Cost-containment in Europe

by

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ABSTRACT

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 comparisons of expenditures can, however, provide indications of the likely impact on costs/expenditures of structural features of health care systems. This paper reviews the evidence based upon OECD data for both European countries and a wider set and outlines some current policies in Europe that are directed at controlling health care costs.

Cost-containment in Europe

A.J. Culyer

A cost cannot be held "too high" or "too low" either in relation to itself or to costs elsewhere. This is true at a micro level: 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 macro 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 other non-health 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 a comparison is, of course, intrinsically difficult to make - so are all judgements at all levels about what is "worthwhile" - but the difficulty must not be allowed to obscure the fundamental truth that such a judgement (approximate and fuzzy though it may in many respects be) has to be made and that the only rational and humane way in which to make it is (I shall insist on this assertion without seeking to justify it) in terms of benefits gained and forgone.

Expenditure is not synonymous with opportunity cost. Much of the concern that has commonly been 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

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expenditure or gross domestic product (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 (and this is particularly true in Britain) relates to a concern that levels and shares are too high because the <u>same</u> benefit could be had at a lower level of expenditure. 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.

Questions of "cost-containment" can be seen to resolve therefore into two distinct sorts of question. One is normative: what is 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 is positive: 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 micro analysis, the focus is on cost-effectiveness, cost-utility and cost-benefit analysis (Drummond et al., 1987) in which 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 pay-off to increased spending (or the marginal dis-benefits of reduced spending). There is a dense jungle here to be hacked through and, although the methodology that ought to be used seems clear, its empirical implementation is very under-developed (a

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pioneering study is Williams 1985). In aggregate analysis, the emphasis is on total spending, its share in GDP and its principal components, the determinants of this total and its components, and the value-judgmental element involved in assessing the marginal pay-off of the aggregate and its marginal opportunity cost.

The focus in this paper is mainly on the aggregate approach and, within that, on the aggregate determinants and the 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.

European health care expenditure patterns and growth

In this section an aggregated statistical picture is drawn for those countries for which OECD data are available. Table 1 shows the overall levels of expenditure and GDP (current prices) in 1970 and 1987 for 15 European countries. In 1970 health care expenditures (valued at OECD purchasing power parities) averaged (unweighted) $192, rising to $888 in 1987, an annual nominal growth rate of 9.4 per cent. GDP per head over the same period rose from $3347 to $12031, an annual nominal growth rate of 7.8 per cent. The average share of health care expenditures in GDP rose from 5.7 per cent to 7.4 per cent. 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

Table 1: Health Care Expenditure (HCE) and GDP per head 1970 and 1987
(US $ at GDP purchasing power parities, current prices)

	1970			1987			Compound Annual Growth Rate	
	HCE	GDP	HCE/GDP	HCE	GDP	HCE/GDP	HCE	GDP
Austria	163	3056	.053	988	11710	.084	11.2	8.2
Belgium	147	3652	.040	881	12183	.072	11.1	7.3
Denmark	252	4147	.061	784	13129	.060	6.9	7.0
Finland	183	3280	.056	970	13061	.074	10.3	8.5
France	223	3685	.061	1117	12849	.087	9.9	7.6
Germany	220	3993	.055	1072	13308	.081	9.8	7.3
Greece	70	1756	.040	337	6410	.053	9.7	7.9
Iceland	288	3382	.085	1205	15566	.077	8.8	9.4
Ireland	122	2196	.056	553	7446	.074	9.3	7.4
Italy	171	3093	.055	837	12190	.069	9.8	8.4
Netherlands	232	3881	.060	1041	12263	.085	9.2	7.0
Norway	191	3083	.062	1024	15495	.066	10.4	10.0
Spain	102	2473	.041	521	8676	.060	10.1	7.7
Sweden	359	4976	.072	1233	13770	.090	7.5	6.2
United Kingdom	161	3563	.045	763	12414	.061	9.6	7.6
Mean (unweighted)	192	3347	.057	888	12031	.074	9.4	7.8

Source: OECD (1987) Table 20 and Health OECD: Facts and Trends (forthcoming)

Data for Luxemburg, Portugal and Switzerland were not available for 1987.

