How Does The Quality Of Care Compare In Five Countries?

An international quality comparison shows that each country performs best and worst in at least one area of care.

by Peter S. Hussey, Gerard F. Anderson, Robin Osborn, Colin Feek, Vivienne McLaughlin, John Millar, and Arnold Epstein

ABSTRACT: International data on quality of medical care allow countries to compare their performance to that of other countries. The Commonwealth Fund International Working Group on Quality Indicators collected data on twenty-one indicators that reflect medical care in Australia, Canada, New Zealand, England, and the United States. The indicators include five-year cancer relative survival rates, thirty-day case-fatality rates after acute myocardial infarction and stroke, breast cancer screening rates, and asthma mortality rates. No country scores consistently the best or worst overall. Each country has at least one area of care where it could learn from international experiences and one area where its experiences could teach others.

MOST INDUSTRIALIZED COUNTRIES share an interest in measuring, reporting, and improving the quality of medical care. Despite this interest, there have been limited internationally comparable data available on quality indicators, especially in areas involving medical care interventions. Collaboration between countries to produce internationally comparable data permits benchmarking and allows policymakers and clinicians to identify specific areas where individual countries could improve.

In the United States, sparked by Institute of Medicine (IOM) reports focusing attention on gaps in the quality of medical care, interest in improving quality has expanded rapidly among policymakers, corporations, clinicians, the media, and the public.[1] Despite this concern about the quality of care, U.S. policymakers and clinicians often recite the mantra, "Americans have the best medical care in the world."[2] The empirical basis for this statement is unclear. The limited empirical

Peter Hussey is a doctoral candidate at the Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland. Gerard Anderson (ganderso@jhsph.edu) is a professor there. Robin Osborn is assistant vice president of the Commonwealth Fund, in New York City, and director of its International Program in Health Policy. Colin Feek is deputy director-general, Clinical Services Directorate, in the New Zealand Ministry of Health. Vivienne McLaughlin is assistant secretary of the Health Priorities Branch, Australia Department of Health and Ageing. John Millar is executive director of Population Surveillance and Disease Control Planning, Provincial Health Services Authority, British Columbia. Arnold Epstein is the John H. Foster Professor and chair of the Department of Health Policy and Management, Harvard School of Public Health, in Boston, Massachusetts.

DOI 10.1377/hlthaff.23.3.89

international data on quality that exist—life expectancy and infant mortality statistics—place the United States in the bottom quartile of industrialized countries, although most observers do not attribute this poor performance primarily to the performance of the medical care system.[3]

This paper presents data collected for twenty-one quality indicators in five countries. Our intent is to draw attention to potential opportunities to improve medical care in the five countries; raise questions about why some countries do well on some measures and others do poorly; provoke debate within countries about health care priorities and policies; and stimulate efforts to examine, refine, improve, and collect additional data.

Methodology

In 1999 the Commonwealth Fund convened a working group of quality measurement experts from governments in Australia, Canada, New Zealand, England, and the United States, along with academic researchers and representatives of institutions involved in medical care quality measurement.[4] This group examined a variety of working definitions of *quality,* ultimately choosing one developed by the IOM: "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."[5]

The next step was to choose among the various measurement domains that give structure to the quality reporting effort. The five countries have each created similar measurement frameworks. Canada's framework was adopted to guide the data collection exercise mainly because of its comprehensiveness. The working group focused on developing indicators of the appropriateness and effectiveness of care—the extent to which care is delivered in accordance with established standards and achieves its desired results. Other quality measurement domains (such as equity and responsiveness) were left for future work, because of measurement difficulties (for example, continuity and safety) or because they are the subject of other measurement activities (for example, efficiency and access).

The working group then identified indicators for collection, starting with lists of potential indicators reflecting each domain of health system performance. Indicators were evaluated using the following criteria. (1) Feasibility: Only indicators that were already being collected by one or more countries were candidates. (2) Scientific soundness: Only indicators that were deemed valid and reliable were considered. Since all of the indicators considered were already in use, determination of scientific soundness relied on existing reviews of the scientific evidence and approval by a consensus process or similar method in one or more countries. (3) Interpretability: Only indicators that allowed a clear conclusion for policymakers were included. This meant that the indication had to have a clear direction (higher is either good or bad). (4) Actionability: Only measures of processes or outcomes of care that could be directly affected by health care policy or health care

delivery system intervention were eligible. (5) Importance: Only indicators that reflected important health conditions accounting for a major share of the burden of disease, the cost of care, or policymakers' priorities such as vulnerable populations were pursued.

