

NON-URGENT AND HEAVY USE OF THE EMERGENCY DEPARTMENT

Intervention and follow-up studies

by

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- I. Hansagi H, Carlsson B, Olsson M, Edhag O. Trial of a method of reducing inappropriate demands on a hospital emergency department. *Public Health* 1987; 101: 99-105.
- II. Hansagi H. Referral of non-urgent cases from an emergency department: patient compliance, satisfaction and attitudes. (submitted for publication).
- III. Hansagi H, Allebeck P, Edhag O. Health care utilization after referral from a hospital emergency department. *Scandinavian Journal of Social Medicine*, in press.
- IV. Hansagi H, Norell SE, Magnusson G. Hospital care utilization in a 17,000 population sample: 5-year follow-up. *Social Science and Medicine* 1985; 20: 487-92.
- V. Hansagi H, Allebeck P, Edhag O, Magnusson G. Frequency of emergency department attendances as a predictor of mortality: nine-year follow-up of a population-based cohort (submitted for publication).

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INTRODUCTION

The function of the hospital emergency department

Hospital emergency departments (EDs) are designed to provide highly professional medical treatment with immediate availability of special resources for those in need of urgent or emergent care at any time of day or night.

In spite of widely differing organization of the health care systems, studies from several countries indicate that two patient categories contribute a considerable portion of the total number of visits to EDs, namely those who use the ED for non-urgent ailments and the heavy users, those who use the ED very frequently (1-5). Frequent ED use is of course justified for certain health conditions, but several studies claim that a great many of the ED visits made by heavy users are for problems that could be managed in primary health care settings (1,5,6,7).

According to a review by Gifford et al (8) the proportion of non-urgent visits to EDs ranged in different studies from 30% to 81%, partly depending on the criteria used and the methodology applied, such as retrospective or concurrent categorization.

In Sweden, Magnusson (9) reported a study conducted in 1977, that an estimated 39% to 64% of the visits to the ED of Huddinge Hospital were general practitioner-type cases. Further, 4% of the population accounted for 32% of the total number of the visits to the ED. Edhag et al (10) found 30% non-urgent cases at the same ED's medical section in 1982 and Westin et al (11) 33% at the ED of Östra Hospital in Gothenburg in 1980.

Several factors contribute to an "inappropriate" use of emergency facilities. Wolcott (12) has indicated that while patients, emergency department staffs and society all agree on the role of the emergency department, each party has a different definition of what constitutes an emergency. In some cases these definitions overlap, but very often they do not (Figure 1). Obvious examples of universal agreement that

an emergency exists are major trauma and crushing chest pain in middle-aged men. The agreement is less complete concerning a sprained ankle, an upper respiratory infection of five days' duration or a patient brought to the emergency department by police for public drunkenness. Considerable discrepancy has thus been found between the amount of worry and pain patients felt and the physicians' assessment of the appropriateness of visits (13).

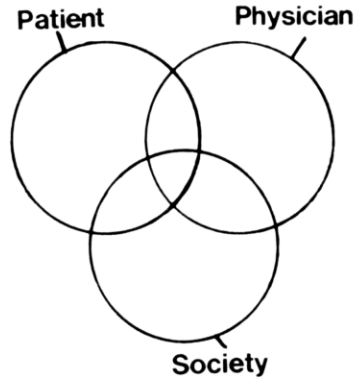


Figure 1. Overlapping definitions of what constitutes an emergency by different interested parties. (From Wolcott BW, JACEP 1979; 8: 242).

The definition of what constitutes an emergency varies also within the different parties, depending on their background. General practitioners, for instance, may have different ideas than emergency room physicians, and older physicians different than younger ones, about what cases are appropriate for the ED and what cases are appropriate for primary health care (14-16).

"Society", for instance health care planners, can adjust their definitions to suit the financial and instrumental resources available (17,18).

Definition of 'emergency'

The European Health Committee (19) classified medical emergency as:

- a) Extreme emergency. Immediate treatment (within seconds or minutes) is essential.
- b) Primary emergency. Treatment must be given in the space of one or several hours.
- c) Secondary emergency. Treatment is not needed quickly.

Hospital emergency departments are especially equipped to care for a and b. They may also have better resources than other care facilities to handle c. Therefore, other care providers may, for special reasons, send patients to be treated at the ED.

In the present study, patients attending the ED were classified as either urgent or non-urgent by the emergency department staff.

Definition of 'primary health care'

Starting out from WHO:s Alma-Ata Declaration (20), Vuori (21) considers primary health care more of an idea, an idea that should permeate the entire health care system, rather than as an identifiable part of the system. According to him, primary care can be interpreted as:

- 1. A set of activities.
- 2. A level of care.
- 3. A strategy of organizing health care.
- 4. A philosophy.

In the present study, the primary concern is with number two, primary health care as a level of care. More precisely, primary health care is here restricted to the care provided at health care centres.

The role of biological influences, internalized norms and external factors

The patient's perception of the urgency and/or severity of a condition and his/her behaviour is, as Mechanic (22) has suggested, influenced by a number of factors. Biological influences such as age, sex and symptoms make up one part. Further, internalized norms, emanating from the socio-cultural background of the individual have great impact, as do organizational and situational factors, such as the availability and accessibility of various types of service. He further states that this is an iterative process; patients learn on the basis of their experience and the responses of the health care personnel how they are expected to use the system (23).

Biological factors, internal and external norms also influence patient attitude and the outcome of a medical encounter. The outcome - both in a physiological sense in terms of improvement of health, and in a psychological sense in terms of patient satisfaction - influences in its turn future patient behaviour. The impact of patient satisfaction on patient compliance and choice of care services have been emphasized - among others - by Ware et al (24).

The impact of satisfaction on patient behaviour may be seen as an indirect effect, via "attitude", provided that attitude is conceptualized according to Allport's (25) classic definition, as containing both a dimension of opinion and a readiness to act. In this sense, attitude has more generality, while satisfaction has more specificity - although this distinction is not always made in the literature (26,27). Thus, it is conceivable that a person could be satisfied with a specific treatment or encounter at a care facility, yet his/her general attitude to this care facility is not fully positive.

Based on the above, a model is here used to visualize the concepts and how they relate to each other (Figure 2).

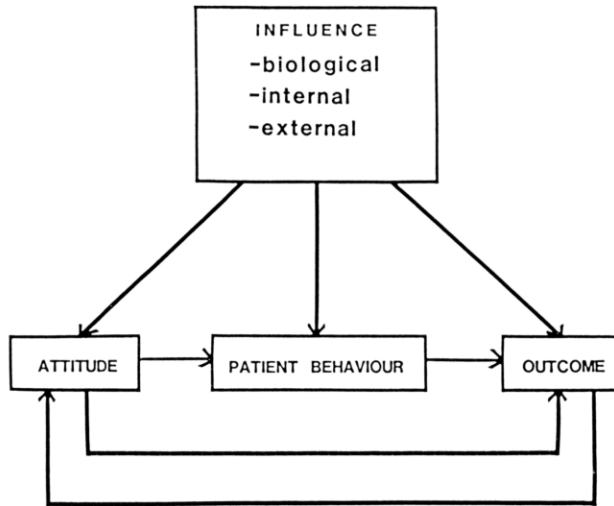


Figure 2. Conceptual model of interaction between patient attitude and behaviour.

There is empiric evidence for the influence of biological factors (age, sex, symptoms) on patient attitude, on behaviour and on psychological, and naturally, on the physiological outcome of medical encounters. Thus, older patients, men, and those with more severe health problems have been shown to be more likely to have a positive attitude to health care than other types of patients (28-31). Biological factors also influence behaviour, as can be seen by the fact that women, elderly and severely ill make high use of health care (32-34). Internal influences, such as socio-cultural norms and psycho-social characteristics affect attitude, behaviour and outcome (35-38). Finally, external factors, for instance the organization and structure of health care, have great importance. The following structural and organizational features of care facilities exemplify such influence on patient preference for the hospital emergency department:

- 1) Availability. Difficulty in obtaining an appointment with a general practitioner versus the 24-hour, 7 days a week, accessibility at the ED (14,16,31,39).

