

Medical Care Costs: How Much Welfare Loss?

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Hardly a week goes by without a front-page newspaper article on rising health care costs and the uninsured. In this article, I focus mainly on costs, arguing that the issue has been somewhat misconceived: while the level of medical care spending in the U.S. is a cause for concern, the welfare losses associated with *rises* in that level of spending may not be as large as the public rhetoric can make them seem. In fact, cost containment may not be as urgent as is widely supposed, and some proposed “cost containment” policies may result in welfare losses for the insured, and even increase the number of uninsured.

The Magnitude of the Medical Expenditure Increase

As both newspapers and pay stubs remind us, the health care sector is a large part of the economy; spending on health care, \$666 billion in 1990, exceeded 12 percent of GNP. At the federal level, Medicare (for the elderly) and Medicaid (for the poor) represent 15 percent of outlays. Medicare is the second largest domestic program of the federal government. At the state level, Medicaid is 11 percent of total expenditures (1991 Economic Report of the President, Tables B-76, B-82).

Despite these magnitudes, I think the crux of public concern over health care costs comes from the data in Table 1; real medical care expenditures per capita have been growing at around 4 percent per year for *five decades*, except

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Table 1

Growth in Real Health Care Expenditure and GNP, by Decade
 (% per year)

| | Growth in real health care dollars, per capita | Growth in real GNP per capita | Health care share of GNP at end of period |
|-----------|--|-------------------------------------|---|
| 1929–1940 | 1.4% | 0.0% | 4.0% ^a |
| 1940–1950 | 4.0% | 3.1% | 4.5% |
| 1950–1960 | 3.6% | 1.5% | 5.3% |
| 1960–1970 | 6.5% | 2.5% | 7.3% |
| 1970–1980 | 3.8% | 1.7% | 9.1% |
| 1980–1990 | 4.4% | 1.7% | 12.2% |

Sources: Health care expenditure figures: Personal Health Care Expenditure 1929–1950: *Health Care Financing Review*, Summer 1979, Table 3. 1960–1980: Office of National Cost Estimates, "National Health Expenditures, 1988," *Health Care Financing Review*, Summer 1990, Table 14. 1990: Levit et al., "National Health Expenditures, 1990," *Health Care Financing Review*, Fall 1991, Table 11. Deflated by GNP Personal Consumption Expenditure Deflator, *Economic Report of the President*, 1991, Table B-3. Population: *Statistical Abstract*, 1990, Table 2, (1929 figure interpolated geometrically between 1925 and 1930) and *Statistical Abstract*, 1991, Table 2. Real GNP from *Economic Report of the President*, 1991, Table B-2.

^a1929: 3.5%

in the 1960s when growth was even more rapid. At these rates of growth, the share of GNP devoted to medical care has also been steadily growing.

Neither citizens nor economists, of course, are especially concerned about rapid growth in most sectors of the economy, like the personal computer industry, the fax machine industry, or the cellular phone industry. The conventional explanation of why growth in medical costs is different emphasizes the moral hazard from health insurance and particularly the tax treatment of health insurance.

Traditional health insurance reimburses as a function of expenditure or use. Because insurance drives the marginal price of medical care at the point of use to near zero, so the usual view goes, consumers—or physicians acting as their agents—demand care until the marginal product of additional care is nearly zero. To use Alain Enthoven's (1980) phrase, we engage in "flat-of-the-curve" medicine, where spending on medical care increases even though the additional gains from such spending are very low or nonexistent.¹ Moreover, the argument continues, the exclusion of employer-paid premiums from taxable income exacerbates this situation by leading to excessive health insurance (Feldstein and Allison, 1974). Pauly (1986) offers a review of this literature; a

¹This view is buttressed by studies showing a reasonably high percentage of procedures—a sixth to a third, among three procedures studied—that upon clinical review were deemed to be "medically inappropriate" (Chassin et al., 1987).

more recent example of this line of argument is the 1991 *Economic Report of the President* (p. 142).

However, I will contend that economists have been too preoccupied with a one-period model of health care services that takes technology as given, and that we need to pay more attention to technological change.² In particular, the literature has focused on the tradeoff between moral hazard and risk sharing in the context of the one-period model. The cocktail party story of excessive medical spending built around that model has some validity, of course. The price elasticity of demand for medical care services is not zero. Far from it; a fully insured population spends about 40 to 50 percent more than a population with a large deductible, and their health status is not measurably improved by the additional services (Manning et al., 1987).

In this essay I wish to distinguish the welfare losses at a point in time from those that may occur because of the increases in expenditure over time. My initial focus, then, is why medical expenditure is increasing, as opposed to merely "high." To explain increasing expenditure, one needs to point to something that is changing, indeed to factors that have been changing for 50 years.

