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Comparing Health System Performance In OECD Countries

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Abstract

We present data from the Organization for Economic Cooperation and Development and the World Health Organization on the performance of the health care systems in twenty-nine industrialized countries in 1998. We also compare the performance of the United States with the other industrialized countries for selected indicators in 1960, 1980, and 1998. On most indicators the U.S. relative performance declined since 1960; on none did it improve.

Cross-national comparisons can determine whether additional health care spending results in better outcomes.

International comparisons of health system data have been used to inform health policy debates for years.[1] Tony Blair, for example, recently committed the United Kingdom to increasing its share of gross domestic product (GDP) spent on health care to the average level in Northern Europe. This action was prompted in part by international data showing that the British were spending a lower percentage of GDP on health care than were most other countries in Northern Europe. In the United States, one of the arguments for training more generalist physicians has been international data that showed that the United States trains a higher proportion of specialists than most European countries.[2]

The Organization for Economic Cooperation and Development (OECD) and the World Health Organization (WHO) have taken the lead in collecting and publishing data for conducting international comparisons in recent years.[3] WHO has recently published indicators that monitor health system performance in 191 countries. These indicators measure attainment of three health system goals as defined by WHO: improving health status, responding to people's expectations, and fairly distributing the financial burden of health care. WHO transformed these indicators into country-by-country performance rankings. These rankings have led to considerable controversy, stemming from philosophical differences about the specific indicators, doubts about the reliability of the data used, and debates over how the various indicators should be weighted. WHO's *World Health Report* recognizes the need to refine and improve the data, and careful scrutiny of the country-by-country rankings will no doubt result in refinements to the methodology. Nevertheless, the *World Health Report 2000* introduced many innovative and important health system performance concepts and indicators.

In this paper we present data from the OECD and WHO on the performance of the health care systems in twenty-nine industrialized countries.[4] We focus our comparisons on six subject areas: (1) prevention, (2) health care resources and utilization, (3) medical procedures involving sophisticated technology, (4) mortality, (5) responsiveness, and (6) health spending. This paper is a continuation of an annual series presenting the latest OECD data.[5] This is the first year that we present WHO data as well.

Preventive Health Care

Immunization.

While by 1998 some OECD countries had achieved nearly universal immunization rates for communicable diseases such as measles and diphtheria, pertussis, and tetanus (DPT), others had immunization rates below 90 percent (Exhibit 1⇓). Since 1980 immunization rates have generally been increasing in all twenty-nine OECD countries (data not shown). Interestingly, wealthier OECD countries (measured by GDP per capita) and countries with higher spending per capita on health generally have lower immunization rates than do poorer OECD countries. For example, there is a small negative association between per capita health spending and immunization coverage rates for both DPT and measles (correlation, -.49 for DPT, -.30 for measles).

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EXHIBIT 1

Indicators Of Preventive Health Care Among OECD Countries, 1996–1998

Although mortality from vaccine-preventable diseases is near all time lows in many developed countries, many unnecessary deaths still occur. For example, WHO estimated that in 1994 more than 20,000 children died from measles in developed countries.[6] A variety of methods have been used to increase immunization rates in the United States and other countries.[7] Australia, for example, offers cash to parents and doctors and fast-food vouchers to children as incentives. Doctors in the United Kingdom have a financial incentive to reach target immunization coverage levels. In the United States, the state of Georgia raised immunization rates by assessing and providing feedback to immunization clinics; other states also have had success with this approach.[8] Despite the availability of proven strategies to increase immunization rates, the United States is currently not on track to achieve the goals outlined in *Healthy People 2010*.[9] The Institute of Medicine (IOM) recently found that instability of funding for state immunization programs, the lack of a comprehensive national-level immunization strategy, and insufficient immunization programs in private health plans were some of the major challenges facing the U.S. immunization system.[10]

Unhealthy lifestyles.

One aspect of the performance of a health system is the promotion of healthy lifestyles (Exhibit 1⇑).[11] The ability of health care systems to promote healthy lifestyles is unclear from international data, however. Much of the variance across countries appears to be attributable more to cultural factors than to health promotion efforts. For example, the very low alcohol consumption rate in Turkey is probably closely related to religious practice. A

systematic comparison of health education campaigns across countries is a necessary first step to evaluate the performance of countries' efforts in promoting healthy lifestyles.

Health Care Use And Services

Physicians.

