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ABSTRACT

The organization and functioning of Sweden's government controlled public health and health personnel educational systems are detailed in the report. The functions of the organizations involved in health care delivery are described. The delivery of health care is carried out at the county level. Regional hospitals provide more specialized services. Figures on in-patient and out-patient capacity, costs, and number of health care workers are presented. The organization of Skaraborg county is given as illustrative of welfare and medical services provided. Information collected by the National Center for Statistics and feedback from health personnel and hospitals form the basis for health planning accomplished at the national and regional levels. The educational system is discussed with reference to: (1) requirements for admission to State-run institutions of higher learning, (2) medical education and research at the universities, (3) education of physicians and nurses (detailed in various phases with the use of flow charts), and (4) education of other health personnel and new branches of education. Coordination between agencies involved in educational planning and long-term health planning is pointed out. Finally, the relationship between research and policy planning at various levels is briefly shown. (MS)

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PATTERNS OF HEALTH CARE AND EDUCATION IN SWEDEN

by
Anders TENGSTAM

The Ministry of Health
and Social Affairs
Stockholm, Sweden

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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PREFACE

Just as with so many facets of modern society, health care poses major developmental problems. Access to complete health care has come to be regarded as a right, and the last 20 years have seen an explosive growth in national systems of health care. At the present time they constitute major elements in our society, involving 4 to 6 per cent of the labour force and from 4 to 8 per cent of annual expenditure in most OECD Member countries.

Behind these signs of size and growth lie many riddles. Health care has achieved remarkable advances in terms of falling infant death rates, new treatments, and surgical wonders - yet there remain large pockets of society without adequate access to health care, and there is growing dissatisfaction with health care in its individual and human aspects. A lengthening life span and the complexities of modern society have created the need for new approaches to escalating socio-medical conditions such as ageing, chronic illness, mental illness, drug abuse, and alcoholism. To sustain the excellence of the present while grappling with these new problems, and to do so within reasonable limits of human and financial resources, is the challenge now facing the health professions.

New answers to new problems in whatever field inevitably call for personnel with different kinds of knowledge and skill. It was with this fact in mind that CERI in 1972 undertook a study of education of the health professions in the context of evolving health care systems, with the financial support of the Josiah Macy, Jr. Foundation.

The study was directed by a Group of Experts appointed by the Secretary-General of the OECD, Mr. Emile van Lennep. From the first, the Group addressed itself to certain basic questions: where are health care systems going, and why? Do these directions put new calls to our patterns for educating the health professions and occupations? Are there models of innovation that deserve to be followed up at national or international level?

The far-ranging results of the Group's study have been published under the title "New Directions in Education for Changing Health Care Systems" (OECD, Paris, 1975). Future health care, in the Group's view, will have a much stronger orientation to individualised,

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community-based primary health care. This reorientation will require professional personnel with new understanding and skills in social, psychological and management areas. The effectiveness of the reorientations and the speed with which it will come hinge on new partnerships between education and health care - partnerships forged at the regional level, and fostered by national and international policy clarification.

In the course of their study, the Group commissioned a number of special investigations dealing with important aspects of the health care/education interaction. The present document was prepared by Anders Tengstam, The Ministry of Health and Social Affairs, Stockholm, Sweden.

J.R. Gass
Director
Centre for Educational
Research and Innovation

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I. THE PUBLIC HEALTH SYSTEM

1. Organisation

All health and medical care services available to the public in Sweden come under Government control, but direct responsibility for most of these falls to the County Councils. There is also a fairly sizeable private dental sector and a small corpus of private medical practitioners. Until 1971, pharmaceuticals also were distributed by private firms, though under strict Government supervision. The pharmacies are now owned by the State.

In this field of health and medical care the State functions at two levels: first, the Ministry of Health and Social Affairs; secondly, certain main departments of the civil service, particularly the National Board of Health and Welfare. This division of Government activity between ministry and civil service departments is a special feature of the Swedish administrative system which has 300 years of tradition behind it.

The Ministry of Health and Social Affairs

The Ministry of Health and Social Affairs - often in direct co-operation with Parliament - determines the general lines of operation for the health and medical care services, making them effective usually through legislation or orders-in-council. The Ministry also prepares the Government budget, by means of which appropriations are allocated to activities within this same area. Two Government hospitals also come under the Ministry. These are the Karolinska Hospital and the Akademiska Hospital, both of which, however, are part of the health services organisations of the Stockholm and Uppsala County Councils and are largely financed by them. The Ministry has also a number of purely administrative functions.

The Permanent Committee on National Health Planning is a body under the Ministry which fosters co-operation and negotiation between the administrative and decision-making bodies of the health system.

The National Board of Health and Welfare

The National Board of Health and Welfare is the central point at national level for planning health and medical care, and social welfare work. It has general supervisory functions for health and

medical care in both public and private institutions; not only the County Council hospitals, but physicians and dentists in public and private practice also come under its control or supervision. The Board has many other administrative functions, including certification of physicians, midwives, nurses, and other health professionals. It represents a reservoir of expert knowledge in the fields of environmental hygiene, drug distribution and the like.

The Board's powers are not unlimited. As explained later, each County Council is responsible for planning within its own jurisdiction, and groups of County Councils have responsibility for the regional planning of health services. The Board can, however, influence County Council planning in a number of ways, e.g. by establishing hospital construction standards, determining priorities for building, and deciding on the numbers and types of physicians required to staff hospitals and health centres.

The County Councils

The functions of government are shared by bodies at national, regional, and district levels. In Sweden the regional level is the County, with its County Council; the district level is the Primary Municipality which is represented by the Municipal Council.

Normally, the County Council is the determining body for its own region; there are, however, three exceptions to this: the island of Gotland constitutes a single administrative area, and the municipalities of Malmö and Göteborg are outside the County Council system. This means that these three areas themselves are responsible for activities that elsewhere fall to the County Council. Thus at present there are 24 counties but only 23 County Council areas.

Under medical care legislation, the County Councils are responsible for providing medical services for the population of the county and for those temporarily resident there until they can be transferred, without risk, to the medical system in their home county. Medical care must be available both inside and outside the hospital system.

Other County Council activities are education and social services. Medical care, however, is the largest sector (Figure 1).

County Council activities are financed from three main sources: county taxation (54 per cent), government allocations, and charges.

The County Council's right to levy taxes is one of the main reasons for its high degree of independence. In this respect it differs from those counterparts abroad whose freedom is restricted by relatively small independent incomes with a consequent dependence on contributions from the central government (Figure 2).

Figure 1

OISTRIBUTION OF COUNTY COUNCIL EXPENOITURES, 1970

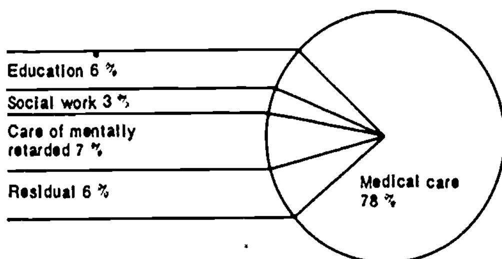
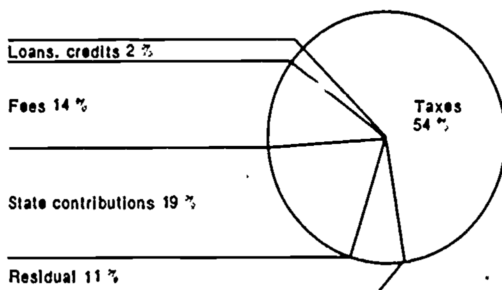


Figure 2

SOURCES OF COUNTY COUNCILS' TOTAL INCOME, 1970



The Federation of Swedish County Councils

The Federation of Swedish County Councils came into being in 1920 as the central organisation - free and independent of all other bodies - for the autonomous County Councils. Its function vis-à-vis the County Councils was fixed from the beginning as advisory, informative and supporting. Responsibility for framing the Federation's policy is vested in its Board which is elected by delegates from the County Councils assembled at regular congresses. Ultimate authority rests with these delegates.

The function of the Federation is thus to represent and safeguard the joint interests of the County Councils, to supply information on topical matters and, by means of recommendations and advice, to make it easier for the County Councils to deal with the various matters that concern them.

