Insurer-Provider Integration, Credible Commitment, and Managed-Care Backlash

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Abstract

People are more distrustful of managed care organizations (MCOs) than traditional health plans, a phenomenon that has become known as "managed-care backlash." This paper investigates a model of the interaction between insurers, physicians, and patients and identifies two possible motivations for MCO backlash. The first, which traces to traditional health plans' superior ability to credibly commit to providing better than least-cost care through the contracts they sign with indpendent physicians, is efficiency promoting. The second, which arises when patients are able to obtain higher benefit treatments through reneging on their initial insurance contracts through "doctor shopping," may reduce efficiency.

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1 Introduction

There is a growing body of evidence that people are distrustful of managed care organizations (MCOs) and believe that MCOs are unlikely to provide necessary care should they become seriously ill. For example, one study found that only 30% of MCO members trust their health plan to provide the right level of care, as opposed to 55% of people in traditional plans, and that 61% of MCO members believed their health plan was more concerned with saving money than with giving patients the best treatment, compared with 34% of people in traditional plans.[1]

This paper presents a partial explanation for this "managed-care backlash" based on differences in the ability of the involved parties (insurers, physicians, and patients) to make credible commitments in the managed-care and traditional health plan markets. The analysis focuses on providers' incentives to choose the efficient treatment for a patient (as opposed to the least-cost or highest benefit one), whether these incentives can be credibly communicated to potential consumers, and how the degree of payer-provider integration affects performance. We argue that while backlash may sometimes be justified on efficiency grounds, other times consumers' dislike of managed care may reflect their inefficient desire to be able to renege their insurance contracts after becoming ill.

We focus on two polar cases, which we denote Integrated (INT) and Contracted (CON). In the INT case, a single agent fulfills both the payer and provider roles, and patients are not allowed to seek outside care. In other words, the insurer and provider are identical, with a single set of preferences. Thus the INT case is a stylized representation of managed care, most closely corresponding to a staff-model HMO in which physicians are employees whose decisions are closely monitored (and controlled), and patients have no access to independent physicians.[2] At the other extreme, the CON model is one in which an insurer contracts with multiple, independent providers to treat patients. This case represents traditional health plans, and most closely corresponds to an indemnity or PPO plan with contracted fee-for-service rates and no balance billing.

We consider the interaction between insurers, physicians, and patients in both the INT and CON environments. In each case, the insurer receives a premium payment from patients and in

[1] The statistics come from Blendon et al. (1998), which reports the results of a 1997 Kaiser/Harvard/Princeton Survey Research Associates survey. Dranove's (2000) discussion of the evolution of the health care industry discusses the "general distrust" of the managed care industry and reports the results of a number of corroborating studies.

[2] While a prime example, staff-model HMOs have become much less prevalent in recent years. Consequently, after laying out the two extreme cases, the paper also discusses how the results apply to other arrangements, such as group-model HMOs, which have become the predominant form of managed care organization in recent years (Harvard Managed Care Industry Center Group, 2002).

exchange pays for the patients' health care, either through directly employing physicians (INT) or paying independent physicians based on the type of treatment provided (CON).

The physician's task is to examine patients and choose which of two possible treatments they should receive. There are a great number of clinical examples that correspond to situations such as this. A few have been examined in detail in the health economics literature. Chetty (1998) discusses the case of cesarean vs. abdominal deliveries in the face of possible complications in childbirth. Chandra and Staiger (2004) consider the case of medical vs. surgical treatment of heart attacks in a case where, depending on the characteristics of the patient and hospital, one or the other treatment is more appropriate. Malcomson (2005) presents a number of examples, including whether to treat coronary artery disease with angioplasty or to begin with a less invasive treatment and progress to angioplasty only if necessary, and whether to treat a malignant tumor with surgery or chemotherapy (or radiation).

The type of situation we consider also arises in less acute circumstances, such as whether to manage diabetes or high cholesterol through lifestyle modifications (diet and exercise) or medically (with oral or injected medication). Finally, the two treatments could be interpreted as reflecting a quantity decision, as in the case of a patient with progressive heart disease where one option is to continue to monitor the disease and the other is to operate.

In the main part of the analysis we focus on the interplay of two particularly salient incentive problems. The first, which we denote the "physician incentive problem," is concerned with how closely the insurer can control the physician's behavior. For example, the insurer may desire to rein in the physician's tendency to prescribe high-cost treatments (such as an on-patent statin rather than a generic one) according to his own judgement rather than the insurer's more restrictive guidelines. When the insurer and physician are integrated, as in the INT case, whether the insurer can induce the physician to behave in a particular way is not an issue, since the insurer-provider is a unified agent with a single set of preferences. In contrast, when the insurer and provider functions are separate, as in the CON environment, the insurer must rely on the incentives provided by its contract with the physician to induce the behavior it desires.

We call the second incentive problem the "insurer-credibility problem." This incentive problem concerns whether the patient will expect the insurer to implement its promised treatment rule. Because the physician's appraisal of the patient's condition is not verifiable and the patient's premium is sunk at the time care is provided, profit-maximizing insurers will be tempted to choose

the treatment that costs the least given the patient's condition. Consequently, unless something can be done to convince them otherwise, patients will expect to receive (and hence only be willing to pay for) least-cost care.

