Cost Containment in Europe

by A. J. Culyer

Health care cost containment is not in itself a sensible policy objective, because any assessment of the appropriateness of health care expenditure in aggregate, as of that on specific programs, requires a balancing of costs and benefits at the margin. International data on expenditures can, however, provide indications of the likely impact on costs and expenditures of structural features of health care systems. Data from the Organization for Economic Cooperation and Development for both European countries and a wider set are reviewed, and some current policies in Europe that are directed at controlling health care costs are outlined.

Introduction

Questions of cost containment resolve into two distinct sorts of question. One sort is normative: For example, what are the right level and growth rate of health care costs? This question in welfare economics is appropriately discussed in terms of the value of the beneficial outcomes that health services produce in relation to the value of what is necessarily forgone. The other sort is positive: For example, given the available technology, what resources are necessary in order to produce any given level of outcome? These questions can be tackled at either the microeconomic or the aggregate level. In microeconomic analysis, the focus is on cost effectiveness, cost utility, and cost-benefit analysis (Drummond, Stoddart, and Torrance, 1987). The aim is to make cross-program comparisons of marginal costs and benefits in order to determine both the optimal mix of programs and the payoff to increased spending (or the marginal lost benefits of reduced spending). A dense jungle must be hacked through here, and, although the methodology that ought to be used seems clear, its empirical implementation is underdeveloped. (A pioneering study is Williams, 1985.) In aggregate analysis, the emphasis is on total spending, its share in gross domestic product (GDP) and its principal components, the determinants of this total and its components, and the value-judgmental element involved in assessing the marginal payoff of the aggregate and its marginal opportunity cost.

A cost cannot be held too high or too low in relation either to itself or to costs elsewhere. This is true at a microeconomic level. For instance, the capital and recurrent costs of a new imaging procedure in diagnosis or treatment are worth incurring only if the expected benefit is deemed high enough. (I do not imply a narrow financial notion of benefit.) It is also true at the macroeconomic level: The overall expenditure (public and private) on health care is worthwhile only for what it enables the system to accomplish, bearing in mind that benefits at the margin from extra health spending have as their real costs the nonhealth benefits that could have been had, but were not, because less is being spent on other sources of human welfare. (These are opportunity costs.) Such comparisons are, of course, intrinsically difficult to make, because they involve approximations and judgments about what is worth while, but they are necessary. The only rational and humane way in which to make such comparisons, however imperfectly, is in terms of benefits gained and forgone. (I insist on this latter assertion without seeking to justify it.)

Expenditure is not synonymous with opportunity cost. Much of the concern commonly expressed about cost containment is more accurately represented as a concern about overall expenditure levels and, in particular, a concern about the share of health care expenditures in either public expenditure or GDP. A part of this concern may relate to a belief that existing levels or shares are too high in the sense that, at existing levels of expenditure, marginal benefits are less than marginal costs. Another part relates to a concern that levels and shares are too high because the same benefit could be had at a lower level of expenditure. (This is particularly true in Britain.) Yet a third may be a more global concern on political or macroeconomic policy grounds to reduce public expenditure (or at least its growth rate), with the implication that health services must take their share along with other parts of public spending.

The focus in this article is mainly on the aggregate approach and, within that, on the aggregate determinants and broad policy instruments available that may affect the total. At the aggregate level, there is no satisfactory measure either of the aggregate outcome of health care expenditures (let alone their value) or of the aggregate health production function either in Europe or elsewhere. Nonetheless, an aggregate analysis can help to identify some of the factors on which policy to control expenditure might be targeted and also identify areas where further more detailed inquiry is needed. The next section is a review of the expenditure patterns observed in Europe. Some theories as to why these patterns are observed are then discussed and the evidence for them reviewed. Finally, some other institutional and environmental factors, not included in these theories of aggregate expenditure, are identified and their impact on health care costs assessed.

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Table 1

Health care expenditure (HCE) and gross domestic product (GDP) per capita: Selected countries, 1970 and 1987

Country	1970			1987			Annual compound rate of change	
	HCE	GDP	HCE/ GDP	HCE	GDP	HCE/ GDP	HCE	GDP
							Percent	
Austria	$163	$3,056	.053	$988	$11,710	.084	11.2	8.2
Belgium	147	3,652	.040	881	12,183	.072	11.1	7.3
Denmark	252	4,147	.061	784	13,129	.060	6.9	7.0
Finland	183	3,280	.056	970	13,061	.074	10.3	8.5
France	223	3,685	.061	1,117	12,849	.087	9.9	7.6
Germany	220	3,993	.055	1,072	13,308	.081	9.8	7.3
Greece	70	1,756	.040	337	6,410	.053	9.7	7.9
Iceland	288	3,382	.085	1,205	15,566	.077	8.8	9.4
Ireland	122	2,196	.056	553	7,446	.074	9.3	7.4
Italy	171	3,093	.055	837	12,190	.069	9.8	8.4
Netherlands	232	3,881	.060	1,041	12,263	.085	9.2	7.0
Norway	191	3,083	.062	1,149	15,495	.074	11.1	10.0
Spain	102	2,473	.041	521	8,676	.060	10.1	7.7
Sweden	359	4,976	.072	1,233	13,770	.090	7.5	6.2
United Kingdom	161	3,563	.045	763	12,414	.061	9.6	7.6
Mean (unweighted)	192	3,347	.057	896	12,031	.073	9.6	7.8

NOTE: U.S. dollars at GDP purchasing power parities and current prices are used.

SOURCES: (Organization for Economic Cooperation and Development, 1987, Table 20); Organization for Economic Cooperation and Development: Health Data File, 1989.

European expenditure patterns and growth

In this section, an aggregated statistical picture is drawn for those countries for which data from the Organization for Economic Cooperation and Development (OECD) are available.

Expenditure and income

The overall levels of expenditure and GDP (current prices) in 1970 and 1987 are shown in Table 1 for 15 European countries. In 1970, health care expenditures per capita, valued at OECD purchasing power parities, averaged (unweighted) $192; they rose to $896 in 1987, an annual nominal growth rate of 9.6 percent. GDP per capita during the same period rose from $3,347 to $12,031, an annual nominal growth rate of 7.8 percent. The average share of health care expenditures in GDP rose from 5.7 percent to 7.3 percent. In all countries, save Denmark and Iceland, the share of health care expenditures in GDP rose. Countries with a below average nominal rate of growth of health care expenditures were Denmark, Iceland, Ireland, Netherlands, and Sweden. The fastest growth rates of health care spending (>10 percent) were in Austria, Belgium, Finland, Norway, and Spain. Of these, only Belgium and Spain experienced a growth of GDP below the European average.