A considerable part of the Federation's work consists in the preparation and issue of statements, proposals and petitions to the Government, to other authorities and to parliamentary committees about a wide range of subjects, and participation in public inquiries and joint co-ordinating committees. As a result, the Federation occupies

a central position in such matters as, for instance, care of the sick where there are social, economic, organisational and personnel implications. Such experience and authority make it possible for the Federation to contribute on a nation-wide scale towards the framing of policy for medical care. Its concerns are virtually unlimited, ranging from structural changes associated with major medical care reforms to organisational changes within the various hospitals and other health care institutions. For social welfare work, care of the elderly and children and such like, the Primary Municipalities are responsible. These are represented at national level through the Union of Local Authorities which, in many respects, functions like the Federation of Swedish County Councils.

The Institute for the Planning and Rationalisation of Health and Social Welfare Services (SPRI)

SPRI was established in 1968 as a result of an agreement between the Swedish Government and a Foundation formed by the Federation of Swedish County Councils and the three communities outside the County Councils - Gotland, Göteborg and Malmö.

The purpose of the Institute is:

- to further, co-ordinate and participate in the planning and realisation of health and welfare services in Sweden;
- to gather and distribute information;
- to further the integration of health and welfare services;
- to approve standard specifications for hospital equipment;

It is called upon to study problems common to all or most of the County Councils and Primary Municipalities and thus avoid duplication of work. In fact, however, it has not yet worked with the Municipalities and the Union of Local Authorities is not represented on its Board.

SPRI's investigations involving the gathering and analysis of information are carried out by means of research projects inside or outside the Institute and through conferences with expert councils or special committees. As a result, it is in a good position to give advice to the public bodies responsible for health and welfare and to assist in programming the various components in the health delivery system.

The Institute's publications include reports on its own investigations, general advice and recommendations on planning and implementation procedures, and a series of papers giving norms and standards for all kinds of equipment and materials needed in the health delivery system.

The SPRI has a permanent staff of about 160. It is financed one-third by the Government and two-thirds by the Foundation. The Government appoints the chairman and 5 members of the Board, the Foundation appointing a further 10.

In the spring of 1972 the Institute established two subsidiaries: Spri-Konsult AB, for commissioned work, and Sjukvardens materielprovningsinstitut AB, for the testing of hospital equipment.

The Permanent Committee on National Health Planning

This Committee is chaired by the Under Secretary of the Ministry of Health and Social Affairs. Its members include: representatives of the Cabinet Office and the Ministries of Finance, Education and Interior; the Directors General of the National Boards of Health, Education, and Labour; and representatives of the Federation of Swedish County Councils, the Federation of Primary Municipalities and of SPRI.

The task of the Committee is to study the expansion of public health resources in the country and to promote co-ordination of public health planning.

The Committee also establishes national priorities for the allocation of capital investment and physician manpower to the health sector. These priorities are initially analysed, prepared and submitted to the Committee by the National Board of Health and Welfare. After discussion and endorsement by the Committee, they are then submitted, first to the Cabinet and then to Parliament, for annual approval. The priorities for capital investment for the last few years have been: first, ambulatory care; second, long-term facilities; third, psychiatric services; and fourth, acute somatic hospital services. As concerns physicians, the priorities have been to fill existing positions, to create new posts in ambulatory, psychiatric, and long-term care, and to develop new openings in postgraduate education - in that order. Once approved by Parliament, these priorities are used as guidelines by the state health planning and regulating bodies.

2. The Delivery of Medical Care

During the decades after the Second World War, the direction of all types of medical care was unified under the County Councils, who thus became responsible for both short- and long-term in- and out-patient care. Important parts of a growing preventive health care system also came within their function. The creation in the late 1960s of the new central government administration, the National Board of Health and Welfare, indicates the wish fully to integrate medical and social work from the highest national level of the Ministry of Health and Social Affairs down to field operations. The latter will be achieved with the full development of a system of health and social centres which are now being built all over the country. These will enable integration between the welfare work of the Primary Municipalities and the County Councils' out-patient medical care.

Capacity and cost

The number of beds available for in-patient services in the hospitals and other institutions is estimated at 135,000. This is roughly 16 beds per 1,000 population. Almost 90,000 of these beds are in somatic and psychiatric general hospitals; the 20,000 psychiatric beds are divided among general hospitals and a few remaining large mental hospitals. Somatic and psychiatric nursing homes contain 35,000 beds, and establishments for the mentally retarded almost 15,000. In 1972 there were about 1.4 million admissions to these beds. Most of the hospitals are publicly owned, although there are some small nursing homes (6,000 beds in all) that still belong to the private sector.

Out-patient services in general practice and specialised care amount to about 20 million visits to physicians annually. This is a relatively low figure, about 2½ visits per person per year, which is considerably lower than in the United States. About 50 per cent of these visits are out-patient consultations in hospitals, 25 per cent are out-patient visits to publicly-salaried physicians outside the hospitals, and 25 per cent to private practitioners. The work of private practitioners is concentrated in the larger cities; thus they cover almost 60 per cent of all out-patient visits in the Stockholm area, but less than 10 per cent in the area of Norrbotten, the most northern rural county.

The number of health workers engaged in the health delivery system has been steadily and rapidly increasing over the last decades (Table 1). In 1950 it was a little more than 80,000 (calculated on a full-time basis); now it is over 170,000. Of this total, physicians accounted for some 11,000; nurses, midwives, physiotherapists and other specialised auxiliary health personnel - 39,000; nursing aides and others - 69,000; personnel in institutions for the mentally handicapped - 5,000; dentists, dental technicians and dental assistants - 17,000; pharmaceutical personnel - 10,000; while there are 22,000 people in health administration, general and service work, and suchlike. Additionally there are 80,000 employed in municipal social and welfare work (1970 figures).

In large general hospitals there are about 130 employees per 100 beds, as against about 80 per 100 in the smallest general hospitals and less than 50 per 100 in small nursing homes.

The rapidly increasing number of people employed in the health delivery system has made it one of the largest service areas in Swedish society. The health and social services personnel together account for more than 250,000 employees, which is about equal to the diminishing number engaged in agriculture. In the future, the social and medical services will employ a larger portion of the population than farming and husbandry.

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Table 1

ACTIVE MEDICAL PERSONNEL IN SWEDEN, 1950-1970
(the figures are taken at the end of the year)

Year	1950	1955	1960	1965	1970
Physicians	4,890	5,700	7,130	8,520	10,560
Nurses	12,600	16,370	21,410	23 190	32,700
Nurse-Midwives	210	490	640	1,040	1,540
Midwives	1,350	1,290	1,060	720	620
Physiotherapists	1,090	1,380	1,790	2,310	2,600
Occupational therapists at somatic hospitals	50	150	210	420	660
Social workers at somatic hospitals	105	150	230	360	720(1)
Auxiliary nursing personnel in somatic hospitals	21,520	25,740	32,860	35,790	53,960
Nursing personnel at psychiatric hospitals etc.	7,890	8,930	11,000	12,870	14,950
Ditto at homes for epileptics and mentally retarded	2,220	2,670	3,870	5,430	200(2)
Administrative staff at hospitals	1,350	1,520	1,870	2,730	3,820
Domestic staff at hospitals	13,530	14,310	15,200	16,520	18,490
Dental surgeons	3,430	4,360	5,090	6,080	6,720
Dental technicians	1,500	1,600	1,850	2,300	2,670
Dental chairside assistants	3,400	4,400	5,090	6,800	7,500
Pharmacists	900	860	770	790	810
Bachelors of pharmacy	960	1,150	1,440	1,750	2,420
Pupils	20	25	40	620	280
Technical personnel in pharmacies	4,180	4,575	4,960	5,800	6,500
Total	81,195	95,570	116,510	134,040	167,650

1) Including hospitals for psychiatric care.

2) Excluding homes for mentally retarded.

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Since the health delivery system is a service area with most of the costs generated by salaries, the developments just described have resulted in rapidly rising expenditures. Over the two last decades, the total has risen from about 1.5 billion Swedish crowns to 12 billion. This figure includes a yearly cost of about 2 billion crowns for building and equipment. In 1970, 76 per cent of the total expenditure was met from County Council taxation; health insurance covered 9 per cent, patients' fees 1 per cent, and government and other reimbursements 14 per cent.