- 2) Proximity. Utilization of the ED increases with geographical proximity (14,40-42).
- 3) Specialist care and better availability of high technology facilities. Particularly in Sweden, patients perceive that the easiest way to be seen by a specialist is through the ED (39,43).
- 4) Financial reasons. Although in Sweden there are standardized fees at all public health care facilities, at the ED no patient is denied care for inability to pay the fee. In other countries, ED care is often free of charge (39,44,45).

Hospital based care versus primary health care

Medical care in Sweden has traditionally been hospital based, as described by Smedby (46). Compared to Sweden, Great Britain, e.g., has proportionately only about 60% of the total number of hospital beds, and the USA only 40%. In Finland and Norway the proportions are similar to those in Sweden. This "availability", however, is used - the hospitalization rate in Sweden is among the highest in the world.

Historically, the county councils were responsible for public medical care only when offered at hospitals. In 1963, these local authorities took over the total responsibility for health services, including public primary health care outside hospitals, as well as mental health care. However, no compulsory cooperation was organized between hospital based acute care and primary care. This is in contrast to, for instance the US health care system, where hospital care and primary care are more integrated (47).

After 1963, the main emphasis continued to be on expanding the hospital facilities. The planning and building of Huddinge Hospital is an illustration of this. However, from the seventies on, the political trend shifted and in the program Health Care for the 80's ("HS 80") (48), the Ministry of Health and Social Affairs suggested, that primary health care, i.e. local health care centres, should have the prime

medical responsibility for the population in their geographically defined areas.

The Health and Medical Services Act of 1982 imposes an important responsibility on the primary health care system to promote the general health among certain sub-populations. This goal could not be attained in a system which was primarily hospital-centered (49).

According to an official report on the role of primary health care in prevention (50), primary care facilities should be a patient's first contact when in need of health services. Primary health care is supposed to manage problems which do not require the hospitals' more specialized resources, and should have 24-hour coverage. This latter service - which may be seen as a prerequisite for prime responsibility - is yet far from being attained and may also be regarded as unrealistic, unless it is intended to include some sort of off-hour telephone coverage. Increasingly, a number of health care centres are providing service in evening office hours (51,52), early morning hours (53) or on a "walk-in" basis (54,55).

Yet, in a report from Spri (56) published in 1983, it was noted that the development of primary health care since 1978 was slower than was planned. One hindrance may be that the different functions and responsibilities of the health care centres are somewhat unclear (57).

The hospital emergency department and primary health care

Allocation of resources to primary health care has *per se* no unequivocal effect on patient utilization of hospital emergency departments. Studies by Sjönell (58) and Krakau (59) in the Stockholm region, and Hilditch (60) in Canada, have indicated a reduction in the number of ED visits in their respective study areas with increased primary care resources. In a study from Rochester in the USA (61) of primary health care with extended evening office hours and 24-hours telephone coverage, a greater reduction in pediatric ED use than adult ED use was found. In Houston, patients continued to use the ED for primary care type problems, despite the

establishment of neighbourhood clinics (62), as was also the case in New Zealand, where the establishment of a technically well-equipped health centre, staffed by general practitioners with improved after-hours availability and by paramedical personnel, did not reduce ED use (63).

At Huddinge Hospital, by the year 1983, the number of ED visits had not declined markedly in spite of an on-going expansion of primary health care facilities in the catchment area. The resources of the ED during this time remained about the same. At the internal medicine section of the ED, both the number of the severely ill, as measured by the proportion of patients admitted to hospital directly from the ED, and the total number of patients had been increasing since 1976. Moreover, in 1983, an administrative enlargement of the hospital's basic catchment area was planned to take effect in 1986, implying the incorporation of a parish (Hägersten) which had a high need of health care because of an elderly population. Therefore, towards the end of 1983, new ways of handling patient demand on the ED were discussed.

The issue was raised whether the ED was the appropriate place to treat patients with non-urgent or minor complaints. These patients are naturally given low priority at emergency departments which are heavily burdened by seriously ill, often elderly patients or patients with complicated illnesses. Long waiting times cause irritation both among patients and personnel. Not rarely, such patients leave without being seen, after having waited several hours (64-66).

In some cases, especially in urban areas, and in areas with many immigrants, there is also reason to assume that people turn to the ED because they lack adequate knowledge about the health care system and about where to seek help. Locating general practitioners at the ED for the management of primary health care type problems is occasionally suggested, but this might preserve a hospital based care-seeking pattern (67). Patient education and active guidance is often suggested as a means for helping patients to obtain the most suitable care services (1,3,4,6,16).

A trial of such a patient guidance was conducted at the ED of Huddinge Hospital in the spring 1984.

The present study

Huddinge Hospital's emergency department has been a focus of research almost since its establishment. In 1976, a pilot study was conducted by Allander et al (35), initiated by the dramatic increase in patient demand.

In 1977 a major study, which analyzed patient characteristics in relation to those of the source population, was carried out by Magnusson (9,32,36,40,68-70). It was found that 29% of the population visited the ED during a 15 month's period (32). Those who lived in the geographical proximity of the hospital had higher visiting rates than those who lived further away (40), as had also immigrants as compared with Swedish citizens (36). An estimated 39 to 63 per cent of the visits to the ED were general practitioner type cases (68). Four per cent of the population was found to account for 32 per cent of the total number of ED visits, and these heavy ED users had substantially more psycho-social, medical and abuse problems than other categories of ED visitors (69,70).

In 1982, a screening, a "triage", by a medical specialist was performed at the internal medicine section of the department (10, 71-73). It showed that thirty per cent of the patients were classified as non-urgent cases and that a great majority of these patients could be sent home after examination (10,71).

The design of the trial in 1984 was based on the experiences from the triage in 1982. A specially trained nurse was assigned to counsel and refer patients who sought care at the ED for non-urgent ailments (Figure 3).

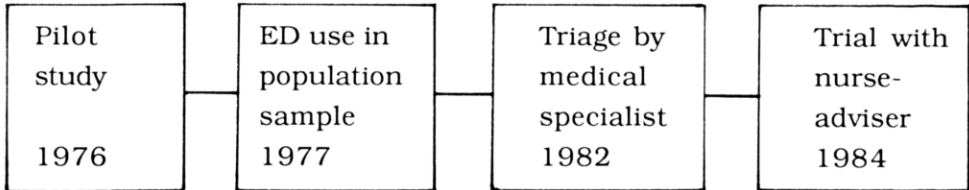


Figure 3. Emergency department studies at Huddinge Hospital

The scope of the present study was to analyze the trial of the method with the nurse-adviser and the effects of it, if any, and to make a follow-up of the population sample from 1977.

The main hypotheses were:

- the attitude to primary health care is more likely to be favourable among patients who were advised and referred elsewhere by the ED than in a comparison group treated at the ED;
- referred patients reduce their use of the ED and increase their use of primary health care centres a year after the trial;
- with no intervention, heavy ED users would continue their high utilization of hospital based care.

The aims of the present thesis are to:

1. determine what proportion of the patients at the ED can be classified as non-urgent cases and whether they can be referred to other care providers (Paper I);

2. assess patient compliance and satisfaction with referral to other care providers and whether referral had any effect on patient attitudes to health care facilities (Paper II);
3. assess the effect, if any, of referral on patient behaviour, in terms of utilization of health care facilities over one year (Paper III);
4. determine whether frequency of ED visits can be used to predict hospital care utilization (Paper IV);
5. determine whether frequency of ED visits can be used to predict mortality (Paper V).

SUBJECTS AND METHODS

Study setting

Huddinge University Hospital is located in a suburban area southwest of Stockholm. Since part of the study population had been selected from those who inhabited the catchment area of Huddinge Hospital in 1976-7, an overview of the development in the area since that time is roughly described.

