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HEALTH TECHNOLOGY ASSESSMENT IN FINLAND

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Abstract

Finland has a long tradition of supporting social programs that promote equality and the welfare state. The healthcare system is financed mainly by taxation. Everyone is insured against illness. Each of Finland's five provinces is run by a provincial government that monitors the provision of social welfare and health care. However, the municipalities actually provide the services and regulate medical equipment and regionalization of services. During the early 1990s, gross domestic product (GDP) fell dramatically, and healthcare expenditure rose to 9.4% of GDP. Due to the economy's rapid recovery, the share of healthcare expenditure has again decreased and now matches the average level of OECD countries of approximately 7.7%. The former Finnish method of central planning and norm setting has guaranteed a fairly uniform development of necessary services throughout the country and free or low-cost access. Tight central planning did not, however, create incentives to contain costs. Therefore, in the beginning of the 1990s, decision-making power was largely decentralized to the municipalities, and the principles of state subsidies were reformed. In 1995, the Finnish Office for Health Care Technology Assessment (FinOHTA) was set up as a new unit of the National Research and Development Centre for Welfare and Health (STAKES). FinOHTA is intended to function as a national central body for advancing HTA-related work in Finland, with the ultimate goal of promoting the effectiveness and efficiency of Finnish health care. At present, the importance of HTA is widely recognized in Finland, especially in the face of rising healthcare costs.

Keywords: Technology assessment, biomedical, Delivery of health care, Finland

Finland, an independent republic since 1917, is located northeast of the Baltic Sea, and is bordered by Norway, the Gulf of Finland, Sweden and the Baltic Sea, and the Russian Federation. With land area of about 337,000 km^2 and a population of about 5.2 million, Finland is the most sparsely populated member state of the European Union (EU). The majority of the population is concentrated in the south and southwest, with about 66% living in urban areas. Low immigration rates mean that the Finnish population is for the most part culturally and racially homogenous. Finland has two official languages, Finnish and Swedish (about 6% of the population speaks Swedish). In addition, a small number of Sami speakers inhabit Lapland, the country's northernmost province (3;16).

Finland has a high level of economic and educational development: four-fifths of 25- to 29-year-olds complete secondary school. In 1998, women accounted for 47% of the workforce. The economy is based on services (66%) and industry (28%). In the beginning of the 1990s, Finland experienced a marked economic recession. Within a few years, the economy shrank by 15% and the unemployment rate increased from 3.5 to 19%. Economic recovery began in 1994, but the level of unemployment is decreasing slowly. Real gross domestic product (GDP) per capita at current prices was US $17,898 in 1996, slightly lower than the EU average.

Although Finland can be considered a capitalist democracy, its people have a long tradition of supporting social programs aimed at promoting equality. Consequently, the income gap is one of the smallest worldwide. In addition, poverty indicators are more favorable than in many other Western countries.

The president, who is elected directly for a maximum of two 6-year terms, is the head of state. Parliament has a single chamber of 200 representatives elected to 4-year terms. Finland is divided into five administrative provinces and the Åland Islands, which is autonomous. Many responsibilities, including health services, education, social assistance, and planning, are devolved by legislation to the country's 452 municipalities, which may levy a proportional income tax varying between 16% to 20% of gross income for all citizens (2). The state collects sales taxes and a progressive income tax, from which it subsidizes the municipalities. Municipalities account for roughly 40% of public spending, including two-thirds of healthcare spending.

HEALTHCARE SYSTEM

The supply of essential health services in Finland has been the responsibility of local authorities for centuries. During the 1950s and 1960s a massive network of hospitals was built. In the early 1970s, Finland had one of the highest numbers of hospital beds per person in the industrialized world. At that time, the limitations of hospital-based care were realized, and major legislative reforms were introduced in 1972 to develop public primary care. These included development of an outline for a comprehensive public health policy that covered inpatient and outpatient services, social services, preventive care, and health promotion. A uniform state subsidy and planning system was created to increase primary care services, particularly in deprived areas. This has reduced regional inequities in the provision of health care, which has shifted from largely hospital-based care to the direction of ambulatory primary care. From 1970 on, the total number of beds in hospitals, nursing homes, and old-age homes has fallen dramatically and is still decreasing, mainly due to shortening lengths of hospital stay and increasing ambulatory services (3;6;13).

During the last decade, the number of mental hospital beds has been reduced markedly due to a policy of deinstitutionalization. Simultaneously, the number of outpatient service visits has doubled but, because the number of staff in ambulatory mental services has not increased according to plans, public concern regarding the adequacy of current mental health services is rising.

Finnish health policy has developed hand-in-hand with World Health Organization (WHO) policy. The Health for All by the Year 2000 program, approved by the WHO and its Regional Office for Europe, and particularly its European application, has influenced the formulation of the national Health for All program. The program's main principles are:

- Consistency;
- Emphasis on equity in health;
- Importance of community participation and commitment;

- Emphasis on prevention and health promotion;
- Attention to all factors of health, not only to healthcare services;
- Cooperation among different sectors of administration;
- Health service reform; and
- International cooperation.

In 1982 the WHO and Finland signed an agreement for Finland to act as a "pioneer country" that would look to WHO strategy in its own health policy planning, make a serious commitment to that planning, and openly exchange information on its experience. As a part of the international health policy follow-up, the WHO Regional Office for Europe conducted an international review of Finnish health policy in 1991. Based on the feedback from that review, Finland's national program was revised, and the total process was evaluated in various international health policy meetings.

Previously, an overall national plan allocated all key resources for both primary health care and hospitals. Local authorities were only responsible for producing plans with nationally set guidelines. From 1993 onward, this planning mechanism was replaced by state subsidy block grants. The central government has little power to control resource allocation in municipalities.

