- Vigorously advocate the implementation of a health care system that is universal, portable, and renewable.
- Urge liability insurance carriers or state legislators through good samaritan laws to cover physicians who are willing to provide care to those for whom it is unavailable.

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# Task Force 5: Access to Cardiovascular Care: An International Comparison

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## Introduction

Wennberg and Gittelsohn (1) have demonstrated variability in clinical practice patterns, resulting in variable access to, or rates of, a variety of medical services and procedures. There is also variation in access to and numbers of services and procedures among countries, presumably related to the health delivery system, average per capita income and the cultural, political and social attitudes of different countries (2).

This report briefly outlines the health delivery systems and access to cardiovascular services in eight countries (Australia, Belgium, Canada, Germany, Japan, the Netherlands, Sweden and the United Kingdom) and compares the data obtained from these countries with that available for the United States. As a July 1991 article (3) in "The Economist" pointed out, "There are lessons to be learned from looking at different ways of paying for and delivering the goods. Instead of each country trying out its own experiments, they should be studying each other's for ideas and pitfalls."

The comparison of data among countries is difficult at best, and impossible at worst, because of the variability of accuracy of the data, and the difficulty in controlling for social, medical, cultural, demographic, economic, and policy differences among countries (4). In this Task Force report we have attempted to collect data directly from cardiovascular specialists. Whenever possible, these data have been substantiated through government, the Organization for Economic Cooperation and Development (OECD), or World Health Organization (WHO) data collections. We have not included outcome data; there have been no studies to date that have demonstrated a relation between quality of life and expenditures on cardiovascular services. We have not attempted to pass judgment, nor to determine the medical appropriateness or effectiveness, or cost-effectiveness of the data or the systems generating them.

A brief description of the country and health delivery systems, with specific reference to the cardiovascular services available, is listed for the eight countries in alphabetical order. Comparisons of collected data are expressed in Tables 1 and 2 and Figures 1 to 11, which follow the descriptions of the countries.

