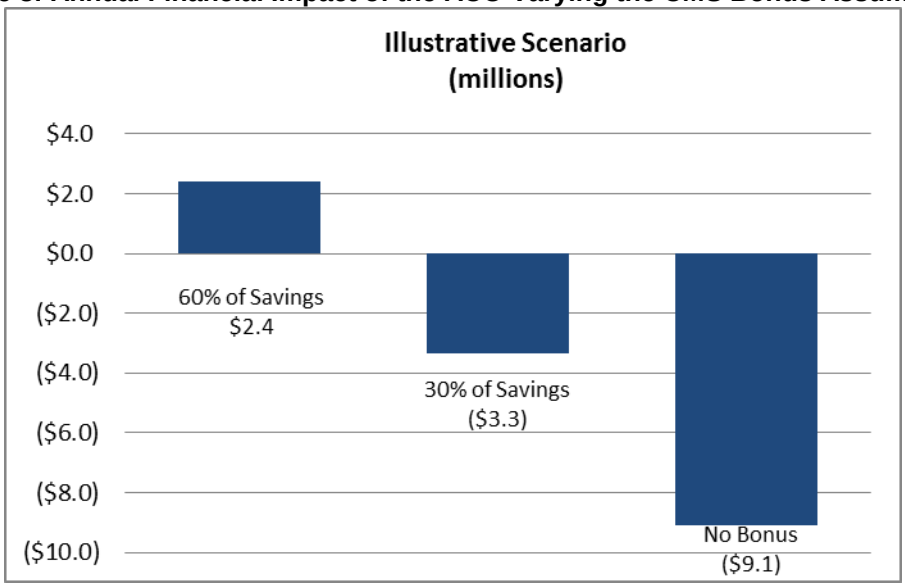
Our illustrative scenario is based on some basic assumptions in Appendix A (Methodology and Assumptions). To determine the sensitivity of the results of the illustrative ACOs, we varied the assumptions as follows.

Bonus. To be eligible to receive shared savings payments, an ACO must meet several requirements under the two-sided shared savings model. If these requirements, which include both quality and financial measures, are met, an ACO is eligible to share in up to 60 percent of overall savings that fall below the provided benchmark. In the two-sided model, the ACO also bears the risk of no savings, and potential loss-sharing, if it fails to achieve minimum attainment levels on its quality measures.

Based on these quality scores (which apply to years 2 and 3), the ACO can achieve a varying shared savings rate up to a maximum of 60 percent. In order to simplify this assumption, we looked at three scenarios, which are illustrated in the chart in Figure 8 and defined below:

- The bonus is 60 percent of shared savings.
- The bonus is 30 percent of shared savings.
- There is no bonus. This assumes that the ACO failed to meet its quality requirements and is thus not eligible for shared savings.

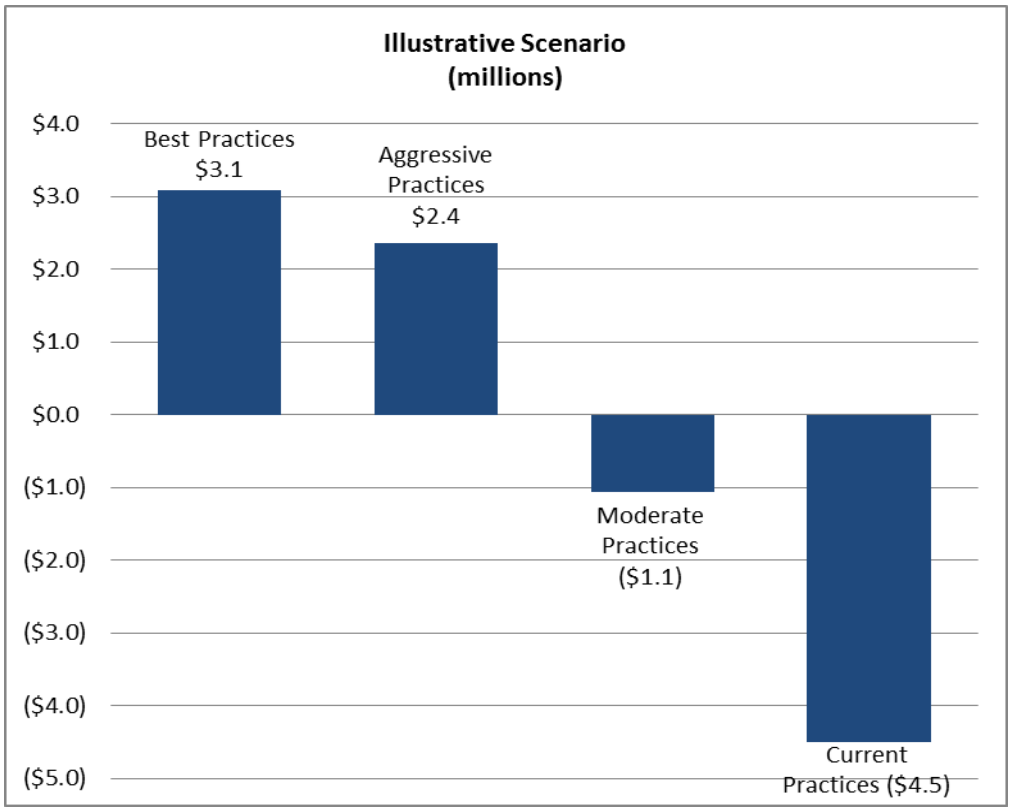
Figure 8: Annual Financial Impact of the ACO Varying the CMS Bonus Assumption



Level of utilization management. The largest impact on results is the level of utilization management. In the illustrative scenario above we have used what can be termed aggressive but achievable management. The chart in Figure 9 also illustrates:

- **Best practices.** This level of utilization management is achievable in theory. In practice, only tightly integrated group practice systems come close to it.
- **Aggressive practices**. This is the baseline for the illustrative scenario. The utilization savings expected are shown in Figure 7.
- **Moderate practices.** This shows some savings, but not at the aggressive level originally assumed.
- **Current practices.** We have seen examples where, despite an attempt to manage utilization, little is achieved. Here we illustrate the results if utilization does not change.

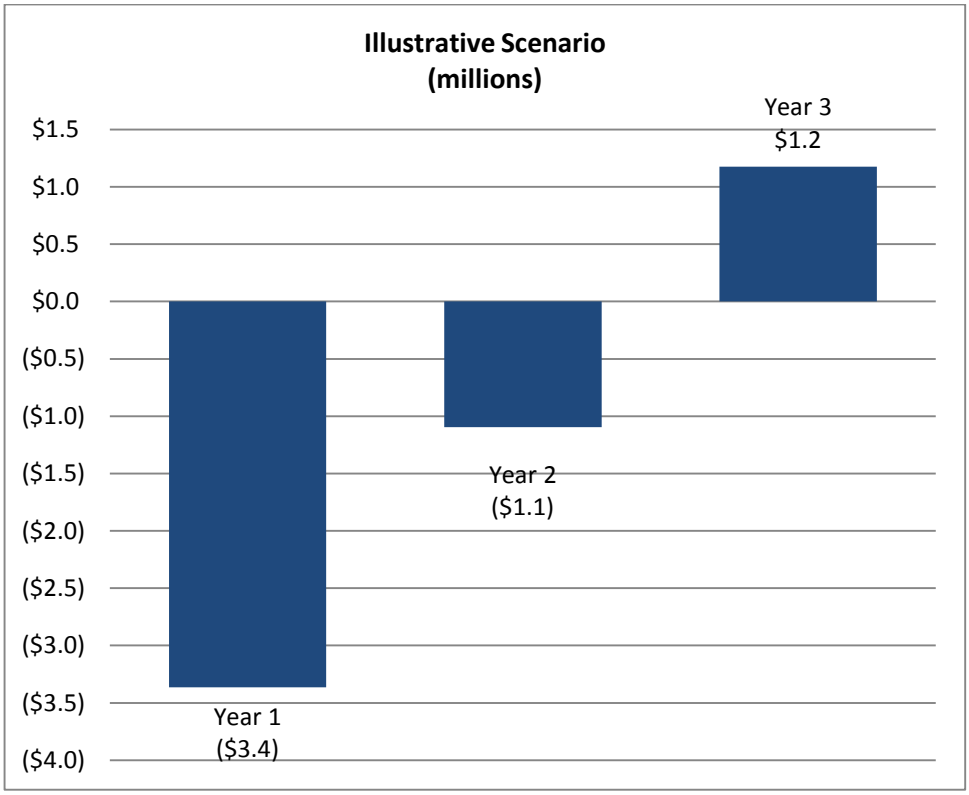
Figure 9: Annual Financial Impact of the ACO Varying the Effectiveness of Management



If there is no reduction in utilization, there is a loss that is due to administrative expenses and start-up costs. The more effectively the ACO can manage its population and costs, the better the financial results will be, although CMS has put a ceiling on how favorable the financial results can be for the ACO. In the two-sided model, ACOs can only receive 60 percent of the shared savings, capped at 15 percent of the benchmark for a given performance year. In Figure 9, the best practices scenario has hit this cap.

Timing of savings. The illustrative scenario in Figure 9 assumes all utilization reductions are instantaneously achieved. In reality, these savings occur gradually. Furthermore, reductions in marginal expenses can occur slowly. The chart in Figure 10 is the illustrative scenario with utilization management reductions and marginal expense reductions grading linearly throughout the period.

Figure 10: Annual Financial Impact of the ACO by Year of Program



If savings occur linearly over three years, as opposed to instantaneously at the outset, the ACO's breakeven during the initial three-year term is unlikely based on our underlying assumptions.[21]

Membership. The dollars involved, with the exception of start-up costs, should be fairly proportional to membership (assuming that fixed expenses are being allocated on a variable basis). Because start-up costs are relatively constant, a higher membership can amplify the results. For example, a 25,000-member population produces a gain of $2.4 million, with start-up costs being charged to each member at $68, but a 100,000-member population will produce roughly a $15.3 million gain, with start-up costs being charged to each member at $17.

It should be noted that with 25,000 members there is a significant chance that a bonus or penalty will occur solely due to statistical chance. This can occur because both the target and the actual expenses are subject to statistical fluctuation. A 25,000-member population has a much higher chance of random fluctuation than a 100,000-member population.

Conclusions from this case study:

- Most ACO savings result from reduced utilization, which in turn reduces participating provider revenue. ACOs can also reduce nonparticipating provider revenue. If certain providers are left

[21] Although the press release from CMS (discussed more below) indicated that 53 of the 220 MSSPs did save money, only five of the 220 organizations chose Track 2 and, of those five, two of them did save money. MSSPs that select Track 1 only share in savings whereas organizations that select Track 2 share in both savings and losses. If the Track 1 ACOs selected Track 2, 100 of them would have had to share in losses. The data for year 1 performance results can be found at *Data.CMS.gov*. Overall results have since been updated as of Nov. 7, 2014, but the detailed results are through October, so results are not current, but trends should hold true. See CMS, Medicare Shared Savings Program Accountable Care Organizations Performance Year 1 Results, accessed December 2014 and current as of October 2014, at https://data.cms.gov/ACO/Medicare-Shared-Savings-Program-Accountable-Care-O/yuq5-65xt.

out of the ACO umbrella, the ACO may benefit from receiving the bonus for the management initiatives without sharing in the revenue loss of the nonparticipating providers.

- If latent demand is sufficient to replace volume lost to utilization declines, shared savings are incremental to revenue, and financial performance will improve beyond what we have shown. (If volume is not replaced with a comparable payer mix, variable and fixed costs must be reduced accordingly.) In practice, replacing lost patients with new patients is difficult, and may be impossible in an environment where other payers and providers are also reducing utilization.

- If volume is not replaced, any savings shared below the percentage of direct costs (50 percent in this example) will be insufficient to offset the adverse revenue impact of utilization management.

- Shared savings may be increasingly difficult to sustain after initial utilization reductions are achieved. As a result, shared savings is only a transitional model that will eventually need to be moved to capitation (something that the Pioneer program recognizes). (9)

It should be noted that, at least for now, most organizations did not elect to participate in the two-sided model and thus the results of this case study would be more applicable to two-sided risk discussed in the next three case studies.

Pioneer ACO Model

The Pioneer ACO Model, as outlined by the Innovation Center, was developed for organizations already providing some aspect of care coordination. This model facilitates the shift from a shared savings payment system to population-based payments in order to align provider incentives with the payer to achieve higher-quality standards in the organization and health outcomes for patients while producing cost savings. The MSSP was defined by the ACA, but the Pioneer program was launched through the Center for Medicare and Medicaid Innovation (CMMI, also known as the Innovation Center), allowing the program to have more flexibility. The overall structure of the two-sided MSSP and the Pioneer program are essentially the same (shared savings models) for the first few years. However, the specific rules such as benchmark calculations, bonus levels, and exclusion or inclusion of indirect medical education (IME) and disproportionate share hospital (DSH) are different. The Pioneer program has more risk and more reward.[22] Given most MSSP participants only elected the one-sided model, looking at the results of the Pioneer program gives us more data points for the overall success of the program so far.

The Pioneer program has had mixed success so far. Only 22 of the original 32 Pioneer ACO Model awardees are still left in the program, with Sharp Healthcare of California dropping out most recently in August 2014. Sharp Healthcare of California indicated in a report that its reason for dropping out was: "Because the Pioneer financial model is based on national financial trend factors that are not adjusted for specific conditions that an ACO is facing in a particular region (e.g., San Diego), the model was financially detrimental to Sharp ACO despite favorable underlying utilization and quality performance." (10)

Despite the problems that some Pioneer ACOs have had, CMS released financial results on Sept. 16, 2014, showing that "Pioneer ACOs generated estimated total model savings of over $96 million, qualifying for $68 million in shared savings payments, and saving $41 million for the Medicare Trust Fund." The total model savings and other financial results are subject to revision. Pioneer ACOs achieved lower per capita growth in spending for the Medicare program, at 1.40 percent, which is about 0.45 percent lower than Medicare FFS. Eleven Pioneer ACOs earned shared savings, three generated shared losses, and three elected to defer reconciliation until after the completion of performance year 3 (PY3). Results for the others fell within the 1 percent risk corridor and, as such, did not receive any savings bonus or penalty.

The Pioneer program also did well on quality measures. (11)

[22] For more specific rules on the Pioneer program and the MSSP program, here is a good reference: http://us.milliman.com/uploadedFiles/insight/healthreform/medicare-shared-savings-program.pdf.

The financial results of the Pioneer program are shown in Figure 11. (12)

Figure 11: Financial Results of the Pioneer ACO Model Program for 2012 and 2013 (savings expressed as a percentage of the ACO's benchmark costs)

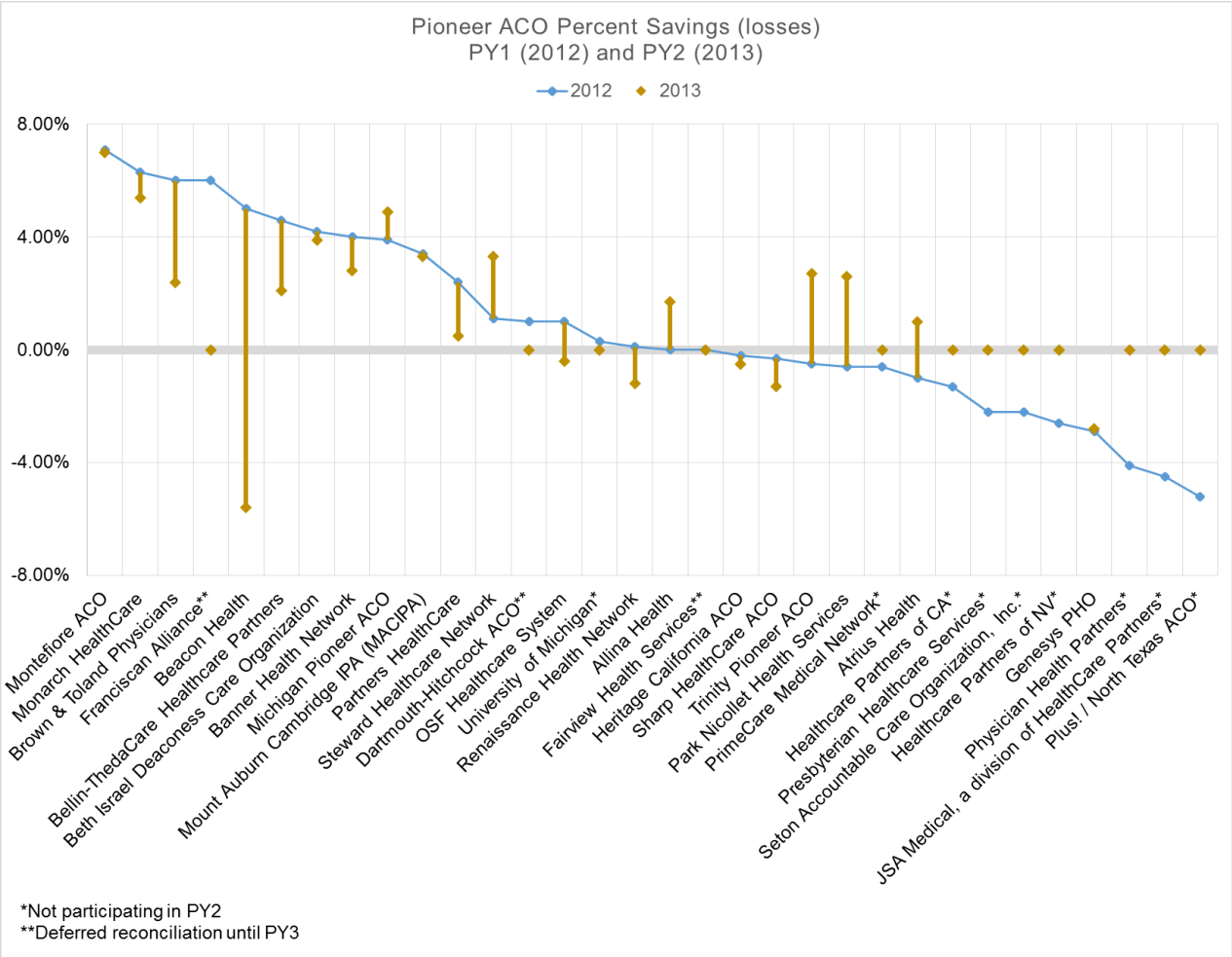


Figure 11 demonstrates an equal probability of losing money versus gaining money. In addition, it shows that the first-year results do not seem to be a predictor of the second-year results.