These criteria were applied in a five-step process. First, all indicators currently available in at least one country—an initial set of more than 1,000 indicators—were assembled. The fifty most promising indicators were then selected based on the five criteria above. We then further assessed these indicators by collecting information on definition, numerator and denominator specifications, the population represented, periodicity of collection, and data sources for each country. Indicators with irreconcilable differences in specifications or that were not nationally representative in several countries were discarded. For the remaining thirty-five indicators, we applied an iterative process of collecting data in the five countries, evaluating the comparability of the specifications, and making adjustments, such as revising coding classifications or age standardization. Finally, we compared the face validity of preliminary data and investigated any unusual differences to increase the reliability of the indicators. We also reviewed the final data with experts in each country.

There are numerous reasons to explain why this specific list of twenty-one indicators was selected and many others were not. Many potential indicators would require a review of medical records, which would be very costly without routine access to electronic medical records, and medical record-keeping practices vary considerably across countries. Some indicators were deemed difficult to interpret.[6] Others were eliminated because of a relative lack of importance.[7] Among the available indicators meeting all other criteria, several were deemed not to be internationally comparable.[8]

Results

Data for all twenty-one indicators are summarized in Exhibit 1. The results are standardized so that indicators with different measurement units can be compared. In Exhibit 1 the country with the worst result for an indicator is given a score of 100. All other countries are given scores relative to the country with the worst result. The scales are structured so that higher scores always indicate better quality. For example, the breast cancer survival rate is 14 percent better (higher) in the United States than in England, and the suicide rate is 55 percent better (lower) in England than in New Zealand. The actual value of the indicator for the country with a score of 100 is given in the right-hand column, so that any country's actual value can be calculated from its score.

None of the five countries consistently scores the best or worst on all of the indicators. In addition, each country has either the best or the worst score on at least one indicator. In other words, no country scores consistently the best or worst overall, and each country has at least one area of care where it could learn from in-

EXHIBIT 1
Standardized Performance On Twenty-One Quality Indicators In Five Countries

Outcome or process indicator	Standardized scores AUS	CAN	Engl	NZ	US	Value of indicator for country with score of 100
Survival rates (outcome)						
Breast cancer	107	104	100	106	114	75[a] (H)
Cervical cancer	111	106	100	105	108	70[a] (H)
Colorectal cancer	116	113	100	123	108	53[a] (H)
Childhood leukemia, ages 0–15	100	118	109[b]	102	110	67[a] (H)
Non-Hodgkin's lymphoma	116	107	100	115	109	58[a] (H)
Kidney transplant	106	113	104	104	100	83[c] (H)
Liver transplant	110[d]	123	100	–[d]	102	71[c] (H)
AMI, ages 20–84	134	100	NA	121	NA	11[e] (L)
Ischemic stroke, ages 20–84	120	124	NA	100	NA	12[e] (L)
Avoidable events (outcome)						
Suicide, all ages	112	114	155	100	120	13[f] (L)
Suicide, ages 15–19	162	151	187	100	165	25[f] (L)
Suicide, ages 20–29	140	149	171	100	154	29[f] (L)
Asthma mortality, ages 5–39[g]	144	NA	122	100	130	0.7[f] (L)
Pertussis	100	135	196	NA	191	31[f] (L)
Measles	187	198	100	160	199	5[f] (L)
Hepatitis B	167	133	168	167	100	6[f] (L)
Smoking rate	111	115	100	106	115	27[h] (L)
Process indicators						
Breast cancer screening rate	117	116	106	100	111	63[h] (H)
Cervical cancer screening rate	119	115	100	116	140	67[h] (H)
Influenza vaccination rate, age 65+	125	114	115	100	112	59[h] (H)
Polio vaccination rate, age 2	113	106	116	100	110	82[h] (H)

SOURCE: Commonweath Fund International Working Group on Quality Indicators.