The average number of visits per physician per year varies widely across the twenty-nine countries (Exhibit 2⇓).[12] In 1998 physicians in the median OECD country had an average of 2,167 visits per year; U.S. physicians, 2,222 visits per year. Physicians in Japan and Switzerland had the most visits per year, while physicians in Sweden and Portugal had the fewest. These data suggest that there is great variation in the duration of a physician visit, hours worked per physician, number of support personnel across the twenty-nine countries, but data on these factors are not available.

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EXHIBIT 2

Indicators Of Physician And Hospital Use And Supply Among OECD Countries, 1998

The average number of annual physician visits per capita also varied widely, from sixteen visits per year in Japan to 1.5 visits in Turkey in 1998. The majority of OECD countries had between five and seven annual physician visits per capita, similar to the U.S. average of six visits per year.

Approximately half of the OECD countries had between two and three practicing physicians per 1,000 population in 1998 (the United States had 2.7). There was a wide range of physicians per capita (from 5.9 physicians per 1,000 in Italy to 1.3 in Korea). Surprisingly, there is little statistical correlation (correlation is .06) between the number of practicing physicians in a country and the number of physician visits per capita. Studies conducted in the United States, on the other hand, have shown a high statistical correlation between the two.[13] More analysis is needed to reconcile domestic and international studies of the relationship between the number of physicians and physician visits per capita.

The United States is close to the OECD median on physician visits per capita, physicians per 1,000, and number of visits per physician. Given that the OECD data show little statistical correlation between numbers of physicians and visits, these data should be evaluated by health professions planners who have used international comparisons to argue that the United States has a surplus of physicians.[14] The mix of specialist and generalist physicians also has been a U.S. policy focus. OECD data (not shown) indicate that the United States has a greater proportion of specialists than most other OECD countries have; however, the data are not complete enough to permit a definitive comparison.[15]

Hospitals.

The number of inpatient acute care hospital days per capita in 1998 ranged from 0.2 days in Mexico to 4.0 days in Japan (Exhibit 2⇑).[16] There has been a consistent trend toward fewer inpatient days per capita in almost every OECD country since 1980 (data not shown).

Since 1980 the U.S. policy focus has centered on keeping people out of the hospital and keeping hospital stays as short as possible. As a result, U.S. hospital use has declined more rapidly than the OECD median: Between 1980 and 1996 the number of inpatient acute days per capita per year declined by an average of 3.3 percent in the United States and 2.7 percent in the median OECD country.[17] In 1998 the average length of a hospital stay in the United States was 6.1 days, compared with the OECD median of 7.3 days; the number of admissions per 100,000 U.S. population was 12,492, compared with the OECD median of 13,800.

Attention to U.S. hospital spending per day has waned recently. In 1997 it was $1,063 per day, more than twice the level of the median OECD country ($447, data not shown). Real hospital spending per day increased more rapidly in the United States than in the median OECD country between 1980 and 1997 (5.1 percent versus 4.9 percent). Nevertheless, the United States continues to promote a cost containment policy of shorter lengths-of-stay and fewer hospital admissions, rather than lower hospital spending per day. International comparisons suggest that the latter might be more effective.

Hospital occupancy rates in 1997 ranged from 59 percent in Turkey to 89 percent in the Netherlands (data not shown). The United States had the second-lowest rate among the OECD countries in 1997—66 percent—far below the 78 percent OECD median (standard deviation, 7 percent). Compared with other countries, the United States has considerable excess capacity in the hospital sector, and recent policy initiatives have done little to decrease this.

Sophisticated Technology

High-tech medical equipment.

We use magnetic resonance imagers (MRIs) in this paper as a proxy for the availability of expensive medical technology. The number of MRIs permillion persons in 1998 ranged from 0.1 in Mexico to 18.8 in Japan (Exhibit 3⇓). The availability of MRIs in the United States was in the upper quartile of OECD countries. Japan, Switzerland, Finland, and Austria had more MRIs per capita than the United States in 1998.

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EXHIBIT 3

Indicators Of Medical Technology Among OECD Countries, 1997 And 1998

Medical procedures.

Comparisons of utilization rates for specific procedures are confounded by differences in the incidence of disease, differences in coding, and many other factors. Nevertheless, there are striking differences in utilization rates for certain procedures across the twenty-nine OECD countries (Exhibit 3⇑). Analysis of available data suggests that the United States performs the most or nearly the most procedures per capita in several areas (for example,

coronary bypass, more than four times the OECD median).While the incidence of disease and other factors make these figures difficult to interpret, it is unlikely that these factors would explain this fourfold difference.

Mortality

Disability-adjusted life expectancy is an estimate of the number of years a person will live in full health.[18] This indicator was used in the *World Health Report 2000* as the summary indicator of the level of population health status because it contains information about both mortality and morbidity. The prevalence of disability is required for its calculation, however, which could lead to comparability problems, since various countries use different definitions of disability.