With respect to this problem, the CON insurer's disadvantage in not being able to directly control the physician's behavior becomes an advantage. Because the insurer and physician relate through an arm's-length contract, this contract can be used by the insurer to convince patients that it will, in fact, provide a higher standard of care. Conversely, the INT insurer's advantage in directly controlling its physician's incentives now becomes a disadvantage. Since the INT insurer has no means of credibly committing to provide a particular standard of care, patients expect only least-cost care to be delivered.

In the end, the insurer-credibility problem proves more of a challenge than the physician incentive problem. The main results of this paper show that while the CON equilibrium insurance plan maximizes the patient's ex ante welfare, the INT equilibrium, because of the INT-model insurer-provider's inability to convince consumers that it will provide non-least-cost care, does not. Comparing these equilibria, patients should rationally expect lower welfare in the INT-model than in the CON-model. As we discuss later, this "credibility gap" may be one justification for consumers' beliefs that traditional plans are more likely to provide the "right" treatment than MCOs.

The main results of the paper focus on the question of whether the insurer can convince patients ex ante (before learning the patient's type) that it will deliver a particular type-dependent treatment ex post (after learning the patient's type). In an extension to the basic model, we consider similar issues of ex ante vs. ex post incentives that arise with respect to the patient. While patients weigh both the benefits and costs of treatment when signing an insurance contract, at the time of care the premium is sunk. As a result, cost is no longer a relevant factor, and patients have an incentive to seek out physicians who will provide the treatment that maximizes their ex post benefit (or somehow induce their own physician to do so) rather than the one they agreed to in their initial insurance contract.

The possibility of this type of "doctor shopping" may make the CON insurer more attractive than the INT one, especially to patients who believe they are likely to be more successful at influencing the physician's treatment decision than others. This points to a second potential reason for MCO backlash: patients may believe it will be easier to renege on their contract with the insurer when insurers and doctors are separate than when they are integrated. Unlike in the

case of our main result, this motivation for backlash is "inefficient" in the sense that consumers prefer traditional plans because they perceive traditional plans as easier to manipulate, and such manipulation reduces overall ex ante consumer welfare.

There is a large literature on issues of incentives in health care.[3] A number of papers have focussed the interaction between the quality of care provided and the method of provider payment. See for example Ma (1994), Ma (1997), Ma and McGuire (1997), and Ellis (1998). Other papers focus on the interaction between provision of incentives through supply-side cost sharing, under which providers are less than fully reimbursed for the costs of treatment, and demand-side cost sharing, under which patients are less than fully insured for the cost of treatment. See for example Ellis and McGuire (1986), Seldon (1990), and Ellis and McGuire (1990). Ellis and McGuire (1993) provides an interesting survey of this literature. A robust result in this area is that optimal incentive schemes tend to involve full insurance with providers being paid according to a scheme that is a "mixture" of capitation and partial cost reimbursement. This bears some resemblance to the optimal reimbursements for CON providers derived in this paper, which involve a cost-based component and a capitation component that sets the physician's profit equal to zero.

Two papers closely related to this one are Chetty (1998) and Malcomson (2005). Chetty (1998) considers a similar problem and, in a model that does not consider commitment issues, argues that the outcomes under HMO insurance and fee-for-service insurance should be identical. Malcomson (2005) uses a model similar to the one considered here to study the design of DRGs.

The remainder of this paper is as follows. Section 2 describes the general model. Section 3 derives the equilibrium in the CON and INT environments and discusses the main results. Section 4 considers ex post incentive issues, and Section 5 concludes.

2 The Model

We consider the interaction between a patient, insurer, and physician. The patient purchases health coverage from the insurer, which contracts with the physician to provide the patient's care. The physician observes the patient's (non-verifiable) condition, chooses one of two treatments, and incurs the cost of treatment.

We denote the two treatments A and B. Let $x \in [0,1]$ denote the patient's condition or **type**,

[3] See Gaynor (1994) for a useful survey of the market for physicians' services.

where x denotes the relative appropriateness of treatment A for the patient. Let $F(x)$ denote the cumulative distribution function for patient types, with density function $f(x)$. Although it is verifiable that the patient requires some treatment (either A or B), the patient's type is observed only by the physician. In the basic model, neither the patient nor the insurer observes x.

The patient's utility function is additively separable in health, H, and wealth, w, taking the form $U(H, w) = H + w$. The qualitative results do not change significantly if the patient is risk averse over wealth.

Let $c_d > 0$ denote the cost of examining a patient in order to determine x, which must be incurred before any treatment occurs. Let $C(T|x)$ be the cost, over and above the diagnosis cost, of treating a patient of type x with treatment T, where $T \in \{A, B\}$ here and throughout the paper denotes a generic treatment. Similarly, let $H(T|x)$ be the dollar-valued health benefit derived by a patient of type x who it treated with T. Define the cost and health benefit of treatment A relative to treatment B as $c(x) = C(A|x) - C(B|x)$, and $h(x) = H(A|x) - H(B|x)$, respectively. Finally, let the relative surplus of the two treatments be given by $n(x) = (H(A|x) - C(A|x)) - (H(B|x) - C(B|x)) = h(x) - c(x)$.