In May 1998, the World Health Assembly endorsed the new World Health Declaration and the new global health policy, "Health for All in the 21st Century." The new policy builds on the previous one but incorporates new developments, such as implications of globalization, new policies in relevant fields, new actors, new disease patterns, and developments in medicine. Finland is currently revising its health policy for the 21st century.

Constitutional Basis

Universal access to medical care is guaranteed for all residents of Finland by legislation and provided for in public health centers and hospitals (12). Health care is mainly organized by municipalities and their coalitions. The share of the private service sector is 20%. The Ministry of Social Affairs and Health directs and guides the operating principles and development of services in social security and in social welfare and health. Together with the Council of State and Parliament, the ministry defines national social and health policy guidelines, prepares key reforms, and guides their implementation. It also provides links with the legislative process.

Every year the ministry draws up a national 4-year plan for the provision of social welfare and health care. In it, the Council of State indicates the national targets to be set by local authorities, but it does not impose binding rules on these authorities. The plan is approved by the Council of State in conjunction with the state budget proposal. The present plan for the years 2000–2003 is, for the first time, strictly connected to the overall policy plan of the government (8).

Legal and Legislative Background and Administration of System

Each of Finland's five provinces is run by a provincial government, which steers and supervises the provision of social welfare and health care. However, the local municipalities actually provide the services. Municipalities vary in population size from some hundreds to over 500,000 people (mean 4,834). Although the main basic services that local authorities must provide are prescribed by law, the scope, content, and organization of services are usually not, a situation that results in differences between municipalities. Under the provisions of the Act on the Status and Rights of Patients (1993), patients must agree to treatment and receive, upon request, information on their state of health, risk factors involved in a course

of care, and feasible treatment alternatives. Furthermore, patients have a right to see and correct the information contained in their records. They are entitled to know the duration of waiting lists and may lodge complaints when dissatisfied. Every institution providing medical care must also have an ombudsman to inform patients about their rights and to assist them, should they wish to submit a complaint.

Under the Patient Injury Act, patients are covered for bodily injury incurred in the course of health care or medical treatment. Indemnification is not dependent on an error, carelessness, or negligence on the part of the healthcare staff. However, compensation is not paid for injury in connection with medically justifiable medical procedures known to involve the risk of such injury. Health and medical care practitioners must all be insured against the risk of injury to patients.

Payment for Services

Everyone residing permanently in Finland, independent of nationality, is insured against illness. Residents pay a certain proportion of their insurance contribution out of their local taxes, and employers withhold a sum from salaries. People are paid a daily illness allowance as compensation for loss of earnings, and a rehabilitation benefit is paid on a per-day basis for treatment received. Insurance also covers part of the loss of earnings caused by pregnancy and childbirth. In addition, illness insurance covers a proportion of the fees paid by clients in the private health sector and part of the costs of medicines classified as indemnifiable and prescribed by a doctor or a dentist; it also reimburses some traveling costs to receive care.

Local authority health care (both primary and secondary) is funded partly by local taxes and partly by government block grants, the latter being dependent on the age–structure and morbidity of municipal inhabitants, population density, and the size and economic standing of the municipality. Until 1993, health center services were basically free. Since then, local authorities have been entitled to charge a nominal fee for services. However, this charge is not applied to those aged 15 or under, or to preventive health care (e.g., maternity or child health clinics or visits to a public health nurse).

Public hospitals, owned by coalitions of municipalities, are funded largely by local authorities, whose payments depend on the quantity and quality of services they purchase. Any unexpected or high-cost medical care incurred by a municipality is evened out by adjustments within its respective hospital district. Payments by patients offset only a small proportion of hospital costs. However, the total out-of-pocket share of households is alarmingly high—about 22% of the total healthcare costs.

In the 1980s, Finland's spending on health care as a proportion of GDP averaged that of other Western industrialized countries. However, as a result of recession in the early 1990s, GDP fell dramatically and healthcare expenditure rose to 9.4% of GDP. Since then healthcare expenditure has declined slightly as a result of austerity measures. Currently, with its economy recovering, Finland spends annually around 7.7% of its GDP on health care. Because of the economic strain caused by the rate of unemployment and the interest on state debt, it is estimated that the public sector will shrink during the years to come, and this shrinkage will curtail healthcare expansion.

Inpatient treatment accounts for 42% of healthcare expenditures, outpatient treatment for 33%, and medication for 15%; the remainder is used for administration and public investments. In 1998, 19% of healthcare funding came from government grants, 42% from local authorities, and 15% from illness insurance. Public sector funding totaled 76% for all health care, with the rest funded by users of the services (20%), and by relief funds, employers, and private insurance (4%). The trend during the last decade has been a steady decrease of government subsidies.

Organization of the System

Municipal primary care health centers provide most medical and health-related services for the population. They are set up either by single municipalities or in collaboration with neighboring municipalities. In 1999 there were 268 health centers in Finland's 452 municipalities. Anyone living in a municipality can seek care for any health problem at the local health center. According to the Primary Health Care Act (1972), the most important duties of the health centers, in addition to providing clinical care, include the integration and implementation of public and preventive health programs, running maternity and child health clinics, arranging for the provision of mental health services, and making medical rehabilitation available. Most health centers also have inpatient departments, over half of which are reserved for long-term care.

Health centers are also responsible for arranging home services within their respective areas. Everyone born in or after 1956 is entitled to dental care provided either by a health center or a private dentist. This right will be extended to the whole population in the beginning of 2001.

Municipalities are also responsible for providing specialized treatment for local people. Each municipality is obliged to belong to a hospital district, which is responsible for organizing specialized medical services and coordinating hospital treatment. In total, there are 20 hospital districts, most of which operate several general hospitals and mental institutions.

