

# Developing Pay-for-Performance Compensation for Physicians in Medicare

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# Motivating Policy Question

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- Public spending on healthcare in USA is unsustainable
- Three principal public programs
  - Medicare – for elderly and disabled
  - Medicaid – for poor
  - Accountable Care Act (ACA) – for lower-middle income
- In 2025, projected federal spending on healthcare, social security (pensions) and interest will consume more than 85% of all revenues
- Recent legislation mandates developing cost containment policies to retard public spending in healthcare programs

# Major Policy Innovation Involves Paying Healthcare Providers Based on Performance

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- A provider's performance measured by costs of care relative to peer providers
  - Also includes some measures of quality
- Adjust provider's reimbursement for medical services depending on measure of performance
  - Lower total costs implies higher payment per service
- P4P (Pay-for-Performance) for physicians begins in 2015 in Medicare, and will be applied to all physicians by the end of the decade
- Purpose of my presentation today is to describe the role played by economics research and tools in designing P4P programs in Medicare

# Presentation Outline

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- Overview of Medicare program
- Features of a P4P compensation system
- Assessing provider's relative cost
- Options for scoring providers based on their costs
- Creating a payment system to incentivize providers

# Presentation Outline

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- **Overview of Medicare program**
  - Description of services
  - Unsustainable cost growth
- Features of a P4P compensation system
- Assessing provider's relative cost
- Options for scoring providers based on their costs
- Creating a payment system to incentivize providers

# Description of Medicare Program

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- Medicare pays for medical services for the elderly (65+) and the disabled
  - About 45 million enrolled
  - Accelerating growth in enrollment
- Services
  - Hospital in-patient
  - Skilled nursing home
  - Physician
  - Drugs
  - Hospital out-patient
  - Home health
  - Durable medical equipment
  - Hospice
- Two main programs
  - Fee-for-service (FFS): Medicare pays 80%+ of cost per service
  - Managed care: Medicare pays base premium

# Cost of Medicare Are High and Growing Rapidly

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- About 85% of FFS beneficiaries have costs during a year
- Average cost for these beneficiaries was about \$12,500 in 2011
- 10% had costs more than \$33,500 and they accounted for about 60% of total annual spending
- 5% had costs more than \$55,500 and they accounted for about 40% of total annual spending
- 2% had costs more than \$90,000 and they accounted for over 20% of total annual spending

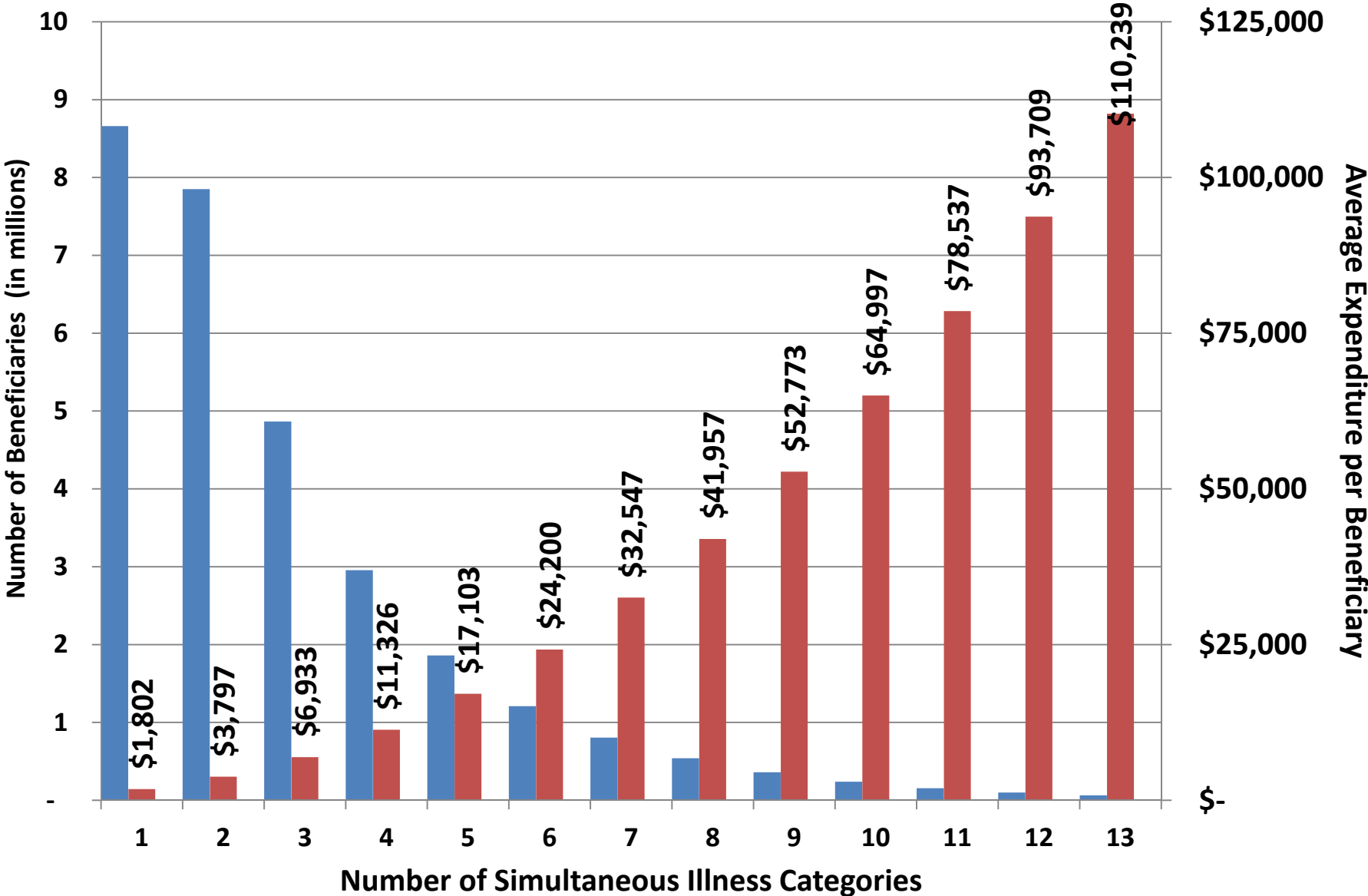
# Sources of High Medicare Costs Consist of Medically Complicated Patients