NOTES: Specifications, years, and technical notes for each indicator are in endnotes accompanying the descriptive text. 100 is the worst result; higher numbers indicate better results (in all but "Value of indicator" column). Whether higher or lower rates are considered more desirable, the standardized scores displayed across countries always show how much "better" one country is (in percentage terms) than the index case (that is, the "worst" country, which is automatically assigned a score of 100). The scores are derived as follows. For cases where higher rates are better (indicated with an H), the score is simply 100 times the ratio of the better country's rate to the index country's rate. For example, since breast cancer survival in the United States is 85.5 percent, its score is 100 x .855/.75 = 114. In cases where lower rates are better (indicated with an L), the score is determined by calculating the ratio of the better country's rate to the index country's rate, substracting that result from two, and, finally, multiplying that by 100. So, for example, the U.S. score for smoking is 100 x [2–(.23/.27)] = 115. AMI is acute myocardial infarction. NA is not available.

[a] Relative five-year survival rate.

[b] For this population, the observed survival rate should almost perfectly equal the relative survival rate.

[c] Observed five-year survival rate.

[d] Australian figure includes Australia and New Zealand.

[e] Thirty-day case-fatality rate.

[f] Rate per 100,000.

[g] Data are for 1990–99 and thus do not correspond exactly to the years in Exhibit 4.

[h] Percent.

ternational experience. Each country also has an area where it could teach others.

The results in Exhibit 1 are intended to stimulate additional inquiry by policymakers and clinicians in each country. There are many reasons why a country could score well or poorly on a particular indicator. We have grouped the twenty-one indicators into outcome indicators (survival rates and avoidable events) and process indicators for presentation purposes.

■ **Outcome indicators: survival rates.** The first five indicators are five-year relative survival rates for various types of cancer.[9] The relative survival rate is the ratio of the number of cancer survivors to the number of people of that age and sex in the same country who would have been expected to be alive after five years if they did not have cancer. It measures the additional deaths attributable to cancer, controlling for differences in underlying mortality patterns between countries.

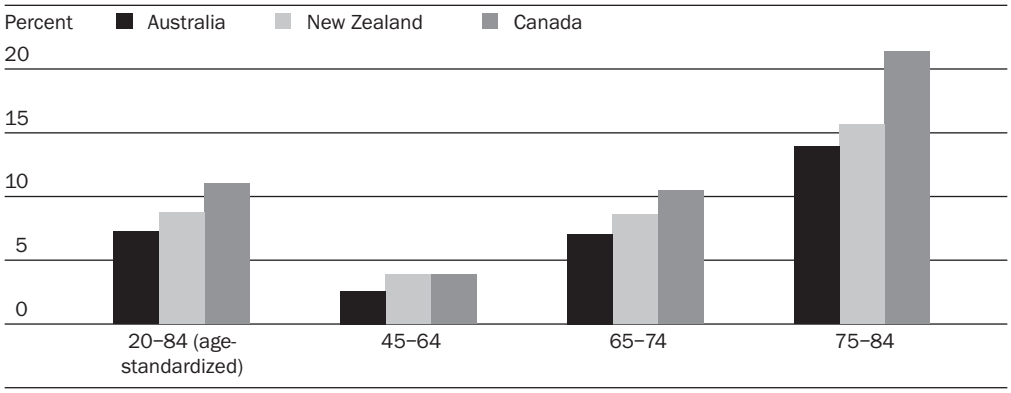
On these indicators, the range in performance was usually small. On most survival rates, the countries are within 10 percent of each other. One pattern that does stand out is that England is consistently at the low end of the distribution for cancer survival. This is consistent with previous comparisons of cancer survival between the United Kingdom and other European countries.[10]

Higher cancer survival rates are unquestionably a desired health care goal. Primary care, including health promotion and screening, can make a difference in the stage of diagnosis for the cancers studied, particularly cervical, breast, and colorectal cancer.[11] Secondary and tertiary cancer care can also make a difference. Other factors such as financial barriers to care, waiting lists, and reluctance to seek care could also influence rates.

Two related indicators of the outcomes of health care are the survival rate following a kidney or liver transplant.[12] The survival rates for both were relatively low in the United States. Differences in the characteristics of patients receiving transplants could influence survival rates. Assuming that transplant recipients in the five countries are similar, the remaining differences are more likely to be attributable to differences in medical care.