All citizens have access to hospitals but principally only through the primary care system. In emergencies, however, no referral is needed. Normally primary care physicians or private specialists refer patients to hospital outpatient clinics or to inhospital care, and hospital-based specialists can admit patients into the hospitals. The hierarchy of acute care hospitals includes regional hospitals, central hospitals, and five teaching (university) hospitals located in the cities of Helsinki, Turku, Tampere, Kuopio, and Oulu. The most complex medical procedures, such as organ transplants, are concentrated in a single hospital.

As mentioned above, the number of mental hospital beds has been in marked decline during the last 15 years, and the decline has necessitated an expansion of the corresponding community care system. Ambulatory care of the mentally ill is now given by psychiatric outpatient departments in hospitals, mental health offices, and health centers.

The public healthcare sector is complemented by private practice, which is concentrated in urban areas. The share of the private care is about 20%, regarding both volume and costs.

Private practice provides a significant proportion of outpatient specialist care and a small proportion of inpatient care. Nevertheless, only 5% of all active physicians work exclusively in full-time private practice, while nearly a third of all publicly employed physicians also conduct private practice on evenings and weekends.

All healthcare professionals must have completed a course of study in health care and must be licensed to practice in the field (and registered by the authorities). Professions in which practitioners are entitled to use a legally protected professional title as conferred by diploma are defined by decree. Names of those entitled to practice under the above requirements are entered into a central register. By the end of 1998, the register held the names of over 230,000 professionals, or 437 persons per 10,000 inhabitants. The largest group was registered nurses (25%) and enrolled and auxiliary nurses (25%). Finland has 1 doctor per 330 inhabitants and 1 dentist per 1,061 inhabitants.

Problems and Reform Proposals

Although life expectancy has increased by almost 15 years among both sexes during the last 50 years, there is still a large gender gap in health. By international standards, Finnish women's health is good, but that of men is poorer than in other Nordic countries. This gender inequality has been attributed mainly to the high rates of cardiovascular diseases,

unintentional injuries, and suicides among young and middle-aged Finnish men. Consequently, cardiovascular diseases have been a major target for community-based interventions, and mortality related to coronary heart disease has decreased by more than 50% since the early 1970s.

Despite this overall decrease, geographical differences still exist in the nation's health status, and the relative difference between the province with the highest and those with the lowest cardiovascular mortality has remained virtually unchanged for the past 20 years. There are also disparities in morbidity and mortality among different population groups. There is no apparent decline in these differences at present.

In international terms, total alcohol consumption is moderate in Finland. Yet heavy binge drinking is common and contributes to a high rate of suicide, violence, and unintentional injuries as well as to many social problems. Alcohol is the most common cause of death among men under 50 years of age.

The Finnish suicide rate is one of the highest in the world. It had increased drastically since 1985, but the economic depression did not accelerate that increase. A project aimed at finding motives for suicide and assessing prevention methods resulted in the establishment in the early 1990s of a suicide prevention program.

In the 1980s the primary healthcare system was increasingly criticized for its bureaucracy, poor access to care, poor continuity of care, and ineffectiveness. This criticism led to the establishment of two consecutive primary care demonstration programs in the mid-1980s to the early 1990s. The population was divided into small, geographically defined areas, usually with 1,500–2,000 citizens per area. Each citizen was assigned to one personal physician. The results of these "family doctor" projects were mainly favorable: access to physician services improved considerably. Furthermore, there were smaller increases in the total cost of primary health care in the demonstration area than in the control area.

Despite these improvements, there are still waiting lists for outpatient services in some parts of the country, and for certain elective procedures like invasive cardiology tests, coronary bypass surgery, and cataract surgery.

TECHNOLOGIES

The Ministry of Social Affairs and Health recently issued guidelines on health care in Finland (5). The stated goals are to ensure that all population groups have better access to health services, to stress the priority of outpatient services, to support smooth cooperation between primary and specialized care, and to give municipalities increased influence over service provision. Moreover, the ministry sees a need to strengthen the integration into the overall service system of both preventive work and cooperation between social services and health services.

In 1996 and 1998 the ministry has published two public health reports that have sought to give a compact overview of the prerequisites for good health, and which reported on actual health status as well as on major health challenges and trends (9). The reports have, among other things, considered the observed decline in cardiovascular mortality and the improvement of dental health in children as evidence of success in Finnish health care. On the other hand, the high number of accidental deaths and the high incidence of diabetes in children, alcohol-related accidents, deaths of young males, and mental health problems are causes for concern, as is the continuing health disparity in the population. Consequently, prevention is seen as an important area where continued emphasis is needed.

The Council of State has approved the latest national 4-year plan for the provision of social welfare and health care to the year 2003 (8). Special emphasis will be placed on preventive social and health policies, support of the balanced development of children

and adolescents, development of nearby services, mental health-related work, care of the elderly, social work, and the education and support of healthcare personnel.

Attempts to Channel Research

Healthcare policy research is financed by the Ministry of Social Affairs and Health, the Social Insurance Institute, the Finnish Academy, universities, and private foundations. Research activities include studies on the influence that various social factors have on the need for health services, the effects of health and social policy measures on equality and accessibility, and the relationship between health care and the national economy. In 1996 the Finnish government adopted a program to raise the level of research and development funding from 2.35% of GDP in 1995 to 2.9% by the end of 1999. For public research funding, this meant an increase of around 1,500 million Finnish marks (FIM) (EUR 250 million) in annual research spending. This program and the investment by the private sector in research and development have meant that the GDP share rose to 2.9% in 1998. Finland is now among the world's top countries in terms of relative research input.

Finnish research policy aims at a balance between basic research, postgraduate training, and applied research. Applied research and technological development have received most of the increase in the state's research budget in the 1990s, because faster returns on that investment are expected than with basic research. Resources available to universities and the Academy of Finland—the main sponsors of basic research—have decreased for basic research, whereas those of the Technology Development Centre of Finland have significantly increased, clearly becoming the priority. Universities responsible for basic research and postgraduate training carry out slightly less than one-quarter of all research and development in Finland. The share of university research funding has been growing slightly throughout the 1990s, while the share taken by state research institutes for sectoral research has declined. The private sector's share of research funding rose to almost 70% in 1998.