Huddinge Hospital and its catchment area

A highly specialized general hospital as well as being a teaching and research hospital, Huddinge Hospital in 1976 covered a population of about 156,000. Due to administrative changes of the catchment area and natural population growth, this figure was 179,000 in 1984 and 224,000 in 1988. The catchment area for specialist fields other than medicine and surgery is even larger.

The hospital has 1300 beds including psychiatric care. The ED is responsible for the management of emergency patients with medical,

neurological, surgical, orthopaedic, gynaecological, urological, otorhinological and, up to 1986, also ophtalmological conditions, as well as for pediatric cases. For psychiatric conditions, there has been a separate unit since 1982.

The emergency department is staffed by doctors on duty from the different departments of the hospital. The other personnel at the ED consist of about 135 persons. There are nurses, assistant nurses, auxiliary nurses and clerical staff. A social worker is also attached to the department since 1987. About 25% of the patients who attend the ED are transferred to the observation ward of the department or admitted directly to one of the hospital wards.

There are about 32,000 admissions and 354,000 out-patient visits a year to the hospital's somatic clinics. Of the out-patient visits, the somatic emergency department received 85,000 in 1988, excluding about 7,000 visits to the ophtalmologic section, this section now being relocated from the ED. Since 1975, when the hospital was being fully set in operation, the number of ED visits had been varying between 83,000 and 98,000 annually.

The number of ED visits per 100 inhabitants in Huddinge Hospital's catchment area has been above the county's level, especially before the trial with the nurse-adviser (Figure 4).

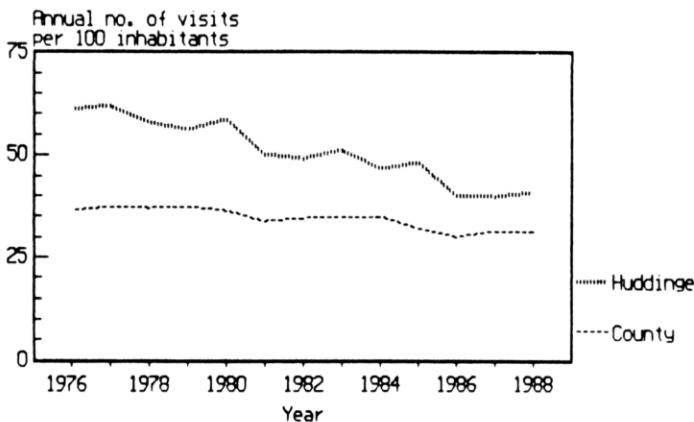


Figure 4. Number of emergency department visits per 100 inhabitants in Huddinge Hospital's catchment area and over the whole of Stockholm County, 1976-1988.

Since 1976 the internal medicine section of the ED has had a growing patient-load, as well as an enlarging share of the hospital's total number of ED visits (Figure 5).

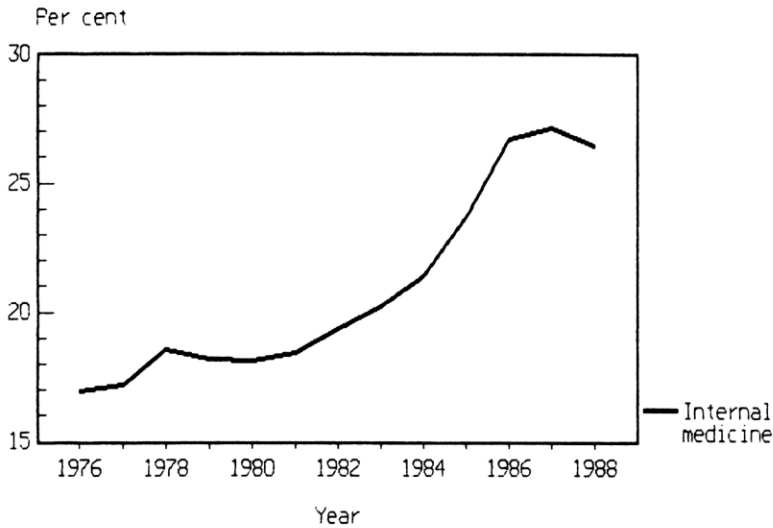


Figure 5. The internal medicine section's percentage of the total number of somatic visits at the emergency department of Huddinge Hospital 1976-88.

Primary health care in the area is provided, as in Sweden in general, mainly by local health care centres. There are very few private general practitioners in the area. The health care centres usually operate with 3 or more general practitioners and a varying number of nurses and district nurses. The number of inhabitants per general practitioner is 3000 to 4500. From being seven in 1976, there were 14 health care centres in the area in 1984 and 18 in 1988 (Figure 6).

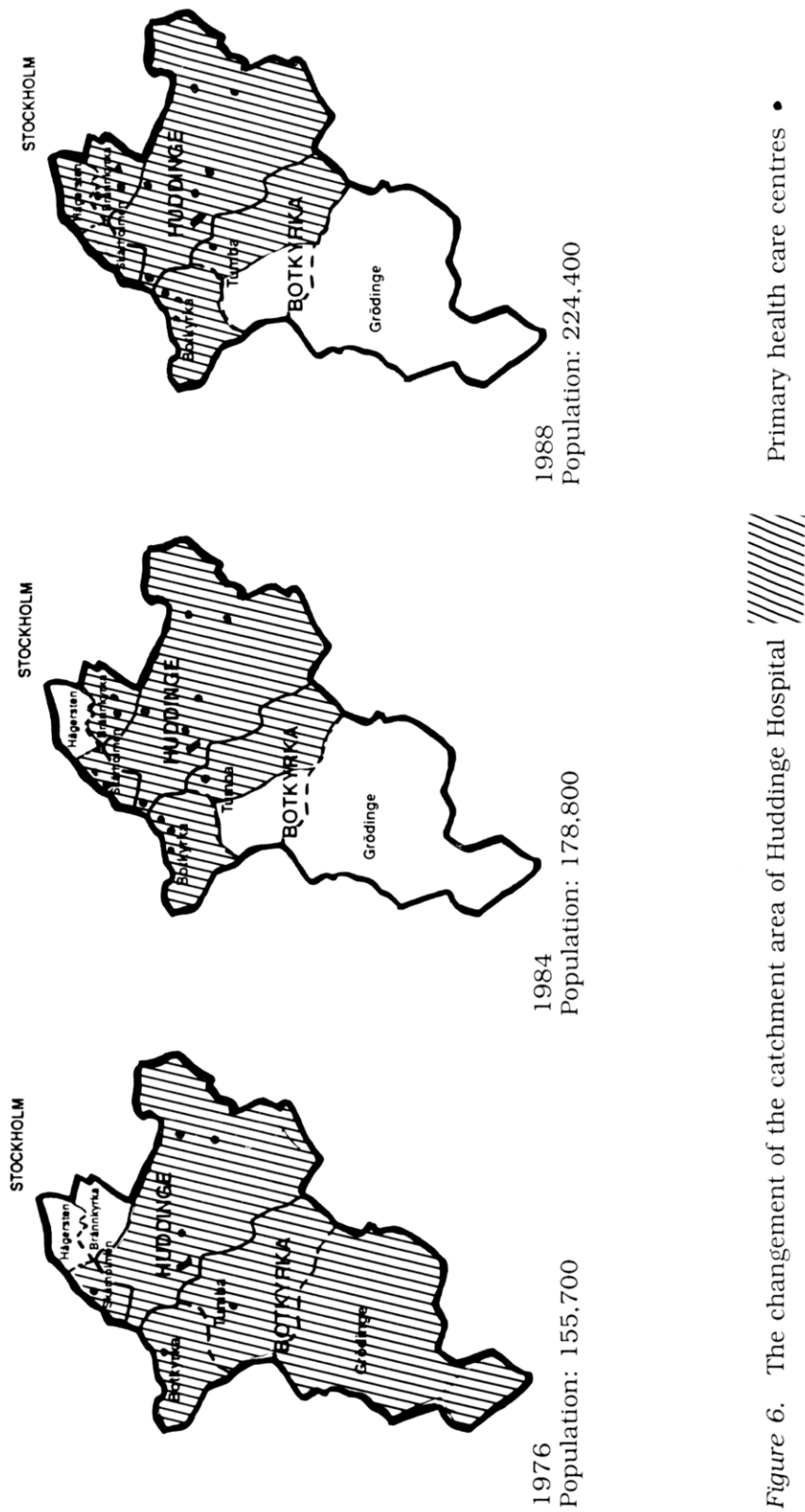


Figure 6. The change of the catchment area of Huddinge Hospital

Primary health care centres •

The total number of visits to general practitioners in primary health care in the area was 59,000 in 1976. It was 123,000 in 1984 and 189,000 in 1988. Taking into account the increase of the population, the number of visits per 100 inhabitants were 38, 69 and 84 for the respective years (74).