The elasticity of real health care expenditure with respect to GDP has been calculated for several OECD countries (Organization for Economic Cooperation and Development, 1987) for the pre- and post-1975 periods in order to compare the responses before and after the oil shock. These elasticities, shown in Table 2, are based on constant price data for each country using the country's own price deflators for the health care sector and the GDP deflators for GDP. The average elasticities exceed 1 for both periods (a point discussed later). Real health spending increased 70 percent faster than GDP in the period 1960-75, before the oil price shock, and 30 percent faster after it. In Belgium, France, Italy, and Spain, the elasticity after the oil shock was, however, higher than the pre-shock elasticity. In fact, in the early 1980s, the rate of growth of real health care expenditures, both absolutely and relative to GDP, slowed. Recent OECD unpublished estimates of elasticities for the period 1970-87 suggest, however,

Table 2

Real gross domestic product elasticities of health care expenditures: Selected countries, 1960-75 and 1975-84

Country	1960-75	1975-84
Austria	0.7	0.7
Belgium	1.3	1.5
Denmark	1.9	1.4
Finland	2.0	0.9
France	1.6	2.6
Germany	1.2	0.9
Greece	1.8	1.8
Ireland	2.3	0.9
Italy	0.9	1.3
Netherlands	1.5	0.5
Norway	1.7	1.5
Spain	1.7	2.1
Sweden	2.4	1.6
United Kingdom	2.1	1.0
Mean (unweighted)	1.7	1.3

SOURCE: (Organization for Economic Cooperation and Development, 1987, Table 21).

that the elasticity has risen substantially in more recent years in some countries, especially in Austria, Belgium, France, the Federal Republic of Germany (hereafter called Germany), and Italy (Organization for Economic Cooperation and Development, 1989).

Regressions

A close association between income and spending on health care has been highlighted, particularly by Newhouse (1975 and 1977). For 13 countries in the early 1970s, he found a linear relationship between per capita health care expenditures (HCE) and per capita gross national product (GNP). (When t values for the constant term are reported in these studies, they indicate that it is not significantly different from zero.) Working in U.S. dollars calculated at annual average exchange rates, he obtained the following results (t values are shown in parentheses):

$$HCE = -60 + 0.079\ GNP \quad (11.47) \qquad R^2 = 0.92$$

The coefficient on GNP is the same as that Kleiman (1974) had found earlier. My own exploration of a more complete set of OECD data (Culyer, 1988) using GDP for 20 countries produces similar results:

$$HCE = -67 + 0.083\ GDP \quad (12.45) \qquad R^2 = 0.91$$

Using OECD's purchasing power parity rates rather than average exchange rates in order to obtain a more consistent measure of dollar command over resources, the results are:

$$HCE = -95 + 0.085\ GDP \quad (8.32) \qquad R^2 = 0.81$$

Parkin, McGuire, and Yule (1987), also using OECD data, found values for 1980 of

$$HCE = -134.4 + 0.086\ GDP \quad (11.79) \qquad R^2 = 0.87$$

using exchange rates and

$$HCE = (+)80.6 + 0.092\ GDP \quad (4.94) \qquad R^2 = 0.60$$

for a subset of countries for which purchasing power parities were available.

The implied income elasticity of 1971 health care expenditures per capita with respect to GDP per capita was +1.35, the same result as that obtained by Newhouse (1975 and 1977), that reported by Leviatan (1964) for Israel in the early 1960s, and that reported by the Organization for Economic Cooperation and Development (1985) for the period 1960-82. Parkin, McGuire, and Yule (1987) found income elasticities of +1.18 for their exchange rate equation but only +0.90 using purchasing power parity. In more recent analysis of OECD data for 1983, however, higher elasticities, +1.47, were found using purchasing power parities (Gerdtham et al., 1988).

The income elasticity of health care expenditure is defined as the percentage change in per capita health care expenditure divided by the percentage change in per capita income (GDP) that induced it. Thus, the results imply that, in 1971, a $100-increase in GDP per capita could have been expected to increase health care expenditure by $8, or that a 10-percent increase in GDP could have been expected to increase health care expenditures by about 13 percent. It is this high income elasticity that gives rise to the view that health care is a luxury good, for it is conventional to classify goods with income elasticities that exceed unity as luxuries.

Interpreting the regression results

A number of points need to be borne in mind when interpreting results of this kind. First, some elements that must be held constant in the microeconomic concept of income elasticity are not held constant in macroeconomic relationships such as these. If, for example, income elasticity is not the same for all income groups, the distribution of income within countries will distort the pure relationship. In particular, if the income elasticity rises with income and if the more unequal countries are also the richer (within the relatively high-income group of the OECD countries), then the slope of the graph will be artificially high.

Second, health care is not homogeneous. Both Germany and the United States are richer countries per capita than the United Kingdom is. Using purchasing power parities, the index of GDP per capita in 1983 was: United States = 100, Germany = 82, and United Kingdom = 71. Thus, the United States was, on average, 40 percent richer and Germany 15 percent richer than the United Kingdom. Homogeneity might be taken to imply that the United States would have about 40 percent more and Germany 15 percent more real health service inputs. In fact, in 1983, the United States had 60 percent more doctors per capita than the United Kingdom had, but 27 percent fewer hospital beds and 30 percent fewer nurses! (Organization for Economic Cooperation and Development, 1985 and 1988). The claim sometimes heard that higher health expenditures go primarily into caring rather than curing (e.g., Newhouse, 1977) is not supported by this evidence. On the other hand, Germany had 40 percent more beds and 85 percent more physicians, but 59 percent fewer nurses! Clearly, once one looks beyond the aggregated expenditure picture, it can be seen that the things people are buying for their health care dollars vary greatly from country to country, and not in any way that is universally systematic with their ability to pay. The relationship between income and inputs within countries is not simple either. After 1960, the stock of beds steadily fell in the United States and the United Kingdom. In Germany, however, it rose until 1975 and only thereafter began to fall. In all three countries, the stock of doctors rose. In all three, the stock of nurses also rose, although it peaked in Germany in 1982. Clearly, more factors are at work than merely the ability to pay. Such factors include the ways in which professionals are paid and the extent to which they earn monopoly rents or the state uses its monopsony power.