health care expenditures were Denmark, Iceland, Netherlands and Sweden. The fastest growth rates of health care spending (> 10 per cent) 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 each country in OECD (1987) for the pre and post 1975 periods in order to compare the before and after oil shock responses. These are shown in Table 2, where the elasticities are based on constant price data for each country using each country's own price deflators for .pn6the health care sector and the GDP deflators for GDP. The average elasticities exceed one for both periods (a point to be discussed below) but in the period 1960-75 real health spending was increasing 70 per cent faster than GDP before the oil price shock and 30 per cent faster after it. In Belgium, France, Italy and Spain the post oil-shock elasticity was, however, higher than the pre-shock elasticity. In fact, in the 1980s, the rate of growth of real health care expenditures both absolutely and relative to GDP has slowed.

Price, population and utilisation effects

The identity:

$$\% \quad HCE = \% \quad P_H + \% \quad POP + \% \quad (Q_H/POP)$$

is a useful way of identifying three components in the rate of change of health care expenditures (% HCE): price changes (%

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Table 2: Real GDP elasticities of health care expenditures 1960-75 and 1975-84

	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: OECD (1987) Table 21

P_H), population changes ($\% \ POP$) and changes in the utilisation of health care $\% \ (Q_H/POP)$

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 structures (for example, ageing populations), changes in technology, and changes in the style of medical practice insofar as this can be separated from changes in technology.

Table 3 shows the results of such an exercise. It can easily be seen that the population component in the growth rate is typically small (save insofar as it is reflected in utilisation rates). The principal components of HCE nominal growth are health care input price inflation and utilisation. Although HCE price inflation is the major part (on average 9.6 per cent compared to an average rate of increase in utilisation of 5.7 per cent) it should be remembered that general inflation was also high. For these 16 countries over the period 1960-84 it was 9.0 per cent, so on .pn8average the growth of nominal HCE in excess of general inflation was 0.6 per cent relative HCE inflation, 0.7 per cent population growth and 5.7 per cent growth in utilisation. In some countries, however, the inflation differential between the health sector and the general economy was above average, notably Germany (1.3 per cent differential), Austria (3.2 per cent), Iceland (2.8 per cent), Netherlands (2.2. per cent), Norway (1.3 per cent) and Switzerland (1.7 per cent). In 6 countries the differential was negative, notably in Greece (-1.0 per cent) and Sweden (-1.3 per cent). Since general

Table 3: Nominal annual growth rates of health care expenditures 1960-84

price, population and utilisation effects, %'s

	HCE	Health Care Prices	Population	Utilisation	GDP Deflator
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 OECD (1987) Table 22

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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 utilisation (see also OECD 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 indices and are therefore weighted by shares of consumer out-of-pocket expenditure in total consumer expenditure. These are inappropriate weights for measures of total health care expenditure inflation (for example, hospital prices are typically very heavily subsidised 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, if an element of the hospital price index is based on per diem costs of care rather than cost per case, falling lengths of stay (indicating, ceteris paribus, a falling cost per case and increasing productivity) will not be picked up by the price index, which may even signal a perverse price rise if the patients not experiencing a falling length of stay are sicker, more costly, cases on a per diem average, and the bed stock and occupancy rates remain roughly constant.

Composition of health care expenditures

Table 4 breaks down public health expenditures into the four categories used by OECD. There are no consistent data available for breakdowns of total health care expenditures. Even the data that are available are fraught with problems and over-

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Table 4: Composition of public HCE in the early 1980s (and annual compound growth rates 1970-80s) percentages.

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

Source: OECD (1987) Table 24

interpretation 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 community-based physicians varies (for example, in Germany and Switzerland virtually no outpatient care is provided by hospitals; in Sweden, 5 per cent of physician visits are by doctors working in hospital outpatient departments). The use of out-patient diagnostic services of hospitals compared to diagnostic procedures in doctors' clinics and surgeries is very variable. The remarkable growth in the Netherlands' ambulatory care is probably an artefact 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 seen .he 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 harmonisation of the data. A breakdown of expenditure on doctors, nurses, pharmaceuticals, other supplies, other hospital expenses (which would ideally be by type of hospital) is not available.

The data of this section can give but 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.