As concerns the patient, most of the immediate costs during a disease episode are covered by the National Health Insurance. He contributes a little more than 1 per cent of his salary (up to a certain limit) to this, paying it with his taxes. For this sum he is entitled to completely free hospital medical care, including laboratory tests and X-rays, and all medicaments during his stay. For out-patient care he pays 12 Swedish crowns per visit (including laboratory and X-ray tests) if he consults a publicly salaried doctor. If he chooses a private practitioner he pays the whole bill to him and is reimbursed by the local insurance office up to 75 per cent of the total if this does not exceed the scale of charges set by the system. However, a reform now being adopted will put most private practitioners under the National Health Insurance, and in most cases the patient's bill will then be limited to 20 crowns. For medicaments prescribed in out-patient practice he pays 50 per cent of the cost up to a total of 15 crowns and nothing more. There are a number of incurable diseases for which all medicaments are free; the same is true for venereal diseases.

Dental care for children and young people up to the age of 20 is provided free by a public dental service organised by the County Councils. This also covers the adult population, but to a limited extent. Additional dental care is supplied by private practitioners, all of whom work within a National Obligatory Dental Insurance Scheme. The reimbursement system for this insurance is somewhat complicated; but in brief, 50 per cent of the cost of dental care up to 1,000 crowns per treatment programme is reimbursed; 75 per cent of the cost exceeding 1,000 crowns per treatment programme is reimbursed. Preventive and health care measures are covered by the insurance to the extent of 75 per cent.

Present structure

The Swedish health care delivery system functions at two levels. The County Councils are responsible, each in its area, for planning, financing and running it; additionally, however, they support, by voluntary contracts, a small number of regional and more specialised hospitals for services they cannot economically provide in their own

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areas. There are 7 regional hospitals of this kind partly financed by the surrounding County Councils. Six of them are also university hospitals where physicians and other medical personnel are trained and medical research is carried out. The teaching and research are financed directly by the Government, but both come under the medical faculty of the local university. The medical professors are at the same time the heads of the clinical wards in the regional hospital. Other types of health personnel, such as nurses, midwives, and physiotherapists can alternatively be trained in the hospitals that come directly under the County Councils.

Complicated psychiatric and somatc illnesses of all kinds are thus taken care of in regional hospitals with about 30-40 medical specialties. Each county also has a district hospital with some 15-20 medical specialties, while at county level there is a varying number of general hospitals with a few specialties (internal medicine, general surgery, anesthesiology and diagnostic radiology) and some laboratory services. The system of psychiatric care is unde re-organisation and there are still a number of isolated, quite large mental hospitals. The future system will provide acute psychiatric wards in the general hospitals, day-time psychiatric care, and out-patient psychiatry.

Out-patient medical care is provided partly in independent health centres where smaller or larger numbers of doctors and auxiliary medical personnel work. Depending on geography, population size and communication facilities, these can have from 2-3 doctors (in that case, mostly general practitioners) to 15-20, of whom half or more are specialised (See Table 2). These health centres also have responsibility for preventive medical work, especially with mothers and children, and they organise out-patient care and long-term medical home care with the help of a field-organisation of home and district nurses. Long-term medical care is provided by small diagnostic units in the central general hospital of the county, their patients being in central or peripheral nursing homes. The peripheral nursing homes are small (50-100 patients) and they are sited in local communities so that their patients can be close to relatives and friends. These are mostly under the medical supervision of the health centre, whereas the larger central nursing homes have their own full-time physicians.

Experimentation with health centres is currently going on in Dalby, Tierp, Wilhelmina and Skara. The Dalby centre is concerned with the delivery of, and research on, primary out-patient care. Its research programmes are financed partly by the Ministry of Health and Social Affairs. The Tierp and Wilhelmina projects are carried out in collaboration with the County Councils, the Primary Municipalities concerned and the National Board of Health and Welfare. Their main objective is the co-ordination of medical and social services.

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The situation in the county of Skaraborg is a good illustration of the basic ideas that lie behind those health centres which are intended to provide the foci for the planned welfare and medical services in the County (see Figure 3). One is to be set up in every municipality, and, as well as being the centre of an organisation co-ordinating the health services, medical care and social welfare, it will offer an integrated medical care service.

Table 2

THE INTENDED NUMBER OF OUT-PATIENT CENTRES IN SWEDEN 1972-1978

(Running projection 1973)

Year / Out-patient centre	1972	1973	1974	1976	1978
with 1 physician	507	414	323	247	216
" 2 physicians	124	108	107	109	111
" 3 "	65	64	65	81	90
" 4 "	33	38	43	43	43
" 5-10 "	19	20	40	56	69
" 10 "	2	6	8	13	14
Total	750	650	586	549	543

When reorganising the medical and social services of the municipalities, the County Council established the following objectives:

1. To provide the local population with medical and social services which are to be qualified, specialised and adaptable to future changes.
2. To carry out examination and treatment of medical and social problems in close relation to the patient's normal surroundings, so far as financial and medical resources permit.
3. To offer a joint medical and social treatment programme.
4. To give better general service by accommodating doctor, pharmacy, insurance and other resources in the same building.

The medical and social welfare organisation of a municipality will be directly responsible for all medical and social care within its own district. This body will also see that on each occasion, the client is given adequate facilities at the health centre and at higher levels. Following the principle of "full treatment at lowest

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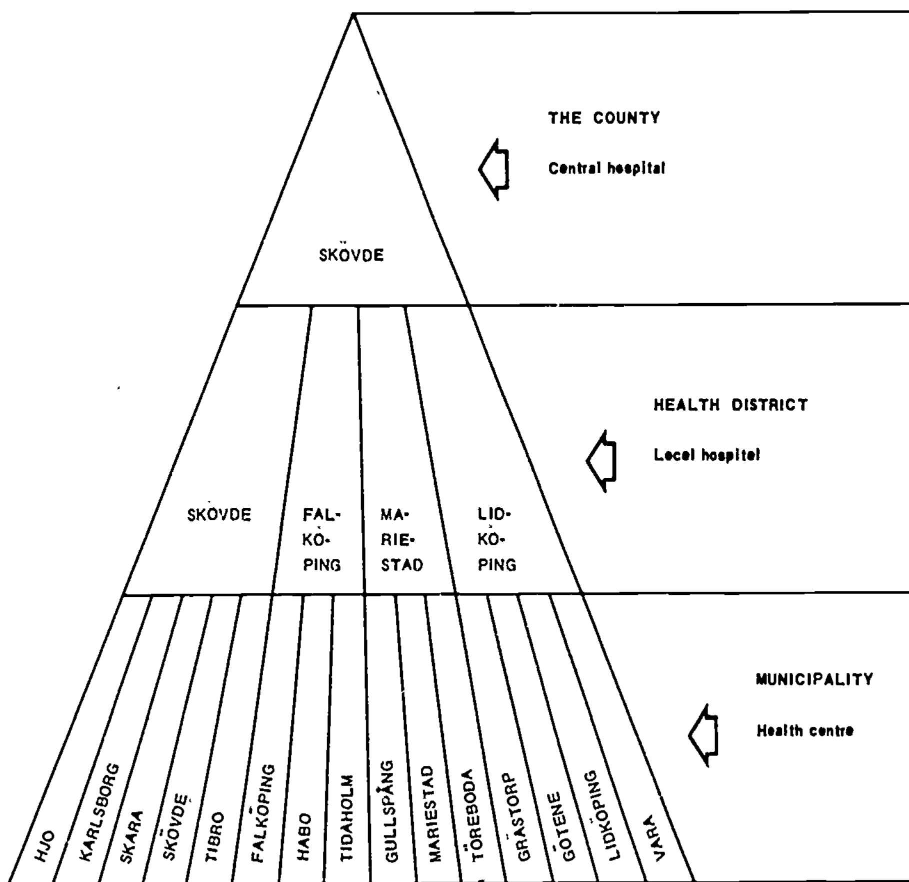
Figure 3

THE MEDICAL SERVICES FOR SKARABORG COUNTY



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possible level", the health centres are to push investigation and treatment as far as they can within their own institution, while patients receiving treatment at higher levels will be transferred back to their local welfare organisation as soon as possible.

The principal functions of the health centres are to be these:

- health and medical care;
- social welfare;
- pharmacy;
- insurance;
- vocational training and rehabilitation.

The Health Centre of Skara, finished in the summer of 1972, is already organised, and the following notes upon it may be taken to illustrate the likely character of the other municipal centres which are still in the planning stage.

