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Introduction

David A. Wise

This volume contains papers presented at a joint JCER–NBER conference held in Nikko, Japan in March 2003. It is the fifth in a series of JCER–NBER projects comparing aspects of the economic systems and economic behavior in the United States and Japan. The previous volumes are *Aging in the United States and Japan: Economic Trends* (1994), *The Economic Effects of Aging in the United States and Japan* (1997), *Aging Issues in the United States and Japan* (2001), and *Labor Markets and Firm Benefit Policies in Japan and the United States* (2003). The papers in this volume direct attention to the health care systems in the two countries.

Recent data compiled by the Organization for Economic Cooperation and Development (OECD) in *OECD Health Data 2005* highlights significant differences in health and health care between Japan and the United States. For instance, among OECD countries, Japan spends close to the lowest percentage of its gross domestic product (GDP) on health care (7.9 percent), while the United States spends the highest (15 percent). Yet life expectancies in Japan are the longest in the world—eighty-two years (at birth), compared with seventy-seven years in the United States. Interestingly, despite its lower spending on health care, Japan has many more hospital beds per capita (8.5 per thousand population compared with 2.8 per thousand in the United States), more computed tomography (CT) scanners (93 per million in Japan compared with 13 per million in the United States), and more magnetic resonance imaging (MRI) machines (35 per million in Japan compared with 9 per million in the United States). Japan

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has the lowest obesity rate among OECD countries (3 percent), while the United States has the highest (31 percent). At the same time, smoking rates in Japan are nearly double those in the United States (over 30 percent in Japan, and 17 percent in the United States). Eighty-two percent of health care spending in Japan is public spending, compared with 44 percent in the United States. These OECD summary measures, and many others, raise all kinds of questions about how the health care systems operate differently in the two countries and how these operational differences relate to health care quality, costs, and outcomes.

The goals of this volume (and the NBER–JCER project more generally) are not to replicate these comparative statistics, but rather to explore the structural characteristics of the health care systems in each country, the economic incentives underlying the systems, and how they operate in practice. In both countries the rising cost of health care presents important financial challenges. Indeed, aging populations and rising health care costs are motivating health system reform throughout the world. The intention of this effort was to begin an assessment of the health care systems in Japan and the United States, with the hope that a better understanding of elements of both systems could lead to improvements in both. The papers have not been selected to provide a systematic or comprehensive comparison of care in the two countries, although with respect to some issues such comparisons are made. Instead the goal is to explore in greater depth selected aspects of each health care system. The studies are topical investigations that can serve as background to more comprehensive and direct comparative work.

The volume is organized in three major sections. The first includes studies of the health care systems in Japan and the United States and how those systems are evolving with the financial pressures of rising health care costs. The second major section includes studies on the variations in medical practice patterns and quality of care in the two countries. A final section addresses selected other health care topics in Japan and the United States. Together, the ten studies offer valuable insight into the differences in health care systems in the two countries. This summary draws heavily on the authors' own words.

The Health Care Systems in Japan and the United States

Four papers direct attention to the structural characteristics of the health care systems in Japan and the United States, the financial challenges posed by an aging population and rising costs, and the impact of these financial pressures on health system reform. How does each country address the basic issues of health insurance coverage, access to care, and financing? And in what ways are the health systems and policies evolving in response to the common pressures of older populations and rising costs?

In “Evaluating Japan’s Health Care Reform of the 1990s and Its Effects to Cope with Population Aging,” Naohiro Yashiro, Reiko Suzuki, and Wataru Suzuki examine the basic structure of the Japanese medical care system, focusing primarily on recent policy issues. Their paper reviews recent demographic developments in light of policy and institutional changes in Japan’s health care system in the 1990s. The authors estimate the quantitative effects of the recently proposed institutional changes in health insurance schemes and show that they have only short-term effects in improving the fiscal balances in the system.