The absolute number of visits to primary health care facilities has increased by 221% from 1976 to 1988, while the number of ED visits during that time only decreased by about 4% (Table I).

Table 1. *Number of visits to the somatic emergency department (ED) of Huddinge hospital and number of visits to general practitioners (GPs) at all health care centers in catchment area 1976-88.*

Year	<u>Huddinge hospital</u>		<u>Catchment area</u>	
	No. of ED visits	% change since 1976	No. of GP visits	% change since 1976
1976	95,015	-	58,885	-
1977	97,838	3.0	59,147	0.4
1978	92,298	-3.0	72,415	23.0
1979	94,647	-0.4	83,639	42.0
1980	98,506	3.7	92,054	56.3
1981	89,488	-5.8	93,369	58.6
1982	87,758	-7.6	106,065	80.1
1983	91,216	-4.0	109,382	85.8
1984	83,517	-11.1	123,001	108.9
1985	86,284	-9.2	133,043	125.9
1986	88,928	-6.4	163,816	178.2
1987	87,519*	-7.9	178,590	203.3
1988	91,321**	-3.9	188,827	220.7

* Including 6,560 visits to the ophtalmologic section of the ED

** Including 6,551 visits to the ophtalmologic section of the ED

The socio-demographic characteristics of the population in the area differ in some respects from the rest of the county, although the differences have diminished since the seventies when huge housing projects attracted new categories of people. The average age of the population is still somewhat lower than for Stockholm county as a whole. Approximately 13% are over the age of 65, versus 15% for the county and 17% for the whole country. Over 30,000 people, or 14% of the population in the catchment area, are foreign citizens, which is a significantly larger proportion than the average for Stockholm county (10%). The national average is 5%. Further, the area contains a somewhat smaller proportion of high income earners, a larger proportion of job seekers and a larger proportion of people drawing disability pensions, than does the county as a whole (75).

Subjects and study design

Papers I-III

The studies in Papers I-III are based on a sample of patients who visited the ED during the month of April in 1984. All consecutive careseekers during this period (except for night-time from 9 pm to 7 am) were classified into urgent or non-urgent cases by the assistant nurses who staff the reception office of the ED. They classified the patients by asking them routine questions about the reasons for seeking care. The definition of a non-urgent condition was: does not require the resources of the emergency department, the disorder being minor or non-acute. All other conditions were regarded as urgent. The six specialities included were: internal medicine, otorhinolaryngology, orthopaedics, gynaecology, neurology and urology. Children under the age of 16 years and patients brought in by ambulance were excluded. Patients considered by the reception staff to have *urgent* conditions and any with a referral letter were then attended to according to the usual routines of the department. Patients considered to have *non-urgent* conditions were seen by a registered nurse, designated as nurse-adviser. She gave medical advice if needed, advised about alternative sources of health care and

helped the patient to make an appointment with an appropriate health care provider, usually the patient's local health care centre.

The trial was planned and designed in co-operation with the health care centres in Huddinge Hospitals' catchment area and reports about resources and problems were exchanged continuously. The nurse-adviser's office-hours were the same as those of the health care centres, 8 am to 17 pm Monday to Friday, but because of meetings and days off, she was not available full-time. When she was not available, patients with non-urgent conditions were, after classification by the assistant nurse, treated at the ED according to the usual routines, thus providing a comparison group, designated as "controls". After two months with the experimental methods, the study period of one month was started.

The study population in Paper I comprised patients classified as non-urgent cases during "office hours", 8 am to 5 pm Monday to Friday. Of these 454 patients, 347 were seen by the specially trained nurse-adviser, while the rest - 107 patients - were not seen by her (controls). The nurse-adviser was able to refer 192 of those patients she saw to care providers outside the hospital, while 155 were signed in at the ED. Data were collected from the special patient charts kept for the study, from the Stockholm County patient data base and from the ED medical records.

Paper II was based on a survey of the 192 referred patients and the 107 controls. Their compliance with referral, satisfaction with care, and general attitudes to health care facilities were measured by means of a questionnaire mailed about one week after the initial ED visit. Of the referred patients, 141 (73%) responded to the questionnaire, versus 86 (80%) of the controls. A conceptual model was used to elucidate the interaction between patient attitude and behaviour.

In Paper III, the 192 referred patients' and the 107 control patients' utilization of hospital and primary health care one year after the trial was compared with the year before the trial. Information on this use was obtained from the Stockholm County patient data base and the ED medical records. Based on their ED use in the pre-trial year, the

patients were referred to as "moderate ED users" (none to three ED visits) and "heavy ED users" (4 or more ED visits). The referred group contained 189 individuals because 3 patients could not be identified in the data base.

Papers IV-V

The studies reported in Papers IV and V were based on a ten per cent population sample of the inhabitants in the catchment area of Huddinge Hospital. The sample was selected in 1977 from the population register of Stockholm County. It consisted of persons born on the 5th, 15th and 25th day of the month and who had resided in the area at the time of January 1st 1976 to the end of March 1977 (15 months). There was also information regarding the use of ED services among these 17,004 individuals during the fifteen month period, as well as interview data about health status, social factors and life style from a representative, stratified subsample of 143 individuals.

In Paper IV, the use of hospital care during the period 1977 to 1982 by the total sample of 17,004 individuals was analyzed by means of the Stockholm County patient data base. Hospital use during the five-year follow-up was related to "ED class", that is, frequency of ED visits during the "qualification period" of fifteen months. Thus, those 12,077 persons who had not made any ED visits were referred to as "ED class A", the 2819 persons with one ED visit as "ED class B", the 1563 with 2-3 visits "C" and the 545 with 4 or more visits "D".

In Paper V the mortality in the sample of 17,004 subjects was studied for the period 1977 to 1985 using the national cause-of-death register as recorded by Statistics Sweden according to the 8th revision of the ICD and, for some specific diagnoses, also the death certificates. Mortality, and premature deaths were related to frequency of ED visits during the fifteen months period 1976-77. Those who had not made any ED visits were referred to as "non-users", those who had made 1 to 3 visits as "moderate ED users" and those with 4 or more visits as "heavy ED users". Since 122 individuals

had died during the initial fifteen months, the follow-up comprised 16,882 individuals.

The general design of the present thesis is shown on the next page.

Data analyses

All information was computerized and stored according to the Swedish Data Law and with the permission of the Swedish Data Inspection Board. The project was also approved by the research ethics committee of the Karolinska Institute.

For the data processing the statistical programs SAS (Papers I, IV and V), Quest (Paper II) and Kronstat (Paper III) were used. Hypothesis testing of differences between subgroups was performed by chi-square test, Students t-test and Fisher's exact test, whenever appropriate.

In Paper IV, the amount of hospital utilization was computed both by the number of individuals in each ED class at the start of the follow-up and person-years under risk in each ED class, thus taking into account the loss of persons through death and migration during follow-up. Person-years were computed for every individual as the time lived in the county during the period 1 April 1977 to 31 March 1982. Person-years were then summarized within each ED class.

In Paper V the mortality for those who were non-users, moderate or heavy ED users prior to the follow-up was compared with the expected mortality based on the total study population's sex- and age-specific death rates. Standardized mortality ratios (SMRs) were obtained by dividing the number of observed deaths by the number of expected deaths. Ninety-five per cent confidence intervals were computed. Premature death was assessed by calculating potential years of life lost before reaching age 65, according to a method described by Romeder and McWhinnie (76). For rates of potential years of life lost the number of (age-adjusted) years lost among those who were non-users, moderate and heavy ED users were divided by the number of people in these categories at the start of the follow-up.

