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Health Care in the United States and Japan

Does the United States Spend Too Much On Medical Care?

David M. Cutler

Harvard and NBER

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Abstract

This paper examines the differences in health spending and outcomes between the United States and other countries. Data on national health spending indicate that the United States spends more on health care than would be expected on the basis of income alone. This is largely a result of the 1980s, however. While the U.S. spent more on health care throughout the post-war period, most of this difference can be justified by higher incomes. Differences in health spending do not appear to be related to differences in life expectancy. While income has a clear effect on life expectancy, variations in spending given income appear to have no mortality consequences. This is consistent with a view that the marginal dollar of health spending has few health benefits.

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"We're spending over 14 percent of our income on health care -- Canada's at 10; nobody else is over nine. We're competing with all these people for the future. And the other major countries, they cover everybody and they cover them with services as generous as the best company policies here in this country."

- President Clinton's Address to Congress, September 1993.

The cost of health care is a concern in virtually all countries. In some countries, low costs are a source of pride. In other countries, rising costs have lead to calls for government intervention. Recent years, for example, have seen spending concerns in Germany, France, and a host of other European countries.

This debate is particularly acute in the United States. Several decades of rising health costs have provoked a great deal of consternation in the public and private sectors (Cutler, 1994). The United States spends close to 50 percent more per capita on health care than other countries. Coupled with a sense that poor health outcomes do not justify spending this amount on medical care, there have been frequent calls to limit spending on medical care.[1] Other analysts argue that the United States experience is not a cause for concern. Since incomes are higher in the United States than in other countries, we would expect the United States to spend more on medical care. In addition, poor outcomes may mask a very productive medical system if outcome differences are due to differences in lifestyles rather than lack of productive medical care. Indeed, the marginal product of medical care could be very high, but be offset by the consequences of adverse lifestyle choices.

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[1]Such controls were in the original Clinton Administration Health Security Act as well as a variety of single payer bills.

The debate over whether U.S. health spening is too high, or doesn't buy enough, thus rages on.

This paper examines international differences in spending on health care and health outcomes to take a first step at addressing these issues. I focus first on the level of spending across countries. I show that, controlling for income, health spending in the United States is significantly higher in 1990 than it is in other countries. The discrepancy arose largely in the 1980s, however. In earlier years, the United States spent more on health care, but this is almost entirely justified by higher incomes. In the 1980s, in contrast, other countries were much more successful in limiting cost groth than the United States, and health spending rose much more rapidly in the U.S. than abroad.

I then turn to the question of health outcomes. I find little evidence that, controlling for income, health spending across countries is correlated with positive health outcomes. This is consistent with the view that the marginal amount of health care has little medical benefit, and therefore, that moderate cutbacks in the level of spending would have few health implications.

I. Trends in Health Spending

Before examining whether health spending in the United States is "too high", I begin with simple descriptive data on health costs in different countries. Table 1 shows data on health costs in 1960 and 1990. The first rows present the G-7 countries individually. The penultimate row reports statistics for the G-7 as a whole, and the last row shows data for the OECD, omitting three countries where spending data were not available in 1960 (Luxembourg, Portugal, and Turkey).

One way to compare spending across countries is to look at real per capita health costs. Data on real spending are presented in the first 3 columns of the Table.[2] In 1960, the average country in

[2]Costs are in U.S. dollars, adjusted using Purchasing Power Parity exchange rates from the OECD.

the G-7 spent $407 per person on health care, and the average country in the OECD spent $376 per person on health. Compared to this amount, the United States was a clear outlier, spending $621 per person, or 55 to 65 percent more than comparable countries. U.S. spending was the highest in the OECD. Between 1960 and 1990, real per capita spending in the OECD and G-7 rose 5 percent annually. Growth in the United States was a bit *below* this rate, however, although not by much. In 1990, the United States spent 53 percent more than the OECD average and 42 percent above the G-7 average, again the highest of any country. Thus, if real per capita spending is the metric of costs, the United States was a clear outlier throughout the 30 year period, by about 50 to 60 percent.