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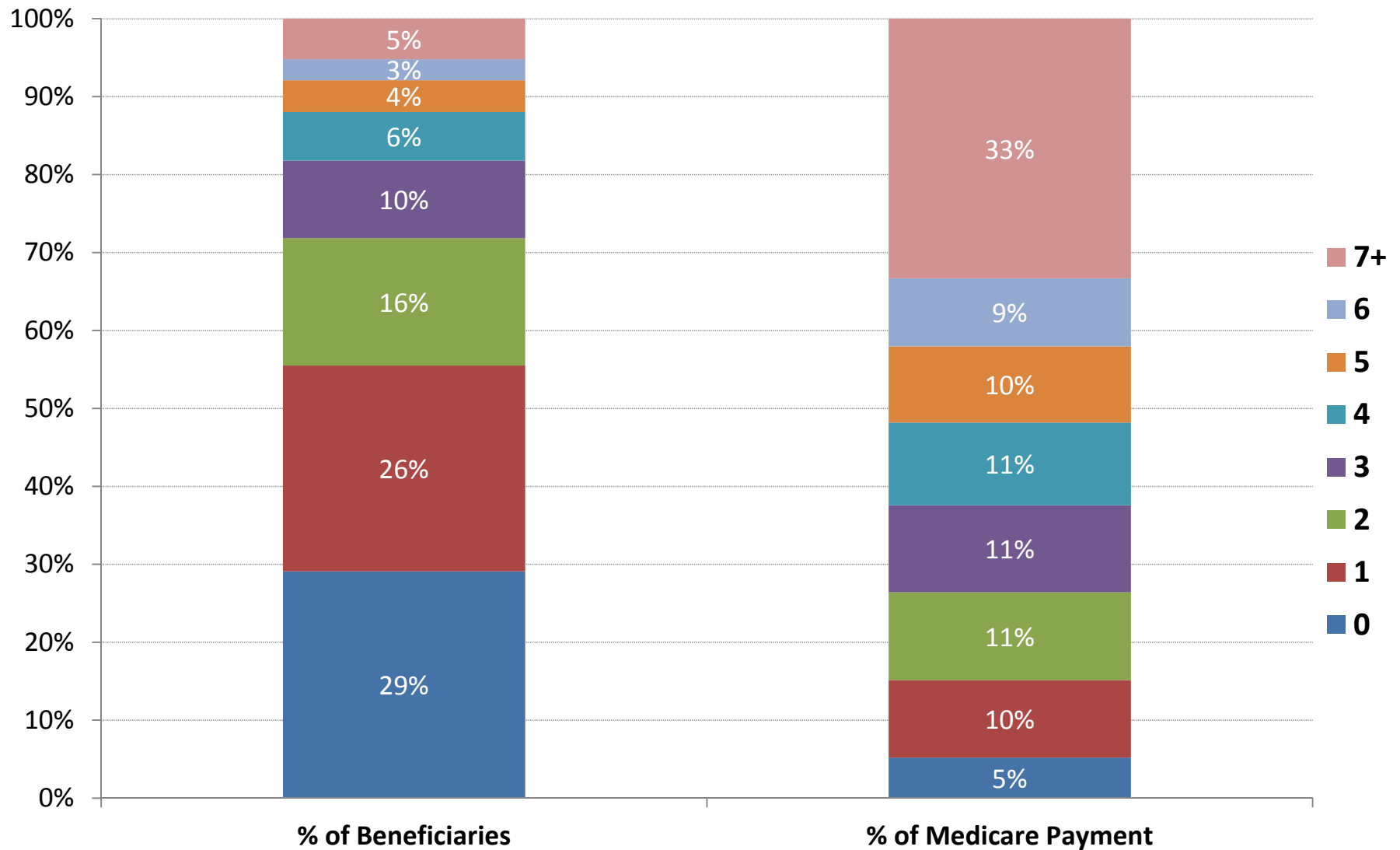
- High cost patients are ones with multiple comorbidities
  - Costs compound significantly with each additional condition
- Consider patients with health conditions falling into the Illness Categories (ICs) used by Medicare for its risk adjustment payments
- About 50 ICs includes such conditions as: cancer, diabetes, myocardial infarction, stroke, renal failure, heart arrhythmias, chronic obstructive pulmonary disease, hip fracture, trauma, organ transplant
- IC categories are broad classifications that hide much relevant underlying complications in health status



# Number of Beneficiaries & Average Expenditure per Beneficiary by Number of Illness Categories



# Share of Beneficiaries and Share of Expenditures by Number of ICs



# Beneficiaries with Multiple Complex Illnesses Account for Most of Medicare Spending

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- 28% of beneficiaries have 3 or more ICs
  - These beneficiaries have nearly 1.2 million combinations of ICs
  - 74% of Medicare spending occurs for these beneficiaries
  
- 8% of beneficiaries have 6 or more ICs
  - These beneficiaries have over 1 million combinations of ICs
  - 42% of Medicare spending occurs for these beneficiaries

## Additional IC Implies Extra Spending Equal to \$500-\$600 Per IC

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- For  $n$  IC conditions  $\leq 3$ ,

$$\$AE_n = \$AE_{n-1} + \$3,600$$

where  $AE_n$  is the average Medicare expenditure per beneficiary with  $n$  conditions.

- For  $n$  IC conditions  $\geq 4$ ,

$$\$AE_n = \frac{n}{n-1} \$AE_{n-1} + \$550n$$

- Beneficiaries with multiple illnesses cost considerably more than would be predicted by taking each condition in isolation

# Presentation Outline

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- Overview of Medicare program
- **Features of a P4P compensation system**
  - Medicare's current approach for paying physicians
  - Proposed modification of payments
  - Steps in developing a P4P system
- Assessing provider's relative cost
- Options for scoring providers based on their costs
- Creating a payment system to incentivize providers

# Method of Payment for Physician Services

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- Physician services include office visits, surgical procedures, and diagnostic and therapeutic services
- Medicare pays based on a list of services and their payment rates, called the physician fee schedule
  - Services identified by HCPCS (Healthcare Common Procedure Coding System), distinguishing about 7,000 services
- Payment rates based on relative value units (RVUs)
  - RVUs measure relative costliness of inputs used to produce physician services
  - Cost of inputs adjusted to reflect regional differences in prices

# Approach for Adjusting Payment Rates in P4P

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- Determine an “efficiency score” for each “physician payment entity,” designated here by  $\theta_i(t)$ 
  - where  $i$  identifies individual physician and  $t$  denotes year

- Fee schedule payment rates will be adjusted by

$$P_{HCPCS}(t) = \theta_i(t) \cdot F_{HCPCS}(t)$$

$F_{HCPCS}(t)$  = rate paid according to physician fee schedule

$P_{HCPCS}(t)$  = P4P rate actually paid

- Policy issue: how to compute  $\theta_i(t)$
- Steps in constructing  $\theta_i(t)$ 
  - 1) Assess physician’s relative cost in treating an illness
  - 2) Develop physician “scores” measuring this relative cost
  - 3) Specify how payments depend on these scores

# Presentation Outline

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- Overview of Medicare program
- Features of a P4P compensation system
- **Assessing provider's relative cost**
  - Measuring costs through episodes of care
  - Provider attribution
  - Creation of comparison groups
- Options for scoring providers based on their costs
- Creating a payment system to incentivize providers