General design of present thesis:

Paper:	I	II	III	IV	V
Main objective:	Referral	Attitudes	Utilization	Utilization	Mortality
Focus on type of patients:	Patients with non-urgent complaints at ED	Patients with non-urgent complaints at ED	Patients with non-urgent complaints at ED/ Frequent ED visitors	Frequent ED visitors	Frequent ED visitors
Sample:	n=454	n=299	n=299	n=17,004	n=17,004
Method:	Study charts Medical records Register	Questionnaire	Medical records Register	Register	Register (Interview) Death certificates
Study period:	1984	1984	1983-85	1977-82	1977-85
Title:	Trial of a method of reducing inappropriate demands on a hospital ED	Referral of non-urgent cases from an ED: patient compliance, satisfaction & attitudes	Health care utilization after referral from a hospital ED	Hospital care utilization in a 17,000 population sample: 5-year follow-up	Frequency of ED attendances as a predictor of mortality over 9 years

Patients in trial in 1984

Population sample in 1976-77

RESULTS AND DISCUSSION

Referral of patients (I)

The study suggests that the two-step classification of non-urgent cases, combined with advice and referral by a registered nurse, is feasible and can be integrated into daily work at the ED. Only a small proportion, 7%, of those patients who were initially classified as non-urgent cases by the reception staff were "misclassified" compared with the nurse-adviser's opinion, and were subsequently signed in at the ED. A further 38% of the patients seen by the nurse-adviser were signed in at the ED, mainly because of insufficient capacity in the primary care facilities, or because the patient was reluctant to be referred (11%).

Internal medicine had the largest proportion of patients who could be referred (64%) while neurology had the smallest (17%).

Of the referred patients, 61% obtained appointments with their local health care centres, the others were given advice of different kinds, such as to contact other care providers themselves, or to practice self-care.

The proportion of patients who sought care at the ED again within one month after the trial was the same (8%) in the referred group as in the control group. Later visits were classified as non-urgent to the same extent (50%) as in the control group according to a blind review of the ED medical records.

Referral rate was thus to a great extent determined by the health care centres' capacity to receive patients at short notice. Assuming unchanged resources in primary health care and the same referral rate in the control group - 55% - a total of 250 patients a month, or 3,000 a year could be relocated from the ED. This is, however, a minimum number, for three reasons:

Firstly, the reception staff made a very "liberal" initial judgement of the care-seekers, so that ambiguous cases were signed in rather than

sent to the nurse-adviser. Further training of the reception staff would probably raise the number of patients possible to refer.

Secondly, these figures apply to strict office-hours. Extended office hours at the health care centres would increase the number.

Thirdly, generally enhanced capacity at the health care centres to receive patients would substantially increase the number that could be referred. Consequently, relocation of about ten per cent of the visits from the ED of Huddinge Hospital, or 8,000 to 9,000 visits a year, is still a very moderate estimation.

Patient compliance, satisfaction and attitudes (II)

According to the patient questionnaire, 93% of those who obtained by the ED an appointment with the local health care centre used that appointment. Compliance was significantly lower when the patients were advised to contact other health care providers themselves or to practise self-care. This is in accordance with findings in similar studies (77,78).

The referred patients seemed satisfied with the service of the nurse-adviser at the ED at least to the same extent (80%) as the controls with their "conventional" treatment (71%).

More referred patients had a favourable attitude to the ED than controls (66% versus 48%, $p < 0.05$). The following groups in the referred patients yielded significantly more favourable attitudes to the ED: native Swede vs immigrant, female vs male, and 45 years or older vs younger.

In the referred group there was a positive relationship between perceived improvement of the presenting symptoms and satisfaction with the service at the ED, and between satisfaction and favourable attitude towards the ED. However, there was no direct relationship between subjective improvement and ED attitude. In the control group a positive association could be seen only between satisfaction

and attitude but not between improvement and satisfaction. However, on the whole, controls reported improvement significantly more often (86%) than did referred patients (69%, $p < 0.01$).

Unexpectedly the referred patients more often had a favourable attitude to the ED than to primary health care and their attitude to primary health care was only insignificantly more positive than the control patients'. Generally, however, somewhat larger proportions of both referred patients (45%) and control patients (41%) commented positively on primary health care services than was found in an - albeit differently designed - study (30%) in an inner city area of Stockholm (59). Long delays in obtaining a doctor's appointment appeared most often as a cause of a negative attitude towards primary health care. Thus, although referral of patients from the ED appeared feasible, it did not seem to improve general attitudes to primary health care.

Health care utilization after referral (III)

The proportion of the referred patients who visited the ED a year after the trial decreased from 48% to 42% while the proportion in the controls increased from 41% to 51%. The difference between the decrease in the referred group and the increase in the control group is statistically significant ($p < 0.01$).

Among those who continued to use the ED the year after the trial, scrutiny of the medical records showed that the referred patients' visits were insignificantly more often appropriate to the ED than the control patients'; 55% versus 51%. This retrospective classification into appropriate or non-appropriate ED visits is, of course, not comparable with the initial classification of the patients, but serves as a tool for comparison between the referred and control groups.

A small group (7%) of the referred patients with four or more ED visits the year before the trial had accounted for nearly half of all the referred patients' ED visits. Advice and referral did not reduce the number of these heavy ED users' visits more than the spontaneous decrease that occurred among the heavy ED users in the control

group. Heavy ED users were found to use also considerable amounts of primary health care at their local health care centres. They increased this use in the year after the trial - as did all the referred patients - but apparently without ceasing to occasionally turn to the ED with non-urgent complaints.

Advice and referral from the ED thus had some effect in lowering the proportion of patients who used the ED in the next year, but not enough to prevent inappropriate visits by those who continued to return to the ED.

Reintroduction of consultation hours part of the day, without appointments (54,55), or extended office hours (51,53) has been suggested as a possible means of attracting patients from the ED to the health care centres.

Frequent visitors at the ED should be paid special attention. Their reasons for contact often seem non-urgent, yet they may have a complexity of basic problems. Efforts should be made to investigate these patients' situations and help them obtain a comprehensive treatment program, instead of un-coordinated and fragmentary care from several providers.

Frequency of emergency department attendances as a predictor of hospital care utilization (IV)

The frequency of ED visits was found to predict hospital care utilization for the subsequent five years in the 17,000 population sample. Persons who had made 2 or more ED visits during a period of 15 months prior to follow-up (12% of the population sample) contributed 24% of all hospital out-patient visits, 29% of all hospital admissions and 31% of all hospital days during the 5-year follow-up. Those who had not made any ED visits prior to the follow-up constituted 71% of the population sample but contributed only 48% of the hospital days.

When taking into account the loss of observed persons due to migration or death, the number of hospital out-patient visits per 100 person-years at risk was more than 3 times higher among those who had made 4 or more ED visits than among those who had been non-visitors to the ED. The number of hospital admissions and hospital days were 5 times higher. The difference increased gradually with increasing number of ED visits and was evident in each age group.

During follow-up, the frequent ED visitors had an especially high utilization rate of psychiatric care, viz. nearly 8 times more attendances, and nearly 17 times more admissions per 100 person-years than non-users of the ED.

Heavy ED users are thus small in number but utilize a great deal of hospital service - parallell with their ED use as shown in other studies (1,7,9) and over a longer time as evidenced by the present study.

Frequency of emergency department attendances as a predictor of mortality (V)

The frequency of ED visits was found to predict 9-year mortality in the 17,000 population sample. The individuals who had made 4 or more ED visits during a period of 15 months prior to follow-up had a two-fold excess mortality (Standardized Mortality Ratio (SMR)=2.0, 95% confidence interval =1.9-2.1), those who had made 1 to 3 ED visits had a slightly elevated mortality (SMR=1.1, 95% CI: 1.0-1.3) while the non-users' mortality was just below the average.