Table 1. Comparison of Access to Cardiac Care in Nine Countries

| | Australia | Belgium | Canada | Germany | Japan | Netherlands | Sweden | United Kingdom | United States |
|---|---|---|---|---|---|---|---|---|---|
| Population | 17.1 | 10 | 27 | 79.1 | 123.5 | 14.9 | 8.6 | 57.4 | 251.4 |
| CV mortality/ 100,000 in 1988* | 379.5 | 328.7 | 329.6 | 422.7 (1989) | 214.9 | 311.9 | 428.8 | 429.7 | 369.2 |
| % GNP Spent on health | 7.5 | 7.4 | 9.0 | 8.1 | 6.5 | 8.0 | 8.7 | 6.2 (no private) | 12.4 |
| % Health budget spent on CVS | — | — | 12.9 | 15 | 23.7 | 13.8 | 15.8 | — | 18.4 (1991) |
| Open heart centers (no.) | 24 | 25 | 33 | 40 | 400 | 13 | 7 | 46 | 826 (1988) |
| Open heart operations/100,000 (no.) | 85.44 | 79.3 | 63 (1989) | 48.9 | 16.2 | 84.2 | 75 | 42 (1989) | 261.8 (1988) (15)‡ |
| CABG procedures/100,000 (no.) | 62.9 | 66.2 | — | 33 | | 61.6 | 50.6 | 26.6 (1989) | 141.8 (1988) (15)‡ |
| Valve operations/100,000 (no.) | 14 | 7 | — | 9.6 | — | 9.2 | 17.95 | 8.3 (1989) | 23.3 (15)‡ |
| Congenital heart operations/ 100,000 (no.); waiting time | 9.1, 2 wk | 5.3 | 5.2 (0–12 mo) (1989) | 10.6 | 3; 3–6 mo | 7.8; 1.5 mo | 6.5; none | 4.4 (1989); 3 mo | 8 (15)‡ |
| Average wait for open heart surgery | (>2 mo) | 3–4 wk | 22.6 wk | 4 mo | 3–6 mo | — | 4–8 mo | 3 mo (2 mo–2 yr) | — |
| Cardiac cath lab centers (no.) | 40 | 53 | 49 | 170 centers; (230 labs) | 2,078 | 54 | 16 | 51 | 1,350 (1988) |
| Cath/100,000 (no.) | — | 296 | 236 (1989) | 255 | — | 117 | 113 | 102 | 373.5 (1988) |
| Average wait for cath | ~3 wk | none | 8.5 wk | 2–10 wk | 1–2 mo | 2 mo | 3–4 mo | (0.5–3 mo) | — |
| PTCA/100,000 (no.); waiting time | 23.1 (20 centers) | 55; 3 wk (25 centers) | 39; 11 wk | 14.4 (277.3 in 1989) (2–12 wks) | 16.2; 1–2 mo | 48.8; 1 mo | 12.8; 1 mo | 14.8 | 84.7 (1988) |
| Cases/yr per open heart unit | 34 to 1,500 | 320 (200–1,500) | 508 (1989) | 688 (200–2,500) | Total ~200/yr | 940 (600–1,000) | (650–1,100) | (200–1,500) | — |
| Cases/yr per cath lab | — | — | 1,247 | 755 | — | 315 | 200–1,500 | 400–3,000 | — |
| Adult cardiologists (no.; (no./100,000) | — | 454; (4.54) | 683 (87 > 60 yr); (2.54) | 2,300; (2.9) | 13,839; (11.2) | 410; (2.74) | — | 161 + 137; (3.46)§ | 12,119 (1989); (4.82) |
| Pediatric cardiologists (no.) | — | — | 55 | — | — | — | — | 40 | 884 (1989) |
| CV surgeons (no.) | 57 | — | 112 (22 > 60) | 340 | 1,701 | 62 | — | 150 | 2,459 (1989) |
| MD cost for triple CABG procedure (US$) | 1,163 Govt; 1,657 AMAs; i.e. 498 by patient | 2,728 | 1,584 | (8,686–14,810; hospital costs) | 3,131 (hospital costs: 22,363) | 1,581 | 2,452 | 3,460; private system (NHS costs: 8,600) | 4,834 (Medicare 4,015) (17)¶ |
| MD cost for elective cath for CAD (US$) | — | — | 450 | (1,185–1,480; hospital costs) | — | — | — | (NHS/hospital 1,730) | 864 (Medicare) (17)¶ |
| MD cost for PTCA (US$) | — | — | 800 | 3,555; hospital costs | — | — | — | (NHS/hospital 7,787) | 1,536 (Medicare) (17)¶ |

All data are for 1990 unless otherwise indicated. *Cardiovascular mortality per 100,000. International Classification of Diseases (ICD) codes for congenital heart disease, rheumatic diseases of the circulatory system, ischemic heart disease and cerebrovascular diseases combined. †Percent gross national product spent on health: data for the United Kingdom do not include private system costs. United States' 1990 data for Medicare payments (Poullier JP, Organization for Economic Cooperation and Development, personal communication). ‡Reference 15. U.S. only: number of open heart operations, number of coronary artery bypass graft operations, number of valve operations, number of congenital heart disease operations. §161 certified cardiologists, 137 internists practicing only cardiology (1988 data). ¶MD cost for triple coronary artery bypass surgery, MD cost for elective cardiac catheterization and MD cost for percutaneous transluminal coronary angioplasty. Conversion factors to U.S. dollars are based on closing spots from Commex (Chicago), September 13, 1991. #Reference 17. CABG = coronary artery bypass graft surgery; Cath = cardiac catheterization; CV = cardiovascular; GNP = gross national product; Govt = government; Lab = laboratory; LTC = long-term care; NHS = National Health Service; PTCA = percutaneous transluminal coronary angioplasty; — =