Commercial ACO contracts

A commercial ACO contract has issues similar to those outlined in the MSSP contract. However, a provider and a payer in a commercial ACO contract have the ability to negotiate the terms of the arrangement, unlike in the MSSP and the Pioneer program. Some items that need to be considered in negotiating a commercial ACO contract are:

- **Target costs.** How are the baseline costs developed? Are they risk-adjusted?[23] Is there rebasing from one year of the contract to the next? Is there an appropriate run-out period or adjustments to incurred but not paid (IBNP) claims?

[23] For more information on how risk adjustment can affect the target, refer to this report: http://www.milliman.com/uploadedFiles/insight/2015/shared-savings-agreements.pdf.

- **Risk adjustment.** Risk adjustment is very important to the final ACO contract. If the contract is not risk adjusted appropriately the provider could be penalized for having sicker patients. The actuary can help the payment reform team understand the benefits and impacts of the different risk adjusters to use in creating the target cost.

- **Trend.** Will the baseline costs be trended? Will the measurement year be trended? What is the appropriate trend to use?

- **Shared savings.** What are the savings rate and loss rate? Are they achievable for the provider to meet using utilization management? Or will it mean marginal pricing for the provider? Will the contract eventually move to capitation? Is the ACO prepared for that?

- **Attribution.** The attribution method is extremely important to both the payer and the provider although the details can be quite complex. We would categorize attribution into five general categories: member choice, geographic, clinical prequalification, retrospective visit-based and prospective visit-based.[24]

- **Random variation.** Does the number of members attributed to the provider group or ACO offer enough of a baseline that gains and losses will not just be due to statistical fluctuation? If not, should the ACO be upside only? Are there enough employee member incentives to choose a narrower network plan, thus driving more members to the ACO? Does the ACO have a large enough physician network to get the number of attributed members it needs and satisfy geographical access requirements?

- **Stop loss.** The ACO and the payer may wish to negotiate specific stop loss, aggregate stop loss, and drug and implant thresholds.

- **Data and reports.** For the ACO to make an impact on the population, it will need member-level detail on enrollment, medical claims and pharmacy claims. It will also need detailed reporting in order to reconcile the member attribution process and the gain/loss reconciliation. Is the payer in a position to provide all of this information? Does the ACO have capabilities to receive and analyze the data once it has it?

- **Quality.** Are there a sufficient number of measures with an adequate number of occurrences to ensure reliable results and reasonably determined benchmarks and targets? Do the providers also have other quality measures they are reporting through other programs (MSSP, etc.) that will make it easier or simpler to set up and comply?

- **Infrastructure cost support.** Will there be a care coordination fee to help the ACO get up and running with its infrastructure?

[24] More information on attribution can be found here: http://us.milliman.com/uploadedFiles/insight/healthreform/whose-patient-is-it.pdf.

Illinois' care coordination entities

Background

As stated above, the CMMI was established to encourage and promote the development of payment delivery models that attempt to improve patient outcomes through several channels. The State Innovation Models Initiative provided federal money for states to create payment reform models. As of the first round, $300 million had been awarded to 25 states to reform their payment and service delivery models. (13) The state of Illinois received $2,088,530 for its model. (14)

After receiving the award, the state of Illinois Medicaid program released a solicitation to form a care coordination entity (CCE) for three years, followed by transition to a Managed Care Community Network (MCCN) thereafter. (69)

The CCE was essentially an ACO that could have a care coordination fee (i.e., a PMPM administrative fee for services related to coordination of care among the various providers), shared savings component, or another innovative payment reform model. The solicitation defined the MCCN as "[a]n entity, other than a health maintenance organization (HMO), that is owned, operated, or governed by providers of healthcare services within Illinois and that provides or arranges primary, secondary, and tertiary managed healthcare services under contract with the Department [of Healthcare and Family Services (HFS)] exclusively to persons participating in programs administered by HFS."

Case study: CCE grant

This case study examines an organization that applied for the CCE grant.

For the application process, the state of Illinois released claims data for the applicant to analyze. This was a key part of understanding the population and the risk associated with the population. We then took the claims data and used the various fields to tease out the organization's target and priority populations and develop PMPM cost summaries. After these steps were done, we were able to create a model.

The first modeling step was to analyze the claims costs and understand the relative acuity by population subgroup. The relative acuity will serve as the relationship used to split the appropriate care coordination fee (CCF), solved for in the next step. The CCF relativities reflect the increased complexity of managing each population.

The second modeling step was to solve for the respective care coordination fees based on the claims data provided and assumptions utilized with respect to factors such as the impact (and timing) of care coordination efforts, future levels of claims trend that are due to future usage increases and inflationary influences, morbidity levels relative to the baseline Medicaid data source, and the impact of social determinants particular to the targeted membership, such as expected operational expenses, distribution of defined population groups, and expected membership each quarter. The overall care coordination fee revenue projected should meet the criteria that it is essentially equal to overall expected operating expenses and the state's disbursement of fees, offset by Medicaid service cost savings. We chose to quantify these measures as the present values over the three-year period starting with calendar year 2013. The nontarget populations are assigned a care coordination fee based on the overall expected membership distribution.

The final step was to provide a complete financial projection by including the shared savings component. Ultimately, there needed to be a three-year breakeven for the state of Illinois and a positive return on investment for the organization. The biggest challenge was determining the parameters and assumptions under which this could be accomplished.

From a high level, here are some specific items related to Medicaid ACOs.

- Data can be very challenging, and, before undergoing a project, the actuary should make sure to have a source of reliable data.

- The actuary needs to understand the complexities of the underlying population. The service delivery model for a pediatric population or for a homeless population will look very different from a general Medicare ACO population. Also, some of these populations tend to be much more expensive, and, as a result, care management has the potential to generate big savings. On the other hand, it costs a lot to manage savings for the population, and that is why the project included a large care coordination fee component.

- Items such as trend, membership level, and operational expenses are important to all ACOs and are discussed in the prior case study.

Commercial DRG contract

Diagnosis-related groups (DRGs) have been used in the United States since 1982 to determine how much Medicare reimburses hospitals for all of the services provided under inpatient admissions and are commonly used by commercial and state Medicaid plans for inpatient reimbursement.

A DRG contract will usually consist of the following elements:

- **A DRG/case rate schedule.** In some cases, a DRG model will use the CMS MS-DRG weight for each MS-DRG. However, a DRG/case rate model does not have to use MS-DRGs (discussed more in the grouper section). If it does use the MS-DRG weights, they are developed based off of the Medicare cost reports and can produce weights that might be high in areas such as maternity. In these cases, a health system or payer may choose to recalibrate the weights.

- **Maximum days.** If a given case exceeds the maximum number of days defined for the particular DRG/case rate, there may be a per diem rate, which will be paid for each day exceeding the maximum number of days.

- **Carve-outs for specialty drugs and implant devices.** In addition to case rates and per diem rates, carve-outs for specialty drugs and implant devices can be part of the inpatient payment schedule.

- **Stop loss.** A contract may also have a stop loss to be applied on a case level.

- **Transplants.** Transplants are usually negotiated separately.

- **Readmissions.** Should readmissions be included or excluded from being paid? This may depend upon the underlying population.

Figure 12 shows a sample case rate schedule.

Figure 12: Sample Case Rate Schedule

DRG Case Rate Schedule
Selected List of DRGs

DRG	Service	Case Rate	Case Rate Applied to Days	Per Diem Rate	Per Diem Applied to Days
001	HEART TRANSPLANT OR IMPLANT OF HEART ASSIST SYSTEM W MCC	Negotiate	Days 0 - 28	$ 4,000.00	Days 29 - 999
002	HEART TRANSPLANT OR IMPLANT OF HEART ASSIST SYSTEM W/O MCC	Negotiate	Days 0 - 18	$ 4,000.00	Days 19 - 999
003	ECMO OR TRACH W MV 96+ HRS OR PDX EXC FACE, MOUTH & NECK W MAJ O.R.	$ 270,720.17	Days 0 - 27	$ 4,000.00	Days 28 - 999
004	TRACH W MV 96+ HRS OR PDX EXC FACE, MOUTH & NECK W/O MAJ O.R.	$ 156,249.50	Days 0 - 23	$ 4,000.00	Days 24 - 999
005	LIVER TRANSPLANT W MCC OR INTESTINAL TRANSPLANT	Negotiate	Days 0 - 13	$ 4,000.00	Days 14 - 999
006	LIVER TRANSPLANT W/O MCC	Negotiate	Days 0 - 6	$ 4,000.00	Days 7 - 999
007	LUNG TRANSPLANT	Negotiate	Days 0 - 17	$ 4,000.00	Days 18 - 999
008	SIMULTANEOUS PANCREAS/KIDNEY TRANSPLANT	Negotiate	Days 0 - 14	$ 4,000.00	Days 15 - 999
010	PANCREAS TRANSPLANT	Negotiate	Days 0 - 10	$ 4,000.00	Days 11 - 999
⋮	⋮	⋮	⋮	⋮	⋮
984	PROSTATIC O.R. PROCEDURE UNRELATED TO PRINCIPAL DIAGNOSIS W MCC	$ 56,348.35	Days 0 - 10	$ 4,000.00	Days 11 - 999
985	PROSTATIC O.R. PROCEDURE UNRELATED TO PRINCIPAL DIAGNOSIS W CC	$ 33,362.63	Days 0 - 9	$ 4,000.00	Days 10 - 999
986	PROSTATIC O.R. PROCEDURE UNRELATED TO PRINCIPAL DIAGNOSIS W/O CC/MCC	$ 17,997.98	Days 0 - 8	$ 4,000.00	Days 9 - 999
987	NON-EXTENSIVE O.R. PROC UNRELATED TO PRINCIPAL DIAGNOSIS W MCC	$ 52,038.24	Days 0 - 6	$ 4,000.00	Days 7 - 999
988	NON-EXTENSIVE O.R. PROC UNRELATED TO PRINCIPAL DIAGNOSIS W CC	$ 29,176.74	Days 0 - 7	$ 4,000.00	Days 8 - 999
989	NON-EXTENSIVE O.R. PROC UNRELATED TO PRINCIPAL DIAGNOSIS W/O CC/MCC	$ 17,178.27	Days 0 - 6	$ 4,000.00	Days 7 - 999

Because the structure of the contract has some complex elements, the impact to the health system and the payer will likewise be complex.

- In a per diem contract, the days paid will get reduced proportionately by the length of stay.
- In a case rate contract, the payer will have to pay the same rate regardless of how long the individual stays in the hospital.

Therefore, there can be an initial gain to the health system with the initial switch if it is able to discharge patients more quickly.

If a proposed contract has an outlier per diem payment when days are above a certain level, a reduction in days will decrease this payment. In fact, the reduction is leveraged, so it can be a large decrease. For example, with a six-day outlier threshold where the stay is reduced from an eight-day stay to a seven-day stay, the outlier payment is reduced by 50 percent, not by the 12.5 percent reduction in length of stay. This reduces the gain to the health system.

A reduction in length of stay will also affect billed charges. This affects payments that are based on percentage of charges. It also has a small impact because of the "lesser of" provision. Finally, there is an impact because some claims will no longer be subject to the stop-loss provision, as some claims will not reach the stop-loss threshold. While the shorter lengths of stay may ultimately reduce the cost of stop-loss coverage after experience data becomes available to support it, initially the health system will likely pay for the coverage based on its experience prior to changing to a DRG payment basis.

Bundled Payments for Care Improvement (BPCI)

In mid-2008, the Medicare Payment Advisory Commission recommended that CMS test bundled payments for select conditions. There were a few precursors to the pilot program—the CMS Acute Care Episode (ACE) Demonstration and the Medicare Participating Heart Bypass Center Demonstration, discussed in more detail later—but none as large in scope as the BPCI, for both the number of conditions (48) and the number of participating hospitals. The ACA legislated for testing bundled payments (49) and, in 2013, the BPCI initiative was launched through CMMI. In addition, the Medicare Payment Advisory Commission (MedPAC) wrote in its 2013 report, “Nationwide, use rates for [Post-Acute Care (PAC)] services vary widely for reasons not explained by differences in beneficiaries’ health status.” This statement reiterated the reason and the need for bundled payment pilots.

In the BPCI initiative, one entity becomes financially responsible for a set of services rendered to a Medicare beneficiary. This set of services typically includes an acute inpatient stay as well as post-acute care that the patient gets after recovering from surgery at home or in a post-acute facility, even if the hospital does not have any governance or financial stake in the post-acute care provider. Typically these post-acute care providers include:

- SNFs
- Home health care agencies
- Long-term acute hospitals
- Inpatient rehabilitation facilities.

While there are other ways to be successful with a bundled payment, one key driver of success in BPCI is whether the hospital or physician group can discharge the patient to the appropriate care path and that any facilities providing post-acute care are high-value. A report by New York University (NYU) found that, at SNFs, three weeks of care was about five times more expensive than providing the same or similar services at the home setting. The NYU study examined three years of data and over 10,000 patients and found that readmission rates were lower for patients discharged home. The study concluded that "home is the safest place to be" and they discouraged patients from being discharged to a SNF. (15)

The BPCI initiative focused on 48 different clinical conditions and has four different models that include various parts of the acute episode. Bundled payments can also be defined prospectively, or retrospectively, or with a hybrid of the two. In retrospective pricing, the providers are paid on an FFS basis, and the difference between the target price and the actual spending is settled up at the end of the negotiated period. In prospective pricing, the the financial contracting entity is paid an agreed-upon fixed fee for each episode and the contracting entity is expected to divide the money among the other service providers. In addition, there are hybrid models such as Medicare's Inpatient Prospective Payment System in which the amount of payment is prospectively fixed but is not paid until after the hospital discharge occurs. For example, for knee replacements, prior to the procedure it is known that either MS-DRG 469 or 470 would be used, but not until after the patient is discharged will the hospital know whether the patient should be assigned 469 (with comorbidities and complications) or 470 (without complications).

Although the definition for BPCI is quite prescriptive, we have performed permutations on the basic CMMI definitions for various organizations. From this exercise, we would generalize the process of pricing a bundled payment into six basic steps:

1. Obtain claims data.
2. Select DRGs or conditions (if the client hasn't already done so).[25]
3. Define the episode.
4. Define exclusion criteria.
5. Estimate the cost of the bundle.
6. Identify savings opportunities.

[25] The actuary may need to work closely with the providers that are developing their clinical pathways. The actuary can show the data (compared to benchmarks, variation, etc.) to help the providers weed out some DRGs/conditions, but the providers need to make sure it'll work on their end as well.

Obtaining claims data is similar and challenging for all payment reform and is discussed at the beginning of this section. Once we have claims data, we need to choose conditions for which the cost of services will be bundled. Typically, this is at least somewhat directed by the organization and its various goals (e.g., large revenue sources, marketing ideas, etc.). Still, when searching for appropriate candidates the actuary should look for enough volume, a population that will have similar treatment patterns (e.g., it is appropriate to look at surgical cases and nonsurgical cases separately for lung cancer), and potential for savings that is due to variation in care. Knee and hip procedures are often popular selections because they are among the most frequent procedures occurring in hospitals.