As background, the paper discusses Japan’s generous health insurance schemes, under which all citizens, including the self-employed, are supposed to have some form of health insurance. Japan guarantees patients “free access” to hospitals with no gatekeepers and provides certain medical services under a “fee-for-service” health insurance arrangement. The authors point out that such generous access aggravates the financial challenges of population aging. Thus the effect of population aging is already reflected in growing fiscal deficits in health insurance budgets that are burdened by an increasing number of elderly enrollees, who are heavy users of health resources. Given the generous access to care and the limited financial incentive for cost-effective health care decision making, the authors are surprised that Japan’s national health expenditures have remained at a relatively low level.

One interpretation of the combination of low costs and generous access is that Japan has maintained relatively low physician salaries. The system also has been efficient in providing basic health care services to the population as a whole, reflecting people’s strong preference for egalitarian access in Japan. With the aging of the population, however, the major burden of disease has shifted from infectious and acute diseases to chronic disease. This reduces the positive externalities of medical treatments as well as the extent of the asymmetry of information between providers and patients. Also, the preferences of patients have shifted toward better quality health services with medical information. It is against this background that changes in the Japanese health care system are considered.

The health system in Japan has many features in common with the Medicare program for the elderly in the United States. The question of how to reform the current welfarelike health scheme in Japan has much in common with U.S. Medicare reform. The major reform proposals include standardization of medical treatments, partial replacement of public health insurance with private health insurance, introduction of a partial managed care system, and introduction of for-profit hospitals to stimulate competition.

The authors find that various policy reforms introduced in the 1990s did not effectively solve the fundamental problems. For example, the expansion of long-term care insurance in 2000 was intended to move care for the

frail elderly from costly hospitals to nursing homes, but the effect has been marginal, with free access to hospitals basically maintained. Another reform was raising the copayment rate and redistributing costs among various insurance providers, though the positive fiscal impacts of these reforms is projected to last only over the short run. The 2003 health insurance reform is a first step toward a more comprehensive reform of the health care services sector, the authors conclude.

The next two papers in the volume address some of the same general issues that are addressed in the Yashiro, Suzuki, and Suzuki chapter, but with a focus on the United States health care system and on the health systems of OECD countries more generally. “The U.S. Medical Care System for the Elderly” characterizes the health care system in the United States, while “An International Look at the Medical Care Financing Problem” considers the financing challenges posed by population aging and rising health care costs, how health systems may continue to evolve going forward, and the extent to which health care costs are likely to continue to increase into the future.

In “The U.S. Medical Care System for the Elderly,” David Cutler and I examine the structure of the American medical care system, especially the system of care for the elderly. We focus on three sets of interactions: *coverage rules* (how people get health insurance and who pays for it), the *reimbursement system* (how providers are paid), and *access rules* (what are the financial and nonfinancial barriers to receipt of care).

We note that Medical care systems are multidimensional, and so our description must be as well. The basis for our analysis is the medical care triad. There are three participants in the medical care system: patients, providers, and insurers. Patients pay money to insurers (either directly or indirectly, as we discuss in the following) and pay for some care directly. Insurers reimburse providers for care and set rules under which the care can be provided. Providers diagnose and treat patients.

Corresponding to these three participants are three sets of interactions. The first is *coverage rules*. This encompasses the mechanisms by which people get health insurance and who pays for that insurance. The second interaction is the *reimbursement system* between insurers and providers—how is payment determined and what rates are paid? Finally, there are the *access rules*—which providers are patients allowed to see and under what circumstances? In this paper, we describe the insurance, reimbursement, and access rules in the American medical care system. We present broad outlines of the system for everyone in the United States. Because the system is so heterogeneous, we focus particular attention on the system for the elderly. We note where research has explored a link between system provisions and outcomes, but we do not take the further step of relating system provisions to health outcomes in any systematic way.

While there is variability even within the United States, we suggest the following simple summary. Coverage in the United States is spotty—excellent for the elderly, but not guaranteed for the nonelderly. Historically, reimbursement of providers was very generous, and access was open as well. Increasingly, though, the reimbursement and access routes are being restricted as insurers respond to moral hazard and the demand for cost containment.