**Table 2. Payment and Access to Health Care Services in Eight Countries**

| | Health Care Insurance | Individual or Employer/ Employee Contribution | Private Insurance | Access to Services | Cardiac Surgical Units | Open Heart Procedures | Wait Lists |
|---|---|---|---|---|---|---|---|
| Australia | Compulsory | 1.25% levy on taxes. Patient pays 25% of hosp. costs, 15% out of hosp. costs | Yes. (50% of population have "gap" coverage for hospital services) | Unlimited (choice of MD by patient; limited in public system) | Limited by state | Limited by hospital budget | Yes |
| Belgium | Compulsory (85% of population). National Health Service, 98% enrollment | Employees (2.55% of salary, employers 3.8% of employee salary) | Yes. Information not available | Unlimited. System covers 75% costs except below certain level income (100%) rates for low income | Not limited | No | No |
| Canada | Compulsory national | No (except premiums in Alberta, B.C. and Ontario) | Very limited (covers drugs, ambulance, nursing home) | Unlimited (via MDs) | Limited by Ministry of Health | Limited by hospital budget | Yes |
| Germany | Compulsory (80% of population). National Health Services, 92% enrollment | Contribution proportionate to income. (Contributions range from 8%-16% of income.) Equal contributions by employee & employer | Available (cost containment legislation 1977) | Unlimited primary care physician, consultant requires MD referral | Limited by hospital global budgets and tightly by Ministry of Health permit | Limited by hospital budget | Yes |
| Japan | Compulsory | Premiums based on income | Yes | Unlimited in private system only | Limited by Ministry of Health | Limited by hospital budget | Yes |
| Netherlands | Compulsory below income limit (~52% of population). Virtually entire population enrolled | Employer/Employee rate income | Above income limit (~32% of population) | Unlimited 1st line, limited for 2nd line (hospitals) by MD | Limited by Ministry of Health | Limited by Ministry of Health | Yes |
| Sweden | Compulsory National Health Service. | 9.5% of cost paid by patient (15% of income tax used for health) | Limited | Unlimited | Limited by regional council | Limited by hospital budget & regional council | Yes. |
| United Kingdom | Compulsory National Health Service | Tax base | Yes | Limited via MDs | National Health Service, limited by regional health authorities. Private, unlimited. | Limited by regional health authorities (National Health Service). Private, unlimited. | Yes |




**Figure 1.** Cardiovascular disease mortality rate per 100,000 population (1988). In all figures the following abbreviations are used: Aus = Australia; Bel = Belgium; Can = Canada; Ger = Germany; Jap = Japan; Net = the Netherlands; Swe = Sweden; UK = United Kingdom; USA = United States of America. *1986 data. **1989 data (West and East Germany combined).

## 1. Australia

Australia is a country of 17.1 million people (1990), with a cardiovascular disease mortality rate of 342.4/100,000 (1989). In 1990, 7.5% of the gross national product was spent on health (5,6).

Funding for health services in Australia comes from four sources: The federal government (Medicare), the state governments (hospital services), private health insurance (hospital accommodation plus gap between Medicare reimbursement and agreed level of remuneration) and the private sector. Medicare is compulsory for anyone with residency status in Australia and there is compulsory tax contribution to Medicare.

Medicare funds most medical services and is itself funded through a 1.25% levy on all taxpayers and through federal government resources. Medicare payments are made to private doctors for all out-of-hospital services and to private patients being treated in a hospital. For medical services provided to private patients in a hospital, Medicare pays




**Figure 2.** Percent of gross national product spent on health (1990). *Data estimated from Medicare patients. **National Health Service data only; the private system is not included.

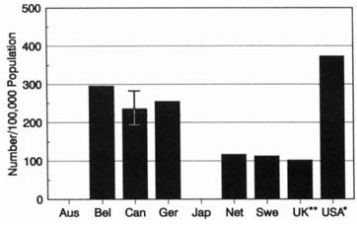



**Figure 3.** Cardiac catheterizations performed per 100,000 population (1989/1990). *1988 data. **National Health Service data only. Data not available for Australia and Japan.

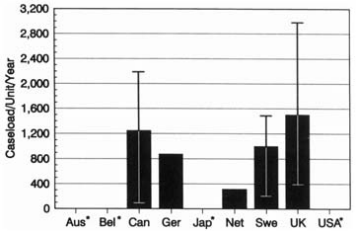



Figure 5. Cardiac catheterization caseload/unit per year (1989/1990). *Data not available.

75% of the government-set fees. For medical services provided outside the hospital Medicare pays 85% of the agreed fees. The federal government makes grants to states from the Medicare program, which the states use to provide hospital services.

Patients may choose to be admitted to state hospitals as public or private patients: as public patients, they pay nothing and doctors are paid on an hourly rate; as private patients, they are attended by the doctor of their choice, pay a daily charge and pay for all physician services. In the parallel system of private hospitals, patients are usually covered by private health insurance and doctors charge above the government rates.