Alternatively, some analysts scale health spending by national income. One of the factors influencing health spending presumably is income, so adjusting for income might present a more meaningful cost comparison. Trends in health spending as a share of income are detailed in the last three columns in Table 1. Scaling by income modifies the story of U.S. health spending substantially. The average country in the OECD spent 4.1 percent of its income on health care in 1960 (4.5 percent in the G-7). Relative to this amount, the United States was an outlier, but by only 15 to 25 percent. Indeed, in 1960, Canada spent a greater share of GDP on health care than did the United States. Over the 1960-1990 period, the disparity between the United States and other countries widened. Growth of health costs in the United States exceeded income growth by 2.8 percentage points annually, compared to 2.2 percent for the OECD as a whole. The result was that the United States was a far larger outlier at the end of the period than at the beginning of the period. In 1990, the United States spent between 45 and 55 percent above comparable countries. Thus, if spending as a share of income is the appropriate metric, the United States was a moderate outlier in 1960, but a much larger outlier in 1990.

How one ranks the spending performance of the United States thus depends on how one treats the relation between income and health spending. In real terms, U.S. spending has always been high, with a small reduction in the differential over time. As a share of income, spending differentials were moderate in the past, but have increased in recent years. I consider which of these comparisons is more appropriate in the next section.

II. Is U.S. Spending Excessive?

Health spending will differ across countries for many reasons. A useful division of these factors is into "exogenous" and "endogenous" reasons, although this distinction is not perfect in practice. Consider three exogenous factors affecting health costs:

Demographics: Some differences in health spending will be due to differences in the demographics of the population covered. The prime example of this is the age distribution of the population. There are very clear age differences in health spending. In the United States, for example, children (aged 0-18) spend about 60 percent of what adults (aged 19-64) spend, and the elderly (aged 65+) spend about 3.2 times what adults spend.[3] Since demographics differ across countries, health spending will differ as well. Further, since most OECD countries are experiencing large increases in the elderly population, there is a natural tendency for health spending to increase over time.

Related to the issue of demographics is lifestyles. If people in some countries live less healthy lifestyles than those in other countries, spending will be higher. This may be a cause for concern if the goal is to improve the health of the population, but is not necessarily a concern about the

[3]These figures are based on the 1987 National Medical Expenditure Survey.

efficiency of the medical sector.

Income: Income is at least partly exogenously related to health spending. Much of the difference in income across countries is due to differences in productivity in non-health sectors. When productivity is higher in non-health sectors, the opportunity cost of inputs to health care increase, and thus their price must increase as well (Baumol, 1988). This increase in price will result in greater total spending on health care provided that demand is inelastic. The Rand Health Insurance Experiment (Manning et al., 1987) suggests that the elasticity of demand for health care is about -0.2, so that the "cost disease" would be expected to increase health spending.[4]

Technology: A third factor influencing health costs is the level of technology. Technology may be increase or decrease costs. New types of radiological equipment, for example MRIs, are likely to be cost increasing. On the other hand, advances in non-invasive surgical procedures may lower spending per person treated.

The level of worldwide technology is clearly endogenous. At a point in time, however, the availability of technology is similar across countries -- particularly among developed countries. Thus, in comparing spending across countries, we want to think of technology as exogenous. If technology were the only determinant of costs, we would expect all countries to spend the same amount per capita on health care, and thus per capita spending, rather than spending as a share of income, would

[4]Income may also be related to health spending for other reasons, in particular the direct effect of income on the demand for care.The Rand Health Insurance Experiment suggests that the income elasticity of demand for care is about 0.2 to 0.4 (Manning et al., 1987). This fact suggests that the income elasticity estimated below may overstate the exogenous part, thus resulting in estimates of U.S. spending that are not sufficiently different from those in other countries.

be the appropriate comparison across countries and over time.

Consider the following parameterization of the factors above:

$$\ln(h) = \beta_0 + \beta_1 D + \beta_2 T + \beta_3 \ln(y) + \beta_4 U.S. \qquad (1)$$

where h is per capita spending on health care, D is an indicator of the demographic mix of the population, T is the level of technology, and y is per capita income. If technology or demographics were the most important source of cost variation, the right measure of spending across countries would be per capita spending adjusted for demographic differences (but not as a share of income). If technology and demographics were unimportant, but relative productivity differences were the most important source of variation, spending as a share of income would be the right measure. More generally, neither per capita spending nor spending as a share of income is the exact comparison of health costs.

Given the exogenous demographic, technologic, and income factors in equation (1), the coefficient β_4 indicates whether the United States spends too much on medical care. There are many reasons this may be true -- the prevalence of third party insurance; defensive medicine resulting from malpractice litigation; administrative expenses from decentralized health provision; overprovision because of quality competition; etc (see Cutler, 1995, for a catalog). A natural long run goal is to isolate the importance of each of these different factors in explaining health costs. Before examining which of these particular factors is important in explaining high costs, however, it is necessary to determine how much costs in the United States are above expectations.