Accounting for the Medical Expenditure Increase

In accounting for the expenditure increase, my methods will be similar to those in the literature accounting for economic growth; identify a series of factors, determine how much of the change they might account for, and attribute the residual to technological change. In particular, I consider three factors known to affect demand for medical services—aging, the spread of insurance, and the growth of income—as well as two factors that are said to affect the supply of services—supplier-induced demand and differential productivity growth. By deferring consideration of technological change, I want to establish that the one-period model, with constant technology, cannot give us much help in explaining the expenditure increase.

Aging

The proportion of elderly has been growing steadily for 50 years, which might be expected to raise expenditures on medical care. But by how much? One way to tackle this question would be to calculate by how much spending would increase solely as a result of the changing proportion by age group, if spending per person in each age group were fixed over time. For example, the proportion of the population between the ages of 19 and 64 stayed nearly constant between 1950 and 1987, rising from 59 to 60 percent. However, the

²Goddeeris (1984a, 1984b) is a notable exception, as is Weisbrod's (1991) survey article of a year ago.

population of those over 65 increased from 8 percent of the population in 1950 to 12 percent in 1987, while the proportion of those below age 19 fell from 33 percent to 28 percent. Using the weights given by the average expenditures per person in each age group in 1987, this swing can account for an increase of 15 percent in total spending.³ However, the data in Table 1 imply that real expenditure per capita grew over this period by more than a factor of 5. Thus, aging can only account directly for a tiny fraction of the increase in expenditure.

Victor Fuchs (1990) has questioned this type of calculation, pointing out that other effects may be associated with aging. He notes that spending rises rapidly in the period shortly before death and that as age-specific mortality rates fall, fewer people at each age are close to death. This would cause the method just described to understate the effect of aging on costs, essentially because deaths are concentrated among the elderly, so spending on the elderly relative to the non-elderly is temporarily depressed while mortality rates are falling. To get some sense of the quantitative importance of this argument, I calculated the effect of aging using elderly to non-elderly spending rates from 1977 rather than 1987.⁴ The 1977 values give virtually the same result as those from 1987. Thus, this criticism does not seem quantitatively important.

Fuchs also speculates that falling age-specific mortality rates may increase the propensity to intervene medically at any age, which provides an alternate reason why an aging population may consume ever more medical care. It is more difficult to assess this argument quantitatively, in part because causation could run the other way; an increased propensity to intervene could lower the age-specific mortality rate. However, whichever way the causation runs, the magnitude of the negative correlation between mortality and spending may not be large. In the four previous decades, age-adjusted death rates fell least in the 1960s and most in the 1970s, but the rate of expenditure increase was greatest in the 1960s and next to least in the 1970s. Unfortunately, the 1960s also saw the introduction of Medicare and Medicaid, which makes any inference from these data about Fuchs' argument problematic. On balance, however, neither the direct nor indirect effects of aging on expenditure appear to account for much of the sustained rise in medical expenditure.

Increased Insurance

This explanation is probably closest to the conventional wisdom among economists; the spread of insurance has steadily reduced price to the consumer

³I used the 1987 data for this calculation because I have data on medical spending by five-year age group for the over-65 for that year and thus can better adjust for aging within the over 65 group. The data are from Waldo et al. (1989) with corrections supplied by Daniel Waldo. Also, I use the period beginning in 1950 because I could not readily locate 1940 data on age, but there can be little doubt that the conclusion would be the same.

⁴The calculation for 1977 is somewhat cruder. I only have data on medical spending per person for the under 19, 19-64, and over 65 age groups for 1977, so I could not use the five-year age cohorts as described in the previous note. In comparing 1977 and 1987 results, I have used the spending comparisons for these three age groups in both cases.

and driven up demand for medical services, thereby resulting in a steady expenditure increase. Like the aging argument, this argument has an element of truth, but it also leaves the great bulk of the increase unaccounted for.

The data from Manning et al. (1987) already referred to show that the effect of moving from an average coinsurance rate of 33 percent to a coinsurance rate of zero at a point in time is roughly a 40 to 50 percent increase in demand.⁵ The change in the average coinsurance rate from 1950 to 1980 was from 67 percent to 27 percent. Thus, if a function relating demand to the average coinsurance rate were linear and if there were no technological change, the 40 percentage point drop in coinsurance should have caused about a 50 percent increase in demand from 1950 to 1980.⁶ Thus, the factor-of-five increase in real expenditure per person over this period is perhaps eight times as large as one could account for solely from the effect of increased insurance on demand in the context of the one-period model.

Another fact that is not consistent with the importance of increased demand from the spread of insurance is that the largest single component of the increase in real medical expenditure per person has been in the hospital sector. Yet the average coinsurance rate for hospital services was essentially constant at about 5 percent in the 1980s (Levit et al., 1991) while real hospital expenditure rose over 50 percent during the decade.

