Overview of international comparisons of health care expenditures

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Health care expenditure and utilization trends in the 24 Organization for Economic Cooperation and Development countries are provided and analyzed in terms of trends in price, population, and volume-intensity. The United States spends more on health than other countries, both in absolute dollar terms and relative to gross domestic product. Moreover, the gap appears to have grown in recent years. Although international comparisons are difficult for a number of reasons outlined in the article, they can be useful in focusing efforts to understand what the United States is getting for its one-half trillion dollar expenditure on health services.

Introduction

This article is an overview of health care expenditure and utilization trends in the 24 Member countries of the Organization for Economic Cooperation and Development (OECD), a Paris-based international organization whose members are the Western industrialized countries. First, the basic underlying data and methodological issues in performing international comparisons are discussed. Second, trends in expenditures are analyzed. Third, increases in expenditures are analyzed in terms of price, population, and volume-intensity trends. Fourth, some concluding methodological and policy prescriptions about international comparisons are made.

Issues in international comparisons

International comparisons are difficult for a variety of reasons, including the following:

- Data are generally not comparable.
- Systems' performance cannot be easily evaluated because of our inability to measure health outcomes.
- It is difficult to measure and control for social, medical, cultural, demographic, and economic differences across countries.
- Transferability of policies across countries is problematic.

International comparisons are only as good as the basic underlying data upon which they are based. Countries produce data for administrative reporting purposes. Their data systems are based on the specific structural features of their health care financing and delivery systems. Thus, for example, if salaried hospital-based physicians are treated as part of hospital sector budgets, as is the case in the Federal Republic of Germany (hereafter called Germany), the Scandinavian countries, and the United Kingdom, then reported hospital expenditures will include these inhospital physician services. On the other hand, in

countries, such as the United States and Canada, where most inhospital physician services are paid for on a fee-for-service basis, such expenditures will be reported separately as physician expenditures. Compounding this problem is the lack of internationally accepted definitions of components of health care expenditures, such as hospitals, nursing homes, and home health care.

Health care information is not presently reported in a standardized format. The data used in this article and reported in the data compendium section in this issue represent an attempt by the OECD to develop international health accounts in a manner similar to the development of national income and product accounts some 40 years ago. Although far from perfect, they represent the best attempt to date to develop comparable spending and utilization information. The spending aggregates are based on public and private health consumption and investment information reported as part of the national income and product accounts of the OECD. However, users of these data must bear in mind that individual countries are continually revising their underlying figures, often to as far back as 1960. Thus, although the orders of magnitude rarely change, analysts should not interpret these data too exactly. A brief methodological discussion is provided in the data compendium section of this issue.

A second problem in making international comparisons stems from our inability to measure the performance of health systems. This is a problem even within individual countries, where definitions, reporting conventions, etc. are relatively uniform. Although the structural characteristics of health systems differ, all countries attempt to provide access to medically appropriate and medically effective services in a cost-effective manner. Much of the difficulty in assessing how well countries meet this objective stems from the problems in defining and measuring health outcomes and access to care. Defining and measuring access involve value judgments. Measuring outcomes—beyond aggregate measures such as life expectancy, infant mortality, and cause-specific mortality—is not generally feasible. In addition to inability to measure outcomes (outputs), difficulties in measuring cost effectiveness are further compounded by our inability to allocate

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overhead and assess efficiency in complex multiproduct firms, such as multispecialty group practices and hospitals. As a result, most comparative studies are focused on inputs such as numbers of doctors and hospital beds or intermediate outputs such as physician visits, hospital days, and number of procedures. Even this information is problematic given the lack of standard terminology, discussed earlier. The nominal expenditure information used in the following analysis is based upon relatively comparable definitions of health spending, but the health care price indexes are not. Hence, one must be extremely cautious in interpreting the results.

A third problem in international comparisons stems from comparing countries with different geographical, cultural, social, demographic, political, and economic structures. Although some factors, such as age differences and certain economic factors, can be controlled for statistically, many other factors, such as climate, attitudes about health and family, pollution, and stress levels, cannot (Organization for Economic Cooperation and Development, 1987). A related problem stems from the lack of detailed information about the structural features of different health systems. To understand the basic empirical information about a system, an understanding of the underlying structural interactions among reimbursement, benefits, cost sharing, planning, public versus private insurance, financing methods, legal systems, etc. is essential. Yet, such information is not readily available for most countries in a standardized format and in sufficient detail to provide an understanding of such interactions.

