

Linking Health Outcomes to Funding

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Abstract

This note is the edited transcript of a commentary delivered at the 1999 Australian Health Outcomes Conference held in Canberra in July 1999.

The commentary considers the currently popular argument that because health improvement is the main objective of health programs or health services then payment for the program or service should be linked to the size of the health improvement. It is argued that this conclusion violates the economic theory for achieving the best possible outcome and that implementation of such a pricing scale would be both impracticable and harmful.

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Linking Health Outcomes to Funding

Introduction: What is the Issue?

Because of the ambiguity of the word 'linking' the subject matter of this session of the conference is somewhat unclear. If, for example 'linking' outcomes to funding is taken to mean that funding should only occur if there are benefits or if benefits exceed costs then it is self evident that linkage should occur. This issue, however, is trivial and not what is meant by many of those who have advocated a direct nexus between funding and outcomes.

The broad issue addressed below is the question of whether or not expenditures should rise as benefits rise. This general question could be, first, applied to unit expenditures or to prices. The question would then be, for example, whether or not the price of a drug should rise as the benefits of the drug rises. Secondly, the question could be applied at the program level and we might ask, for example, whether or not the budget for a screening program should rise with the benefits from screening. Note that this question concerns 'benefits' and not 'outcomes'. This is a more general and more defensible proposition as it is clearly untrue that expenditures should rise with health outcomes if this is accompanied by such an increase in inequity or such a decrease in some other benefit that the community believes that it is worse off because of the change.

Feasibility and Fairness of Funding Based Funding

In the rigid formulation of the proposal, the total program budget would be directly proportional to the benefits. Two sets of practical problems arise. First, the measurement of health outcomes is highly incomplete. The OECD, for example, has estimated that only 20 - 25 percent of common procedures have been subject to evaluation¹. Even when clinical trials have been undertaken these are primarily a guide to likely benefits under certain, controlled conditions. Extrapolation to a different environment—to a different social group and patients with possible co-morbidities—is problematical. Further, clinical evaluations are commonly limited in the time frame adopted; that is, they do not measure total benefits but benefits for, perhaps, twelve months or five years.

Secondly, even where epidemiological data exist there is currently no widely agreed method or metric for comparing the multitude of different outcomes. QALYs represent the only serious attempt at overcoming this obstacle. While useful for economic evaluation, QALYs remain a problematical basis for a rigid reimbursement formula.

A further problem is that the rigid formulation would create incentives for providers to 'cream skim'. That is, there would be a preference for the treatment of 'easy cases'; patients (populations) who could receive the largest benefits at the least cost. For example, life saving antibiotics which entail fairly minimal costs would attract large payments. Psychiatric patients with relatively intractable cases of depression or schizophrenia would be avoided as their high treatment costs would not be associated with significant benefits.

¹

Oxley H & McFarlan M, Health Care 1994, Health Care Reform: Controlling Spending and Increasing Efficiency, Economics Department Working Paper 149 OECD, Paris.

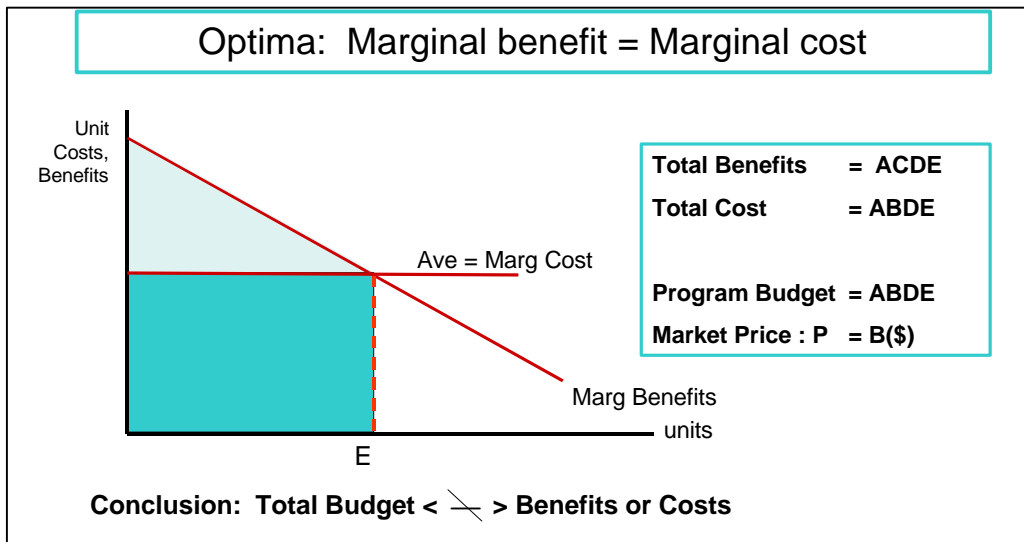
The conclusion to be drawn from this brief discussion is that the rigid formulation of the principle could not be used to allocate a significant proportion of the health care budget. At best, a fairly 'loose' formula could be used which raises budgets with benefits using ad hoc criteria for the quantum of the increase. However even this approach would be limited to cases where benefits were clearly defined, agreed, and quantifiable.