To systematize postgraduate education and supervision, a graduate school system, established in 1995, combines state-of-the-art research with training programs. Most of the 100 graduate schools are composed of active research units in several universities. Participants in systematic postgraduate education are selected by an application procedure, and the Ministry of Education pays their 4-year salaries.

With the aim of promoting university research, a network of Centres of Excellence was initiated in 1993, funded by the Ministry of Education. Research centers receive funding from the ministry via their affiliated universities. The research centers are selected by the Academy of Finland on the basis of scientific competition for a specific period. Some universities have also established their own Centres of Excellence and allocated funds to them.

Until 1993, education and research activities in the country's five university hospitals were subsidized by the state's block grants, which covered roughly 12% of their operating costs. Since then, all subsidies are based on quantified activities, such as number of graduating physicians, length of training for clinical specialists (in months) and nurses' formal education (in weeks), number of doctoral dissertations, and weighted number of scientific publications.

Regulation of Pharmaceuticals and Medical Devices

The National Agency for Medicines (NAM), working under the Ministry of Social Affairs and Health, maintains and promotes the safe use of medicines, medical devices, and blood products according to the EU directives and regulations. NAM performs preliminary examination of applications for marketing authorization (drug application), allows exemptions from processing and annual fees, and maintains the marketing authorization register. It

also maintains contact with the European Agency for the Evaluation of Medical Products (EMEA) and with other EU member states (10).

NAM's Pharmaceutical Department assesses applications for marketing authorization of medical products (drug application) and herbal remedies. The department evaluates pharmaceutical and chemical documentation, assesses pre- and postmarketing quality control, and looks at research relating to quality control activities, brand-specific approval, and batch-specific inspection of contraceptive devices. It contributes to the European Pharmacopoeia.

NAM's Pharmacological Department inspects and evaluates preclinical, toxicological, and clinical documentation; new indications; herbal remedies; and anthroposophical and homeopathic products. It gives special marketing licenses for nonregistered medical products and carries out laboratory monitoring of biological and microbiological efficacy and medical product safety.

To control the rapidly increasing costs of drug treatment, in 1995 the Ministry of Social Affairs and Health appointed a special committee to determine how to ensure a continuing supply of pharmaceuticals for those in need while containing pharmaceutical treatment costs. The committee prepared several proposals on how to affect both the pricing of pharmaceuticals and their use.

The Medical Devices Centre of the NAM carries out market control of medical devices and keeps product control registers. It assesses the applications for clinical investigations of medical devices and monitors the operation of conformity assessment bodies. It also takes part in the standardization of medical devices and maintains liaison with the EU program.

Healthcare Management and Monitoring

The Ministry of Social Affairs and Health, the Ministry of Finance, the Central Statistical Office, and the Association of Finnish Local Authorities monitor expenditures. Expenditures can be broken down according to individual institution or municipality, and according to what proportion of financing comes from the state and the municipality. The National Board of Medicolegal Affairs, the NAM, and the National Research and Development Centre for Welfare and Health (STAKES) maintain registers of healthcare professionals, institutions, provision of services, drugs, and pharmacies. Statistics on these resources are usually broken down into per-capita indices of resource density. The supervision by the central government is based on the principles of guidance by information.

Efforts have been made to prevent the rise of inadequacies, management through information dissemination has been intensified, and internal assessment and quality assurance have been increased in healthcare units. To improve management, the Ministry of Social Affairs and Health is targeting research and development activities more precisely, devising incentives for systematic education and training of healthcare personnel, and carefully selecting priorities (e.g., for the national plan on social welfare and health care).

Provincial governments continue to function as regional management and monitoring authorities. However, the ministry is trying to improve its own monitoring of the service system by developing real-time monitoring and statistical follow-up. It has drafted a bill establishing a Public Health Advisory Committee that would be responsible for development, coordination, promotion, and execution of healthcare policy, and for compilation of action programs on specific disease groups and problems (9).

Healthcare management and monitoring also extends to the private sector, including pharmaceutical supply. The ministry influences management over actors outside the municipal sector through legislation, through annual agreements made between the ministry and its administrative bodies and institutions, and through annual agreements made with provincial governments.

The ministry expects cooperation between expert bodies in health care and municipalities and supports the formation of a cooperative network. Of particular value is the

construction of on-line information systems that can be utilized to produce municipality-specific data to facilitate identification of service needs, which can then be followed up with service delivery. The ministry also financially supports development initiatives, especially where several municipalities work together on a project.

Utilization and Quality Control

About 70% of the adult population visits a healthcare physician annually. After controlling for morbidity, age, and sex, the most important factor affecting utilization is the doctor-patient relationship. Physician contacts are estimated to be 30% higher among individuals who see a particular physician than among those without a familiar doctor.

About 66% of the population purchase at least one type of prescribed medicine annually. In 1996 the number of prescriptions per inhabitant was 6.7, a figure roughly similar to that of other Nordic countries, taking into account different definitions in the statistics.

If the performance of the healthcare system is characterized by utilization rates, the Finnish population is served in much the same way as other European populations. According to a survey, 36% to 79% of the population considers the quantity and 44% to 83% the quality of the public health services appropriate, depending on the service in question. The satisfaction rate is greatest with physician services and maternity and child health clinics (15).

Standardized for age, sex, and morbidity, the same data show only small socioeconomic variation in the overall utilization of health services, although there are differences in the type and sector of services utilized. For example, specialized outpatient care and physiotherapy are concentrated in the upper-income groups. In addition, there is great variation among municipalities in the use of inpatient care, which can be largely explained by differences in service availability and in medical practices.