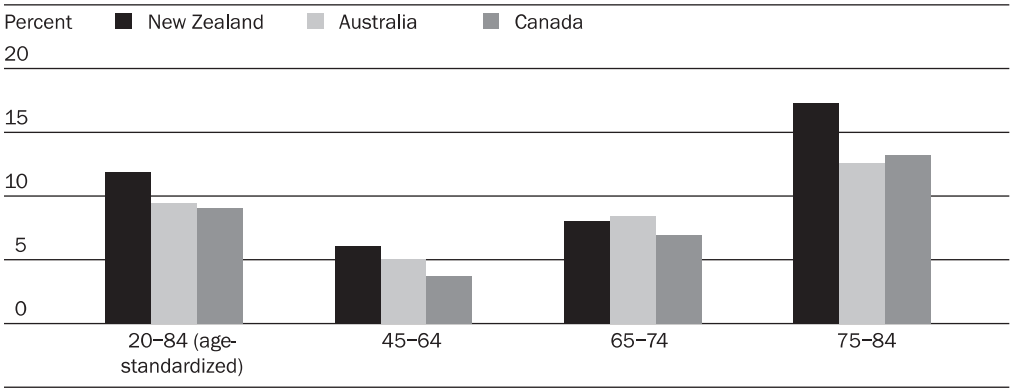
Data on acute myocardial infarction (AMI) and ischemic stroke are also presented, although comparable data are available in only three of the five countries.[13] AMI case-fatality rates are highest in Canada and lowest in Australia (Exhibit 2). The higher case-fatality rate among older people in Canada is an area that war-

EXHIBIT 2
Acute Myocardial Infarction (AMI) Thirty-Day In-Hospital Case-Fatality Rates In Australia, New Zealand, And Canada, By Age Group, 2000



SOURCE: Commonwealth Fund International Working Group on Quality Indicators.

EXHIBIT 3
Ischemic Stroke Thirty-Day In-Hospital Case-Fatality Rates In New Zealand, Australia, And Canada, By Age Group, 2000



SOURCE: Commonwealth Fund International Working Group on Quality Indicators.

rants investigation. Exhibit 3 shows only small differences in the case-fatality rate for ischemic stroke. Noticeable differences are seen only in the 75–84 age group. In addition to medical care received, these rates could be affected by factors including the average severity of AMI and ischemic stroke in the three countries; the rate at which emergency services transport people to the hospital; and hospital discharge, admission, and length-of-stay characteristics.[14]

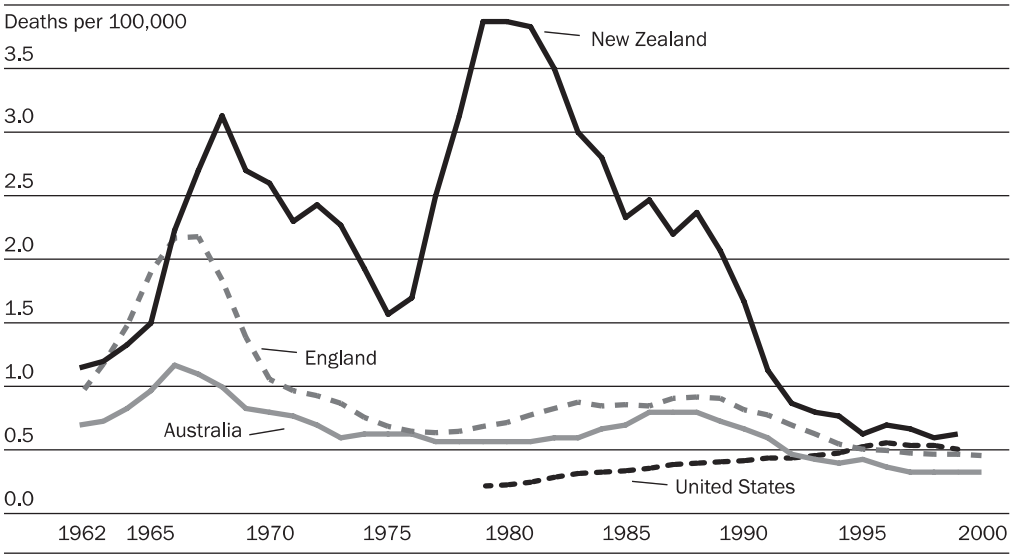
■ **Outcome indicators: avoidable events.** The second group of outcome indicators shows the rates of certain health outcomes that are considered avoidable had appropriate care been delivered. These indicators include suicide rates, the incidence of vaccine-preventable diseases, asthma mortality rates, and smoking rates.