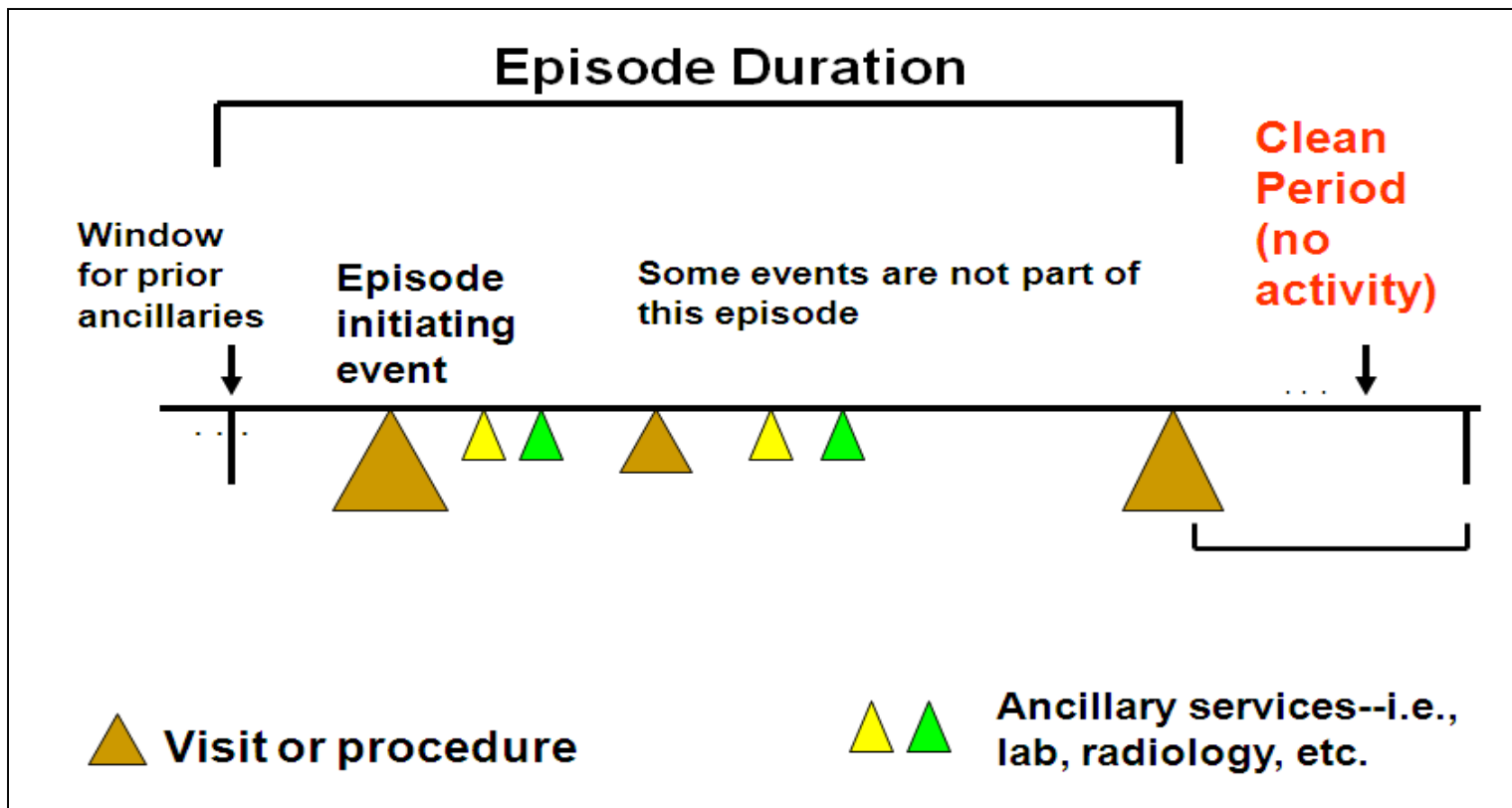
# Four Tasks in Assessing a Provider's Relative Cost in Treating a Health Condition

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- 1) Define a coherent set of services (episode of care) associated with treating a particular illness
- 2) Assess a cost for these services
- 3) Attribute the assessed cost to individual providers
- 4) Compare individual provider's cost to a peer group for treating the illness

# Concepts Underlying Construction of Episodes of Care

- Episode grouping software:
  - Combines claims to create episodes for specific illnesses
  - Clinical logic determines claims allocation to episode type
  - Builds both chronic and acute episodes
  - Cost of episode equals cost of claims assigned to episode



# Two Approaches for Constructing Episodes of Care

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- Alternative perspectives for creating episodes
  - Provider centric
  - Patient centric
- Provider centric
  - Initiated by particular set of medical services (e.g., hospitalization) associated with treating a specific illness
  - Distinguishes “treatment” costs and “post-treatment” costs
  - Post-treatment costs identify those downstream services potentially preventable with appropriate treatment of illness
- Patient centric
  - Attempts to infer total cost of treating a specific illness
  - Aggregates services across different providers
  - Based on idea of computing “costs of treating illness”

# Current Technology in Forming Episodes

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- Popular commercial products for constructing patient-centric episodes
  - Episode Treatment Groups (ETG)
  - Medical Episode Grouping (MEG)
- Basic features of software logic
  - Primarily uses diagnosis on claims to determine allocation
  - Generally assigns a claim to a single episode
  - Generally relies on “clean period” to separate episodes
- Groupers allocate claims into episodes of medical treatment for about 500-600 categories of health conditions
- Medicare is building its own grouper software after evaluating the usability of these commercial products

# Challenges in Assigning Costs to Episodes

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- Not clear one should calculate cost of episode as total cost of claims allocated to it
  - As seen in discussion of Medicare costs, medical care not separable into distinct episodes of treatment with additive costs
  - Adding comorbidities induces a multiplicative cost structure
  - Claims can sometimes be assigned to multiple episodes
- Medical complexities of health status creates difficulties in allocating each service to a single care category
  - In a 3 year period, nearly 7% of beneficiaries have more than 300 claims paid on their behalf

# Challenges in Attributing Episodes of Care to Providers

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- Straightforward in case of provider-centric episode since a provider receives attribution when paid for the services initiating episode
- Typically difficult in case of patient-centric episode since many physicians paid for claims grouped into episode
- Popular rules for attributing patient-centric episodes of care to providers
  - Provider with largest share of all claim cost assigned episode
  - Provider with largest share of Evaluation & Management claim cost assigned episode