For women, disability-adjusted life expectancy at birth varied in 1999 from 61.8 years in Turkey to 77.2 years in Japan (Exhibit 4⇓). For men, the range was from 60.4 years in Hungary to 71.9 in Japan. On average, life expectancy at birth was seven years longer for both men and women than disability-free life expectancy was. Life expectancy and disability-adjusted life expectancy at birth in the United States were below the OECD median for both men and women.

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EXHIBIT 4

Indicators Of Mortality And Morbidity Among OECD Countries, Selected Years 1997–1999

At age sixty, disability-free life expectancy for women ranged from 15.2 years in Turkey and Korea to 21.7 years in France and, for men, from 11.7 years in Hungary to 17.5 years in Japan. Life expectancy at age sixty averaged four to five years longer in 1998 for both men and women than disability-free life expectancy did. At age sixty, both disability-adjusted life expectancy and life expectancy in the United States were similar to the OECD median.

Potential years of life lost (PYLL) measures the years of life lost before age seventy due to preventable conditions.[19] As a result, deaths during childhood can have a major influence on PYLL. The United States performs relatively poorly on infant mortality, child mortality, and PYLL (21 percent above the OECD median for men and 34 percent for women) but is similar to the median OECD country on life expectancy and disability-adjusted life expectancy at age sixty. This suggests that a greater focus on infant and child health in the United States may be warranted.

Health Systems' Responsiveness

One major innovation in the *World Health Report 2000* was the development of an instrument to assess health systems' responsiveness to the expectations of the populations they serve. WHO delineated seven dimensions of responsiveness: autonomy, confidentiality, dignity, prompt attention, quality of basic amenities, access to social support networks during care, and choice of providers.[20] Data were collected by a survey of "key informants" in each of thirty-five countries and imputed for the remaining 156 by multiple regression.[21] Among the twenty-nine OECD nations, the United States scored the highest on responsiveness, and Turkey, the lowest. Our analysis shows a strong positive relationship between health spending per capita and the WHO responsiveness score.[22] This suggests that additional health care spending may be purchasing greater responsiveness. However, because of the method used by WHO to predict missing data values, this finding may overstate the relationship between spending and responsiveness.[23]

Health Spending

Spending per capita.

The United States continues to spend considerably more per capita on health care than any other country —more than double the amount spent by the median OECD country in 1998 (Exhibit 5⇓).[24] We performed two comparisons to place this higher health spending in context.

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EXHIBIT 5

Health Care Spending And Growth Among OECD Countries, 1960–1998

First, studies have shown that most of the difference in health spending across countries can be explained by the level of average wealth, as measured by GDP per capita.[25] Countries with higher average wealth spend proportionally more on health care. Taking the average wealth of U.S. citizens into account, the expected level of U.S. health spending is $2,868 per capita.[26] This is still $1,310 less than the amount actually spent per person in the United States. Multiplied by the approximately 281 million Americans, this represents additional spending of approximately $370 billion. Second, if the United States spent the same amount on health as Switzerland ($2,794 per person), the country with the second-highest per capita spending in 1998, then U.S. health spending would decline by almost $400 billion per year.

Health spending growth.

During the period 1960–1998 the rate of increase in real health care spending in the United States was slightly below the rate of increase in the median OECD country (Exhibit 5⇑).[27] Inmost countries the rate of increase in real health care spending was highest during the 1960s and generally has been declining since then, and the percentage of GDP spent on health care has been relatively stable since the early 1980s. In the United States the stability did not occur until around 1990.[28] From 1990 to 1998 real U.S. health care spending increased at an average rate of 2.0 percent, compared with the OECD median of 2.4 percent.

Between 1960 and 1998 there was some tendency toward regression to the mean in health spending. Countries with high health care spending per capita in 1960 tended to have slower rates of spending growth than did countries with lower spending per capita.[29] Countries with more rapid economic growth also had more rapid increases in health spending.[30]

Relative Ranking Of The United States

Since the number of countries reporting data varies by indicator and year, the relative ranking is expressed as the percentile rank of the United States compared with the other OECD countries reporting data in that year (Exhibit 6⇓).[31] A percentile rank of 100 is given to the country with the highest value for each indicator, except for infant mortality, potential years of life lost, and alcohol consumption, where a percentile rank of 100 is given to the country with the lowest value.