Suicide rates were almost equal in Australia, Canada, New Zealand, and the United States but lower in England.[15] Suicide rates among two groups of younger people show bigger differences.[16] New Zealand had much higher suicide rates among young people than the other four countries; suicide is an area that is already receiving attention in New Zealand.

The incidence rates of three vaccine-preventable diseases—pertussis, measles, and Hepatitis B—show that some countries have these diseases under better control than others do.[17] Pertussis incidence was particularly high in Australia and Canada; measles incidence was higher in England than elsewhere; and Hepatitis B incidence was highest in the United States and Canada.

Another appropriateness indicator reflecting an avoidable outcome is the asthma mortality rate for people ages 5–39, the ages at which asthma is most reliably diagnosed (Exhibit 4).[18] Deaths resulting from asthma are considered preventable if the condition is managed appropriately.[19] New Zealand's asthma mortality rate was much higher than that of England and Australia in the early 1980s. Since then, it has declined markedly to a level close to those of the other countries, as clinicians discontinued use of fenoterol, an adrenergic bronchodilator, and be-

EXHIBIT 4
Asthma Mortality Rate Per 100,000 People Ages 5–39 In Four Countries, 1962–2000



SOURCE: Commonwealth Fund International Working Group on Quality Indicators.
NOTE: Three-year moving averages.

gan using inhaled corticosteroids.[20] Nevertheless, the asthma mortality rate in New Zealand remains higher than in the other countries. The rate in England and Australia has also declined over time, reflecting improvements in asthma care. The United States is the only country where the asthma mortality rate has been increasing recently. In 1990 asthma mortality was lowest in the United States, but by 2000 it was higher than in Australia and England and approaching the rate in New Zealand. The reason behind this increasing U.S. trend is an important area for investigation.

Smoking rates (as percentage of the population) were lowest in the United States and Canada (Exhibit 1).[21] The health care system does not have perfect control over people's decisions to smoke, but advice and treatment provided by physicians have been shown to have an impact on smoking cessation.[22]

■ **Process indicators.** The five countries were similar in performance on several process indicators of appropriate care delivery and widely different on others. The differences in mammography rates between countries were relatively small.[23] However, sizable differences were seen between countries in the cervical cancer screening rate for the population for whom screening is indicated.[24] Cervical cancer screening was much more common in the United States than elsewhere.[25]

Influenza vaccination rates show that all five countries could prevent more influenza-related deaths among older people through vaccination.[26] New Zealand, in particular, might investigate how it could increase its rate to the level of other countries. Polio vaccination rates were above 90 percent in Australia, England, and the United States and above 80 percent in Canada and New Zealand.[27] Al-

though polio has recently been absent in these countries, these low vaccination rates could allow it to recur, particularly in Canada and New Zealand.[28]

If one considers cost-effectiveness, it is hard to identify the clear ideal level for these process indicators; higher rates are better, but at a certain point the marginal returns are likely to be small. In the absence of such an ideal level, it is useful for countries to benchmark their rate against those in other countries. These comparisons show that countries deliver these health care interventions at generally similar rates, although opportunities exist for countries to raise their level to that of the best-performing country.

Summary And Potential For Improvement

The comparisons on this initial set of quality indicators show that each country performs well in some areas and poorly in others compared with other countries. Each country could improve the quality of care.

Australia performed well on many of the indicators. In particular, cancer survival rates were generally high (excepting childhood leukemia); breast cancer screening rates were high; asthma mortality was relatively low; and influenza and polio vaccination rates were high. However, the incidence of pertussis was much higher than elsewhere, suggesting an opportunity for improvement.

In Canada, cancer survival rates were generally average or above average and were highest for childhood leukemia. Stroke case-fatality rates were relatively low. Transplant survival was also relatively high in Canada. However, AMI case fatality was higher in Canada than Australia and New Zealand in older age groups. This confirms previous findings and deserves further investigation.[29] Pertussis incidence was much higher than in the other countries (except for Australia).

Suicide rates were notably lower in England than in the other four countries. The polio vaccination rate there was the highest. However, cancer survival rates were lowest in England, as were breast and cervical cancer screening rates. This confirms previous European comparisons and suggests an opportunity for improvement. Measles incidence was also higher in England than elsewhere.