Private health insurance is optional for all persons and is limited to paying only for the cost of accommodation in a hospital plus the gap between Medicare and the reimbursement set by the Australian Medical Association. The private insurer also pays the government-set accommodation fees in these hospitals.

**Cardiovascular services.** These services (7,8) are provided at 24 open heart surgery units and 40 cardiac catheterization laboratories (1990). Two large centers (Sydney and Melbourne) perform pediatric open heart surgery. Some pediatric surgery on older children is performed in adult units. Cardiovascular services may be obtained through state or private hospitals. Waiting lists for cardiovascular procedures can be avoided by paying in the private system. Only private patients have a choice of physician. Trend information for angioplasty and coronary bypass grafting is shown in Figures 9 and 10. The population at large in Australia is convinced that it has the best imaginable cardiovascular services. Cardiovascular specialists are generally satisfied with the system.

## 2. Belgium

Belgium is a small European country of 10 million inhabitants (1990), with a cardiovascular disease mortality rate of 328.7/100,000 population (1988) (5). In 1990, 7.4% of its gross domestic product was spent on health (5,6). National health insurance is obligatory for 85% of the Belgian population. For persons not insured by the National Health System, there is another social security system covering the cost of the most serious health risks. The insurance system covers 75% of the

**Figure 4.** Percutaneous transluminal coronary angioplasty procedures performed per 100,000 population (1989/1990). *1988 data. **National Health Service data only.

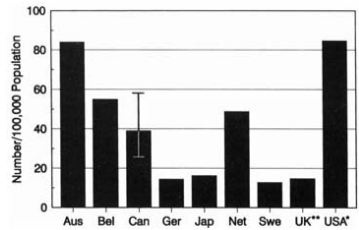
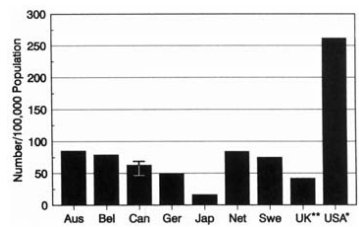



**Figure 6.** Open heart surgical procedures performed per 100,000 population (1989/1990). *1988 data. **National Health Service data.



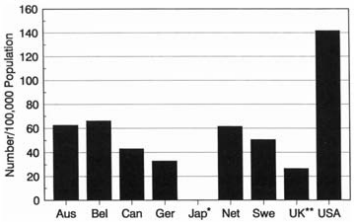



**Figure 7.** Coronary artery bypass graft operations performed per 100,000 population (1989/1990). *Data not available. **National Health Service data only.

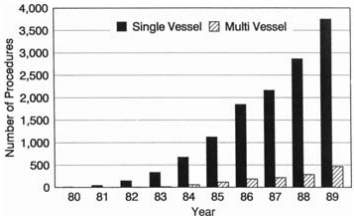



**Figure 9.** Number of percutaneous transluminal coronary angioplasty procedures performed in Australia (1970 to 1989).

costs except for persons with an income below the minimum level, for whom full restitution of costs occurs.

The National Health System is funded by contributions from employees (2.55% of their salary) and employers (3.8% of the employees' salary). The system is implemented by approximately 1,750 local health care funds or sickness funds, which are grouped into six national health care fund organizations. The sickness funds pay nonhospital-based physicians and hospitals on a fee-for-service basis. Although the National Health System is heavily subsidized by government, government rarely intervenes in the negotiation of fees or in the administration of the hospitals except by establishing the number of beds in hospitals.

The Belgium system is characterized by both patient and physician freedom. Patients are free to go to their family doctor, a private specialist, an outpatient department or a hospital for direct admission. General practitioners have no access to hospitals. Physicians are free to choose where to practice and which patients to see. Rates for hospitals and doctors are determined by the National Institute for Health Insurance.