The direction the medical system will go in the United States is not clear. Even in the past few years, reimbursement and access rules have changed, and coverage issues have dominated the public agenda. Changes along all three dimensions bear watching. We emphasize that it is also important to extend this analysis to other countries. By characterizing existing systems and comparing outcomes across countries, we can use the cross-national perspective to inform the evolution of health policy and health systems within countries. Some cross-national perspective is provided in the next chapter, which considers the challenges of medical care financing in all OECD countries.

In “An International Look at the Medical Care Financing Problem,” David Cutler notes that, as populations age and medical spending rises, medical systems will account for an increasing part of economic activity. Virtually all developed countries are worried about how to finance medical care. Medical costs are increasing more rapidly than tax revenues to pay for them, and populations are aging, each of which increases the burden on the public sector. In the United States, we speak of a “Medicare crisis” and a “Social Security crisis,” where the government will no longer be able to meet its health care bills. Other countries refer to “aging crisis” or an “old age insurance crisis.”

Given that medical care costs are certain to rise, Cutler asks how much the increase will be and what magnitude of reform will be needed to meet the needs. To answer these questions, he develops a forecast model of medical spending in OECD countries that uses as inputs current spending on medical care and the demographic mix of the population as it stands now and as it is expected to change. The model estimates the share of medical spending in GDP in the future. Because most countries pay for the bulk of medical services publicly, this forecast is closely related to the increase in the public-sector financing burden that can be expected.

The results yield several important conclusions. First, all OECD countries can expect an increase in the cost of medical care over time. On the basis of demographic change alone, the typical country can expect medical care to increase by 2.2 percent of GDP in the next thirty years and by 3.6 percent of GDP in the next half century. Including continued technological innovation in medicine at the rate experienced in the past raises the projected increase in the next thirty years to 5.7 percent of GDP. Interestingly,

the data suggest that the medical care problem is about equally split between the consequences of aging and the consequences of technological change in medical treatments.

The coming medical care burden differs substantially across countries. The countries that will be hardest hit by demographic change are Spain, Switzerland, the Czech Republic, Italy, and Greece. All of these countries have very low fertility rates and large projected increases in life expectancy. Demographic change will raise medical spending in these countries by 5 to 6 percent of GDP. Japan and the United States rank in the middle of this scale, 9th and 12th, respectively, out of twenty-nine countries (expected increases of 4.4 and 3.7 percent), while Turkey, the United Kingdom, New Zealand, and Mexico are among the countries least affected, with expected increases of 2 percent or less.

Accounting for technological change has a material impact on these rankings. Most importantly, it raises the financing burden in the United States. The United States spends more than other countries do on medical care and has the most technologically advanced medical system. Thus, if technology increases costs at the same rate everywhere, the United States will be particularly hard hit. Using historical growth rates of medical costs as a guide to the future, the projected increase in medical spending in the United States over the next thirty years is close to 10 percent. The increase in Japan will be more than 6 percent of GDP.

These are sizeable estimates, although perhaps not cataclysmic, Cutler concludes. He shows, however, that affording such increases will require reductions in the growth of nonmedical consumption, but not absolute declines in the level of such spending.

The next chapter in the volume considers the distribution of health care costs and health care use by age in Japan, the extent to which costs are cross-subsidized across age groups and across segments of the health financing system, and how recent and prospective health system reforms may affect this cross-subsidization. It enhances our understanding of the components of health care finance in Japan, and how the components interact in support of the overall health care system in Japan.

In "Removing the Instability and Inequity in the Japanese Health Insurance System" Seiritsu Ogura, Tamotsu Kadoda, and Makoto Kawamura compare Japan's current public medical insurance to an unstable two-story building, whose second floor (health insurance for the elderly) is becoming heavier each day, while its first floor is losing strength. There are three pillars in the first floor that support the weight of the whole building. These are (1) insurance programs that cover the health care costs of employees and their dependents, (2) National Health Insurance programs (NHIs)—primarily more than 3,200 municipal programs—that provide insurance to self-employed workers, retirees, and others who are not covered by employees' programs, and (3) subsidies from the national and mu-

municipal governments. Each of these supports is funded in a different way. The employees' programs charge different premiums depending on the program, but collect far more revenue than necessary to pay their benefits. The NHIs, on the other hand, are financially weak and, like the programs for the elderly, depend on generous government subsidies.