Increased Income

Medical care is a normal good, so growth in income can also account for an increase in expenditure. Estimates of the income elasticity of demand for medical care within the United States (done with cross-section observations across households, holding insurance constant) are around 0.2–0.4. From 1940 to 1990, real GNP per capita increased by 180 percent. Using an estimate of income elasticity of 0.2 to 0.4, income growth (given technology) could account for around a 35 to 70 percent increase in expenditure, obviously a small portion of the 780 percent actual increase.

In international cross sections of developed countries, with the country as the unit of observation, however, income elasticities of demand for medical care are around 1.0 or even more (Newhouse, 1977; Parkin, McGuire, and Yule, 1987; Gerdtham et al., 1992). Using aggregate relationships can lead to well-known problems (Parkin, McGuire, and Yule, 1987). Nonetheless, one might

⁵Estimated price elasticities are in the range of -0.1 to -0.2 . See Manning et al. (1987) for three different methods of calculating price elasticities.

⁶There are serious conceptual problems in relating demand to an average coinsurance rate; for example, an average coinsurance rate that comes from a deductible followed by full coverage is likely to have different effects than from a constant coinsurance rate. Thus, one should not expect the function relating an average coinsurance rate to medical expenditure to be unique. Nonetheless, I am only trying to get a rough feel for the importance of various factors, and for that purpose ignoring the conceptual problems associated with this function seems permissible. Moreover, it is worth noting that if the relevant function was constant elasticity rather than linear, there would be a smaller increase in demand than that estimated in the text. For a discussion of these problems and their implications for estimation of demand, see Newhouse, Phelps, and Marquis (1980).

prefer this estimate of the income elasticity because the within-country income elasticities may be distorted by the endogeneity of income at the household level; sickness may simultaneously depress income and raise medical spending. Using 1.0 as an income elasticity rather than 0.2 to 0.4, one could account for a little under a quarter of the overall increase.⁷

Supplier-Induced Demand

A substantial literature in health economics has been concerned with supplier- or physician-induced demand (Cromwell and Mitchell, 1986; Rice, 1983). This literature has not reached consensus on the magnitude of supplier-induced demand, but even granting its importance at a point in time, one can ask about its importance over time. That is, if physicians have considerable discretion in treating ignorant consumers, to what degree might they have induced more and more demand?

Those who emphasize supplier-induced demand as a factor in the expenditure increase argue that as physician supply has grown, physicians have increased demand to protect their incomes (for the theory underlying this view see McGuire and Pauly, 1991). The evidence, however, does not offer much support to the view that supplier-induced demand is important in the rate of change. As a crude measure, I list the decade-by-decade changes in physician supply per person in Table 2. There is no correlation with the similar data on expenditure given earlier in Table 1.

I do not want to make too much of the lack of a simple correlation among six observations. One could, for example, argue that economy-wide growth has slowed since 1970, decreasing demand (*ceteris paribus*) and offsetting inducement effects from the increase in physician supply. Nonetheless, the lack of any obvious change in the rate of expenditure growth after 1970, when physician supply clearly increased, is striking.

A variant of the supplier-induced demand argument is "defensive medicine," or the use of tests and procedures with little or no value to patients to minimize the chance of a successful malpractice suit. Although the amount of such medicine is uncertain, the most widely cited estimate pegged it at around 1 percent of all medical expenditure in 1984 (Reynolds, Rizzo, and Gonzalez,

⁷Income elasticities from time series data within countries are typically around 1. For example, Schieber and Poullier (1989) present data for 20 OECD countries from 1975 to 1987. The countries have income elasticities that vary from 0.9 to 1.3, with 10 having a value of 1.1. (I use the "nominal" income elasticities shown in their Table 2 because I believe there are conceptual problems with the health price deflator they use to estimate "real" elasticities. See the text below.) In general one might expect that time series income elasticities would exceed the cross section income elasticities; technology is not held constant in the time series, and the income elasticity for new technology should be positive, thus adding to the income elasticity for additional care given technology observed at a point in time. Because of the magnitude of the time-series income elasticity, I am inclined to believe that the income elasticity relevant to the calculation in this section, which is the income elasticity for additional care given technology, would be well under 1.

Table 2
Decade-by-Decade Growth in Numbers
of Physicians per Person
(annual rate of increase)

| <i>Year</i> | <i>% Change</i> |
|-------------|-----------------|
| 1930-1940 | 0.6 |
| 1940-1950 | -0.1 |
| 1950-1960 | -0.1 |
| 1960-1970 | 1.1 |
| 1970-1980 | 2.4 |
| 1980-1990 | 2.0 |

Source: Health, United States, 1989, Table 85. The figure for 1990 is a projection. 1930 and 1940 figures from Physicians for a Growing America: Report of the Surgeon General's Consultant Group on Medical Education, Frank Bane, Chairman, Table 1.