A related issue concerns the transferability of policies across countries. Despite the fact that few rigorous policy evaluations have been made at the microeconomic level, there is a great deal of rhetoric concerning transferability across countries. Yet, for a policy that has worked in one country to be successful in another, requires the same set of underlying incentive structures and behavioral responses. For example, in discussing the applicability of health maintenance organizations (HMOs) to countries other than the United States, Luft (1987) points out that transferring risk from the government to the HMO or individuals may be a concept inconsistent with the welfare-state philosophy inherent in many countries; that the performance of HMOs in this country is measured against a fee-for-service system with a great deal of waste and inefficiency; and that, for HMOs to work in other countries, the same types of underlying incentives would need to be operative. Cross-national policy analyses must be based upon rigorous analytical studies and detailed information about the underlying incentive structures of the different health systems.

International trends in health expenditures

Levels and trends in both relative and absolute spending for the 24 OECD countries are analyzed for

Table 1

Total and public health expenditure as a percent of gross domestic product: Organization for Economic Cooperation and Development countries, 1975-87

Country	Total expenditure				Public expenditure			
	1975	1980	1985	1987	1975	1980	1985	1987
	Percent							
Australia	5.7	6.5	7.0	7.1	3.6	4.0	5.0	5.1
Austria	7.3	7.9	8.1	8.4	5.1	5.5	5.4	5.7
Belgium	5.8	6.6	7.2	7.2	4.6	5.4	5.5	5.5
Canada	7.3	7.4	8.4	8.6	5.6	5.6	6.4	6.5
Denmark	6.5	6.8	6.2	6.0	6.0	5.8	5.3	5.2
Finland	6.3	6.5	7.2	7.4	5.0	5.1	5.7	5.8
France	6.8	7.6	8.6	8.6	5.2	6.2	6.9	6.7
Germany	7.8	7.9	8.2	8.2	6.2	6.2	6.4	6.3
Greece	4.1	4.3	4.9	5.3	2.5	3.5	4.0	4.0
Iceland	5.9	6.4	7.3	7.8	5.3	5.7	6.4	6.9
Ireland	7.7	8.5	8.0	7.4	6.4	7.8	7.1	6.4
Italy	5.8	6.8	6.7	6.9	5.0	5.6	5.4	5.4
Japan	5.5	6.4	6.6	6.8	4.0	4.5	4.8	5.0
Luxembourg	5.7	6.8	6.7	7.5	5.2	6.3	6.0	6.9
Netherlands	7.7	8.2	8.3	8.5	5.9	6.5	6.6	6.6
New Zealand	6.4	7.2	6.6	6.9	5.4	6.0	5.6	5.7
Norway	6.7	6.6	6.4	7.5	6.4	6.5	6.1	7.4
Portugal	6.4	5.9	7.0	6.4	3.8	4.2	4.0	3.9
Spain	5.1	5.9	6.0	6.0	3.6	4.4	4.3	4.3
Sweden	8.0	9.5	9.4	9.0	7.2	8.7	8.6	8.2
Switzerland	7.0	7.3	7.7	7.7	4.8	5.0	5.2	5.2
Turkey	—	—	—	3.5	—	—	—	1.4
United Kingdom	5.5	5.8	6.0	6.1	5.0	5.2	5.2	5.3
United States	8.4	9.2	10.6	11.2	3.6	3.9	4.5	4.6
Mean	6.5	7.0	7.4	[1]7.3	5.0	5.5	5.7	[1]5.6

[1]Includes Turkey. 1987 means excluding Turkey are 7.5 percent for total expenditure and 5.8 percent for public expenditure.

SOURCE: Organization for Economic Cooperation and Development: Health Data File, 1989.

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the period 1975-87. First, the shares of both total and public health spending relative to gross domestic product (GDP) are analyzed. Next, absolute levels of spending are compared.