**Cardiovascular services.** These services are provided at 25 open heart surgery centers, which performed on average 79.3 open heart operations/100,000 population in 1990. There are 53 hospitals with cardiac catheterization facilities, of which at least 25 perform angioplasty (personal communications to Dr. H. Huysmans from the State Institution for Disease and Disability Insurance: RIZIV). Cardiovascular physicians and surgeons are allowed to charge above the minimum rate set for doctors by the ministry. These additional costs are borne by the patient. An unknown but significant number of foreign patients are treated each year in Belgium. Decisions regarding coverage of cardiovascular services are made by the RIZIV. As of January 1992 a new law prevents the development of new cardiovascular surgical centers unless they do more than 200 cases/year.

The average Belgian citizen is satisfied because there is universal access to comprehensive cardiac services, including heart transplantation, with no significant waiting time. Any constraints in current services occur as a result of shortages of personnel (e.g., nurses). Cardiovascular specialists are reasonably satisfied with the present system.

**Figure 8.** Open heart surgery caseload/unit per year. *National Health Service data only. Figures for the United States are based on estimates from National Health Survey, Series 13, Survey of Discharges of Selected Hospitals, National Center for Health Statistics, Department of Health and Human Services, 1989.

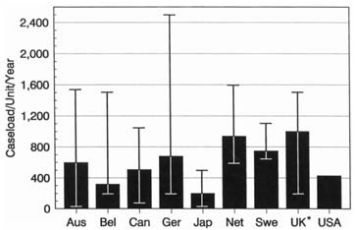
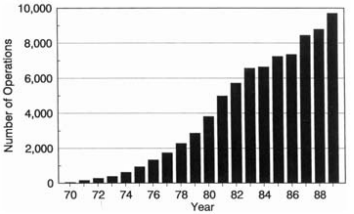



**Figure 10.** Number of coronary artery bypass graft operations in Australia (1970 to 1989).



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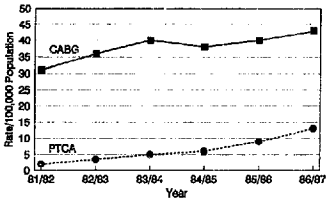


**Figure 11.** Rate of coronary artery bypass graft operations and coronary angioplasty procedures performed in Canada (1981/1982 to 1986/1987).

## 3. Canada

Canada is a country of 27 million people (1990), with a cardiovascular disease mortality rate of 329.6/100,000 in 1988 (5) and 308/100,000 in 1990 (9). In 1990, 9% of gross national product was spent on health (5,6) and 12.9% of the $80 billion health budget for the country was spent on cardiovascular services.

In Canada, health insurance (Medicare) is universal, compulsory and funded by taxation at federal, provincial, territorial and municipal levels, as well as from employer contributions. Standards for general health policy are set at the federal level, although the organization, delivery and administration of health services and their control are under provincial or territorial jurisdiction. Each province and territory, therefore, has a separate health insurance system that controls both inpatient and outpatient care, hospital planning and budgeting and payments to physicians and other health care workers. The system is comprehensive in coverage, accessible to all and must be publicly administered.

Most physicians are paid on a fee-for-service basis, except for some physicians in academic centers and in some aspects of public and mental health who are paid on either a salary or a sessional basis. Negotiations to determine the level of fee-for-service remuneration occur between the medical associations and the provincial or territorial governments. Billing above the predetermined level of fees is not permitted in any province or territory. Hospitals are funded directly by government on an annual global budgetary basis. Private insurance is available for comfort services in hospitals (private rooms, for example), ambulance services and prescription drugs. There is an increasing interest by governments and the medical profession in developing reimbursement methods other than fee-for-service, especially for academic centers.

Patients are free to choose the physician of their choice and vice versa. Patients have free access to specialists without referral from general practitioners, but when this occurs the specialists are paid at "general practitioner level." There is portability within the system in that patients visiting another province or territory are able to obtain health care services there with charges to their province or territory of residence.

