

GENERAL PRACTITIONER HOSPITALS: USE AND USEFULNESS

A study from Finnmark County in North Norway

by

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This study has been accommodated to my particular interests in communication and co-operation in health care, not always easily suitable for research. There have been moments of doubt when I asked myself: "Is it worthwhile to proceed?"

Thanks to the encouraging support from the Institute of Community Medicine, University of Tromsø, particularly to my two supervisors Anders Forsdahl and Olav Helge Førde, I have been able to accomplish the process. In addition to my supervisors, I have drawn on the insight and competence of several people, especially Hasse Melbye, Ivar Sønbo Kristiansen, Helge Søråsdekkkan, Knut Fylkesnes, Bjørn Odvar Eriksen and Øyvind Irtun. They have all given inspiring and constructive contributions.

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Absence from home and absence of mind may be typical characteristics of my life during these years. Ann-Mari, Elisabet and Øyvind, thank you for your patience with me as husband and father. After everything and most important: Thank you for the pleasant days we have shared.

LIST OF PAPERS

I

Aaraas I. The Finnmark general practitioner hospital study. Patient characteristics, patient flow and alternative care level. *Scand J Prim Health Care* 1995; 13: 250-6.

II

Aaraas I, Melbye H, Eriksen BO, Irtun Ø. Is the general practitioner hospital a potential "patient trap"? A panel study of emergency cases transferred to higher level hospitals. *Scand J Prim Health Care* 1998; 16: 00-00.

III

Aaraas I, Fylkesnes K, Førde OH. General practitioner motives for referrals to general hospitals: Does access to general practitioner beds make any difference? *Family Practice* 1998; 15: 252-8.

IV

Aaraas I, Førde OH, Sønbo Kristiansen I, Melbye H. Do general practitioner hospitals reduce the utilisation of general hospital beds? Evidence from Finnmark County in North Norway. *J Epidemiol Community Health* 1998; 52: 243-6.

V

Aaraas I, Søråsdekkkan H, Sønbo Kristiansen I. Are general practitioner hospitals cost-saving? Evidence from a rural area of Norway. *Family Practice* 1997; 14: 397-402.

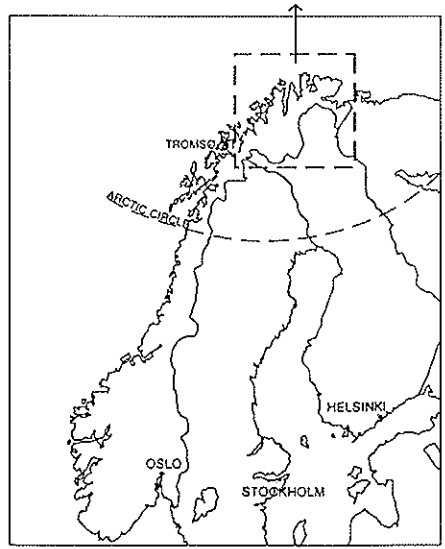
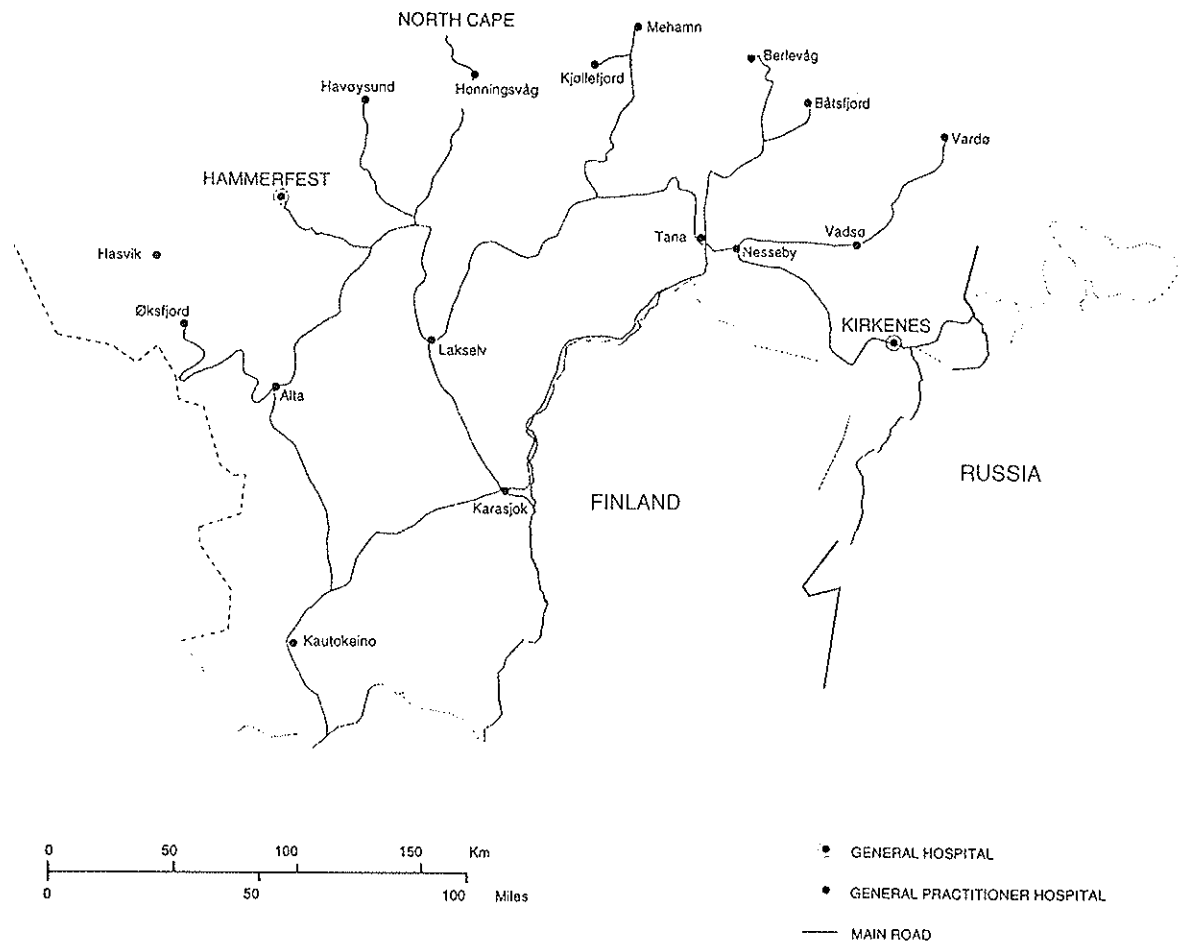
1. INTRODUCTION

During the 1970s and 1980s general practitioner hospitals (GP hospitals) in Norway were the subject of several studies (1-5). It is acknowledged that these hospitals can take on a variety of medical tasks and represent an alternative to hospital admission and home care. Their potential to reduce admissions to general hospitals has been suggested. Indirectly, this effect has been supported by studies from general hospitals in Finnmark (6-8). In the 1990s, the possibility of favourable co-operation between GP hospitals and general hospitals has been recognised in both professional (9) and political (10-11) statements. Nevertheless, since the statements have ignored questions regarding administrative and economical responsibility for the GP hospitals, the number of beds has continued to decline. In Finnmark, the county in Norway with the most widespread use of GP hospitals, funds were allocated to run 45 beds in 1997 (12), which was a reduction of 50% since 1994.