Heavy ED users had an elevated mortality from all causes, the most important excess mortality being due to suicide and/or alcohol abuse with an SMR of 6.3 (95% CI 6.0-6.7). The excess mortality due to these two causes constituted more than one third of the heavy ED users' total excess mortality.

The validity of the cause-of-death diagnoses was not studied specifically, because it was unlikely to influence the comparison between non-users and heavy users.

The concept of "lost years before age 65" was used as a measure of premature death. Heavy ED users lost over 4 times more years of life compared with non-users and three times more compared with moderate ED users. In accordance with other Swedish studies (79,80), violent death, particularly suicides - which usually occur in younger ages - accounted for most lost years. This was especially true for heavy ED users.

The multi-problem features of patients who die prematurely - often due to "unnatural" causes like suicide - are usually manifested for a long time in recurrent visits to the emergency department. Alcohol abuse appears as one of the most important matters for prevention among these patients.

GENERAL DISCUSSION AND SUMMARY

Referral of patients. A quarter of the patients who sought care at the emergency department during office hours were classified as having non-urgent or minor ailments. Roughly half of these cases, somewhat more than in similar studies (62,81,82), could be referred to other care providers. Only a small proportion were reluctant to the referral proposed by the nurse-adviser. The most severe obstacle to refer patients was the difficulty to obtain appointments at the health care centres. It should then be noted that the nurse-adviser had special, direct telephone numbers to the health care centres and that her colleagues there co-operated very willingly since the project was jointly planned and designed. The patients' ability to get an appointment on his/her own was probably smaller.

Primary health care. About half of the target patients had not made any attempt to contact their health care centre before going to the ED (I). The number of patients that refrained from trying because of previous failures is not known. It should in this context be noted, that

the accessibility to the health care centres varies within the area, and did so especially in 1984 when the trial was performed. The service areas of some of the centres are especially high in immigrants, low income earners and people drawing disability pensions. Moreover, the number of inhabitants per general practitioner varied from roughly 2000 to over 4000. The goal for the 90's set by the health care centres in Huddinge Hospital's catchment area is, in their planning documents, one general practitioner per 2000 inhabitants.

Advice and referral to the health care centres had been hypothesized to render patient attitude to primary care more favourable. In the patient questionnaire after the trial, it was found, however, that the referred patients were more likely than the control group to have a favourable attitude - but to the ED, not to primary health care. The explanation may be that the patients in the intervention group were seen by the nurse-adviser immediately on their arrival at the ED. This nurse helped them to find a good solution to their problems. Many patients commented positively on this. Long waiting hours at EDs are often a source for discontentment among patients, even occasionally causing their departure without having been seen by a physician (64-66).

Patient attitudes. Patient answers to the open-ended questions regarding their attitude to the ED and to primary health care were easy to categorize and were judged on the whole to measure a dimension of both opinion and a readiness to act. A draw-back when using open ended questions is usually a lower response rate. On the other hand, structured response alternatives may limit or influence the respondent's own associations and view-points. "Attitude" and "satisfaction" seemed not to be congruent entities, although a positive attitude was correlated with satisfaction with the help obtained. Improvement of the presenting complaint did not seem to determine attitude in a direct way. Thus, improvement was indicated to a significantly greater extent by control patients. Still, the referred patients had more often a favourable attitude to the ED than the controls (II).

Relocation from the ED had mostly been tried in the United States, sometimes with a positive effect (81), sometimes with little or no effect (78,82). It should be mentioned that in those studies, patients were usually referred for follow-up in primary health care settings after having been treated in the ED. In contrast to this, referring patients directly to a more appropriate care level was meant to enable continuity of care at that site from the very beginning.

Effect of referral. Referral obviously did reduce the proportion of patients who would have sought care at the ED within one year after the trial. However, many of the users continued to attend for non-urgent or minor ailments. This was especially true for those who had used the ED frequently the year before the trial (III). For these patients, who are often both frequent ED users as well as frequent health care centres users, individually tailored programs ought to be tried. Intervention by a social worker for instance, has been shown by Genell-Andrén (83) in another Stockholm region to reduce the frequency of visits by heavy ED users. The importance of strengthening the social support for the diseased has also gained increased attention (84-86). A single doctor having comprehensive responsibility for the continuity and co-ordination of the care of patients with multiple disorders may also be a good solution (87). Action for intervention should take place as soon as patients are noticed to use the ED frequently - especially when the reasons for contact seem non-urgent.

When no intervention was made for patients who used the ED "inappropriately", the long-term effect appeared to be a continued high level consumption of hospital based care and an elevated risk for premature death (IV-V). Of course, it can by no means be taken for granted that the picture would be different if these patients had been referred to more comprehensive and continuous care. Nevertheless, the episodic character of the care given at the ED, the lack of any treatment program for patients for example with alcohol problems, and the large number of health professionals involved, could hardly have been a benefit to the patient.

Even if heavy ED users had a poorer state of health and therefore used more health care services, the most striking finding was their unproportionately high mortality from "unnatural" death causes, such as suicide and intoxication (V).

Appropriate care. For the individual and for society, it is of utmost importance that patients are cared for at the appropriate care facility in an appropriate way. Patient counselling and active guidance is necessary and may help. Ultimately, however, the choice is made by the patient. This choice is strongly dependent on the attitudes formed by experiences of previous contacts with health care providers including the obstacles met in obtaining desired services. When patients become frustrated by trying in vain to contact their health care centre, their return to the ED makes patient education and referral seem pointless, as well as difficult for the nurse-adviser to maintain. On the other hand, diverting patients from the ED must not have the effect that patients refrain from turning to the ED when in need of urgent care.

Responsibility of primary health care. If primary care is to reach the expectation of having the prime and principal responsibility for the health care of the individual, it must be open-minded and sensitive to the needs of the population. It also requires co-operation, not only with specialists at other health care facilities, but also with social services (88-91).

A basic and undoubted legitimate claim of the population is easy accessibility. The newly introduced reform implying that patients are free to choose the services of any health care centre within the county, should encourage each individual health care centre to try new ways of improving doctor availability. Patients seem to prefer to be seen by a doctor at once even for only a short while, rather than to wait a long time for a longer appointment. Extended evening office hours, and perhaps also morning office hours, walk-in hours (51-55), substantially more short notice appointments (92), and good telephone service, would probably attract patients. In a survey of health care centres in Stockholm county it was found that some centres have more than 55 days waiting time for a doctor's

appointment (93). This cannot be considered acceptable, and merely organizing better telephone service would scarcely help in such cases (94).

Alternative health care providers. Mere ease of accessibility for minor ailments - the type of service offered at "freestanding emergency centres" (City-akuten) - does not seem to lead to a decline in ED visits to hospitals, according to an American study of over 100 freestanding centres (95) although patients have high expectations on these centres (96). These facilities lack comprehensiveness and continuity of care, qualities which the health care centres strive for. Extended primary care services seem to have been successful, for instance in Finland (97), where hospital-based care, like in Sweden, had formerly dominated.

Visits at Huddinge Hospital's ED after the trial. Since 1984, primary health care has been further expanded in Huddinge Hospital's catchment area and the number of visits there has greatly increased. Despite this, the number of ED visits have not decreased substantially. A limited form of patient counselling and referral by nurse has been continued since 1984. Many of the problems have not found a final solution, at least not within the whole catchment area, such as the difficulty in obtaining appointments at health care centres, and doctor continuity.

A continuous follow-up of how the resources of an ED of the size of Huddinge Hospital are used and how to guide patients to an optimal care is mandatory in a situation with limited resources for health care.

In summary, the present study, conducted at a metropolitan emergency department, has focused on two patient categories which were considered to use that facility inappropriately. Patients with non-urgent complaints were judged to constitute about a quarter of the care-seekers at the ED during day-time. Practically all these patients could have been diverted from the ED to health care centres - if these centres have had the possibility to receive them. It was also

found that patient attitudes were not as positive to the health care centres as to the ED.