In the ministry's National Plan for 1995–98, STAKES was asked to prepare a recommendation on quality management in relation to social welfare and health care. Its purpose was to support quality management in social welfare and health care by encouraging quality activities, emphasizing client perspectives, providing examples of quality management methods, and clarifying concepts relating to quality.

The recommendations on quality management are directed at all individuals and organizations concerned with quality of social welfare and health: public and private service providers, workers and managers in social welfare and health care, clients and their families, social welfare and healthcare organizations, the population in general, and political decision makers. Specific quality legislation has not been considered necessary.

The organized providers (hospitals, health centers, and many private healthcare enterprises) have created their own quality policy by establishing programs, writing handbooks, and collaborating regionally in networks. The Finnish League of Physicians has given a quality certification to a number of laboratories and other healthcare units. Many providers have organized internal quality education.

Many municipal providers and private units offer a declaration guaranteeing clients a certain level of services, providing information about services offered and results. Follow-up data have revealed the changes in practice. Quality evaluations are compiled using questionnaires to determine patient/client satisfaction, internal and external assessment (audit), and reports of client ombudsmen. A future task will be to create databases that register client satisfaction and professional and management quality.

Problems and Proposals for Change

One of the national health policy's main goals is to reduce differences in health between social groups and regions. Unfortunately, some disparities have grown in recent years and,

although health differences between men and women have decreased somewhat, they too are still large. Similarly, the occurrence of disease risk factors differs according to population group.

Systematic differences in regard to smoking, alcohol use, and nutrition can be found based on region and group membership. The incidence of work-related diseases and accidents at work differs according to occupational groups. Health education and other measures taken by the community and society are needed to reduce these differences in health (5;7).

The prevention and treatment of diseases caused by the environment and research on such diseases are an increasingly important challenge to social, environmental, and health policies and to health care.

At the national level the infrastructure for planning investments, budgeting operational (personnel) costs, and human resource development is not quite coordinated. The Ministry of Education finances health personnel education and training. Municipalities in charge of organizing services (thereby determining the need for staff) have no say in higher education policy. The involvement of the Ministry of Social Affairs and Health in planning has also been rather limited. Investments for new technology are decided by municipalities. Educational policy and negotiations for remuneration are not well coordinated. Now that market forces are being introduced into the provision of health services, monopsonistic national labor negotiations and the formulation of educational policy need to be reconsidered.

Social welfare and healthcare statistics and central registers constitute important elements in the evaluation of work practices: there are, for example, registers for discharge/care notifications, for cancer, and from the Social Insurance Institution. These registers should be used more effectively for the reengineering of work practices, particularly in finding reasons for differences in practices and regional variations.

The quality of health services must be assured in the future, primarily through improved education and training for personnel engaged in health care, through legislation regulating the standards of competence for healthcare professionals, and by the overall structure of the healthcare system. Local quality assurance projects should be continued and developed.

Municipalities' competence in health services management should be improved. Moreover, it must be determined whether provincial governments should take a considerably more active role in healthcare management and what type of follow-up data and assessment information they should produce. Municipalities should invest more in continuing and supplementary education and training of healthcare professionals, with an emphasis on upgrading professional skills. Education and training should reflect the client population's service needs and be flexible in responding to changes in those needs. Maintenance of skills and acquisition of new skills based on developments in healthcare and information technology should be actively promoted.

POLICIES RELATING TO SPECIFIC TECHNOLOGIES

Preventive Healthcare Policy

The principles of preventive health care in Finland are based on the Health for All by 2000 program and Finland's national strategy incorporating the targets stipulated in that program. Changes in legislation have shifted responsibility for preventive health care from the state to local authorities, and have therefore increased the need for collaboration among authorities, voluntary organizations, and the business community at the local level (7).

Maternity clinics, part of the municipal health service network, seek to secure the health of the expectant mother, the fetus, and eventually the newborn baby. Around 99% of women attend maternity clinics for examination during the first 4 months of pregnancy: indeed, they must do so if they wish to qualify for maternity benefits after delivery.

Child health clinics cater to children from birth to school age, when the school healthcare system takes responsibility. School health care continues the course of vaccinations and health checkups begun in childhood. In university cities the health of the students is the responsibility of the Student Health Care Foundation. Employers are responsible for the provision of occupational healthcare services for their employees, with more or less optional arrangements for medical care and other health services. Employers receive compensation from the National Sickness Insurance for all necessary and reasonable costs incurred by arranging occupational health care.

Screening

Local authorities are obliged to provide cervical cancer screening for women aged 30 to 60 years and breast cancer screening based on mammography for women aged 50 to 59 years. The attendance rate for cervical cancer screening has been around 60–70%, and it has been 90% of those referred for breast cancer screening. Screening for cervical cancer started in 1966 and has resulted in a 75% decrease in the incidence of and mortality caused by the disease. However, the majority of cervical cancers are still diagnosed among women over age 65, who are not covered by the screening program. Screening for breast cancer began in 1987. It works as follows: screening every 2 years, age groups 50–59 years, free of charge, two projections, and two radiologists. From 1987 to 1994, 1.1 million women were referred for screening; malignant tumors were found in 3,503 women (0.36%) (9).

Immunization

The general immunization program in Finland covers the whole population, beginning with childcare in health centers and continuing in schools. High immunization coverage rates have been achieved for tuberculosis, poliomyelitis, tetanus, diphtheria, measles, mumps, German measles, and *Haemophilus influenzae* type b (Table 1). In total, the immunization coverage rate is among the highest in the world.