The second floor of the building consists of health care insurance for the elderly, which provides medical care benefits to those over seventy for very little cost. Because this program does not collect premiums on its own, the benefits are paid by collecting charges from the "first-floor" public insurance programs. Thus, most of the health care costs of the elderly have been shifted from the employees' health insurance programs and the national government. Under the current system, 70 percent of the health care costs of the elderly (net of their small out-of-pocket costs) are charged to these insurance programs, with each program contributing an amount in proportion to the number of its insured individuals and the average health care cost of elderly in the system. Of the remaining 30 percent, the national government contributes 20 percent and local governments contribute 10 percent.

This two-story structure, the authors say, has become very unstable for two reasons, one cyclical and the other structural. Japan's prolonged economic slump over the past decade has had a large negative effect on the revenues of all the insurance programs in the first floor. In addition, the rapid increase in the number of individuals who are reaching age seventy adds a significant weight to the second floor while removing support from the first.

Given the current two-story system, the bulk of the increase in health care costs of the elderly has been absorbed by increases in employee insurance premiums and budget deficits. Employees' out-of-pocket costs have been raised in steps, from 10 percent to 20 percent in 1997, and from 20 percent to 30 percent in 2003 for employees, and from 20 percent to 30 percent for their dependents. These changes have left employees on par with individuals covered by NHIs as far as the out-of-pocket costs are concerned, while increasing premiums by a factor of two. Similarly, the government has to deal with the swelling need for subsidies and the deepening of the budget deficit amidst a rapid decline in tax revenues.

The analyses in this paper address what the authors consider to be the two major weaknesses in the Japanese health insurance system. The authors examine the consequences of the "special" treatment of the elderly and conclude that it will be difficult to continue to support the elderly at current levels. The authors also emphasize that strengthening the financial base of the NHI system is a critical part of reforming the health insurance system for the elderly.

Ogura, Kadoda, and Kawamura's analysis is based on a microsimulation model, which is used as a tool for judging the properties of a given health insurance system. This model consists of a large number of individ-

ual households that collectively represent the economic and health statistics of the Japanese economy. The purpose of the simulations was to find a scenario under which an employee in his or her working prime (i.e., a household head age forty to sixty-four), who may be supporting children, would have a financial burden appropriate to the benefits he or she receives. The authors find systems that they believe would meet these goals. These systems would make the elderly responsible for a larger fraction of health care costs than they now pay. By replacing the current system with a consumption tax to finance health insurance benefits, it is also possible, the authors conclude, to reduce the large disparity in the contribution-to-cost ratios across different age groups and improve the vertical equity of the medical insurance system.

Practice Patterns and Quality of Care

The next four papers consider differences in medical practice patterns and quality of care issues in the United States and Japan. While the studies focus narrowly on individual diagnoses or other aspects of the health care system, rather than on broad cross-national comparative analyses of quality, they provide important insights on selected dimensions of quality in both countries. For example, the first paper looks at the effects of a hospital's volume of angioplasty procedures on outcomes among acute myocardial infarction (AMI), or heart attack, patients in Japan. The second looks at the effects of market concentration on quality among home health care delivery services in Japan. The third compares how AMI patients are treated in Japan and the United States. And the fourth looks at the dramatic variation in treatment patterns across geographic regions even within the United States and what this suggests about the quality of care in different places. Together, these studies highlight the value of studying medical practice patterns in different countries, as well as across geographic regions within countries, as a statistical basis for evaluating and improving quality.

In "The Volume-Outcome Relationship in Japan: The Case of Percutaneous Transluminal Coronary Angioplasty (PTCA) Volume on Mortality of Acute Myocardial Infarction (AMI) Patients," Koichi Kawabuchi and Shigeru Sugihara examine the relationship between the number of percutaneous transluminal coronary angioplasty (PTCA) procedures performed and negative medical outcomes among AMI patients in Japan.