1987). Thus, even if defensive medicine were zero in 1940, its growth can only account for a trivial fraction of the expenditure increase.

Factor Productivity in a Service Industry

Yet another argument that has been made to account for increases in medical spending is that medical care is a service. If productivity gains are lower for services like medical care than in the rest of the economy, then relative medical prices would rise over time; because demand is inelastic expenditures would also rise (Baumol, 1988). The magnitude of productivity gains in medical care is an exceedingly difficult question because of the difficulty in measuring the product. Perhaps zero productivity growth is appropriate for long-term care and home health care. These sectors, however, represent only about 10 percent of the entire medical care sector. In the light of the technological change discussed in the next section, I think the assumption of no productivity gain for acute medical care services is implausible; indeed, a true productivity measure might even go up at or in excess of economy-wide rates. For example, the treatment of heart attacks has certainly changed more than haircuts or the performance of Mozart string quartets, standard examples of services whose productivity has scarcely changed. Thus, it is not clear that much of the expenditure increase should be assigned to this factor.

In principle, a price index for medical care offers the potential to shed light on this point. If medical care inflation were similar to general price inflation, one could reject the concept that differential productivity growth is driving the price levels apart. In the 1980s, medical price inflation exceeded

the general consumer price index by 3.4 percent per year, which would seem to offer some support for the idea that lagging productivity growth is the reason more is spent on medical care. However, the gap was only .4 percent per year in the 1970s, 2.0 percent per year in the 1960s, and 1.9 percent per year in the 1950s.

Moreover, the consumer price index for medical care has severe measurement problems, so severe so that I would not draw any inferences on productivity from it. Four main problems include:

First, the consumer price index for medical services focuses on the costs of physician visits and days in the hospital, not the costs of treating ailments. As Scitovsky (1967) emphasized a quarter century ago, the product the consumer is really purchasing is the treatment of a medical problem. The relevant cost, therefore, is the cost of treating, say, a heart attack or appendicitis, not the cost of a day in the hospital. Especially in the 1980s, length of stay for various diseases has been falling sharply. Setting aside the issue of whether this reflects a change in quality, a true price index would need to reflect the total cost of treatment, but the existing index does not. Moreover, the last day(s) of a stay are less resource-intensive than the first days. Thus, a fall in the average length of stay will increase the resource intensity per day, which conceivably could result in an increase in the price per day; that is, the consumer price index could be signalling an increased price (per day) when there was actually a decreased price (per treatment). By focusing on the cost of a day in the hospital, the consumer price index also fails to register any savings when the treatment of some diseases, like cataracts, is shifted out of the hospital to out-patient surgery or when a new drug changes treatment so that surgery is not required as often, as has happened with ulcers.

Second, the consumer price index has historically used the list price for medical care, not the actual transaction price. In fact, there are hardly any transactions at the list price that the CPI uses for hospitals. The Bureau of Labor Statistics is attempting to correct this problem. But Dranove et al. (1991) estimate that this factor alone caused the CPI to overstate hospital price increases in California by 40 percent in the 1980s.

Third, the consumer price index makes no adjustment for quality change. With the rate of introduction of new products and procedures into medical care, surely acting as if quality is unchanged will lead to large overstatement in the medical portion of the consumer price index.

Fourth, the various components of the medical care portion of the consumer price index—hospital, physician, dental, drug—are combined into an overall medical care price index using weights proportional to out-of-pocket expenditure. Because insurance coverage differs between these components, hospital spending, which accounts for about 40 percent of personal medical care spending, has a weight in the medical care CPI that is half as large. Indeed, the weight on hospital spending is only slightly larger than the weight on dental spending, although dental spending accounts for less than 10 percent

of total health care spending. This criticism affects the component price indices much less, but it certainly affects one's ability to use the overall medical care CPI to decompose the increase in health care expenditure into increases in price and increases in quantity, as is needed to test the productivity-based explanation for growth in overall medical expenditures.⁸

For all these reasons I do not believe we have any good empirical basis for decomposing the medical care expenditure increase into increases in price and increases in quantity.

Technological Change in Medical Care

Because of the problem in measuring productivity, it is hard to know how much of the increase all the above factors can account for (assuming no technological change). My own view is that they account for well under half—perhaps under a quarter—of the 50-year increase in medical care expenditure. Thus, we are left with trying to explain a large residual.

I believe the bulk of the residual increase is attributable to technological change, or what might loosely be called the march of science and the increased capabilities of medicine. By technological change I mean not only new types of physical capital, such as magnetic resonance imaging, but also new procedures, such as coronary artery bypass grafting. Other examples abound: renal dialysis; transplantation; artificial joints; endoscopy; monoclonal antibodies; drugs for mental illness. Both the last example and the polio vaccine example emphasize that technological change is not necessarily expenditure-increasing, but if it is on balance expenditure-lowering, as is sometimes argued (Thomas, 1975), accounting for the rise in expenditure is more difficult than ever.