To capture the idea that the relative clinical appropriateness of treatment A increases in x, we assume that $c(x)$ is decreasing in x and $h(x)$ is increasing in x, which implies that $n(x)$ is increasing in x. Figure 1 illustrates a typical situation.[4] Points x_c, x_h, and x_n, assumed distinct, are the respective points where $c(x)$, $h(x)$, and $n(x)$ equal zero.

Throughout the paper, we assume that the entire cost of care is borne by the provider. In the INT case, this is the integrated insurer-provider, while in the non-integrated case, the physician is the provider. In reality, physicians usually bear less than the full cost of care, since some insured costs are incurred by hospitals, labs, rehabilitation facilities, etc. The results of the paper are qualitatively unchanged as long as the physician's relative cost of treating a patient with A declines in the patient's type. That is, letting $\hat{c}(x)$ denote the relative physician cost of treatment A, the results of the paper hold as long as $\hat{c}(x)$ is decreasing. Consequently, for expositional ease we simply assume that the physician bears all costs of care in the CON case.

The insurer is risk neutral, profit maximizing, and one firm in a perfectly competitive industry. While the result of the physician's examination (i.e., his observation of x) is non-contractible, the treatment provided to the patient is. Thus, in the CON environment, a contract between

[4] It is also possible that $c(x)$ and $h(x)$ cross above the horizontal axis.

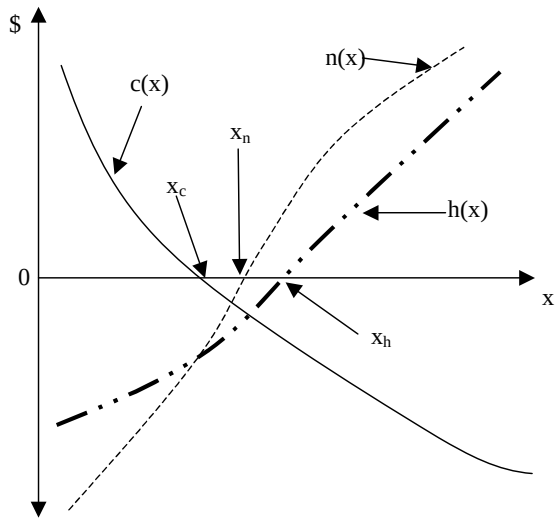

Figure 1: Relative cost, gross benefit, and net benefit of treatment A.

the insurer and physician consists of reimbursements w_A and w_B paid to the physician following treatments A and B respectively. No contracts are used in the INT case. We assume that a physician who diagnoses a patient is reimbursed the diagnosis cost, c_d, which is in addition to the reimbursement w_A or w_B provided if the physician also treats the patient.[5] Finally, we assume that treatment is expensive enough that patients will not choose to go to an out-of-plan provider to receive treatment.

An *insurance plan* consists of a *premium* and a *treatment rule*. The premium is the price, p, that the patient pays to the insurer for health coverage. The *treatment rule* defines the terms of the insurance policy. Formally, let a *treatment rule* be a function $T(x) : [0,1] \to \{A, B\}$ that specifies for any signal x which treatment a patient generating that signal will receive. Implicit in this specification is that all types of patients receive some treatment. Thus, we assume that the patient's condition is a "covered condition" and treatments A and B are "covered treatments." The only question is which patients should be given which treatment.

Under our assumptions, treatment rules of interest can be defined by a cut-off value $\hat{x}$ such that patients of type $x \in [0, \hat{x})$ are treated with B and patients of type $x \in [\hat{x}, 1]$ are treated with A, and we will often identify a treatment rule simply by its cut-off value.

We conclude this section by characterizing the treatment rule that maximizes (ex ante) total

[5] While not important for our base case, the difference between diagnosis and treatment costs is important for the discussion of ex post incentives in Section 5.

surplus, which we denote x^*. This rule solves:

$$\max_{\hat{x}} \int_0^{\hat{x}} \left(H\left(B|x\right) - C\left(B|x\right) - c_d\right) f\left(x\right) dx + \int_{\hat{x}}^1 \left(H\left(A|x\right) - C\left(A|x\right) - c_d\right) f\left(x\right) dx. \tag{1}$$

Differentiating (1) with respect to x^* and simplifying yields first-order condition:[6]

$$H\left(B|x^*\right) - C\left(B|x^*\right) - \left(H\left(A|x^*\right) - C\left(A|x^*\right)\right) = -n\left(x^*\right) = 0.$$

Hence, not surprisingly, $x^* = x_n$. The welfare-maximizing treatment rule treats those with types below x_n with B, and those with types at least x_n with A, and each type of patient is given the treatment that maximizes his net welfare (benefit less cost).

3 Equilibrium Analysis

The timing of the game between the insurer, physician, and patient is:

Stage 1: The insurer offers the physician a contract $(w_A, w_B, \hat{x})$ specifying the payments w_A and w_B to be made following each treatment and the treatment rule $\hat{x}$ that the physician should follow. The physician may either accept or reject this contract. If accepted, the insurer-physician contract is observed by the patient.

Stage 2: The insurer offers the patient treatment plan $(p, \hat{x})$, which the patient may either accept or reject.