Estimating equation (1) is difficult for two reasons. First, there is no single measure of

technology across countries or over time. I thus include the technology term in the constant of the regression. Second, since health spending may affect longevity, including the demographic mix in the regression could be endogenous. Since most analysis suggests that the effects of demographics on cross-country spending is likely to be small (Aaron, 1991), this is not a particularly important omission. The equation I estimate is therefore:

$$\ln(h) = \beta_0 + \beta_1 \ln(y) + \beta_2 U.S. + \epsilon. \qquad (2)$$

Equation (2) may be estimated in either levels or differences.

Table 2 presents estimates of equation (2). The sample for all regressions is the 21 countries in the OECD with data in all years. The upper panel of the Table reports estimates of equation (2) for the level of spending in 1960, 1970, 1980, and 1990. In all cases, there is a strong income effect. Each one percent increase in income raises spending on health care by 1.3 to 1.4 percent.

Relative to the effect of income, the United States is a significant spending outlier in 1990 but is not a significant outlier prior to 1990. In the equations for spending in 1960, 1970, and 1980, the point estimates suggests that spending in the U.S. was 13 to 20 percent above expected levels, but the standard errors are all large. In 1990, spending in the United States was 36 percent above the predicted amount, a difference that is statistically significant. Thus, the conclusion is that spending in the United States was not significantly out of line prior to 1980s, but became out of line in the 1980s. Substantively, the difference between spending in 1980 and 1990 is quite large (about 20 percent)..

This conclusion is confirmed in the bottom panel of the Table, which reports regressions for the change in health spending for decadal intervals. The United States did not have above average

spending growth in either the 1960-70 period, or the 1970-80 period, but had extremely rapid growth in the 1980-90 period -- over 2 percent per year above expected levels.

The fact that the United States became a spending outlier so rapidly suggests that the explanation for higher spending in the United States is not differences in demographics or lifestyles across countries. Both of htese factors are likely to be persistent, rather than experiencing sharp changes. Indeed, to confirm this result, I reestimated the equations in the top panel of Table 2, including measures of alcohol and tobacco consumption per adult. Consumption of these two products is likely to be indicative of a range of adverse lifestyle effects. In fact, neither alcohol consumption nor tobacco consumption were significantly related to health spending, and including these variables had essentially no effect on the coefficient for the U.S. dummy variable.

Some indication of what was happening in this period is provided by the coefficient on income growth in the bottom half of the Table. In the 1960-70 and 1970-80 periods, changes in income are associated with large increases in health spending -- on the same order as the cross section regression results. In the 1980-90 period, however, changes in income are essentially unrelated to changes in health spending. The coefficient on income growth is one-third its value in early periods, and is statistically insignificant. I return to the explanation behind this in the next section.

III. Structural Differences in Health Systems

The superior performance of other countries in controlling health costs leads naturally to questions about what other countries did that resulted in this better performance. In fact, the striking development in international health systems in the 1980s was the extent to which governments *increased* their involvement in the health sector, and in particular, in limiting health spending.

Health spending may be limited by either demand or supply factors. In the United States, both measures are common. Demand side measures include cost sharing at the point of treatment and at the choice of insurance. The use of both of these incentives increased in the 1980s (Gabel et al., 1994). Supply side cost containment is typically of two forms: enrollment in managed care, where individuals forego complete choice over providers in exchange for lower premiums; and direct limitations on payments to providers or the ability to perform certain services. The latter mechanism is particularly common in the public sector.[5]

Internationally, the dominant trend in the 1980s was increased public sector involvement in limiting the supply of health care (Hsiao, 1992). Table 3 shows some evidence on cost containment mechanisms in different countries. The list is not a complete sample for the OECD; it does contain most of the G-7 countries, however.

Most countries (Canada, France [public hospitals], Germany, and the United Kingdom) have some form of global budgets for hospitals. Global budgets are fixed amounts of revenue that are given to hospitals lump sum. Hospitals are supposed to use this amount to treat all needy patients. Sometimes the budgets are negotiated with the government (as in Canada), while other times they are negotiated with private insurers in light of government decisions as to desired spending increases (as in France). On the physician side, most countries have a fee schedule for inpatient and outpatient care. In some cases (for example Germany), the fee schedule is adjusted to guarantee a total amount of spending. In other cases (for example Japan), the rates are set to reach a given level of spending, but this need not automatically occur. The United States is virtually the only G-7 country without

[5]These limitations may be purely fee reductions, as with the Medicare Relative Value Scale for physicians, or may consist of bundling services together and paying for the bundle jointly, as with the hospital Prospective Payment System.

large-scale supply-side cost containment measures of this form.