Outcomes, Funding and Economic Theory

A more fundamental question is whether or not it is desirable to attempt to link funding to outcomes. Apart from the trivial proposition that funding should only be undertaken when benefits exceed costs, economic theory does not support this proposal. Rather, economic theory suggests that subject to total benefits exceeding total costs—output—the number of units of care or treatment—should be determined by marginal costs and marginal benefits and that the total budget or total expenditure should then be determined by the cost of producing this output.

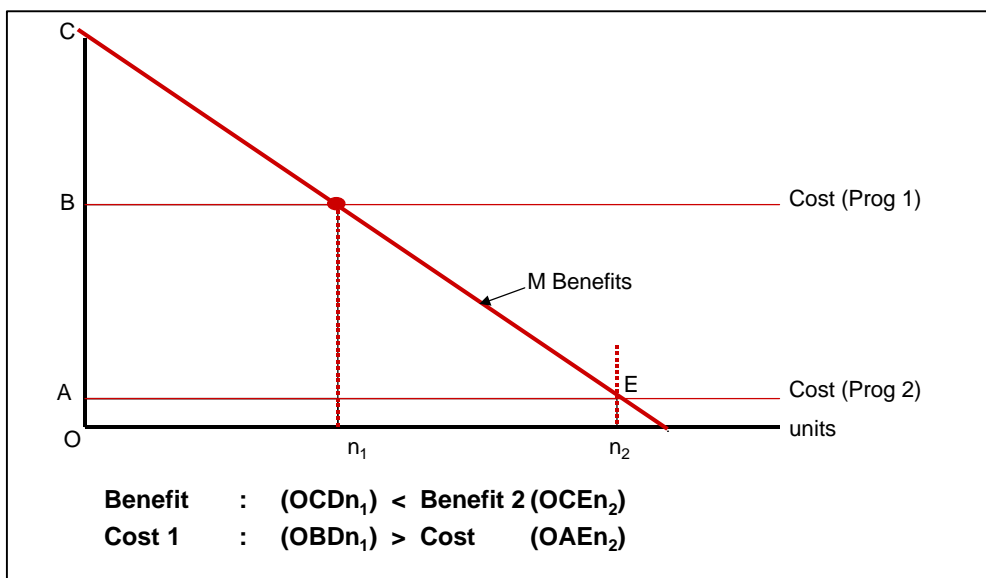
This is illustrated in Figure 1. In this, costs and benefits are measured on the vertical axis in undefined units. (Note: as economic costs represent foregone benefits there is no need for the unit of measurement to be the dollar.) If services are first provided to those who receive the greatest benefits then an increase in production will be associated with a reduction in marginal benefits, as shown. Marginal costs are usually envisaged as rising because of some capacity constraint, but for simplicity average and marginal costs in Figures 1 and 2 are held constant. At the optimal output, E, the total cost of production, and the appropriate budgetary expenditure, is shown by the shaded area; that is, by the unit cost (now translated into dollars) times output. Note that this does not correspond with total benefit which is the area under the marginal benefit curve to the left of 'E'.

Figure 1 Economic Theory: Should Budgets Rise with Benefits?



With this framework it is easy to demonstrate that there is no necessary correlation between total benefits and appropriate expenditures. Figure 2 represents two alternative programs providing an identical pattern of benefits but at different costs.

Figure 2 A Rising Benefit does not Imply a Higher Budget



According to economic theory, output should be expanded until marginal costs are equated with marginal benefits. This occurs at n_1 and n_2 respectively for the two programs. As shown, the benefit from the second program ($OCEn_2$) exceeds the benefit from Program 1 ($OCDn_1$). Despite this, the efficient expenditure and appropriate budget for Program 2 ($OAE n_2$) is less than the appropriate budget for Program 1 ($OBDn_1$). In this case, the program with the larger benefit should receive the lower budget.