Third, there is no reason to expect individual preferences for health care to remain homogeneous within countries, let alone in cross-sectional comparisons. The tastes of individuals (partially conditioned, no doubt, by established custom and the medical culture) for styles of care (e.g., generalist versus specialist community-based physicians; long versus short inpatient stays) vary. Moreover, they are likely to vary both intrinsically and in response to incentive structures, such as insurance benefits when off work sick, that are not endogenous to the model explaining overall levels of expenditure in relation to income.

Fourth, administrative costs are more a function of the organization of finance than of income. The U.S. systems of health insurance are costly (compared, say, with a country such as Canada that has public health insurance). The European systems that rely on social insurance are also relatively costly compared with countries, like the United Kingdom, that rely on taxation.

Finally, in several of the studies reported here, it was found that the intercept of a linear expenditure function was not significantly different from zero. If it were actually zero, then, of course, the income elasticity is constrained to be unity. With a significant positive slope and a significant negative intercept, the elasticity will always exceed unity. With both slope and intercept positive, the elasticity will always lie between zero and unity. This leads to a curiosity in the interpretation of Newhouse's results, as pointed out by Parkin, McGuire, and Yule (1987), that (given a negative intercept), as GDP increases, the income elasticity decreases, implying not only that health care is always a luxury but also that the higher is GDP, the less of a luxury health care becomes!

An iron law?

Because of the typically high R^2 values that have been found, some have suggested that HCE is not really a policy variable. For example, in the exchange rate equations reported earlier, from 87 percent to 92 percent of the variation in expenditure per capita was statistically explicable by variations in income per capita. The danger is that the income relationship easily becomes interpreted as a kind of iron law of health care expenditures. If income explains so much, there is nothing left for other determinants to explain: "[T]he negative inference may be drawn that other factors hypothesized to affect medical-care spending are not of quantitative significance" (Newhouse, 1977). Newhouse was careful not to claim that factors other than income, such as the form of organization and the finance of health care, bore no relationship to total expenditure. In fact, he suggested that there might be an association between the organizational forms of health care and total health care spending. Socialization (or at least centralized control of or influence over budgets) is itself a response to low income and a desire to control costs. The mode of organization is endogenous. Low per capita income, according to his argument, leads to both controls and low per capita expenditure. That argument would seem more plausible had concern over rising health care expenditures been less universal than it has been, had their composition been more homogeneous, and had the United States been less active in developing cost-control mechanisms (albeit largely within a fairly decentralized system).

One is therefore tempted to conclude that the inexorable nature of the relationship is beyond the reach of policy. But this, it turns out, is not the case, for relevant variables are plainly omitted from estimating equations. Although the omitted variables may be hard to measure for econometric purposes or may not actually have varied over the period used for estimating relationships or across the sample used in a cross-sectional analysis, some of them may correlate with GDP per capita.

Price, population, and utilization effects

The well-known identity relating % $\triangle$ HCE to the % $\triangle$ P_H, % $\triangle$ POP, and % $\triangle$ (Q_H/POP) is a useful way of identifying three components in the rate of change of health care expenditures (% $\triangle$ HCE): price changes (% $\triangle$ P_H), population changes (% $\triangle$ POP), and changes in the utilization of health care (% $\triangle$ (Q_H/POP)), as shown in the Schieber and Poullier article in this issue. The last of these terms is not directly measurable and is a residual after the effect of the other two has been taken into account. It will depend on changes in demographic structure (for example, aging populations), changes in technology, and changes in the style of medical practice insofar as they can be separated from changes in technology.

The results of such an exercise for the period 1960-84 are shown in Table 3. It can easily be seen that the population component of the growth rate is typically small, 0.7 percent (save insofar as it is reflected in utilization rates). The principal components of HCE nominal growth are health care input price inflation and utilization. Although HCE price inflation is the major part (on average, 9.6 percent, compared with an average rate of increase in utilization of 5.7 percent), it should be remembered that general inflation was also high. For the 16 countries shown, general inflation was 9.0 percent. Therefore, on average, excess health care inflation contributed 0.6 percent per year to the growth of HCE. In some countries, however, the inflation differential between the health sector and the general economy was above average, notably Austria (3.2 percent differential), Iceland (2.8 percent), Netherlands (2.2 percent), Switzerland (1.7 percent), Norway (1.3 percent), and Germany (1.3 percent). In six countries, the differential was negative, notably in Sweden (−1.3 percent) and Greece (−1.0 percent). Because general inflation is largely exogenous to health care inflation, the conclusion is hard to resist that the main endogenous health care factor contributing to rising HCE in Europe has been utilization. More information can be

Table 3

Annual compound rate of change in health care expenditure (HCE), by component, and gross domestic product deflator: Selected countries, 1960-84

Country	Annual compound rate of change				
	HCE growth				
	Total	Health care prices	Population	Utilization	GDP deflator
	Percent				
Austria	11.3	8.3	0.3	2.7	5.1
Belgium	11.8	6.3	0.3	5.2	5.4
Denmark	14.1	8.2	0.5	5.4	8.2
Finland	15.4	8.1	0.4	6.9	8.8
France	15.3	6.9	0.8	7.6	7.5
Germany	10.1	5.6	0.4	4.1	4.3
Greece	18.3	9.3	0.7	8.3	10.3
Iceland	34.8	30.2	1.3	3.3	27.4
Ireland	18.2	10.0	0.9	7.3	10.3
Italy	17.6	10.5	0.5	6.6	10.5
Netherlands	13.7	8.4	1.0	4.3	6.2
Norway	14.5	8.4	0.6	5.5	7.1
Spain	21.8	13.0	1.0	7.8	12.1
Sweden	13.7	6.0	0.5	7.2	7.3
Switzerland	12.1	6.7	0.9	4.5	5.0
United Kingdom	13.1	8.3	0.3	4.5	8.7
Mean (unweighted)	16.0	9.6	0.7	5.7	9.0

SOURCE: Calculated from (Organization for Economic Cooperation and Development, 1987, Table 22).

found in (Organization for Economic Cooperation and Development, 1987.)