Table 1 contains the estimated shares of both total and public health spending in GDP for the OECD countries for 1975, 1980, 1985, and 1987. In 1975, the share of total health spending in GDP (excluding Turkey) ranged from 4.1 percent in Greece to 8.0 percent in Sweden and 8.4 percent in the United States, with an OECD average of 6.5 percent. By 1980, the OECD average had increased to 7.0 percent. It has been increasing at a slower rate ever since, reaching a mean (including Turkey) of 7.3 percent in 1987. In 1987, the shares ranged from 5.3 percent in Greece (3.5 percent in Turkey) to 11.2 percent in the United States. In other analyses, the increasing share of the U.S. GDP devoted to health spending compared with the relative stability of the share in most other major industrialized countries has been documented (Schieber and Poullier, 1989).

The public share of health spending relative to GDP generally mirrors these trends. Public spending accounts for more than three-quarters of health spending, on average, in the OECD countries and accounts for more than 60 percent of spending in all countries except the United States and Turkey, where it is about 40 percent. The share of total health spending that is public has been quite stable since 1980. In 1975, public health spending ranged from 2.5 percent of GDP in Greece to 7.2 percent in Sweden, with an OECD average of 5.0. In 1987, the public share ranged from 3.9 percent of GDP in Portugal (1.4 percent in Turkey) to 8.2 percent in Sweden, with an OECD average of 5.6 percent. The ratios for the United States were 3.6 percent in 1975 and 4.6 percent in 1987, well below the OECD average. The fact that both the share of total health spending in GDP and the public share of total health spending have been relatively stable since 1980 explains the relative stability of the public health share in GDP since 1980, when it was 5.5 percent. It will be interesting to monitor future changes in this ratio in the United States, where there are competing public and private sector approaches to covering those without health insurance, as well as in other OECD countries, where some governments are . ˄using on more private sector involvement in the financing and delivery of health care.

Although the share of GDP devoted to health care has increased, on average, from 6.5 to 7.3 percent of GDP from 1975 to 1987, there has been some variability across countries. Table 2 contains the rates of growth in real and nominal per capita health spending relative to the rates of growth in real and nominal per capita GDP for selected OECD countries for 1975-87. These elasticities represent the percentage changes in real and nominal per capita health spending relative to the percentage changes in real and nominal per capita GDP, respectively.

The average nominal elasticity for 20 of the 24 OECD countries is 1.1, indicating that, during this

Table 2

Elasticity of per capita health expenditure relative to per capita gross domestic product (GDP): Selected countries, 1975-87

Country	Nominal	Real[1]
	Elasticity	
Australia	1.1	0.9
Austria	1.1	0.8
Belgium	1.3	1.6
Canada	1.2	0.9
Denmark	0.9	0.9
Finland	1.1	0.9
France	1.2	3.1
Germany	1.1	0.9
Greece	1.1	2.5
Iceland	1.1	1.5
Ireland	1.0	1.5
Italy	1.1	1.7
Japan	1.3	1.4
Netherlands	1.2	1.1
Norway	1.0	2.0
Spain	1.1	1.1
Sweden	1.1	1.0
Switzerland	1.2	1.0
United Kingdom	1.1	1.0
United States	1.3	1.1
Mean	1.1	1.3

[1]Health-price-deflated per capita health spending relative to GDP-deflator-adjusted per capita GDP.

SOURCE: Organization for Economic Cooperation and Development: Health Data File, 1989.

period, nominal per capita health spending grew 10 percent faster than nominal per capita GDP did. The nominal elasticities ranged from 0.9 in Denmark to 1.3 in the United States, Belgium, and Japan, indicating that in the latter countries every 10-percent increase in nominal per capita GDP was associated with a 13-percent increase in nominal per capita health spending, thus resulting in a growing share of health in GDP. In terms of the growth in real per capita health spending (health price deflated) relative to real per capita GDP (GDP deflator adjusted), the elasticities ranged from 0.8 in Austria to 3.1 in France, with a 20-country OECD average of 1.3. The U.S. real elasticity is 1.1. To a large extent, these relatively small values, on average and for most countries, reflect the time period chosen. Following the oil shocks in the mid-1970s, most countries faced a protracted period of inflation and economic stagnation. These adverse economic conditions forced many countries to constrain public spending. Elasticities for the period 1960-75, an era of strong economic growth and expansion of public programs, are substantially higher, 1.4 for the average nominal elasticity and 1.7 for the average real elasticity. In the decomposition analysis presented later in this article, these trends are further analyzed in terms of price, population, and volume-intensity changes.