A common presumption is that as the number of procedures increases, the quality will improve due to the learning-by-doing (or "practice makes perfect") effect. The authors refer to an inverse relationship between volume and negative medical outcomes as a "volume effect." Hospitals in Japan generally perform limited numbers of PTCA procedures each year. Nearly

half of the hospitals performed fewer than 50 PCTA procedures per year, while only 15 percent of the hospitals performed more than 200 (the minimum number recommended by the American College of Cardiology/American Heart Association). Hospitals with more than 400 PTCA procedures are quite rare in Japan.

This paper examines empirically the relationship between volume and quality among PTCA procedures in Japan. The authors also investigate the nature and channels of this effect, which have implications for reimbursement policy as well as competition policy. If there is a strong volume effect, policies should favor the concentration of PTCA procedures in a small number of hospitals or physicians. If this is not the case, policies favoring concentration of PTCA procedures may be inappropriate.

The main conclusions are as follows: (a) The volume effect operates not at the hospital level but at the physician level, (b) the volume effect is non-linear. Under a specific estimation specification, volumes above a certain level result in worse outcomes, so too much is as bad as too little, (c) risk adjustment is essential for the evaluation of the quality of health care, as risk factors such as shock and multiple occlusions vary considerably across physicians and hospitals, and (d) there are virtually no spillover effects and no independent organizational influence. The implication is that physicians learn by themselves. This does not necessarily mean that there is no role for peer groups, teamwork, mentors, and so on. Presumably, the authors say, it simply means that these effects are independent of volume.

In “Market Concentration, Efficiency, and Quality in the Japanese Home Help Industry,” Yanfei Zhou and Wataru Suzuki consider the effect of market concentration on the quality and cost of home help services. The authors point out that until quite recently the family network played the primary role in providing care for the frail elderly. However, changes in the social structure, such as weakening community ties, a cultural redefinition of the family nucleus, and an increasing number of women in the workforce, have raised both the financial and psychological burdens of family-based care for the aged.

In response to the expanding elderly population and the increasing demand for community-based–long-term care services, the Public Nursing Insurance Act (*Kaigo Hoken Ho*) was formally enacted in September 1997. Under this legislation, the Ministry of Health, Labor and Welfare (MHLW) introduced a new public long-term care insurance system in April 2000. This new system aims to respond to society’s major concerns about aging and to assure citizens that they will receive care, if necessary, and be supported by society as a whole. According to the MHLW statistics, the supply of care services expanded after implementing the insurance system. However, the effects of market-oriented reform on service quality and efficiency are unknown. It is unknown, for example, whether intro-

ducing competition by expanding the number of providers in an area can simultaneously improve the quality of service and management efficiency.

Zhou and Suzuki use cross-sectional data to investigate the effect of market concentration on the quality and cost of home help services. They focus on home help services because the reforms in this market have been dramatic, and the proportion of for-profit providers is one of the highest among the at-home nursing care businesses. The number of home help service care providers per thousand elderly is used as an index of market concentration. To evaluate the impact of market-oriented reform on service quality and efficiency, the authors consider whether care providers in unconcentrated (i.e., highly competitive) markets have a higher level of quality and efficiency than those in highly concentrated markets. The authors note that this information is also helpful for determining the appropriate number and scale of operations of care providers in each district.

According to the Survey of Nursing Care Management (*Kaigo Jigyō Kei Jita Chosa*) 2002 by MHLW, the higher the market competition (or, the fewer users per care facility), the higher the costs per care plan. This suggests that competition among care providers may lead to higher management costs, which is reminiscent of the “medical arms race hypothesis” in hospital industry research. The paper shows that this finding does not hold in the context of the home health industry when an appropriate econometric framework is used to control for the effect of other related factors such as the quality of service.

The major findings are (a) holding constant the scale of operations, region, and ownership, there is a positive relationship between market competition and quality of services only in the case of information services. This result shows that the impact of market competition on the quality of care service, if any, was quite limited in 2000, (b) contrary to the impression created by the descriptive results from the survey by MHLW, this analysis shows that competition is associated with lower costs. In other words, market competition induces cost savings in the home help care market, and (c) there is a tradeoff between quality and cost; running a subsidiary business has few cost-saving premiums; branch offices have lower costs than headquarters; and new providers and nonprofit providers incur higher costs than their counterparts.

