

# Has Cost Containment Gone Too Far?

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COST-CONTAINMENT STRATEGIES ARE SWEEPING through the health care system like fire through parched underbrush. Medicare's prospective payment system based on diagnosis-related groups is leading the way, with health maintenance organizations, preferred provider organizations, state regulatory agencies, and deductibles and coinsurance close behind. The reasons for the changes in health care financing and organizations are well understood (Fuchs 1986). But what about their effects? We know that there was a dramatic decline in the rate of growth of health care expenditures in 1984, but other than that it is too soon to expect systematic, definitive assessments.

Over the long run, the current reimbursement revolution is likely to change every aspect of the health care system: medical practice, medical education, medical research. Moreover, the effects are likely to vary greatly among patients by age, income, and employment status, and among hospitals and physicians by type, location, and specialty. The debate over whether cost containment has gone too far has already begun. This article does not attempt to resolve that debate or to discuss all of the eventual ramifications of cost containment. It does offer a framework for thinking about the direct effects of current

policies on *health* and *social welfare*, and it shows why reasonable observers may differ in their evaluation of cost containment.

## How Cost Containment Works

Regardless of whether cost containment is sought through competition or regulation or a combination of both, reductions in spending on health care can be achieved in only three ways. First, the producers of health care may be forced to increase *production efficiency*, i.e., to deliver the same amount of services with fewer inputs. Such gains in efficiency are always possible in every organization, but it is unlikely that they will prove to be a major source of cost reduction. Even under the old payment systems there was no reward for the inefficiency associated with using more resources for a given amount of services. The inefficiencies that critics pointed to had more to do with *what* care was delivered than *how* it was produced.

Second, even with the amount of services and production efficiency unchanged, health care spending can be reduced by *reducing the prices* paid for inputs. As with efficiency, it is always possible to squeeze input prices a little—to trim nurses' wages and physicians' fees and drug industry profits. But it is highly unlikely that this will be the major source of cost reduction, especially over the long run. In the short run, supplies of inputs may be relatively inelastic and, therefore, their prices can be squeezed. In the long run, however, nurses, physicians, drug companies, and other inputs into health care must receive competitive compensation or the supplies will not be forthcoming.

The third, and by far the most important way to contain costs is to deliver fewer services. At the most fundamental level, cost containment must mean fewer hospital admissions, shorter lengths of stay, fewer tests and X rays, and similar reductions across the spectrum of care. Thus, the question about the effects of cost containment can be restated: How will health and social welfare be affected by a reduction in the amount of health services? This question can be illuminated with the help of a few diagrams.

## Maximizing Health and Social Welfare

Figure 1a presents a stylized description of the relation between health benefit and amount of services, defined to include all possible dimensions.

For instance, an increase in the amount of care can be thought of as an increase in length of stay in the hospital (holding services per day constant), or as an increase in the number of tests per day, or as any combination of changes in days and tests that results in more services. For each patient the health benefit typically increases as the amount of services increases, but at a decreasing rate. Eventually a point is reached,  $Q_2$ , where the health benefit is at a maximum, and additional services do more harm than good. To be sure, health benefits also depend on the timeliness and appropriateness of services, but it is useful to focus on the effects of changes in the quantity of services, holding constant the levels of timeliness and appropriateness.

Figure 1a also records how cost changes as the amount of services increases. To simplify the presentation without undue violence to reality, it is assumed that cost rises at a constant rate, i.e., each additional unit of service adds as much to cost as does the preceding unit. If all the benefits of care are reflected in the health curve, the amount of services that maximizes social welfare is  $Q_1$ . If any less care is provided, the benefit would decrease more than the cost; if any amount greater than  $Q_1$  is provided, cost would increase more than the benefit.<sup>1</sup>

The basis for defining the amounts of services that maximize health and maximize social welfare can perhaps be seen more clearly in Figure 1b, which shows the marginal (i.e., additional) benefit and marginal cost curves derived from the total benefit and total cost curves of figure 1a. The exact shape of the marginal benefit curve will vary from disease to disease and from patient to patient, but the marginal benefit, on average, surely declines as the amount of services increases, and eventually becomes negative. Overall, the linear approximation may not be far off, and greatly simplifies the analysis.