Once the conditions are selected, the actuary will need to define the episode. Our case study is based on a provider that enrolled in the CMS BPCI Model 2, which looked at acute inpatient stays and the post-acute care delivered up to 90 days thereafter, and our focus was on that provider's work with total hip and knee replacements—as classified by MS-DRG codes 469, major joint replacement of the lower extremity with significant comorbidities and/or complications, and 470, major joint replacement of the lower extremity without significant comorbidities. As part of the CMS BPCI Model 2 program, CMS offered a very strict specification on how the models would be defined. Under the Model 2 program, episodes are defined using an MS-DRG anchor. However using this to build other bundles, MS-DRGs can be challenging because MS-DRGs are assigned post-discharge and reflect the complication rather than the original procedure, so they typically work better for retrospective pricing than for prospective pricing.

Episode definitions can be generalized from these specifications and also applied to more chronic conditions, longer periods, outpatient procedures, etc., but the basic definitions are the same.

Episode: The full time period and mix of services provided for which the organization is financially responsible and at risk. For example, in the BPCI this would start with a single case of an MS-DRG (or other anchor event) and span the anchor stay and post-discharge periods. In a more general example, the episode could start at a predefined period before the anchor event and include post-anchor events.

The episode will typically include the following:

- **An anchor stay:** The period of time between admission and discharge dates of an episode. This can be generalized to be an event for a chronic patient or an outpatient procedure.

- **Post-discharge period or post-anchor event period:** The period of time covering 30, 60, and 90 days from the discharge date. If this is a chronic condition, it may be extended to a much longer period of time and not necessarily follow a hospital discharge but some other anchor event. In any case, it is important to define enrollment criteria for the episode. For example, the definition may require that the member is enrolled for the entire episode. However, if the episode includes patients that die, the criteria may need to be redefined.

- **Post-episode period:** The period of time covering 30 days past the episode end date. This is usually used as a quality control to make sure providers are not waiting until the end of the episode to provide services.

In some cases, such as a back surgery, it would benefit the actuary to create a pre-index period as well to measure physical therapy received before the surgery.

It is appropriate that certain types of claims be excluded from the study. In general, we believe that most organizations (including CMS) will favor exclusion criteria that are easy to implement and not overly specific. Usually, inpatient claims are excluded by certain MS-DRGs, and professional and outpatient claims are excluded by a list of International Classification of Diseases (ICD)-9 diagnosis codes or CPT/HCPCS codes. Or the bundled payment can have a list of included codes.

Once the definition for the episode is defined, the actuary can pull a bucket of all the claims from the claims data source. Payer claims data is called for, not provider data, because all of the individual claims are needed regardless of the facility where the service occurred or the service was provided (if outside of a

facility). The tables in Figures 13 and 14 show the episode costs for commercial patients using the Model 2 specifications.

Figure 13
Commercial Patients
Total Number of Knee Patients[26]

	Discharge to Home Health or Home	Discharge to SNF	Discharge to Rehab Facility Unit	Other	Total
Total DRG 469 & 470 patients	62,670	7,183	4,037	2,389	76,279
% of total patients	82.2%	9.4%	5.3%	3.1%	100.0%
Total DRG 469 patients	1,362	341	274	115	2,092
% of 469 patients	65.1%	16.3%	13.1%	5.5%	100.0%
Total DRG 470 patients	61,308	6,842	3,763	2,274	74,187
% of 470 patients	82.6%	9.2%	5.1%	3.1%	100.0%

Figure 14
Commercial Patients
Total Bundled Allowed Charges, Knee Replacement by Period

	Discharge to Home Health or Home	Discharge to SNF	Discharge to Rehab Facility Unit	Other[27]	Total
Both DRGs	**$34,113**	**$42,110**	**$54,820**	**$39,455**	**$36,129**
Pre-index	$1,149	$1,442	$1,364	$1,223	$1,190
Anchor	$28,054	$30,447	$38,983	$29,390	$28,899
Post-discharge, 90 days	$4,911	$10,222	$14,473	$8,841	$6,040
MS-DRG 469	**$48,511**	**$57,705**	**$71,338**	**$70,342**	**$54,200**
Pre-index	$1,795	$1,916	$2,468	$2,183	$1,924
Anchor	$36,357	$37,447	$46,357	$38,546	$37,965
Post-discharge, 90 days	$10,359	$18,342	$22,512	$29,613	$14,311
MS-DRG 470	**$33,793**	**$41,332**	**$53,617**	**$37,893**	**$35,620**
Pre-index	$1,135	$1,418	$1,284	$1,175	$1,169
Anchor	$27,869	$30,098	$38,446	$28,927	$28,644
Post-discharge, 90 days	$4,790	$9,817	$13,887	$7,791	$5,807

[26] MS-DRG 469 and MS-DRG 470, limited to ICD-9 procedure code 8154, "Total Knee Replacement."
[27] Discharge status definitions and proper coding are discussed more here: http://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNMattersArticles/downloads/SE0801.pdf. "Other" captures all of the other discharge statuses, which could include critical access (66), cancer/children's hospital (5), against medical advice (7), etc.

A few observations from Figures 13 and 14:

- As would be expected, costs for a patient with comorbidities or complications (MS-DRG 469) are much higher than for those without complications (MS-DRG 470), averaging over 50 percent for these benchmarks. Providers will need to make a distinction between patients who fall into MS-DRG 469 and who had significant comorbid conditions going into the procedure and those patients who were low-risk and had significant complications during a routine procedure. The latter would indicate opportunities for improvement for the provider.

- Usually, around *50 to 75 percent* of costs occur during the anchor period for patients not sent home after discharge and are higher for those discharged to home.

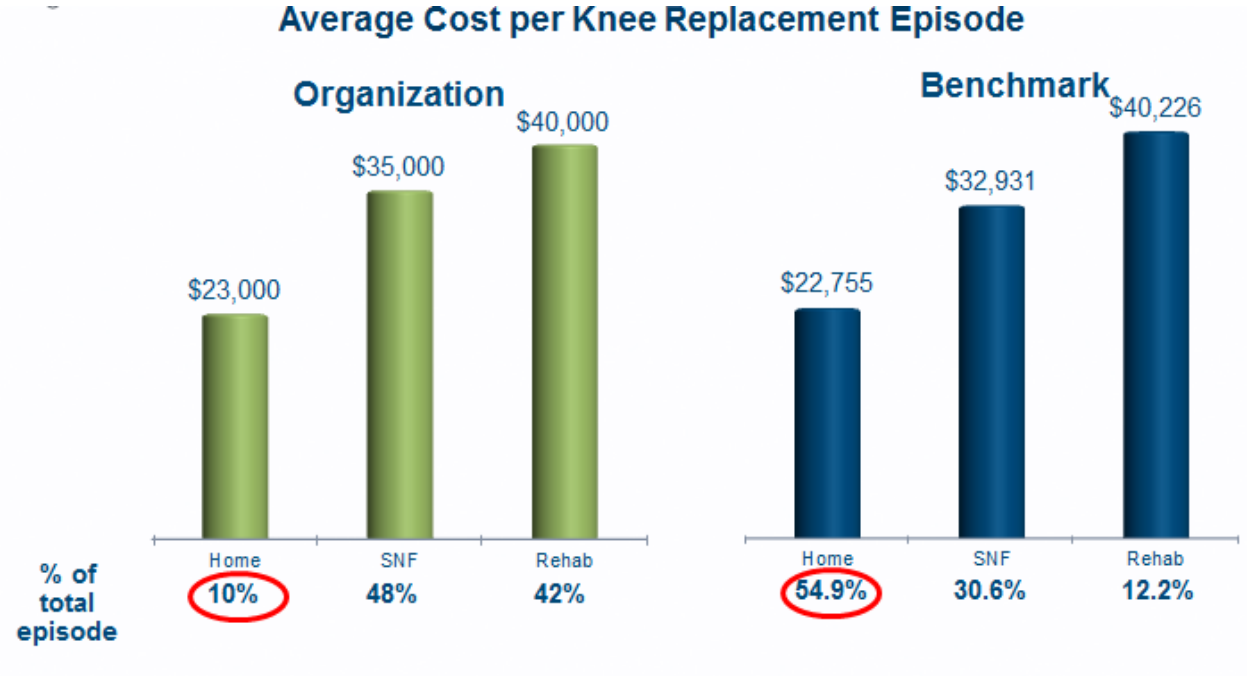
- Most surgeries are without major complications, but a surgery with complications can have a bundled cost *almost twice as expensive* as an equivalent surgery without complications.

- We found that post-discharge hospitalization costs are *less than 25 percent* of total costs.

- We also found that hospitalization rates are about *two to three times higher* for patients who had surgery with complications.

While Figures 13 and 14 look at the benchmarks nationwide (development of the benchmarks is discussed in Appendix A) for commercial patients with *knee replacements only*, Figure 15 compares a *specific* BPCI awardee's results to the national benchmarks for Medicare FFS patients for *knees and hips combined*. Commercial contracts usually want to look at knees and hips separately, which is why Figures 13 and 14 were knee replacements only.

Figure 15: Organization Average Allowed Charge per Episode by Discharge Status vs. Benchmark Average Allowed Charge per Episode: Knee and Hip Replacements



As shown in the results, the discharge to home for this particular awardee is very low, 10 percent, while the benchmark shows that for knee replacements typically 54.9 percent are discharged home. If the awardee was able to move closer to the average and discharge more of its patients to their homes, the savings for this awardee could be substantial. It should be noted that the 54.9 percent is a blend of efficient and

inefficient facilities, so it could be inferred that best-practice facilities would be discharging an even greater percentage of patients home.

Potential savings from the episode will be different for every episode and every organization. It is good to consult with a clinician in these cases to understand care paths. In this particular case study, the client was discharging only 10 percent home. This data showed that the cost for home health care was significantly cheaper than the cost for inpatient rehab. By changing discharge protocols for their less severe patients, the organization could potentially save a lot of money. In addition, patients may be happier recovering at home and being with their families and may recover more quickly. They are likely exposed to less disease than they would be in a facility (depending on their living situation). Additionally, care from a home health agency can be quite beneficial to the patient as it is one-on-one. NYU reported that providers achieved success with regard to patient satisfaction, outcomes and financials by discharging more patients home and fewer to facilities. (15)

In conclusion, bundled payments can be a useful way to study both patient treatment patterns as well as benchmark costs. Even if a provider organization is more expensive it may be more efficient on an episodic basis. However, the downside of bundled payments is that they can be difficult to administer as the necessary infrastructure to monitor quality metrics and process needs to be invested in and implemented for only a small set of conditions where the clinicians are ready, which can be too costly for some providers. In addition, claims data does not indicate severity of disease, which makes it difficult to include only certain stages or types of disease in a bundled payment. Data includes only costs that are reimbursable, and excludes things such as care management. Changes in treatment or drug practice patterns should be factored into the price of bundled payments. There can be variations in the cost of devices (for procedures that have an implant). For procedural bundled payments, if a doctor is the responsible provider, then he or she has the ability to choose where the procedure happens (hospital or outpatient). In this particular example, this physician could achieve savings by choosing a cheaper discharge facility. Providers must also consider who would be the best point of contact to manage the care of a patient (e.g., the point of contact entity, an employee at the hospital, the case manager, or the individual physician).

Reference pricing

In an attempt to bring down the variation in spending of commodity types of procedures and services, reference-based pricing (RBP), a payment reform system, was created by setting a negotiated “reference price” that the insurer or payer will cover for a specific service or procedure from a set of health systems or providers.

There are three main parties involved that are at risk in this payment system: the enrollee, the insurance provider, and the health system or provider group. The primary interaction and negotiation of the reference price occurs between the insurer and the health system or provider group. To illustrate this process, imagine that in a given region the price of a service or procedure among a group of competitive providers ranges from \$20 to \$80 at the 20th and 80th percentiles, with the average being around \$30. It is important to note that there need to be enough providers available in a given region that provide the specific procedure so that contractual negotiations to cap the reference point will work under competition. The insurer will then send out a request to the providers to bid their lowest allowed charge amount that they would accept. The insurer might pick one of those values and set that as the reference price, or use some mix of this and say the average of \$30 mentioned in the example above.

Once the reference price is set by the insurer, the group of providers agrees to pay the difference between the *billed charge* and the negotiated reference price, or *allowed charge,* which is where the risk sharing occurs for the provider. This attempts to provide the incentive for the provider to contain costs by reducing excess expenses associated with the procedure. The insurer, on the other hand, agrees to reimburse the provider on behalf of the claimant up to this reference price, after accounting for plan-specific cost sharing.

Although this type of payment system is designed to lower costs and benefit enrollees, there can be substantial out-of-pocket risks for the enrollee. In most contracts, if an enrollee receives service from a provider that is not under the negotiated reference price, they will then have to pay all cost sharing up to

the reference price, plus all applicable charges above the reference price. For instance, in the example above, if the reference price was set at the $30 average and the enrollee went to a provider that is not included in that negotiated price, the enrollee could be liable for $50 in excess out-of-pocket charges if the service came from a high-cost provider.

There is evidence that, implemented properly, RBP can influence enrollee behavior, reduce charges from high-cost providers, and create savings potentials for the insurer. A recent California Public Employees' Retirement System (CalPERS) study on RBP has shown potential benefits of this reformed payment model. (16) In 2008 CalPERS, the largest employer and health care purchaser in California, launched an RBP program by contracting with providers for hip and knee replacement services for their PPO enrollees. The negotiated reference price limit to be paid for these services was set at $30,000 and included a 20% member cost sharing with an annual out-of-pocket (OOP) maximum of $3,000 for those members who elected to receive surgery from the RBP providers. Value-based purchasing providers were chosen based on price, geographical access, and quality.

An analysis of the data through 2011 indicated that, because of RBP, CalPERS saved $3.1 million from lower payments to its hospital providers. The analysis found that once the RBP program was implemented in 2010, there was a shift in enrollee behavior as visits to the low-cost providers increased for hospital groups that charged below the reference price while patient visits decreased at the high-cost hospitals that charged above the reference price. Additionally, during these two years, the high-cost hospitals saw the prices paid for these services drop from around $40,000 to levels more closely in line with the low-cost hospitals below the reference price.

It is interesting to note that the study also found evidence that low-cost hospitals saw slight increases in the prices paid for these services at their facilities. This slight increase could be attributable to several factors, one of which might be that they realized that they can set their prices near the reference price if they were below that value. It could also be due to having an increase in new patient visits (and with that the increased expenses and necessary infrastructure to handle these new patients). The low-cost hospitals could have also seen an increase in case mix of the patients they saw, which would increase prices as well.

RBP shows promise as a payment reform mechanism through the way it can influence enrollee behavior by directing individuals toward lower-cost providers. Careful consideration must be taken into account when developing RBP for enrollees to ensure that they are not burdened with high OOP charges if they receive services outside of the provider network. This burden and risk can be reduced and shifted to the insurer and provider as insurers are able to contract reference pricing with a larger share of the providers in the market. In turn, the high-cost providers must compete and find ways to reduce their charges so that they can maintain adequate levels of patient visits and revenue. Through these interactions, as the CalPERS case study and analysis provide a glimpse of, RBP pricing can be a valuable payment reform tool to lower health care costs in the medical system.

One of the most important aspects of a reference-based benefit is the member education. There is a variance problem inherent in this benefit design. Even if a member chooses a provider that has a reasonable "price" there is a non-zero probability that the procedure can become very expensive. In this circumstance, the member may be on the hook for the remaining expenses. To help alleviate the previous problem a health system payer might wish to offer both a reference-based benefit and also contract on episodes with local providers to shift the risk of high variance to the provider rather than the member.

Pay-for-performance

In 2003, Medicare launched the Premier Hospital Quality Incentive Demonstration (HQID) and changed its incentive design in late 2006. This program was a multiyear collaborative with efforts “to determine if economic incentives are effective at improving the quality of inpatient care."

Around the same time, at the end of 2002, the American Hospital Association, the Federation of American Hospitals, and the Association of American Medical Colleges launched the Hospital Quality Alliance (HQA), a national public-private collaboration to encourage hospitals to collect and report data on a voluntary basis.

Analyzing these results is very important because both of these programs are precursors to the current Medicare Hospital Value-Based Purchasing (VBP) program. In addition, as most payment reform models try to incorporate P4P elements, it is important to understand if they really work.