The authors caution against generalizing their findings beyond the home help business, but find foundation for the concern that market-oriented reforms will sacrifice quality in the name of cost savings.

In “A Comparison of the Quality of Health Care in the United States and Japan: Treatment and Outcomes for Heart Attack Patients,” Haruko Noguchi, Yuichiro Masuda, Masafumi Kuzuya, Akihiko Iguchi, Jeffery Geppert, and Mark McClellan consider differences in treatment patterns and the relationship between treatment patterns and health care quality among AMI patients in the two countries.

Heart disease is the leading cause of death in the United States, and AMIs are directly or indirectly responsible for most of these deaths. In Japan, as in the United States, heart disease has become one of the significant causes of death. Perhaps more than one-third of those with heart diseases died of AMI in 1998. Though death from AMI remains less common in Japan than in the United States, the increasing incidence of AMI and the overall aging of Japanese society suggests that heart attacks may become a significant health problem in the future, much as cancer is now.

This study had several main objectives. The first was to create a data set containing information on treatments and outcomes among AMI patients in Japan, comparable to the Cooperative Cardiovascular Project (CCP) in the United States. The second objective was to investigate variation between the United States and Japan in the quality of health care for elderly patients (age sixty-five or over) with AMI, with respect to treatments and outcomes and controlling for chart-based detailed clinical information.

In this study, the authors divide medical procedures performed on AMI patients into high-tech and low-tech treatments. They define *high-tech treatments* as those with large fixed or marginal costs and *low-tech treatments* as those with relatively low fixed and marginal costs. Low-tech treatments, in principle, could be provided by virtually any medical facility. Both types of procedures are used widely enough to contribute substantially to patient outcomes and hospital expenditure.

The main conclusions are as follows. First, among elderly AMI patients the authors find significant heterogeneity both in the presence of comorbid conditions and also in the treatments received. This heterogeneity underscores the importance of utilizing a richly detailed data set when performing an observational analysis focusing on health outcomes. Second, after adjusting for chart-based patient characteristics and treatments received, the authors observe that high-tech treatments contribute significantly to improved patient outcomes and to increased hospital expenditure, but that the effects are much larger for the CCP than Japanese patients. Third, the aggressive use of intensive treatments soon after admission tends to improve patient outcomes in the short term, while it may lead to increased risks in the longer term. Fourth, a CCP patient who undergoes an intensive procedure tends to stay in the hospital longer compared to the one who does not, while a patient in Japan tends to have a shorter hospital stay, before and after, controlling for various characteristics. Finally, the CCP patients are more aggressively treated by beta-blocker use and smoking cessation than Japanese patients, but the authors observe that collaborative medical centers in the Japanese data tend to perform intensive procedures more often.

In “Geography and the Use of Effective Health Care in the United States,” Jonathan Skinner focuses on the variation in medical practice patterns across geographic regions of the United States. There is a growing

concern in the United States about shortfalls in health care quality. There are a wide variety of procedures that are proven to be effective yet are often used at rates as low as 50 percent. Examples of such effective treatments include the use of beta-blockers and aspirin for appropriate heart attack patients, annual eye examinations for people with diabetes, and mammography examinations for women over age fifty. On the other hand, there is evidence of overuse of procedures where they are not appropriate. For example, 20 percent of antibiotics prescribed in 1992 were used for common colds and respiratory tract infections, illnesses where the effectiveness of such antibiotics is questionable and may even be harmful. Only about one-third of angioplasties (PTCA) for cardiovascular disease are clearly appropriate, with about one-half uncertain and the remainder inappropriate. Technological advances in diagnostic methods to detect appendicitis, such as computerized tomography, have improved tremendously, but there has been no apparent decline in the rate of inappropriate surgery.