A study of GP hospitals in Norway in the 1990s naturally had to be based on data from Finnmark, since the majority of the rather few remaining GP hospital beds were located here. The materials of the present study arise during the period 1990-1994, when the total number of GP beds for all of Finnmark was stable, around 90. Fig. 1 shows a map of Finnmark with main roads and the location of 16 GP hospitals and two general hospitals. The general hospitals provide specialist services within anaesthesia/intensive care, internal medicine, surgery, obstetrics, gynaecology, paediatrics, and rehabilitation. Other and more advanced specialist services are available for the population of Finnmark at the University Hospital in Tromsø, located in the neighbouring county. The travel time by car from the GP hospitals to the two general hospitals varies from about one to four hours. The standard of the roads is generally high.

Fig. 1

Distribution of general hospitals and GP hospitals in Finnmark



Kartillustrasjon Statens Kartverk Finnmark 1997

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Many communities with a GP hospital have a local airport. In addition to ground ambulances, air and sea ambulance services are well developed and easily accessible alternatives for hospital transport. Despite occasionally rough weather (arctic climate), hospital transports are rarely prevented.

What is a general practitioner hospital?

In Norway, the purpose of the GP hospitals is described in the Hospital Act (1969) as: “to explore whether admission to hospitals should be accomplished, or to give simpler treatment which is neither appropriate for home care nor necessitating hospital admission”. Norwegian general practitioner hospitals in the 1990s are usually small bed units integrated in a common facility with a health centre and a nursing home (Fig. 2). The majority of general practitioners (GPs) in Finnmark are employed in community health centres with a GP hospital. The GP hospital emergency room with attached beds is supposed to have a function in linking home care, nursing home care and general practice together in a pre- and post-hospital ward. The ward is equipped and staffed for exploring the principal issues for patients in GP hospitals: whether, how and when admission to a general hospital should be accomplished, or possibly avoided.

Staff, services and equipment

Medical responsibility for the GP hospital patients is a duty regularly shared on a rotating basis between all the local GPs. Some centres are regularly visited by collaborating specialists from the county or regional general hospital. The nursing staff is assigned to work in both the GP hospital and the nursing home. Both bed units are served from the health centre with respect to x-ray, laboratory investigations, physiotherapy, occupational therapy and other services. Equipment commonly available in the GP hospitals includes: ECG (for diagnosis and monitoring), defibrillator, oxygen, spirometer, airway tubes, stomach tubes, catheters,

surgical instruments, plaster and remedies (for fracture stabilisation), intravenous infusions and drugs (for common diseases, emergencies, malignant disorders, etc.), incubator. Occasionally, some wards perform dialysis in close co-operation with the University Hospital.

Fig. 2
The general practitioner hospital (GP hospital).
Principal organisation model.

<p>GP HOSPITAL</p> <ul style="list-style-type: none"> - Emergency room - Beds (2-16) 	<p>COMMUNITY HEALTH CENTRE</p> <ul style="list-style-type: none"> - GP surgeries - X-ray - Laboratory - Physiotherapy - Occupational therapy - Other services
<p>NURSING HOME</p>	

Financial support

Since the GP hospitals are regulated by the Hospital Act and located in primary care, the question of who should pay for the beds has been disputed and is not yet settled. In Finnmark, the county authorities, being economically responsible for the general hospitals, have decided to support

the GP hospitals financially by transferring funds to municipal authorities to run the beds. However, the county authorities, with their administration located far away from the GP hospitals, have had critical comments concerning whether the GP hospitals are performing relevant hospital work and whether they are worth their costs.

What is the appropriate name?

At the outset of this study «*GP hospital*» was chosen as the translation for the Norwegian name «*sykestue*». In English literature, the original name was cottage hospital (13). This later changed to GP hospital, and in the 1990s the official designation has been GP Community hospital. Recently, some hospitals in England have preferred to revive the old name, *cottage*. This revival points to a function of these institutions that is still relevant: personal care in a homely atmosphere. By the end of the study, being more aware of the history and recent trends, I must admit that «*cottage*» could have been a more appropriate translation of «*sykestue*» than the one chosen.

2. HISTORY

GP hospitals in Finnmark - the Norwegian model

The first hospital in Finnmark was opened in Alta in 1836, and during the next 90 years up to 1927, small GP hospital-like institutions were established in 18 Finnmark communities (14). Until 1900, patients with mental, infectious and nutritional disorders represented major challenges. In coastal villages, the institutions were often run on a seasonal basis simultaneous with periods of active fishing. During these periods, the population of a coastal village (Vardø, 1853) could increase from 200 up to 2000, due to visiting fishermen from southern regions. Often living in open boats under bad conditions, many were brought to the GP hospital severely ill and mortality was high. In the beginning of this century, the GP hospitals were supplied with separate local hospitals to take care of an increasing number of patients with tuberculosis. Also, a community cholera hospital was built (Vardø, 1909) due to the danger of infection from busy trade connections between Finnmark and Russia.

After the end of World War I The Norwegian Red Cross started the building of several new GP hospitals according to a model located in Kjøllefjord (15). In June 1936, doctor Knut Schrøder describes his patients and tasks in the GP hospital in Kjøllefjord in a letter to a friend in this way:

"I have treated 76 patients during the last half year. I have operated on 4-5 hernias, 4 appendectomies, 1 sterilisation, 2 uterine evacuations, performed several tonsillectomies and removed small tumours, amputated two fingers and made a lot of incisions. Fishermen's fingers are often badly infected. I use spinal anaesthesia as well as ether, evipan and clorethyl. So far, the operations - knock on wood - have proceeded exceptionally well, without complications. - - I have often the pleasure of

patients asking to stay in the GP hospital instead of being sent to Vardø or Hammerfest. - - It is no exaggeration to say that this greatly eases the burden for emergency patients. To reach the closest hospitals in Vardø and Hammerfest, it takes 9 and 10 hours boat travel."

During World War II Finnmark was totally destroyed. After the war, GP hospitals were temporarily re-established in barracks and occupied by patients with diseases such as cancer, infections, traumas, mental illnesses and of maternity cases (16). After 1950, modern health centres with a GP hospital, according to the principal plan outlined in Fig. 2, have been built and rebuilt. The geographical distribution in the 1990s (Fig. 1) closely resembles the situation 60 years ago (14).

In other parts of rural Norway, a development similar to that in Finnmark took place during the first two thirds of this century. In 1972, a total of 64 GP hospitals with 1005 beds were distributed in 15 Norwegian counties (17). After 1970, the government has prioritised the development of general hospitals and the number of GP hospitals has declined. Since 1988, when a political reform transferred the responsibility for nursing homes from county to municipal authorities, many GP hospital beds have been closed down for financial reasons. Finnmark, despite a gradual reduction of beds, still represents an exception. In 1988, Finnmark County authorities, in contrast to other counties, determined to continue funds to municipal authorities to maintain the GP hospital function in rural communities.

Other countries

Local institutions similar to GP hospitals have probably existed, and may still exist, in various fashions in different countries. Written documentation of such institutions, however, is sparse. Papers on GP hospitals are primarily based upon English experiences.