Absolute health spending levels also differ significantly across countries. However, establishing absolute levels in a numeraire currency is difficult. Exchange rates reflect short-run capital flows and other confounding aspects of international capital markets. As such, they are not pure price indexes and

hence will not provide real volume difference estimates when used to deflate health spending. Purchasing power parities (PPPs) are price indexes that represent the average prices in specific countries relative to the average international prices for an entire group of countries for purchasing the same market basket of goods and services (Ward, 1985). Although PPPs have been developed for health services, they are in only a preliminary stage of development and are considered less reliable than GDP PPPs.

Table 3 contains 1987 per capita health expenditures and per capita GDP denominated in U.S. dollars through the use of GDP PPPs. Per capita spending ranged from less than $400 in Turkey ($148), Greece ($337), and Portugal ($386) to more than $1,200 in Switzerland ($1,225), Sweden ($1,233), Iceland ($1,241), Canada ($1,483), and the United States ($2,051), with an OECD average of $934. Expenditures in the United States were more than double the OECD average and 38 percent higher than expenditures in Canada, the second highest country. Although the United States has the highest per capita GDP and health spending is directly related to GDP, U.S. spending exceeds the basic underlying trend relationship by more than $400 per person (Schieber and Poullier, 1989). As in the case of the health share in GDP, the United States spends more than any other country in the world, and the gap between the United States and other countries is widening. To obtain a better understanding of these macroexpenditure trends, nominal increases in health care expenditures are disaggregated into health care price inflation, overall inflation, excess health care inflation, population, and volume-intensity changes.

Decomposition of health expenditures

Health expenditure trends across countries can also be analyzed by comparing growth in health spending, health care prices, and volume-intensity changes within individual countries based on local currencies and prices. This is done through the well-known identity stating that 1 plus the annual percentage growth in nominal health spending equals the product of 1 plus the annual percentage growth in health care prices times 1 plus the annual percentage growth in volume-intensity (utilization) times 1 plus the annual percentage growth in population. Aggregate data on volume-intensity increases do not exist, but information on nominal expenditures, prices, and population is available. Therefore, volume-intensity is calculated as a residual (Organization for Economic Cooperation and Development, 1987) in the following way. Let $H = 1 +$ annual percentage increase in health spending, $POP = 1 +$ annual percentage increase in population, $HP = 1 +$ annual percentage increase in health care prices, and $V = 1 +$ annual percentage increase in volume-intensity. Suppose that nominal health expenditures increased at a compound annual rate of 10 percent during the time period under consideration, population increased by 1 percent, and health care prices increased by 4 percent. To calculate the volume-intensity increase, the following equation is solved:

$$H = HP \times V \times POP.$$

In the example cited,

$$V = H/ (HP \times POP) =$$
$$1.10/ (1.04 \times 1.01) = 1.047.$$

In other words, volume-intensity increased at a compound annual rate of 4.7 percent over the time period in question.

Inflationary trends in the health sector relative to general inflation can be analyzed by comparing health care price increases with increases in the GDP deflator. If one makes the assumption that health sector prices should increase at the same rate as overall price increases as measured by the GDP deflator, then any excess growth in health care prices can be defined as excess health care inflation. Mechanically, this is done through the identity that 1 plus the annual percentage increase in health care prices equals 1 plus the annual percentage increase in overall prices times 1 plus the annual percentage increase in health care prices in excess of overall prices. Substituting this identity into the previous one

Table 3

Per capita health expenditure and per capita gross domestic product (GDP): Organization for Economic Cooperation and Development countries, 1987

