Setting Pay for Performance Targets: Do Poor Performers Give Up?

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P4P

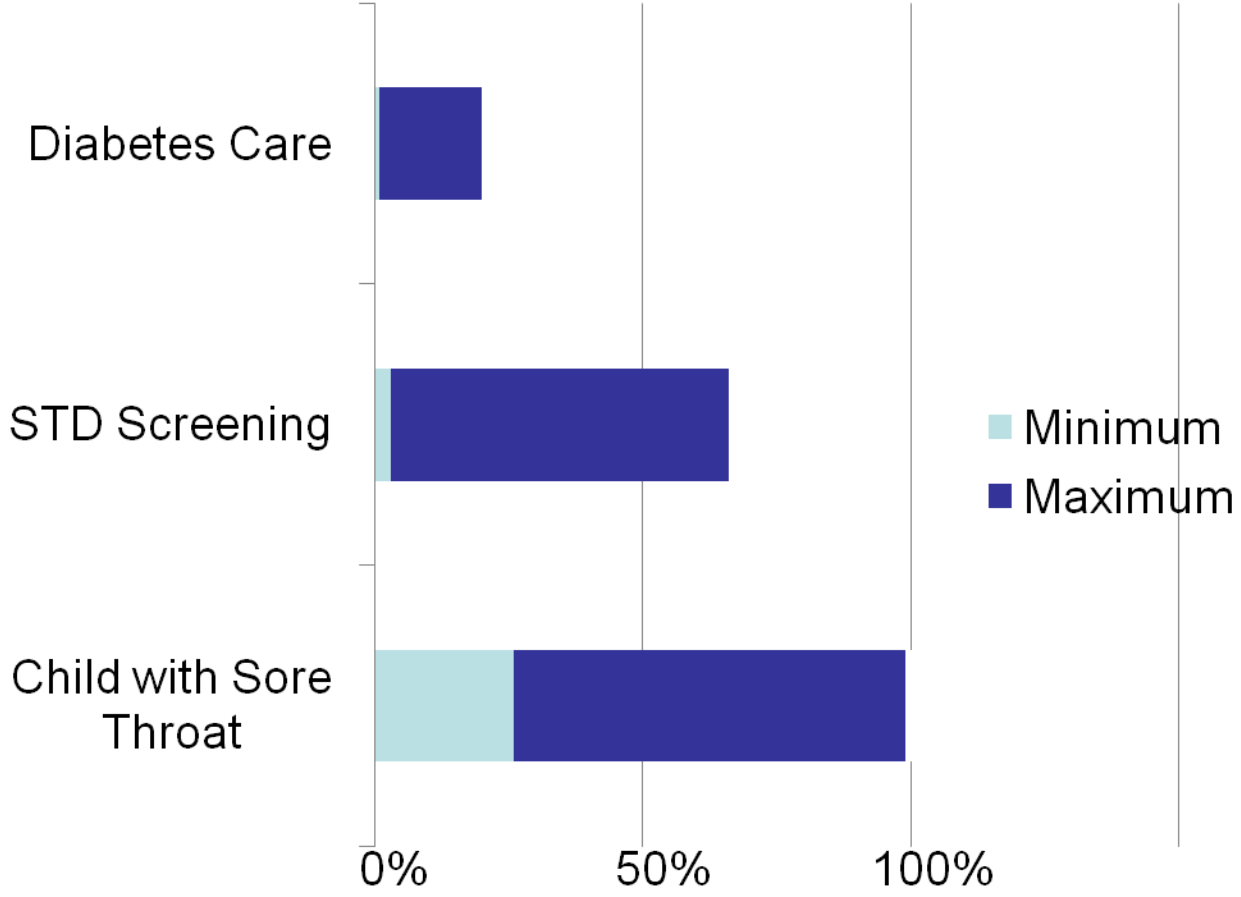
- ***Pay for Performance (P4P):*** financial incentives to encourage health care providers to improve their performance
- Performance usually means quality of care
- Most analyses of physician P4P programs have estimated ***average treatment effects*** across all participating physicians or physician practices
- Most studies show positive but modest average effects

Our Goal

- To estimate ***heterogeneous treatment effects*** of a P4P program directed at physician practices
    - Do poor performers try to improve?
    - Do practices above the performance target improve, stay put, or fall back?
- Motivation, prior research, our study setting, data, methods, results
- Implications for design of P4P programs

Why Do We Care?