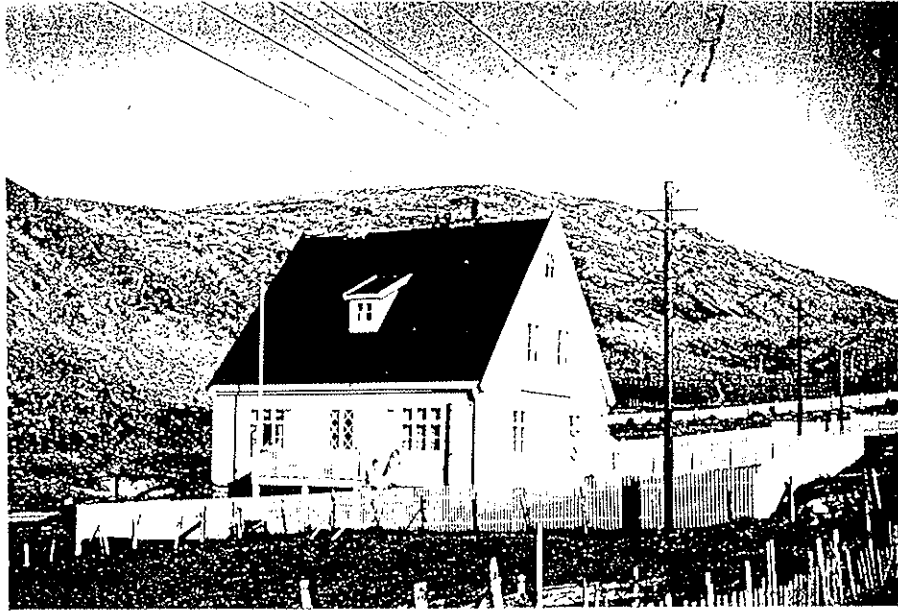
In England, the first GP hospital, or cottage hospital, was founded by Albert Napper in 1859 in Cranleigh in Surrey (13). The subsequent emerging cottage hospital movement was very successful, and by 1895, 294 hospitals had been opened (18). These were usually rural institutions open to all practitioners in the district. Patients were generally charged a small fee, according to their means, with the aim of preserving their dignity and avoiding the stigma of pauperism. The need for hospital beds for general practitioners was recognised in an influential report from the British Medical Association in 1938 (19). A paragraph in this report stated:

“There is a growing need for a more extensive provision of a type of hospital or accommodation in which a general practitioner can treat cases falling within his sphere of competence. It commonly happens today that, for a social reason such as unsatisfactory home surroundings, a patient is admitted to hospital for a condition which in a more fortunately circumstanced patient would be treated at home by the patient’s own doctor. It is contrary to the interest of the patient and damaging to the efficiency of general practice if social conditions lead to a discontinuity of treatment. The importance to a general practitioner and to the efficiency of his service to the community of an association with a hospital is difficult to exaggerate.”

Out of more than 400 such hospitals that were developed by 1930, 350 still existed in England and Wales in 1978 (20). In 1983, the Royal College of General Practitioners concluded that GP hospitals were providing a large and important contribution to medical care and must be supported (18). In 1990, it was reiterated that GP community hospitals “are an important resource within the National Health Service” (21).

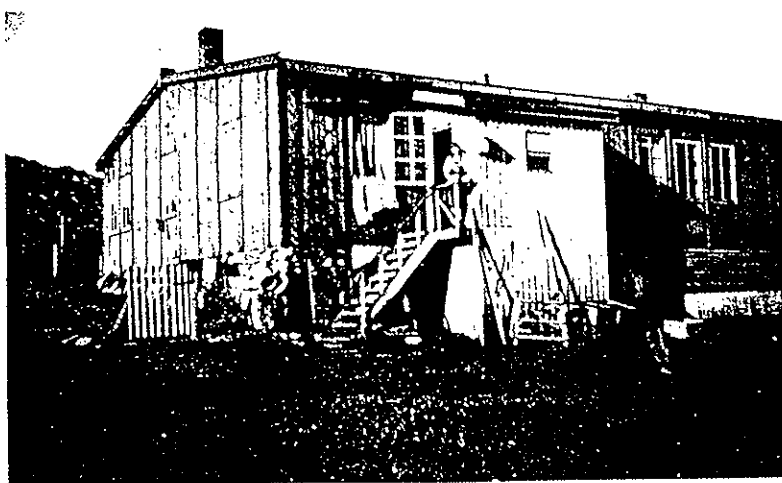
When Finland, through their Primary Care Act of 1972, aimed at providing comprehensive health care to the population, they included beds

for general practitioners in their community health stations (22). This resulted in improved geographical distribution of health services and a reduction in the requirement for central hospital beds and bed occupancy (23-24). In Jokkmokk, a rural community in Sweden, use of GP hospital beds has a long history (since 1896) and these beds still seem to defend a place in modern Swedish health care (25). For many third-world countries, an organisation of community hospitals closely connected to primary care seems to be the only reasonable alternative in the foreseeable future. The close contact with the medical problems in the district was described as especially useful in a hospital serving a rural population in Zimbabwe (26). The same doctors were in charge of health service in the hospital as well as in the district, the same as the doctors in the GP hospitals in Finnmark.



GP hospital in Kjøllefjord opened in 1924, burnt down in 1944
under evacuation during World War II

(Photo: Knut Schrøder)



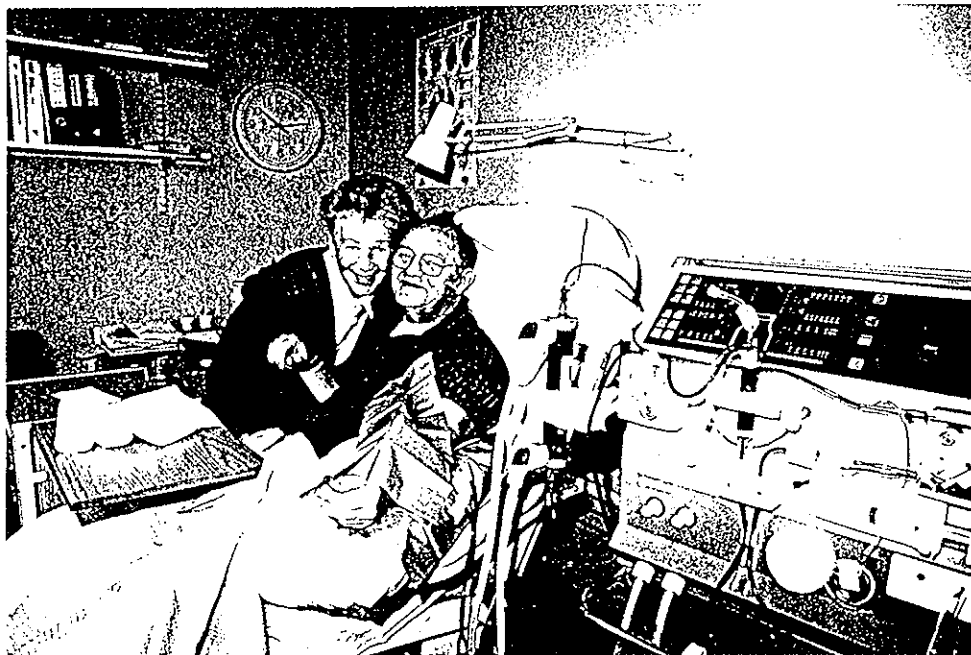
GP hospital in Havøysund in a post-war barrack, 1947

(Photo: Eli Bjørnstad)



Modern health centre including GP hospital, Alta, 1997

(Photo: Berit Espe)



Patient having dialysis in the GP hospital, Alta. Dialysis is occasionally given in close co-operation with the University Hospital

(Photo: Jarle Mjøen)

3. THE PRESENT STUDY

3.1 Aims of the study

The main aims of the present study have been to describe and explore the GP hospitals of Finnmark with respect to the following issues:

- Flow of patients between health care levels
- Quality of care of emergency patients transferred to general hospitals
- Impact on referral decisions among GPs
- Effect on utilisation of general hospital beds
- Costs of care compared with alternative care

3.2 Materials and methods

Table 1 outlines the materials and methods upon which the papers included in the study are based. Data were collected from three different settings:

1) general practice, 2) GP hospitals and 3) general hospitals.