A close association between income and spending on health
care has been highlighted particularly by Newhouse (1975, 1977).
For 13 countries in approximately 1971, he found a linear
relationship between per capita health care expenditures (HCE)
and per capita gross national product (GNP). Working in US
dollars calculated at annual average exchange rates, he obtained
the following results (t-values in parentheses):

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

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) and using Gross Domestic Product (GDP) for 20
countries produces a similar result:

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

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

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

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(Where these studies report t-values, they indicate that the constant term is not significantly different from zero.)

Parkin et al (1987) found values (again using OECD data) for 1980 of

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

using exchange rates, and

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

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

The implied income elasticity of 1971 health care expenditures per head with respect to GDP per head was +1.35, the same result as that obtained by Newhouse, as that reported by Leviatan (1964) for Israel in the early 1960s, and as in OECD (1985) for the period 1960-82. Parkin et al found income elasticities of +1.18 for their exchange rate equation but only +0.90 using purchasing power parity. Some more recent analysis of OECD data for 1983 indicates, however, higher elasticities at 1.47 using PPPs (Gerdtham et al. 1988).

The income elasticity of health care expenditure is defined as the percentage change in per capita health care expenditure

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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 per cent increase in GDP could have been expected to increase health care expenditures by about 13 per cent. It is this high income elasticity that gives rise to the luxury good view, for it is conventional to classify any good whose income elasticity exceeds unity as a "luxury".

Interpreting the results

A number of points need to be borne in mind when interpreting results of this kind. One is that macroeconomic relationships such as these do not hold constant elements that the (microeconomic) concept of income elas-ticity requires. 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 more unequal countries are also the richer (within the relatively high income group that is the OECD countries) then the slope of the graph will be higher than it "really" is.

Second, "health care" is not a homogeneous thing. Both Germany and the United States are richer countries (per head) than the United Kingdom. Using purchasing power parities, the index of GDP per head in 1983 was United States = 100, Germany = 82, United Kingdom = 71. Thus the United States was on average 40 per cent richer and Germany 15 per cent richer than the United

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Kingdom. Homogeneity might be taken to imply that the United States would have about 40 per cent more and Germany 15 per cent more real health service inputs. In fact, in 1983, the United States had 60 per cent more doctors per head of population but 27 per cent _fewer_ hospital beds and 30 per cent fewer nurses! (OECD 1985, 1988). The claim sometimes heard that higher health expenditures go primarily into `caring' rather than `curing' (e.g. Newhouse 1987) is not supported by this evidence. On the other hand, Germany had 40 per cent more beds and 85 per cent more physicians, but 59 per cent _fewer_ nurses! Clearly, once one looks beyond the aggregated expenditure picture, the things people are buying for their health care dollars vary greatly from country to country and not in any universally systematic way with their ability to pay. Nor _within_ countries, is the relationship between income and inputs a simple one. In the 1960s and 1970s, the stock of beds steadily fell in the United States and the United Kingdom. In Germany, however, it rose up to 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 throughout the period except for Germany, when it peaked in 1982. Clearly there are more factors at work than merely the ability to pay (for example, 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 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

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community-based physicians; long versus short in-patient stays)
are likely both to vary intrinsically as well as 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
organisation of finance than of income. The United States
systems of health insurance are very costly (compared say to a
country like Canada with public health insurance). The European
systems that rely on social insurance are also relatively costly
compared to countries like the United Kingdom that rely on
taxation.

An iron law?

The typically high R^2's that have been found have suggested
to some that HCE is not really a policy variable. For example,
in the exchange rate (ER) equations reported earlier, from 87 per
cent to 92 per cent of the variation in expenditure per head was
statistically explicable by variations in income per head. The
danger is that it 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 hypothesised
to affect medical-care spending are not of quantitative
significance" (Newhouse 1977). Newhouse was careful not to claim
that other factors than income, factors such as the form of
organisation and the finance of health care, bore no relationship

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to total expenditure. In fact, he suggested that there might be an association between the organisational forms of health care and total spending on it because of his asserted nature about health care as a luxury good. Socialisation (or at least centralised control of or influence over budgets) is itself a response to low income and a desire to control costs. The mode of organisation is endogenous. Low per capita income, his argument goes, 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 decentralised 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 estimating equations plainly omit relevant variables - though ones that may be hard to measure for econometric purposes or that may not actually have varied over a period used for estimating relation-ships or across the sample used in a cross-section analysis - some of which may correlate with GDP per head.