This conclusion should, however, be seen as tentative, because it depends crucially on the adequacy of the OECD deflators for HCE. These are intended to be consumer price indexes and are therefore weighted by shares of consumer out-of-pocket expenditure in total consumer expenditure. However, shares of out-of-pocket expenditures are inappropriate weights for measures of total health care expenditure inflation. For example, hospital prices are typically heavily subsidized and have a small weight in consumers' expenditure but take up the bulk of total health care expenditure. There are also other snags. For example, an element of the hospital price index may be based on per diem costs of care rather than cost per case. If so, falling lengths of stay (indicating, all things being equal, a falling cost per case and increasing productivity) will not be picked up by the price index. In fact, a perverse price rise may be signaled if the patients not experiencing a falling length of stay are sicker, more costly cases on average and if the bed stock and occupancy rates remain roughly constant.

Composition of health care expenditures

In Table 4, public health expenditures are grouped into the four categories used by OECD. No consistent data are available for breakdowns of total health care expenditures. Even the data that are available are fraught with problems, and overinterpretation must be avoided. Percentages do not add to 100 because the data, even for single countries, do not relate invariably to the same year. For some countries (e.g., Belgium) it is difficult to assign physician incomes between the institutional and ambulatory sectors. The balance between outpatient care provided by institutions and that provided by community-based physicians varies. For example, in Germany, virtually no outpatient care is provided by hospitals; in Sweden, 5 percent of physician visits are to doctors working in hospital outpatient departments. The use of outpatient diagnostic services in hospitals compared with diagnostic procedures in doctors' clinics and offices is variable. The remarkable growth in ambulatory care in the Netherlands is probably an artifact of the data.

In general, however, it is clear that hospital care is the largest component of health care expenditure. The most variable component is pharmaceuticals, and this element has also had the greatest variation in its growth rate. This is, in large part, the result of different methods of paying for drugs. Patient out-of-pocket shares vary greatly, thus affecting the public share.

Systematic comparisons must await greater harmonization of the data. A breakdown of

Table 4

Composition of public health care expenditure: Selected countries, selected years

Country and year	Institutional	Ambulatory	Pharmaceutical	Other
	Percent			
Austria, 1983	25.3	20.3	9.9	44.7
	(1.2)	(-1.4)	(-2.6)	(1.5)
Belgium, 1981	21.0	37.7	11.8	29.5
	(2.0)	(-0.3)	(-3.4)	(1.8)
Denmark, 1984	73.9	22.0	4.8	—
	(1.0)	(-1.2)	(0.3)	(—)
Finland, 1983	55.2	28.1	5.9	10.7
	(-1.0)	(5.0)	(0.1)	(-1.6)
France, 1984	59.5	22.9	13.1	7.9
	(2.1)	(-1.2)	(-2.6)	(—)
Germany, 1983	43.0	25.5	19.2	12.3
	(0.3)	(-1.6)	(0.4)	(4.1)
Greece, 1982	49.5	13.4	14.8	22.3
	(2.0)	(-1.9)	(-1.9)	(-0.4)
Ireland, 1983	73.4	11.5	7.0	9.7
	(—)	(—)	(15.9)	(—)
Italy, 1984	55.3	27.8	13.0	4.6
	(0.5)	(-1.1)	(-1.3)	(—)
Netherlands, 1984	69.3	23.2	7.2	3.7
	(1.7)	(31.3)	(0.6)	(-8.0)
Norway, 1981	69.9	15.3	7.2	7.6
	(-0.5)	(-2.0)	(-1.3)	(—)
Portugal, 1983	46.3	20.7	20.3	12.7
	(—)	(-1.7)	(2.3)	(1.0)
Spain, 1981	42.5	16.7	15.8	25.7
	(—)	(-0.1)	(-5.2)	(—)
Sweden, 1983	72.6	10.2	4.9	12.3
	(0.3)	(3.7)	(0.2)	(-2.7)
United Kingdom, 1979	59.7	11.2	10.3	20.0
	(0.7)	(-1.6)	(0.3)	(0.0)
Mean (unweighted)	54.4	20.4	11.0	14.9

NOTE: Annual compound rates of growth from 1970 to the 1980s are given in parentheses.

SOURCE: (Organization for Economic Cooperation and Development, 1987, Table 24).

expenditure for doctors, nurses, pharmaceuticals, other supplies, and other hospital expenses, which would ideally be by type of hospital, is not available.

The data in this section can be used to gain only a broad indication of European patterns, and one that cannot be held to be particularly accurate. It is nonetheless useful to pursue an aggregate analysis by investigating the determinants of the more reliable elements in these data, particularly total health care expenditures.

Public choice view[1]

One way of trying to build a more complex narrative is the public choice approach of Buchanan (1965) and Leu (1986). Such work is not narrative in any historical sense—Buchanan's self-confessedly so—but is an attempt to provide a systematic explanation for the international differences that are observed.

Buchanan thesis

The thesis of Buchanan (1965) was prompted by the 1965 crisis in Britain's National Health Service (NHS). Many members of the medical profession were poised to withdraw from the NHS, and problems of waiting lists and medical emigration were seen, each of which was much exaggerated into a failure of the NHS.

At the time, economists' standard objection to the provision of health care at zero price to the patient was that doing so encouraged overuse. Excess demand, they had predicted, would inexorably draw too many resources into the health sector ("too many" in the sense that the cost of the additional resources would exceed any reasonable assessment of their value in health care). After 17 years of socialized medicine, however, it was all too clear that this oversupply had not materialized. Buchanan proposed an alternative theory: Political decisions about the supply of services are made independently of demand, so inefficiency (failure) manifested itself not as oversupply but as reduced quality in the form of more congestion, longer waits, less qualified immigrant nurses and doctors, and so on.