Country	Health expenditure	GDP
	Per capita amount	
Australia	$ 939	$12,612
Austria	982	11,664
Belgium	879	11,802
Canada	1,483	17,211
Denmark	792	13,329
Finland	949	12,838
France	1,105	12,803
Germany	1,093	13,323
Greece	337	6,363
Iceland	1,241	15,508
Ireland	561	7,541
Italy	841	12,254
Japan	915	13,182
Luxembourg	1,050	14,705
Netherlands	1,041	12,252
New Zealand	733	10,680
Norway	1,149	15,405
Portugal	386	6,297
Spain	521	8,681
Sweden	1,233	13,771
Switzerland	1,225	15,842
Turkey	148	4,247
United Kingdom	758	12,340
United States	2,051	18,338
Mean	934	12,207

NOTE: Amounts are denominated in U.S. dollars through the use of GDP purchasing power parities.

SOURCE: Organization for Economic Cooperation and Development: Health Data File, 1989.

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results in increases in nominal health expenditures being equal to increases in volume-intensity times increases in overall prices times increases in health prices in excess of overall prices times increases in population. Using the definitions in the earlier example and defining 1 plus the annual percentage increase in the GDP deflator as P and 1 plus the annual percentage increase in excess health care inflation as EHP:

$$EHP = HP/P,$$

$$HP = P \times EHP,$$

$$H = HP \times V \times POP = P \times EHP \times V \times POP.$$

This identity provides useful comparative information on increases in nominal health spending, health care inflation, and growth in the volume-intensity of services. However, because these relationships are based on an identity, no causality can be attributed. Moreover, because the decomposition analysis provides information only on rates of increase over some time period, it provides no information about the base levels of spending and/or the appropriateness of the base or rates of increase.

Table 4 contains a decomposition of health expenditures for the seven major OECD countries for 1975-87. Columns (1) and (9) of the table contain baseline information on the shares of GDP devoted to health care in the seven countries in 1975 and 1987. Columns (2) through (8) contain information on the annual compound rates of growth in nominal health expenditures, health care prices, GDP deflator, excess health care inflation, real health expenditures, population, and volume-intensity of services per person (i.e., real per capita expenditures). From 1975 to 1987, nominal health expenditures increased, on average, at an annual compound rate of growth of 11.8 percent; health care prices increased at a rate of 8.3 percent; real expenditures (health care price deflated), 3.3 percent; population, 0.5 percent; and volume-intensity of services per person, 2.8 percent. Health care prices, on average, increased annually 0.9 percent faster than overall inflation did.

From the perspective of individual countries, nominal annual expenditure increases ranged from 6.2 percent in Germany to 17.6 percent in Italy. Nominal expenditures in the United States increased at an annual compound rate of growth of 11.7 percent. Health care price increases ranged from 3.9 percent per year in Germany to 14.9 percent in Italy, with the U.S. increase being 8.1 percent. Excess health care inflation (the amount exceeding overall inflation) ranged from -1.1 percent in France to 2.2 percent in the United States. Increases in volume-intensity per person ranged from 1.9 percent per year in Canada and the United Kingdom to 4.9 percent in France, with the U.S. increase being 2.3 percent. As shown in other analyses for different years, U.S. and Canadian trends appear to be quite similar (Schieber and Poullier, 1989).

From a health policy perspective, the two basic endogenous factors driving health expenditures are excess health care inflation and real increases in the volume-intensity of services per person. If excess health care inflation had been eliminated in the seven countries, annual nominal expenditure growth would have been reduced by almost 1 percentage point. Reducing the annual increase in volume-intensity growth by one-third would have had about the same effect. In the United States, if the 2.2-percent annual increase in health expenditures resulting from excess health care inflation had not occurred, nominal spending during the period 1975-87 would have increased by 9.3 percent per year instead of 11.7 percent, resulting in 1987 expenditures of $390 billion instead of $500 billion. Similar analyses can be performed for other countries.