Stage 3: The patient becomes ill, and the physician observes the patient's type, based upon which he chooses whether to treat the patient with A or B. Following treatment the physician is reimbursed according to the contract with the insurer.

Our notion of equilibrium requires that the patient, insurer, and physician all act optimally. The term "provider" is used in the definitions to refer to the party making the treatment decisions. In the CON, the physician is the provider, whereas in the INT case, treatment decisions are made by the combined insurer-provider.

[6] Since $n\left(x\right)$ is increasing, welfare is globally concave, and hence the first-order condition is necessary and sufficient for the problem's unique solution.

At stage 1, we require:

Ex Ante Participation: Given contract $(w_A, w_B, \hat{x})$, the provider's ex ante expected profit is non-negative.

Provider Incentive Compatibility: Given contract $(w_A, w_B, \hat{x})$, for each patient type x, treatment rule $\hat{x}$ specifies the treatment that maximizes the provider's expected profit.

As the name suggests, Ex Ante Participation is imposed before learning the patient's type, which seems to be the natural point at which a physician must choose whether or not to accept a particular patient. For example, some physicians trained in obstetrics and gynecology choose not to practice obstetrics, a decision that is considered reasonable. However, if a physician were to examine pregnant women and accept as patients only those believed to be low cost, this would likely be a violation of the physician's professional and legal obligations. The AMA's statement on "Ending the Physician-Patient Relationship" supports this point: "Once a patient-physician relationship is begun, a physician generally is under both an ethical and legal obligation to provide services as long as the patient needs them."[7]

Embedded in the Provider Incentive Compatibility requirement is that only the provider's incentives matter in determining which treatment the patient receives. In some circumstances, the patient may be able to influence the provider's decision, and in such cases the patient's influence on the treatment rule may influence the outcome. We return to this issue in Section 4.

Provider Incentive Compatibility and Ex Ante Participation are important for two reasons. First, if $(w_A, w_B, \hat{x})$ satisfies these properties, then, given reimbursements w_A and w_B, the physician will have an incentive to follow treatment rule $\hat{x}$. Second, if the insurer's contract with the physician satisfies these properties, then a consumer choosing this insurer should rationally expect to receive treatment rule $\hat{x}$ because he knows that the contract is legally enforceable and that under its terms it is in the physician's best interest to follow this rule. To emphasize the second point, we call an insurer-physician contract $(w_A, w_B, \hat{x})$ **credible** if it satisfies Provider Incentive Compatibility and Ex Ante Participation.[8]

[7] Physicians are permitted to sever their relationship with a patient for cause provided they give the patient sufficient notice and opportunity to locate an alternative source of care. See http://www.ama-assn.org/ama/pub/category/4609.html. See Miller (2004) for a version of the model in which the physician must expect to break even after learning x.

[8] For convenience, we will sometimes refer to the treatment rule, rather than the contract, as being credible. In this case it should be understood that a credible treatment rule is accompanied by some reimbursements that make it credible.

At stage 2, we require that the insurer-physician contract be credible, as well as:

Actuarial Fairness: Given the treatment rule, the premium is equal to the (ex ante) expected cost of a patient's care.

Constrained Welfare Maximization: The insurance contract $(p, \hat{x})$ maximizes the patient's expected welfare from among all insurance contracts consisting of a credible treatment rule and its actuarially fair premium.

For a cut-off rule $\hat{x}$, the Actuarially Fair premium $\bar{p}(\hat{x})$ is given by:

$$\bar{p}(\hat{x}) = c_d + \int_0^{\hat{x}} C(B|x)\, dF(x) + \int_{\hat{x}}^1 C(A|x)\, dF(x), \tag{2}$$

Actuarial Fairness and Constrained Welfare Maximization embody the assumption that the insurance market is competitive, and thus that the market acts to provide patients with the best-possible fairly-priced insurance contract.

An equilibrium insurance plan consists of a credible insurer-physician contract and the associated actuarially fair premium that maximize the patient's expected welfare.

3.1 Insurer-Provider Contracting

In this section, we consider the CON case, in which the insurer and provider are separate entities whose relationship is governed by a contract– i.e., there is an insurance company that pays independent physicians according to a prespecified fee schedule, as in traditional insurance. The equilibrium must satisfy the four requirements described above.

We begin with credibility. Treatment rule $\hat{x}$ satisfies Provider Incentive Compatibility if $w_A - C(A|x) - c_d \geq w_B - C(B|x) - c_d$ if and only if $x \geq \hat{x}$, or:[9]

$$w_A - w_B \geq c(x) \text{ if and only if } x \geq \hat{x}. \tag{3}$$

Ex Ante Participation requires that:

$$w_B F(\hat{x}) + w_A (1 - F(\hat{x})) \geq c_d + \int_0^{\hat{x}} C(B|x) f(x)\, dx + \int_{\hat{x}}^1 C(A|x) f(x)\, dx. \tag{4}$$

[9] By convention, we assume that if the physician is indifferent between the treatments he chooses treatment A.

As is standard in contracting problems, in writing its contract with the physician, the insurer will attempt to minimize its compensation cost, and thus at any optimal solution (4) will hold with equality.