1. General practice

The recording from general practice was done during one week in November 1992, in the middle of the GP hospital recording period (described below). 48 GPs in Finnmark, 74% of the total number, recorded consecutive patient contacts with regard to age, sex, time, type and urgency of the contact (n=2.496). Patients considered for referral were recorded (n=411) together with the final referral decision (type of referral or no referral). 205 patients were referred to general hospitals, with 59 inpatient and 146 outpatient referrals respectively, while 29 patients were admitted to the GP hospital. The impact of various listed motives on the decision was

Table 1. Papers, methods and materials of the study

Setting/ period	Paper no.	Design and principal data	Numbers	Main research issue
1. <u>General practice</u> 1 week 1992	III	Consecutive recordings of GP-patient contacts	n=2.496	The impact of the GP hospital on referral decisions among GPs
2. <u>GP hospital</u> 8 weeks 1992	I	Consecutive recordings of GP hospital stays	n=395 (exclusive of 20 deliveries)	The role of the GP hospital in the patient flow between care levels
	II	Retrospective study of emergency patients transferred to general hospitals, included in the recordings in paper I.	n=73/395	The quality of care for emergency patients transferred via GP hospitals to general hospitals
	V	Cost-minimisation study based upon recordings in paper I combined with 1992 cost data	n=415 (inclusive 20 deliveries)	Costs of GP hospitals compared with costs of alternative care
3. <u>General hospital</u> 5 years 1990-1994	IV	Observational study based upon routine recordings of general hospital stays	n=35.435	The effect of access to GP hospital on the utilisation of general hospital beds

rated on a scale from 1 (no importance) to 4 (major importance). The possible effect of having access to GP hospitals and of main motives (medical, social/nursing, general hospital advice, distance to general hospital) on referrals to general hospitals was explored by logistic regression. Motives for different referral decisions was also explored through frequency analyses. Further details on material and method are outlined in Paper III. The registration form applied is included in Appendix II.

2. GP hospital

The core material of the study upon which three of the papers (I, II & V) is based, stems from the GP hospitals. It includes a consecutive recording of patients during eight weeks, from 14 October to 10 December 1992. The design and period of the study were adjusted to experiences from a pilot study and from discussions with professionals during the planning phase. Eight weeks were considered to be a maximum during which motivation among participating personnel could be maintained. According to previous experience, the chosen period would represent a normal work load. To secure completeness of data, the registration form was designed so that the nurses could complete parts of it. A nurse was appointed in each unit in charge of data recording. The nurses recorded basic information concerning the patient such as age, sex, type of care (GP hospital care, obstetric, nursing home care), from where and to where the patient was transferred and dates of admission and discharge. The doctors recorded diagnoses and assessed alternative care "if the possibility to admit to the GP hospital had not existed". Paper I, characterising the patients and their flow through the GP hospitals, includes 395 completed stays, excluding 20 deliveries. Paper II, examining outcomes for emergency patients, includes 73 patients (out of a total of 395) transferred from the GP hospitals to the general hospitals. For reasons of completeness, Paper V, the cost analysis, in addition to 395 stays

includes the 20 deliveries in its basic material (n=415). For further details regarding methods and supplementary data of the studies based on the GP hospital recording referral is made to the original papers. The registration form used is included in Appendix I.

3. General hospitals

Paper IV, assessing the influence of GP hospitals on the utilisation of general hospital beds, is based upon routine hospital data for the five-year period from 1 January 1990 through 31 December 1994. The general hospital material, covering a period of 2.5 years before and 2.5 years after the GP hospital recordings includes admissions to the two general hospitals in Finnmark and comprises 35,435 stays over 224,969 days. Admissions due to administrative/non-disease related reasons and patients with obstetric or missing diagnoses, or with residence outside the county hospital area, were excluded. Based upon the GP hospital recordings and general hospital data from the same eight weeks when the GP hospital recordings were done (27), certain diagnoses were classified as "GP hospital diagnoses". With the total population of Finnmark as the reference population, differences in general hospital use over five years from sub-populations with and without access to GP hospital care were tested for "GP hospital diagnoses" and other diagnoses.

The general hospital routine data were transferred via 3.5-inch diskettes and transformed for analysis in Epi Info (28). Epi Info was the database and statistics system that was primarily utilised for processing and analysing data in all the papers included. With regard to further details on use of statistical methods reference is made to the specific papers.

3.3 Summary and main conclusions of the papers

Paper I

The paper presents an analysis of patient characteristics and patient flow in 15 GP hospitals based upon 395 completed stays. The typical GP hospital patient was admitted for an acute medical incident and discharged to home after a few days. Patients in this category represented 60% of the stays and had an average stay length of 6.8 days. 19% were transferred to higher-level hospitals after short transient stays (mean 3.6 days). Patients admitted from general hospitals for post-hospital stays represented 9% of the material, with stays lasting on average 22.3 days, significantly longer than other groups. The GPs assessed 61 % of the patients as candidates for higher-level hospitals, if the GP hospitals did not exist. Adjusted for those actually admitted, this would imply that 45% of GP hospital stays replaced admissions to higher-level hospitals. It is concluded that the GP hospitals have a pre- and post-hospital “buffer” function, and that they are primarily used for short-term care and observation of medical problems, not for long-term care of geriatric patients.

Paper II

The paper explores 73 patients who had transient stays in the GP hospitals prior to an emergency admission to a general hospital. It was examined whether the GP hospital stays resulted in 1) permanent health loss, 2) aggravated disease course or 3) whether the stays were favourable. A retrospective design was applied, with an expert panel scrutinising relevant GP hospital and general hospital record documents in two rounds. In 96-97% of the cases, no negative health effects were found. The panel agreed upon the possibility of negative effects in two patients (2.7%), while a possible favourable influence was ascribed to six cases (8.2%). It is

concluded that negative health effects due to transitory stays in GP hospitals are uncommon and moderate, and balanced by benefits, particularly with regard to early access to life-saving treatment for critically-ill patients.

Paper III

The aim of the study was to explore the relative impact of medical and other situational motives upon GP decisions to refer patients to specialist care in a general hospital, and to assess whether having access to a GP hospital influenced the decisions. Among 2496 doctor-patient contacts recorded, 411 were considered for any kind of referral, of which 205 were referred to general hospitals. Medical needs were recorded as the only referral motive of major importance in about half the cases considered for referral, while additional motives were recorded in the other half. The rationale for admissions to general hospital and GP hospital inpatient care was compatible in terms of the relative importance of the medical arguments. The GP hospital option was mainly chosen because of long distances, nursing needs and preferences of the patient and the family, and resulted in a lower proportion of referrals to general hospitals from doctors with access to a GP hospital. The conclusion is that medical motives dominate the decision to refer patients to general hospitals, but access to a GP hospital in cases where nursing needs and long distances to the general hospital are supplementary considerations reduces the proportion of referrals to general hospitals.

Paper IV

In an observational study, covering five years (1990-1994), an assessment was made as to whether populations with access to GP hospitals utilise general hospitals less than populations without such access, particularly with respect to conditions commonly managed in GP hospitals. The material was based upon routine hospital data from two county general

hospitals in Finnmark, and comprised 35,435 stays over 224,969 days. The findings of the study strongly suggested that GP hospitals resulted in lower utilisation of general hospitals. This effect was primarily linked to diagnoses commonly treated in the GP hospitals, particularly cancer, strokes, fractures and respiratory disorders, and it was due both to reduced admission rates and reduced occupied bed days.