Much of international health reform in the 1980s was directed at tightening the use of global budgets and fee schedules. In Germany, for example, hospitals were moved from spending *targets* to spending *caps* in 1986. Physicians have been under budget controls since 1978. In France, per diem rates in public hospitals were replaced with budgets caps in 1984. In Canada, tight budget controls were implemented as early as 1971.

By imposing limits on cost growth, many countries managed to decouple health costs from income in the 1980s. This is apparent in Table 2 as a reduction in the income elasticity of health spending. Indeed, Figure 1 shows this graphically. The figure shows the growth of "residual health spending" by decade for the G-7 countries. Residual spending growth is the growth of real per capita health costs less that amount explicable by income growth -- defined as 1.4 times the growth of real per capita income (the factor 1.4 is a rough income elasticity from Table 2).

In the 1960s, residual spending growth was relatively common across countries -- about .25 percent to 1 percent per year. The country with the lowest growth of residual spending was the UK, which also had the tightest controls on health spending in this period. In the 1970s, residual spending growth was again common across countries, and at a higher level. Indeed, the United States actually did well in this period, compared to the G-7 average. The one country with large reductions in cost growth was Canada, where spending growth was below the amount predicted on the basis of income alone. As noted above, budget constraints in Canada were implemented at the beginning of the 1970s.

In the 1980s, however, the story was dramatically different. Three of the countries had cost growth below that predicted on the basis of income growth -- Germany, Japan, and the U.K.

Germany and Japan both implemented tight cost containment in this period. Only the United States and Canada had cost growth far above income growth. Indeed, the striking fact about the pre- and post-1980 period, detailed in the Figure, is that cost growth did not accelerate in the United States in the 1980s. Rather, cost growth slowed dramatically in the other countries. The increase in relative spending in the United States thus appears to be largely a result of actions taken by other countries to limit costs, rather than above average cost growth in the United States.

The natural question is whether this relative performance differential is sustainable? Reductions in cost growth may be one of three types: temporary -- a reduction that is eliminated after several years; permanent but one-time -- a reduction of spending to a level that is permanently lower but not declining further; or permanent and continuing -- a sustained reduction in the growth of spending, leading to increased spending gaps over time.

If the long-term growth of health costs is largely driven by worldwide changes in technology, as argued in Newhouse (1992), there is some reason to believe that payment caps may have one time cost savings, but will not have long-term effects on cost growth. Indeed, the scant evidence that is available suggests that no countries have achieved permanent reductions in the growth rate of costs. Three examples illustrate this point. The first is the United Kingdom. In 1960, the UK spent about 8 percent less on health care than comparable countries.[6] By 1970, spending in the UK was about 20 percent below expected levels, and remained at that level for the next 20 years. The UK example thus suggests the potential for permanent reductions in the level of spending, but no permanent reductions in cost growth.

The situation in Canada is even less optimistic. In 1970, health spending in Canada was

[6]This is based on regressions as in Table 2, including a dummy variable for the U.K.

almost 30 percent above the level predicted given its income. By 1980, spending in Canada was almost exactly at the level predicted by income. Yet by 1990, spending in Canada had risen to 11 percent above the predicted level. If these trends continue, spending in Canada will return to its 1970 level by 2010.

The third example is alternative care arrangements in the United States. Many studies show that costs are lower in managed care plans than in fee-for-service plans (Miller and Luft, 1994), and that costs are lower in plans with more cost sharing than in plans with less cost sharing (Manning et al., 1987). Yet, no evidence suggests that cost *growth* is lower in managed care plans than fee-for-service plans, or in plans with more cost sharing relative to plans with less cost sharing. This suggests there may be one-time savings from alternative care arrangements, but there may not be continuing cost reductions.

Most of the European countries have not had sufficient experience with tight spending controls to infer the long run outlook for spending growth. In both Canada and European countries such as Germany, the 1990s and future years will indicate whether spending reductions are permanent or only transitory.

IV. What is Saved?: Health Spending and Life Expectancy

Knowing only that some institutions lead to cost savings does not indicate whether these institutions are good or bad. Spending that is wasteful (that brings benefits less than it costs) is good to eliminate. Spending with large benefits relative to cost, in contrast, is quite valuable. It is thus crucial in evaluating the welfare implications of cost changes to determine what benefits flow from the marginal amount of spending.