Referral of patients to primary health care had a reducing effect on ED visits. However, a considerable proportion - especially of the heavy ED users - of those who continued to consult the ED did so for non-urgent complaints.

A number of the heavy ED users were also frequent users of their health care centres, but the care provided at the different facilities was not co-ordinated.

Heavy ED users were shown to be a very vulnerable group, medically and socially. Special efforts should be made to identify patients who use the ED frequently and to assess their basic problems and needs. This calls for an integrated approach with cooperation between social services, health care centres and the ED.

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REFERENCES

1. Ullman R, Block JA, Stratmann WC. An emergency room's patients: their characteristics and utilization of hospital services. *Med Care* 1975; 13: 1011-20.
2. Elliott MJ, Vayda E. Characteristics of emergency department users. *Can J Publ Health* 1978; 69: 233-8.
3. Richards JG, White GR. Accident and emergency services at Auckland hospital. *NZ Med J* 1977; 85: 272-4.
4. Davison AG, Hildrey ACC, Floyer MA. Use and misuse of an accident and emergency department in the East End of London. *J R Soc Med* 1983; 76: 37-40.
5. Mannon JM. Defining and treating "problem patients" in a hospital emergency room. *Med Care* 1976; 14: 1004-13.
6. Purdie FRJ, Honigman B, Rosen P. The chronic emergency department patient. *Ann Emerg Med* 1981; 10: 298-301.
7. Jacoby LE, Jones SL. Factors associated with ED use by "repeater" and "nonrepeater" patients. *J Emerg Nurs* 1982; 8: 243-7.
8. Gifford MJ, Franaszek JB, Gibson G. Emergency physicians' and patients' assessments: urgency of need for medical care. *Ann Emerg Med* 1980; 9: 502-7.
9. Magnusson G. Excessive use of medical care or rational patient behaviour? A study of a large hospital emergency department. Doctoral thesis. Karolinska Institute 1980.
10. Edhag O, Olsson M, Rosenqvist M, Rosenqvist U. Emergency room triage by a medical specialist. *Scand J Soc Med* 1986; 14: 93-6.
11. Westin J, Almersjö O, Andersson K et al. Akutmottagning i storstad - akutsökande patienter vid Östra sjukhuset i Göteborg vecka 16-19, 1980. Spri rapport 140, 1983.
12. Wolcott BW. What is an emergency? Depends on whom you ask. *JACEP* 1979; 8: 241-3.
13. Stålhammar J, Berfenstam R, Korpela M, Smedby B. Akuta besök i primärvården - en studie vid hälsocentralen i Tierp. *Socialmedicinsk tidskrift* 1978; 55:429-34.
14. Wood TCA, Cliff KS. Accident and emergency departments - why people attend with minor injuries and ailments. *Public Health* 1986; 100: 15-20.

15. Peppiatt R. Patients' use of GPs or accident and emergency departments. *Practitioner* 1980; 224: 11-14.
16. Myers P. Management of minor medical problems and trauma: general practice or hospital? *J R Soc Med* 1982; 75: 879-83.
17. Jeffers JR, Bognanno MF, Bartlett JC. On the demand versus need for medical services and the concept of "shortage". *Am J Publ Health* 1971;61:46-63.
18. Liss P-E, Nordenfelt L. Health care need, values and change. How changed values influence an evaluative concept. In: *Changing values in medical and health care decision making*. (Ed by Jensen UJ and Mooney G). London: John Wiley & Sons, in press.
19. Council of Europe: European health committee. Comparative study of the organization and functioning of emergency medical assistance services. ACDSP 8.87. Strasbourg 1987.
20. World Health Organization. Alma-Ata 1978: Primary Health Care. WHO "Health For All" Ser. No. 1. Geneva. 1978.
21. Vuori H. Primary health care in Europe - problems and solutions. *Community Med* 1984; 6: 221-31.
22. Mechanic D. *Medical sociology* (p 18). Second edition. New York: The Free Press 1978.
23. Mechanic D (ed). *Symptoms, illness, behavior, and help-seeking* (p 1). New York: Prodist 1982.
24. Ware JE, Davies-Avery A, Stewart AL. The measurement and meaning of patient satisfaction. *Health & Med Care Services Review* 1978; 1: 2-15.
25. Allport GW. Attitudes. In: *A handbook of social psychology* (chapter 17, Ed by Murchison C). Worcester, Massachusetts: Clark University Press 1935.
26. Persson E. Patienters tillfredsställelse med vård: begreppet, dess mätning och användning. En litteraturöversikt. Medicinska forskningsrådet 1980.
27. Linder-Pelz S. Toward a theory of patient satisfaction. *Soc Sci Med* 1982; 16: 577-82.
28. Linn LS. Factors associated with patient evaluation of health care. *Milbank Memorial Fund Quarterly Bulletin* 1975; 53: 531-48.

29. Genberg M, Korpela M, Smedby B. Patienters tillfredsställelse med läkarbesök i primärvården. *Socialmedicinsk tidskrift* 1985; 62: 301-4.
30. Klein Buller M, Buller DB. Physicians' communication style and patient satisfaction. *J Health & Soc Behav* 1987; 28: 375-88.
31. Stratmann WC. A study of consumer attitudes about health care: the delivery of ambulatory services. *Med Care* 1975; 13: 537-48.
32. Magnusson G. Utilization of a hospital emergency department in Stockholm. The effects of age, sex and marital status. *Scand J Soc Med* 1980; 8: 141-8.
33. Grimsö A, Siem H. Factors affecting primary health care utilization. *Fam Pract* 1984; 1: 155-61.
34. Haglund B. Vilka får sjukvård? En statistisk och kartografisk studie av vårdutnyttjande i Uppsala län. Doctoral thesis. *Acta Universitatis Upsaliensis*, 1986.
35. Allander E, König U, Landell N-E, Magnusson G, Teglund B, Vågerö D. Akutmottagningen - den nye husläkaren? *Läkartidningen* 1977; 74: 1392-6.
36. Magnusson G, Aurelius G. Illness behaviour and nationality. A study of hospital care utilization by immigrants and natives in a Stockholm district. *Soc Sci Med* 1980; 14: 357-62.
37. Genell Andrén K. A study of the relationship between social network, perceived ill health and utilization of emergency care. *Scand J Soc Med* 1988; 16: 87-93.
38. Bohland J. Neighborhood variations in the use of hospital emergency rooms for primary care. *Soc Sci Med* 1984; 19: 1217-26.
39. Geyman JP. Trends and concerns in emergency room utilization. *J Fam Pract* 1980; 11: 23-4.
40. Magnusson G. The role of proximity in the use of hospital emergency departments. *Sociology of Health & Illness* 1980; 2: 202-14.
41. Schneider KC, Dove HG. High users of VA Emergency room facilities: are outpatients abusing the system or is the system abusing them? *Inquiry* 1983; 20: 57-64.
42. Lindmark J. Akutmottagningen vid Östersunds sjukhus. *Spri tryck* 78, 1985.