The overlapping reporting requirements between the HQA and the HQID allowed several organizations to compare improvements in quality associated with public reporting with those achieved using financial incentives. Several studies looked at the results of these programs:

- **Lindenauer et al., Public Reporting and Pay for Performance in Quality Improvement:** This study saw greater quality improvements among hospitals that were offered bonus incentives of 1 to 2 percent than among hospitals that received no financial bonus or incentive for quality improvement. Although these results seem promising for the use of incentive bonus payments, the author notes that they are based on a short study interval (two years) and that it is unclear as to whether providing larger bonus payments would drive better results while still maintaining cost-effectiveness. (17)

- **Werner et al., The Effect of Pay-for-Performance in Hospitals: Lessons for Quality Improvement:** This study compared the hospitals in the HQID to those in a control group and found that the HQID initially had higher performance but both groups had similar results over a longer horizon (five years). Hospitals that were eligible for larger bonuses, were well financed, or operated in less competitive markets (because competition already drives improvements in quality) tended to improve more. (18)

- **Jha et al., The Long-Term Effect of Premier Pay for Performance on Patient Outcomes:** This study found little evidence that hospitals participating in the Premier HQID program had larger declines in mortality than hospitals participating in the HQA. The HQID is the precursor for the current VBP, which focuses on process measures now, but will be extended to 30-day mortality soon. (19)

- **Peterson et al., Does Pay-for-Performance Improve the Quality of Health Care?:** This study performed a systematic review in the *Annals of Internal Medicine* and concluded that documentation, rather than actual performance, improved with financial incentives. (20)

All articles had mixed views on whether pay-for-performance (P4P) actually worked in the HQID program and were skeptical if it will work in the current Medicare Hospital VBP program. The articles had similar conclusions on whether P4P programs were optimally designed.

Key features for consideration include:

- **Population target:** Chronic diseases, acute care or preventive care services.

- **Payment specifics:** Magnitude, frequency and duration of financial incentives.

- **Success measures:** Absolute threshold, improvement over the baseline, etc.

- **Recipient:** Patient, the health care provider, the provider group, or the hospital.
- **Quality measures of performance:** Domains of quality.
- **Non-quality measures of performance:** Audit and feedback, recognition, clinical reminders, academic detailing, or information technology support.
- **Timeline:** Will good performance continue after the program is over?

The articles also address the major issues with this payment method, summarized as:

- Unintended incentive to avoid the most severely ill patients
- Gaming the system by miscoding diagnoses or services
- Selecting patients on the basis of the likelihood of a positive outcome
- Compliance with treatment protocols rather than need
- Unmeasured objectives could be ignored.

In addition, P4P has a similar theme as the other payment models: a contract with only one payer may not generate enough revenue at risk to cover the substantial fixed costs that come with quality improvement. (3)

Patient-centered medical home for complex patients

Although a patient-centered medical home (PCMH) is a service delivery model and not a payment model, it is a very popular tool used in payment reform, and so it is useful to discuss here.

Beginning in the 1960s, medical homes were a way to facilitate quality primary care delivery for children with special needs. The Agency for Healthcare Research and Quality (AHRQ) defines this model framework through the functions in the following list. (21)

- **Comprehensive care:** This is where the patient will receive most of the resources and is comprised of several different care providers (e.g., physicians, nutritionists, social workers, etc.).
- **Patient-centered:** The active, relationship-based process to educate and allow patients the opportunity to define the levels of care with which they are comfortable.
- **Coordinated care:** Incorporating the entire health care system, from specialty care hospitals to local support groups, in order to facilitate communication about the patient as well as discuss best practices among different provider groups.
- **Accessible services:** Providing multiple channels for the patient to be able to reach out and gather information or receive care.
- **Quality and safety:** The commitment to implement and monitor quality improvement measures while also taking into account the patient's progress, concerns and overall well-being.

The service delivery model is prevalent with all payers (Medicare, employer, commercial insurers and Medicaid).

A payment model for a typical medical home might have a capitation rate for primary care services (defined by HCPCS) and also include a management fee. There would be defined in-network physicians who would

receive the capitation rate. AHRQ believes the framework should achieve “high-quality, accessible and efficient healthcare.” (21) Organizations that have implemented PCMHs may equate efficiency with decreasing health care cost trends for the population utilizing the PCMH model. Measuring and proving this trend can be very difficult, which we discuss more below.

Our case study is a PCMH designed to target a chronic population. For modeling purposes, the actuary identified the population that used a significant number of valuable resources by using multiple iterations. The following criteria were used:

- Lived in provider’s area
- Age 18 or older
- On Medicaid, Medicare, dual-eligible or uninsured
- Excluded obstetric primary diagnosis
- Top X percent of hospital costs
- X or more inpatient admissions in a year
  - X or more ER visits
  - X inpatient admissions and X ER visits.

The provider tested these criteria by using chart review. The provider found that patients with two inpatient admissions usually had a legitimate stay. The provider felt that patients with three or more inpatient visits could be managed with appropriate primary care intervention.

For this PCMH, the provider team defined the intervention as shown in Figure 16.

Figure 16: Patient-Centered Medical Home, Super-Utilizers

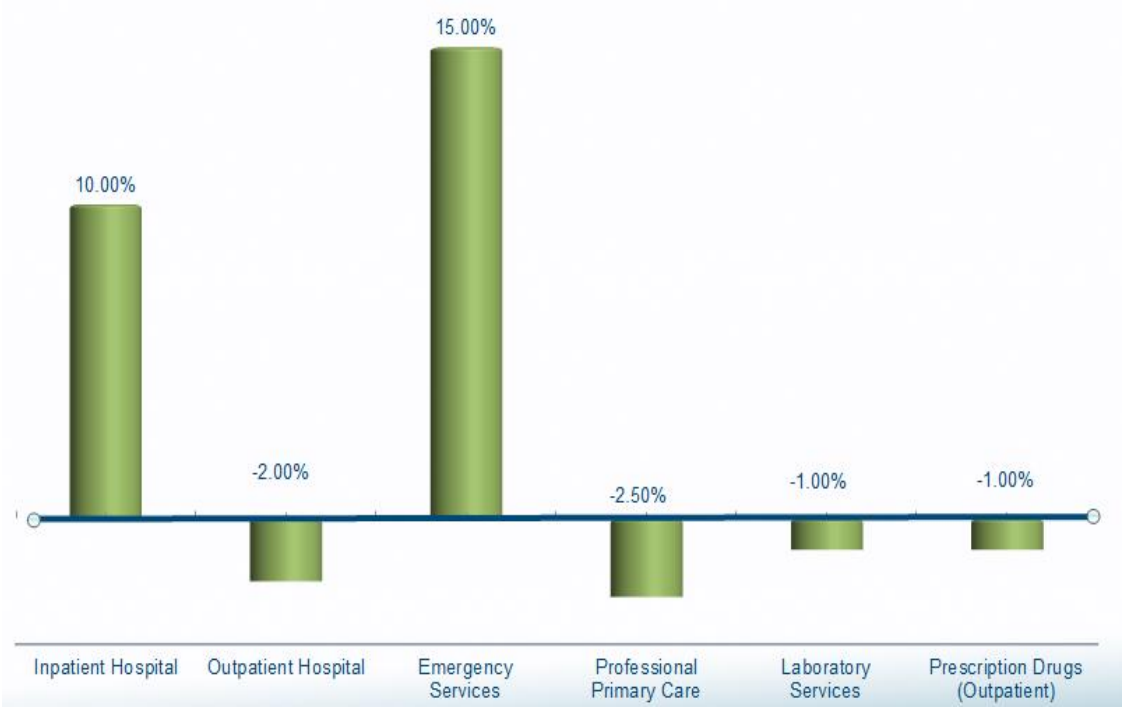
Definition: A team based health care delivery model led usually by a physician that provides comprehensive and continuous medical care to complex patients with the goal of obtaining maximized health outcomes.

- Specialty care > Primary care
- Full spectrum of related specialties
- Continuous specialist involvement
- On-site pharmacists
- Palliative care

For complex patients in the PCMH, the role of the specialists can become more important and more centralized than that of the PCP (i.e., "Specialty care > Primary care"). For example, a Parkinson’s patient’s team will typically be led by neurologists, not internists.

Because the intervention was much more comprehensive, which was due to the complex nature of the population, the estimated savings for the population was more extensive, as shown in Figure 17.

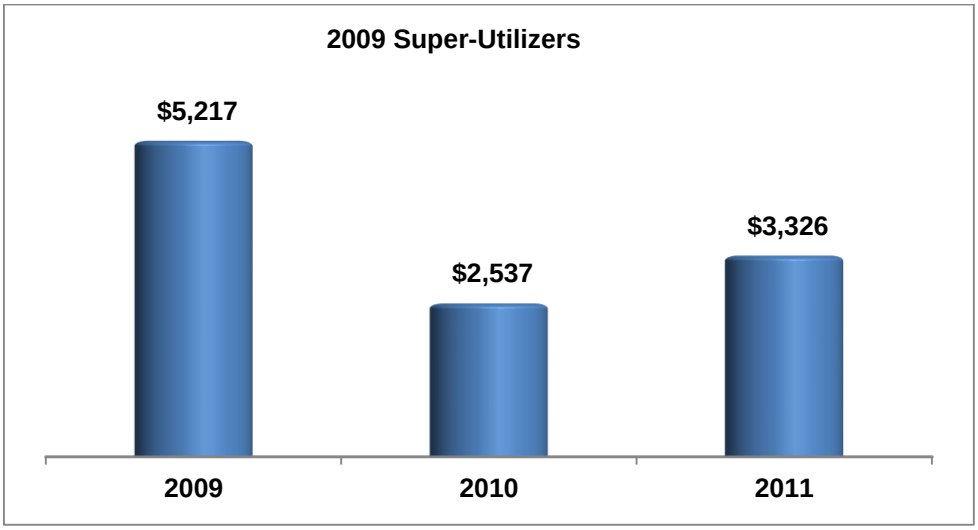
Figure 17: Estimated Savings for a Complex Patient Medical Home



It is the actuary's job to determine if these savings are appropriate for the model. To do this an actuary may first want to consult with a clinician to understand the feasibility of these programs. Many of the programs are still being tested, so the actuary may not have a huge database of experience to draw upon to understand results. However, the actuary can gather data points from various literature reports, other relevant data, or even well-managed benchmarks, where appropriate. When reviewing results of studies that are reporting savings, the actuary should determine if the studies are methodologically rigorous, and also that they are not "pre/post"[28] studies with no control group. Pre/post studies can be expected to be subject to reversion to the mean. Using the 5% Medicare sample, we measured reversion to the mean by finding super-utilizers, using the criteria above, and calculating their PMPM in the 2009 data. We then found the PMPM for the exact same members in the 2010 and 2011 data (see Figure 18). We assumed that these members (selected from the 5% sample from all over the country) had no intervention on them. Therefore, we assume that their ultimate expected claims costs are $2,537 and any "savings" estimates in a pre/post study are overestimated by roughly 50 percent ($2,537/$5,217). For super-utilizers, it is not unreasonable to expect that studies using a pre/post design overstate savings.

[28] This is taken to mean that the analysis used the same population to analyze results of the study without an adequate control group to compare for baseline results.

Figure 18: Estimated Cost of 2009 Super-Utilizers Over a Three-Year Period



Some additional points to consider when modeling a PCMH:

- There is a high potential for variability of types of services offered across different medical homes.
- The actuary should consider increases in utilization for other services.

In this case study, we were reviewing the feasibility of the model, but have not had a chance to review the experience results. To validate savings estimates, we compared them against results from external publications that were available to us. In these external studies we found:

- A randomized study that examined PCMH savings generally indicated that PCMHs do not save significant amounts of money, with the single exception of care to a high-risk subgroup of Medicare patients in the third (post-intervention) year, where cost savings were 23 percent.
- There are also a number of studies that indicate that the overall cost savings from PCMHs are modest at best. Overall savings from insured PCMH programs have been reported as less than 3 percent. Other studies have shown mixed results, with savings sometimes negative. Unfortunately, we do not always know the extent of incentives or fees paid to the care managers, so without a more extensive review we cannot draw firm conclusions about these studies.

Our review of a more general PCMH that serviced all of the population showed trends 5 to 6 percent lower than the population not enrolled in a PCMH. In this case study, it is useful to consider that this only considered the non-capitated services. Also, it is possible that the patients who enrolled in the PCMH were relatively healthier than the non-PCMH population and that was the real difference in the trend. Actuaries have to pay close attention to these items.

V. CONCLUSIONS AND BEST PRACTICES

Through our review of the results of the payment models in the demonstration projects, we found that the results of payment reform are decidedly mixed. Some of the programs have demonstrated varying levels of success, while others have documented failures. Below, this paper discusses specific program results and ends with general payment model best practices and overall conclusions.

Program results

As part of the Patient Protection and Affordable Care Act (ACA), various organizations have been set up to monitor cost trends, and demonstration projects have started to test the ability of various payment models to decrease trends. The authors found that it is not easy, nor transparent, to see how these organizations interact or coordinate results even for those well versed in U.S. health care.

In addition, methods of reporting the results of payment reform studies were not necessarily methodologically rigorous, which made it difficult to come to definitive conclusions on whether payment reform models work. In some cases, results were designed with pre/post studies rather than randomized control trials. Other studies indicated that there were reductions in services such as inpatient admissions or emergency room visits without indicating the impact to the total cost of care. Studies that did indicate the results of the total cost of care may have left out the total dollars spent on the program, making it impossible to calculate a return on investment. Quality was also difficult to report and measure as the infrastructure necessary to accurately obtain this information in a timely manner is still being developed and implemented. Reporting and study design should be considered in more detail when considering pilot demonstrations. We have compiled results for some of the programs below.

ACO results (Medicare and commercial)

On Sept. 16, 2014, the Centers for Medicare and Medicaid Services (CMS) released financial results for its accountable care organization (ACO) programs, which include the 23 Pioneer ACO Models and 220 Medicare Shared Savings Program (MSSP) ACOs. The results show that these Medicare programs have successfully improved the quality of care. According to CMS, they had higher quality and better patient experience than published benchmarks, and Medicare has generated $417 million in savings to the Medicare trust fund through the Pioneer and MSSP models, while the potential shared savings payments to the ACOs were $460 million.

For the MSSP, 58 MSSP ACOs held spending $705 million below their targets and earned performance payments of more than $315 million as their share of program savings. One ACO in Track 2 overspent its target by $10 million and owed shared losses of $4 million. The Medicare trust funds will save about $383 million, including repayment of losses for one Track 2 ACO. An additional 60 ACOs reduced health costs compared with their benchmarks, but did not qualify for shared savings, as they did not meet the minimum savings threshold. (11)

In the commercial market, Aetna Inc. and Banner Health ACO generated $5 million in shared savings and a 5 percent decline in medical cost. (22) UnitedHealthcare cited its ACO initiatives as achieving a 16 percent reduction in ER visits and 17 percent reduction in inpatient days. (23)

Bundled payment results

Although bundled payments are not new, they have recently become popular again. There were reports of cost savings for the ACE Demonstration and the Geisinger ProvenCare Model. IHA also did an experiment with bundled payments for which it published a white paper. In addition, CMS recently announced an extension of the Bundled Payments for Care Improvement (BPCI) program.