In New Zealand, the improvement in asthma mortality over the past twenty years is a true success story, although there may be room for further improvement. The colorectal cancer relative survival rate was highest. However, the suicide rate in New Zealand, particularly among younger people, was much higher than elsewhere. Stroke case-fatality rates were higher among older age groups. Breast cancer screening and influenza and polio vaccination rates were relatively low.

In the United States, breast cancer survival rates were higher than in the other countries. Cervical cancer screening rates were very high. One area for concern is that asthma mortality rates were increasing in the United States but decreasing in the other countries. Transplant survival rates were also relatively low in the United States.

While the United States often performs relatively well for this set of indicators,

it is difficult to conclude that it is getting good value for its medical care dollar from these data. The huge difference in the amount the United States spends on health care compared with the other countries could very well be justified if the extra money provided extra benefits. Population surveys have shown that the extra spending is probably not buying better experiences with the health care system, with the exception of shorter waits for nonurgent surgery.[30] Earlier studies have shown the United States to be in the bottom quartile of population health indicators such as life expectancy and infant mortality.[31] Our results also fail to reveal what the extra spending has bought, although there are many important places to look.

The limitations of this indicator list preclude the definite conclusion that any country has the best quality of care. It should be emphasized that this initial set of twenty-one quality indicators was distilled from a starting compendium of more than 1,000. It is an opportunistic list, rather than a comprehensive list. Some indicators relate to health conditions that account for a large share of the burden of disease in these countries, while others (such as transplant survival rates) have smaller implications for population health. Some conditions that represent a large share of the disease burden, such as diabetes, are not represented at all. More work is clearly needed to expand the scope and depth of the indicator set so that it can be used to judge overall health system performance, and further investment in data collection and international harmonization of indicators to allow valid international comparisons are necessary.

During the time frame of this project, which began in 1999, major improvements in quality measurement capabilities have been made in many countries, which indicates the potential for improvement. Most importantly, building on the Commonwealth Fund's International Working Group on Quality Indicators and a similar effort undertaken by a group of five Scandinavian countries, the Organization for Economic Cooperation and Development (OECD) has undertaken an initiative to move this work forward, expand the number of countries involved, develop additional quality indicators, and institutionalize the collection of these indicators. We hope that these twenty-one indicators will be a first installment in ongoing efforts to conduct international quality comparisons.

The working group thanks Jonette McDonnell and the Australian Institute for Health and Welfare, who made the reporting of Australian data possible. This research was supported by the Commonwealth Fund and the Nuffield Trust.

NOTES

1. D.M. Berwick, "A User's Manual for the IOM's 'Quality Chasm' Report," *Health Affairs* 21, no. 3 (2002): 80–90; and E.C. Becher and M.R. Chassin, "Improving the Quality of Health Care: Who Will Lead?" *Health Affairs* 20, no. 5 (2001): 164–179.
2. A recent example is the 2004 State of the Union address. White House, "The State of the Union," 20 January 2004, www.whitehouse.gov/news/releases/2004/01/20040120-7.html (20 February 2004).
3. U.E. Reinhardt, P.S. Hussey, and G.F. Anderson, "Cross-National Comparisons of Health Systems using

OECD Data, 1999," *Health Affairs* 21, no. 3 (2002): 169–181. Other international comparisons using general health status indicators as outcomes include J. Macinko, B. Starfield, and L. Shi, "The Contribution of Primary Care Systems to Health Outcomes within Organization for Economic Cooperation and Development (OECD) Countries, 1970–1998," *Health Services Research* 38, no. 3 (2003): 831–865; V. Navarro and L. Shi, "The Political Context of Social Inequalities and Health," *Social Science and Medicine* 52, no. 3 (2001): 481–491; and World Health Organization, *World Health Report 2000* (Geneva: WHO, 2000). Studies comparing the appropriateness of specific procedures in two countries include E.A. McGlynn et al., "Comparison of the Appropriateness of Coronary Angiography and Coronary Artery Bypass Graft Surgery between Canada and New York State," *Journal of the American Medical Association* 272, no. 12 (1994): 934–940; and S. Bernstein et al., "The Appropriateness of the Use of Cardiovascular Procedures: British versus U.S. Perspectives," *International Journal of Technology Assessment in Health Care* 9, no. 1 (1993): 3–10. Finally, one study compared the applicability of primary care quality indicators between the United States and United Kingdom: M.N. Marshall et al., "Can Health Care Quality Indicators Be Transferred between Countries?" *Quality and Safety in Health Care* 12, no. 1 (2003): 8–12.