Paper V

Based upon assessments of alternative care for GP hospital patients (Paper I), the objective was to determine whether GP hospitals are cost-saving as compared to alternative care. In a cost-minimisation study, costs (funds) to finance GP hospitals were compared with extra (marginal) costs of care in general hospitals, nursing homes and homes if the GP hospitals did not exist. The estimated annual operating cost of the GP hospitals was 32.2 million NOK while the cost of alternative care totalled 35.9 million NOK. Sensitivity analyses indicated that GP hospital care incurs the lowest costs for society under a range of assumptions. The conclusion is that the GP hospital can result in better access to health care for people in rural areas at a lower cost than other options.

4. GENERAL DISCUSSION

This section contains a discussion of the following issues:

- Materials and methods (4.1)
- The main findings of the five studies (4.2 -4.6)
- Quality and appropriateness of care in GP hospitals (4.7)
- Implications and further research (4.8)

4.1 Materials and methods

Compared with earlier Norwegian studies of GP hospitals, the present one attempts to make a more comprehensive analysis of the main roles of this type of institution. Besides studying the use of GP beds as such, examinations are made to see if and how these beds can affect service at adjacent levels.

Data quality is generally important for the conclusions of scientific studies. The aspects of data quality considered to be most important for the conclusions of the present study are completeness, reliability, validity, bias and confounding. In the following, these aspects will be discussed. In addition, the lack of evidence based ~~on~~ upon randomised clinical trials in this and previous studies on GP hospitals will be considered.

Completeness of data

Preliminary consultations with local health personnel made clear that the study had to be restricted in time, in order to be at all feasible in the GP hospital and in general practice. It had to be recognised that an extended recording period, preferable from a statistical point of view, might reduce compliance with the protocol. To secure completeness of the recordings, the following points were particularly considered: First, the recordings were

integrated in the daily activity, thereby disturbing normal routines as little as possible. Second, the data were collected during a period of normal workload. When the autumn was chosen, this was partially due to practical reasons. In addition, this provided an opportunity to compare the results from the GP hospital setting with a previous Norwegian study with a similar design that was performed in the spring (4). Third, one responsible person, a nurse in each GP hospital and a medical secretary in each general practice, was especially appointed to ensure that the records were completed and returned. Under the circumstances, there is reason to believe that this contributed to a high degree of completeness of the data from the GP hospitals and general practices.

Regarding the five-year observational study from the general hospitals, these data are most probably complete since they constitute the basis for the planning and running of the hospitals.

Reliability and validity

An indication of the reliability and validity of the data in this study can be the degree of agreement between the results from different settings. Based upon materials from the three settings, Table 2 shows estimates of admissions to GP hospitals and general hospitals in one week for doctors and populations with access to a GP hospital. To be comparable, the estimates are adjusted to only cover admissions mediated by GPs and to cover the whole population with access to GP beds (55,409 inhabitants = 100%). The numbers of estimated admissions to general hospitals during one week based upon the one-week material from general practice and the five-year material from the general hospitals are 61 and 58, respectively. Indeed, these figures show a high degree of agreement between the materials of the study, indicating that the reliability and validity are satisfactory.

Table 2. One week's estimates of GP-mediated admissions to GP hospitals and general hospitals for the population of Finnmark with access to GP hospitals based upon materials from different settings

Setting/material	Estimated admissions to GP hospitals	Estimated admission to general hospitals
1. General practice		
<u>Material:</u> 2006 doctor-patient contacts in 1 week ; 29 and 43 admissions to GP hospitals and general hospitals, respectively, from 40 GPs covering 71% of the population	$(29/71 \times 100)$ = 41	$(43/71 \times 100)$ = 61
2. GP hospital		
<u>Material:</u> 395 stays covering 94% of the population during 8 weeks; 76 pats. sent to gen. hospitals; 79% of the GP hosp. admissions were mediated by GPs	$(395/94 \times 100) \times (79/100) / 8$ = 42	$(76/94 \times 100) \times (79/100) / 8$ = 8
3. General hospital		
<u>Material:</u> 23.390 stays covering 100% of the population during five years (260 weeks); 65% of the admissions were mediated by GPs		$(23.390 \times 65/100) / 260$ = 58

The above internal estimates are supported by external data. Two previous Norwegian studies covering rural (4) and urban (29) areas, respectively, both concluded that 43-45% of stays in GP beds represented avoidable admissions to a general hospital. This closely corresponds to the results from Finnmark, where the GPs assessed that 45% of the GP hospital stays implied avoided general hospital admissions (Paper I). The net number of “saved” general hospital admissions in our study would correspond to 19 admissions during one week (45% of 42 admissions based upon the GP hospital material, Table 2). If these 19 are added to the 58 general hospital admissions (the general hospital material, Table 2), the weekly admission rate per 1000 inhabitants to general hospitals would be 1.39. Still, this is lower than the corresponding estimate for populations without GP hospitals, which is 1.46.

Together, the internal agreement between results from different settings and the external agreement between the present and previous studies support that the conclusions in this study are based upon reliable and valid data.

Bias

An objection against a Norwegian GP hospital survey (5), was a possible bias in favour of these hospitals since data were recorded by enthusiastic local doctors (30). The enthusiasm of doctors for their favourite types of care can be one factor in explaining variations in the use of health care (31). In GP hospitals, this factor might be wanted and intended. Its real influence would easily be missed in a study based upon records from “neutral” doctors without local insight and a personal involvement with her/his patients. Such an “ideal” study, if at all feasible, might not give a valid picture of real life in these hospitals.

Arguments for including the GPs in the recording process to achieve valid data, however, do not rule out the possibility of a bias in favour of the

GP hospitals in the present study. This possibility is particularly discussed in Papers I & III. That 45% of GP hospital stays represent “saved” admissions to general hospitals, is a consequential implication based upon the GPs’ subjective judgements (Paper I). This might be disregarded as too optimistic, due to bias. As already maintained, the results of the judgements by the GP hospital doctors are compatible with findings from the two other settings studied (Table 2). Again, the internal consistency of the data and the correspondence with previous studies indicate that the results from the two GP settings are fair, and mainly non-biased.

The five-year material from the general hospitals, including over 35,000 admissions, was not subject to any bias from the present study, because only routine recordings in combination with population statistics (32) were utilised. Cardinal variables such as date, age and address should be correct in the hospitals’ routine recordings. Since the diagnostic comparison is based principally upon ICD-9 main groups, and systematic recording differences between the two populations is unlikely, possible variations in the detailed diagnostic classification should be unimportant for the analysis.

Confounding

The geographical factor is an important confounder, when the effect of GP beds on general hospital utilisation is studied. This is because long distance to the general hospital and the location of GP hospitals are two aspects of the same phenomenon. This problem is further discussed in Paper IV. The materials included in this study did not allow any direct adjustment for this factor. However, the differences found with regard to the particular “GP hospital diagnosis” indirectly demonstrates an effect of GP hospitals on the use of general hospitals, independent of geographical distance.

Lack of evidence from randomised clinical trials (RCTs)

A criticism against GP hospitals has been that there is little objective evidence, such as RCTs or cost-benefit analyses, to help define their place (33). None of the papers included in this study could be designed according to the ultimate scientific claims of an RCT. Practical and ethical obstacles against this method are discussed in two of the papers (II & V). Three factors would most obviously interfere with the accomplishment of an RCT: First, care in the GP hospitals is represented by a case-mix that would be difficult to delimitate and define with respect to common end-points. Second, it would be difficult to achieve practical compliance with a protocol requiring participation of many doctors from different wards. Third, ethical and human considerations would motivate objections. For example, the prospect of unwanted random allocations, such as long travels, would easily deter participation.