Rhetorical ('Pragmatic') Arguments

Two superficially plausible arguments (from a probably much larger set) are briefly considered below.

If budgets rise with benefits then there will be an increasing incentive to carry out the program and thereby achieve the greater benefits.

The argument is unambiguously false. Incentives depend upon the difference between the budget and the cost and not simply upon the budget. Further, economic theory suggests that the optimal incentive is normally the minimum difference between the benefit and cost that is necessary to produce the desired outcome. Excess profits create inefficiency.

From the theory of Cost Benefit Analysis the criterion for the conduct of a program is that benefits exceed cost. Hence if benefits rise a higher budget is justified.

The first but not the second part of this argument is true. However, it describes a necessary but not sufficient condition for increasing the budget. That is, if both benefits and costs rise and benefits continue to exceed costs then an increased budget is justified but only because costs have risen. If benefits but not costs rise then there is no basis for increasing the budget.

Discussion

In the private market, 'productive efficiency' is defined by least cost production of the product. In a competitive environment the revenue received in exchange for this—the budget—is equal to the cost of production plus the minimum profit margin that is necessary to create appropriate incentives. In such a market there is still a 'consumer surplus'; that is, a gap between the total benefits received by consumers and the total cost of production and it is standard theory that the size of this consumer surplus is largely independent of production costs. For example, the consumer surplus from the provision of water is huge while the price and unit costs are low; the consumer surplus from the provision of cosmetic jewellery is comparatively small while unit production cost and price are high.

There are compelling reasons why revenue—'budgets'—in this context must be determined by production costs and not total benefits. Competition creates pressure for a reduction in revenue (lower prices) and this can only be achieved in a competitive market place if production costs are reduced. That is, there is continuous pressure for efficient production and the elimination of waste. A hypothetical market in which unit price and total revenue rose with the consumer surplus would be harmful for two reasons. First, the higher unit price would represent a higher 'marginal cost' from the perspective of the consumer/patient and this would lead to a reduction in the use of the product despite the fact that, now, marginal benefits exceeded the marginal cost of production. Secondly, a prediction of economic theory is that in such an environment where there is a 'super normal profit'—a profit greater than the level necessary to induce optimal production—technical inefficiency will be encouraged as there will be no direct pressure upon production costs.

A direct analogy to this argument applies in the context of a Government funded program. Increasing the budget beyond the level needed to ensure optimal output may also be harmful for two reasons. First, the vulnerability of the program will increase. From the Government's

perspective the benefits of the program relative to its costs are reduced if there is an excessive budget. This increases the likelihood that the program will be ended during a period of financial austerity. Second, and as in the market environment, an excessive budget will remove the need for technical efficiency and encourage the inappropriate use of the surplus revenue.

As a concrete illustration of this latter situation there is (relatively) little doubt that the total benefits from Australia's hospitals have always exceeded the cost of their operation by a large margin. This does not imply that hospital budgets should exceed the minimum cost of (fully) achieving optimal quality and quantity of output. It is almost universally agreed that ten to fifteen years ago hospitals did indeed receive a budget which significantly exceeded necessary costs and it is (almost) universally recognised that this was associated (then) with significant inefficiency and inappropriate expenditures.

It has not been argued here that there should be no relationship between budgets and benefits. This proposition is clearly nonsense. However this does not imply a linear relationship. Rather, the relationship is indirect. First, if costs exceed benefits there should be no budgetary allocation. Second, where there are higher costs it is possible to justify a larger budget and, for this reason a scattergram relating optimal budgets to benefits would reveal a positive correlation. However the correlation would be incomplete and possibly quite low as high benefit low cost programs are not uncommon. Third, where there is 'market failure' by either the government or the private sector that is, when programs are not provided despite benefits exceeding costs—then it is appropriate and desirable to increase budgets or unit prices until a sufficient incentive has been created. As an example, case payments in particular DRG groups could, appropriately, be increased if it was known that, on the margin, service benefits exceeded costs. Reduced payments would also be appropriate if the opposite was true.

In sum, a program is justified if benefits exceed cost but the appropriate budget is determined by the total cost. When marginal adjustments are possible, more should be produced when marginal benefits exceed marginal costs, but the appropriate addition to the budget is equal to the marginal cost and not the marginal benefit. In this second case adjustment should continue until marginal benefits and marginal costs are equal but, as the marginal benefit is unrelated to the total benefit this does not imply a close or linear relationship between total benefits and the appropriate price, budget or expenditures.

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