4. Members of the Commonwealth Fund's International Working Group on Quality Indicators were Gerard F. Anderson, Anne-Marie Audet, Arnold Epstein, Carolyn Clancy, Karen Scott Collins, Janet M. Corrigan, John E. Craig Jr., Colin M. Feek, Elma G. Heidemann, Jeremy Hurst, Peter S. Hussey, Edward Kelley, Sheila T. Leatherman, Elizabeth A. McGlynn, Vivienne L. McLoughlin, Soeren Mattke, Gregg S. Meyer, John S. Millar, Robin Osborn, Stephen C. Schoenbaum, Robert Shaw, John Wyn Owen, and Nick York. The data in this paper for England are for England only and not for the entire United Kingdom.
5. K. Lohr, ed., *Medicare: A Strategy for Quality Assurance,* vol. 2 (Washington: National Academies Press, 1990).
6. For example, utilization rates of procedures such as coronary artery bypass graft were eliminated because it was not clear whether higher or lower use reflected better quality.
7. For example, the immunization rate for tuberculosis was not included because tuberculosis is a rare condition in these five countries and immunizations were already reflected by other indicators, including immunizations against polio and influenza and the incidence of vaccine-preventable diseases.
8. For example, we wanted to measure how many cancers were diagnosed at an early stage. Although each country has some information on stage of cancer at diagnosis, each uses a different classification system for cancer stage, which makes international comparisons impossible.
9. Survival rates are for cancers diagnosed in 1992 in Australia and Canada, 1994 in New Zealand and the United States (except breast cancer diagnosed in 1992), and 1991–93 in the United Kingdom. All rates were age-standardized to the OECD 1980 population. U.S. data are from Surveillance, Epidemiology, and End Results (SEER), which covers large portions of the country but is not nationally representative. Some differences between countries in statistical modeling and cancer registry operation could affect rates.
10. G. Gatta et al., "Toward a Comparison of Survival in American and European Cancer Patients," *Cancer* 89, no. 4 (2000): 893–900.
11. M.J. Quinn et al., "Variations in Survival from Breast Cancer in Europe by Age and Country, 1978–1989," *European Journal of Cancer* 34, no. 14 (1998): 2204–2211; G. Gatta et al., "Survival of European Women with Gynaecological Tumours during the Period 1978–1989," *European Journal of Cancer* 34, no. 14 (1998): 2218–2225; and G. Gatta et al., "Survival of Colorectal Cancer Patients in Europe during the Period 1978–1989," *European Journal of Cancer* 34, no. 14 (1998): 2176–2183. When cancer detection improves without an accompanying improvement in prognosis, lead-time bias can affect cancer survival rates without actually making a difference in patient survival; see H.G. Welch, L.M. Schwartz, and S. Woloshin, "Are Increasing Five-Year Survival Rates Evidence of Success against Cancer?" *Journal of the American Medical Association* 283, no. 22 (2000): 2975–2978.
12. Kidney transplant survival rates are for transplants performed in 1995 in Australia and Canada, 1994–96 in the United Kingdom, and 1995–96 in New Zealand and the United States. Liver transplant survival rates are for transplants performed in 1985–96 in Australia/New Zealand, 1995 in Canada, and 1995–96 in the United States. Liver transplant rates for Australia and New Zealand were combined. Survival rates are observed, not relative survival.
13. Case-fatality rates are from 2000 (Canada) and 2000–01 (Australia and New Zealand). Australia uses *International Classification of Diseases,* Tenth Revision (ICD-10) diagnosis codes; Canada and New Zealand use ICD-9. The rate for ages 20–84 was age-standardized using the sum or the study population from the three countries as the standard population.
14. S.M. Davies et al., *Refinement of the HCUP Quality Indicators,* Pub. no. 01-0035 (Rockville, Md.: Agency for Healthcare Research and Quality, May 2001).