Savings in health costs may come from several sources. First, savings may be pure efficiency improvements, for example reductions in the administrative costs of running the health system. Estimates of administrative expense in the United States range up to 15 percent of health spending more than in other countries (Himmelstein and Woolhandler, 1984), although it is widely speculated that administrative costs in other countries are understated.

A related source of savings is reductions in provider rents. Doctors typically charge far above marginal cost for their services, because of limited competition and the need to earn a return on past investments. Prices could be lowered substantially for the existing stock of doctors, therefore, without dramatic reductions in care provided. While reductions in provider reimbursement may have long-term effects on the quality of medical personnel, in the short run it could be a large source of savings.

A third source of savings is reductions in care provided. Aaron and Schwartz (1984), for example, document that care provided for many diseases is much less intensive in the United Kingdom than in the United States. Fuchs and Hahn (1990) show that resource input is greater in the United States than in Canada. Not all reductions in the quantity of care received are bad. If moral hazard, fee-for-service reimbursement, malpractice concerns or other factors result in care provision that is above the efficient level, cost savings by reducing this care may be efficiency-improving. The key concern is whether spending is at the right amount in aggregate, and whether the total amount of care is allocated efficiently.

It is, unfortunately, difficult to determine which of these sources of savings have been most important internationally. To examine how valuable marginal amounts of care are, however, I examine the direct link between health spending and life expectancy. Life expectancy is a natural

measure to examine because reductions in mortality is one of the goals of increased spending. I examine life expectancy at birth and at older ages because of several recent suggestions that medical care may have more effect at the end of life than at the beginning of life (Fuchs, 1994).

To the extent that increased spending lowers morbidity these benefits will not be reflected in life expectancy. Data on disability across countries are difficult to find, however, so I restrict attention to changes in life expectancy.

Table 4 presents some first evidence on the relation between health spending and life expectancy. The Table relates real per capita health spending in 1990 to female life expectancy at birth, age 40, age 60, and age 80.[7] For the first three measures, the sample of countries is the 19 OECD countries with health spending and life expectancy in both 1960 and 1990 (the sample in Table 2 less Greece and Spain). For life expectancy at age 80, only 13 countries report data.[8]

Within the G-7 countries, the Table suggests some relation between spending and life expectancy, particularly at older ages. The United States, which spends the most on health care, has the sixth highest life expectancy at birth and age 40, the 5th highest life expectancy at age 60, and the 2nd highest life expectancy at age 80. The United Kingdom, in contrast, which spends the least amount on health care, has the lowest life expectancy through age 60, and the second lowest life expectancy at age 80.

Examining the relation between spending and life expectancy is problematic if there are country-specific effects that influence spending and mortality. In the United States, for example,

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[7]Because age-reporting is more suspect at older ages, life expectancy at age 80 may be less reliable than life expectancy at younger ages.

[8]This sample is the 19 countries noted above less Australia, Denmark, Ireland, The Netherlands, New Zealand, and Norway.

higher rates of violence may lead to more health spending, but also higher mortality. In Japan, better diet may lead to lower health spending and increased life expectancy. A natural solution to this problem is to examine *changes* in health spending and life expectancy. If social and nutritional determinants of health are constant over time, using changes in spending and changes in mortality will give an unbiased estimate of the marginal value of health spending.

Table 5 presents regressions explaining the change in life expectancy (in years) with changes in health spending (expressed as annual growth rates). The upper panel includes health spending as the only independent variable. The lower panel adds changes in income to the regression.

The regressions with just health spending included (the upper panel) suggest a strong relation between life expectancy and health spending. In countries with more rapid spending growth, life expectancy increases more rapidly. The estimates suggest that a 1 percent increase in annual spending growth raises life expectancy by 1 year at birth, .7 years at age 40, .5 years at age 60, and .1 years at age 80. The first three estimates are statistically significant; the last is not.

When income growth is added to the equations, however, the results are markedly different. At younger ages, most of the explanatory power of health spending appears to be due to income growth instead. The coefficient on health spending in explaining life expectancy at birth falls by 80 percent, and the coefficient for life expectancy at age 40 falls by 40 percent. In both cases, the coefficient on income is positive and statistically significant.

In the regressions for life expectancy at older ages, the coefficients do not change significantly once income is included, and income itself does not appear to affect life expectancy. The standard errors on health spending increase dramatically, however, making it difficult to draw firm conclusions from these regressions. Thus, there is a little evidence that health spending does increase life

expectancy, but this evidence has a large standard error.