Skara has about 17,000 inhabitants, 11,000 of whom live in the central municipality. The responsibilities of the Health Centre's staff have been assigned in the following way:

The general practitioners essentially handle patients with illnesses traditionally belonging to their field and in accordance with the principles of the Swedish Medical Association. Two of this group are under training; the others are already fully qualified.

The proportion of specialist time to be provided is not yet definitely settled. This can be done only when the local needs for such treatment have been investigated. The nearest specialised institution is the central hospital at Skövde, 25 km. from the central municipality of Skara. At present a pediatrician attends for three days a week for child health care and more specialised treatment of children. The paediatrician co-operates with a psychologist.

A psychiatrist attends for half a day a week as a consultant to the health centre. He also takes part in the teamwork.

The health centre will probably cater also for industrial medicine, but to a limited extent.

Three of the district nurses have service premises at the health centre. A fourth works in the municipality.

As to other health personnel, it is probable that special district work-therapists and physiotherapists stationed at the centre will use it as a base for their domestic services. At present a physiotherapist is working part-time there.

The position of the psychologist is not yet clearly defined. At present his work consists mainly of preventive child psychiatry. Other kinds of activity will probably be group therapy in co-operation with social workers, geriatrics, assistant nursing, students and so on.

One of the social officers is head of his branch and spends most of his time on administration, whereas his colleagues give most of

their time to direct work with clients. They all follow the "holistic", or "family", principle - that is, the same social worker handles a complex of problems, such as the husband's hard drinking, the wife's psychological troubles, the childrens' disturbances and the financial difficulties of the whole family.

The regional insurance office also has three expert posts for preparatory social analysis.

The health centre at Skara has been built in association with a nursing home mainly for geriatric cases. These two units have, to some extent, a joint-operation economy. It is natural to assume a certain degree of co-operation between the geriatricians of the nursing home and the medical and social staff of the centre.

3. Health Planning

A functioning health delivery system has to adapt to the changing health needs of the population. This adaptation should be a continuous process in which rapid information is needed regarding the inputs and outputs of the system. A long-term strategy for its organisational development should guide this process. The health objectives of the community at large and scientific progress are the deciding sets of factors.

The national level

The Swedish health delivery system is organised and directed by the County Councils. However, the National Board of Health and Welfare has the responsibility for planning at the national level. Here, the needs of the country are viewed in the perspective of available resources, especially increased personnel and finance for investment in buildings. This planning can be said to be qualitative in the sense that the Board, through its special scientific advisory committees (recruited largely from medical faculties), makes studies of the future development of the organisation of medical care in clinical disciplines and service areas. It is also quantitative, indicating the future needs for hospitals and out-patient institutions and for medical personnel, especially doctors required to staff the various sectors of the health delivery system. The results of these national studies are handed over to the County Councils as a guide in their own planning.

In 1973, after more than two years of intensive committee work, the National Board of Health and Welfare published a study of the future organisation of the health delivery system up to the 1980s. The principal points made in this report are the following, although, perhaps, we give more attention to those where priorities differ from ones that presently obtain.

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The need for acute somatic in-patient care for the foreseeable future is believed to be covered by the existing volume of hospital beds. Resources serving these beds will, however, be expanded for radiology and laboratory work. A reorganisation of psychiatric care is proposed, whereby the number of hospital beds will be greatly reduced, probably by one-third to one-half of their present number. This reduction means that the large, isolated mental hospitals will disappear. Acute psychiatric care will be absorbed into the psychiatric wards in general hospitals; long-term psychiatric care, which is believed to be diminishing because of intensified acute treatment, will be integrated with somatic long-term care. Some of the old mental hospitals will be rebuilt and will provide for somatic and psychiatric long-term care. Future expansion of psychiatric care will take place in day-time clinics in general hospitals and in a greatly expanded out-patient psychiatric organisation. Physicians in primary patient care will take part also in the care of psychiatric out-patients. The education of primary care physicians will in the future give greater attention to psychiatry.

Because of the increasing number of old people in the population the need for long-term medical care will be greater in the coming years. The study proposes an increase of at least 10,000 beds for long-term care over the next 5-10 years; this is about one-third of the present number. Around 70 per cent of the additional beds will be in nursing homes, some of which will be large central ones, but most will be small peripheral nursing homes sited in local communities. Medical care will be supplied by primary care physicians working in community health centres. The outline of an expanding rehabilitation organisation is also contained in the report.

A strong priority is given to the expansion of primary medical care in out-patient health centres. Some of these centres will be linked to hospitals (especially the district general hospitals) and to nursing homes. Most primary medical care, however, will be given in those unconnected with hospitals. These will have at least 2-3 physicians trained in general practice, perhaps with some special interest in, and training for, surgery and internal medicine. All primary care physicians will have had additional psychiatric training; they will also be specially educated in social medicine, and be taught to collaborate closely with the social workers of the local community. It is suggested that, so far as possible, the social centres in local communities should be located in the same buildings as the health centres. In any case the two sectors, social and medical, should function in an integrated way. In densely populated areas, health centres may be larger, with 10-20 physicians, a number of them specialists.

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It is planned that, in the health centres, child medical care and preventive child care should be provided by paediatricians, and maternity care by gynaecologists. The centres will also contain the dental clinics of the County Council, as well as personnel working with medical gymnastics and physiotherapy. It will also fall to the health centres to organise medical care in patients' homes with the help of a special staff of home-nurses and they will direct a staff of district nurses. In areas where industries are small, they will take responsibility for industrial health as well.

The County Council level

Within these general guidelines, the County Councils have started work on a comprehensive plan for the development and expansion of their health delivery systems. The blueprint for this plan was drawn up by the Permanent Committee on National Health Planning as instructed by the Ministry of Health and Social Affairs. The basic intention is to have a public health planning system with a structure that provides for a continuous feedback of information to the central authorities. The proposed system has three planning levels, for cycles of 30 years, 15 years and 5 years (a continuous review of plans is assumed):

- An outline for development over the next 30 years will be produced for the national level. This should contain a forecast of the future development of society on the basis of data provided by the central and regional authorities. An outline for the development of the health delivery system at County Council level is also to be produced, indicating activities that should be given long-term priority.
- For the 15-year prospective, the County Council should present a total plan for all of its activities with certain minimum objectives. It should also include a long range budget or a programme to illustrate the economic targets for the next 15 years. This budget should comprise operating costs, investment plans and financial plans. Health activities should be described in a specific way, giving targets and resource allocations for the various component items. The plan should show the total planned volume of medical care during the period as well as estimated total staff requirements and total annual expenditures. It will be reviewed every 5th year.
- The financing and implementation plan for the first 5 years of the overall plan represents the third level, and it should coincide in time with the County Council's overall 5-year budget. The allocation of personnel and economic

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resources among different activities and the means of financing will be reported for each year. The first year of this 5-year plan is identical with the financial budget for the next year. By comparing the actual annual costs with the programmed costs, yearly corrections can be made in the 5-year budget. This automatically results in changes in the long range budget.

Detailed guidance has been prepared for the County Councils to show how the plans should be worked out and the various components that should be included, and their preparation has already begun. Most of the plans submitted to the National Board of Health and Welfare for discussion already follow these guidelines. A year ago the County Councils presented a 5-year estimate of their future expansion for the health delivery system. This estimate covered all the data to be included in the new planning system. Thus, today there is a set of plans covering the period 1974-78. These do not meet the degree of precision required in the future, but it is hoped that by 1975 the County Councils will be able to present a set of plans that to a large extent will follow the guidelines given by the Permanent Committee on National Health Planning.

4. Information and Feedback

A continuous feedback of information is important as a basis for the national as well as the County Council's planning of the health delivery system. Hence, the construction of a statistical information system at both levels is of great importance.

The National Centre for Statistics, an independent agency within the government, collects information on the vital statistics of the country. The Division of Statistics of the Department of Planning of the National Board of Health and Welfare collects information, either annually or periodically, on, among other things:

- Medical manpower, including all health personnel;
- Out-patient care;
- Administrative and economic statistics;
- Care-planning lists; and
- Hospital discharges.

By law, every physician, nurse, and midwife, as well as other professionals and paraprofessionals, have to report annually their address and specialty. On the basis of this, a central manpower registry is kept by the division of statistics. Twice a year hospitals and other health care facilities report to this central registry on their manpower situation, with information on vacancies, retirements, and suchlike.