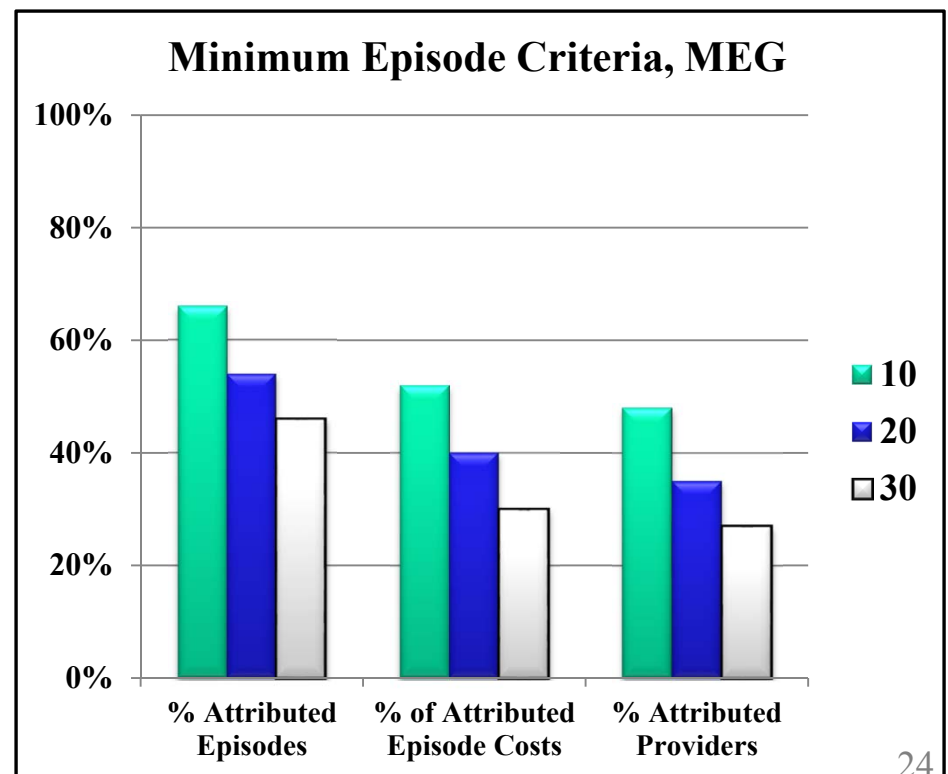
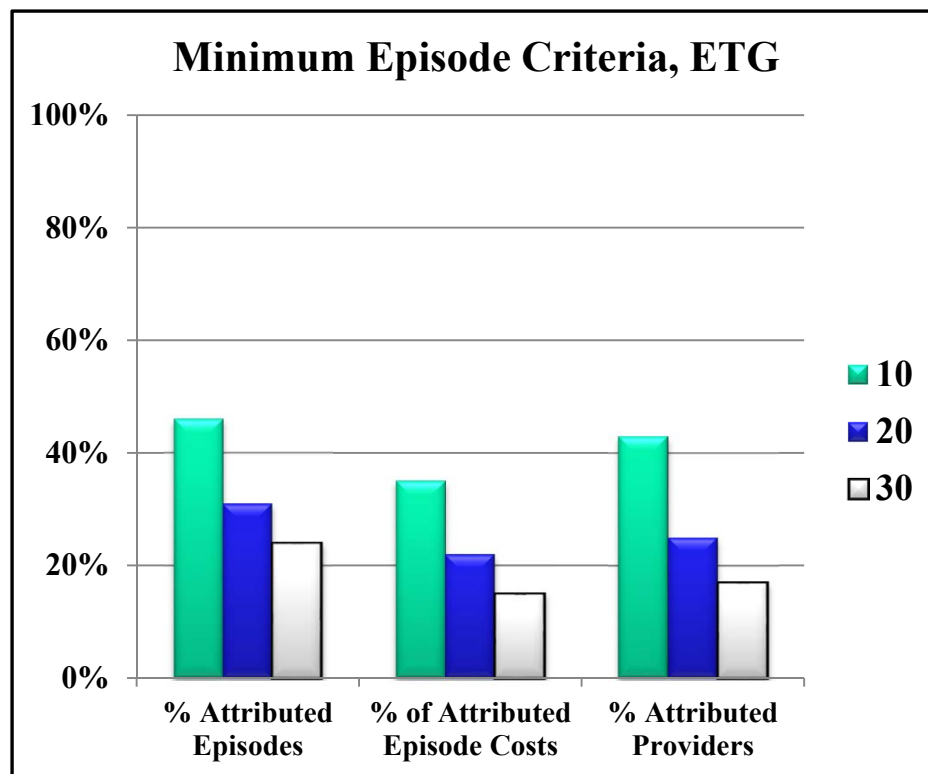
# Challenges in Creating Comparison Groups for Measuring Provider's Relative Costs

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- To compare providers, must group them into “cells” measuring their attributed costs for treating a common episode type (i.e., for treating the same illness)
- To have reliable comparisons:
  - A provider must have a sufficiently large number of attributed episodes to be included in the cell
  - A sufficiently large number of peer providers must be allocated to the cell
  - Otherwise small sample issues can induce outliers and uninformative relative rankings
- Establishing comparison groups requires specifying:
  - Minimum # of episodes of same type for a provider to be included in cell
  - Minimum # of providers meeting this criteria