Considering the present study, a principal question is whether the main objective, to examine the roles of the GP hospital in a comprehensive manner, would be at all suitable for a controlled clinical trial. The same question could be raised for general hospitals and nursing homes. It appears improbable that clinical trials would be appropriate for ultimately defining the place of these institutions. For partial and well-defined GP hospital activities, such as care for patients with cancer, asthma, strokes and post-surgery needs, an RCT is theoretically possible. A reason why no such study has been done until now can be due to difficulties similar to those conceived and discussed above.

4.2 Characteristics and flow of patients

A persistent scepticism towards GP hospitals is that the beds are improperly used as a supplement for long-term geriatric care of nursing home patients. This is reasonable due to the fact that both the GP and nursing home beds are run on the same premises. Critics visiting an integrated GP hospital/nursing home in Finnmark might easily get a strengthened impression of this since the majority of the patients observed actually belong to the nursing home.

The eight-week prospective study (Paper I) shows that the idea that the GP beds are mainly blocked by long-term geriatric patients is not correct. A predominance of short stays clearly demonstrates that there is a regular circulation of patients through the beds; 93% of the stays lasted less than one month, with an average duration of 4.9 days. That the few prolonged stays were principally connected to the 9% of patients admitted from general hospitals indicates that long-term stays were primarily medically motivated. In these cases, social and nursing needs were probably additional motives, since the post-hospital patients in the GP beds were commonly elderly and suffered from strokes and fractures. The fact that the great majority of patients were sent home after a few days emphasises that the GP beds in Finnmark are not a place for keeping long-term geriatric patients. This agrees with studies from Norway (4), Sweden (25) and England (34-35). Everywhere, the majority of patients were admitted from home and discharged to home after short stays.

The age distribution and case-mix in our study bears great resemblance to the findings in the above-mentioned studies. Although 46% of the patients were over 70 years of age, the average age of 61, including ages from 0 to 99 years, indicates that paediatric, adult as well as geriatric problems are handled. The diagnoses classified according to the ICD

(Paper I) and the ICD-9 system (27) revealed a varied spectrum of medical problems. The particular selection of “GP hospital diagnoses” (Papers I & IV) indicates the most common use of the beds: *Observation of acute symptoms* (e.g. pain, dyspnoea and traumas), *treatment of acute episodes in chronic patients* (e.g. cancer, asthma and cardiac failure), *intermediary care between/after hospital stays* (e.g. cancer, strokes, fractures and surgery), and *terminal care* (e.g. late stages of cancer, strokes and cardiac failure).

The relatively low rate of patients with principal psychiatric and social diagnoses does not imply that the GP hospitals are unimportant for these problems. Obviously, the GP beds can be psychosocially advantageous inasmuch as the elderly can be cared for closer to their homes and families. This is of particular importance in Finnmark, where a large Sami minority can use their own language in the local GP hospital, while usually not in the general hospital. As previously mentioned, psychosocial problems were additional rather than main reasons for stays. Among 76 patients transferred to higher-level hospitals, only three went to psychiatric wards. Together, they had a pre-hospital waiting time in the GP beds of 73 days before they were received for further treatment. This illustrates that the GP beds can have a useful pre-hospital “buffer” function for psychiatric patients. A similar post-hospital function is documented through the fact that GP hospitals primarily receive elderly patients for long-term follow up. A favourable effect of this is that earlier discharges increase the capacity in the general hospitals.

4.3 Emergency care

In accordance with previous papers (4, 35), the present study confirms that the majority of patients are admitted to GP beds due to acute incidents, and that a minority of them are further transferred to a general hospital. In the panel study scrutinising emergency patients transferred to general hospitals, 73 patients admitted to somatic wards were included. As mentioned, three patients admitted to psychiatric wards had waiting times in the GP hospitals, indicating less urgency for specialist care. When these three were excluded, the average time in the GP beds before emergency admission to general hospitals was reduced from 3.6 days (Paper I) to 2.7 days.

The principal question related to emergency patients in GP hospitals considered in Paper II was: Do stays in the GP hospitals possibly delay necessary specialist treatment with negative consequences for the health of the patients and the disease course? To our knowledge, this inquiry has not been previously examined. Although negative consequences were found to be uncommon and moderate, a general conclusion should be carefully drawn, since the material is limited. However, emerging from as many as 395 consecutive stays from 15 different units, the material at least supports a general impression of the GP hospitals as not dangerous. On the other hand, the examples of critically-ill patients given treatment that was probably both life-saving and prevented serious damage, point towards safe institutions. On the whole, the possible favourable effects of temporary GP hospital stays more than outweighed the negative effects for emergency patients transferred to general hospitals.

It may be questioned whether the remaining 80% of the patients not transferred and not included in the panel study also would have benefited from a general hospital admission. As maintained in Paper II, since very few were admitted later during the following two months, it is not

reasonable to believe that they were subject to neglect or that they were kept away from major therapeutic opportunities.

A contrasting question is whether the 80% were mainly luxury cases who would have been handled without admission if the GP beds had not been available. Although the local GPs regularly rated the GP hospital as the optimal choice, they assessed a lower-care level, nursing home or home, to be the most probable second alternative for one-third of the patients (Paper I). In a study conducted by an independent assessor, criteria for admission to a general hospital and GP hospital were compared (36). The evidence from this study showed that if there were any luxury admissions to the GP hospital at all, this number was very small. Also, the comparatively low rate of hospital admissions from populations with access to GP beds (Paper IV) counts against needless luxury use.

4.4 General practitioner referrals

The suggestion that GP hospitals give rise to avoided admissions to general hospitals is primarily based upon inpatient data. To search for further evidence, examinations of adjacent care levels were carried out.

On the community level, the GPs play a key role. They are the principal referrers to GP hospitals and general hospitals, as well as outpatient specialist services. With some precautions, the analyses in Paper III give support to previous (4, 29, 37) and present (Table 2) findings based upon data from GP hospitals and general hospitals. Because the GPs in Finnmark without access to a GP hospital are relatively few and work close to the general hospitals, it was not possible to obtain material that was well-balanced between doctors with and without access to GP beds. In addition,

one week's recording appeared to be scanty. Together, these limitations excluded more advanced models in the multivariate analyses.

The basic finding of the study was that 29 patients were referred to the GP beds. This is consistent with the demonstrated 40% reduction in total referrals to general hospitals for doctors with access to GP beds. Actually, the 29 patients constituted 33% of the inpatient referrals among all the participating doctors. Calculated exclusively for the 40 doctors with access to a GP hospital, this proportion amounted to 40%. The result from one week's recording among the GPs in Finnmark is rather modest compared with two English studies covering one year (38-39), where respectively 58% and 78% of all hospital admissions from general practice were to the GP hospital.

4.5 Use of general hospitals

Paper IV reveals that reduced use of general hospitals in populations with access to GP hospitals is caused by a combined effect of reduced admission rates and reduced occupied bed days. The reduction is particularly linked to diagnoses commonly managed in the GP beds. This association, not previously demonstrated, strongly suggests a specific decreasing effect of GP hospitals on the use of general hospitals in Finnmark.

Twenty years ago, Sander already suggested that the GP hospitals in Finnmark had a considerable decreasing effect on the use of general hospitals (6). This was based upon the finding that patients from municipalities with a GP hospital occupied 0.38 bed days in the medical department per inhabitant per year, compared to 1.19 bed days from the general hospital municipality. Our results confirm that this effect is enduring.

In our opinion, Finnmark is comparable to rural areas elsewhere regarding development and provision of health care. Two similar studies from England (40-41), published in 1986 and 1996, respectively, commonly concluded that there is evidence to support the view that GP beds are associated with reduced use of general hospital beds. These studies, covering periods of 2-3 years and based upon much larger and probably less rural populations than that of Finnmark, support the general relevance of our finding.