The "public choice" approach[2]

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

The Buchanan thesis. Buchanan's thesis was prompted by the 1965 crisis in Britain's National Health Service: many members of the medical profession were poised to withdraw from the NHS and there were seen to be problems of waiting lists and medical emigration, 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 over-use; "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 socialised medicine, however, it was all to clear that this oversupply had not materialised. Buchanan proposed an alternative theory: that political decisions about the supply of services are made independently of demand so that inefficiency ("failure") manifests 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 (or so it was assumed) to all intents and purposes a private good, 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

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recognises (1) 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 (2) 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 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 lies not in the accuracy of his predictions about the NHS (many of which have proved factually wrong - see Bosanquet 1986 - demonstrating that theory without history can be as misleading as evidence without theory) but in his recognition that the financing of collectivised health care is itself subject to decisions. That 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 between demand, supply, and finance. What is special about the public element in the finance of health care is that decisions about spending are quintessentially political. It is beside the point

whether voters behave as Buchanan suggested (refusing to will the financial means, while, 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 come to have a prima facie claim to our attention. We have an expectation that expenditure will be related to these factors in some way.

The Leu thesis. Leu's analysis is founded on a useful identification of three types of actors/decision-makers in the system. Real health care expenditures depend on the behaviour 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 on 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 (1) the user-price to the consumer falls (but fees to the providers do not), and (2) there is an incentive for providers 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 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 decided.

Notice that the argument just described concerned public finance, not public ownership: paying for health benefits with tax dollars raises spending on them even if their 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, his argument was that the lack of competition for the ownership of publicly owned institutions leads to a reduced incentive for management to minimise costs at each rate of activity so that, other things being equal, publicly owned hospitals are costlier per unit of activity than privately owned hospitals. In addition, non-profit institutions, in the public and private sector, have bureaucracies whose behaviour seems to be that of budget-maximisers. 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 that the supply of finance is perfectly responsive to whatever level of provision bureaucratic decision-makers prefer.

Leu recognised 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 _ex ante_ centralisation of political decisions about the size of the health care budget (centralisation that he held to exist only in New Zealand and the United Kingdom). He also used a non-theoretical public variable to represent direct, as distinct from representative, democracies, where, he said, there was evidence that public expenditures are smaller. In addition, two demographic variables were included: proportion of the population under 15 years and the degree of urbanisation.

Leu's public choice model thus offered six explanatory variables, in addition to GDP per head:

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 countries (2) having a centralised health care budget;

DD, a dummy variable for direct democracy (Switzerland);

POPU15, proportion of the population under 15 years.

URB, percentage of population living in cities of over 100,000 inhabitants.

He then ran a cross-section multiple regression on 1974 data for the OECD countries (excluding Luxemburg, Iceland, Japan, Portugal and Turkey) and obtained the elasticities shown in Table 5. One set of equations (column A) included PF, one used PP (column B), and one had both PF and PP (column C); 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.)

Equation A shows that an increase in the share of public and non-profit beds by 10 per cent was associated with a 9 per cent increase in expenditure per head. The presence of centralised budgetary control was associated with a much more substantial 21 per cent fall in expenditure. .pn22Direct democracy was associated with a dramatic fall of 31 per cent.

Replacing PP with PF, equation B shows that a 10 per cent increase in the share of public finance was associated with a 3 per cent increase in health expenditure per head. The impact of centralised budget control rose, reducing per capita expenditure by 24 per cent. The effect of the direct democracy variable was smaller and insignificant. In equation C, which includes both public-share variables, the effect of public provision appears

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Table 5: Leu's elasticities of per capita health care expenditures with respect to several variables, OECD countries, 1974

| | Equation | | |
	A	B	C
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-per cent level.

Note: See the text for definitions of the variables. Equation A included PP but not PF; equation B included PF but not PP; equation C included both.

Source: Leu (1986)

smaller, and the impact of public finance has fallen dramatically, ceasing to be significantly different from zero. Centralised budget control was significant, and so was the Swiss effect. In some recent careful econometric work by Gerdtham et al. (1988), however, some of these 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 logs specification in which HCE per head was a function of GDP per head, the proportion : the population under 15 years, the share of public financing and the proportion of public finance for inpatient care. Using pooled OECD data for 1974 and 1983, the income elasticity was highly significant (and relatively high) at +1.52, the young population variable had a small elasticity (-0.085) of the opposite sign to Leu's finding apparently denying the assumption that these, like the elderly, are relatively high utilisers of health care (in value terms), and the PF variable also changed signs, becoming negative, possibly suggesting less rather than more X-inefficiency under public financing than private and probably also reflecting heavier transaction costs, with an elasticity of -0.515.