# Consequences of Imposing Minimum Number of Episodes Before Scoring Provider

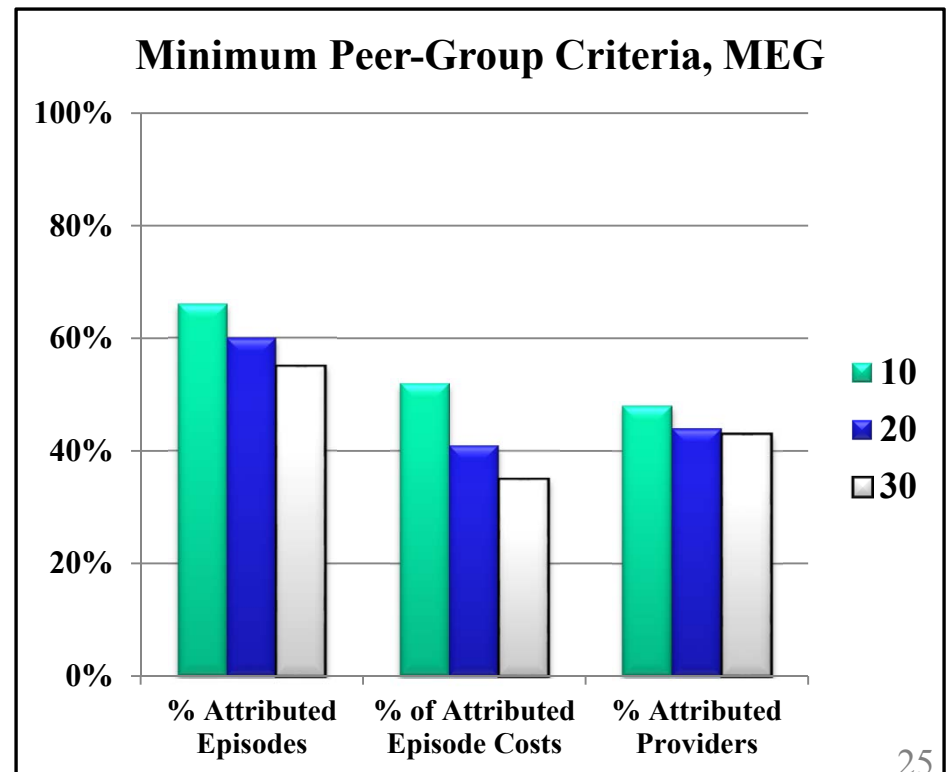
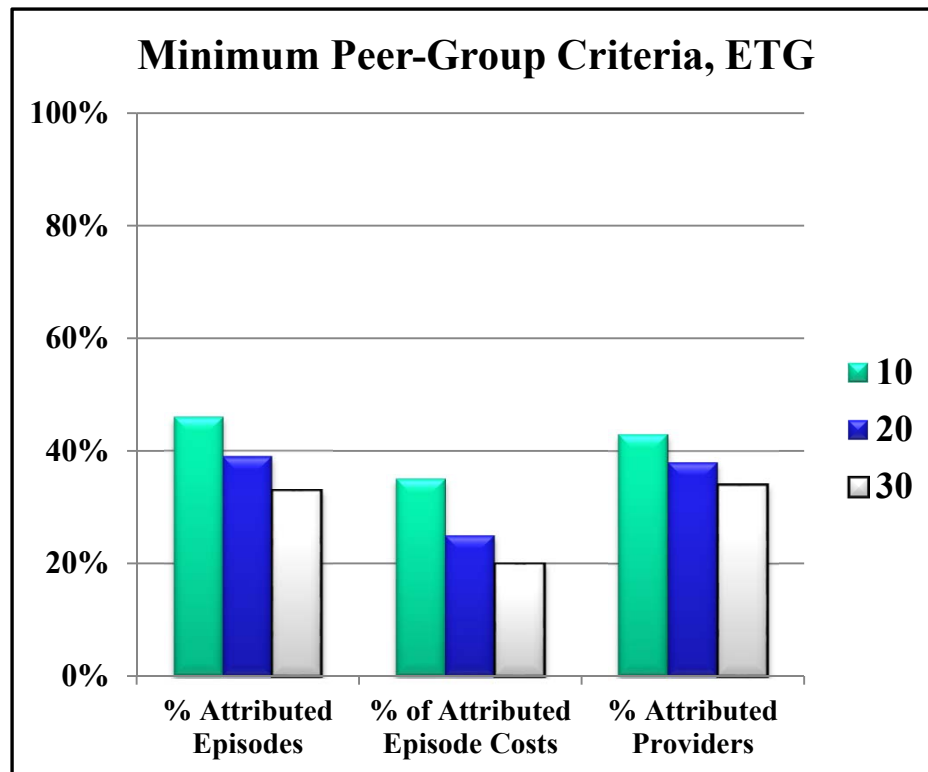
- **Tradeoff:** *Increasing episode minimums*
  - Decreases likelihood that outliers significantly affect score
  - Reduces number of providers attributed episode types
  - Results: 30 episode minimum
    - *ETG*: Only 17% of providers attributed an episode are scored
    - *MEG*: Only 26% of providers attributed an episode are scored





# Consequences of Imposing Minimum Size of Peer Groups

- **Tradeoff:** *Increasing peer-group minimums*
  - Provides meaningful comparisons across providers
  - Reduces number of providers attributed episode types
  - Results: 30 provider comparison group
    - *ETG*: Only 34% of providers attributed an episode are scored
    - *MEG*: Only 43% of providers attributed an episode are scored



# Summary of Tradeoffs in Imposing Stricter Criteria for Cell Sizes

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- Raising required minimum # episodes per provider and # providers per peer group
  - Improves comparability and stability across providers
  - Reduces:
    - Share of providers evaluated
    - Share of costs covered by evaluation
- Policy questions for expanding reach of P4P
  - What health conditions might be compared/combined?
  - What specialties might be compared/combined?
  - What geographical areas can be compared?

# Presentation Outline

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- Overview of Medicare program
- Features of a P4P compensation system
- Assessing provider's relative cost
- **Options for scoring providers based on their costs**
  - Goals of physician VBP
  - Candidate constructions of efficiency scores
  - Implications for incentives
- Creating a payment system to incentivize providers

# Goals of VBP (Value Based Purchasing) for Physicians

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- Enhance incentives to encourage physicians to:
  - Reduce costs of episodes
  - Specialize in areas of efficiency
- Consider the following example physician:

Condition	# Episodes	Expected Cost	Actual Cost
A	10	\$100	\$90
B	2	\$200	\$175
C	4	\$1,000	\$1,750

- Two purposes of P4P program
  - Lower costs of treating conditions A, B and C
    - Especially C since it is higher cost
    - Especially A since many are performed
  - Specialize in treating conditions A and B
    - Especially B since relatively more efficient

# Calculation of a Treatment Efficiency Score for a Specific Health Condition

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- Condition-specific scores compare a physician's risk-adjusted cost per episode against the mean of their peers

$$ConditionScore_{mk} = \frac{1}{n_{mk}} \sum_{i=1}^{n_m} \frac{Cost_{mk}^i}{E(Cost_{mk}^i)}$$

$i$  = episode number index

$m$  = episode type (a.k.a. health condition) index

$k$  = physician index

$n_{mk}$  = number of episodes of type  $m$

$Cost_{mk}^i$  = risk-adjusted cost of episode  $i$ , of type  $m$ ,  
for physician  $k$

# Four Weighting Options for Computing Composite Efficiency Scores for a Physician

$$CompositeScore_k = \sum_m \alpha_{mk} \cdot ConditionScore_{mk}$$

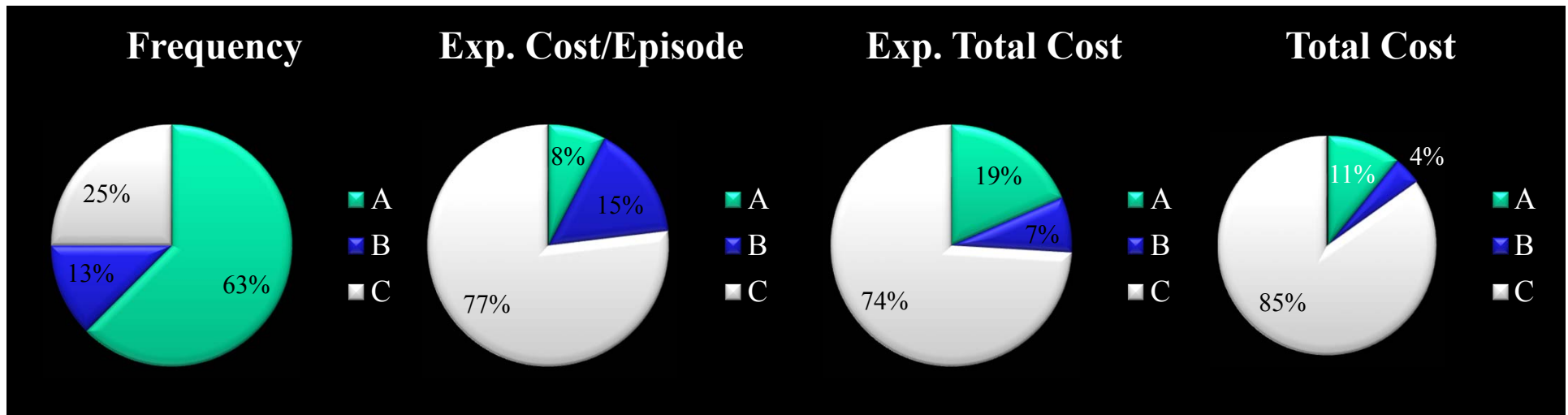
Weight/Share	Description	$\alpha_{mk}$
Frequency	Number of episodes with a condition relative to total number of episodes	$n_{mk} / N_k$
Expected Cost/Episode	Expected cost of treating a patient with a condition relative to the expected cost per treatment for all attributed conditions	$E(Cost_{mk}) / \sum_m E(Cost_{mk})$
Expected Total Cost	Expected total cost of treating all patients with a condition relative to the expected total cost of all attributed conditions	$[ n_{mk} \cdot E(Cost_{mk}) ] / \sum_m [ n_{mk} \cdot E(Cost_{mk}) ]$
Total Cost	Physician's total <i>incurred</i> costs for treating all patients with a condition relative to the total cost of all attributed conditions	$TotalCost_{mk} / \sum_m TotalCost_{mk}$