## The Effects of Less Care

What happens as cost-containment strategies reduce the amount of services? The answer clearly depends on how much is being provided.

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<sup>1</sup> The amount  $Q_1$  will maximize social welfare, given the distribution of income in society and assuming that the cost reflects the benefit to society that could be realized by putting the resources to some alternative use.

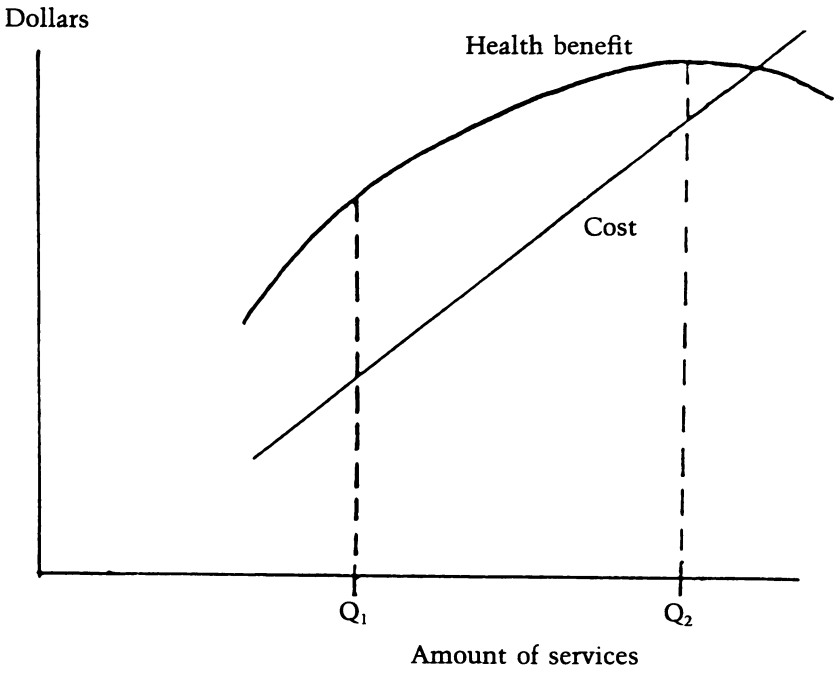


FIG. 1a.

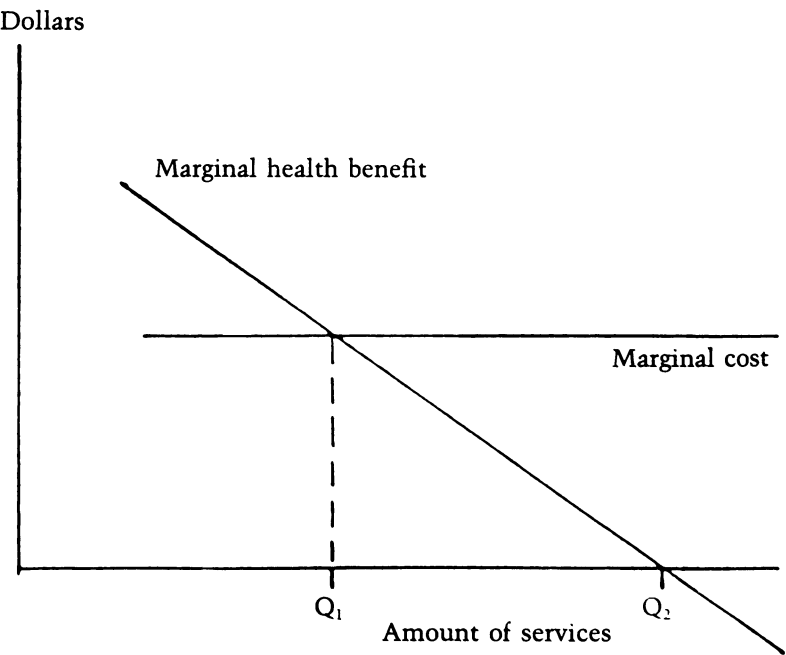


FIG. 1b. Determination of the amounts of services that maximize health and social welfare.