43. Johnson K. Den moderna akutmottagningen: Bättre för patienterna men stor omställning för läkarna. *Läkartidningen* 1986; 83: 3208-9.
44. Kljakovic M, Allan BC, Reinken J. Why skip the general practitioner and go to the accident and emergency department? *NZ Med J* 1981; 93: 49-52.
45. Dutton D. Financial, organizational and professional factors affecting health care utilization. *Soc Sci Med* 1986; 23: 721-35.
46. Smedby B. Svensk sjukvård i internationellt perspektiv. Hälso- och sjukvård inför 90-talet, SOU 1981: 3.
47. Weiner J. A comparison of primary care systems in the USA, Denmark, Finland and Sweden: Lessons for Scandinavia? *Scand J Prim Health Care* 1988; 6: 13-27.
48. Socialstyrelsens principprogram för sjukvård inför 80-talet. Hälso- och sjukvård inför 80-talet. Socialstyrelsen anser 1976: 1.
49. Dahlgren G, Diderichsen F. Strategies for equity in health: report from Sweden. *Int J Health Serv* 1986; 16: 517-37.
50. Primärvårdens uppgifter i det förebyggande arbetet. Hälso- och sjukvård inför 90-talet. SOU 1984: 46.
51. Bjarne H. Kvällsmottagning vid vårdcentral. Principdiskussion. *Allmänmedicin* 1984; 5: 19-20.
52. Skoglund JE, Hellström P, Söder O, Arver S. Den kvällsöppna vårdcentralen - en fungerande verksamhet. *Läkartidningen* 1983; 80: 4856.
53. Jonsson L. Morgonmottagning i Edsbyn. *Allmänmedicin* 1984; 5: 121-2.
54. Järhult B. Behovet av öppen mottagning. *Läkartidningen* 1988; 85: 1400-1.
55. Löfvander M, Bohman-Kjellberg L. Öppen mottagning på vårdcentral - erfarenheter från en stockholmsförort. *Läkartidningen* 1988; 85: 4513.
56. Primärvårdens organisation. Spri rapport 147/1983.
57. Haglund G. Vårdcentralen - vem och vad är den bra för? *Läkartidningen* 1988; 85: 3649-50.
58. Sjönell G. Relationship between use of increased primary health care and other out-patient care in a Swedish urban area. Doctoral thesis. Karolinska Institute, 1984.

59. Krakau I. Development of primary care in Sollentuna. Doctoral thesis. Acta Universitatis Upsaliensis, 1985.
60. Hilditch JR. Changes in hospital emergency use associated with increased family physician availability. *J Fam Pract* 1980; 11: 91-6.
61. Ullman R, Block JA, Boatright NC, Stratmann WC. Impact of a primary care group practice on emergency room utilization at a community hospital. *Med Care* 1978; 16: 723-9.
62. Merrill JM, Lounsbury BJ, Gopalakrishna GS, MacMahon AE, Sanford S, Boisaubin EV. Relocating primary care patients from tertiary hospital to neighborhood health centers. *South Med J* 1980; 73: 780-3.
63. Maynard EJ, Dodge JS. Introducing a community health center at Mosgiel, New Zealand: effects on use of the hospital accident and emergency (A & E) department. *Med Care* 1983; 21: 379-88.
64. Wartman SA, Taggart MP, Palm E. Emergency room leavers: a demographic and interview profile. *J Community Health* 1984; 9: 261-8.
65. Dershowitz RA. Patients who leave a pediatric emergency department without treatment. *Ann Emerg Med* 1986; 15: 717-20.
66. Weissberg MP, Heitner M, Lowenstein SR, Keefer G. Patients who leave without being seen. *Ann Emerg Med* 1986; 15: 813-7.
67. Nylén H-O. Vad har allmänläkarjouren på sjukhuset att göra? *Läkartidningen* 1978; 75: 1244.
68. Magnusson G. The hospital emergency department as the primary source of medical care. *Scand J Soc Med* 1980; 8: 149-56.
69. Hansagi H, Magnusson G. Akutmottagningens patienter - hälsotillstånd och vårdbeteende. *Socialmedicinsk tidskrift* 1980; 57: 318-24.
70. Olsson M, Magnusson G. Kurator på akutmottagningen? *Socialmedicinsk tidskrift* 1980; 57: 325-32.
71. Edhag O, Rosenqvist M, Robèrt C-H, Olsson M, Allander E, Rosenqvist U. Kan man styra patientflödet vid en invärtesmedicinsk akutmottagning? *Läkartidningen* 1984; 81: 2446-7.

72. Olsson M, Rosenqvist U, Edhag O. Stort socialt hjälpbehov bland patienter som sändes hem från akuten. *Läkartidningen* 1984; 81: 2450.
73. Olsson M, Edhag O, Rosenqvist U. Emergency care. Identification of psychosocial problems. *Scand J Soc Med* 1986; 14: 87-91.
74. Hälso- och sjukvårdsstatistik. 1976-1988. Stockholms läns landsting.
75. HSN-områdesdata 1987 för Stockholms län. Stockholms läns landsting, Regionplanekontoret, Rapport 1987:4. (ISSN 0280-4468).
76. Romeder J-M, McWhinnie JR. Potential years of life lost between ages 1 and 70: an indicator of premature mortality for health planning. *Int J Epidemiol* 1977; 6: 143-51.
77. Wolf Lauck B, Bigelow DA. Why patients follow through on referrals from the emergency room and why they don't. *Nurs Res* 1983; 32: 186-7.
78. Straus JH, Orr ST, Charney E. Referrals from an emergency room to primary care practices at an urban hospital. *Am J Publ Health* 1983; 73: 57-61.
79. Smedby B, Åberg H. Möjligheterna att förebygga död i åldern 15-64 år. *Läkartidningen* 1981; 78: 1190-3.
80. Wall S, Rosén M, Nyström L. The Swedish mortality pattern: a basis for health planning? *Int J Epidemiol* 1985; 14: 285-92.
81. Skinner TJ, Price BS, Gorry GA. Directing the hospital outpatient to the neighborhood health clinic. *Am J Publ Health* 1977; 67: 1191-3.
82. O'Shea JS, Collins EW, Pezzullo JC. An attempt to influence health care visits of frequent hospital emergency facility users. *Clin Pediatr* 1984; 23: 559-62.
83. Genell Andrén K, Rosenqvist U. Heavy users of an emergency department: psycho-social and medical characteristics, other health care contacts and the effect of a hospital social worker intervention. *Soc Sci Med* 1985; 21: 761-70.
84. Edhag O, Johansson S, Lind E, Sundbom L, Theorell T. De hjärtsjukas psykosociala situation. *Socialmedicinsk tidskrift* 1976; 53: 518-26.
85. Theorell T. On the purpose and duration of social support. In: Isacsson S-O, Janzon L: *Social support - health and disease*. Stockholm: Almqvist & Wiksell International, 1986.

86. Östergren P-O, Isacsson S-O, Janzon L, Tejler L. The social support and network of patients in a medical emergency room - a case-control study. (Communication concerning a planned study). In: Isacsson S-O, Janzon L: Social support - health and disease. Stockholm: Almqvist & Wiksell International, 1986.
87. Björn-Rasmussen E. "Behandlande läkare" - en modell för kontinuitet för utsatta patienter. Läkartidningen 1986; 83: 2610-1.
88. Engstrand I, Eriksson M. Samarbete mellan primärvård och ländelssjukhus - ömsesidig respekt minskar konkurrensen. Läkartidningen 1988; 85: 303-4.
89. Brismar B. "Emergency medicine" gav bättre samverkan akutmottagningar - primärvård - socialtjänst. Läkartidningen 1987; 84: 1465-6.
90. Westrin C-G. Primary health care: co-operation between health and welfare personnel. An international study. Scand J Soc Med 1986; suppl 38.
91. Bengtsson C. Samverkan - det nya lösenordet i svensk hälso- och sjukvård? Läkartidningen 1988; 85: 2721-2.
92. Ejlertsson G, Lithman T, Scherstén B, Sundström A. Produktion och konsumtion av hälso- och sjukvård i en definierad befolkning. Metoder för registrering och analys med tillämpning i ett primärvårdsdistrikt. Lund: Studentlitteratur 1981.
93. Kartläggning av reumatikervården vid vårdcentralerna i Stockholms län. Reumatikerföreningen i Stockholms län, 1987.
94. Westman G, Eriksson C-G, von Post H. Health care utilization and attitudes to health care before and after development work in a health centre. Scand J Soc Med 1989; 17. 217-22.
95. Ferber MS, Becker LJ. Impact of freestanding emergency centers on hospital emergency department use. Ann Emerg Med 1983; 12: 429-33.
96. Thulin L, Edhag O, Allander E. Större patientförväntningar på privatakuten men likvärdig bedömning gjord av behandling. Läkartidningen 1984; 24: 2448-50.
97. Kekki P. Analysis of relationships between the availability of resources and the use of health services in Finland. Med Care 1980; 18: 1228-40.