This theory is derived from consideration of the nature of the decision each member of the community confronts as a demander of publicly provided health care and as a taxpayer. As a demander of what is, to all intents and purposes, a private good (or so it was assumed), each has an incentive to extend his or her demand (malingering) as long as additional service has value, no matter how small. As a taxpayer, however, each recognizes that the health care benefits to be had per tax dollar directly compete with the other publicly provided goods that tax dollars can buy (education, social security, and so on) and that tax-supported health care benefits must be shared with other beneficiaries. In other words, in the supply-side decision, the taxpayer both confronts the costs of providing the service (which he or she does not do on the demand side, there being no price) and has the potential personal benefit reduced by virtue of having to share access with others. It follows that supply will not be sufficient to meet the excess demand and queues will develop. The result is that the individual as taxpayer gets the same chance in the queue as anyone else rather than the direct ability to purchase personal service.

For present purposes, the significance of Buchanan's analysis does not lie in the accuracy of his predictions about the NHS. Many of these have proved factually wrong, as seen in (Bosanquet, 1986), demonstrating that theory without history can be as misleading as evidence without theory. The significance lies rather in his recognition that the financing of collectivized health care is itself subject to decisions. Financing is not automatic, as it would be under a full market system in which price both brought supply and demand into equilibrium and provided the funding via the care supplied.

Of course, the same may be argued of health care financed by private insurance, which also severs the intimate links among demand, supply, and finance. However, the public element in the finance of health care is special in that decisions about spending are quintessentially political. It is beside the point whether voters behave as Buchanan suggested (refusing to will the financial means, but, in their other role as patients, inflating demand and driving it still further apart from supply) or whether they only appear to behave like that thanks to the accurate interpretation of their supply-side wishes by democratic politicians. In either case, the political process and the way in which health care is financed and provided have a prima facie claim to our attention. We have an expectation that expenditure will be related to these factors in some way.

Leu thesis

The analysis of Leu (1986) is founded on a useful identification of three types of actors and decisionmakers in the system. Real health care expenditures depend on the behavior of patients, of health care providers, and of health care financiers. The last group is especially significant to health care because, in all developed countries, direct, out-of-pocket charges to consumers are not the typical method by which the providers acquire their revenue. Instead, they get it from government, from insurance agencies, or from charitable gifts.

In this model, public finance of health care will raise the level of spending on health care so long as the user price to the consumer falls (but fees to providers do not) and providers have an incentive to respond to the increase in demand by increasing supply (rather than, for example, letting queues develop). Given these circumstances, we expect a correlation between total spending on health care and the share of public finance in that spending.

Leu therefore postulated that total expenditure on health care increases as the share of public finance in

[1]This section is largely drawn from Culyer (1988).

the total increases. This proposition can be seen to depend on two conditions: that the public finance increases demand (by reducing the user price to the consumer) and that it increases supply (by maintaining or increasing, as necessary, the price paid to suppliers). Both must be present; having either without the other implies no correlation at all between total expenditure on health care and health care's share of public finance. Both—in particular, the second—imply willingness on the part of the taxpayer (or insurance-premium payer) to finance whatever supply is determined.

Notice that the argument just described concerned public finance, not public ownership: Paying for health benefits with tax dollars raises spending even if suppliers remain in the private sector. Leu also argued, however, that public ownership affects total expenditure. Drawing on the general property-right literature and a scattering of specific studies of hospitals, he argued that the lack of competition for the ownership of publicly owned institutions leads to a reduced incentive for management to minimize costs at each rate of activity. Therefore, other things being equal, publicly owned hospitals are costlier per unit of activity than privately owned hospitals are. In addition, nonprofit institutions in both the public and private sectors have bureaucracies whose behavior seems to be that of budget maximizers. So, said Leu, the public sector is likely to evince not only oversupply but oversupply at inflated cost.

Again, then, a public variable—this time, the share of public provision in total provision—is expected to correlate with total expenditure: The higher the public share, the greater the total expenditure. Notice that this argument, like the previous one, depends on particular assumptions, especially the assumption that the supply of finance is perfectly responsive to whatever level of provision bureaucratic decisionmakers prefer.

Leu recognized the theoretical significance of the financing constraint and included it as a variable additional to the shares of public finance and public provision. The variable he used to capture it was the centralization of political decisions about the size of the health care budget (centralization that he held to exist only in New Zealand and the United Kingdom). He also used a nontheoretical public variable to represent direct, as distinct from representative, democracies. He held that public expenditures are smaller in direct democracies (the Swiss effect). In addition, two demographic variables were included: proportion of the population under 15 years and degree of urbanization.

Leu's public choice model thus contained six explanatory variables in addition to GDP per capita:

- PF, share of public finance in total health care expenditures.
- PP, share of public provision in total provision (of hospital beds).
- CB, a dummy variable for the two countries having a centralized health care budget.
- DD, a dummy variable for direct democracy (Switzerland).
- POPU15, proportion of the population under 15 years of age.
- URB, percentage of population living in cities of more than 100,000 inhabitants.

He then ran a cross-sectional multiple regression on 1974 data for the OECD countries (excluding Luxembourg, Iceland, Japan, Portugal, and Turkey) and obtained the elasticities shown in Table 5. One estimating equation (column 1) included PF, one used PP (column 2), and one had both PF and PP (column 3); all three included CB and DD.

The income elasticities of +1.18 to +1.36 were similar to those reported earlier. (In fact, these seem to be robust results that vary little from study to study.)

According to equation (1), a 10-percent increase in the share of public and nonprofit beds was associated with a 9-percent increase in expenditure per capita. The presence of centralized budgetary control was associated with a much more substantial fall in expenditure, 21 percent. Direct democracy was associated with a dramatic fall of 31 percent.

According to equation (2), in which PP is replaced by PF, a 10-percent increase in the share of public finance was associated with a 3-percent increase in health expenditure per capita. The impact of centralized budget control rose, reducing per capita expenditure by 24 percent. The effect of the direct democracy variable was smaller and insignificant.

In equation (3), which includes both public-share variables, the effect of public provision appears to be smaller, and the impact of public finance has fallen dramatically, ceasing to be significantly different from zero. Centralized budget control was significant, and so was the Swiss effect.

Table 5

Elasticities of per capita health care expenditures: Selected countries, 1974

Item	Equation (1)	(2)	(3)
GDP per capita	1.18	1.36	1.21
PF	—	0.34	*0.16
PP	0.90	—	0.85
CB	-0.21	-0.24	-0.23
DD	-0.31	*-0.20	-0.29
POPU15	0.56	1.10	0.69
URB	*0.11	0.28	—
Intercept	-12.41	-9.65	-10.06
R^2	0.97	0.96	0.97

*Elasticities were not significant at the 5-percent level.