Lemma 1 *In the CON environment, there exist reimbursements such that any cut-off treatment rule with* $\hat{x} \in [0,1]$ *is credible and (4) holds with equality.*

Proof. Since $c(x)$ is monotonically decreasing, for any $\hat{x}$ and any constant k, reimbursements $w_B(\hat{x}) = k$ and $w_A(\hat{x}) = k + c(\hat{x})$ satisfy (3). To satisfy Participation with equality, for each cut-off $\hat{x}$, choose constant $k(\hat{x})$ according to:

$$\begin{aligned} k(\hat{x}) &= c_d + \int_0^{\hat{x}} C(B|x)\, dF(x) + \int_{\hat{x}}^1 C(A|x)\, dF(x) + c(\hat{x})(1 - F(\hat{x})), \\ &= \bar{p}(\hat{x}) - c(\hat{x})(1 - F(\hat{x})). \end{aligned}$$

■

The Actuarially Fair premium associated with credible cut-off rule $\hat{x}$ when (4) holds with equality is $\bar{p}(\hat{x})$. Hence the equilibrium plan is found by solving the following Constrained Welfare Maximization problem:

$$\max_{\hat{x}} \int_0^{\hat{x}} H(B|x)\, dF(x) + \int_{\hat{x}}^1 H(A|x)\, dF(x) - \bar{p}(\hat{x}) \tag{5}$$

subject to (3) and (4). However, since Lemma 1 applies to the unconstrained welfare maximizing treatment rule, x^*, this rule must also be the Constrained Welfare Maximizing treatment rule.

Proposition 1 *In the CON environment, the equilibrium involves insurers paying reimbursements*

$$\begin{aligned} w_A &= \bar{p}(x^*) + c(x^*) F(x^*), \text{ and} \\ w_B &= \bar{p}(x^*) - c(x^*)(1 - F(x^*)), \end{aligned}$$

and charging premium $p(x^*)$. *Physicians treat patients of type* $[0, x^*)$ *with* B *and patients of type* $[x^*, 1]$ *with* A.

Proof. *Note that these reimbursements satisfy (3) and (4) with equality, and that for these reimbursements problems (1) and (5) are identical.* ■

Proposition 1 establishes that the equilibrium insurance plan in the CON environment is the welfare-maximizing plan. The key to the CON environment maximizing patient welfare is that, by judiciously choosing its reimbursements, the insurer makes it credible for the physician to provide the welfare-maximizing treatment rule, and competition among insurers to attract patients leads them to offer the welfare-maximizing insurance plan in equilibrium.[10]

3.2 Integrated Insurer-Provider

In the INT model, the integrated insurer-provider structure replaces the CON model's arm's-length contracting between the insurer and physician. In both its insurance and treatment decisions, the integrated insurer-provider seeks to maximize its expected profit.

Once again, we begin by determining which treatment rules are credible. In the INT environment there is no contract between the insurer and provider that can be used for incentive purposes. Even if such a contract could be written, reimbursements w_A and w_B are purely internal transfers that do not affect the insurer-provider's expected profit and therefore cannot be used for incentive purposes. Since the insurer-provider's revenues are fixed, in the INT environment a Provider Incentive Compatible treatment rule must satisfy $p - C(A|x) \geq p - C(B|x)$ if and only if $x \geq \hat{x}$, or:

$$c(x) \geq 0 \text{ if and only if } x \geq \hat{x}. \tag{6}$$

The only treatment rule satisfying (6) is the cost minimizing rule, x_c. The Actuarially Fair premium for this rule is given by $\bar{p}(x_c)$. Since actuarial fairness implies that the insurer-provider earns zero profit, participation is satisfied, and thus the only credible insurance plan is $(x_c, \bar{p}(x_c))$.

Since there is only one credible insurance plan, this plan (trivially) satisfies Constrained Welfare Maximization, and therefore it is the equilibrium insurance plan. Comparing the INT equilibrium with the welfare maximizing plan yields Proposition 2 as an immediate consequence.

Proposition 2 *The equilibrium insurance plan in the INT environment is* $(x_c, \bar{p}(x_c))$. *If* $h(x_c) > 0$, *then* $x_c > x^*$; *if* $h(x_c) < 0$, *then* $x_c < x^*$.

Proof. *Follows from the definitions of* $h(x)$, $c(x)$, *and* $n(x)$. ■

[10] The fact that neither the insurer nor the physician earns a positive surplus turns out to be critical for the efficiency of the CON equilibrium. If the physician is subject to an ex post participation requirement, then the physician earns a positive surplus and the equilibrium no longer maximizes patient welfare. See Miller (2004).

At its base, the integrated payer-provider's preferred treatment rule differs from the welfare-maximizing treatment rule because the former considers only the cost of care, while the latter also takes into account patients' health benefits. Although competition still pushes the insurer-provider toward maximizing patient welfare, without a mechanism of making higher-welfare treatment rules credible it lacks the lever needed to raise its standard of care.

3.3 Integration, Performance, and Managed-Care Backlash

Propositions 1 and 2 establish that the CON-environment outcome is better for patients than that of the INT environment. To the extent that managed care organizations (MCOs) more closely resemble the INT model and traditional insurance plans more closely resemble the CON model, this suggests a justification for consumers' pessimism about managed care.[11] CON-model insurers are indeed better able to convince consumers that they will provide "right" care, as opposed to least-cost care.