The out-patient care registry covers only the public sector. Personnel at the professional and paraprofessional level working in

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the public sector have to report annually the number of visits (by type, e.g. - first or follow-up visit) and the estimated percentage of their time spent in providing care, administration, and research or teaching during the year. These estimates are rough and subjective, recording the reporter's own impressions of how he used his professional time. It is worth pointing out that they refer to the total amount of service (i.e. visits) given annually and do not include the number of patients seen. The latter information is collected by the local insurance fund, which records the number of visits per insured person and the nature of each visit.

Each hospital produces an annual report of administrative and economic statistics which it sends to the County Council and to the Division of Statistics. This includes numbers of visits and admissions, occupancy rates, and aggregate costs for services and departments. A copy is also sent to the local insurance fund.

As concerns the queue for beds, the National Board of Health and Welfare collects information from the hospitals at three-monthly intervals. The raw material for these statistics is the so-called care-planning lists which enable the hospitals to utilise the outpatient facilities as much as possible before the admission of inpatients. The data sought include the number of patients registered in the care-planning lists with their priorities, and the number of registered and admitted patients since the last report.

Many hospitals voluntarily complete a form for each discharge. A discharge survey, based on these records, includes information on the civil, demographic, and employment characteristics of discharged patients, as well as diagnoses and the therapy given. A similar form is made out for deliveries. These forms are sent to the Division of Statistics, who publish regular reports, copies of which are sent back to the hospital departments. This survey is a voluntary one and 65 per cent of all hospitals in Sweden contribute to it. It gives very important information on the health needs of the population. From its lists can be deduced, for example, the disease groups most important for short-term and long-term care, and the different types of medical care services most needed. Ultimately, the survey should indicate long-term trends in the health needs of the country as a whole.

There are many other statistical facilities used by organisations both inside and outside the public health system. For these, data are gathered on such topics as professional personnel groups and expenditures. Thus, the Federation of Swedish County Councils has ready to hand information on running costs, costs of investments and expenditures.

The present statistical facilities, however, do not quite fill the need of the planning system. For the future, a more ambitious

scheme is being developed by SPRI, the Institute for Planning and Rationalisation of the Health and Social Welfare Services. This project involves a patient administration system (PAS) and includes data processing routines that can be generally applied to medical care. The "blocks" of PAS will include such data as patient registration, admission planning and a discharge survey, as well as economic statistics and data storage for analyses and production control. Work is also being done on a system for data processing in clinical chemistry and microbiology, and file handling. The PAS should be applicable to a County district, the operative data systems providing information necessary for the daily management of health care. Additionally, they will periodically discharge data to a system for long-term storage serving the regional level (about one million inhabitants).

II. THE EDUCATIONAL SYSTEM

A basic principle of the Swedish educational system, which is run almost exclusively by the State or local authorities, is to give all children and young people a chance of obtaining the education for which they are best suited. Every attempt has been made to eliminate geographical, economic, cultural, or social obstacles, and discrimination between the sexes. All school and university teaching is free. Children under sixteen receive children's allowances paid to the family, and students over sixteen receive study allowances. There is a special system of study grants for higher education.

Another principle is that children should be brought up in a democratic spirit. By and large, the traditional division of schools into different types each with different streams, has been abolished. Specialisation has been reduced. After compulsory school, it is intended that at least 90 per cent of students should choose to continue their studies in the integrated upper secondary school. This type of school was introduced on 1st July, 1971, when three previously separate types, the gymnasium, the continuation school and the vocational school, were integrated into "gymnasieskolan", containing 22 optional subject combinations.

Admission to an institution of higher education usually presupposes completion of a three-year course in an upper secondary school. In spring 1972 Parliament decided that, from the mid-1970s, students who have completed their studies in a two-year course should be qualified to enter post-secondary education. This expresses a third important principle of Swedish educational policy, namely that the system must be flexible. Those still at school must be able to change the direction of their studies without major difficulty. Any Swedish citizen must be able to improve and supplement his knowledge subsequent to his initial education. There should be no risk of anyone being excluded permanently from the possibility of further education.

In June 1969 the Government decided that adults over 25 who have worked for 5 years can take certain courses at university if they fulfil the special pre-requisites for them.

Post-secondary education is given mainly by universities and university-level colleges. In the academic year 1970/71 approximately

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120,000 students have enrolled in them. The necessary period of education there varies widely with the different types of course.

The faculties of theology, law, and arts and sciences in Swedish universities - the "free faculties" - are open in principle (with the exception of certain laboratory subjects) to all those who have completed gymnasium studies or received a corresponding education. Admission to some other branches of education, including medicine and technology, is restricted. In these fields, annual applications are far in excess of the places available.

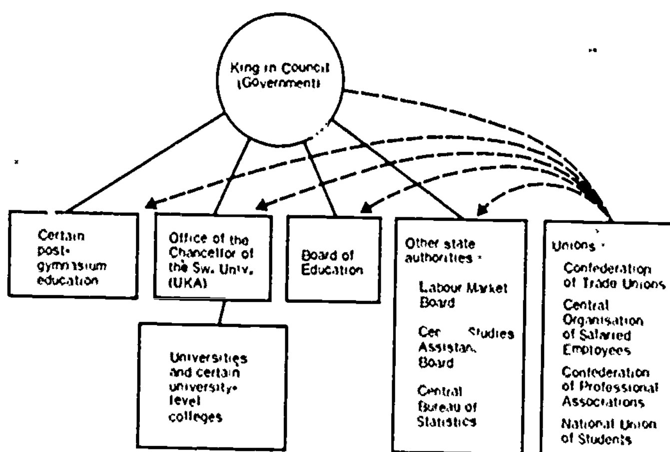
1. Organisation

The majority of institutions of higher education are under the Ministry of Education, whose 1972/73 grant for higher education and research amounted to 1,508 million Swedish crowns i.e. approximately 2.5 per cent of the national budget.

The Office of the Chancellor of the Swedish Universities acts as the planning and investigating governmental body for higher education. It is organised in five Departments: Planning, Training, Educational Research and Development, Administration and Organisation. Management and Auditing. All members of its Board are appointed by the government and among them are representatives of the various professional and student organisations. The Chairman is the Chancellor himself. Representatives of commercial and industrial life, professional organisations, administration, teachers, students and the like have a say on five Faculty Planning Councils which advise the Chancellor on, among other things, the universities' budget proposals (see Figure 4).

Figure 4

SCHEME OF RESPONSIBILITIES AND REPRESENTATION IN HIGHER EDUCATION IN SWEDEN



2. Education and Training for the Health Professions

The education of health personnel and related research and developmental activities are the responsibility of the State. Most training and research comes under the Ministry of Education and Cultural Affairs. There are two main departments of the civil service responsible for this: the National Board of Education and the Office of the Chancellor of the Swedish Universities. Medical education comes under the Office of the Chancellor. The education and training of other personnel groups, including nurses, comes under the National Board. Responsibility for the training of physiotherapists is at present divided between the two departments.

Education and research at universities

As already mentioned, there are several advisory bodies concerned with planning (Faculty Planning Councils) within the Office of the Chancellor. One of them is responsible for education and research in the medical, dental and pharmaceutical fields.

Medical education in the universities is the responsibility of the faculties of which at present there are six, admitting a total of 1,026 students a year. These faculties have special committees that deal with problems of undergraduate medical education and training for research.

The organisational units for education and research at university level are the departments (or institutes) - for example, the Department of Medical and Physical Chemistry, the Department of Internal Medicine and so on. The departments concerned with clinical subjects are all situated in university hospitals. Most of them are directly associated with the corresponding hospital department, the professor being administrative head of both the academic and the hospital unit. All university hospitals belong to the County Councils, with the exception of the Karolinska Hospital in Stockholm and the University Hospital in Uppsala which are state-owned. Professors, other teachers and research scientists are appointed by the government on the suggestion of the faculty. There is a special agreement between the State and the County Councils that regulates the use of the non-state-owned university hospitals for education, training, and research. Special government grants are made to the hospitals that provide these facilities.

University departments in Sweden are also responsible for basic research, for which funds are made available from the university chest. Additionally, there are national research councils, such as the Medical Research Council, covering the medical, dental, and pharmaceutical field, that give supplementary support to research on application by the scientist who is undertaking it.