An implication of this result is that two geographically distinct populations receive health care that differ both quantitatively and qualitatively. Although local variances with regard to risk factors of disease have been found (42), there is no indication of major differences in morbidity between urban and rural populations in Finnmark that could explain the findings. This raises two questions: 1) Does GP hospital care compensate for the lower use of general hospital beds from rural populations? 2) Do urban populations receive care in the general hospitals that otherwise are given in the local GP beds? Considering indications from the previous (6) and the present study (Papers I, III & IV) as well as the high average use of general hospital beds in Finnmark (43), we are inclined to answer “yes, probably” on both questions.

4.6 Cost considerations

An inference of the above “yes, probably” is that the outcome of care for patients in the GP hospitals is comparable to that of general hospitals. Further support of this assumption is discussed in Paper II. Actually, this is a cardinal assumption in the cost study (Paper V).

A widespread belief has been that one of the main advantages of the GP hospitals is their low cost, since care in GP beds generally costs less than care in general hospitals. In addition, costs of transport are saved. The lower cost of care in GP beds has previously been documented both in Norway and England (1, 39, 44). A single English study based upon a GP hospital experiment in 1976 concluded that the units were not cost-effective, but under certain circumstances could be made to be so (45). This was a complex and meticulous study demonstrating the difficulty in making valid comparisons of cost-effectiveness in the field. In 1979, Loudon claimed that until adequate cost-effective studies are carried out, it is impossible to be sure of the general validity of the conclusion (44). No such study has been performed during the past 20 years.

The cost-minimisation design utilised in the present study is of a simpler kind. Because of methodological limitations discussed (Paper V), the general validity of our conclusion is of course uncertain. Two aspects may favour the conclusion in Paper V as conservative on behalf of the GP hospitals. First, the present comparison attempts to incorporate costs at all levels. In addition to costs of the two levels most often compared (the GP hospital and the general hospital), costs of primary care and transport are also included. Second, the costs of alternative care to GP hospitals can be underestimated due to conservative assumptions. Everything considered, it seems reasonable to maintain the conclusion that in Finnmark, GP hospitals are cost-saving compared with alternative care.

4.7 Quality and appropriateness of care

In our opinion, other important issues not directly explored in the five papers are primarily related to quality and appropriateness of care in the GP hospitals. The following discussion concerns the role of the GPs as gatekeepers and moderators in the care of acute and chronic patients. In addition we discuss appropriateness of care from three perspectives considered to be of particular importance (46): The perspectives of the professionals, the patients and society.

Gatekeeper role of the GPs in acute care

Quality of care for emergency patients passing through the GP hospitals is an important aspect, that already has been discussed (Paper II). In addition, we will address two questions reflecting opposing tendencies inherent in the management of acute care: 1) Does easy access to specialist care inappropriately increase the intensity of the services? 2) Do emergency patients have access to appropriate specialist care when really needed?

Paradoxically, if the answer to the first question is “yes”, one of the inappropriate consequences can be a detriment of the access for serious emergencies. Too easy access to specialist care may lead to blocking of the service by less serious incidents, with disrupting consequences for the health service as a whole (47). It has been maintained that the problems of expenditures and intensity of care will be exacerbated unless ways to moderate the use of new forms of technology are developed (48-49). Rationing of health care is inevitable, but should become more explicit (50). Logical reasoning (51) as well as objective data (52) provide support for the role of the primary care physician as a gatekeeper. Gatekeeping can both secure access to care for the underprivileged and protect patients from overtreatment. As it regards acute care, the gatekeeper role may be difficult

to fulfil unless a minimum of low-technology resources (e.g. assistant personnel, laboratory services, observation beds) are provided to secure quality. In a study from Bergen, Øie and Fanebust suggested observation units to reduce the pressure on the departments of internal medicine (53). Similarly, an analysis of emergency admissions to a large surgical department in Oslo concluded that an observation unit with a few beds could have taken care of nearly half of the patients (54). In Finnmark, such resources have been organised around the local GP beds, and thus support the gatekeeper role of the primary care physician.

Care of chronic and terminal patients

According to Øie and Fanebust (53), the possibility of earlier discharges of patients would have substantially reduced the number of care days in general hospitals. Our data (Papers I & IV), as well as Sander's observation twenty years ago (6), support that GP hospitals can release pressure on general hospitals by promoting shorter stays. This has apparent social advantages, particularly for elderly, chronically-ill and terminal patients who can have care close to their homes. For these patients, a direct discharge from the general hospital to home or nursing home can often be difficult. A transfer to the GP hospital makes the way short both back to the hospital and to the nursing home/home depending upon the clinical situation. There is reason to believe that the discharge process can be more appropriate and faster by the use of intermediate GP hospital stays. The much lower use of general hospital beds in the care of cancer (Paper IV) might be illustrative. Supplementing this picture is a high rate of terminal cancer patients in the GP beds. Among the 16 patients dying in the GP hospitals (Paper I, Table III), seven (44%) had cancer.

It follows from this discussion that the GPs can play a moderator role at discharges from general hospitals, not only at admissions. Again, to tackle

this role appropriately, it seems obvious that the doctors need to be supported by an organisation of local beds.

Professional perspectives

There are wide variations in what the health professionals take as their working definition of appropriateness. This is indicated by the considerable variations in the rates of medical procedures and interventions that cannot be explained by local variations in morbidity or availability of resources (55, 56, 57). Hopkins et al. (46) argue that: “much of the cited work on regional variations seems to be in the context that research will disclose inappropriate overuse of interventions”. Evidence from our study supports that the use of GP hospitals is *not* associated with overuse of general hospital services. This is consistent with a prevailing view expressed by key professionals (GPs and nurses) during the study. According to them, GP hospitals are appropriate in health care because they function as «platforms of flexibility» to meet the need of the local population as well as the general hospital before and after hospital stays. In addition, the tasks in the GP hospital are challenging and contribute to attracting and stabilising qualified personnel in community health care. The latter point suggests that closing GP beds can impair access and quality of care to rural populations (58).

Patients' perspectives

It is acknowledged that the quality of health care includes the views of the patients as one important dimension (59). With regard to the patients, we attempted to obtain information about their opinions of the care in GP hospitals through a separate brief questionnaire. Due to the patients' conditions, the situation and other reasons, the questionnaire was only completed in 164 out of 395 stays. Therefore, a more extensive analysis of the data has not been performed. In short, the answers showed that 88% regarded the GP hospital as the best choice for them. Only four patients had

admission to a higher-level hospital as their preferred choice. Actually, three of these four *were not* referred, while ten patients not having a general hospital as their first choice *were* admitted to general hospitals. Considering the low response rate, we will abstain from drawing general conclusions. A cautious inference, however, should be that stays in GP hospitals are based upon medical judgements that are largely in accordance with the patients' preferences.

Perspectives of society

Seen in a societal context of limited resources, means must be found for the rational and equitable distribution of the resources. The society might have different views on GP hospitals depending upon particular interests at different public levels, i.e. municipal, county and state. From a superior governmental perspective, the "GP hospital model" is described in a 1997 Parliamentary report (11). It states that the GP hospital, through cooperation with specialists, general hospitals and via modern tele-communication, can give a "one-and-a-half level of service", including observation before hospital transports, treatment of simpler medical conditions, rehabilitation after hospital treatment and terminal care. Similar views have been repeatedly voiced in official reports during the last 20-30 years. The hard fact, as expressed in the declining number of beds, is that the GP hospital model is about to be eradicated. At the municipal level, the model might well be preferred by the patients and the professionals, but it is disapproved of by the administration due to economical reasons. Similarly, the county authorities use economical arguments when reducing their support to the GP beds (12). If the government earnestly wants to give priority to the GP hospital model, the only way seems to be through earmarked funds.