Table 1. Vaccination Schedule for Children and Adolescents According to the General Immunization Program in 1995

Vaccine	Age
HBV[a]	
BCG	<1 week
DPT I	3 months
DPT II, Hib I	4 months
DPT III	5 months
Polio I, Hib II	6 months
Polio II	12 months
MMR I, Hib III	14–18 months
DPT IV, Polio III	20–24 months
Polio IV, MMR II	6 years
Polio V	11 years
Td	11–13 years
MMR[b]	11–13 years
Polio VI	16–18 years

Abbreviations: HBV = hepatitis B; BCG = bacille Calmette-Guérin; DPT = diphtheria-pertussis-tetanus; Hib = *Haemophilus influenzae* type b; Td = tetanus-diphtheria; MMR = measles-mumps-rubella.
[a] Only to newborn babies of infected mothers at the age of 0, 1, 2, and 12 months.
[b] Only if the child has not received two doses of MMR vaccine earlier.
Source: Nohynek et al. (11).

Transplants and Implants

Solid organ transplantations began in Finland in 1964 with a kidney transplant. All transplantation surgery is performed at the Helsinki University Central Hospital. The actuarial survival rates of organ transplants for heart compare favorably with international results. Transplant operation activity is supported by the Scandinavian transplant register and by Nordic collaboration.

The NAM keeps implant registers. Of these, the Finnish Arthroplasty Register contains data on endoprosthesis operations performed in Finland since 1980. It provides data for the assessment and follow-up of the safety and technical life span of endoprostheses.

The Finnish Dental Implant Register contains dentists' reports of all dental implant operations performed in Finland since 1994. It includes the number of primary operations, number of dental implantations according to tooth location, length of the installed dental implant, trade name of the implant, and the reason for the operation or the revision (14).

Biotechnology

Biotechnology and molecular biology research have undergone major growth and transformation in Finland since the early 1980s. Widespread application of the basic research findings is projected to occur over the next 10–20 years. Since 1988, development programs have targeted special funding to top-rated research groups and have resulted in the creation of new research institutes. A special emphasis has been placed on the development of training and researcher exchange programs. There is no major focus for research, although the field of cell and molecular biology of animal cells predominates. It is notable that several centers carry out multidisciplinary work, and exclusive specialization in a certain research area is rare (1;4).

After 8 years of implementation, the biotechnology development program's outcomes were assessed by an international evaluation conducted by the Council of the European Molecular Biology Organisation (EMBO). The EMBO review concluded that Finland has a strong science base with several leading world-class groups, but that some organizational and structural issues need attention. There are some deficits in biophysics, structural biology, biocomputing, transgenic techniques, and areas of microbiology that should be corrected. The available funds seem to be appropriate, but in the future a majority should be distributed based on an objective peer-review process. Furthermore, according to the EMBO review, the teaching or clinical obligations of graduate students should be reduced to allow for an earlier doctorate degree. Moreover, a postdoctoral program should be introduced.

HEALTH TECHNOLOGY ASSESSMENT

In 1986 a working group set up by the Academy of Finland defined for the first time the general internationally accepted practice of medical technology as "all the preventive and diagnostic treatment and rehabilitation methods and practice applied in health care, including medical interventions, medicines, instruments and equipment used in health care and the organisational and administrative systems within which diagnosis, treatment and rehabilitation take place."

A second working group report on medical technology assessment, published by the Academy in 1988, considered the term "medical technology" misleading. It suggested using the more descriptive and comprehensive term "health care functions and technology." The report also stated that the need for assessment and assessment research has been prompted by rapid developments in medical science and technology, and the shift in emphasis from lengthening life to improving the quality of life. It recommended that a center for research and development in health technology assessment (HTA) be set up in at least one Finnish

university. While specializing in and concentrating on HTA research in Finland, the center would also examine the potential for initiating postgraduate studies, possibly in the form of a degree program.

In 1990 the National Board of Health appointed a health technology working group, which issued its report in 1992. The report broadly defined technology and the division of labor and training in regard to technology assessment work being carried out in Finland, the other Nordic countries, and EU projects. The working group proposed that a national technology unit be established at the Ministry of Social Affairs and Health and identified the need for a national team of experts on health technology representing different healthcare sectors. Their 1993 report, *A Research Programme for Welfare Technology: Developing Welfare and Primary Health Care Technology*, published by the Finnish National Fund for Research and Development, suggested that work could be carried out by the National Board of Health, the Helsinki University of Technology, the Technical Research Centre of Finland, and others.

In 1994 the Research Institute of Finnish Economics reported on the current state of technology research. It found that much research is being conducted at institutions and in various parts of the country, mostly by industry and business economists. There was, however, virtually no mention of welfare and health care. A Finnish working group for prioritization in health care stressed the importance of technology assessment in its report, *From Values to Choices*, also published in 1994.

Although quality assurance and technology assessment were considered important areas in national plans for the organization of social welfare and health drawn up in the late 1980s, they were later deleted due to changes in planning and downsizing of the administration. In the 1995–98 plan, these issues re-emerged, and STAKES was deemed to be responsible for quality assurance and HTA.

National and Regional Bodies

Although organizations such as university faculties and hospitals, other hospitals and health-care units, the Social Insurance Institution, and the NAM were already doing some HTA work, coordination and cooperation were lacking. Discussions informed by the reports mentioned above led to the establishment of FinOHTA as a part of STAKES in the beginning of 1995.

FinOHTA was intended to function as a central body for the advancement of HTA-related work in Finland, to act as a clearing house for accumulating, evaluating, and disseminating knowledge on assessment, and to promote national high-standard, multidisciplinary assessment research. It relies on the definitions of technology made by the Academy of Finland. FinOHTA concentrates on keeping abreast of technology assessment research being conducted both in Finland and abroad, dissemination of information, coordination of joint ventures, development of research and education in the field, and prioritization of the focal areas at any given time.

The office has six employees representing medicine, nursing, and economic expertise. In addition, FinOHTA regularly utilizes the services of three part-time consultants representing clinical medicine, primary care medicine, and biometrics. Since the beginning of 2000, FinOHTA has also been able to utilize 50% of the time of the Professor of Health Economics at the University of Helsinki.