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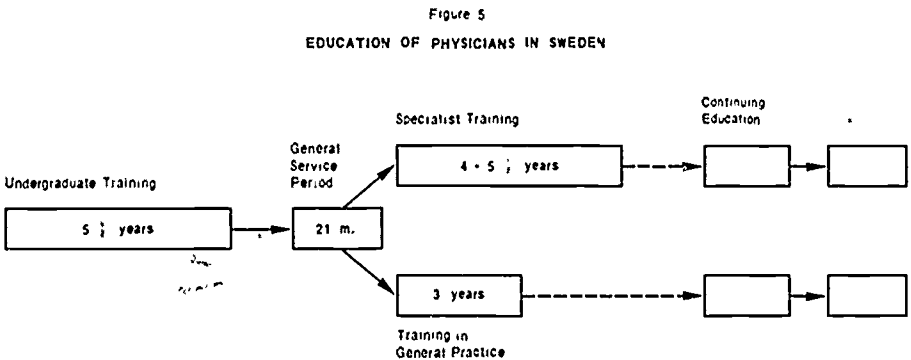
The education of physicians

Responsibility for directing undergraduate medical education lies with the Office of the Chancellor of the Swedish Universities. The National Board of Health and Welfare has representatives on the Medical Faculty Planning Council who advise the Chancellor on the curriculum and the types and methodology of practical work that should obtain.

Figure 5 shows the basic scheme for training physicians in Sweden. This includes not only undergraduate education in the universities, but post-graduate specialist training, and continuing education that together complete the education of a physician for work in a special field of medicine.

Figure 5
EDUCATION OF PHYSICIANS IN SWEDEN



Undergraduate teaching should give a basic education, common to all physicians, after which specialisation can follow. The student leaving the university is not yet, of course, fitted for practice in an independent position and he must take further training appropriate to the type of medical work he wants to do in the future. Efforts have been made to shorten the basic undergraduate course and to strengthen its scientific content in response to the need for increased specialisation in the total physician workforce. As a result, more of the behavioural sciences have been introduced; the content of preventive and social medicine has been increased; and stronger emphasis has been given to the importance of out-patient treatment in all sectors of the health delivery system.

Responsibility for the post-graduate training of physicians lies with the Committee for Post-graduate Training of Physicians in the National Board of Health and Welfare. In this committee there are representatives of the medical faculties, the Office of the Chancellor of the Swedish Universities, the Swedish Medical Association and the Swedish Society of Medical Science, the County Councils and, of

course, the Board itself. It is important to note that the leadership of this Committee rests with the Ministry of Health and Social Affairs and the National Board of Health and Welfare; all interested parties, including representatives of physicians themselves, are, however, included in the directing body and take part in its decision making.

The policies for the post-graduate education of physicians are intended to insure that all physicians in Sweden will have training in the classical specialties and the specialised lines of primary medical care. Additionally, its internal sequence must be arranged to suit the needs of the different service positions the physician will occupy after finishing training. It is, in fact, one of the most important instruments - both in qualitative and quantitative terms - for directing young physicians towards those fields of work that are of most interest to the country.

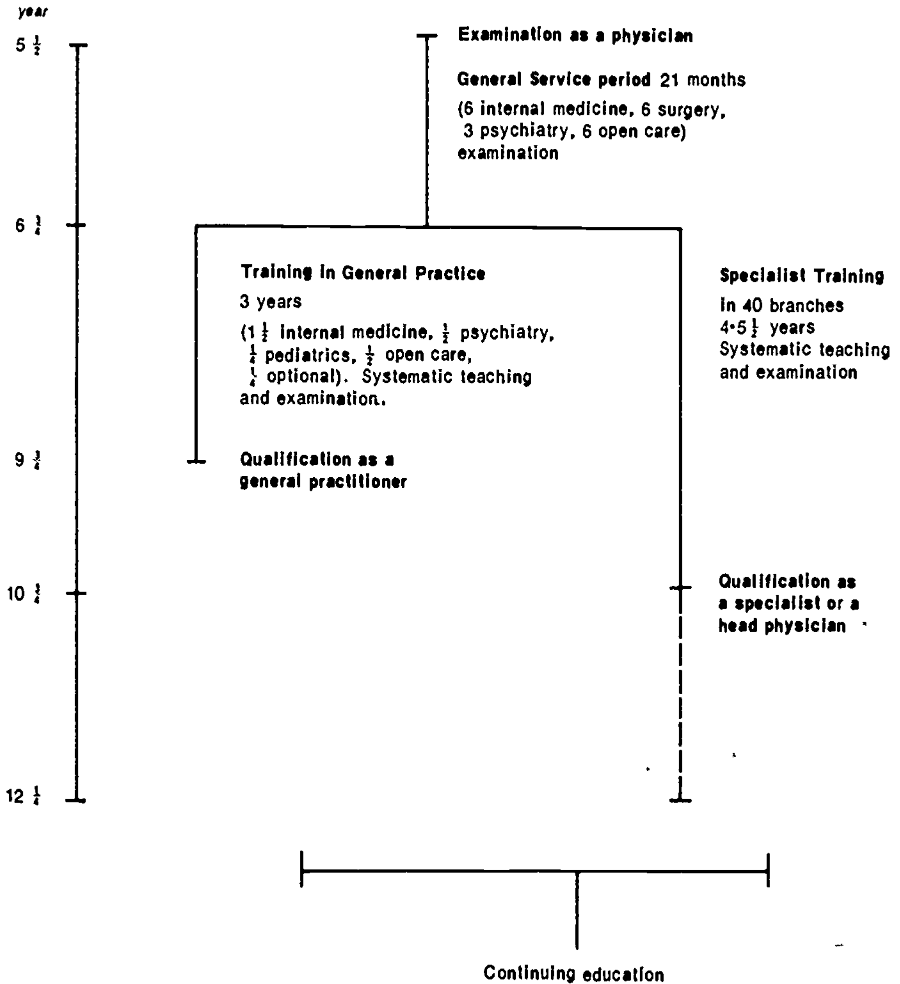
Since 1969, Sweden has followed a new pattern of post-graduate training. The medical examination after 5½ years of basic training gives only limited qualification to the physician. On its completion, he has the right only to do subordinate work. This starts for all physicians with a general service period of 21 months consisting of 6 months in internal medicine, 6 in surgery, 3 in psychiatry and 6 in out-patient care. A second period of specialist training comprises 41 different options that give competence for independent medical work. These include a branch for general practitioners, which has a strong element of social medicine and the same educational rating as the various options for specialist training.

Figure 6 shows the general service period and specialist studies in detail, and it will be seen there that the training consists mainly of general service in a subordinate position. For the specialist, a certain part of this service must take place in a teaching, or some other kind of highly specialised, hospital. Post-graduate training - both as regards specialists and general practitioners - includes systematic teaching and examinations, and the physician must pass the special courses offered by the hospitals.

A second phase of the post-graduate training of a physician can be seen as continuing education, although it has not yet been systematically organised in Sweden. It is the third part of the reform of medical education and is now being worked out. For the moment, continuing education is the responsibility of the various societies of physicians in their specialised branches and of the Swedish Society of Medical Sciences. This Society organises discussions, demonstrations and lectures in the form of short courses all over the country in local branch societies. The County Councils, too, support and arrange lectures and demonstrations of importance in continuing education.

Figure 6

POSTGRADUATE TRAINING FOR PHYSICIANS



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The time is over-ripe, however, to introduce a systematic form of this third phase of medical education, since it is one of the most important instruments for adapting the work of health manpower to the changing needs of the population and to progress in the fields of medicine and science.

The training of nursing personnel

At present about 6,000 nursing assistants and 1,900 qualified nurses are trained each year. In spite of this effort more than half of the nursing assistants now working in health and medical care have no adequate professional education. For recruitment reasons it is necessary to increase the educational possibilities for this category of personnel.

Figure 7 shows the scheme for nurses' education in Sweden. At present the admittance level for their training is completion at the comprehensive school; a change has been proposed, however, whereby entrance should be dependent on a compulsory examination taken from continuation school (i.e. after two years in upper secondary education). The period of basic education is 2½ years and thereafter the nurse receives her licence with the right to work as a staff nurse. Post-graduate training can be in one of several different branches, the courses for which vary from six months to a year. For most of them previous practice is required. The branches are internal medicine, surgery, psychiatric care, intensive care, operative care, and a special one for social activities (e.g. geriatric care).