NOTES: GDP is gross domestic product. PF is public finance share of total health care expenditures. PP is public provision share of total hospital beds. CB is a dummy variable for the 2 countries having a centralized health care budget. DD is a dummy variable for direct democracy (Switzerland only). POPU15 is proportion of population under 15 years of age. URB is percentage of population living in cities of more than 100,000 population. Equation (1) included PP but not PF; equation (2) included PF but not PP; equation (3) included both. All equations included CB and DD.

SOURCE: (Leu, 1986).

Is public provision inefficient?

Detailed microeconomic evidence casts serious doubts on the empirical validity of the claim that public provision is relatively X-inefficient. Explicit comparisons have been made between investor-owned for-profit hospitals and voluntary nonprofit hospitals. Such comparisons are relevant for Europe, which has been experiencing some growth in the market share of for-profit organizations. Care must be taken, however, to determine those differences that reflect the inherent qualities of the for-profit and nonprofit hospitals as distinct from those that are reflections of particular features in the system of financing and organizing health care delivery in the United States. Great care must also be taken to ensure that like is compared with like. Bays (1977), studying the United States, and Butler (1984), studying Australia, both found that for-profit hospitals specialized in the less complicated case mixes, concentrating on routine and non-urgent surgery. Stoddart and Labelle (1985), in a review of the entire field, concluded that evidence "does not substantiate (indeed it refutes) claims that privately owned for-profit hospitals operate more efficiently (i.e., at lower costs of production) than do non-profit hospitals." The case for privatization as a method of cost control or an agent for the promotion of efficiency is thus uneasy.

The absence of an unambiguous effect of ownership on overall spending should not come as a surprise. It is not self-evident that private sector bureaucracies are better controlled than public sector ones; that costs in the service market are higher in the public sector than in the presence of competition (a claim that standard theory does not imply, given the presence of advertising and other selling costs); or that market pressures are more reliable than professional ethics and regulation as a means of ensuring high quality. Of course, case mix varies greatly between the two sectors.

The pioneering econometric work by Newhouse and Leu continues to be followed up by others, and the definitive story remains to be unraveled. Most recently, Gerdtham et al. (1988) made a careful econometric analysis of the public choice issue. Their results differed from Leu's in that some of the variables changed signs and all had reduced t values.

The model preferred by Gerdtham et al., after extensive econometric testing of alternatives, was a linear in logarithms specification in which HCE per capita was a function of GDP per capita, the proportion of the population under 15 years of age, the share of public financing, and the proportion of public finance for inpatient care. Pooled OECD data for 1974 and 1983 were used. The income elasticity was highly significant and relatively high, +1.52. (The intercept term was negative and statistically significant.) The young population variable had a small elasticity (−0.085) of the opposite sign to Leu's finding, apparently denying the assumption that the young, like the elderly, are relatively high utilizers of health care (in value terms). The PF variable also changed signs, becoming negative, possibly suggesting less rather than more X-inefficiency under public than private financing and probably also reflecting heavier transaction costs. (The elasticity was −0.515.)

The foregoing suggests some lessons for those seeking effective leverage on overall expenditures:

- The wealthier (per capita) a country is, the more it spends on health care per capita and the greater the proportion of its total income spent on health.
- Centralized control of health care budgets seems to result in lower spending levels than otherwise would be expected.
- The effect of both public finance and public provision or ownership is ambiguous, but the former probably lowers expenditure.

Aggregate expenditures: Determinants and controls

In addition to centralized budgetary controls, other general institutional arrangements may be conducive to both cost control and greater efficiency. Although these do not emerge as candidates from aggregate analysis of the sort discussed in the previous section, there are either a priori or empirical reasons (sometimes both) for regarding them as policy instruments worth exploring.

Competition among hospitals

It has been frequently observed that, in most European countries, there is a large variance in cost per case (adjusted for diagnostic mix) among hospitals in both private and public sectors. In Britain, the evolution-survivor approach to industry theory (Alchian, 1950) has been espoused. This has led to the official policy idea that no a priori view of the inherent superiority of one form of ownership over another need be taken. It is better to create instead market conditions under which the more efficient providers (whatever their ownership) will tend to thrive and the relatively costly or inefficient will tend to be driven out via contestable markets and open competition among supplying agencies for the custom of publicly financed health authorities (with predetermined budgets).

This proposal for hospital financing (United Kingdom Department of Health, 1989a) has two main features. Both features rest on an important distinction of principle: that the principal public bodies responsible for ensuring the availability of health care to client populations (the District Health Authorities, or DHAs) need not be directly responsible for the provision of the care as distinct from its purchase. This separation of function is clearest in the case of the proposals for self-governing hospital trusts (SGHTs) run by boards of directors (based on ideas by Enthoven, 1985a and 1985b). SGHTs and private sector hospitals will compete for the business of DHAs. (They also will compete for the business of private patients and that of large practices of general practitioners, as discussed later.) Contracts

between SGHTs and DHAs will specify workloads, quality assurance procedures, etc. The intention is to liberate managerial enterprise in those hospitals that are sufficiently geared up with internal information and management systems, to widen choice, and to provide market-type incentives for cost effectiveness. The responsibility of DHAs will remain to ensure adequate provision at the time of need for their clients. Even for hospitals that do not successfully apply to become SGHTs and remain under the direct control of DHAs, explicit management budgets will embody clear targets for quantity and quality with formal performance assessment.

Group practices of general practitioners (GPs) that serve more than 11,000 patients are also to be given the opportunity to receive practice budgets. Out of these budgets, they may purchase outpatient services, a defined set of elective surgical procedures, and diagnostic kits, such as X-ray and pathology services, directly from DHA hospitals and SGHTs (United Kingdom Department of Health, 1989a, b, c, and d).

Prospective payment for hospitals

Hospital-based care accounts for the lion's share of health costs. Countries that achieve relatively short lengths of stay and short turnover intervals will tend to have lower costs per case and, if they also achieve a low rate of hospitalization, will have lower overall costs. The pattern in Europe is extremely variable. In some countries, such as Germany, an above average rate of admissions, a higher than average bed stock, and long lengths of stay seem to raise health care expenditures substantially. Of the European countries, Finland has the most hospital-intensive style of medical practice, reflected in its admission rate and its bed stock. It is also among those with the longest lengths of stay. The United Kingdom, in contrast, is below average in all respects and offers a relatively cost-effective service.