Skinner focuses on the underuse of effective procedures and, in particular, the remarkable variation across regions in the United States with regard to the use of such treatments. Geographical variation in quality of care is of interest for two reasons. First, it provides a snapshot of the degree of technological inefficiency in the health care system, that is, how much do some regions and hospitals lag behind best-practices available in other areas? It is not surprising that health care innovations take time to diffuse; physicians need to be trained in the use of new technology (perhaps through residency programs), and their use spreads as the newly trained residents diffuse to new practice areas. What is more surprising is the persistence of shortfalls in quality across regions.

To quantify the degree of technological “process” inefficiency in the United States, Skinner uses data from the *Dartmouth Cardiovascular Atlas of Healthcare* (2000) that, in turn, is based on a large detailed survey (with chart reviews) of more than 160,000 heart attack patients during 1994 and 1995. He finds that the average loss per heart attack patient, relative to best-practice care, is between \$1,500 and \$5,000 per year, depending on the benchmark used, the value of a life-year, and other assumptions. The measured inefficiency does not stem from specific skills of the surgeon, but instead largely reflects the use (or nonuse) of pharmaceuticals such as beta-blockers and aspirin.

Geographic variation is then used to estimate a reduced form model of technology adoption that depends on “supply” factors that might be expected to lower the cost of adapting the new technology, such as the prevalence of cardiologists—who are presumably most aware of new technologies in the use of health care innovations—and “demand” factors such as education, income, and the overall incidence of heart disease in the region. The author finds that supply factors are less important in explaining technology diffusion than expected, but estimated demand effects are signifi-

cant both statistically and economically. More cardiologists per capita is not significantly associated with higher rates of beta-blocker use, nor is there an association between cardiologist supply and the *average* quality use rate for beta-blockers, aspirin, reperfusion, and angiotensin converting enzyme (ACE) inhibitors.

In conclusion, the author says, there seems to be a missing link between the potentially large benefits of effective care for heart attack patients and financial incentives to pay for them. While beta-blockers may not be reimbursed directly by the Medicare program (and indeed cost just pennies per dose), other procedures with uncertain (or potentially negative) effects on outcomes, such as nonprimary angioplasty, or angioplasty for non-Q-wave heart attacks, are paid in full by Medicare. An intriguing question that remains is why physicians working in hospital settings do not comply with quality guidelines, given the large benefits in terms of patient outcomes.

Given the significant variation in medical treatment patterns and the geographic variation from best-practices—even within the health care system of one country—continued research on the differences in health care across countries would seem extremely valuable in assessing and improving quality in all countries.

Other Topics in Health Care

The final two chapters of the volume deal with selected other issues in health care in Japan and the United States. In “Does Caregiving Affect Work? Evidence Based on Prior Labor Force Experience,” Kathleen McGarry assesses the impact of caregiving on the labor force behavior of women. The United States General Accounting Office estimates that by 2040 there could be as many as 12 million disabled elderly. Based on current caregiving patterns, the vast majority of these needy individuals will receive care exclusively through informal networks of family and friends, most typically a spouse or child. Intuitively one would expect this caregiving to affect the labor market behavior of the provider; caregivers may reduce hours or exit employment entirely in response to the needs of an elderly family member. On an individual level, reductions in labor market activity would be expected to affect later financial well-being. Not only would there be the obvious decline in earnings and thus an expected decline in retirement savings, but also future pension benefits may be adversely affected as well. These adverse effects may be especially severe for women as they comprise the majority of caregivers and, perhaps for this reason, the majority of poor elderly.

However, it is not clear whether those who provide care do so because they are working fewer hours, or if they work fewer hours because of their caregiving chores. McGarry takes advantage of a longitudinal panel of observations on employment and caregiving to begin to address this issue.

She examines labor market behavior prior to caregiving and notes how it differs for those who subsequently provide care and those who do not. She looks both at short-term effects through changes in behavior over a two-year period and at more extended effects over a period of six years. Her measures of labor market attachment include employment status, hours worked, and expected retirement.

She finds surprisingly little relationship between previous employment and later caregiving. The results of her multivariate analysis show little relationship between labor market ties and caregiving later in life. Having a parent who needs care does not affect employment behavior, and lagged labor force participation does not affect current caregiving.