Provision for the education of other health workers has now been made within the secondary school system. This lasts two years, and after the first the student will be qualified to act as a nursing assistant. The second year qualifies her as a practising nurse. Figure 8 illustrates this scheme. The first half of the first year gives a common education for medical care, geriatrics and child welfare. The second half offers an option between medical and geriatric care, and child care. The second year offers further options, for instance internal medicine and surgery, psychiatric care, and geriatric work. This training is integrated also with sociological disciplines such as child and youth welfare.

This new scheme envisages that a student will get the opportunity to go from a lower level to a higher level of training. Now, a further proposal has been made whereby there should be a shorter period of medical training for nurses who wish to become doctors.

Other health personnel

The requirements for admission to a dental school are the completion of the Swedish gymnasium, or corresponding Swedish or foreign studies, plus certain standards in physics, chemistry,

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Figure 7

THE NEW SCHEME FOR THE EDUCATION OF NURSES IN SWEDEN

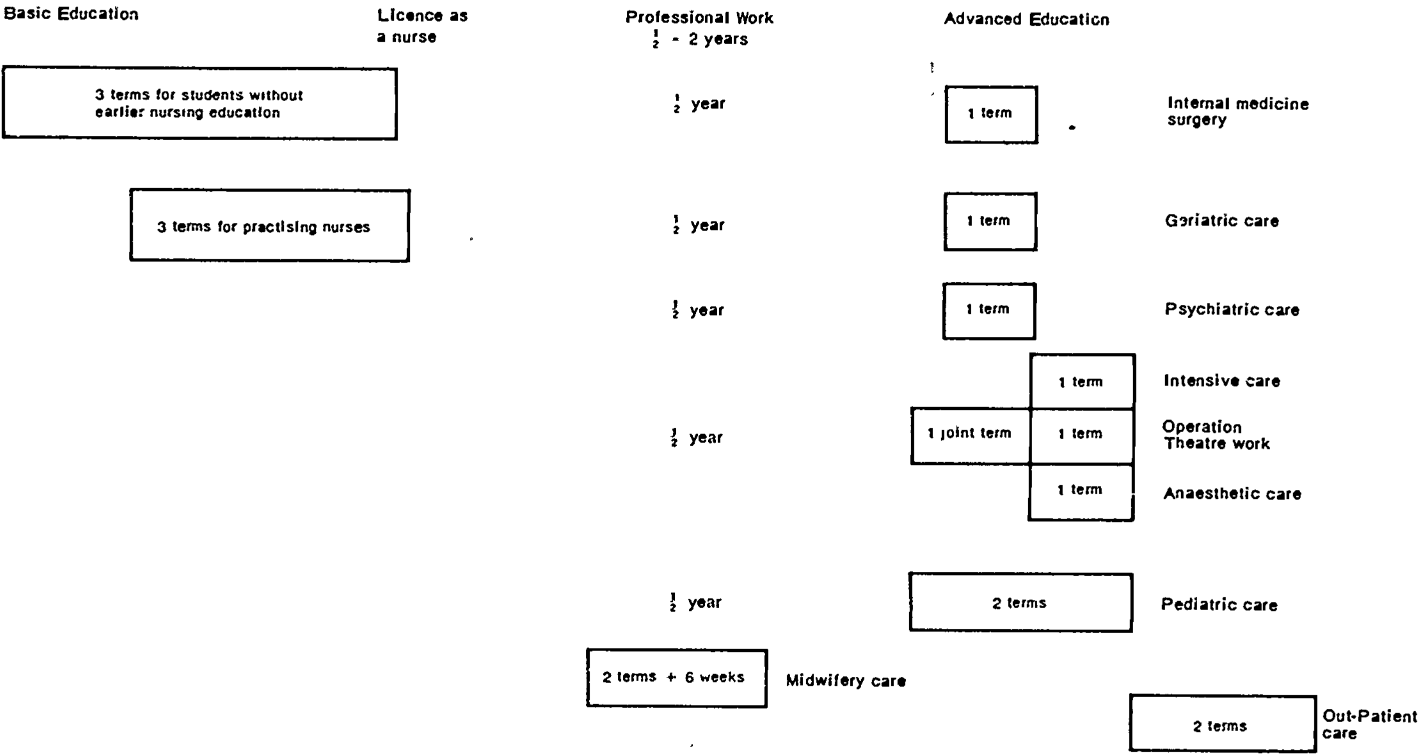

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Figure 8

THE EDUCATION OF NURSING AND SOCIAL PERSONNEL
LOWER LEVEL

Term		
4	In-patient medical and geriatric care (education for practising nurses)	Other lines
3		
2	Line for medical and geriatric care	Line for pediatric care
1		

Comprehensive School

mathematics and biology. Eighty per cent of the students complete their studies within five years. Teaching is largely practical, with a considerable degree of individual guidance in clinics and laboratories.

Teaching in pharmacy is given at the pharmaceutical faculty in Uppsala, and is divided into the training of pharmacists (four years) and dispensers (1½ years theoretical and 1½ years practical training). Requirements for admission are the completion of the Swedish gymnasium, or corresponding Swedish or foreign studies, plus certain standards in physics, chemistry, mathematics and biology.

The requirement for admission to an institute of physiotherapy is a certificate from a theoretical stream in a nine-year compulsory school, with special courses in English and mathematics. A quota system is used for groups of applicants with different educational backgrounds. Applicants with a gymnasium education can therefore compete only for a limited proportion of places.

New branches of education

The present demand for increased specialisation in medical education is something unlikely to be met fully within the traditional disciplines and sub-disciplines, and attention is being given to the possibility of creating training facilities in the areas of interface between medicine and other branches of science. It is believed that this will be a way of transferring some of the traditional roles of the physician to professionals who have had a different, and perhaps a shorter, training. In fact a few inter-faculty courses at the university level have been running for some years. For example, there is an established course in Stockholm in logopedics - a combination of phonetics and pedagogics with certain medical subjects included. Since 1968, there has been a combined course in medicine

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and pharmaceutical chemistry at Uppsala, and in Stockholm, again, a combined course in medicine and natural science with emphasis on dietetics. The training of clinical psychologists has for a long time been conducted on a similar inter-faculty basis.

As long as fifteen years ago the desirability was seen for combined medical and engineering training to meet the growing need for well qualified engineers within the medical service, Parliament having decided in 1965 to continue the expansion of universities and other higher educational establishments. It became possible to realise this at the new University College in Linköping, where a special educational and research organisation in medical engineering was established, with two chairs located in the regional hospital there. Medical engineering thus became a special subject in the Systems Engineering degree course, where all students are given a joint basic training in mathematics, physics, electricity and the like. The course lasts two and a half years.

3. Educational Planning and Long-term Health Planning

The long-term planning for the health delivery system being done by the County Councils and the National Board of Health and Welfare cannot, of course, have much effect unless it is matched with coordinated planning in the education sector - in fact, it is no exaggeration to say that the planned training of physicians and other health professions is the most effective way of ensuring the future performance of the health delivery system. In Sweden, this is fully possible because the Ministry of Health and Social Affairs and the National Board of Health and Welfare have the responsibility for specialist training while the Board has the additional responsibility of predicting the number of physicians who will be needed in the different sectors of the system.

Fulfilling the latter of these duties, the National Board of Health and Welfare has recently published a report ("LP 77") on the use of physicians in the different areas of the health delivery system, taking into account the long-term needs of society. This covers the period 1973-77 and was drawn up in close collaboration with the County Councils and the Swedish Medical Association. The legal authority for this type of planning lies in the Board's responsibility for controlling the number of posts for physicians in public health institutions, both hospitals and out-patient facilities. Physicians who work in private practice are not subject to this control; but not many are attracted to it nowadays, so their number remains practically constant with a relatively high average age. The vast majority of physicians, therefore, join the public health delivery system and come under the Board's authority.

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The LP 77 report, which has been accepted by government, is based very largely on a report by the National Board of Health and Welfare on projected developments in the organisation and structure of the health delivery system up to the 1980s. From this the number of doctors and other health personnel who will be required in the different sectors of hospital care and in primary medical care can be estimated. Estimates for the number of physicians with specialist training take into account the need for a geographical balance between the various levels of the system, i.e. teaching hospitals, general hospitals and primary care. The demand for the different types of physicians with specialist training, or training in general practice being known, it becomes possible to estimate the number of training posts necessary to provide for retirement replacements and expansion in specialist services in hospitals and primary care.