Optimal Care for Patients in 128 Physician Practices in Minnesota, 2007



Prior Research

- Peterson (*Annuals of Internal Medicine*, 2006) reviewed 17 evaluations of P4P
  - 7 of 9 group-level studies showed improvements in quality
- Christianson, Leatherman, and Sutherland (2008) identified problems with existing studies:
  - small samples
  - lack of control groups
  - failure to understand the details of particular P4P programs

Rosenthal's study

- Rosenthal and co-authors (*JAMA*, 2005) compared performance of 300 physician practices that got P4P incentive with 42 control practices in the same network
  - Rewards were based on meeting targets
  - Average effects: Cervical cancer screening improved significantly more in P4P practices
  - Heterogeneous effects: Practices that began at lowest levels of performance got the least rewards
  - Interestingly, these practices improved the most
- Most similar to our study

Goals of Our Study

- Like Rosenthal, we are interested in ***heterogeneous treatment effects***
  - In particular, do poor performers simply give up when the P4P reward is based on meeting a performance target?
- Other goals:
  - Distinguish between random changes in performance versus changes caused by the P4P incentive
  - If we find non-random changes, are they related to the distance between the practice's baseline performance and the P4P target?

Study Setting

- A health plan in the Minneapolis area offered a financial incentive to a physician network to increase the generic prescription rate (GPR) for outpatient pharmaceuticals for that plan's enrollees
  - GPR = % of prescriptions written for generic drugs
- The network set targets for individual practices that varied by specialty and year (2004-2007)
  - Target rates varied between ~ 33% and 67%
  - In 2007 a practice with 8 physicians got $8,960 for meeting the target
  - Practices below the target got nothing

Study Setting

- We examined P4P incentives to improve performance
- We did not measure:
  - Changes in copayment tiers for generics, brand-name (sole source) drugs on the plan's formulary, and name-brand drugs not on the formulary
  - Patents expire and new generic opportunities arise
- We captured these factors with annual time effects common to all physician practices

Data

- 54 physician group practices specializing in pediatrics, internal medicine, ObGyn, and family medicine
  - All practices were in ‘primary’ patient care
  - Results generalize only to such practices
- Average practice wrote 2,700 prescriptions (Rx) per year for enrollees from this health plan
  - We had 12 quarterly observations on each practice from 2nd quarter of 2004 through 1st quarter of 2007
  - We calculated GPR by quarter and compared it with the target
  - We also used differences over time (11 observations per practice)