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EXHIBIT 6

Relative Ranking Of The United States On Selected Indicators, 1960, 1980, And 1998

For no indicators did the relative performance of the United States improve from 1960 to 1998. Indicators for which the United States showed the greatest relative decline were life expectancy at birth for females, life expectancy at age sixty for females, and infant mortality. The relative number of practicing physicians and the number of acute hospital beds per capita declined. Health spending per capita remained consistently high. Potential years of life lost remained consistently low, and life expectancy for males at birth and at age sixty and alcohol intake remained in the mid-range of OECD countries.

Policy makers are most interested in determining whether additional health care spending will result in better outcomes. Countries offer natural experiments that could suggest whether an investment in a certain area has resulted in better outcomes in that country. Unfortunately, the availability of outcome indicators that can be used to compare the performance of health care systems is sparse. A concerted effort to increase the number of indicators that can be used to compare the performance of health care systems across countries should be a priority of the international community. Particular attention should be given to quality of-care indicators. Policymakers want to know how the billions of dollars spent on hospitals, physicians, pharmaceuticals, and other health services translates to improvements in health status for their populations. Comparable international data are needed to conduct these comparisons.

Footnotes

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NOTES

1. For example, see World Bank, *World Development Report 1993: Investing in Health* (Oxford: Oxford University Press, 1993); Organization for Economic Cooperation and Development, *Health Care Systems in Transition: The Search for Efficiency* (Paris: OECD, 1990); U.S. General Accounting Office, *Canadian Health Insurance: Lessons for the United States*, GAO/HRD-91-90 (Washington: U.S. Government Printing Office, June 1991); and GAO, *Health Care Spending Control: The Experience of France, Germany, and Japan,* GAO/HRD-92-9 (Washington: U.S. GPO, November 1991).
2. S.A. Schroeder, "Western European Responses to Physician Oversupply: Lessons for the United States," *Journal of the American Medical Association* **252**, no. 3 (1984): 373–384. CrossRef Medline
3. OECD, *OECD Health Data 2000: A Comparative Analysis of Twenty-nine Countries* (Paris: OECD, 2000). This database can be obtained from the OECD Information Center, <washcont@oecd.org>. Also see World Health Organization, *World Health Report 2000—Health Systems: Improving Performance* (Geneva: WHO, 2000).
4. Whenever possible, we also present the value for the median OECD country.
5. See G.F. Anderson et al., "Health Spending and Outcomes: Trends in OECD Countries, 1960–1998," *Health Affairs* (May/June 2000): 150–157; G.F. Anderson and J.P. Poullier, "Health Spending, Access, and Outcomes: Trends in Industrialized Countries," *Health Affairs* (May/June 1999): 178–192; and G.F. Anderson, "In Search of Value: An International Comparison of Cost, Access, and Outcomes," *Health Affairs* (Nov/Dec 1997): 163–171.
6. WHO, *State of the World's Vaccines and Immunization* (Geneva: WHO, 1996).
7. World Health Organization Expanded Program on Immunization, *Imaginative Ways of Raising Immunization Coverage* (Geneva: WHO, 1997).
8. W. Atkinson, ed., *Epidemiology and Prevention of Vaccine-Preventable Diseases* (Atlanta: U.S. Centers for Disease Control and Prevention, 1996).
9. R. Guyer, D.R. Smith, and R. Chalk, "Calling the Shots: Immunization Finance Policies and Practices—Executive Summary of the Report of the Institute of Medicine," *American Journal of Preventive Medicine* **19**, no. 3S (2000): 4–12. CrossRef Medline
10. Ibid.
11. Any use of data on lifestyles is hindered by the reliability and comparability of the data. This type of indicator is generally collected by survey, and the specific measures tend to vary on different surveys in different countries.
12. The average number of visits per physician was calculated by dividing the number of physician visits per capita by the number of practicing physicians per capita.
13. Dartmouth Medical School, *The Dartmouth Atlas of Health Care, 1998* (Chicago: American Hospital Publishing, 1998).
14. Pew Health Professions Commission, *Critical Challenges: Revitalizing the Health Professions for the Twenty-first Century* (Third Report of the Pew Health Professions Commission, December 1995); and R.M. Politzer et al., "Matching Physician Supply and Requirements: Testing Policy Recommendations," *Inquiry* (Summer 1996): 181–194.
15. Data on the generalist/specialist ratio are missing for many countries in the OECD database, and definitions of specialists vary from country to country.