Medicare originally announced BPCI in 2011, with the first group of providers taking financial risk beginning in 2013. About 243 providers agreed to participate as of July 2014. CMS had a pool of over 4,000 candidates of other providers that were exploring the possibility of integrating BPCI into their operations as of early 2015. Program participants were able to analyze their Medicare spending data to determine whether BPCI would be appropriate for their care settings. Barring few exceptions, they must reduce their Medicare costs by at least 2 to 3.5 percent before they receive any financial rewards. CMS said the surge of interest in the program is encouraging. (24)

IHA's Bundled Episode Payment and Gainsharing Demonstration results were not encouraging toward moving to bundled payments, as IHA admitted it was unsuccessful in meeting its goals. Based off of reading the results, we speculate this is most likely due to the size, availability and comprehensiveness of the commercial data versus the Medicare data (which is generally more informative and easier to work with). Most of the BPCI programs also use retrospective bundling, whereas the IHA program attempted prospective bundling. Prospective bundling proved to be more difficult to administer, track and reconcile. (25)

The Center for Medicare and Medicaid Innovation (CMMI) BPCI program had two precursors in the Medicare ACE Demonstration and the Medicare Participating Heart Bypass Center Demonstration. From the provider's viewpoint, the demonstration project had the opportunity to improve volume (i.e., number of orthopedic or cardiovascular inpatient procedures performed at the participating facility) by receiving more referrals or marketing a "Value Based Care Center." In the Medicare ACE Demonstration, the five participating hospitals did not *improve volume* but did *improve margins.* The participating hospitals were able to improve margins by decreasing their cost of care by standardizing high-cost supplies such as stents and joint implants. Both Baptist and Ardent Health Services report a 10 to 12 percent decrease in materials costs during year 1 of the ACE Demonstration, and no corresponding price increases (typically an estimated 5 percent) in subsequent years. Given that savings have been largely driven by supply costs, participants found more consistent savings on orthopedic bundles than on cardiovascular bundles. (26)

The Medicare Participating Heart Bypass Center Demonstration was one of the more successful CMS pilot demonstrations, running from 1991 to 1996. Through the initiative, according to its report, "[t]he Medicare program saved $42.3 million on bypass patients treated in the demonstration hospitals. The average discount amounted to roughly 10% on the $438 million in expected spending on bypass patients, including a 90-day post-discharge period. In addition, beneficiaries (and their insurers) saved another $7.9 million in Part B coinsurance payments, so total Medicare savings were estimated as $50.3 million in five years." (27) The Congressional Budget Office (CBO) reviewed the Medicare demonstration projects on value-based payment pre-ACA. Of the four the CBO reviewed (Physician Group Practice Demonstration, Premier Hospital Quality Incentive Demonstration, Medicare Home Health Pay-for-Performance Demonstration, and the Medicare Participating Heart Bypass Center Demonstration) only the Medicare Participating Heart Bypass Center Demonstration succeeded in reducing Medicare expenditures. (28)

In 2006, Geisinger implemented its ProvenCare model, which it believes can be applied to any chronic or acute episode, and thereby raise quality and reduce costs. The program still exists today and the different models are implemented in hospitals across the country. Results for specific programs are discussed in the 2013 annual report. Early results from the Geisinger ProvenCare Lung Cancer pilot project saw positive outcomes in several quality achievement measures. The ProvenCare Perinatal program also had some successes, including reductions in the neonatal intensive care unit (NICU) admissions and a drop of 17 percentage points in the rate of C-sections. These quality improvement outcomes were likely caused by the implementation of educational programs such as smoking cessation and intervention, along with prescreening pregnant women for certain abdominal health risks and providing early treatment for those risks as necessary. (29)

In the future, we can probably expect more focus on cancer care on an episodic basis. Recently Medicare launched the Oncology Care Model, a new pilot program for bundling payments for cancer episodes. (30)

Patient-centered medical homes

To better understand patient-centered medical homes (PCMHs) and their effects on complex patients, we identified several studies that were methodologically rigorous and used randomized controls. We also identified other studies that were pre/post enrollment, but we considered the impact of the reversion to the mean on studies where appropriate.

Overall, our conclusion after reviewing studies available to us is that PCMHs can produce significant savings for a small subset of the population (the subset with high costs), and the best performers produce large savings. However, “The Patient-Centered Medical Home’s Impact on Cost & Quality: An Annual Update of the Evidence, 2012-2013," published in January 2014, was more optimistic about the level of savings thus far.

In addition, there are a number of studies that indicate that the overall cost savings from PCMHs are modest at best. Overall savings from insured PCMH programs have been reported as less than 3 percent. Other studies have shown mixed results, with savings sometimes negative. Unfortunately, we do not always know the extent of incentives or fees paid to the care managers, so without a more extensive review we cannot draw firm conclusions about these studies.

Pay-for-performance

As we mentioned in the case studies, most reports have found that both the precursor demonstration and the Medicare Value-Based Purchasing (VBP) program have given decidedly mixed results on whether pay-for-performance (P4P) really works

Best practices

Success in provider payment arrangements ultimately boils down to good risk management by the payment reform team. This means that the organization must understand its exposure, volatility, probability, severity, time horizon, and correlation to the risk. The actuary can help quantify these risks and financially model them. An actuary can also calculate the full amount of capital to put aside so that there are adequate funds to cover unexpected losses.

In addition, the payment reform team must understand the utilization risk, technical risk, insurance risk and performance risk inherent in the payment models in order to properly choose the appropriate payment model as well as to mitigate the risks of the payment model once they do choose one.

Together the chief financial officer (CFO) and the actuary can set a budget to maintain the return on investment (ROI) of the payment reform model. The CFO then can allocate resources to keep the health system within the predefined budget of the payment model.

The clinician’s job is to provide high-quality care to the patient in order to achieve customer satisfaction and good outcomes. However, clinicians must also choose cost-effective treatments in order to keep within their service and administrative cost budgets.

Coding specialists, data analysts and information technology specialists need to work together with all of the other members of the team to make sure that the clinicians, CFOs and actuaries are receiving timely and accurate information.

It’s the policymaker’s job to address systematic issues such as shortages of primary care entrants into the workforce or the adequacy of care to the most vulnerable and remote populations.

In order for organizations to succeed under payment reform they need to have the following qualities:

- Highly integrated system (compared with market)
- Effective care management initiatives
- More efficient health system than the rest of the market (or will get there soon)
- Select and restricted networks
- Collaborative relationship between the provider organization and payers to reduce costs
- Reasonable methods to establish capitation rates, episode payments, etc.
- Equitable methodology for allocating the global capitation payments or quality incentives, etc., among the individual participating providers.

These are necessary attributes but not sufficient. Large insurance companies have a large base of members and are more equipped to pool and reduce insurance risk. It is important for providers to take on some of this insurance risk to incentivize them to monitor patients and care more holistically. However, when providers take over some of the insurance risk for their patients or individuals in their geographic areas (for example through shared savings arrangements and capitation), it can be difficult to get enough members to both smooth over random volatility from year to year and to spread the administrative cost of the program. As a result, providers have to be careful in taking on and monitoring this risk and can benefit from maintaining ties with health plans that may be better equipped to handle insurance risk.

The mechanics and administration of payment models that incorporate provider risk have improved since the 1990s consumer backlash against them, which is due to the following developments since then:

- More clinical integration
- Electronic health records and other information systems
- Widespread use of clinical guidelines
- Stronger health plan incentives to transition risk
- More refined risk adjustment methods
- Experience from current successes and past failures
- Political and population pressure on providers to transform the health care system—both quality and cost pressures
- Increased transparency of provider performance reporting.

As well, organizations have evolved to be more fit to accept risk, and leaders have seen the need for their organizations to take on risk.

Overall conclusions

Despite the many roadblocks payment reform faces, it appears that increasing data sharing, results and implementation challenges shared through literature—and Medicare, commercial and Medicaid programs—are propelling the momentum forward. In this paper, we have outlined the general steps and considerations for designing, implementing and measuring results of existing payment reform models. As stakeholders become more skilled at managing the more practical details of these contracts, and enhance

their infrastructures to collect and process meaningful quality and savings metrics for their target populations, defining the key features that hinder or help the success of payment reform models will become easier. In doing so, providers and stakeholders will refine and implement more sophisticated payment reform models to better manage costs and quality of medical care.

The case studies presented in this report had varied success. However, it should be kept in mind that other organizations implementing similar payment and service models could achieve different results, even directionally.

VI. LIMITATIONS AND RELIANCE

This analysis was prepared on behalf of the Society of Actuaries (SOA) to provide information on provider payment reform, as well as to stimulate discussion about the ability of payment reform models to achieve higher quality and lower costs in our health care system. The analysis is not intended for other purposes.

This report is based on information and data from various sources, which Milliman has not audited. In preparation for writing this paper, we reviewed various published reports on provider payment reform. Case studies presented are from programs with which we were familiar through either our direct work with them, from information provided directly to us by program managers, and through review of publicly available results. There could be other actual case studies that would indicate results different from those presented in this report. To the extent that any of the information in these interviews and reports was incorrect, incomplete or misunderstood by us, the information presented in this paper could be affected. We have also not reviewed every ACA rule, antitrust regulation or payment model regulation. A legal review of these programs might provide other insights into the potential for success of each program and/or cost reform approach.

Milliman does not intend to legally benefit any third-party recipient of its work product. Even though Milliman has consented to the release of its work product to a third party, any third-party recipient of this report should not rely upon Milliman's report, but should engage qualified professionals for advice appropriate to its own specific needs. The statements contained in the report are those of the authors and do not necessarily represent the views of Milliman or its other consultants.

APPENDIX A
Methodology and Assumptions

FEE-FOR-SERVICE SCHEDULE

For the organization-specific results, we relied on proprietary data. Using this data, we calculated the amounts that would have been paid under the 2013 Medicare Physician Fee Schedule (MPFS) and prorated them to the health plan's commercial allowed amounts.

MEDICARE SHARED SAVINGS PROGRAM

The model is based on a typical Medicare population of aged individuals reimbursed on a diagnosis-related group (DRG) basis. For scenario 1 we assumed the following:

- **ACO start-up expenses:** Start-up expenses are $5.0 million, and we have amortized this cost on a straight-line basis over three years at $1.7 million per year.
- **Ongoing administration:** There are ongoing expenses incurred in order to administer the ACO, which we have estimated as $2.8 million per year (increased in scenarios with more lives and/or more aggressive management). This assumption is probably on the lower end of the range that can be expected.
- **Reduction in direct expenses:** Half of the provider's internal costs of care can be eliminated to offset the revenue declines (i.e., 50 percent of the provider's costs are direct, and all of the direct costs can be eliminated as an offset to revenue declines). Alternatively, it is possible that a hospital operating at 100 percent capacity could find new patients to offset the reductions in services to existing patients. The direct expenses then can be paid for by the revenues.
- **Bonus:** Of the savings to the Medicare program, 60 percent is returned in the form of bonuses from the Centers for Medicare and Medicaid Services (CMS). This assumption requires that the ACO meets its quality standards.
- **Level of utilization management:** The physician-hospital organization (PHO) performs aggressive but achievable utilization management. Overall the impact of management is about an 8 percent decrease in revenue.
- **Timing of savings:** Scenario 1 assumes that the utilization and expense reductions occur immediately.
- **Membership:** The ACO has 25,000 members.

The initial model of health costs, before any adjustment for utilization management, was developed using the Milliman Health Cost Guidelines™ (HCGs), an industry standard that has been produced for 60 years. The HCGs comprise an extensive amount of research into health care costs and allow extensive amounts of customization for demographics, reimbursement levels, and other factors. The key assumptions we used in developing this model were:

- Standard Medicare age demographics based on the national composition of Medicare enrollees by age and gender
- Standard Medicare benefit levels for Parts A and B
- 2010 Medicare-allowed charges and utilization levels adjusted to a midsize city
- Payments made on a DRG basis.

We then allocated the costs between the PHO and other providers using the matrix shown in Figure 19.

Figure 19: Hospital and Other Provider Costs

Part A Benefits	**Scenario 1: PHO Only**
Inpatient facility	
Medical	PHO
Surgical	PHO
Psychiatric	PHO
Alcohol/drug abuse	PHO
Skilled nursing facility	Other providers
Home health care	Other providers
Part B Benefits	
Outpatient facility	
Emergency room	PHO
Surgery	PHO
Radiology	PHO
Pathology/lab	PHO
Pharmacy	PHO
Cardiovascular	PHO
PT/OT/ST	PHO
Other	PHO
Professional	
PCP, immunization, physicals	PHO
Specialist	PHO
Other professional services (continued)	
Chiropractor	PHO
Outpatient psych/alcohol & drug abuse	PHO
Vision exams	PHO
Hearing and speech exams	PHO
Other	
Ambulance	Other providers
DME and supplies	Other providers
Prosthetics	Other providers
Prescription drug—Part D (f)	Excluded
Benefits not covered by Medicare	Excluded

When services were allocated both to the PHO and to other providers, we used allocation factors that varied by broad service categories and were based on data from Medicare experience for a midsize city. For physician services and other services where the Medicare data does not identify whether the provider is associated with a PHO, we allocated the services using the proportion developed for facility services.

We then developed adjustments to the model for utilization management:

- Our base model assumes effective inpatient and outpatient utilization management, care and disease management, and panel management that results in lower utilization and costs, as demonstrated in Figures 6 and 7.
- We also show results if only half of the potential benefits of these programs are achieved. Many organizations only reach this level of savings.
- In addition, we show the impact of extremely aggressive levels of utilization management. For most organizations, these levels are not attainable.
- We also show financial results if no material utilization changes are achieved. There are certainly examples of this in practice.

BUNDLED PAYMENTS

Data sources

For this work, we used medical claims from 2009, 2010 and 2011 commercial data and the 2009, 2010 and 2011 5% Medicare sample set, limited to patients from the noninstitutionalized aged population. We applied a 5% annual trend adjustment based on the anchor stay end date. If the anchor stay ended in 2009, then all of the corresponding episode's medical claims were trended 5% for two years. If the anchor stay ended in 2010, then all of the corresponding episode's medical claims were trended 5% for one year. Anchor stays that ended in 2011 were not trended at all; thus, all of the episodes were stated in 2011 dollars.

We also relied on proprietary data for the organization-specific results.

Conditions and cohort definition

We identified all knee replacement patients to be those with an MS-DRG code of 469 or 470 and an ICD-9 procedure code of 8154. Knees and hips in the third example were not limited by ICD-9 procedure code. We eliminated all anchor claims that were identified as being provided by a long-term care hospital or an inpatient rehab facility.

Anchor stays were bucketed into one of four discharge statuses, shown in Figure 20.

Figure 20 Discharge Buckets		
Discharge Status Code[29]	**Discharge Status Code Value**	**Discharge Bucket**
01	Discharged to home/self-care (routine charge)	Discharged to home or home health
06	Discharged/transferred to home care of organized home health service organization	Discharged to home or home health
03	Discharged/transferred to skilled nursing facility (SNF) with Medicare certification in anticipation of covered skilled care. (For hospitals with an approved swing bed arrangement, use Code 61, swing bed. For reporting discharges/transfers to a noncertified SNF, the hospital must use Code 04, ICF.)	Discharged to SNF
62	Discharged/transferred to an inpatient rehabilitation facility including distinct units of a hospital (effective January 2002)	Discharge to rehab facility unit
All other		Other
20	Expired	Excluded from the study

Once we identified the index admission using the ICD-9 procedure code and the MS-DRG, we looked at all medical claims associated with the patient. We excluded claims that were most likely not relevant to the knee replacement episode using the Innovation Center's Bundled Payments for Care Improvement (BPCI) exclusion definition. These exclusions are available upon request. We then looked at the index admission and limited the knee replacement claims up to 90 days past the index discharge date. We also looked at 30 days prior to the admission date. Medical services that continued over the 90-day mark were prorated to the episode using the Model 2 Center for Medicare and Medicaid Innovation (CMMI) BPCI episode specifications. We used a similar methodology to break out the post-acute costs into the following periods: discharge to 30 days, days 31 to 60, and days 61 to 90. We also excluded all knee replacement patients who did not have complete 90-day post-discharge data or 30-day pre-index admission data.

We split data into periods of care. The anchor period includes the index admission and the applicable surgical procedure with a knee replacement MS-DRG and ICD-9 procedure code and any professional services that occurred in the inpatient setting during the time between the index admission date and the index discharge date. Any services that were not one of these surgeries and fell after the index admission date were part of the post-discharge period. Any services that occurred within the 30 days prior to the index admission were part of the pre-index period.

Selected geographic markets

The study was not limited to any select geographical markets and includes all nationwide data.

DRG CONTRACT

We used a proprietary data source to develop the DRG contract. We trended the claims data from the midpoint of the data period to the current contract period. We analyzed the percentiles of the claims data to determine an appropriate stop loss. The contract was intended to be revenue-neutral so we solved for the case rate. We based the maximum numbers of days on CMS' geometric mean length of stay, rounded up to the nearest integer. All inpatient claims were reviewed on a case basis to determine whether a given

[29] Discharge status definitions and proper coding are discussed more here: http://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNMattersArticles/downloads/SE0801.pdf. "Other" hospital captures all of the other discharge statuses but could include critical access (66), cancer/children's hospital (5), against medical advice (7), etc.

case exceeded the benchmark by MS-DRG. The per diem rate was developed in aggregate by calculating the number of dollars that exceeded the day threshold divided by the number of days that exceeded the day threshold.

PATIENT-CENTERED MEDICAL HOME

We used the Medicare 5% sample and studied a population of super-utilizers (defined above) in the 2009, 2010 and 2011 claims data set. We measured the total cost of care per member per month (PMPM) of the claims to quantify reversion to the mean.

Some of the studies we reviewed in the results section include:

- Coleman, E.A., C. Parry, S. Chalmers and S.J. Min. (2006). The Care Transitions Intervention: Results of a Randomized Controlled Trial. *Archives of Internal Medicine* 166: 1822–1828.

- Peikes, D., A. Zutshi, J.L. Genevro, M.L. Parchman and D.S. Meyers. (Feb. 27, 2012). Early Evaluations of the Medical Home: Building on a Promising Start.

- Leff, B., L. Reider, D. Frick, D.O. Scharfstein, C.M. Boyd, K. Frey, L. Karm and C. Boult. (2009). Guided Care and the Cost of Complex Healthcare: A Preliminary Report. *American Journal of Managed Care* 15(8): 555–559. This study examined the PCMH savings more generally. Overall, the study said that PCMHs do not save significant amounts of money, with the single exception of care to medically complex adults, where cost savings were 23 percent.