FinOHTA's 26-member Advisory Board monitors health assessment activities. It develops proposals for national and international cooperation, for improved assessment training, and for the promotion, dissemination, and accessibility of assessment results. It also monitors FinOHTA's activities. The Advisory Board consists mainly of high-level senior representatives from universities, health care–related national institutions, hospital districts,

and medical societies; in addition, organizations such as the Consumers' Association and the Association of Manufacturers of Hospital Devices are represented.

FinOHTA's 13-member Scientific Committee, consisting of leading members of the country's medical-scientific community, looks at priorities in HTA and evaluates the quality and priority of assessment projects presented to FinOHTA. The committee may also make proposals on assessment areas and dissemination of information on assessment results. It supports and assists both FinOHTA and the Advisory Board in other areas dealing with HTA.

FinOHTA benefits from the expertise and resources of its parent organization STAKES, in having access to health and social services research, information services, logistical support, and international contacts. STAKES also houses the national Cochrane Collaboration Centre and maintains official health and social services statistics, registers, and databases.

Financial Support

FinOHTA is a government funded nonprofit organization and an independent public assessment agency. Its annual budget is decided by STAKES and the Ministry of Welfare and Health. During the 5 years of FinOHTA's existence, its annual budget has been approximately FIM 4 million (approximately US $750,000). Approximately 40% of the total budget goes to supporting scientific work dealing with HTA outside FinOHTA. The remaining 60% covers personnel, travel, information collection and dissemination, and international cooperation.

Level of Interest

FinOHTA's ultimate goal is to promote the effectiveness and efficiency of Finnish health care. It operates on the principles of impartiality, objectivity, and close cooperation with the entire healthcare field. FinOHTA must be certain that the knowledge it produces and disseminates really does serve the everyday practice of health care. It operates under the assumption that assessment calls for a multidisciplinary approach covering safety, costs, effectiveness, efficiency, quality of life, and social and ethical issues.

The goals of assessment are to consolidate the knowledge basis of health care, to improve its quality, to optimize healthcare processes, to create tools for controlling healthcare costs, and to speed up replacement of inappropriate, ineffective, and harmful technologies with effective, efficient, and useful ones.

Identifying the need for assessment is the first stage in the evaluation process. FinOHTA began its activities by directing a questionnaire to the entire Finnish healthcare field (hospital districts, specialist societies, and primary care health centers) in order to identify health technologies—both those regularly used as well as new ones just coming into use—in need of assessment. More than a thousand responses covered a range of concerns, from the costs of disease prevention to the treatment of flat feet and the use of magnetic resonance imaging. Regular check-ups, routine laboratory tests, and use of antibiotics were also considered appropriate assessment areas.

It is impossible for FinOHTA, a small office with limited resources and funding, to answer every call for technology assessment. The Ministry of Social Affairs and Health mandate has been to concentrate assessment activities on technologies that are important for the health of citizens or the national economy. Accordingly, FinOHTA established fixed criteria for grant applicants. FinOHTA has thus far participated in nearly 50 studies dealing with various aspects of clinical medicine (e.g., active rehabilitation of patients with stroke, cost-effectiveness of breast cancer screening, conservative versus operative treatment of lumbar disc herniation, assessment of telemedicine). FinOHTA also acts as a national clearinghouse by collecting, analyzing, synthesizing, and disseminating information on

HTA studies (national and international studies, diffusion of technologies, and identification of new emerging technologies). It makes relevant and timely information available to the Finnish healthcare system.

FinOHTA relies heavily on international collaboration. It has contacts with a number of foreign assessment agencies and has taken the first steps for practical collaboration on HTA projects with the Swedish Council on Technology Assessment in Health Care (SBU) and other Nordic assessment agencies. Collaboration with European assessment projects (EUR-ASSESS, HTA-Europe, ECHTA), the International Network of Agencies for Health Technology Assessment (INAHTA) and the International Society of Technology Assessment in Health Care (ISTAHC) have also proved fruitful.

Use of Results

The use of results aims to change existing healthcare practices where needed. Consequently, it is important to reach as wide an audience as possible. FinOHTA's main channel for dissemination of information is currently a bi-monthly newsletter called *Impakti*, distributed to all hospital districts and primary healthcare centers, as well as to certain political decision makers. It can also be ordered free of charge by anyone with an interest in HTA. *Impakti* contains brief reports of ongoing studies funded by FinOHTA as well as brief summaries of the results of studies completed by other assessment organizations. Longer summaries are sometimes published as separate documents and distributed to the same groups as the newsletter. *Impakti*'s current circulation is about 5,000 copies and is continuously increasing.

Publishing summarized results and articles on HTA in Finnish medical journals is another way of reaching the medical profession. One of the journals (the *Finnish Medical Journal*) has already created a regular section on assessment results.

Reviews commissioned by FinOHTA are usually published as separate reports both in Finnish and in English. Thus far, 11 such reports have been published, dealing with, among other telemedicine applications in Finland, formal assessment of telemedicine, national and regional patient registers in Finland, technology assessment in dental health care, and technology assessment in nursing. Some studies supported by FinOHTA are published in international scientific, peer-reviewed journals. For maximal coverage, results of these studies are also summarized in FinOHTA's own newsletter and circulated as reprints to other assessment agencies.

Participation in meetings and conferences, where results can be presented and discussed, is another way of disseminating information. In Finland, meetings are organized by groups such as the Finnish Medical Association, the Finnish Medical Society Duodecim, and various specialist societies. FinOHTA aims to take part in organizing meetings, and together with both national and international experts, to propagate new ideas. FinOHTA, along with other groups, organized courses on evidence-based medicine.

According to a recent survey, 29% of the Finnish population accesses the Internet at least once a week, and the proportion of those making regular use of the Internet is steadily growing. The World Wide Web (WWW) provides an excellent means of informing people who would otherwise be difficult to reach. On its own web pages (http://www.stakes.fi/finohta/) FinOHTA offers general information on HTA, ongoing assessment projects, and the organization itself, and provides an electronic version of its newsletter. In the near future, the Web pages will include a searchable database tied in to FinOHTA's library.