**Cardiovascular services.** These services (9–11) are provided in 33 open heart surgery units and 49 cardiac catheterization laboratory centers for a total of 236 cardiac catheterizations/100,000 population (1989) and a total of 65 open heart operations/100,000 population (1989). There were 12 centers providing pediatric cardiovascular surgery in 1989. The majority of cardiac services are delivered in health science centers, which are part of or affiliated with academic centers. Cardiovascular services are planned regionally across the country. All medical and hospital costs of cardiovascular care, including transplantation, are funded through the Medicare system. The average wait is approximately 8 weeks for elective cardiac catheterization and 23 weeks for elective open heart surgery, though this period varies considerably from province to province. It is not possible to avoid the waiting list in Canada by paying, as there are no private cardiovascular centers in the system. Emergency or urgent cases are dealt with promptly by the system with prioritization on the basis of medically determined urgency. Most cardiovascular specialists are paid fee-for-service at government rates, though many of the cardiologists working in this area are at least partially salaried. Trend information for angioplasty and coronary bypass grafting is shown in Figure 3. Overall, the people of Canada feel relatively satisfied with their health care system, though complaints frequently surface about the timeliness of cardiovascular care. Cardiovascular care specialists tend to be less satisfied about their ability to deliver timely cardiac services to elective patients.

## 4. Germany

Germany is a country consisting of the former West and East Germanies (FRG and GDR) with a total population of 79.1 million people (1990) (12). The overall cardiovascular mortality rate was 422.7 per 100,000 population in 1989 (5,13). A total of 8.1% of the gross national product of the combined countries was spent on health care in 1990 (8.2% of the gross national product in West Germany in 1989) (5,6).

Germany has a national health system that covers 88% of the population, more than 80% of whom have obligatory coverage. Obligatory insurance applies to employees with an income below a certain level (U.S. equivalent, $2,710/month), their dependents and some other groups like unemployed people, students and persons with a handicap. The system is funded through income-dependent contributions (8% to 16% of income) half of which is paid by the employers and half by the employees.

The federal government sets guidelines requiring insurance coverage but implementation of the health system is

through a series of approximately 1,200 sickness funds that are independent of federal and state governments. Negotiation of budgets and fees between medical associations and the sickness funds is subject to government approval. State governments control the planning and capacity decisions of hospitals. The choice of a sickness fund is limited by residence and by occupation. Patients are free to choose any general practitioner or specialist registered with their fund and patients are free to change doctors within their fund. Only those people with incomes above a certain level may join a private health insurance plan. Access to specialists is through general practitioners. Physicians in ambulatory practices are reimbursed by the sickness funds on a fee-for-service basis. In hospitals which are part of the regional plan, physicians are paid on salary through the sickness funds, and the costs of hospitalizations are reimbursed to the hospital by way of a hospital day-price which is fixed on an annual basis. Private hospitals are allowed, in which case all costs are paid by the patient, most of whom have private insurance. In such situations physicians are paid on a fee-for-service basis.

**Cardiovascular services.** The capacity for cardiac services (14) is fixed on a regional basis by state governments through regulation of the budget for each specialty. For cardiac surgery, a fixed lump sum rate is made for every hospital. There is a limitation, through a permit system, on the number of centers performing cardiac surgery, although the actual number of procedures and the number of cardiac diagnostic centers and private clinics are unrestricted. There are a total of 40 centers performing open heart surgery and 179 cardiac catheterization centers with 230 catheterization laboratories. Of the 179 catheterization centers, 126 are performing coronary angioplasty. The majority of cardiac surgery centers are affiliated with universities, and many provide pediatric cardiac surgery as well. Cardiac transplantation is performed. As a rule, cardiovascular specialists are paid on a fee-for-service basis, whereas assistants are salaried. Waiting times have been reduced considerably over the past few years, resulting in few complaints about the system by either cardiovascular specialists or the public. There is some concern that within the regional health plans, implementation or dissemination of new developments is too slow.

## 5. Japan

Japan is a country with a population of 123.5 million (1990), with a cardiovascular disease mortality rate of 214.9/100,000 population (1988) (5). In 1990, 6.5% of the gross domestic product was spent on health; however, the rate of increase in spending on health on a per capita basis in Japan is the fastest among industrialized nations over the past decade (5,6).

Japan has a national health insurance system that is universal and compulsory but is composed of numerous separate health insurance plans depending on occupation and income. The health insurance systems pay 75% of costs of medical care to an upper limit of 50,000 yen/month (equivalent to approximately $373 in U.S. currency). The control and regulation of the health insurance system rest with the national government, although it delegates responsibility for day to day administration to the various health insurance associations or plans.

Most physicians are paid on a fee-for-service basis although hospital-based physicians are paid by salary. Hospitals are financed on a fee-for-service basis and must control their own capacity decisions. As a result, 60% of hospital beds are privately owned in Japan. Patients have the right to choose their physician; physicians do not have the right to refuse patients.