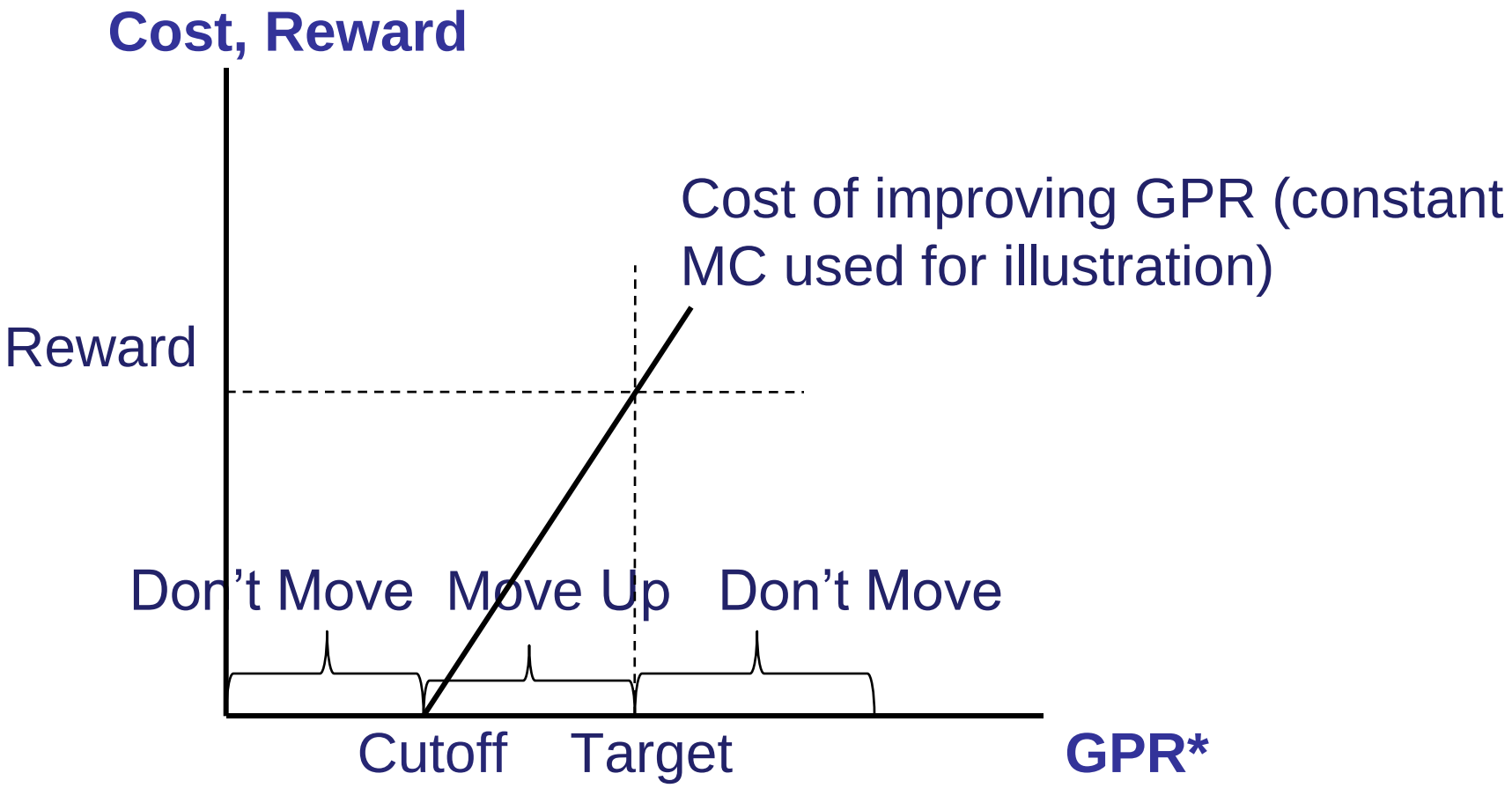
‘Equilibrium’ GPR*

- In absence of P4P every practice has ‘equilibrium’ GPR* based on:
  - Patient mix (more or fewer generic drugs available for its type of patients)
  - Doctors’ awareness of generics and willingness to recommend generics
  - Technology to manage and monitor Rx
- Let GPR* = Xβ, where X are observed practice characteristics that may vary over time
- Deviating from GPR* is costly

Model of Moving Up

- Based on simple profit maximization with a threshold: practice moves up to target if Reward > Cost
- Why is moving up costly?
  - Patient resistance to trying generic drugs
  - Costly for physicians to learn about generics
  - Overcoming inertia of past prescribing patterns
  - Overcoming influence of ‘detailing’ (efforts by drug companies to promote brand-name products)