Any reductions that occur to the right of  $Q_2$  will result in an improvement in health; reductions to the left of  $Q_2$  will decrease health. For social welfare,  $Q_1$  is the critical point. Reductions in the amount of services to the right of  $Q_1$  increase social welfare (because they reduce cost more than benefit); reductions to the left decrease social welfare (because they reduce benefit more than cost). Thus, the effect of cost containment on health may differ from the effect on social welfare; any reductions between  $Q_2$  and  $Q_1$  would simultaneously decrease health and increase social welfare. Both effects, however, depend on the initial distribution of patients by amount of services and on the change in services.

It is reasonable to assume that prior to cost containment different patients are receiving different amounts of services (relative to potential benefit); a stylized description of such a frequency distribution is presented in figure 2. Some patients are receiving the amount that maximizes the health benefit,  $Q_2$ ; some are receiving more, and some less. Some patients may not even be receiving as much as  $Q_1$ . *This distribution and the size and pattern of the reduction in services determine the changes in health and social welfare.* Consider the following hypothetical scenarios:

1. *Equal absolute reductions.*

If cost containment results in a uniform absolute reduction,  $a$ , in the amount of services received by each patient, the average effects on health and social welfare will be determined entirely by the size of the reduction,  $a$ , and the mean ( $\bar{Q}$ ) of the distribution prior to the change. For instance, suppose the reduction in services takes the form of two days less hospitalization for every patient. The effect on health will be favorable if (prior to cost containment) the mean length of stay was more than one day to the right of  $Q_2$ .<sup>2</sup> If the mean was less than one day in excess of  $Q_2$ , the effect on health will be unfavorable; the further to the left the mean was, the more unfavorable the effect. In the same way, the effect on social welfare will be favorable if the mean was to the right of  $Q_1$  by more than one-half  $a$  and unfavorable if it was not.

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<sup>2</sup> The change in health,  $\Delta H = a(\bar{Q}/Q_2 - 1 - a/2Q_2)$ .

Percentage of  
patients

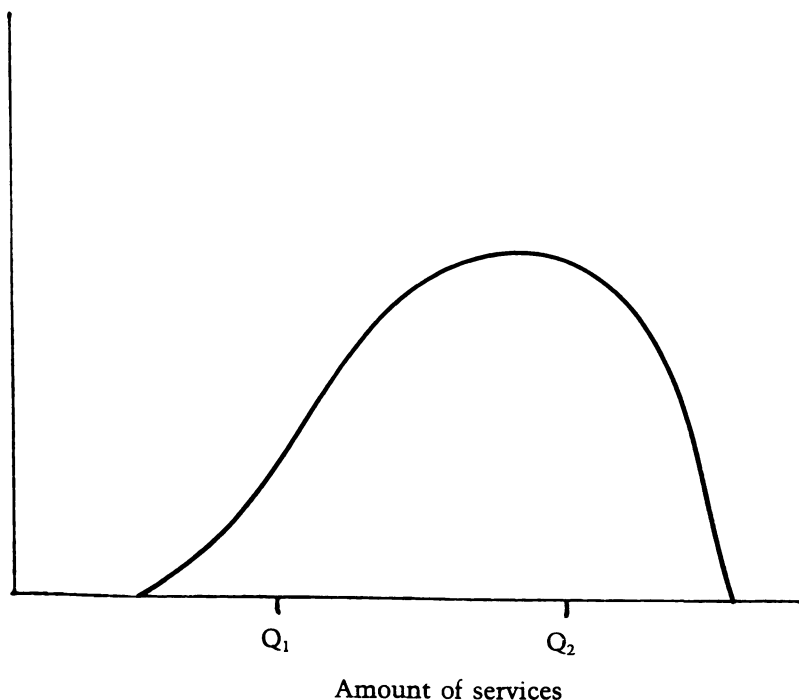


FIG. 2. Hypothetical distribution of patients.

## 2. *Equal percentage reductions.*

Suppose that cost containment results in a uniform percentage reduction,  $\alpha$ , in the amount of services received by each patient. For instance, suppose each length of stay is reduced by  $\alpha Q$  where  $Q$  is the original amount. In that case, the effects on health and social welfare will depend on the size of  $\alpha$ , the mean of the distribution,  $\bar{Q}$ , and the variance ( $\sigma^2$ ) of the distribution. The larger is the variance, the smaller can be  $\bar{Q}$  consistent with a favorable effect on health or social welfare.