Trying to attribute a residual to a specific factor is an inherently frustrating exercise, and the best I can do to support my argument that much of the residual is attributable to the new capabilities of medicine—new product lines, if one prefers—is to buttress it with data that I believe are consistent with it. There are three such sorts of data.

The first are shown in Table 3. If medical technology were constant, then increased demand from more elderly, more insurance, and more income should result in more hospital patient days. However, patients are not going to the hospital more frequently—indeed, admission rates are now barely above 1960 levels and age adjustment would wipe out the difference—nor are patients staying longer; length of stay has fallen. But the real cost of a day (or a stay) in the hospital rose by nearly a factor of 4 from 1965 to 1986. (Data are

⁸Even the component indices are affected to the degree that the actual services priced have differential insurance coverage. For example, prior to the late 1970s, insurance commonly did not cover maternity services, or covered such services with a lump-sum allowance. This caused the hospital component of the CPI to overweight maternity services if the aim was to decompose hospital expenditure increases into price and quantity increases.

Table 3

Utilization of Short Stay General Hospitals

| <i>Year</i> | <i>Adm / 1000</i> | <i>Length of Stay (days)</i> | <i>Days / 1000</i> | <i>Adjusted Cost / Day (1982 dollars)</i> |
|-------------|-------------------|------------------------------|--------------------|---|
| 1950 | 110.5 | 8.1 | 895.1 | n.a. |
| 1960 | 128.9 | 7.6 | 980.0 | \$114 ^a |
| 1970 | 144.9 | 8.2 | 1188.1 | \$172 |
| 1980 | 160.4 | 7.6 | 1219.2 | \$282 |
| 1986 | 135.4 | 7.1 | 961.3 | \$437 |
| 1989 | 134.6 | n.a. | n.a. | n.a. |

Sources: Total non-federal and short-term general and other special admissions, length of stay and cost: American Hospital Association, Guide Issue, Civilian Population, *Statistical Abstract* 1990. 1989 admissions data on community hospitals from *Health Care Financing Review*, Winter 1990. GNP Personal Consumption Deflator used for cost per day. Adjustment in cost figures is for outpatient activity.

^aFigure is for 1965.

not readily available from before 1965.) Thus, what is being done to and for people who are in the hospital is affecting hospital costs, not an increased number of people at the hospital.

Remember that the increase in hospital expenditure is the single largest component of the overall expenditure increase. The evidence that this increase has occurred in the cost of a patient day, not in the rate of patient days per person, is certainly consistent with a story that technological change accounts for the bulk of the increase in costs.⁹

The second set of data are data on costs of enrollees in Health Maintenance Organizations (HMOs). HMOs combine the insurance and delivery functions and are generally paid a fixed dollar amount per month per enrollee. The costs borne by enrollees in HMOs have risen at roughly the same rate as personal health care expenditures, albeit at each point in time they are at a lower level (Newhouse et al., 1985). Although HMOs appear to eliminate some of the low benefit (relative to cost) hospitalization at each point in time (Luft, 1981; Sloss et al., 1987), whatever drives up costs in the predominantly fee-for-service medical care system also drives up costs in HMOs. The factor or factors responsible for increasing costs could be common rises in factor prices in both systems, but common changes in the technology available is also consistent with the data.

Third, international comparisons also underline the conclusion that different types of medical systems have much the same increases in spending. The

⁹Nor have visit rates to physicians much changed. In 1958-59 they were 4.7 per person; in 1970s, 4.6; in 1980, 4.8; and in 1989, 5.4. Data are from the National Health Interview Survey for the respective year.

annual percent increase in real per capita health spending in the U.S. from 1960 to 1987 was 5.0 percent. The rate of increase was lower in the United Kingdom, Canada, and Germany, at 3.7, 4.7, and 4.8 percent, respectively. But the rate of increase was higher in France, Italy, and Japan, at 5.8, 6.0, and 8.9 percent, respectively.¹⁰ In the light of the pronounced institutional differences among these countries in medical care financing arrangements, the similarity in the real rate of growth is striking. Thus, whatever is behind the medical care expenditure rise appears to be common across these countries. The advance in medical technology is, of course, one such common factor.

Was Technological Change Induced by Insurance?

I come below to some normative comments about the increase in costs. One's views about the cost increases, however, might differ if one thought the change was induced by high levels of insurance, perhaps in turn induced by the tax subsidy, such that there was a welfare loss from too much change. At this point I only want to point out the fallacy in an argument sometimes heard in the public debate—that without insurance people could not afford to pay for much of the technology; hence, the change was induced by insurance, and *ipso facto* the technology represents a welfare loss. The essence of the fallacy is that the appropriate first-best condition is not what would be observed in an uninsured market, but what consumers are willing to pay for an insurance policy that would cover the technology in relevant states of the world (Marshall, 1976; De Meza, 1983; Goddeeris, 1984a, 1984b). In other words, a principal function of insurance is to transfer income across states of the world; one may well want more income, for example, in a state of the world where one's kidneys have failed. The inference that kidney dialysis or kidney transplant technology necessarily represents a welfare loss because most uninsured consumers could not afford it is thus incorrect.