For most of the 1960-1990 period, health spending was determined at least somewhat by market forces in most countries. A separate question is whether government-imposed changes in spending affect mortality. As the earlier discussion suggested, the 1980s are a natural period to examine this issue, since spending in most countries was driven as much by public policy as by the market.

Table 6 therefore repeats the regressions from Table 5, using life expectancy and spending data only from the 1980s. The results suggest even in the 1980s, health spending is not related to changes in life expectancy once income is controlled for. Countries with more rapid increases in spending actually had reductions in life expectancy over this decade, although the result is not statistically significant. Income growth, in contrast, is significantly related to increases in life expectancy at all ages.

An example of this finding is instructive. The country with the most successful cost containment in the 1980s was Germany, with real per capita health spending growth below 1 percent annually. Over the 1980s, life expectancy at birth increased by 2.4 years in Germany, compared to an OECD average of 2.1 years. Life expectancy at age 60 increased by 1.5 years, compared to 1.3 years on average in the OECD.

How is the lack of a relation between health spending and life expectancy possible? One explanation is that savings came from lower administrative costs or reduced provider rents. Indeed, many of the actions taken by these countries were fee reductions for providers. For medical personnel like doctors, the marginal cost of providing health services may be low, and fee reductions may be like a lump-sum transfer away from providers. Even if savings came from reduced care

provided, however, it may be that the marginal amount of care has less value than the average amount. Because of relatively lax reimbursement throughout the post-war period, patients and providers may have acted as if the marginal cost of health care was zero (which it was for many patients), and therefore all care of any value would be provided (Fuchs, 1974). Starting from this point, reductions in the marginal amount of care provided -- if taken from the least productive uses -- might have no effect on health outcomes.

Indeed, some evidence on this point comes from the Canadian experience in the early 1990s. Table 7 is drawn from a General Accounting Office (1991b) report on queuing for 7 high-tech services in Ontario in October 1990. While there appears to be queuing for most services, the queuing is particularly prevalent for elective surgery, and very small for emergency services. By rationing elective procedures most, the rationing that does take place may not lead to much of a mortality increase.

V. Conclusions

This examination of international differences in health spending suggests two conclusions. First, the United States is a spending outlier, but only became so in the 1980s. Per capita health spending has been much higher in the United States throughout the post-war period, but most of this higher spending is because of higher incomes. In the 1980s, in contrast, other countries took steps to limit spending on health care while the United States did not. It is uncertain given the historical record whether the spending reductions in other countries are transitory, permanent but one time only, or permanent and continuing, but very little evidence suggests there are permanent, continuing reductions in spending from cost containment measures.

Second, health spending does not appear to affect life expectancy at the margin. Once income is controlled for, there is not a strong link between changes in health spending and changes in life expectancy. This is particularly true for the 1980s, when health spending was artificially constrained in most countries. These results are consistent with the often-expressed view that incentives in the current health system lead all care of any value to be undertaken, and thus that moderate reductions in spending have no large effect on health.

Two issues are raised by this analysis. The first is to pinpoint more directly the sources of international cost differences. If the differences are because of differing administrative burdens or provider rents, they may cause less concern than if they reflect differences in the underlying amount of care received. More detailed data on the types of care provided in different countries is required to assess this question, however.

The second issue is what type of health system results in the most efficient provision of health care in the long-run. In the short-run, government controls may work well in many industries. After all, optimal resource allocations do not change rapidly, and there are often rents that can be reduced. Over the longer run, however, public programs have the potential to create large inefficiencies if they cannot adapt to changing circumstances. Over time, it is difficult to know "what would have been" without public sector involvement, and thus how to modify public programs. Examining the experience of countries with government involvement for a longer period of time, such as Canada or the United Kingdom, may shed light on some of these issues.