# Composite Efficiency Score for Example Physician Under Different Weighting Options

- Condition scores for our example physician

Condition	# Episodes	Expected Cost	Actual Cost	Condition Score
A	10	\$100	\$90	0.90
B	2	\$200	\$175	0.875
C	4	\$1,000	\$1,750	1.75

- Candidate composite scores for this physician



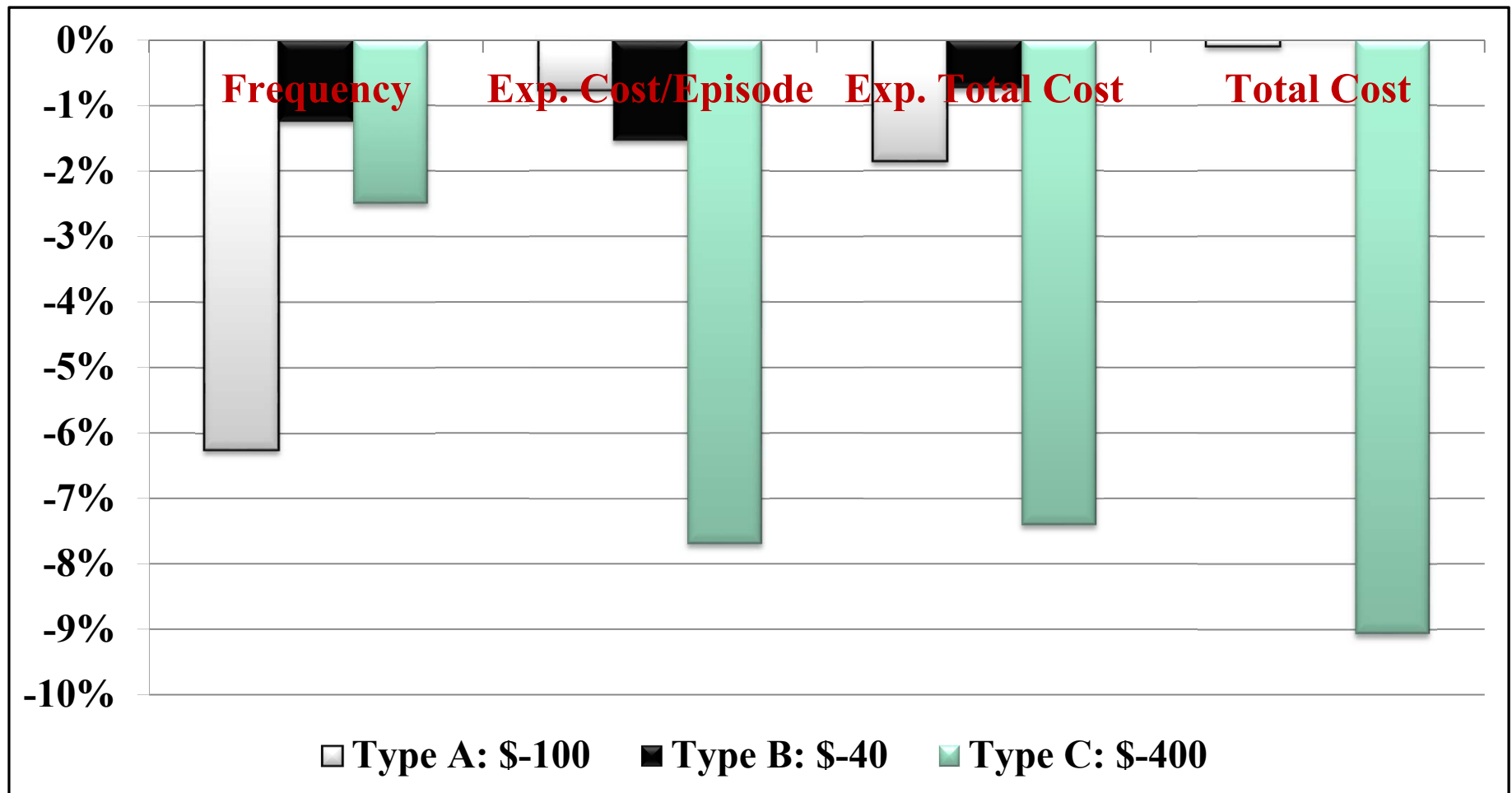
# Learning about Incentives Created by Different Composite Scores

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- Suppose policymakers wish to incentivize physicians to:
  - Achieve a 10% decrease in costs for treating any episode type or
  - Specialize in those conditions that a physician is most efficient in treating
- Which of the 4 composite scores most encourages physicians to realize these goals?
- Answer this question by examining how much each composite score would improve (i.e., decrease) for our example physician if he/she alters practice to reach these goals