The difference in the performance of the CON and INT models arises from the ability of the insurer in the CON environment to use its contract with the independent physician to induce the physician to follow the welfare-maximizing treatment rule, and, because this contract is enforceable, to credibly communicate to patients that it will provide this standard of care to them should they actually become ill. Even though at the time of care the insurer would prefer to provide least-cost care, its contract with the physician allows it to bind its hands in a way that is credible to patients. Despite the fact that the INT payer-provider has no difficulty with providing incentives to physicians, it totally lacks the ability to credibly commit not to skimp on care. Given this, the patients are unwilling to pay for any higher standard of care, and so the INT equilibrium involves lowest-cost care.

Seen in this light, we can recast the discussion in terms of the ability of the insurer to make credible commitments to patients. The CON environment is one in which the insurer has full credibility, and the INT environment is one in which the insurer has no credibility to promise anything other than lowest-cost care. Of course, in the real world, insurers that contract with independent providers lack full credibility, and integrated insurer-providers do not totally lack credibility. Nevertheless, it remains true that the arm's length relationship between physician

[11] Rosenthal and Newhouse (2002) provide an alternative, though related, explanation for backlash. They argue that backlash against managed care arises from the fact that people believe that MCO ration care without regard to consumers' preferences about which services should be rationed.

and insurer in the CON environment provides the insurer with a method of commitment that the INT insurer-provider lacks. Indeed, this commitment power is exactly the physician autonomy, albeit directed by the reimbursement schedule, that insurance customers cite as attracting them to more-expensive traditional insurance plans rather than managed care.

In our model, the INT payer-provider most closely resembles a staff-model HMO, where the physicians are salaried employees. Although once the predominant form of managed care organization, staff-model HMOs have become much less prevalent in recent years. According to an analysis by the Harvard Managed Care Industry Study Group (2002), in 1998 only 7% of managed care enrollees belonged to HMOs that employed salaried physicians. The vast majority of the remainder belonged to HMOs that compensated physicians primarily through capitation (58%) or primarily through fee-for-service payments (35%).

In the context of the present analysis, the behavior of HMOs compensating physicians using capitation payments is likely to be very similar to that of the staff-model HMO, and hence our INT case. Since the capitation payment received by the physician group does not vary with the treatment provided to patients, the contract between the HMO and the physician group cannot be used to make commitments to patients. And, given that it is capitated, the physician group will have the same incentive to provide only least-cost care as the HMO. Consequently, the (theoretical) outcome for the capitated group-model HMO will be the same as for the staff-model HMO.

To the extent that the contract between an HMO compensating physicians on a fee-for-service basis can be used to make commitments to patients, the (theoretical) performance of these organizations should resemble that of the CON model. However, by virtue of the limits it places on patients' choices, it may be difficult for the HMO to convince its patients that the physicians are, in fact, operating independently. If the HMO is unable to accomplish this, patients may believe that the HMO will attempt to induce physicians to cut costs, leading its performance to resemble that of the staff-model HMO.

Several qualifications to the main results are in order. First, throughout this analysis we have assumed that the providers in the INT and CON frameworks have the same cost structure. However, this may not be the case. One of the advantages of managed care is its superior ability to control costs. To the extent that MCOs are able to enact real cost reductions (as opposed to providing less generous care), the efficiency gain due to these cost reductions must be weighed in favor of the MCO when comparing the performance of the two models. Nevertheless, the relative

cost advantage of MCOs may not be apparent to patients, and thus, even though it reduces the welfare advantage of traditional plans, it does not significantly reduce backlash.

Second, although the paper shows that properly chosen reimbursements induce the efficient treatment rule in the CON model and that competition in the CON market will drive the equilibrium toward efficiency, it assumes that the insurers properly understand the physician's production function. However, understanding physician costs is not easy. Physicians perform many different treatments for many different conditions, and some costs (such as office staff and rent) are not directly attributable to patient care.

Third, in the present analysis, we allowed only a single commitment device, the insurer-physician contract. However, other commitment devices can help the INT insurer-provider to make credible commitments to patients and thus perform better. For example, reputational concerns may induce an MCO to provide more costly care as a way of attracting new customers and retaining older ones. To the extent that patients understand these mechanisms, they may be effective in credibly communicating the MCO's intentions and mitigating backlash.

Finally, in this paper we have assumed perfect competition in the insurance and physician sectors. It remains an open question how the conclusions presented here would be affected by the presence of market power in either sector.

While these other factors may be important, the issues of trust and credible commitment raised in this section will continue to play a role in determining the relative performance of INT and CON-type models, even under more general circumstances. Perhaps most importantly, the results of this section shed light on the importance of patients' perceptions. If MCOs want to reduce backlash, it will be necessary not only to provide a superior level of care, but also to undertake measures that will convince patients that they should expect superior care when they need it.

4 Ex Post Patient Incentives and "Doctor Shopping"

When the patient agrees to an insurance contract, he chooses the one that maximizes his expected ex ante welfare. However, if after paying the premium the patient were to learn his true condition, his incentives would change. Letting p^F denote the patient's premium, upon learning that he is sick (and his value of x), the patient's final utility from treatment A or B is $H(A|x) - p^F$ or $H(B|x) - p^F$, respectively. Thus, ex post, the patient prefers A if and only if $H(A|x) - p^F \geq H(B|x) - p^F$, or

$h(x) \geq 0$. In other words, at the point of care, the patient prefers the treatment that offers more benefit, regardless of cost.