What Has Been Done About Medical Costs?

Over the years a variety of "cost containment" techniques have been tried. On balance, these techniques appear to have been beneficial, but they have had primarily a once-and-for-all effect on the level of medical expenditure, leaving the steady-state rate of change little affected (Schwartz, 1987). I will discuss three of the recent efforts to control costs by both the private and the public sector.

¹⁰The bulge in Japan is entirely attributable to the decade of the 1960s, when real per capita GDP in Japan grew by 11 percent per year and real health care expenditure grew by 14 percent per year, thus helping drive up expenditures on health care along with everything else.

First, initial cost sharing by patients has increased. Private insurers increased deductibles substantially in the early 1980s. For example, the proportion of firms with a deductible of \$200 or more in a sample of medium and large firms rose from 4 percent to 21 percent between 1982 and 1984 (Goldsmith, 1984). Even more strikingly, the number of such firms that had no initial cost sharing for hospital services fell from 70 percent to 37 percent in that two-year period. This increased amount of cost sharing almost certainly was responsible for part of the decline in admissions shown earlier.¹¹

Although this increase in initial cost sharing appears effective and efficient, there is little reason to think that it will change the long-term rate of cost increases. Indeed, another trend in the 1980s, toward caps on out-of-pocket spending, will increase cost, since it creates a marginal price of zero for most hospitalized patients.¹² The spread of such caps provides better protection against risk, but has meant an even greater proportion of hospital patients face no cost for the marginal service or procedure, consistent with the increase in services delivered per stay.

Increased enrollment in health maintenance organizations has been a second approach to cost containment. The federal government has encouraged enrollment in health maintenance organizations since the mid-1970s as a cost-containment technique. We have already seen, however, that the effects on costs were of the once-and-for-all variety; the rate of growth in HMO spending appears similar to the entire sector.

A third method of addressing costs has been the adoption of prospective payment systems. In particular, in 1983 Medicare began to reimburse hospitals using Diagnosis Related Groups (DRGs), which shifted the basis of payment from one which paid marginal cost approximately in full to one which paid a lump sum per type of admission, which meant the marginal revenue for an additional day was zero.¹³ Not surprisingly, length of stay fell, but in a few years bottomed out (Schwartz and Mendelsohn, 1991). Whether there will be an effect on the steady-state rate of growth in spending remains to be seen. That will depend upon the degree to which Medicare accounts for new technology in changing its lump sum over time. Uncertainty about such reimbursement,

¹¹A much smaller decline in admissions was seen among the elderly, consistent with this story. The hospital portion of Medicare (Part A) has a deductible that rose in real terms; however, the majority of Medicare beneficiaries have so-called Medigap or supplementary insurance that typically pays the deductible. Thus, most Medicare beneficiaries face no effective deductible, and the increases in the nominal deductible are transformed into increases in premiums.

¹²The increased use of caps on out-of-pocket expenditure and increased deductibles left the out-of-pocket share constant, as noted above. The argument in the text about the marginal price assumes that price is foreseen. Typically, this will hold if the initial deductible will be small enough that with high probability it will be exceeded during the hospitalization. There may be some uncertainty about whether a cap on out-of-pocket payments will be exceeded, however, mitigating the force of this argument.

¹³Marginal revenue is positive for outlier patients, but they are less than 5 percent of cases. Medicare accounts for just over a quarter of hospital revenues.

however, may well decrease spending on the development of new technology by increasing risk.

The Willingness to Pay for New Technology

Clearly medical expenditures cannot grow forever at a rate 2 to 3 percentage points greater than the growth in the economy. Thus, if market forces do not act to slow the growth, at some point public sector interventions, such as global budget ceilings, may be desirable. Indeed, legislation contemplating such ceilings has been introduced. The key issue in appraising such ceilings from a social welfare point of view is whether consumers are willing to pay for the new capabilities available to them.

As already noted, the dominant view of health insurance in the economics literature, at least in the American literature, is that "too much" health insurance leads consumers to demand "too much" medical care at each point in time, which is reasonably well established, as well as "too much" technological change, which is less well established. In two interesting theoretical papers, Goddeeris (1984a, 1984b) derives the conditions under which a costly technological change that increased capabilities would increase or decrease welfare. In the case in which income elasticity for change exceeds zero, surely the interesting case, an innovation that would not be bought without insurance may nonetheless increase welfare. Whether it does so depends on the marginal utility of income in the state to which the innovation applies and the number of low-benefit users induced by the insurance coverage. Although this tells us that the simple intuition that any subsidy represents a welfare loss does not necessarily apply, it leaves us with the empirical question of how much welfare loss there might be from the actual rate of change.