16. The OECD defines hospital acute care beds as "beds accommodating patients where the principal clinical intent is to do one or more of the following: manage labor (obstetric), cure illness or provide definitive treatment of injury, perform surgery, relieve symptoms of illness or injury (excluding palliative care), reduce severity of illness or injury, protect against exacerbation and/or complication of an illness and/or injury which could threaten life or normal functions, or perform diagnostic or therapeutic procedures." However, the country-specific definitions vary. Any comparison of OECD hospital data should include a careful examination of the definitions given in the *OECD Health Data 2000* database. In this paper data on total inpatient care beds were used instead of data on acute care beds for Canada, Greece, Japan, Mexico, and Poland, because of availability of data. For Canada this definition includes "all hospital care beds, excluding nursing home beds"; for Greece, "acute and psychiatric care beds"; for Japan, "all types of hospital beds, general clinic beds, dental clinic beds, and beds at health service facilities for the aged"; for Mexico "beds in acute, chronic, and psychiatric hospitals"; and for Poland, "all hospitals including public and private hospitals, excluding psychiatric and army hospitals."
17. There were an average of 1.2 inpatient acute care days per capita in the United States in 1980 and 1.7 in the OECD median.
18. These WHO estimates are based on life tables, population representative surveys assessing physical and mental disability and health status, and detailed information on the epidemiology of major disabling conditions in each country. Some of the variation may be attributable to differences in how disability is measured in country-specific surveys.
19. The calculation for PYLL involves adding up deaths occurring at each age and multiplying this with the number of remaining years to live until a selected age limit. The limit of seventy years has been chosen for the calculations in *OECD Health Data 2000*. The PYLL per 100,000 population is calculated by the OECD secretariat based on age-specific death statistics provided by WHO. The total OECD population in 1980 is taken as the reference population for age standardization.
20. For amore detailed explanation of the WHO responsiveness index, see WHO, *World Health Report 2000.*
21. N.B. Valentine, A. De Silva, and C.J.L. Murray, "Estimating Responsiveness Level and Distribution for 191 Countries: Methods and Results," GPE Discussion Paper Series no. 22 (Geneva: WHO, 2000).
22. The regression line is given by the function Responsiveness = .96ln (health expenditures per capita in $PPP) - .43 ($r^2$ = .86, $p < .001$).
23. A. De Silva and N. Valentine, "Measuring Responsiveness: Results of a Key Informants Survey in Thirty-five Countries," GPE Discussion Paper Series no. 21 (Geneva: WHO, 2000).
24. Health spending data for 1998 are slightly different than those published previously (Anderson et al., "Health Spending and Outcomes") because the previously published figures were estimates by the OECD secretariat. The OECD has ceased producing these estimates. All spending data were adjusted for cost of living differences to U.S. dollars using purchasing power parities (PPPs). PPPs are based on the cost of an identical market basket of goods in each country (broad-based, not limited to health). Aggregate health spending data do not give a true indication of the true economic costs of health care. See M.V. Pauly, "U.S. Health Care Costs: The Untold True Story," *Health Affairs* (Fall 1993): 152-159.
25. See, for example, J.P. Newhouse, "Medical Care Expenditure: A Cross-National Survey," *Journal of Human Resources* **12**, no. 1 (1976): 115-125; R.E. Leu, "The Public-Private Mix and International Health Care Costs," in *Public and Private Health Services*, ed. A.J. Culyer and B. Jonsson (Oxford: Basil Blackwell, 1986), 41-63; and P. Barros, "The Black Box of Health Care Expenditure Growth Determinants," *Health Economics* **7**, no. 6 (1998): 533-554. In our analysis, a double logarithmic regression gave the equation: ln (health expenditures per capita) = 1.4 (ln[GDP per capita]) - 6.5 (1998 data) with R^2 = .91. CrossRef Medline
26. This value was calculated by substituting the U.S. value of GDP per capita into the regression equation given in Note 25.
27. These calculations are sensitive to the choice of the base year. The average annual rate of real growth in total health expenditures between 1965 and 1998 was 4.1 percent in the United States and 4.3 percent in the OECD median. The average annual rate of growth between 1970 and 1998 was 3.2 percent in the United States and 3.4 percent in the OECD median.
28. G.F. Anderson and P.S. Hussey, "Multinational Comparisons of Health Systems Data, 2000," prepared for the Commonwealth Fund, October 2000.
29. The coefficient of correlation between health expenditures per capita in 1960 (PPP) and mean annual growth in health expenditures per capita (PPP) between 1960 and 1998 is .76.
30. The coefficient of correlation between mean annual growth in GDP per capita between 1960 and 1998 and mean annual growth in health expenditures per capita (PPP) between 1960 and 1998 is .83.
31. A minimum of fifteen countries with available data is required for the construction of the percentile ranking.

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