**Cardiovascular services.** These are provided in approximately 400 cardiac centers by approximately 600 cardiovascular surgeons. There are 2,078 hospitals that have cardiac catheterization equipment. It is known that a total of 20,000 patients underwent coronary angioplasty in 1990 (personal communication to Dr. H. Yasui from the Ministry of Public Welfare of Japan, Japanese Association for Cardiology, Japanese Association for Thoracic Surgery). In most centers in Japan, both adult and pediatric cardiac surgery are performed by the same surgeons. Cardiovascular services account for 23.7% of the overall health budget of government. Physicians and surgeons in cardiac departments are paid a monthly salary unrelated to the number of procedures. Prioritization for procedures is based on medical condition, determined by physicians. Transplantation is not funded because of differences in criteria for brain death.

Generally, there is satisfaction with the Japanese system, although there is considerable frustration among providers of cardiovascular services in terms of the limitations of numbers of procedures, and waiting times within the health insurance system. These waiting times can be bypassed in the private system.

## 6. Netherlands

The Netherlands is a country of 14.9 million inhabitants (1990), with a cardiovascular mortality rate of 311.9/100,000 population (1988) (5). In 1990, 8% of the gross national product was spent on health (8.1% in 1989) (6).

Two thirds of the population is insured under obligatory health insurance (persons with an income below a certain limit, plus a variety of other groups), and one third by private health insurance. Six percent of the population, mainly state employees, is insured by the public health care insurance system.

The health insurance system is funded through income-related contributions paid partly by employees and partly by employers, with no payment by those receiving income from government assistance. The private insurance system is funded by premiums. All forms of insurance cover all aspects of health care, except for costs of treatment of

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chronic disease, which are covered by a separate system for special health care costs.

The national health insurance system is implemented by regionally organized health care funds or sickness funds, administered by local councils, each of which negotiates with physicians under the supervision of a national committee. Many hospitals are state or community owned. The central and provincial governments plan the capacity and distribution of facilities and license new facilities.

General practitioners are reimbursed by capitation for patients insured by sickness funds and by fee-for-service for privately insured patients. Specialists are paid fee-for-service. In the public system, patients must see the general or family physician contracted by their fund and may only see specialists with a referral. In the private system patients are free to see the doctor and are referred to the hospital of their choice.

**Cardiovascular services.** These services (15) are controlled by the Ministry of Health and include 13 open heart surgery units and 54 cardiac catheterization laboratories, 12 of which perform interventional procedures. Between 1971 and 1986 the number of cardiovascular cases was determined by need, calculated by the Dutch Health Council once every 5 years, based on epidemiologic factors. Because the budget has been frozen since 1986, there are long waiting lists and waiting times, resulting in some complaints by the average Dutch citizen, who is otherwise happy with the health care system. All cardiovascular services defined as "no longer experimental" are included in the National Health Care system, and must be available to all patients. The decision as to whether a service is still experimental is made by the National Health Insurance Council, sometimes with the advice of special committees from the National Health Council. Cardiac transplantation is strictly limited to two centers and to a total of 50 cases/year for the country. Heart-lung transplantation is considered experimental and is therefore not funded (personal communication to Dr. H. Huysmans from Advisory Committee on Cardiac Surgery, Working Group on Interventional Cardiology, Dutch Society on Cardiology).

## 7. Sweden

Sweden is a country of 8.6 million inhabitants (1990), with a cardiovascular disease mortality rate of 428.8/100,000 population (1988) (5). In 1990, 8.7% of the gross national product was spent on health care (8.8% in 1989) (6).