- Massachusetts General Hospital Demonstration Project for High-Cost Beneficiaries, CMS demonstration project. (31) This project achieved 12.1 percent in gross savings among enrolled patients and 7 percent in annual net savings among enrolled patients after accounting for the management fee paid by CMS to Massachusetts General Hospital. The return on investment: for every $1 spent, the program saved at least $2.65.

APPENDIX B
The Role of the Affordable Care Act in Payment Reform

THE ROLE OF THE AFFORDABLE CARE ACT IN PAYMENT REFORM

The Patient Protection and Affordable Care Act (ACA) was signed into law by President Barack Obama on March 23, 2010. (32) The law challenged the existing health care system through sweeping reforms related to making coverage more accessible, expanding covered services and benefits, and reducing costs, along with curbing the high medical cost trend and improving health outcomes. The ACA proposed various changes related to payment reform. These changes were an attempt to not only achieve a lower cost of care, but also to increase both accessibility and medical care quality.

Even with these goals, the ACA was not necessarily the catalyst for payment reform, but happened in sync with trends that were already brewing in the provider market. The long-standing provider payment model of fee-for-service (FFS) was losing its effectiveness for some providers. Commercial utilization rates were starting to flatten and reverse, making the FFS model less reliable for assuring providers earned the revenue levels upon which they depended (a provider's FFS revenue decreases with decreasing utilization). In addition, the growing Medicare population (along with the aging of the population) and the expansion of Medicaid[30] to millions of new people, which was due to the ACA, also intensified financial pressures on health care providers because both Medicare and Medicaid are reimbursed at lower rates than commercial plans. These factors are contributing to more providers taking on risk and ultimately influencing the overall treatment patterns of the population. Along with the enactment of the ACA, physician integration, quality improvement and information technology (IT) infrastructure investments are making it easier to design and implement payment models that depart from the standard FFS design to help providers better manage these risks while still maintaining the overall quality of care of the population.

Overview of ACA payment reforms

In concert with these changes, the ACA introduced its own payment reforms, including:

Reforms regarding quality improvement

- Establishing the Medicare Hospital Value-Based Purchasing (VBP) program
- Strengthening quality for Medicare Advantage.

Reforms regarding accessibility

- Creating programs that address primary care shortages and support the building of the health care workforce
- Adding a temporary increase in the Medicaid payments for primary care doctors (from Jan. 1, 2013, to Dec. 31, 2014)
- Increasing payments for rural health care providers
- Requiring commercial health plans to meet specific criteria in terms of distance and mix of specialties in establishing provider networks.

Reforms regarding affordability and cost

[30] The expansion of Medicaid has resulted in fewer charity cases and higher revenue from people who were previously uninsured. However, the trade-off is that the Department of Health and Human Services (HHS) cut disproportionate share hospital (DSH) payments, which had at least in part compensated for the charity care. But fewer charity cases for the hospital could jeopardize its not-for-profit status. In addition, some providers and hospitals have invested resources in educating their patients on expanded coverage and helping them enroll. So it is difficult to know how exactly this will net out. Providers in non-Medicaid-expansion states had their DSH payments cut without receiving the extra bump from expanded coverage.

- Establishing the Independent Payment Advisory Board (IPAB)
- Addressing the benefit discrepancies between an FFS beneficiary and a Medicare Advantage beneficiary
- Reducing unnecessary paperwork and administrative costs
- Establishing the Center for Medicare and Medicaid Innovation (CMMI, or Innovation Center)
    - Creating accountable care organizations (ACOs)
    - Expanding authority to bundle payments.

Each of these elements of payment reform is discussed below and targets one or more of the three main problems facing the health care system: achieving a higher quality of health care, increasing or maintaining current levels of accessibility for beneficiaries, and reducing cost by either cutting wasteful expenditures or controlling payment rates. It is difficult to succeed in all three because improving quality and access will typically result in increased expenditures from hiring more experienced staff or providing more training and monitoring for quality control. Likewise, reducing costs can potentially lead to less accessibility if high-cost, low-utilization procedures are strategically relocated in larger hospital groups—for instance from a rural to a more urban setting.

Besides the ACA, CMS also makes some payment reforms through its fee schedules, and we will also discuss that below.

Quality improvement

Establishing the Medicare Hospital Value-Based Purchasing (VBP) program

In addressing the first of the three goals, achieving higher-quality clinical outcomes, the ACA established VBP programs. VBP programs allow acute care hospitals to receive rewards, or incentive reimbursements, for providing care that improves the health outcomes for patients (programs like this are also known as "pay-for-performance"). Health outcomes in VBP programs are benchmarked on several comparative measures for patient experience and clinical care, key mortality measures for acute care, and also by reporting infection rates related to health procedures. Although one of the goals of VBP programs is improving quality of care, they also make a concerted effort to at least monitor and potentially control Medicare spending per beneficiary. (33) The effectiveness of these programs remains mixed. A recent study found that many hospital programs were having difficulty quantifying and reporting performance goals; although a majority of hospital groups were able to identify goals relating to cost containment. (34) The concern here is that if VBP programs cannot clearly define and relay quality and cost goals, it will make it difficult to monitor them both internally and externally in order to measure the effectiveness of current benchmarks used for incentive payments.

Strengthening quality for Medicare Advantage

The ACA also established incentives for Medicare Advantage programs through several channels: establishing bonus payments for programs that can show increases in managed care, especially for patients with chronic conditions; identifying gaps in coverage for current beneficiaries and noncovered members in surrounding service locations; and improving general quality through educating staff, improving technology, and providing additional support in the form of nurses, physicians, etc. To ensure that Medicare Advantage programs are dedicating as many of the premium dollars as possible toward these services, a medical loss ratio (MLR) requirement of 85 percent was also established. (35)

Accessibility

Creating programs that address primary care shortages and support the building of the health care workforce

The ACA includes measures to address the accessibility of health care services. One way it seeks to address this is by examining the health care workforce and assessing how the government can support its appropriate training. Two areas that the law focuses on are primary care shortages and accessibility to rural health care providers.

The ACA recognizes a shortage of primary care physicians (PCPs), but also has provisions in the law that will increase demand by extending coverage to the uninsured. Other delivery reforms such as patient-centered medical home (PCMH) reforms call for additional primary care hours. Thus the health care industry and ACA must not only address current PCP capacity issues but also the additional capacity issues created by the law. The ACA intends to address some capacity issues in various ways:

- Payment reform (increase in provider incentive payments, discussed above)
- Service delivery models such as ACOs and PCMHs that are anchored on team-based primary care practices
- Financial and program support for training doctors in the primary care field. (36)

The National Institute for Health Care Reform (NIHCR) thinks that the current changes in the ACA may not be sufficient to boost the primary care workforce or may take decades to achieve the goal. It believes policymakers may want to increase capacity of PCPs by examining scope-of-practice policies, e.g., allowing advanced practice nurses (APNs) to deliver more primary care services. (37)

Adding a temporary increase in the Medicaid payments for primary care doctors (from Jan. 1, 2013, to Dec. 31, 2014)

To boost the incentive for primary care physicians to better manage care, the ACA established incentive payments of up to 10 percent of the total amount for certain qualified services. Incentive payments are also available for PCPs that opt to provide major surgical procedures in designated areas that have shortages of qualified health professionals. This is not only to increase overall quality, but also to increase access for individuals. (38)

Increasing payments for rural health care providers

For rural communities, the ACA also outlined several items relating to rural health centers that primarily involve expanding existing programs. The ACA extended the Rural Community Hospital Demonstration Program created by the Medicare Prescription Drug, Improvement, and Modernization Act of 2003. The rural-based demonstration program began as a feasibility study aimed to determine whether 15 rural community hospitals in areas with low population densities would be able to provide better access to Medicare beneficiaries for a defined set of inpatient procedures. (39) The ACA extended this program for five additional years beginning in 2010, which also included expanding the number of states currently eligible by two and the number of potentially eligible hospitals by 30. (40) The extension to this program and other existing programs attempted to increase the number of serviceable areas in communities with limited access to medical services or providers.

One of the largest efforts to analyze accessibility in low-utilization, low-access areas was establishing the study by the Medicare Payment Advisory Commission (MEDPAC) on adequacy of Medicare payments for health providers in rural areas. This study, released on a biannual basis, is intended to provide insight and potential recommendations on accessibility, payment programs for both providers and suppliers, the adequacy of payments, and the overall quality of care provided for rural health care beneficiaries. (41)

MEDPAC was established by the Balanced Budget Act of 1997 to advise Congress on the Medicare program (including on issues such as access to care, quality of care, policy and payment issues, etc.). Recent recommendations from MEDPAC have ranged from ensuring that Medicare policy is similar across

all payment types with the addition of new models, such as ACOs, to providing more clear and relevant statistics in measuring quality of care among beneficiaries. (42)

Requiring commercial health plans to meet specific criteria in terms of distance and mix of specialties in establishing provider networks

When qualified health plans (QHPs) are certified, they must meet federal and state regulations for network adequacy for commercial populations. Under federal regulations, QHPs are required to have a sufficient number and type of providers to ensure that all services are available without unreasonable delay.[31] This includes providers that treat substance abuse and mental health conditions. This also includes having a "sufficient number and geographic distribution" of essential community providers (ECPs) to ensure reasonable and timely access to them.[32] Beginning in 2015, the ACA also requires QHPs to only include hospitals and other providers that meet certain patient safety and quality standards, as determined by CMS. It also calls for rewarding quality through market-based incentives.[33]

Cost containment

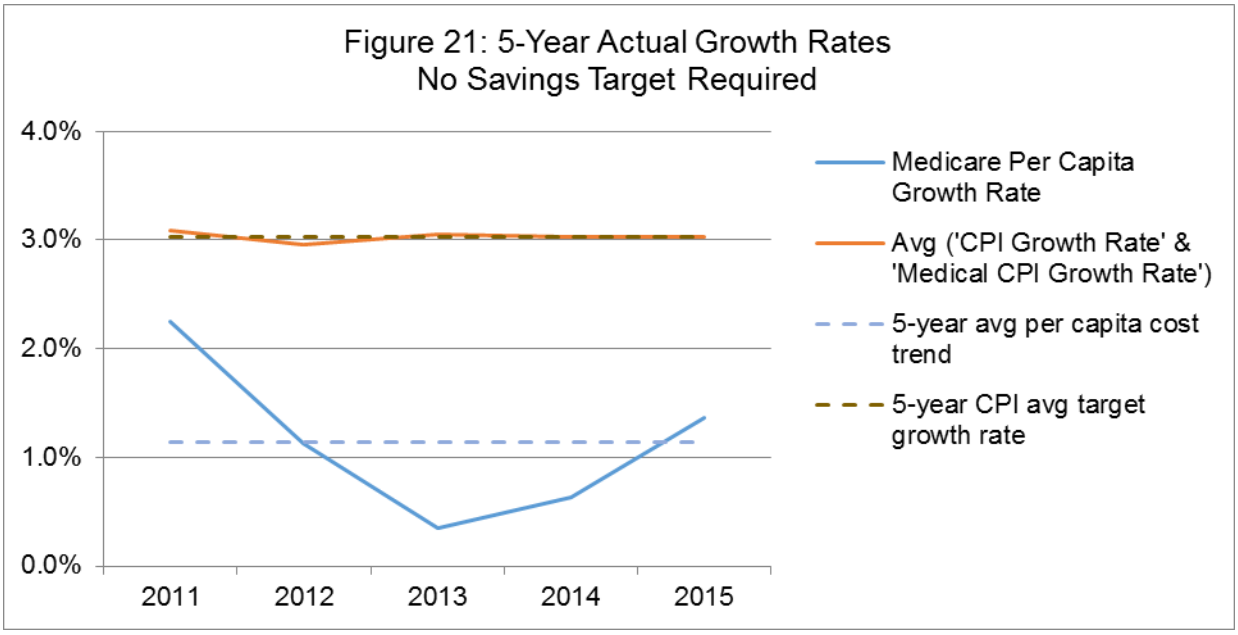
Addressing the final measure—cost containment—the ACA not only established regulation for payment reform models in the form of ACOs and the savings models associated with them through the newly established CMMI, but also created the IPAB to monitor Medicare cost trends. (43) Because MEDPAC could only make nonbinding cost-cutting recommendations, the IPAB was created as a body required by law to make cost-cutting recommendations, which Congress had to either approve or make another recommendation that saves a similar amount.

Establishing the IPAB

Every two years, beginning in 2013, the chief actuary of CMS will provide projected five-year average growth rates for Medicare per capita spending and compare that with the five-year average growth target, based off the average of the total consumer price index (CPI) for All Urban Consumers and the medical care expenditure category from that index. If the IPAB's five-year average projected per capita cost trend is greater than the target trend set by the chief actuary, then the IPAB must submit a proposal to reduce the growth rate to a predetermined savings rate that varies and is set by CMS. The IPAB proposal must not only reduce overall costs, but also cannot limit a beneficiary's access to providers by reducing utilization levels through restricting services, increasing premiums, or adjusting cost-sharing benefits. In the first report by the chief actuary to Congress on April 30, 2013, the five-year average growth rate for Medicare per capita spending was calculated to be 1.15 percent. This was less than half of the five-year average cost trend targeted growth rate, which meant that no savings target was needed and the IPAB did not need to submit a proposal to curb Medicare per capita spending growth for the implementation year beginning in 2015. See Figure 21 for an illustration where there is no savings rate required, as indicated in the recent report, and also a scenario in Figure 22 where a savings target would need to be implemented. (44)

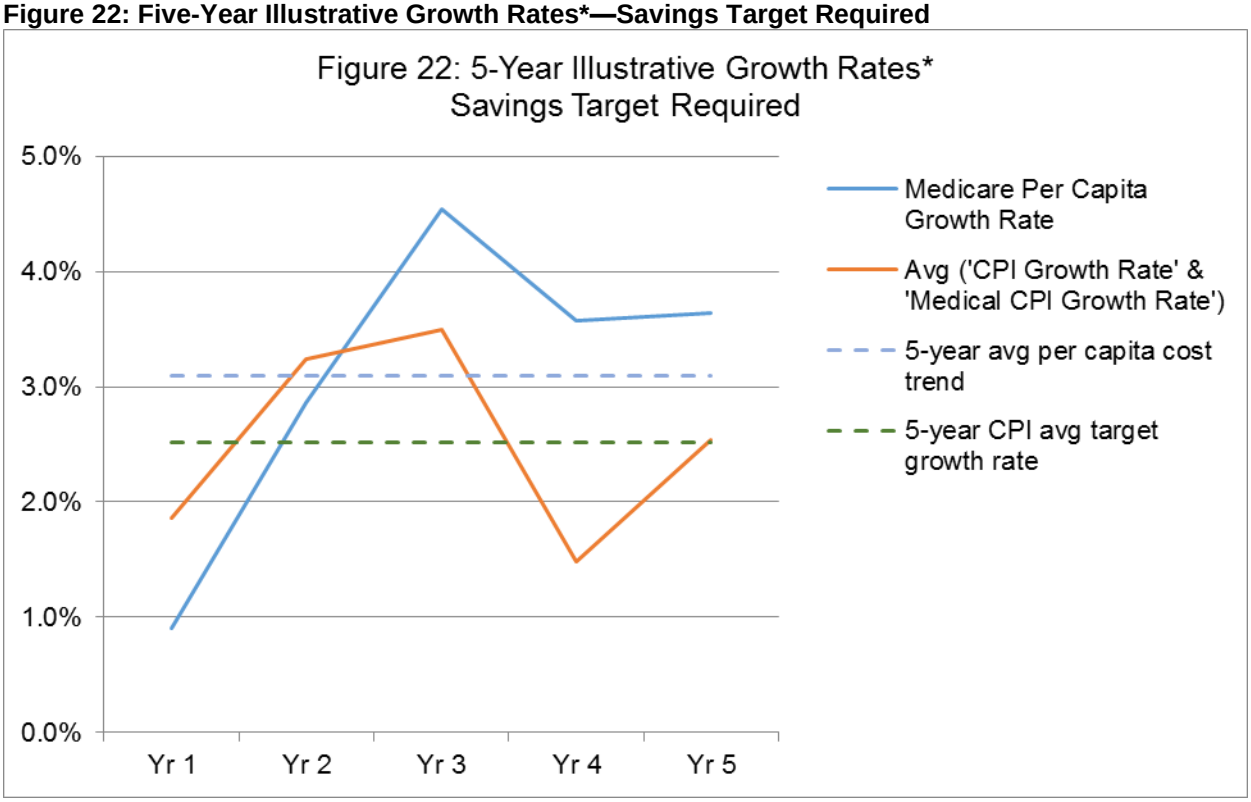
Figure 21: Five-Year Actual Growth Rates—No Savings Target Required

[31] 45 CFR 156.230: Code of Federal Regulation; Department of Health and Human Services; Health Insurance Issuer Standards under the Affordable Care Act, including Standards Related to Exchanges; Qualified Health Plan Minimum Certification Standards; Network Adequacy Standards.
[32] 45 CFR 156.235: Code of Federal Regulation; Department of Health and Human Services; Health Insurance Issuer Standards under the Affordable Care Act, including Standards Related to Exchanges; Qualified Health Plan Minimum Certification Standards; Essential Community Providers.
[33] ACA §1311. Affordable Choices of Health Benefit Plans. Subsections (g) and (h).