The determinants of these differences are complex. One is plainly financial. German hospitals, for example, are reimbursed on a per diem basis, whereas United Kingdom hospitals have annual prospective budgets. Because most profit is to be made out of days that are not treatment intensive, long lengths of inpatient stay are profitable for hospitals paid per diem. However, other factors must be at work, too. It seems clear that clinical practice in Europe is not uniformly guided by the results of clinical trials and cost-effectiveness inquiries into the optimal length of stay, use of day-case surgery, and so on.

Clearly, any system that uses open-ended retrospective reimbursement for hospitals is likely to see a higher overall level of expenditure per capita and possibly a faster rate of health care cost inflation. Almost any form of prospective payment is likely to limit these tendencies by relating rewards to planned workload and encouraging awareness of cost per case. Costs could be reduced by improving efficiency; for example, by substituting less expensive inputs for costlier ones or reducing the number of unnecessary hospital stays or tests. Minimizing costs might, however, also be achieved by cutting corners and providing a lower quality of care. It thus becomes important to audit quality under this system. Another way acute care hospitals can reduce costs is to shift the burden of care to other providers, such as GPs. For example, early discharge from hospital increases the use of long-stay facilities, community services, GP visits, and so on.

The authors of the aggregate studies to date do not effectively identify a distinction between open-ended and closed-ended systems of finance, and it is clear that Leu's centralization variable is a poor proxy for closed-endedness (Culyer, 1988). Prepaid group practices such as health maintenance organizations are, for example, closed-ended systems without budget centralization; public health insurance, by contrast, may be centralized and governmentally operated but open ended. Systems that are closed ended lend themselves, on the face of it, more readily to expenditure control (Hurst, 1985), but they confront starkly the difficult issue of determining what the prospective budgets of health care suppliers should be. This task is made the more difficult by the nearly total ignorance of decisionmakers about the marginal costs and benefits of additional health care. It is also made the more politically daunting because of decisionmakers' vulnerability to charges (which may not be valid) that essential care is not being (or will not be) provided. Systems that are open ended seem to avoid this political charge, only to run into another: that costs are out of control. Moreover, ignorance of the marginal costs and benefits is not less under open-ended systems. Yet only when this ignorance has been substantially removed is it possible accurately, or even approximately, to assess which of these two approaches is more likely to produce an approximation to the optimal rate of expenditure.

Throughout Europe, there has been much discussion of the potential for using methods related to the U.S. system of diagnosis-related groups (DRGs) for prospective funding of hospitals (though not for billing purposes). DRGs are used to classify acute inpatients in groups using routine medical records data. The inventors of DRGs at Yale University claim that the groups are clinically meaningful and homogeneous in resource use (Fetter et al., 1980). The use of DRGs to pay hospitals creates, however, new patterns of penalty and reward. A limitation of DRGs in the United States is that they do not extend to outpatients and day cases, which therefore remain funded at cost. This provides an incentive for shifting costs from inpatient budgets to outpatients or day care. Such shifts could be achieved by genuinely efficient substitution or, less happily, at the expense of proper patient care. As a consequence, researchers at Yale have been developing ways of extending the DRG system to cover ambulatory categories. Like any classification system, the DRG system still contains a considerable range of costs per case. This encourages hospitals to select cheaper cases. Moreover, DRGs are

based on the recorded primary diagnosis, comorbidities, and complications, which are based on clinicians' judgments, some of which may not be firmly based. Clinicians who are aware of the financial consequences for their hospitals of differing reporting conventions will be under pressure to adopt those that maximize income. (This medical form of creative accounting has been termed "DRG creep.")

Evidence on the consequences of prospective payments in the hospital sector is limited to the early U.S. experience with the Medicare prospective payment system. It should be interpreted with caution not only because experience is based on a fairly limited period but also because there would be major difficulties in transferring the results to Europe, with its different cultures, traditions of medical practice, and general levels of funding. U.S. hospitals financed by the DRG system were found to have reduced costs per day by 9.8 percent and costs per admission by 14.1 percent. Average length of stay in a hospital was shortened by 6.5 percent under the DRG program. (A review is contained in Culyer, Brazier, and O'Donnell, 1988.) The effect on total costs was, however, largely offset by an 11.7-percent rise in admissions with the DRG program. The net savings with the DRG program was, as a result, only 2.4 percent at a maximum.

The early U.S. experience with DRGs is still inconclusive. Although it would appear that length of stay has been significantly reduced, it cannot be determined whether this has been brought about by cost shifting among agencies and budgets, a rise in readmission rates, or a reduction in the quality of care and a deterioration of outcome. Evidence on the consequences of DRGs for throughput is conflicting. In general, total expenditure continues to rise. There has been a dearth of analyses of effects on patient outcomes. The potential for cost savings via this route would, of course, vary in Europe.

Medical remuneration

Because reimbursement methods can affect behavior, they can also affect economic rents and opportunity costs. Although there is some controversy about the ways in which doctors alter workload in response to changes in their methods of payment, it seems fairly clear that fee-for-service methods result in both more active treatment and higher incomes for doctors. Evans (1974) originated the theory of supplier-induced demand (SID). The idea here is that physicians have a target income; under a fee-for-service system of paying doctors, they will adjust workload in response to changes in the environment. The concept of SID seems to have grown out of the empirical observation in the United States that regional utilization of health care is positively associated with the regional stock of doctors, holding price and other variables constant. The hypothesis is that physicians will induce patients to use more services in order to maintain income. A positive association has also sometimes been found between physician stock and prices, although this result is even more disputed than the fundamental utilization effect is. There are a number of econometric and empirical problems in testing for SID, but Rice's claim (Rice, 1983; Gabel and Rice, 1985) that experimental rather than routine data strongly support an inverse relationship between reimbursement rates and use of services seems persuasive. (A review can be found in Culyer, Donaldson, and Gerard, 1988.)