Model of Moving Up



‘Final’ GPR

$$GPR_{i,t}^{F} = X_{i,t}\beta + (T - X_{i,t}\beta) \times D_{i,t}$$

$$D_{i,t} = 1 \;\; if \;\; cutoff \leq X_{i,t}\beta \leq T$$

- Denote the ‘final’ GPR under P4P as GPR^F
- Recall that all practices have ‘equilibrium’ GPR* = $X\beta$
- Practices with $X\beta > T$ and those with $X\beta <$ *unobserved cutoff* are not motivated to deviate from their equilibrium
- Other practices want to move up to the target
- Next, we choose a function that approximates the unobserved cutoff

‘Final’ GPR Function

$$GPR_{i,t}^{F} = X_{i,t}\beta + \delta_1 BELOW_{i,t-1} +$$

$$(T - GPR_{i,t-1}) \times \delta_2 BELOW_{i,t-1} + u_{i,t}$$

- Proxy *D* = *1* if the practice was below the target last period
- We expect practices below the target last period will move up ($\delta_1 > 0$)
- But practices farther below the target last period will be less likely to move up ($\delta_2 < 0$)
- We also include the square of distance below *T* (not shown here)

Adjustment Process

- We embed the GPR^F function in a standard partial adjustment process:

$$GPR_{i,t} - GPR_{i,t-1} = (1-\gamma) \times$$

$$(GPR^F_{i,t} - GPR_{i,t-1}) + e_{i,t}$$

- We estimate the speed of adjustment along with the parameters of GPR^F

  $(1-\gamma)$ = 1 implies complete adjustment in one period

- We estimate the model with OLS because *u* and *e* are independent of explanatory variables

Descriptive Results

- The mean of 11 changes in GPR was +1.6 percentage points, but the change varied from -15 to +21 percentage points
- Overall, GPR increased by about 14 percentage points over the study period
- On average, 40% of practices met the target each quarter

Average and (Target) GPR

Specialty/Year	Internal Medicine	ObGyn	Pediatrics	Family Practice
2004 (last 3 quarters)	48.15 (44)	41.81 (34)	46.71 (41)	50.09 (44)
2005	53.08 (54)	48.55 (44)	50.12 (46)	54.97 (54)
2006	58.72 (65)	53.35 (63)	58.80 (60)	60.12 (65)
2007 (first quarter)	62.54 (65)	58.60 (63)	64.48 (60)	63.24 (65)

Main Regression Results

Variable	Coefficient
$(\text{Target} - GPR_{i,t-1}) \times \text{BELOW}$	0.3361**
$(\text{Target} - GPR_{i,t-1})^2 \times \text{BELOW}$	-0.0154**
BELOW	-0.2986
$-GPR_{i,t-1}$	0.2146**

* = significant at α =.05
** = significant at α =.01

Explanation

- Distance below the target has a curvilinear (inverted U) effect on moving up
  - Positive coefficient of distance and negative coefficient of squared distance
- Being BELOW the target last quarter does not have an independent effect on the change in GPR
  - Practices above T are just as likely to move up as those below T

Adjustment Process

- The coefficient of -$GPR_{i,t-1}$ provides an estimate of the speed of the adjustment process
- *(1-γ)*= 0.2146 → about 1/5 of the adjustment to the long run occurs within 3 months
- About 60% of the adjustment is complete within one year