Direct evidence is scarce, but some of the evidence cited above suggests the welfare loss from the additional spending on technology may be less than some of the rhetoric surrounding the need for cost containment would imply.

First, the real rate of increase in costs is similar across countries, some of which make centralized decisions about how much to spend on medical care and all of which have financing institutions that differ from those of the United States.¹⁴ Countries like Canada and the United Kingdom make explicit budgetary decisions about the size of the medical care sector each year and explicitly trade off medical care against other public sector goods and private consumption.

¹⁴The U.S. has a large positive residual if current cross sectional health expenditures are regressed on income (Schieber and Poullier, 1989). A similar regression on earlier data, however, shows the U.S. with a much smaller residual (Newhouse, 1977). Thus, relative to GNP growth, U.S. health expenditure has grown faster than other countries in the 1980s. There is no obvious change in U.S. financing arrangements in the 1980s that would explain this, however.

Second, the rate of increase in HMO costs in the United States has been similar to the overall medical care sector. If there were a public preference for less and cheaper technology, HMOs might have offered it. However, they apparently do not believe that demand exists for cheaper medical care using a lower level of technology.

Drawing the inference that consumers are willing to pay for new technology from the fact that HMOs have had similar cost increases is open to argument on several grounds. Some consumers do not face the price difference between the HMO and traditional reimbursement insurance, because the employer subsidizes the difference. Others pay the difference with before-tax dollars. Moreover, offering a markedly outdated technology would open an HMO to malpractice complaints, since the legal standard used to establish negligence is the conventional standard of care. Nonetheless, if many consumers felt that new technology wasn't worth the price, it seems odd that we do not observe some firms trying to enter and offer at least some aspects of 1960s medicine at 1960s prices.

A Note on The Terminally Ill

One frequently mentioned cause of rising medical expenditure in popular writing is the treatment of the terminally ill. There is a grain of truth in the popular perception; among those over 67 years of age, 6 percent died in 1978, but that group accounted for 28 percent of the expenditure over a two-year period (Lubitz and Prihoda, 1984).

But taken as a whole, the data offer little support for the notion that society is wasting an ever-larger share of resources in a fruitless attempt to save those who are about to die. Spending in the last year of life has not contributed disproportionately to the *increase* in medical care costs. The share of spending by those in their last year of life was stable between 1967 and 1979 (Lubitz and Prihoda, 1984). Moreover, only 6 percent of those who died in 1978 had more than \$15,000 of Medicare expenses, which does not fit the popular image of heroic efforts being exerted on many terminally ill patients. Put another way, most dying patients are sick individuals who will receive some sort of care; it does not appear that a great many of them are receiving enormous amounts of care.

Furthermore, one usually does not know twelve months before the date of death that this is one's last year of life. In the late 1970s, physicians were asked to predict short-term survival probabilities of patients being admitted to an intensive care unit (Detsky, Striker, Mulley et al., 1981). Those conducting the study then looked at spending as a function of predicted survival probabilities. They found that among survivors, expenditure correlated negatively with predicted survival probabilities (for example, expenditure when the predicted probability of survival was 25 percent was approximately three times as large as

when the predicted probability was 75 percent). Among those who died, however, expenditure correlated positively with survival probability (for example, expenditure was nearly twice as large when the predicted probability of survival was 75 percent as when it was 25 percent). Thus, spending was largest for patients whom physicians expected to live but did not, or for whom physicians expected to die but did not. These findings are consistent with rational sequential choice under uncertainty or Bayesian learning; in other words, many of the 6 percent who spent more than \$15,000 may well have been expected to live.

While the terminally ill undoubtedly absorb some spending of little or even negative value, it does not appear that such spending is a disproportionate cause of the increase in medical care costs.

The Uninsured

I now turn from the level of costs to another major health policy issue of the day, the lack of universal health insurance coverage. About 15 percent of the U.S. population has no health insurance. The conventional economics view of this issue is that it is partly distributional; partly an issue arising out of the connection in the United States between health insurance and one's employment (for example, those in their 20's seeking their first job have disproportionately high numbers of uninsured); and partially a market failure resulting from asymmetric information. As is well known, if the insured knows more about his or her expected expense than the insurer, there may be no competitive equilibrium, because of adverse selection (Rothschild and Stiglitz, 1976). Indeed, Akerlof's (1970) classic paper on asymmetric information views the Medicare program as a public sector remedy for insurance market failure among the elderly (because they lack the labor-market tie to employer-based insurance), and Diamond (1992) has recently proposed breaking the connection between employment and health insurance to remedy selection problems among the non-elderly.