The evidence from the United States seems to be borne out by Canadian experience. Extra billing was banned in Ontario in 1986; the fee-for-service profession expanded billable items of service substantially (by about 18 percent) in subsequent years. In Quebec, a doubling of fees for home visits was followed by rapid increases in the number of home visits: 14.6 percent in 1977, 25.2 percent in 1978, and 28.4 percent in 1979 (Poullier, 1987), despite a general decline in home visits by community-based doctors generally.

No evidence for Europe exists that is comparable to that for North America. However, the relative remuneration of doctors seems to correlate with the method of payment. Although most countries adopt a mixture of systems of remuneration that differ between hospital-based and community-based doctors, those that use a predominantly fee-for-service method (Belgium, France, Germany, and Switzerland) have relatively high earnings for the profession. Slightly less than one-half of Germany's doctors are community based, are paid on a fee-for-service basis, and have complete freedom as to choice of practice location, and there is no effective control on the numbers entering the profession. Senior hospital doctors in private practice are also on a fee-for-service basis. Gross earnings for private doctors and some specialists (e.g., radiologists) are twice or three times those of salaried hospital doctors. Physician expenditures in Germany amount to about 25 percent of total HCE, the highest share in Europe. It is striking that the four countries that do not use fee for service as the principal means of payment (Denmark, Italy, Sweden, and the United Kingdom) have the four lowest ratios of average doctor income to GDP per capita (Organization for Economic Cooperation and Development, 1985 and 1988).

A related factor affecting expenditure for physicians' services is entry into the profession. The outputs of medical schools in European countries vary considerably, as does the proportion of doctors trained outside Europe. The highest rate of admission to medical school seems to be in Belgium, where entry is unrestricted (33 per 100,000 population), but the wastage rate is also high (only one-half graduate). In Germany, the rates are 19 admitted and 11 graduated. In the Netherlands, the rates are 13 and 10, and in the United Kingdom, 7 and 6, but the United Kingdom has the highest proportion of foreign medical graduates, 26 percent (Schroeder, 1984). In each of these countries save the United Kingdom, there has been a recognized oversupply of doctors and, in particular, of specialists.

Direct price and quantity controls

There has been no study in Europe in which the effect of the exercise of the state's monopsony power on the remuneration of personnel or the prices and quantities of medical supplies has been quantified. However, it is widely believed that the effect has been substantial in some countries, especially in those, like Britain, that have centralized pay negotiating machinery. The potential efficiency losses of the exercise of monopsony power have not been estimated.

One of the most regulated parts of the health care industry in Europe has typically been the pharmaceutical industry. Because of this regulation, countries with a substantial local pharmaceutical industry have experienced a tradeoff between the desires for low-cost modern medicines and for having a dynamic, high-technology, exporting (but oligopolistic) industry. In addition, most European countries subsidize drug consumption, but they have widely differing consumer copayments. In Europe, the highest expenditure per capita on drugs was in Germany ($194 in 1983, which was nearly five times that of Denmark). The variability derives not only from price regulation but also from quantity controls. For example, several European countries have limited lists from which physicians must select their prescriptions, and some allow pharmacists to substitute generic drugs for branded products. The United Kingdom is about to introduce cash-limited budgets for general practitioners' prescribing (United Kingdom Department of Health, 1989e). Perhaps surprisingly, no correlation has been found between the number of physicians or pharmacists per capita and the expenditure per capita on drugs (Organization for Economic Cooperation and Development, 1987). If adequate statistical controls could be placed on the other factors affecting drug expenditures, such a relationship might emerge. The variability in spending per capita strongly suggests that this component of HCE (on average about 10 percent of the total in the early 1980s) is rather sensitive to policy variables.

It may be possible to argue that the exercise of monopsony power; use of prospective cash-limited health care budgets; a preference for capitation and salary over fee for service; and price, quantity, and prescribing regulation in pharmaceuticals are all endogenous elements from the perspective of some overarching model of public choice and are therefore more likely to be chosen by countries with a relatively low GDP per capita. They nonetheless remain options for selection in any country wishing to exercise greater control over the growth of health care expenditures. The idea of harnessing competitive forces in a relatively poor OECD country like the United Kingdom seems, however, to be an entirely new option, neither obviously predicted by public choice theory nor, as yet, subjected to empirical test.

Conclusions

Aggregate international comparisons cannot be used to indicate what health care spending ought to be, nor can they be used to prescribe its optimal growth rate. Such issues require patient and fairly detailed cost-benefit analysis of specific health care programs. Aggregate comparisons can, however, be used to test theories of the determinants of spending. The principal conclusion to be drawn from such analyses is that in Europe, as elsewhere, income per capita is the main determinant. Income is also, however, likely to be related to particular policies adopted to control HCE. Therefore, the existing cross-sectional regression analyses do not permit any independent measure of the impact of such policies other than the general conclusions that centralized cash-limited budgets have a significant negative impact on the total and that public finance also reduces total expenditures. Microeconomic, as distinct from aggregate, comparisons suggest that private for-profit ownership of hospitals tends to raise costs.

The large variations in the composition of HCE in Europe are, in turn, the product of the great variety in forms of finance, provision, and regulation that exist. Detailed investigation of the causes of this variety remains to be done. Meanwhile, it is hard to resist the conclusion that the selective use of instruments that appear to bear on these components currently offers the best way forward: promoting competition among suppliers, use of closed-ended prospective systems for paying suppliers, controlling entry to the major professional groups, use of salary and capitation rather than fee for service in medical remuneration, and various direct price and volume controls. None is a panacea and none is without its own cost. Moreover, it should always be borne in mind that cost containment in itself is not a sensible objective. The ultimate objective of any system of health care is to promote the health and welfare of its clients. More precisely, the objective is to maximize health and welfare subject to the resources available and to adjust these resources so that, at the margin, they are neither more nor less valuable in the health care sector than elsewhere. The practical difficulties entailed in making these judgments, whether one depends on markets or planning mechanisms, should never serve as an excuse for mere cost cutting, regardless of its consequences.

Acknowledgments

My thanks for helpful comments from Jeremy Hurst, Bengt Jönsson, David Parkin, Jean-Pierre Poullier, and an anonymous Health Care Financing Administration reviewer. I have not taken all the advice given, sometimes because I stubbornly persisted in an original position and sometimes because space did not permit further elaboration. Therefore, most and probably all of any remaining faults are entirely my own.

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