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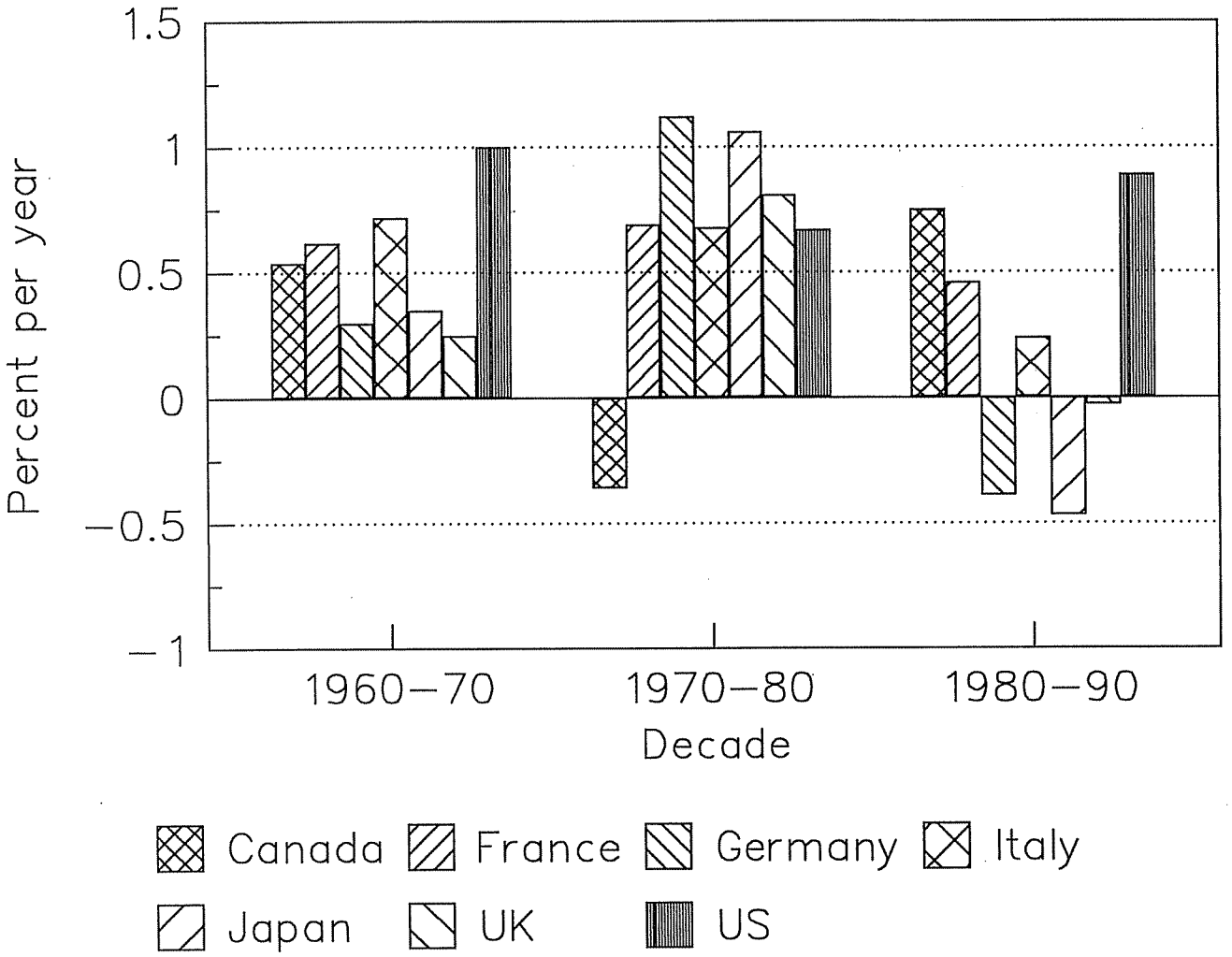
Figure 1

Change in Residual Health Spending



Note: Residual spending is annual growth of health spending less 1.4 times annual growth of income

Table 1: Trends in Health Spending and Income

	Spending ($1990)			Spending/GDP		
Country	1960	1990	Growth	1960	1990	Growth
Canada	$473	$1,770	4.4%	5.5%	9.5%	1.8%
France	326	1,532	5.2	4.2	8.8	2.4
Germany	425	1,486	4.2	4.7	8.3	1.8
Italy	223	1,236	5.7	3.3	8.1	2.5
Japan	117	1,171	7.7	2.9	6.7	2.7
UK	349	972	3.4	3.9	6.2	1.5
US	621	2,566	4.7	5.2	12.2	2.8
G-7 Average	$407	$1,808	5.0%	4.5%	8.5%	2.1%
Ratio: US/G-7	1.53	1.42	-0.3%**	1.16	1.44	0.7%**
OECD Average*	$376	$1,680	5.0%	4.1%	8.0%	2.2%
Ratio: US/OECD	1.65	1.53	-0.3%**	1.27	1.53	0.6%**

* The OECD average excludes Luxembourg, Portugal, and Turkey, for which data were not available in 1960.

** The number reported is the percentage point difference between growth in the United States and in other countries.

Table 2: Is the United States a Spending Outlier?