Involving Clinicians and the Public

To better involve clinicians in its work, FinOHTA has recruited 65 experts representing various medical specialties who will evaluate technology assessment–related project proposals

as well as participate in the evaluation and dissemination of results obtained elsewhere. Furthermore, they are expected to propose new topics in fields where they believe technology assessment is urgently needed in Finland.

Public involvement is mostly still in the planning stage. Suggestions to increase the public's knowledge about treatment and technologies include publishing patient guides and other educational material, perhaps in collaboration with patients' associations or the pharmaceutical industry (both of which are currently responsible for the bulk of the patient directed material produced in Finland). Some articles dealing with HTA have already been published in consumer newsletters.

DISCUSSION AND SUMMARY

Relative Success in Controlling Health Technology

FinOHTA has been operational for only 5 years. Consequently, it is difficult to assess its impact, let alone prove its success. However, clinicians' attitudes toward HTA have been mostly positive. The expectations regarding FinOHTA's key position in the future development of the Finnish healthcare system are strikingly high among the leading healthcare managers and decision makers. It is widely recognized that technology assessment is a necessity, especially in the face of rising healthcare costs. This has made it relatively easy to recruit key figures and opinion leaders in the medical community as FinOHTA's Advisory Board and Scientific Committee members.

Of the FinOHTA-commissioned studies so far published, the reports on telemedicine applications have gained the widest interest. Obviously, some hospital districts and primary healthcare centers facing outside pressure to utilize telemedicine applications are willing to wait for more concrete results from ongoing assessment studies before making their final decisions to purchase and install new equipment.

Another FinOHTA-supported study, which assessed the possible benefits of surgical treatment over conservative treatment of patellar dislocation, illustrated the differences in treatment in different countries. In Finland, primary patellar dislocation has traditionally been surgically treated, whereas most other countries use conservative treatment. In a well-executed, randomized controlled trial, it was shown that by most criteria, treatment results do not differ significantly between these two approaches. Consequently, it became evident that the common treatment strategy of primary patellar dislocation in Finland should be changed from a surgical to a conservative approach. Economic calculations revealed that the healthcare system could save an estimated US $1.9 million annually if the conservative approach were adopted countrywide. This highlights the importance of HTA and the need for efficient dissemination and implementation of results obtained through such an activity.

Mechanisms That Work Well

FinOHTA's policy of commissioning assessment studies to be performed by outside organizations and research groups has proved fruitful and has enabled it to launch and support nearly 50 scientific studies or reviews thus far. FinOHTA personnel, together with its three regular consultants, first review all project applications. The authors may be asked to revise the protocol (occasionally several times) before it is sent to the Scientific Committee, which decides whether the project will receive FinOHTA support. The decision is based on the protocol's scientific quality as well as the proposed study's importance to public health and the national economy. Although the whole process of evaluation is sometimes tedious and time-consuming, most protocols are greatly improved when reviewed by several assessors with a scientific background.

Mechanisms That Do Not Work Well

According to a survey conducted among FinOHTA's interest groups a few years ago, FinOHTA's activities were at that time still poorly known in Finland. This is no surprise, as it takes time and effort to make a new organization clearly visible. To be able to effectively disseminate knowledge about HTA and results from related studies, the organization must gain a solid reputation within the healthcare sector.

At present, FinOHTA is certainly better known that at the time of the abovementioned survey. Despite this, continued efforts are needed to establish the role of FinOHTA in Finnish healthcare and to guarantee economic support (which has not been growing according to original plans) for future work.

Finnish universities are not yet providing enough formal education on technology assessment. Consequently, general knowledge about its aims and methods is not well understood by the medical profession in Finland. This hampers the execution of well-planned scientific studies dealing with technology assessment. The shortage of health economy experts in the country further impedes this activity.

Suggestions for Change

While FinOHTA sees no immediate need for a change in its practices, it does see the need for more dissemination of assessment study results. Furthermore, the effect of these results on decision making and medical practice needs to be carefully monitored. This was also stressed in a recent international evaluation of STAKES, which, among other things, also emphasized the need for strengthening the activities of the unit by increasing the number of personnel.

To improve dissemination activities, FinOHTA is planning to recruit a few clinicians or other suitable persons from various hospital districts to actively inform their colleagues about new results. Arrangements need to be negotiated with hospital districts so that the clinicians can devote part of their time to dissemination activities. This means financially compensating hospital districts for time lost in the clinicians' regular practices. FinOHTA also must provide suitable material to facilitate the clinicians' efforts in disseminating results: this requires increased editorial expertise within FinOHTA.

Finland has many legally specified healthcare registers, which contain information on hospital discharges, local rates of different operations, and relative use of resources. FinOHTA aims to make better use of these registers to compare operative methods across the country and to identify regional differences in treatment practices that should be assessed. The registers will allow FinOHTA to document changes resulting from effective dissemination of assessment results. Comparing treatment results and methods, for example, within Europe might facilitate the recognition of local problems and lead to an improvement of health care in general. Such information should be available through the Internet, where all those interested could easily access it.

Formal education on technology assessment needs to be initiated in Finland. At the very least, medical faculties should include lectures on technology assessment in their curriculum. Cooperation on the European level to promote education and training in HTA could possibly take the form of European technology assessment schools.

Implications for Other Countries

For a small country like Finland, it is vital that results from assessment studies performed elsewhere are readily available. This can only be achieved through active international collaboration. FinOHTA has made it a priority to take part in suitable EU projects as well as those of both INAHTA and ISTAHC. Active international collaboration is also the only means to prevent the wheel from being reinvented, to ensure that technology assessment

agencies in various countries work in a coordinated manner, and to eliminate duplication of effort.

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