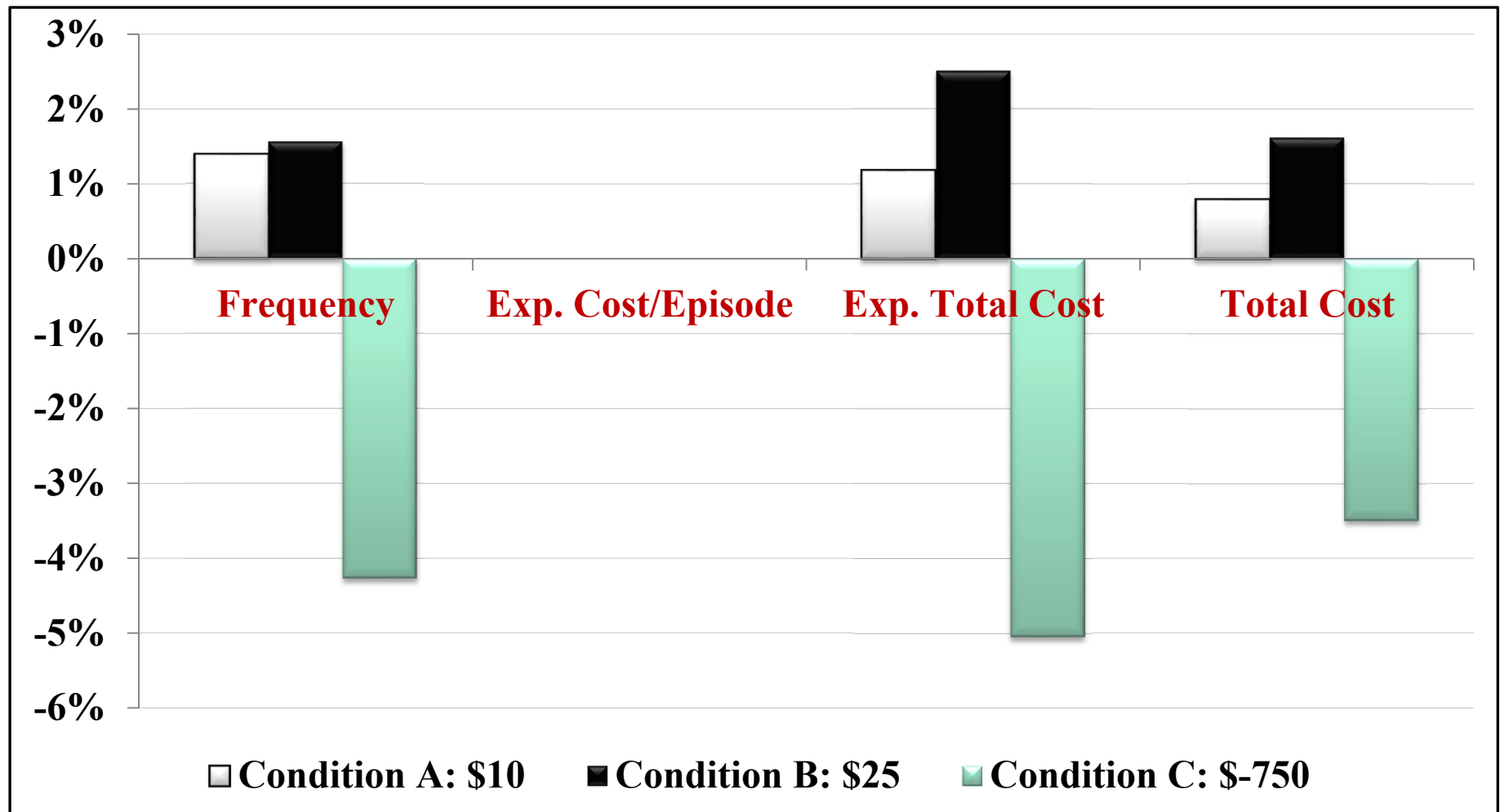


# Change in Scores Resulting from a 10% Decrease in Costs for Treating a Condition



- **Takeaway:** Frequency weighting does not promote optimal targeting of efficiency efforts

# Change in Scores Resulting from Stopping Treatment of a Condition



- **Takeaway:** Expected-cost-per-episode weighting does not promote specialization

# Which scoring method offers the most appropriate incentives?

- Goal is to incentivize physicians to:
  - Target efforts to lowering costs of highest-cost episodes
  - Specialize in the conditions they treat efficiently
- Do the composite scores achieve these goals?

Goal	Frequency	Exp. Cost/ Episode	Exp. Total Cost	Total Cost
Target High Cost Conditions	<i>No</i>	Yes	Yes	Yes
Specialize in efficiently treated conditions	Yes	<i>No</i>	Yes	Yes

- *Expected Total Cost* weights preferred
  - Total Cost weights heighten incentives by placing more emphasis on the most inefficient conditions

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- **Creating a payment system to incentivize providers**
  - Converting scores to payments
  - “Gatekeeper” vs. “direct-supplier” physicians

# How Should Efficiency Scores Affect Payments to Achieve P4P Goals?

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- How responsive do payments need to be to changes in composite scores to incentivize providers to lower healthcare costs?
- To address this question, suppose again that policymakers wish to incentivize physicians to:
  - Achieve a 10% decrease in costs for treating any episode type or
  - Specialize in those conditions that the physician is most efficient in treating
- Answers depends on the circumstances of the provider

# Translating P4P Scores into Payments

- P4P payments depend on efficiency score according to

$$Payment = \frac{Fee}{1 + (Score - 1) \cdot \delta}$$

- Fee = rate paid by physician fee schedule
- $\delta$  = incentive factor
- As incentive factor increases, physician penalized more for inefficiency

Fee	Incentive Factor ( $\delta$ )	Score	Denominator	Payment
\$100	0%	1.53	1.00	\$100
\$100	50%	1.53	1.26	\$79
\$100	100%	1.53	1.53	\$65
\$100	250%	1.53	2.32	\$43

# Two Views of Physicians' Role in Producing Medical Services

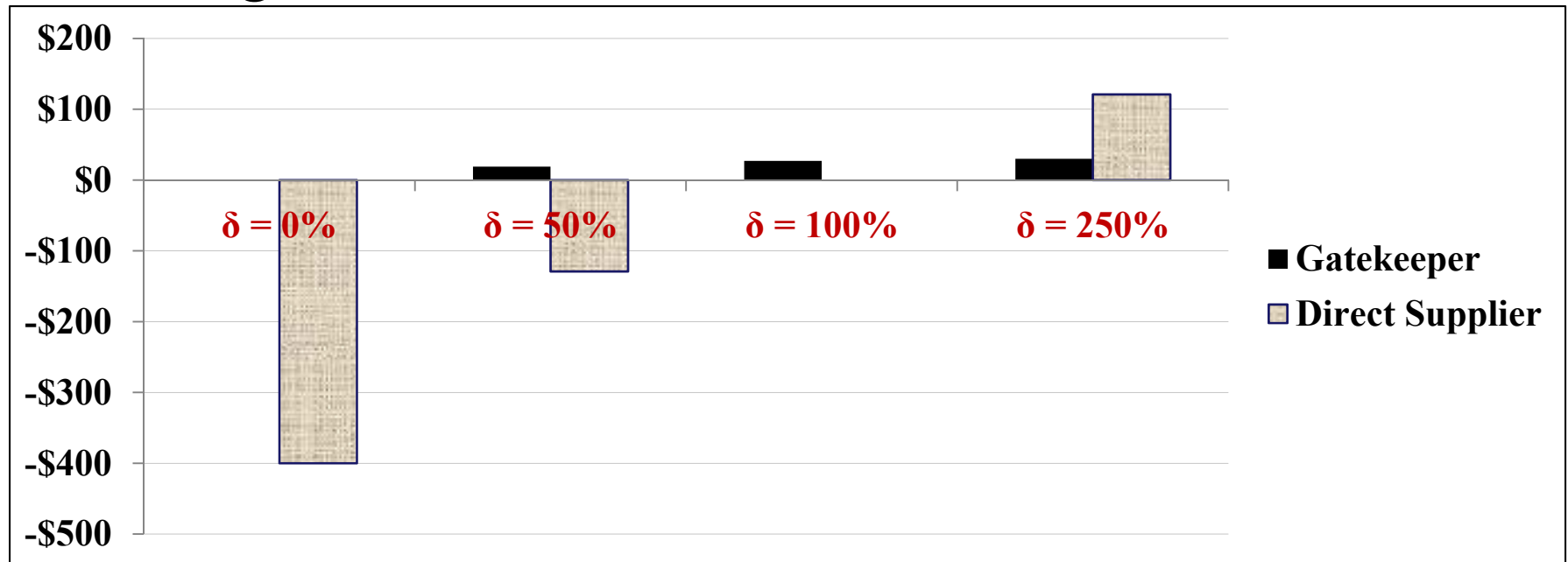
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- In “**Gatekeeper**” model, physicians receive flat rate
  - Changes in episode cost do not affect physician revenue
  - Physician manages services provided by others
  - e.g., preventive care
- In “**Direct Supplier**” case, physician reimbursement proportional to episode cost
  - Rising episode cost increases physician revenue
  - Physician provides services dependent on episode intensity
- Examples of Gatekeeper & Direct-Supplier physicians