In "Conjoint Analysis to Estimate the Demand for Nicotine Replacement Therapy in Japan," Seiritsu Ogura, Wataru Suzuki, Makoto Kawamura, and Tamotsu Kadoda consider the demand for nicotine gum. Cigarette smoking is associated with such life-threatening illnesses as cancer, ischemic heart disease, cerebrovascular disease, and chronic lung disease. Passive smoking is also a risk factor for such diseases, and cigarette smoking is one of the most serious causes of premature mortality in Japan. It is estimated that about 95,000 Japanese die annually due to smoking-related illnesses, accounting for 12 percent of total deaths. Estimates of the annual medical cost due to smoking-related disease range from 5 to 15 percent of national medical expenditures.

In response to escalating national health care costs, particularly those of lifestyle-related diseases, smoking cessation has become one of the most important national health policy objectives. The MHLW established the "Committee on Tobacco Control for the 21st Century" in the year 2000 and was committed to a national no-smoking-week campaign. The ministry also established as an objective the provision of support to help smokers in all communities to stop smoking. The Japanese Medical Association has also conducted an antismoking campaign since 2001.

A significant proportion of smokers seriously consider quitting smoking. For example, according to the 1998 Survey on Smoking and Health Problems conducted by the Japanese government, 26.7 percent of current smokers aged fifteen and over want to quit smoking, and 64.2 percent of them want to quit smoking or reduce smoking. However, only a small fraction of them actually succeed on their own. Recently, however, smoking intervention programs, particularly those using nicotine replacement therapy (NRT), have been shown to be effective in other countries, such as the United States.

Nicotine replacement therapy is a method of treatment that helps smokers by alleviating the withdrawal symptoms associated with smoking cessation by replacing the nicotine. Two types of NRT products are available in Japan: nicotine transdermal patches and nicotine gum. Nicotine patches were approved by the MHLW in 1994, and nicotine gums were approved in

1999. Despite the effectiveness of the products, they failed to come into wide use in Japan as they were available only by prescription, and their costs were not covered by the public health insurance.

In September 2001, the MHLW approved nicotine gum (brand name Nicorette) as an over-the-counter drug. There immediately followed an extensive national campaign by the pharmaceutical company using TV, newspapers, and magazines. As a result, Nicorette is now widely recognized among smokers as well as nonsmokers.

In this paper, Ogura, Suzuki, Kawamura, and Kadoda estimate the demand for nicotine gum and examine the smoking cessation assistance policy with NRT using original survey data they gathered in late 2001. Their analysis is based on conjoint analysis (CA), a technique that is relatively new to the field of health economics.

Conjoint analysis is one of the techniques belonging to contingent valuation methods (CVM) used to estimate an individual's utilities from various choices, based on responses to hypothetical questions. Conjoint analysis was originally developed in the field of market research and psychometrics. It has been widely used in environmental economics and transportation economics, and it has been introduced into health economics. In Japan, CA has been used to estimate the demand for nursing, the choice of medical facilities, and the demand for medical care for minor illness.

The estimates obtained from conjoint analysis indicate that a 10,000 yen decrease in the price of nicotine gum (a price reduction of about 30 percent) would increase its demand by 16.5 percent, and a 100 yen increase in the price of cigarettes (a price increase of about 40 percent) would lead to an increase of 4.2 percent in the demand for nicotine gum. The analysis also revealed that if nicotine gum were sold from vending machines or convenience stores, its demand would increase by 3.3 percent. A cost-benefit analysis was conducted to estimate the consequence of a subsidy policy for nicotine gum. A 70 percent subsidy for the nicotine gum would cost the government 352.4 billion yen. The benefit of such a subsidy would be the reduction in smoking-related illnesses through successful smoking cessation. This would reduce annual medical insurance benefits by 67.6 billion yen. In five years, therefore, the government would be able to save 338.5 billion yen—almost equal to the cost of the original subsidy. A national health promotion program called Healthy Japan 21, established by the MHLW in 2000, established smoking cessation promotion as one of the most important policy objectives. The authors conclude that a subsidy for nicotine gum or insurance coverage for the gum could be a means of achieving that goal.

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