Although the relation between the change in health and  $\alpha$ ,  $\bar{Q}$ , and  $\sigma^2$  is complicated,<sup>3</sup> the reason why the variance matters is not. If the variance is very small, as in figure 3a, an equal percentage reduction for each patient is almost the same as an equal absolute reduction,

<sup>3</sup>  $\Delta H = \alpha[\bar{Q}^2 + \sigma^2](2 - \alpha)/2Q_2 - \bar{Q}]$ . Derivations available on request.

Percentage of patients

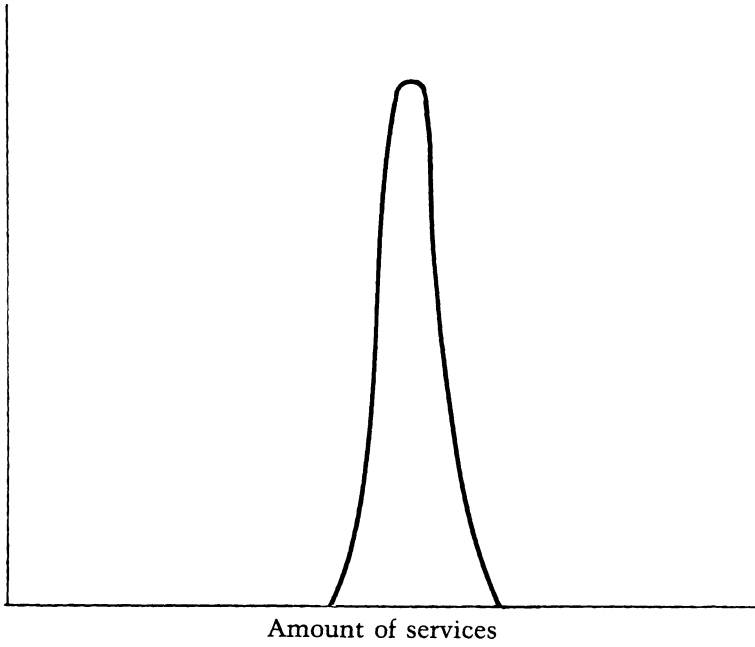


FIG. 3a (small variance).

Percentage of patients

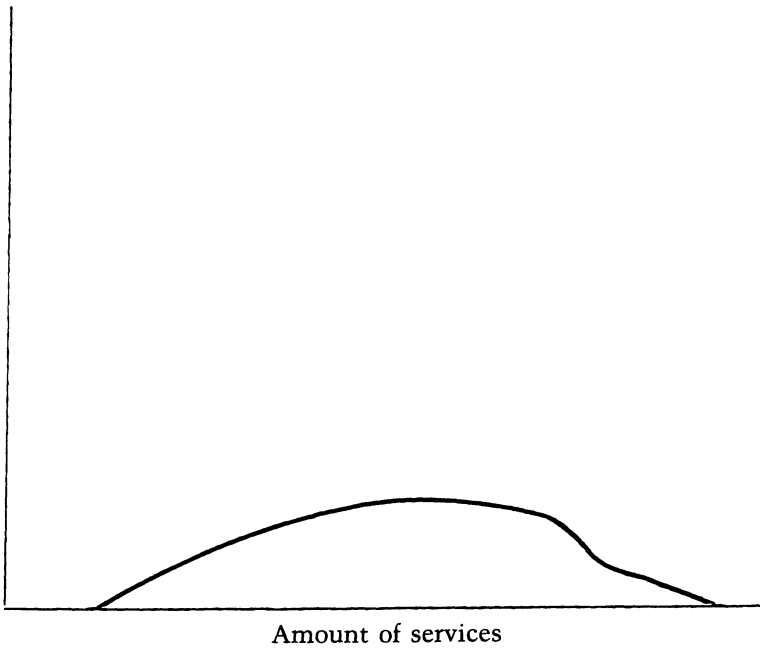


FIG. 3b (large variance).