Specification	Constant	log(Income)	US	N	R^2
Level of Spending					
1960	-6.79	1.40	.13	21	.860
	(1.25)	(.14)	(.25)		
1970	-5.72	1.30	.21	21	.876
	(1.16)	(.13)	(.17)		
1980	-6.05	1.36	.16	21	.820
	(1.54)	(.16)	(.18)		
1990	-6.07	1.36	.36	21	.921
	(1.05)	(.11)	(.12)		
Growth of Spending					
1960-70	.016	1.48	.005	21	.706
	(.010)	(.23)	(.017)		
1970-80	.028	1.04	-.006	21	.460
	(.008)	(.28)	(.014)		
1980-90	.017	0.31	.021	21	.151
	(.007)	(.43)	(.013)		

Note: Data are from the OECD. The sample is the same as in Table 1.

Table 3: Supply Side Restriction on Health Spending

Country	Hospitals	Physicians
Canada	• Global Budgets	• Fee schedules
France	• Global Budgets (public)	• Fee schedules
	• Per diem rates (private)	
Germany	• Global Budgets	• Fee schedules set to meet spending cap
Japan	• Fee schedules	• Fee schedules
United Kingdom	• Global Budgets	• Salaried
United States	• DRGs (Medicare/Medicaid)	• RBRVS (Medicare)
		• Fee schedules (Medicaid)

Source: GAO (1991a, b); Aaron, 1991.

Table 4: Health Spending and Life Expectancy

Country	Spending	Life Expectancy at Birth	Age 40	Age 60	Age 80
Canada	$1,770	80.4	41.9	23.7	9.3
France	1,532	80.9	42.2	24.0	8.6
Germany	1,486	79.0	40.4	22.2	7.6
Italy	1,236	80.0	41.4	22.9	8.0
Japan	1,171	81.9	43.0	24.4	8.7
United Kingdom	972	78.5	39.9	21.8	8.2
United States	2,566	78.8	40.2	22.7	9.0
G-7 Average	$1,808	79.7	41.1	23.1	8.6
Ratio: US/G-7	1.42	-0.9**	-0.9**	-0.4**	0.4**
OECD Average	$1,746	79.7	41.1	23.0	8.6
Ratio: US/OECD	1.47	-0.9**	-0.9**	-0.3**	0.4**

Note: Data are from the OECD. The OECD average is based on 19 countries with data on health spending and life expectancy in 1960 and 1990. This includes the countries in Table 1 less Greece and Spain. Life expectancy at age 80 is available for only 13 OECD countries. These countries are those for younger ages less Australia, Denmark, Ireland, The Netherlands, New Zealand, and Norway.

** The number reported is the numeric difference between life expectancy in the United States and in other countries.

Table 5: Does Health Spending Increase Life Expectancy?

Change in Female Life Expectancy at:	Change in log(Health)	Change in log(Income)	N	R^2
Birth	117.8 (30.9)	---	19	.462
Age 40	70.6 (23.8)	---	19	.341
Age 60	55.1 (19.9)	---	19	.311
Age 80	12.5 (9.4)	---	13	.139
Birth	26.4 (75.3)	130.5 (98.5)	19	.515
Age 40	42.9 (60.8)	39.6 (79.5)	19	.351
Age 60	53.7 (51.1)	2.1 (66.9)	19	.311
Age 80	12.4 (23.3)	0.0 (29.3)	13	.139

Note: The sample is the same as that in Table 4.

Table 6: Health Spending and Life Expectancy in the 1980s

Change in Female Life Expectancy at:	Change in log(Health)	Change in log(Income)	N	R^2
Birth	-9.5	53.8	19	.180
	(14.2)	(29.2)		
Age 40	-11.3	45.4	19	.217
	(11.0)	(22.7)		
Age 60	-6.2	37.5	19	.165
	(10.3)	(21.3)		
Age 80	-7.6	37.3	13	.440
	(5.2)	(10.9)		

Note: The sample is the same as that in Table 4.

Table 7: Queuing for Health Services in Ontario, 1990

		Number with Queues		
Service	Number	Emergent	Urgent	Elective
CT Scan	13	0	4	13
MRI	7	1	2	7
Cardiovascular Surgery	10	0	7	9
Eye Surgery	9	0	3	9
Orthopedic Surgery	8	0	6	8
Lithotripsy	1	1	1	1
Specialized Physical Rehabilitation	5		4	
Autologous Bone Marrow Transplants	6		5	

Source: GAO (1991b).