Aggregate expenditures and aggregate control mechanisms

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

(1) the wealthier (per head) a country, the more it spends on

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health care per head and the greater the proportion of its total income spent on health

(2) centralised control of health care budgets seems to result in lower spending levels than otherwise would be expected

(3) the effect of both public finance and public provision or ownership is ambiguous, but the former probably lowers expenditure.

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); that market pressures are more reliable than professional ethics and regulation as a means of ensuring high quality, and, of course, case-mix is very variable between the two sectors. Detailed microeconomic evidence casts serious doubts on the empirical validity of the claim that public provision is relatively x-inefficient. There have been explicit comparisons between investor-owned for-profit hospitals with voluntary non-profit hospitals. This is relevant for Europe which has been experiencing some growth in the market share of for-profit organisations. Care must be taken, however, to determine those differences that reflect the inherent qualities of the for-profit and non-profit hospitals as distinct from those that are a reflection of particular features in the system of financing and organising health care delivery in the United States. Great care must also be taken to ensure that like is compared with like. Bays (1977) for the United States and

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Butler (1984) for Australia both found that the for-profits specialised 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 privatisation as a method of cost control or an agent for the promotion of efficiency is thus uneasy.

In addition to centralised budgetary controls, there are other general institutional arrangements that may be conclusive both to 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 that are at least worth exploring.

Competition between hospitals.

In most European Countries it has been frequently observed that there is a large variance in cost per case (adjusted for diagnostic mix) between hospitals in both private and public sectors. In Britain this has led, via an espousal of the evolution/survivor approach to industry theory (Alchian 1950), to the official policy idea that, rather than take an a priori view of the inherent superiority of one form of ownership over another, it is better to create the market conditions under which the more efficient (whatever their ownership) will tend to thrive

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and the relatively costly or inefficient to be driven out via contestable markets and open competition between supplying agencies for the custom of publicly financed health authorities (with pre-determined budgets).

This proposal (Working for Patients 1989) for hospital financing has two main features both of which 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, 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 b). These (and private sector hospitals) will compete for the custom of DHAs (and private patients and also - to be discussed below - that of large GP practices). The idea is that 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, there will be explicit management budgets embodying clear targets for quantity and quality with formal performance assessment.

Large group practices of GPs (over 11,000 patients) are also to be given the opportunity to receive "practice budgets" out of which they may purchase directly from DHA hospitals and SGHTs outpatient services, a defined set of elective surgical procedures, and diagnostic kits such as X-ray and pathology services (see Working for Patients 1989; Self-Governing Hospitals, 1989; Funding and Contracts for Hospital Services, 1989; Practice Budgets for General Medical Practitioners, 1989).

Prospective reimbursement for hospitals

Hospital-based care takes the lion's share of health costs. Countries which 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 hospitalisation, 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 admissions rate and its bed stock. It is also amongst those with longest lengths of stay. The United Kingdom, by 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. Since most "profit" is to be made out of treatment un-intensive days, long lengths of inpatient stay are profitable for hospitals reimbursed in this way. But there must be other factors at work too. It seems clear that clinical practice in Europe is not uniformly informed by the results of clinical trials and cost-effectiveness enquiries into the optimal length of stay, use of day-case surgery, and so on.

It seems clear that any system that uses retrospective reimbursement for hospitals is likely to see a higher overall level of expenditure per head, and possibly a faster rate of health care cost inflation. Almost any form of prospective reimbursement is likely to limit these tendencies by relating rewards to planned workload and encouraging aware-ness of cost per case. Costs could be reduced by improving efficiency by, for example, substituting less expensive inputs for costlier ones, or reducing the number of unnecessary hospital stays or tests. Minimising 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 hospitals can reduce costs is to shift the burden of care on to other agencies, such as GPs. For example, early discharge from hospital increases the use of long stay facilities, community services, GP visits and so on.