Critical to all these analyses is the validity of the price indexes employed. This is an especially difficult area for international comparisons. Health care price indexes that accurately capture the actual amounts paid per unit of quality-adjusted service are difficult to construct even in the most data-sophisticated countries. The price indexes used here are based on extant indexes in the individual countries. They are not based on standard definitions and concepts. (Refer to the data compendium section in this issue.) However, these indexes are an improvement over previous indexes used for comparative analyses in that they reflect both public and private prices, thus, to some extent, obviating the problem that public price measures are overweighted by services provided by the public sector, with the converse being true for private consumer price indexes. A second and equally serious problem is the difficulty in adjusting for productivity changes. For example, how well do most currently employed indexes that are based on charges or input costs capture the secular declines in lengths of stay and the increased sophistication in diagnostic capability witnessed recently? The negative excess health care inflation found for France may well represent an overadjustment for these factors in comparison with other countries, which do not make such adjustments. Once again, international comparisons are clearly limited by the methodological state of the art.

Conclusion

The analyses described in this article are some simple examples of the kinds of comparative studies that can be performed from existing international data bases. Unfortunately, use of such analyses for making definitive policy prescriptions is limited by both data constraints and the inherent difficulties underlying all health services research. Although some of these difficulties stem from lack of standardized definitions and data, others stem from the basic difficulties of evaluating health and other social systems. Lack of reliable outcome measures coupled with the difficulty of measuring behavioral response to policy interventions, even within individual countries,

Table 4

Decomposition of health expenditure increases into price, population, and volume-intensity increases: Selected countries, 1975-87

Country	Share of health expenditure in GDP, 1975 (1)	Annual compound rate of growth, 1975-87							Share of health expenditure in GDP, 1987 (9)
		Nominal health expenditure growth (2)	Health care price deflator (3)	Of which GDP deflator (4)	Of which excess health care inflation (5)	Real expenditure growth (6)	Of which population growth (7)	Of which per capita volume-intensity growth (8)	
		Percent							
Canada	7.3	11.8	8.6	6.5	2.0	2.9	1.0	1.9	8.6
France	6.8	13.4	7.6	8.8	−1.1	5.4	0.5	4.9	8.6
Germany	7.8	6.2	3.9	3.4	0.4	2.2	−0.1	2.3	8.2
Italy	5.8	17.6	14.9	14.1	0.7	2.3	0.3	2.0	6.9
Japan	5.5	9.1	4.1	2.9	1.2	4.8	0.8	4.0	6.8
United Kingdom	5.5	13.0	10.8	9.7	1.0	2.0	0.1	1.9	6.1
United States	8.4	11.7	8.1	5.8	2.2	3.3	1.0	2.3	11.2
Mean	6.7	11.8	8.3	7.3	0.9	3.3	0.5	2.8	8.1

NOTE: GDP is gross domestic product.

SOURCE: Organization for Economic Cooperation and Development: Health Data File, 1989.

exacerbates the problem several-fold. Even within the United States, despite detailed data and substantial resources devoted to health services research, we have little valid information about the behavioral responses of consumers, medical care providers, and third-party insurers. The debates about the costs of a Medicare drug benefit and the cost and supply response impacts of physicians to a fee schedule based on the Harvard resource-based relative value scale provide good examples of the difficulties in predicting behavioral response.

Nevertheless, several relevant facts are clear. First, the United States spends far more in absolute dollar terms and relative to GDP than any other country in the world. Second, this gap appears to have grown in recent years. Third, the higher GDP of the United States can explain only a small part of these disparities. The United States tends to have about the same physician-population ratio as the average for the OECD countries and fewer inpatient medical care beds. U.S. use rates in terms of physician visits, hospital days, and average lengths of stay are among the lowest in the OECD. Yet, the costs for medical procedures and the costs per hospital bed, day, and stay are the highest in the world by far. Americans appear to practice a much more intensive style of medicine. Nevertheless, on the basis of crude outcome measures such as infant mortality and life expectancy as well as access-to-care criteria, the achievements fall short of those in many other OECD countries (Organization for Economic Cooperation and Development, 1987).

Do Americans with good insurance coverage and access to technologically sophisticated urban tertiary care facilities really receive the best quality care in the world? Are amenities in the United States far superior to those in other countries? Is the U.S. system simply more wasteful because Americans can afford to be wasteful? The current knowledge base is not sufficient for obtaining answers to these queries. However, international comparisons can be useful in focusing our own efforts to understand what the American health care system is getting for its more than one-half trillion dollar expenditure on health services and how the system might be changed in order to promote a "kinder and gentler" America.

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