More Regression Results

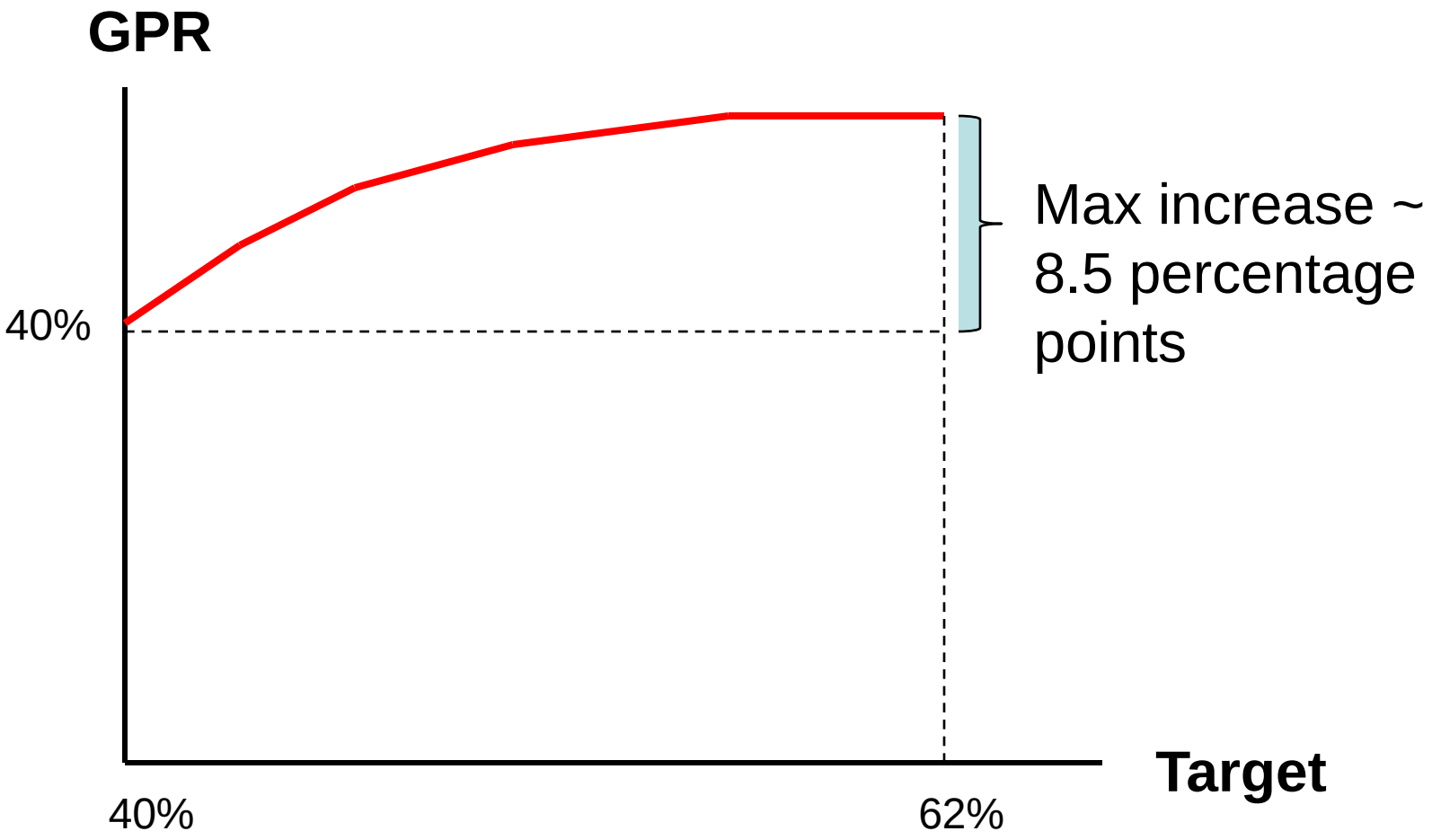
Variable	Coefficient
OBGYN	-1.8329*
Pediatrics	-0.7908
Family Practice	-1.0394
2005	-0.0926
2006	0.6222
2007	1.4332
Second quarter	-1.6961**
Third quarter	-09052**
Fourth quarter	0.7872*

Long-Run Effect of P4P

In the long run: $GPR_{i,t} = GPR_{i,t-1}$

- Set GPR before the P4P program at the practice's equilibrium rate of generic prescribing, Xβ
- Vary the target and solve for GPR under the influence of the program
- Goal is to determine the maximum improvement and when poor performers give up