Throughout Europe there has been much discussion of the potential for using methods related to the United States systems of diagnosis related groups (DRGs) for prospective funding of hospitals (though not for billing purposes). DRGs classify acute inpatients in groups using routine medical records data. The

inventors of DRGs at Yale claim that the groups are clinically meaningful and homogeneous in resource use (Fetter et al. 1980). The use of DRGs to reimburse 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 out-patients or day care. This 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. As with any classification system, DRGs still contain a considerable range of costs per case. This encourages hospitals to select cheaper cases. Moreover, DRGs rely on the recorded primary diagnosis, co-morbidities and complications, which are based on clinicians' judgements, 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 which maximise 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 United States 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. Hospitals financed by DRG in the US were found to have reduced costs per day by 9.8 per cent and costs per admission by 14.1 per cent. Average length of stay in hospital was shortened by 6.5 per cent under the DRG programme (for a review see Culyer, Brazier and O'Donnell, 1988). The effect on total costs was, however, largely offset by rises in admissions of 11.7 per cent with the DRG program. The net savings to the DRG program was, as a result, only 2.4 per cent at a maximum.

The early United States experience with DRGs is still inconclusive. Although it would appear that there have been significant reductions in length of stay, it cannot be determined whether this has been brought about by cost shifting between 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 studies looking at effects on outcome. The potential for cost-savings via this route will, of course, vary in Europe.

Medical remuneration

Since reimbursement methods can affect behaviour, 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

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(1974) originated the theory of "supplier-induced demand" (SID).
The idea here is that physicians have a target income and adjust
workload (under a fee-for-service system of paying doctors) in
response to changes in the environment, and seems to have grown
out of the empirical observation in North America that regional
utilisation 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, though this result is even more disputed than the
fundamental utilisation effect. There are, of course, huge
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
(for a review see Culyer, Donaldson and Gerard 1988).

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

In Europe there is no comparable evidence to that in North
America. However, the relative remuneration of doctors seems to

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correlate with the method of payment. Although most countries adopt a mixture of systems of remuneration that differs as between hospital-based and community-based doctors, those (Belgium, France, Germany, Switzerland) that use a predominantly fee-for-service method show relatively high earnings for the profession. Slightly under half of Germany's doctors are community-based, paid on a fee-for-service basis and with complete freedom as to choice of location of practice and 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 per cent 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 head (OECD 1985, 1988).

A related factor affecting expenditure on physicians is entry into the profession. Medical schools' outputs 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 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 at 26 per cent)

(Schroeder 1984). In each of these countries, save the United Kingdom, there has been a recognised "oversupply" of doctors and, in particular, of specialists.

Direct price and quantity controls

There has been no study in Europe that has quantified the effect of the exercise of the state's monopsony power on the remuneration of personnel or the prices and quantities of medical supplies, despite a wide-spread belief that it has in some countries been substantial, especially in those like Britain that have centralised pay negotiating machinery. Nor have the potential efficiency losses of the exercise of monopsony power been estimated.

One of the most regulated parts of the health care industry in Europe has typically been the pharmaceutical industry. This regulation has required, in those countries with a substantial local pharmaceutical industry, a nice trade-off between the desire for low-cost modern medicines and for having a dynamic high-technology exporting (but oligopolistic) industry. In addition, most European countries subsidise drug consumption but have very widely differing consumer co-payments. In Europe the highest expenditure per head 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

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introduce cash-limited budgets for general practitioners' prescribing (Indicative Prescribing Budgets for General Medical Practitioners 1989). There is, perhaps surprisingly, no correlation between the number of physicians or pharmacists per head and the expenditure per head on drugs (OECD 1987) though, if adequate statistical controls could be placed on the other factors affecting drug expenditures, such a relationship might emerge. The variability in spending per head strongly suggests that, prima facie, this component of HCE (on average about 10 per cent of the total in the early 1980s) is rather sensitive to policy variables.

Although 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 head, 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 indicate what

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

The European evidence indicates large variations in the composition of HCE which are in turn the product of the great variety in forms of finance, provision and regulation that exist. The 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 offer the currently best way forward. But 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 to maximise these 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 that making these judge-ments entails, whether one depends on markets or planning mechanisms, should never serve as an excuse for mere cost-cutting regardless of its consequences.

Notes

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2.   This section draws heavily on Culyer (1988)

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