The intensive training programme now approved will bring about a rapid change in the total number and age distribution of physicians. The figures are given in Table 3 and a sharp increase will be seen as between 1972 and 1985. By 1985 there will be about 7,000 physicians under training while fully trained specialists will number over 16,000. To decide how to train these doctors and how many to train in the different specialties, a forecast was made of the demand for physicians with specialist training or training in general practice in 1985 in the various branches of the health delivery system. This is set out in Table 4. To achieve the desired numbers and distribution, a year-by-year plan for the provision of training places in each specialty has been worked out for the period 1972 to 1985. This takes into account (a) the present distribution of practitioners and trainees, (b) the known anticipated number of medical school graduates, and (c) anticipated losses through death and retirement.

The way being used to direct physicians into the areas of special priority is to create an adequate number of training posts specifically for them, and not to open up any others. There is a certain dirigism in this system, but this is in response to a kind of marketing enforcement. The quantity and types of physicians needed in the future have been calculated, and the number of educational options to fill this need have been provided. It is seen as quite reasonable now to ask the physicians to distribute themselves according to their ability and inclination within these options in order to meet the future demands of Swedish society.

This type of planning will, no doubt, have to be corrected from time to time and information will therefore be collected continually on the development of the health delivery system and the distribution of physicians in it. This should reveal that changes are to be expected in long-term needs. Undergraduate training will also have to be progressively adapted if it is to continue to serve as the common basis for the different lines of specialist training.

Table 3

THE SUPPLY OF PHYSICIANS IN SWEDEN

	1972	1985
Physicians under specialist training	3,300	7,000
Specialists	8,400	16,100
Non-active physicians	1,200	2,500
TOTAL	12,900	25,600

Table 4

THE PROBABLE DEMAND FOR PHYSICIANS WITH SPECIALIST TRAINING IN 1975

Field	Supply of specialists 1972		Distribution of specialists 1985	
	%	Number	%	Number
General practice	22.3	1,470	24.0	3,700
Psychiatry	8.1	531	8.5	1,350
Long-Term Care Rehabilitation	1.8	116	4.6	750
Acute somatic care	53.1	3,484	48.2	7,700
Radiology and clinical laboratory	14.6	960	15.2	2,400

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III. RESEARCH AND DEVELOPMENT

Figure 9 shows the relationship between research and policy planning at various levels in Sweden: the political level, where general planning decisions are made and where the national objectives of research are drawn up; the executive, where political decisions are translated into appropriations to institutions and individual scientists; and the practical, which includes the research conducted in institutions, research establishments, and industrial laboratories. At the political level, the Science Advisory Committee, chaired by the Prime Minister, was set up in 1962. Its membership consists of some 20 research scientists and policy makers, and it provides a forum for joint deliberations on long-term science policy.

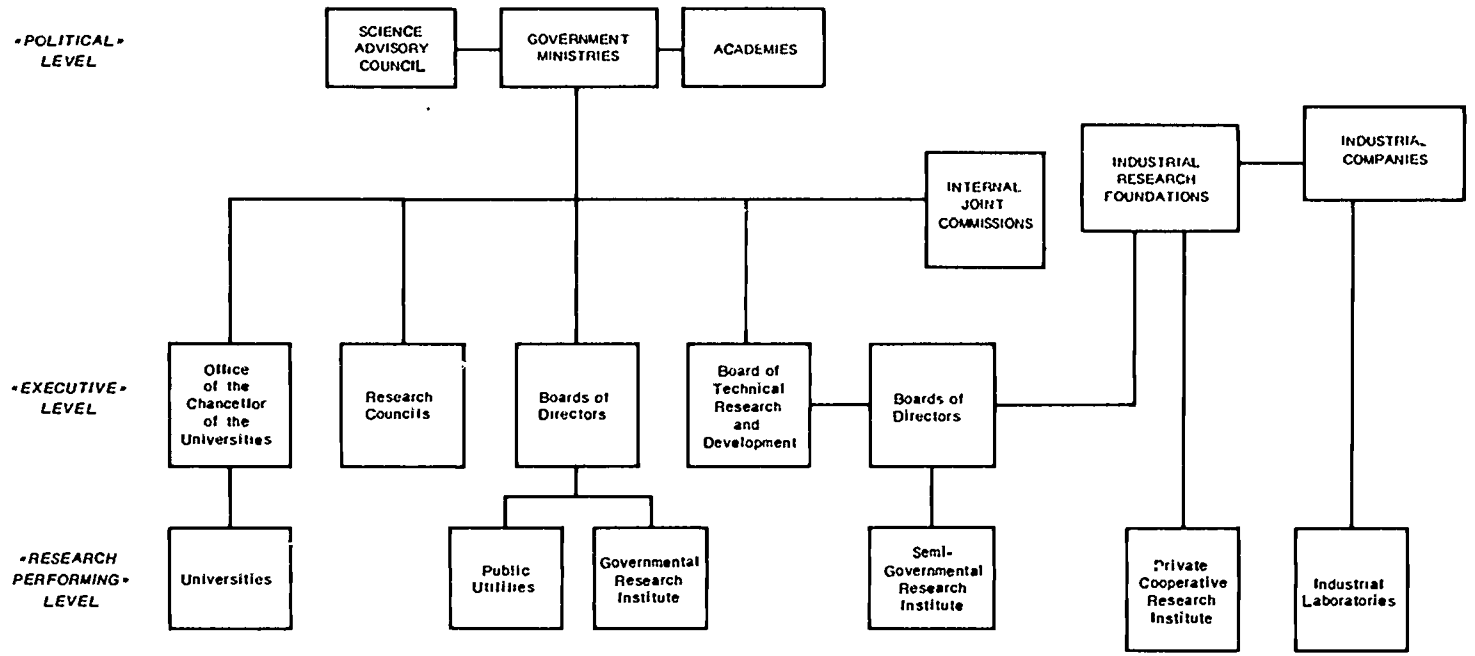
Most government research is administered through six research councils whose members are appointed for periods of three or six years. The one that administers the largest allocation of research and development funds (70 million Swedish crowns) is the Board of Technical Research and Development, which was established in 1969/1970 to succeed the former Council for Applied Research. Next in terms of funds administered come the National Science Research Council (51 million crowns), and the Medical Research Council (47 million crowns). The figures refer to the budget year 1972-73.

Medical Research

Medical research in Sweden is carried out for the most part in the universities which receive the necessary funds through the Office of the Chancellor. Funds may also be sought from the Medical Research Council, which functions on lines similar to the National Institutes for Health in the United States. The main reason for the concentration in the universities is economic. Sweden's size does not permit the same proliferation of institutions as in large countries. Inside the universities, however, independent research units are possible within the formal structure, having full-time staff who can pursue their own careers right up to professorial level. This procedural pattern is very much on the increase. Financial support for medical research activities in the Swedish universities (including about half of the appropriate university salaries) totals about 700 million Swedish crowns a year. This may seem small in

Figure 9

THE RELATION OF RESEARCH TO POLICY PLANNING IN SWEDEN



Adapted from *The Swedish Institute, «The Organisation and Planning of Swedish Research,» **Fact Sheets on Sweden** (Stockholm · 1970), 1*

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comparison with other developed countries, but in relation to the size of Sweden it is by no means so. Medical research is seen there as a priority area, and the resources allocated to it compare very well with those given to the natural sciences or technology.

From the viewpoint of public policy, research has two very important functions. Firstly, training physicians in research heightens their appreciation of quality in medical work and increases their psychological readiness to accept innovations. Hence, quality in the medical-care system is guaranteed by incorporating a research training component into medical education. With some exceptions, it is difficult to get a senior clinical position in Sweden - even at County Council hospitals - without having had research experience earlier in one's career. The second function of medical research in the present context is that it trains the physician to develop a selective judgement. Of all new medical research Sweden itself produces only 1 per cent, and has to take the other 99 per cent from the outside world. How to assess research results produced elsewhere is perhaps best learned by doing one's own - which also makes one aware of what is going on abroad. These two main objectives are stressed in defence of the current medical research effort in Sweden when it is charged by outsiders and politicians as being unnecessary. What is more, of all Western countries, Sweden has suffered least from the brain drain. It has lost very few trained physicians, apart from those who have gone abroad for specific research work, and they very often return home afterwards.

Besides its support for research in the traditional biological fields, the Medical Research Council finances health-services research, concerned with such topics as the evaluation of diagnostic methods and procedures or the appraisal of therapeutic tradition. Epidemiology and operational research on health services also come within the Council's purview.

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