Condition	Expected Episode Cost	Income for Gatekeeper	Income for Direct Supplier
A	\$100	\$50	\$100
B	\$200	\$50	\$200
C	\$1,000	\$50	\$1,000

# P4P Impact of an Efficiency Improvement on Physician Incomes

- Our example physician achieving a 10% efficiency gain in treating Condition C would earn

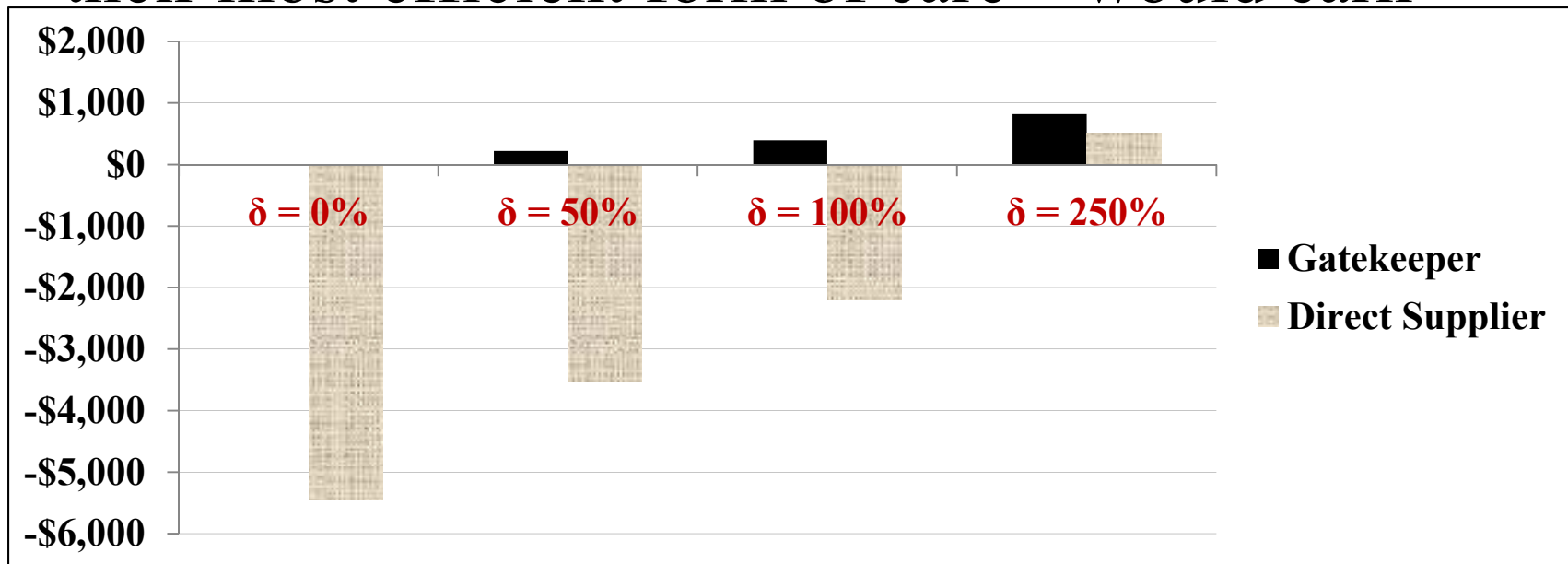


- **Takeaway:**
  - Gatekeeper income increases as long as  $\delta > 0\%$
  - Direct supplier lose money unless  $\delta > 100\%$ 
    - Direct suppliers receive more revenue as episode costs rise, *unless* the efficiency bonus is larger than savings



# P4P Impact on Physician Incomes of Reallocation to More Efficient Treatments

- Our example physician specializing in treating Condition B—their most efficient form of care—would earn



- **Takeaway:**

- Gatekeeper income revenue as long as  $\delta > 0\%$
- Direct suppliers lose revenue unless  $\delta > 217\%$ 
  - By switching from high-cost inefficient episodes to low-cost efficient episodes, direct supplier loses significant revenue
  - Large monetary incentives needed to convince direct supplier to specialize

# Summary of Findings

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- Two key VBP goals
  - Targeting efficiency efforts towards *high-cost episodes*
  - Physician *specialization* in areas of efficiency
- Substantial challenges exist in assigning costs of care and in attributing these costs to providers
- Using “Expected Total Costs” to weight condition-specific efficiency scores yields an incentive-compatible Composite Score
- Effectiveness of VBP system depends on physician type
  - VBP incentive compatible for “*gatekeeper*” physicians
  - VBP efficiency bonuses may not offset revenue gains from inefficient treatment by “*direct suppliers*”
    - Bonuses can conceptually be higher than savings to align incentives

# Policy Implications

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- Introducing VBP payment modifiers has been mandated to occur in Medicare over this decade and is currently being instituted
- This policy is being adopted as an approach for lowering the growth of Medicare spending
  - Attractive alternative to the lowering of provider fees across the board irrespective of performance
- Design of these VBP policies intricately relies on
  - Integration of economic principles
  - Empirical analysis of options
  - Extensive monitoring of impacts and continuous refinements of designs

# References

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*“Issues in the Construction of Medicare Episodes”* (May 2010)

*“Optimal Pay-for-Performance Scores: How to Incentivize Physicians to Behave Efficiently using Episode-based Measures”* (June 2010)

*“A Robust Approach to Constructing Episodes for Medicare Value-Based Payment Modifiers ”* (Sept 2013)

\* Most drafts currently available at <https://www.cms.gov/Reports/>