In some cases the benefit-maximizing treatment will differ from the treatment specified by the patient's insurance plan. In such situations the patient will have an incentive to attempt to influence the physician's treatment decision. One way to do this is to "shop doctors," i.e., to look for a physician who can be induced to provide the treatment the patient desires.[12] For example, although a patient may agree to an insurance contract that provides generic drugs rather than on-patent ones in all but extreme circumstances, after learning that he has high cholesterol a patient may search for a doctor who can be persuaded to prescribe a more-expensive on-patent statin rather follow the insurer's guidelines.

The problem of doctor shopping is a manifestation of the well-known problem of moral hazard by a fully insured patient. When the patient bears no cost at the time of treatment, he will seek the treatment that maximizes ex post benefit, even when the benefit of such treatment is less than its cost (or the net benefit of that treatment is less than the net benefit of some other treatment). In this section we briefly sketch a model that shows that, when doctor shopping is possible (i.e., when patients cannot commit ex ante not to seek out the treatment that maximizes ex post benefit), the CON equilibrium will not maximize the patient's (ex ante) welfare and may even be inferior to the INT equilibrium.

To incorporate the possibility of doctor shopping, we consider a slight variation on our basic model. Stages 1 and 2 are as described earlier. However, we modify Stage 3 by assuming that after the physician's initial examination both x and the physician's recommended treatment are revealed to the patient.[13] The patient can then either accept this recommendation or go to another physician, who performs another examination. When visiting the second physician the patient can influence the physician's perception of x. To simplify the presentation, we assume that patients can mimic any x when visiting the second doctor, and that the second physician does not take into account that the patient has already seen another doctor or may be attempting to manipulate him.[14]

[12] I thank a referee for suggesting this topic.

[13] Qualitatively similar results would obtain if, instead of learning his actual type, the patient instead observed a noisy signal of his type. If the patient could be prevented from learning any information about his type then the possibility of doctor shopping would not be an issue. However, situations where the patient learns no information from the doctor are functionally equivalent to ones where the patient commits ex ante to let the doctor choose his treatment.

[14] Patients with limited ability to distort x and physicians who incorporate the possibility of distortions into their

As before, we require that the equilibrium insurance plan satisfy Constrained Welfare Maximization subject to it being credible and actuarially fair. To this, we add the following requirement:

Ex Post Patient Incentive Compatibility (EPPIC): No type of patient can improve his welfare by seeking a second opinion and distorting his type.

EPPIC has different effects on the INT and CON cases. Due to the closed network and direct control of provider incentives, EPPIC has no additional bite in the INT environment. There is simply no "second opinion" to get. Even if the patient were to go to an independent physician and distort the physician's perception of which treatment was needed, the INT insurer could simply refuse to pay for this out-of-network service. Thus the possibility of doctor shopping cannot affect the INT insurer-provider's behavior. At the same time, the addition of EPPIC does not help the insurer-provider solve the insurer-credibility problem.

We now turn to the CON model, where the imposition of EPPIC does affect the equilibrium. Suppose the insurer and physician have agreed to a contract with reimbursements w_A and w_B that implies cut-off value $\hat{x} \in (0,1)$ as defined by (3). Initially, patients visit a physician and learn their value of x as well as the physician's recommended treatment. Patients with types between $\hat{x}$ and x_h are not satisfied with the first physician's recommendation and seek a second opinion, distorting the second physician's perception of their type so that the physician prescribes the correct treatment for their true type. For example, in the case where $\hat{x} < x_h$, the first physician recommends treatment A to patients of type $x \in [\hat{x}, x_h)$ even though treatment B maximizes their ex post benefit. These patients have an incentive to seek a second opinion and deceive the second physician into believing their types are less than $\hat{x}$ in order to receive treatment B. In the end, patients are treated according to treatment rule x_h, and patients of type $x \in [\hat{x}, x_h)$ are examined twice.

Since examinations are costly and the patients eventually receive the treatment that maximizes their ex post benefit, constrained welfare maximization implies the insurer sets its reimbursements so that there are no second opinions. To see why, suppose that reimbursements are chosen to solve (3) and (4) with equality for $\hat{x} \in (0,1)$, and the patient is charged the actuarially fair premium,

inference process can be incorporated into the model without affecting the qualitative results that the equilibrium in the CON environment is generally not socially optimal, and if examinations are sufficiently costly the equilibrium treatment rule in the CON environment has cut-off point x_h.

$\bar{p}(\hat{x})$. The patient's ex ante welfare is given by:

$$\begin{array}{l} \int_0^{x_h} H(B|x) f(x)\, ds + \int_{x_h}^1 H(A|x) f(x)\, ds - c_d \\ \quad - \int_0^{x_h} C(B|x) f(x)\, dx - \int_{x_h}^1 C(A|x) f(x)\, dx - c_d \left| F(\hat{x}) - F(x_h) \right|, \end{array} \tag{7}$$

Note that (7) depends on $\hat{x}$ only in the last term, which represents the additional cost imposed on the system because patients with types between $\hat{x}$ and x_h receive their ex post desired treatment from the second physician they visit instead of the first. Consequently, through its choice of reimbursements the insurer can control how much doctor shopping occurs, but it cannot control the treatment patients ultimately receive, and therefore (7) is maximized by minimizing the cost of second opinions, which occurs when $\hat{x} = x_h$.