Source: U.S. Department of Health and Human Services, Office of the Actuary, 2013 IPAB Determination (April 2013)

Figure 22: Five-Year Illustrative Growth Rates*—Savings Target Required



* ***Note:*** *This chart uses illustrative data and is provided to illustrate a scenario where the five-year average per capita cost trend exceeds the five-year CPI average target growth rate provided by the chief actuary, resulting in a savings target needing to be implemented.*

This program should not be confused with the recently repealed sustainable growth rate (SGR)[34] system (from the Balanced Budget Act of 1997) nor the Medicare Volume Performance Standard (MPVS). The SGR system originally required rate cuts for physicians and health systems to curb the increasing cost of Medicare. Unlike the trends shown in Figures 21 and 22, the SGR only focused on the physician spending portion of the Medicare program. The rate was calculated based on the percentage increase in the physician fee schedule, the percentage increase in the average number of Medicare FFS beneficiaries, the estimated 10-year percentage change in GDP per capita, and the percentage change estimates in expenditures that are due to legislative changes. This program faced legislative resistance because of the steep cuts—as much as 30 percent in a given year—to physician fee schedules that were supposed to take place beginning in 2012. Many of these cuts have been delayed, reduced, and even reversed to increases through last-minute legislation. Although this program was in place prior to the ACA, MEDPAC has been required to report these growth trends and to provide suggestions to limit future Medicare spending and physician fee schedule payment rates. (45) With the repeal of the SGR, the physician fee schedule will have modest increases from one year to the next and incentives and reward physicians for value.

Addressing the benefit discrepancies between an FFS beneficiary and a Medicare Advantage beneficiary

Another attempt by the ACA to contain costs for beneficiaries in Medicare Advantage programs was to close the gap between the Medicare Advantage and traditional FFS per beneficiary payment rates. In the years leading up to the passing of the ACA, Medicare Advantage programs were paid 14 percent more, on average, per beneficiary, than traditional FFS Medicare plans. The ACA addressed this issue by

[34] SGR was repealed as part of the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA).

implementing a program from 2012 through 2017 to gradually reduce rebate levels and implement a rebate system based on the plan's five-star quality rating, further emphasizing the need not only to contain costs but also to increase quality. Recent results provide evidence of cost containment and quality efficiencies as benchmarks, bids and program payments have declined as a percent of FFS expenditures from 2009 levels. Medicare Advantage bids as a percent of FFS rates have declined from pre-ACA levels. (46)

Establishment of the Innovation Center

Further, to test new payment methods and to facilitate this transition, the ACA established the Innovation Center under CMS to encourage and promote the development of payment delivery models that attempt to improve patient outcomes through several channels. Examples of the innovations these models promote include: more efficient coordinated care, increased risk sharing among physicians and hospital groups, fostering collaborative institutions that promote best practices for improving the quality and cost of care for beneficiaries, and generally to increase managed care services that monitor and improve patient health status. (47) The Innovation Center began with testing 17 different payment models, 11 of which fall under Sec. 3021 of the ACA,[35] while the other six models were required under separate ACA provisions.[36] (48)

To implement these models, the Innovation Center must first develop feasibility proposals outlining budget considerations and projected payment reform impact and submit them to CMS, HHS, and the Office of Management and Budget (OMB) for review. Once the model has been reviewed and approved, and budgetary appropriations have been established, further planning, testing and development begins. For models implemented under Sec. 3021 of the ACA that established the Innovation Center, CMS set aside $10 billion through 2020 to fund them. (47) For models developed that do not fall directly under this section of the law, such as the six identified in the footnote, funding is appropriated as needed once approved.

Payment reform in fee schedule announcements

In general, to gain a better understanding of how Medicare addresses payment reform, the fee schedule announcements and final rules outline various payment reform updates related to implementing new programs, revising existing programs and initiatives, and updating rates, coding and documentation standards. For instance, the Medicare Hospital Inpatient Prospective Payment System (IPPS) final rules have recently focused on new programs that were established under the ACA, such as the Medicare Hospital VBP program and the Hospital-Acquired Condition (HAC) Reduction program. Additionally, the IPPS continually refines payment reform methods through updating the coding and documentation standards used to calculate repayment rates, such as the weights used to repay MS-DRG services, clarifying rules regarding inpatient admissions. (50) Similarly, recent rules regarding payment reform in the Medicare hospital outpatient setting found in the yearly Hospital Outpatient Prospective Payment System (OPPS) final rule have focused on implementing revisions to the Social Security Act and the implementation of the ACA. These updates have modified portions of the law for certain existing outpatient programs such as the Quality Improvement Organization (QIO) (increasing flexibility for administering the program) and the Medicare FFS Electronic Health Record (EHR) Incentive program (improvement in claims payment reporting for critical access hospitals), as well as expanding the scope and authority of the Advisory Panel on Hospital Outpatient Payment. (51) The IPPS and OPPS final rules help regulate and redefine payment reform in the Medicare setting by readjusting rate and payment systems, while also implementing new organizations required by the ACA to better manage the cost and quality of care for Medicare beneficiaries moving forward.

Conclusion

[35] State Demonstrations to Integrate Care for Medicare-Medicaid Beneficiaries; Federally Qualified Health Center Advanced Primary Care Practice; Partnership for Patients: Hospital Engagement Networks and Other Strategies; Pioneer ACO Model; Strong Start for Mothers and Newborns; Advance Payment ACO Model; Health Care Innovation Awards; Comprehensive Primary Care Initiative; Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents; BPCI; and Financial Alignment Initiative.

[36] Incentives for Prevention of Chronic Diseases in Medicaid; Partnership for Patients: Community Based Care Transitions; Treatment of Certain Complex Diagnostic Laboratory Tests; Independence at Home Demonstration; Medicaid Emergency Psychiatric Demonstration; and Graduate Nurse Education Demonstration.

The ACA has made substantial headway in the transformation of Medicare and Medicaid programs, one of the driving forces toward payment reform. These changes have created trickle-down effects in the commercial market. Certain programs from the ACA, such as the MSSP and the BPCI, have served as frameworks for programs emerging in the commercial market. However, reduction in payments in the Medicare and Medicaid markets incentivizes some providers to seek other sources for offsetting the lost revenue, most typically commercial market reimbursement levels. Effectively, through its dictating public program provider payment levels, the government has apportioned the challenge to control costs to private health insurance plans.

APPENDIX C
Hospital and Physician Organizations

HOSPITAL AND PHYSICIAN ORGANIZATIONS

It is important for the payment reform team to consider types of provider organizations in a payment reform model because they provide governance, organizational and structural functions to the payment model chosen, which helps the payment model to succeed operationally and to accept and manage risk. In this process of choosing a payment or service delivery model, partnerships between organizations of providers might form. These partnerships can serve the purpose of providing better care continuity, meeting geographical access requirements, securing referrals, increasing market share and negotiating better rates. There are many laws that ultimately decide how these provider organizations need to take shape, so a deeper understanding should be sought from a legal or compliance expert specializing in health care.

Care coordination and antitrust regulations

A health plan's members may see multiple providers for their health care. Payment reform by definition involves a level of "horizontal" integration—or, at least, coordination—among providers who might otherwise be competitors, as well as "vertical" integration among providers at different levels, such as hospitals, primary care physicians (PCPs), specialists, durable medical equipment (DME) providers, home health care organizations, skilled nursing facilities (SNFs), inpatient rehab facilities, etc. For example, bundled payments (discussed above) encourage vertical integration among hospitals, doctors, SNFs and home health agencies, as the hospital is now ultimately responsible for the cost of patients once they leave its facilities. High-quality care is one of the main objectives of payment reform, and care coordination is one of the tools used to achieve quality and lower costs. The Institute of Medicine has estimated that care coordination efforts could save $240 billion to $310 billion in annual health care savings (excluding administration costs). (52) Given that the actual national health expenditures in 2012 were $2.8 trillion, care coordination could contribute an 8 to 10 percent decrease in costs. This coordination is fundamental to the goals, but may raise antitrust concerns in a given locality. (53) Unaffiliated horizontal coordination may make it possible for providers to obtain pricing power over commercial insurers.

To comprehend the legality of existing and new provider organizations under payment reform, the U.S. Department of Justice (DOJ) and the Federal Trade Commission (FTC) are tasked to determine whether provider organizations violate antitrust laws. Their point of emphasis is to review cases where organizations might be price-fixing. Guidance on the general framework in establishing antitrust law violations was initially released in their "Statements of Antitrust Enforcement Policy in Health Care" in August 1996. (54)

Within that guidance, they note several safety net rules regarding physician joint ventures and multiple-provider networks. Their guidelines suggest that exclusive networks[37] should not exceed 20 percent of the number of physicians in their areas. Likewise, for nonexclusive networks, the guidance stresses that they do not exceed 30 percent of the physicians in the area. This guidance is not prescriptive, but is a flexible target that provider groups can exceed as long as the DOJ and FTC determine that the venture is still pro-competitive. Additionally, the guidelines suggest that these ventures agree to a risk-sharing arrangement to promote overall efficiency goals and proper incentives to meet those goals. Again, this guideline is flexible in that if a venture does not have substantial risk sharing but demonstrates clinical integration or overall efficiency gains, then it can be deemed pro-competitive. In some cases, these efficiencies can be as simple as the fact that the health plan does not have to incur the burden of costly negotiations with every physician in the venture.

[37] Exclusive networks are provider organizations that contract with insurers only reimbursing members if they obtain service from a provider in that organization. In contrast, an example of a nonexclusive network would be a preferred provider organization (PPO).

Providers are subject to these antitrust regulations in part to prevent them from having too much pricing leverage over insurers in their negotiations because of a lack of alternative provider competition. In the study, "Competition in Health Insurance: A Comprehensive Study of U.S. Markets," the American Medical Association (AMA) analyzed how much pricing power the insurers have when they come to the bargaining table, by calculating the concentration of health insurers in defined geographical areas. The AMA calculates Herfindahl-Hirschman Indices (HHIs) for 385 metropolitan statistical areas (MSAs). Of the 385 MSAs in the index, the report found that 72 percent were "highly concentrated," with an HHI greater than 2,500.[38] Additionally, at least one insurer had a commercial market share of more than 30 percent in 90 percent of the MSAs. (55)

Network access and adequacy

DOJ and FTC requirements limit the size of a provider organization, while access and adequacy requirements prevent accountable care organizations (ACOs) and ACA-compliant health plan networks from being too small. Health plans must meet state and federal requirements for access and adequacy, which include rules for the number of essential community providers (ECPs) and state rules for network adequacy based on plan type, e.g., PPOs and health maintenance organizations (HMOs). In general, though, most health plans evaluate the sufficiency of their networks to meet the needs of the population using two standards:

1. **Access.** Presented in distance or time, access is a way of measuring the distance between provider offices and member locations. Access standards are typically expressed in terms of a percentage and a miles standard (e.g., 90 percent of patients have access to two PCPs within 10 miles). There are variations on this theme, including an *X*-mile radius, an *X*-mile driving distance, and an *X*-minute driving time. Our research suggests that the radius measure is the most common, but that use of driving distance is increasing because of the ready availability of software for calculating true driving distances.

2. **Adequacy.** Presented in ratios of providers per member or members per provider, adequacy is a way of measuring whether a network has enough providers to meet the medical needs of the population. They are typically expressed for primary care and selected specialties. For example, PPO adequacy ratios for the state of Illinois are:

    — Primary care (56):

        - PCP: 1 physician per 1,000 members

    — Specialty care (56):

        - Cardiology: 1 per 10,000
        - Gastroenterology: 1 per 10,000
        - General surgery: 1 per 5,000
        - Neurology: 1 per 20,000
        - Obstetrics and gynecology (OB/GYN): 1 per 2,500
        - Oncology: 1 per 15,000
        - Ophthalmology: 1 per 10,000
        - Urology: 1 per 10,000

[38] The horizontal merger guidelines issued by the DOJ and FTC incorporate the HHI. They define un-concentrated markets with an HHI less than 1,500, moderately concentrated between 1,500 and 2,500, and highly concentrated greater than 2,500. See: U.S. Department of Justice and Federal Trade Commission (August 2010), Horizontal Merger Guidelines.

Some organizations have started using “appointment availability” as a third standard for evaluating their provider networks. These standards typically involve measuring the number of appointments available for a routine appointment within a given time period (e.g., on average, the provider should be able to offer three appointment slots within seven days of the patient’s request). Health plans measure performance against this standard through outbound telephone calls to a sample of providers, by surveying members, and by researching member complaints. (57)

In an ACO application we have seen, the provider was asked to fill out the total full-time employees (FTEs) within a five-, 10-, and 15-mile radius by ZIP code for the following providers:

- Internists and family practitioners
- Specialty (defined by the employer)
- Pediatricians
- OB/GYNs
- Hospitals.

The employer or health plan can then assess whether it needs additional providers to meet access adequacy requirements. If it does, this may require providers to have alliances and control costs for providers with whom they would not otherwise have worked.

When forming partnerships and delivery models in attempts to tackle these geographical issues, hospital and provider organizations have to really consider the legal restrictions to avoid violating any antitrust legislation.

Rural versus urban

Most rural health care is not as advanced in payment model risk as its urban counterpart. However, it is on the path to coordinate with more telemedicine and electronic health care. As a result, rural health care will eventually be able to accept more provider risk as well as integrate care.

Rural hospitals are generally more sensitive to economic and legislative changes, which is due to the low volume of patients. This puts a financial burden on rural hospitals to offer a wide variety of services, similar to their urban counterparts, but with less utilization and resources. The delicate balance of increasing access and coverage of services while keeping costs for rural Americans low makes it difficult for rural hospitals to attract and support a diverse and adequate supply of providers; especially so for staffing specialists. (58)

Other legal limitations

Other legal considerations regarding the formation of provider organizations and referral arrangements include:

- **Stark law:** “Under the federal physician self-referral law, a physician may not refer Medicare patients for certain 'designated health services' (DHS) where the physician has a financial relationship with the entity to which the patient is referred unless all components of an applicable exception are met. These exceptions include 'fair market value' or 'personal service arrangement.' In order to fit within the exception, the compensation paid must be set in advance, not exceed market value, and not take into account the volume or value of the physician referrals.” (59)

- **Anti-kickback statute:** “This law prohibits knowingly and willfully paying to induce referrals for services paid for by federal healthcare programs.” (59)

- **Civil Monetary Penalty (CMP) statute:** "The CMP Statute prohibits hospitals from making payments to physicians directly responsible for patient care that might have the effect of reducing or limiting services to Medicare or Medicaid beneficiaries." (59)

Other legal considerations include the False Claims Act, an entity's tax-exempt status, Medicare's provider-based requirements, and state laws. (59)

In 1999, the U.S. Office of Inspector General (OIG) ruled that gain-sharing arrangements between hospitals and physicians violate current federal law. (60) However, in 2001, the OIG approved its first exception to the ruling and, since then, has approved 12 additional gain-sharing programs and one P4P program. (60)

Other key considerations and specific types of provider organizations

In addition to care coordination, antitrust considerations, and geographical access requirements when forming provider organizations to meet payment reform objectives, other key considerations are:

- Whom does the payer pay?
- Must the payee distribute payments to other organizations?
- If so, how is the payment allocated among the organizations?
- Will new business relationship(s) be required?
- Are there specific legal and operational issues related to these relationships?
- How will beneficiary choice be maintained?
- Will the payment model operate within the existing billing and payment system framework or require a new payment mechanism?
- How will the quality criteria be integrated into the payment mechanism?

As noted, these provider organizations are varied and flexible, but some more structured physician networks and alliances include:

- Comanagement service agreements
- Hospital physician employment
- Independent practice associations (IPAs)
- Physician-hospital organizations (PHOs).

Comanagement service agreements

Comanagement service agreements are becoming more popular with the increase in value-based arrangements. The American Health Lawyers Association (AHLA) defines a comanagement agreement as follows: "Agreement between a health system and a physician group [that] can provide for the performance of a variety of services, including, for example, medical director services, strategic planning, scheduling and staffing, and human resources duties. These types of arrangements can range from simple relationships amounting to no more than glorified medical directorship agreements to complex structures such as giving the entire profit and loss responsibility of a hospital service line to a physician group." Structured around regulatory considerations listed above, these agreements with the hospital system allow the physicians to retain some independence to better manage operational risks, while still having governance and interest in the hospital operations and health care delivery. As such, "they may be implemented more quickly and economically than physician employment and gains-sharing arrangements." (59)

Hospital employment and hospital-owned physician organizations

Physician employment by hospitals means that the doctors are direct employees of the hospital and are paid salaries. (59) Physician employment has been gaining more traction lately as the newest generation of physicians like the work/life balance that can come with it. And the hospitals have more direct control over the care coordination efforts that they are making with their physicians.