FIG. 3. Hypothetical distributions of patients.

but if the variance is large (figure 3b), those patients who were receiving the greatest amount of services will receive much larger absolute reductions. This will result in more favorable (or less unfavorable) effects on health and social welfare than if every patient received the same absolute reduction.

Thus, equal percentage reductions will not decrease health even if  $\bar{Q}$  is less than  $Q_2$ , provided the variance is sufficiently large and  $\alpha$  is not tremendously large. For instance, if  $\bar{Q} = Q_2$  prior to cost containment and the reduction in care was 30 percent ( $\alpha = .3$ ) there would be a favorable effect on health if the variance exceeded .176. All these results are identical for social welfare if  $Q_1$  is substituted for  $Q_2$ .

### 3. Unequal percentage reductions.

If the reductions are selective; i.e., if the patients receiving more services (relative to potential benefit) experience larger than average percentage reductions, the effects on health and social welfare will be more favorable than those in case 2 for any given values of  $\bar{Q}$  and  $\sigma^2$ . Of course, if the reductions are perversely selective, i.e., if those patients receiving fewer services (relative to potential benefit) experience larger than average percentage reductions, the effects will be less favorable than in case 2.

## The Policy Debates

The foregoing analytical discussion should help to clarify key aspects of the current debate about whether cost containment has gone too far.

*Disagreement over the criterion for judging "too far."* Which side a person takes in this debate may depend on whether health or social welfare is the criterion. It is certainly possible (many experts would say probable) that reductions in the amount of services will simultaneously decrease health but increase social welfare because the value of the decreases in health will be smaller than the value of the resources freed for other uses.

*Disagreement over the distribution prior to cost containment.* Even individuals who agree that health should be the criterion may disagree about the distribution of patients with respect to  $Q_2$  prior to cost containment. If  $\bar{Q}$  is substantially to the right of  $Q_2$  (a large amount of services that harm health), then equal absolute reductions in care



will not reduce health on average. Some patients will be hurt by the reductions but others will benefit. Even if  $\bar{Q}$  is to the left of  $Q_2$  it is still possible for equal percentage reductions to be benign if the prior distribution has considerable variance.

*Disagreement over how selective the reductions will be.* Even individuals who agree about the criterion and about the prior distribution may disagree about how the reductions will be applied. If reductions are selectively concentrated on those patients who were receiving too much care, the effect will be very different than if the reductions are experienced by all patients.

In the absence of hard data it is not surprising that experts differ in their estimates of the prior distribution and of the probability that reductions will be selective. Those who believe that many patients receive excessive care and that the variance is large can point to the uneven incidence of surgery across geographical areas (Wennberg 1984). They may also cite the findings of the Rand Health Insurance Experiment that although cost sharing resulted in substantial reductions in the amount of care received by some families, no major effects on health were observed for either adults or children (Brook et al. 1983; Valdez et al. 1985).

On the other hand, a study of the effects of Medicare and Medicaid on utilization of surgical operations casts doubt on the ability of patients to reduce care selectively when faced with less insurance coverage. Urban nonwhites experienced an increase of 50 percent in their utilization of 11 selected surgical procedures after the government insurance programs went into effect, but the average level of urgency or necessity of the procedures performed on these patients was the same as it was prior to Medicare and Medicaid (Bombardier et al. 1977). If any selectivity had been present during the period of limited or no insurance, the average level of urgency and necessity should have fallen as the amount of services increased. There is no doubt that deductibles and coinsurance can induce consumers to demand less medical care, but given the complexity of many medical decisions, it is questionable whether consumers know which services to cut back on and which to retain.

Selectivity will become increasingly important as the reductions in amount of care (relative to potential benefit) grow larger. The more selective the reductions, the greater can be the decrease in cost for any given change in health or social welfare. This suggests that the

question "Is cost containment being pursued in the best possible way?" may be as important as how far it is pursued. Those strategies such as prepaid group practice that rely on physicians to contain costs are likely to result in more selective reductions than those relying on patients' responses to cost sharing: physicians have more understanding of the potential effects on health of alternative protocols. Moreover, the improvement and expansion of research and education programs designed to increase that understanding will be essential in the long run in order to contain costs in the best possible way.

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