Proposition 3 *In the CON environment, if there is an equilibrium satisfying EPPIC in which both treatments are offered, the reimbursements are given by* $w_A = \bar{p}(x_h) + c(x_h) F(x_h)$, *and* $w_B = \bar{p}(x_h) - c(x_h)(1 - F(x_h))$, *and the premium is* $\bar{p}(x_h)$ *as defined in (2). Physicians treat patients of type* $[0, x_h)$ *with* B *and patients of type* $[x_h, 1]$ *with* A.[15]

Proposition 3 establishes that, when doctor shopping is possible, the CON equilibrium no longer maximizes ex ante welfare. Depending on the welfare comparison of insurance plans $(x_h, \bar{p}(x_h))$ and $(x_c, \bar{p}(x_c))$, the CON equilibrium may even be inferior to the INT equilibrium.[16]

Whereas the results of Section 3 suggest an efficiency-promoting justification for managed-care backlash (patients prefer CON insurers because they promise efficient care), Proposition 3 suggests an *efficiency-reducing* justification for backlash. That is, patients may prefer CON insurers because they believe that they will be better able to secure the treatment that maximizes ex post benefit should they get sick. This motivation becomes even stronger in a "partial equilibrium" world in which patients believe that their individual behavior is unlikely to affect premiums. To illustrate the point, consider the CON equilibrium without EPPIC, where the insurer offers patients treatment rule x^* and premium $\bar{p}(x^*)$. If a patient believes he can effectively shop doctors without affecting his premium, he may believe that he can secure treatment rule x_h at cost $\bar{p}(x^*)$, which is preferable

[15] If there is no equilibrium in which both treatments are offered, then the equilibrium involves the insurer structuring reimbursements so that physicians only perform one treatment. Such cases only arise if welfare as defined by (1) is greater at $\hat{x} = 0$ or $\hat{x} = 1$ than at $\hat{x} = x_h$. While this is possible, and the fact that the possibility of doctor shopping could drive one of the treatments out of the market is interesting, for the remainder of the section we will focus on cases where there is a two-treatment equilibrium.

[16] In particular, the CON equilibrium is inferior to the INT equilibrium if the CON equilibrium with EPPIC is such that only one treatment is offered.

to his original insurance plan. Of course, this is not tenable in equilibrium, since if all patients shop doctors the equilibrium premium must be at least $\bar{p}(x_h)$. Thus, the overall effect of this motive is to reduce patient welfare in the CON case, and the possibility of doctor shopping may lead to a situation where patients prefer CON arrangements to INT ones not because CON insurers provide more efficient care, but because they believe that the CON system is easier to manipulate.

5 Conclusion

This paper has proposed two possible justifications for managed-care backlash based on the abilities of the involved parties – insurers, providers, and patients – to make credible commitments to the other parties. They correspond to two possible readings of the claims that, relative to MCO enrollees, traditional plan enrollees are more likely to believe their insurer will give them the "right" treatment for their condition, and less likely to say that their plan is more concerned with saving money than with giving the "best" treatment.

In our basic model, we show that, due to a superior ability to credibly commit to non-least-cost-care, the CON insurer follows the welfare maximizing treatment rule, whereas the INT insurer does not. Thus, in this case, "right" and "best" are interpreted as statements about efficiency. In this sense, patients' relative preference for the CON model (i.e., traditional insurance) can be seen as efficiency promoting. They are drawn to CON insurers' superior care.

However, "right" and "best" can also be interpreted in an ex post sense, as we do in our discussion of the doctor shopping model. Due to the CON insurer's large network and decentralized control of physician incentives, patients may believe that they are more likely to be able to shop doctors (or otherwise influence the treatment they receive) in the CON model than in the INT model, where the insurer exercises tight control over physician behavior and outside opinions are prohibitively costly. Thus, the fact that the CON model is relatively more vulnerable to manipulation could also account for the fact that people are more likely to believe that traditional insurers will provide them with the "right" treatment than MCOs, where "right" here refers to the treatment that maximizes ex post benefit.[17] In this case the patients' relative preference for traditional insurance is not welfare enhancing. The CON equilibrium with doctor shopping is certainly less

[17] Although we have focused on doctor shopping for the sake of illustration, the point is true for moral hazard more generally. The openness of the CON model may be seen as an opportunity to manipulate the system, be it through doctor shopping or overconsumption of care, that would not be permitted in the INT environment.

efficient than the equilibrium without it, and it may even be less efficient than the INT equilibrium.

Identifying the extent to which one or the other of these explanations is driving enrollees attitudes toward managed care will be important for determining whether managed care backlash should be seen as a force that disciplines markets or a sign of market failure. Dissatisfaction with managed care may either be an indicator that managed care is failing to provide patients with necessary care, or that it is succeeding in preventing them from obtaining unnecessary care.

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