In addition, a growing number of hospitals are acquiring physician practices or hiring physicians as employees to provide office-based professional services, driven in part as a result of the financial incentives of the ACA. While this trend is most pronounced in specialty physician care, it encompasses a wide spectrum of care delivery. This sort of consolidation builds integrated delivery systems that can lead to care that is better coordinated—that reduces duplication of tests and treatment and should lower total expenditures. This trend has benefits and drawbacks to all interested parties.

Hospital employment of physicians can also guard against certain self-referrals that the Stark law does not anticipate. Although the Stark law prevents self-referrals, there are several exceptions, most notably physician services and in-office ancillary services.[39,40]

Independent practice association

An independent practice association (IPA) organizes physicians together to help create certain efficiencies and allow them to achieve goals that would be difficult for an individual physician or a small practice. The responsibilities of IPAs vary widely, but some roles include: negotiating contracts with insurance companies, credentialing and organizing physicians, disbursing payments, creating referral processes, and utilization review. They can also make sure that the physicians in the group are upholding certain quality standards. Because an IPA is typically a business, it must maintain its overall fiscal integrity. An IPA is more capable of taking on risk than individual physicians.

Physician-hospital organizations

A physician-hospital organization (PHO) has objectives that are similar to an IPA but involves collaboration and cooperation with hospitals *and* physicians. It often is created by an IPA and a hospital system. The purposes for creating PHOs can vary widely as well, but some roles include sharing of best practices, overseeing the integration of physicians and hospitals into health delivery networks, assisting in voluntary group formation, collecting and analyzing data, contracting with health plans and distributing global capitation and other types of payments among participants, developing benchmarks for standards of care, and building trust between hospitals and independent physicians. In addition, PHOs assist with developing protocols for utilization management, quality improvement and credentialing. PHOs can establish reimbursement and risk-sharing approaches that help align incentives among all physicians. [DOJ1996]

The degree of legal, financial and structural integration would be dependent on the third-party reimbursement strategies and the degree of integration, as illustrated in Figure 23.

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[39] The full list of exceptions includes: Physician services, in-office ancillary services, prepaid plans, intra-family rural referrals, academic medical centers, implants furnished by ambulatory surgical centers, erythropoietin and other dialysis-related drugs provided by an end-stage renal disease facility, preventive screening tests, immunizations, vaccines, and vision care following cataract surgery. This list was provided from the following source: Atlantic Information Services, Inc. (October 2010), *A Guide to Complying with Stark Physician Self-Referral Rules*, Chapter 400: The Stark Law Exceptions, Section 410.

[40] A recent study explored this exception and the incentive to self-refer by examining how reimbursement levels and utilization varied among urology groups that had purchased intensity-modulated radiation therapy (IMRT) machines. IMRT is an expensive treatment for prostate cancer, but there are two clinically equivalent treatment measures to treat the cancer that are reimbursed at half the rate. For self-referring urologists in private practice, the study found a 17.9 percentage point increase in IMRT use once the IMRT machine was purchased, but only a 1.3 percentage point increase in IMRT utilization by non-self-referring urologists. The study found an even greater difference among urologists employed at National Comprehensive Cancer Network (NCCN) centers. IMRT use increased by 33 percentage points for the self-referring urology groups and remained unchanged for the urologists that were employed directly by the NCCN. (61)

Figure 23: Physician-Hospital Organizations

Some of the most well-known examples of integrated delivery systems (IDSs) include: Kaiser Permanente, Geisinger Health System and the Cleveland Clinic.

One reason that provider-owned health plans and IDSs may be tough for an organization to implement is the large capital requirements. The need for capital will depend upon an organization's state of domicile and partnering organizations. As an example, Unity Health in Wisconsin held $56 million in capital and surplus for 150,000 lives. (62)

APPENDIX D
Types of Other Provider Organizations

TYPES OF OTHER PROVIDER ORGANIZATIONS

Besides doctors and hospitals, other types of provider organizations include ambulatory surgical centers, skilled nursing facilities, hospice providers, durable medical equipment (DME) providers, pharmacies, academic medical centers, Federally Qualified Health Centers (FQHCs), and rural health clinics that serve different needs of the population. A few are discussed below.

Academic medical centers

Academic medical centers consist of accredited medical schools, which include universities where appropriate. These organizations are usually a 501(c)(3) or 501(c)(4) tax-exempt organization faculty practice plan. A key characteristic is that they typically have one or more affiliated hospitals at which a majority of faculty serves as acting physicians. Many of the associated hospital admissions are made by these faculty members. The centers also provide onsite training and internships for the school's medical students. In addition, academic medical centers typically do more complicated procedures than a community hospital, such as certain transplants.

Federally Qualified Health Centers

FQHCs are "safety net" providers that include community health centers and public housing centers and primarily serve individuals and groups lacking access to traditional health services, often underserved urban and rural communities. These centers provide outpatient health programs funded by the Indian Health Service along with several additional programs that serve migrants and the homeless. (63)

Safety net providers

Safety net providers are similar to FQHCs in that they offer care to patients who are underserved and lack traditional medical access. The defining characteristic of these providers is that they often offer care and treatment regardless of the ability of their patients to pay for services. This results in a large portion of patients being uninsured, along with Medicaid, low-income, and other vulnerable groups. The "core" safety net providers often consist of certain public hospitals, community health centers, rural clinics and local health departments, along with a few specialized programs such as school-based clinics and other programs that provide AIDS assistance and relief. (64)

These are just a few of the types of providers and networks that are affected by payment reform and have to consider potential legal issues regarding existing and future payment arrangements as new regulations are passed, such as the ACA. Provider organizations must take into consideration the arrangements they have with different payers along with potential antitrust concerns if integration and payment arrangements change. This area of health law is continuing to evolve. For example, for the Medicare Shared Savings Program (MSSP), the participating hospitals were offered a series of waivers to shield them from potential legal risk. As these programs become more common, there will probably have to be changes to the laws. (65) Effective hospital and physician alignment is critical to the success of value-based health programs and payment reform. Because they are organization-specific, the payment reform team should consult with a health care attorney and the health system executives to best understand the underlying structure.

APPENDIX E
Data Tools

DATA TOOLS

As shown in the case studies above, an actuary needs the appropriate data sets and tools to perform various analyses. In addition, providers need to develop systems and tools to properly identify and manage the risks associated with accountable care organizations (ACOs) and payment reform contracts. To manage the risks associated with the chosen model and specific ACO contract requirements, ACOs and providers need specific data from their partnering payers and also may leverage sophisticated claims groupers that assist in managing the large patient databases.

Analytic support

For an ACO or provider to effectively manage the risk associated with an ACO contract or other payment model design, a robust data analytic system is needed. The ideal solution is to deploy an analytic infrastructure that is designed specifically for population-based health care analytics. Several key characteristics of a successful solution of this nature include:

- Detailed monthly enrollment information from each risk contractor.
- Detailed monthly claims information, including allowed amounts and provider National Provider Identifier (NPI), from each commercial contract. If allowed amount is not available, encounter data is still useful, as relative value units (RVUs) can be used as a proxy for allowed amount. The ACO may need to prioritize its need for NPI or allowed amount from non-ACO providers, as insurers may not be willing to provide both data fields for competitive reasons.
- Monthly pharmacy data for all members, including National Drug Code (NDC), member ID and claims amounts.
- Member risk score information, including the specific risk score used by each commercial contract and any unified risk scores that the ACO uses internally.
- Provider and member matching logic to link data between the various data sources and the ACO's electronic health records (EHR) data.
- Provider attribution logic to assign members to a primary care physician (PCP) as well as specialty and facility attribution for episodes of care.
- Classification systems, such as DRG assignment, service and utilization count assignment, episodes of care assignment, and member risk score assignment.
- Evidence-based measures to calculate industry-standard quality and care metrics, e.g., Healthcare Effectiveness Data and Information Set (HEDIS), AHRQ Prevention Quality Indicators (PQI), New York University emergency department (NYU ED) algorithm, etc.
- Contract quality measures to facilitate tracking of performance and qualification for incentive payments.
- Benchmark information from either an All Payer Claims Database (APCD) or other external source.

An ACO or provider can design and create a solution like this from the ground up or can look to license the use of commercially available systems. Development of a solution can take a significant amount of time and resources. A commercially available system can be implemented more quickly, but usually requires a substantial financial investment. The most critical component of any approach is securing access to the detailed data required to populate the system. This generally requires upfront planning in the contracting phase to secure the permission, data supply cost and cooperation of the data sources. In addition, these types of solutions can be generalized for all payment reform models. However, they will be more complex or simple depending upon the model.

Groupers

A prudent prerequisite to entering into a risk arrangement is an understanding of the various costs that will apply to the subject market and organization. As mentioned above, claims data is usually the best place to start with these types of analyses. Although administrative claims data does have its limitations (e.g., lack of data for all patients in a given health system and lack of disease severity), it is the only place to get all covered services incurred by a patient inside and outside of the system. There are a lot of *groupers* available to help stratify claims data and understand medical costs. A grouper is a tool used to stratify, separate and analyze claims data sets. Each group has specific clinical biases and offers different perspectives of the data, and, in many cases, may not achieve the user's exact objective. In some cases, it will make sense to go with existing software. In other cases, users might decide to write their own claims groupers. Groupers can be clustered into the following categories: Bundled payment and episode payment groupers, chronic condition groupers, and inpatient and outpatient groupers. Our intention is not to endorse any particular grouper, but to make the reader aware of their availability and their value in the process of establishing different payment arrangements.

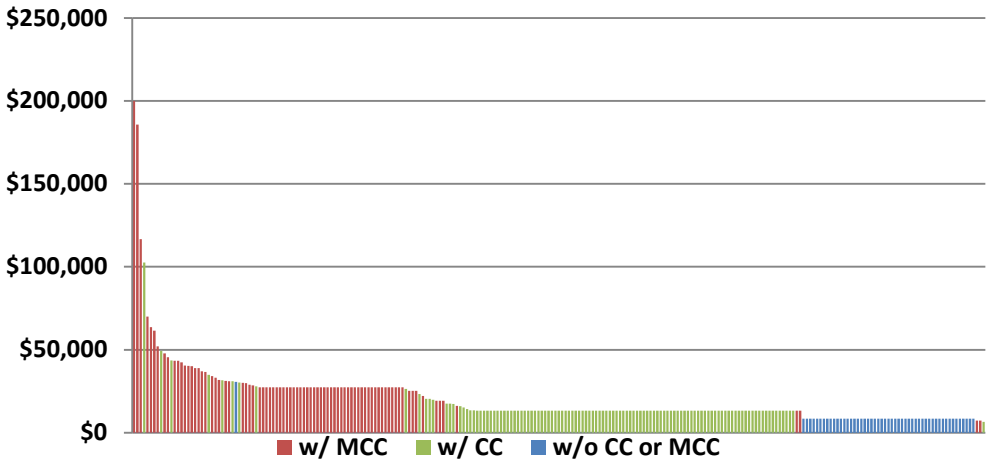
- Inpatient and outpatient episodes
  - Medicare Severity Diagnosis-Related Groups (MS-DRG)
  - Ambulatory Payment Classification (APC) system
  - All Patient Refined DRG (APR-DRG)
  - Enhanced Ambulatory Patient Grouping (EAPG)
- Bundled payment and episode payment groupers
  - Episode Treatment Groups (ETGs)
  - Medical Episode Groupers (MEGs)
  - Prometheus Payment model
- Chronic condition groupers
  - Chronic Condition Hierarchical Groups (CCHGs)
  - Clinical Risk Groups (CRGs)
  - Chronic Illness and Disability Payment System (CDPS)

Inpatient and outpatient groupers

The MS-DRG grouper software categorizes hospital cases into groups based on similar claims types and classifications such as procedure type, discharge status and comorbidities, as well as categorizing claims using several demographic factors such as age and gender. The MS-DRG classification is a prospective payment system where payments occur after hospital discharges. The MS-DRG payment system is typically subject to an outlier-days threshold that kicks in with per diem payments when a certain threshold of days occurs.

The traditional MS-DRG classification system recognizes the statistically significant differences in costs and appropriate revenue between cases having major complications (MCCs), cases with complications (CCs), and cases with no complications. The efficacy of the traditional MS-DRG payment system is illustrated in Figure 24, which shows the traditional Medicare hospital payment—excluding indirect medical education (IME), graduate medical education (GME) and disproportionate share hospital (DSH)—for major small and large bowel procedures (MS-DRGs 329, 330 and 331). Figure 24 demonstrates that there is very little cost variation for MS-DRG 331 ("w/o CC or MCC"), showing that the blue bars are very short and uniform. There is increasing cost variation for MS-DRG 330 ("w/ CC") and significant variation for MS-DRG 329 ("w/ MCC"). Figure 24 shows the difference in cost variation for each of the three buckets. The prospective payment structure (based on discharge status) allows these three very different cost patterns to be paid for separately and outlier payments make up for some of the additional variation seen in MS-DRG 329.

Figure 24: Distribution of MS-DRGs 329, 330 and 331



The APC system is Medicare's way of paying for outpatient services. APCs are analogous to the Medicare prospective payment system for hospital inpatients known as the diagnosis-related groups (DRGs). APCs are quite complex and are out of the scope of this paper, but Medicare is increasingly beginning to focus on savings in the outpatient setting, and more attention may be paid to payment of outpatient services in the future.

Unlike MS-DRGs, the 3M Health Information Systems APR-DRGs used in its grouper are not limited to the Medicare population. All possible reasons for hospitalization are categorized into mutually exclusive groups, encompassing diagnoses for all patients, including children, women, and enrollees of commercial health plans. Weights for MS-DRGs are calculated using the Medicare cost reports; thus items such as maternity or other more commercial diseases may be understated in the MS-DRG grouper. The APR-DRG grouper was designed to address these issues and is a popular reimbursement method for Medicaid agencies.

Additionally, the 3M APR-DRGs utilize the basic DRGs by adding four subclasses that capture severity of illness (SOI) and risk of mortality (ROM) differences among patients. These differences are distinct patient attributes where SOI relates to the extent of physical illness or loss of organ function and ROM relates to the likelihood of dying.

The EAPGs, the outpatient counterpart to 3M's APR-DRG grouper, include the full range of services provided in the ambulatory setting. EAPGs classify patients who receive ambulatory services by both the cost and resource utilization. These patients tend to have similar medical treatments, which results in similar costs and resource utilization per visit.

As of July 2013, nearly 20 Medicaid programs will be using 3M APR-DRGs for inpatient payment, including seven of the eight largest programs in the country.

Massachusetts, New Hampshire, New York, Virginia, Washington and Wisconsin Medicaid (and Illinois soon) are using the 3M EAPG. (66)

Bundled payment and episode groupers

Bundled payment and episode groupers take payments for an episode, such as knee and hip replacements, lung cancer, stroke or coronary artery bypass graft (CABG) surgery, and group the anchor event or incidence of the disease and all of the related services for a predefined payment amount. They take the inpatient/outpatient groupers a step further and look at post-acute care, not just the initial inpatient or outpatient event. There are lots of these groupers on the market, including the Prometheus Payment model, the MEGs, and the ETGs. These groupers may depend on an inpatient or outpatient grouper already being run on the data. Episode groupers can be a quick and cost-effective way to stratify data into episodes.

However, sometimes clinicians and organizations wish to customize underlying clinical definitions and create their own systems.

Chronic condition groupers

Chronic condition groupers take patients and stratify them into broad disease categories. Therefore, all of their claims- or disease-specific episodes and claims costs would get attributed to the overall costs of treatment for the entire patient. This is helpful in terms of understanding the costs of an entire subpopulation.

CCHGs have 43 nonoverlapping categories. The conditions are placed in a hierarchy with the theory that the highest-ranking condition will have the most influence on how a patient is treated. For example, the top condition is psychosis and the second is dementia. A doctor treating a patient with multiple comorbidities and psychosis will need to treat the patient's psychosis first. Thus the patient gets stratified into its highest-ranking condition, and the costs go with that category.

CDPS: Medicaid groups and state agencies typically use the CDPS to help stratify populations. The CDPS was originally developed for states to use in adjusting capitated payments for Medicaid beneficiaries. (67) There is also a Medicare version that was developed later.

CRGs assign patients to a single, mutually exclusive risk category based on a classification system that enables clinicians to more easily interpret and further communicate the grouper outputs. Like the CCHGs, these categories are hierarchical. The individuals are assigned to one of nine health statuses. (68)

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