Long Run for GPR* = 40%



Discussion

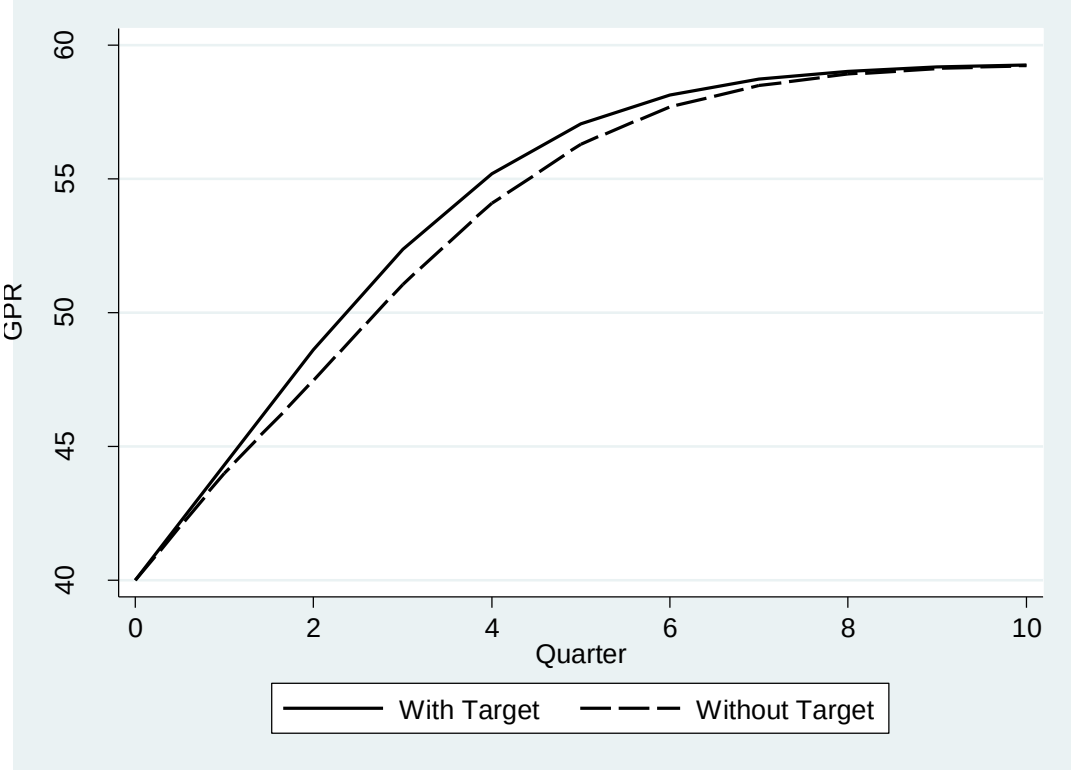
- Poor performers stop trying to improve only when the target is substantially higher (~23 percentage points) than the equilibrium rate of generic prescribing
  - Only one practice in our data is predicted to give up
- Targets will motivate poor performers unless they are set at unrealistically high levels
- But poor performers do not reach the target
  - They improve, but not enough to get rewards
  - What motivates them: Peer pressure? Agreeing with the goal of the target, even if they can't reach it?

Effect of Target on Practices with Unexpected Poor Performance

- Suppose the practice's equilibrium rate is at or above the target, but GPR_{t-1} was below the target (unexpected bad luck)
- Does the target speed up the practice's return to its equilibrium rate?
- We did an experiment like this and iterated until GPR converged to GPR*
- Target speeds up the adjustment process

Speeding Up the Adjustment

Quarterly changes in GPR, with and without Target



Implications for P4P Design

- Some argue that P4P targets should be lower for practices with low initial performance, otherwise, they will give up trying to improve
- Others argue that setting low targets for this group would create ‘pushback’ from high performers
- Our findings suggest this debate may not be necessary because low performers do not give up trying to reach a realistic target
- Further study of incomplete improvement is warranted

Thank You

- Copies of the paper are available from feldm002@umn.edu
- Paper is forthcoming in Health Economics