A program that provided full insurance for the uninsured, according to the best estimates available, would cause their demand to double (Keeler and Rolph, 1988). The overall increase in demand for medical care would then be determined by whether the uninsured are above or below average in their rate of spending.

The uninsured are a heterogeneous risk group; some of them are individuals with a chronic illness who do not have a labor force connection and cannot purchase individual insurance, or at least insurance that covers their condition. This group is presumably of above-average risk. Others are people in their 20s looking for their first job who have chosen not to purchase individual insurance in part because they believe they are healthy. This group is presumably of below-average risk. On balance the uninsured as a group probably are

somewhat above average in their risk. On the other hand, partial rather than full insurance coverage is a more likely scenario in any intervention to cover the uninsured.

Taken all together, covering the uninsured (exclusive of chronic long-term care) would probably increase demand for medical care by less than 10 percent, or the equivalent of roughly two years of real growth in health expenditure at historical rates. Thus, universal insurance, while adding nonnegligible costs, would not wreak havoc on the nation's medical care economy.

The method of financing any increase in medical care costs, whether those costs stem from future technological change or from covering the uninsured, does raise the issue of deadweight loss. If the increase is financed by additional taxes, a middle-of-the-road estimate of the losses might be around 30 percent of the revenue raised (Stuart, 1984; Ballard et al., 1985; Browning, 1987). If extra revenue is raised by imposing costs on employers, that will cause labor market distortions (Summers, 1989). Raising revenue through imposing additional cost-sharing on patients is limited by the desire to avoid imposing much additional risk, although the level of risk appears modest for usual levels of initial cost sharing (Buchanan et al., 1991). All these factors would need to be considered in a full analysis of the gains from expanding medical coverage, whether for the uninsured or for anyone else.

Concluding Thoughts

I mentioned earlier that the conventional analysis of economists, emphasizing how the tax exemption for employer-provided health insurance distorts choice toward too much insurance and too much care, is valid as far as it goes. However, ending the tax subsidy would probably neither address concern about rising medical care costs, nor be unambiguously a good policy.

It is not clear that insurance or the tax subsidy has much to do with rising medical costs, as opposed to high ones. The tax subsidy affects the demand for insurance, but the spread of insurance cannot quantitatively account for much of the increase in expenditure except to the degree it has induced technological change, and there is reason to think consumers want to pay for much of this change. Moreover, average marginal tax rates were roughly constant from 1951 to 1967 and again from 1978 to 1985 (Barro, 1986).¹⁵ After 1986 marginal tax rates fell at the median income and above and did not much increase at half the median income (Bosworth and Burtless, 1992).

None of this is to say that reducing the tax subsidy to health insurance by some amount does not make sense—for example, by capping the amount employers can contribute to employee health insurance tax-free—but eliminating the tax benefit altogether runs the risk of increasing selection problems in

¹⁵Robert Barro has generously provided me unpublished data on 1984 and 1985 rates.

the group health insurance market if young, healthy workers opt for compensation in the form of cash.¹⁶ This, of course, would increase the number of uninsured.

Whatever is done about the uninsured, the possibility that medical care costs will continue to rise faster than GNP with no further intervention seems plausible. I have argued that consumers, at least to this point, may want to pay for most of the increase. If so, a binding cost ceiling might well impose a welfare loss, by preventing medical care consumers and providers from making mutually advantageous exchanges. Such a loss would increase to the extent that those services foregone under a cap were not the least valued ones. Physicians might mitigate such a loss, however, by allocating services among patients in a way that would jettison the least valued ones.

There is considerable evidence that the level of medical expenditure is too high, and there can be little question that trying to find once-and-for-all gains is worthwhile. Suppose, however, that some magic wand could almost costlessly get rid of medical services whose marginal benefits were less than their marginal cost. Or perhaps no more realistically than that magic wand, suppose that some well-crafted reform of the health-care system manages to bring down the level of American health care costs (as a share of GNP) to the level found in many other countries. Even so, the argument presented here predicts that if the march of science continues, after a few years we may wish to be back where we are now, spending over 12 percent of GNP on medical care and worrying about whether the increased capabilities of medicine are worth their ever increasing opportunity costs.

■ *I would like to thank Carl Shapiro, Joseph Stiglitz, and Timothy Taylor for comments on an earlier version of this paper. Their comments were extraordinarily helpful, but the usual disclaimer applies.*

¹⁶In the Rothschild-Stiglitz model an equilibrium may not exist if there are a few high risks who know they are high risk, but are not known to the insurer. This may well be the case in the health insurance market, although it is difficult to show because one must know what individuals and insurers know before an insurance contract is signed. Still it is suggestive that 5 percent of individuals account for 50 percent of the expenditure and 10 percent for 70 percent of the expenditure.

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