The entire Swedish population is insured by the National Health System, which is financed mainly through a proportional income tax, with 9.5% of costs paid by patients. The National Health Insurance system is implemented by 26 county councils, each of which is responsible for the provision of health care to the inhabitants of that area. The national government makes only general planning and policy recommendations so, as with the provincial health plans in Canada, there are large differences among the county council systems in Sweden. The county councils are made up of elected representatives who make the decisions about the allocation and provision of health services. Hospitals are owned and administered by councils that set budgets and make planning and capacity decisions. Physicians are paid by salaries determined by county councils on the basis of the number of patients. Private practitioners may utilize the county facilities for a limited number of private patients; private insurance is available for these services but is very expensive. Private hospitals are few in number and treat mainly foreigners. Swedish citizens may be treated at private hospitals only if their condition is declared an emergency, in which case both physicians and the hospitals are paid county rates. Patients are assigned to a specific health center and hospital and seldom have any influence over which doctor treats them. Hospitals and doctors are paid directly by the county health system. Few doctors practice privately. All health care facilities have a yearly budget that limits capacity. If the capacity in one of the counties turns out to be insufficient and leads to long waiting times, patients can be referred to other counties or private institutions in Sweden or abroad.

**Cardiovascular services.** These are provided in seven open heart units and 16 cardiac catheterization laboratories, 7 of which are performing angioplasty. In those units performing open heart surgery, there is an agreement to perform no fewer than 500 or more than 1,000 cases/year in a given unit. There is essentially no difference in payment amounts between the private and state systems, with all cardiovascular services available to all citizens. Transplantation is not funded in Sweden. The average Swedish citizen is satisfied with the National Health System, although there are complaints about waiting times for cardiovascular services, and at least some support for privatizing parts of the health care system.

## 8. United Kingdom

The United Kingdom includes Britain, Wales, Scotland and Northern Ireland and consists of approximately 57.4 million people (1990), with a cardiovascular disease mortality rate of 429.7/100,000 population (1988) (5). In 1990, 6.2% of gross domestic product was spent on health through the National Health System (6), although this does not include all private health care costs.

The National Health System is based on the Beveridge model and consists of publicly owned hospitals and national control of the factors of production and delivery in health care. Ten percent of Britons have private insurance. Funding for the National Health System is entirely tax based and is divided among the Regional Health Authorities, which plan local health services and allocate funds to districts and hospitals. Reimbursement of physicians for outpatient services is on a capitation basis; hospital-based physicians are salaried. Patients are free to see any general practitioner, and general practitioners are free to accept or reject any patient. Access to specialists is controlled through general practitioners. Recently contractual arrangements have been

developed with groups of primary care physicians, and the equivalent of "preferred provider" competitive contracts have been negotiated between community-based primary care groups and hospital-based diagnostic and specialist physicians.

**Cardiovascular services.** These are provided through 46 open heart surgery units in the National Health System and an unknown number of private units. There are 51 cardiac catheterization laboratories within the National Health System, and an unknown number in the private system. Payment to cardiovascular specialists and for hospital costs in the private system is based on a fee-for-service system. There is no central planning for cardiovascular services in the United Kingdom. There are waiting lists within the National Health System and essentially none within the private system. The waiting lists can be bypassed by paying in the private system.

The public is generally accepting of the National Health System, in that those who might complain move into the private system. Cardiovascular care providers are frustrated at the financial and facility restraints within the National Health System.

## Summary

It is apparent that in most countries outside the United States, cardiovascular services are limited to some extent by government, often with the participation and advice of physicians and the public. In many countries, fee-for-service amounts are negotiated between physician associations and paying agencies, whether they are government or sickness funds. In virtually all countries studied, emergencies and urgent cases are determined on a medical basis. Additional centers for either cardiac surgery or catheterization have, in Germany, the Netherlands, Sweden, United Kingdom, Canada and Australia, been added on the basis of perceived need (physician and public input). In all countries studied, other than the United States, provision is made to provide cardiovascular services to persons unable to afford them.

Physicians in all systems remain free to make *clinical* decisions modified by "available resources." As constraints are imposed on resource allocation within the health care systems, the methods used in decision-making and by regulatory authorities are being reviewed in all countries studied. Initiatives to develop better methods to improve clinical decision-making through the establishment of practice guidelines, clinical audits and quality assurance methods are widespread in the systems compared.

In the United States, regulation of the minimum numbers of procedures required for competence and the minimum case load per catheterization laboratory or surgical unit may well free up sufficient resources to cover those parts of the American population not currently receiving cardiovascular services.

## Recommendation

We recommend that the American College of Cardiology collect cardiovascular data of this type on a regular basis.

The Task Force thanks the following contacts for their data gathering, time and cooperation:

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