15. Suicide rates for the total population were age-standardized to the OECD 1980 population. Data are from 2000 in Australia and England/Wales, 1998 in Canada and the United States, and 2000–01 in New Zealand. Suicide rates are influenced by many factors in addition to medical care but are also influenced by mental health care. This, in addition to the dearth of mental health quality indicators, led to its inclusion by the working group as well as in other quality measurement activities including the U.S. National Quality Report. AHRQ, *National Healthcare Quality Report* (Rockville, Md.: AHRQ, December 2003).
16. The rate for the United Kingdom is for ages 14–19, not 15–19, and the rate for the United States is for ages 20–24, not 20–29.
17. Data are from 2000 except in Canada (1999). Some differences in notification requirements and practices may affect rates.
18. The ages of 5–39 were chosen after consultation with clinical experts in each of the five countries.
19. Asthma-related mortality was a rare event in the four countries that reported these data. Since this could lead to sizable year-to-year fluctuations, a moving average of the rate over the period 1980–2000 is shown in Exhibit 4. J.R. Charlton et al., "Geographical Variation in Mortality from Conditions Amenable to Medical Intervention in England and Wales," *Lancet* 1, no. 8236, Part 1 (1983): 691–696; W.W. Holland and the EC Working Group on Health Services and "Avoidable Death," eds., *European Community Atlas of Avoidable Death, 1985–1989*, 3d ed. (Oxford: Oxford University Press, 1997); D.G. Manuel and Y. Mao, "Avoidable Mortality in the United States and Canada, 1980–1996," *American Journal of Public Health* 92, no. 9 (2002): 1481–1484; and Australian Institute for Health and Welfare, "National Health Priority Areas," www.aihw.gov.au/nhpa/asthma/indicators.html (20 February 2004).
20. N. Pearce et al., "End of the New Zealand Asthma Mortality Epidemic," *Lancet* 345, no. 8955 (1995): 41–44; and S. Suissa and P. Ernst, "Optical Illusions from Visual Data Analysis: Example of the New Zealand Asthma Mortality Epidemic," *Journal of Clinical Epidemiology* 51, no. 7 (1997): 1079–1088.
21. The smoking rate for Canada is for age twenty and older, and the rate for the United Kingdom is for age sixteen and older, not eighteen and older. Data are from 2001 in Australia and New Zealand, 2000–01 in Canada, 2000 in England, and 1999 in the United States.
22. M. Raw, A. McNeill, and R. West, "Smoking Cessation: Evidence Based Recommendations for the Healthcare System," *British Medical Journal* 318, no. 7177 (1999): 182–185.
23. Data from Australia, Canada, and the United States are from a population survey; data from England and New Zealand are from an organized screening program. Australia, England, and New Zealand measure the screening rate within the past three years; Canada and the United States measure within the past two years. Australia and Canada use ages 50–69; England and New Zealand, ages 50–64; and the United States, age 40 and older. Data are from 2001 in Australia and England, 2000–01 in Canada, 2002 in New Zealand, and 1999 in the United States.
24. The cervical screening rate during the past three years is measured except in England, where 3.5 years is used, since reminders are sent to the eligible population after three years. Data from Australia, Canada, and the United States are from a population survey; data from England and New Zealand are from an organized screening program. Rates are for ages 18–69 in Australia, Canada, and the United States and ages 20–69 in England and New Zealand. Data are for 2001 in Australia and England, 2000–01 in Canada, 2002 in New Zealand, and 1999 in the United States.
25. E.L. Franco, E. Duarte-Franco, and T.E. Rohan, "Evidence-Based Policy Recommendations on Cancer Screening and Prevention," *Cancer Detection and Prevention* 26, no. 5 (2002): 350–361.
26. Data from Australia, Canada, and the United States are from a population survey; data from England and New Zealand are from an organized screening program. Data are from 2000 in Australia, 2000–01 in Canada, 2001–02 in England, 2001 in New Zealand, and 1999 in the United States.
27. Data are from 2001 in Australia and New Zealand, 2002 in Canada, 2000–01 in England, and 2000 in the United States. The U.S. rate is measured for the period 19–35 months, not 24 months.
28. The incidence of polio was 0.00 per 100,000 in all five countries in 2000 (1999 in Canada), according to unpublished data collected by the Working Group.
29. P. Moise and S. Jacobzone, "OECD Study of Cross-National Differences in the Treatment, Costs, and Outcomes of Ischaemic Heart Disease," OECD Health Working Paper no. 3 (Paris: Organization for Economic Cooperation and Development, 2003).
30. R.J. Blendon et al., "Inequities in Health Care: A Five-Country Survey," *Health Affairs* 21, no. 3 (2002): 182–191.
31. Reinhardt et al., "Cross-National Comparisons of Health Systems."