A reorganisation of the functions and structures of Norwegian hospitals is presently discussed (11, 60). In the future, more tasks and increased responsibility can be transferred to primary care, especially with regard to

initial treatment of acute illnesses. An example can be thrombolytic treatment of coronary incidents. To be efficient, this must be started as soon as possible (61), preferably by the primary care physician. In the rehabilitation of chronic patients, an extended local involvement is also anticipated.

To secure quality of care when new tasks are transferred from general hospitals to primary health care, increased shared care between the levels is mandatory (62). In this respect, telemedicine, already in frequent use in North Norway (63-64), appears to be useful. Modern developments in medicine and tele-communication together may involve more tasks to be managed locally by GPs, under the supervision of "remote" specialists. Clearly, this actualises a future need for "one-and-a-half level beds" within community health care, as outlined in the governmental report.

4.8 Implications and further research

A main implication of this thesis is that GP hospitals can be useful in moderating the flow of patients between primary health care and general hospitals. This is primarily shown to be the case for rural populations far from general hospitals. Since care in GP beds can be accomplished without negative consequences for the patients' health and at a comparatively low cost, this mode of care should also be an alternative closer to general hospitals. A more widespread use of GP beds would be in accordance with idealistic views expressed both in professional and governmental papers. Realistically, however, the development is opposite, shown by the fact that the GP beds in Finnmark have been reduced by 50% since 1994. Using this background, a reasonable question seems to be: Are the government, local politicians and influential health bureaucrats *in agreement* willing and able to reverse this trend? If not, future research on GP hospitals to extend our knowledge on care in and effects of these institutions, will hardly be possible in Norway.

5. CONCLUSIONS

Regarding the particular aims stated, the conclusions of this study are:

1. GP hospitals are primarily used for short-term care and observation of medical problems, not for long term care of geriatric patients. They play a moderator role in the flow of patients between primary health care and general hospitals.
2. Negative health effects caused by transitory stays in GP hospitals before emergency admissions to general hospitals are uncommon and moderate. Positive effects, particularly life-saving treatment for critically ill patients, more than outweigh the negative effects.
3. Access to GP hospitals reduces the proportion of patients referred to general hospitals among GPs.
4. GP hospitals reduce the utilisation of general hospital beds. The effect is caused by a combination of reduced admissions and reduced occupied bed days, and it is particularly associated with conditions commonly cared for in the GP beds.
5. GP hospitals can result in better access to health care for people in rural areas at a lower cost than the alternative options.

These conclusions are consistent with the purposes of the GP hospitals described in the Hospital Act and in governmental papers. The professionals' characterisation of the GP hospital as a "platform of flexibility" appears to be aptly chosen.

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8. PAPERS I-V

PAPER I

The Finnmark general practitioner hospital study

Patient characteristics, patient flow and alternative care level

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Aaraas I. The Finnmark general practitioner hospital study. Patient characteristics, patient flow and alternative care level. *Scand J Prim Health Care* 1995;13:250-6.

Objectives – In a study assessing the role of general practitioner hospitals (GPHs) in the health service two main questions were addressed: 1) Are general practitioner beds used for short-term medical observations, or as a supplement for long-term geriatric care? 2) What are the alternatives to stays in GPHs?

Design – In a prospective design GPH stays during 8 weeks were recorded.

Setting – 15 GPH units in Finnmark county in Norway.

Subjects – 395 completed stays were recorded.

Main outcome measures – the patients' sex, age and diagnosis, flow of patients, length of stays, bed occupancy rate, and doctors' assessments of alternative level of care.

Results – 60% of the patients were admitted from and discharged to their home after a mean stay of 6.8 days. The 19% who were transferred to higher level hospitals stayed significantly shorter than the rest (3.6 days), while 9% transferred from hospital stayed significantly longer (22.3 days). Of the 395 patients discharged 61% were assessed as candidates for higher level hospitals, if GPHs did not exist. 45% of the GPH stays seem to replace higher level hospital admissions.

Conclusion – The GPHs have a pre-hospital »buffer« function by preventing patients with acute symptoms from being unnecessarily admitted to general hospitals through short-term observation stays. A post-hospital function was also demonstrated, since GPHs allow for long-term follow up stays for patients transferred from general hospitals.

Key words: general practitioner hospital, primary care, level of health care, health service delivery.

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General practitioner hospitals (GPHs), also called "cottage" hospitals or by other local names, contain beds in which general practitioners (GPs) can treat or temporarily observe patients to decide the appropriate level of care: an ordinary hospital, at home or elsewhere. In other words they represent a ward level between the patient's home and general hospitals. Except for Finland, Western coun-

tries have neglected this kind of institution in their health planning strategies (1). In Norway, the official number of GP beds has been reduced from some 1 000 to less than 250 during the last 20 years. The decline in GPHs in Western countries can be ascribed both to the technological development in medicine and to the organizing of public services into separate administration

levels. GPHs seem to be squeezed between economic interests of two levels, i.e. the state or county level responsible for hospital services, and the local level responsible for primary care and nursing. This tendency is also present in Finnmark, the northernmost county of Norway, where GPHs have been a cornerstone in the health service since around 1850 and up to now (2). During the last years, Finnmark county authorities, supporting the units financially, have raised questions concerning the use of the beds. Are they used properly, offering hospital relevant care to patients, or improperly, to cover long-term nursing needs for which primary care and the local municipality are responsible? Could the money spent on these beds be more efficiently used on ordinary hospitals? GPs have claimed that GPHs serve as a flexible tool to improve co-operation between the primary and secondary care level, and that they contribute to decreasing the total health expenditure by preventing unnecessary hospital stays. This has also been indicated in a Norwegian survey conducted in 1986 (3).

The 16 GPH units still running in Finnmark are, with one exception, integrated in nursing homes. They consist of 2–16 beds and are all located next door to primary doctors' surgeries. Together they serve a population of 55 000 (72% of the population of Finnmark) scattered in small communities (Fig. 1). Due to arctic climatic conditions and long travel distances, patient transports to the two county general hospitals by road, boat or air are occasionally hindered.

Based on these 16 units, we have conducted a study to assess the role of GPHs in health service. This first paper presents an analysis of the patient flow through GPHs. The aim is to answer the following questions: Are GPH beds used for short-term care of medical conditions or as a supplement for long-term geriatric care? What would be the alternatives to stays in these beds?

Material and method

During 8 weeks, from 14 October to 10 December 1992, all admissions to and discharges from GPHs were consecutively recorded on a registration form. The design of the form and the duration of the study were adjusted to experiences from a pilot study and from discussions with pro-

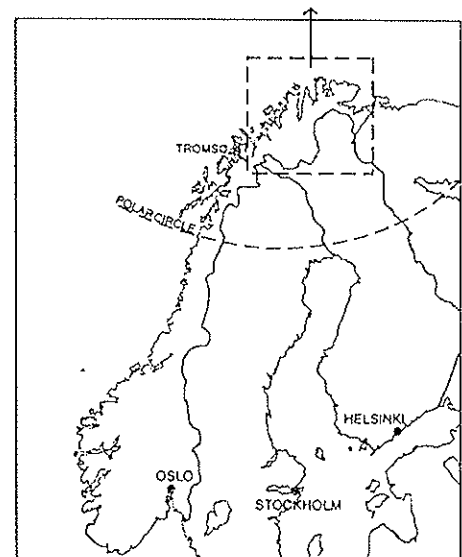
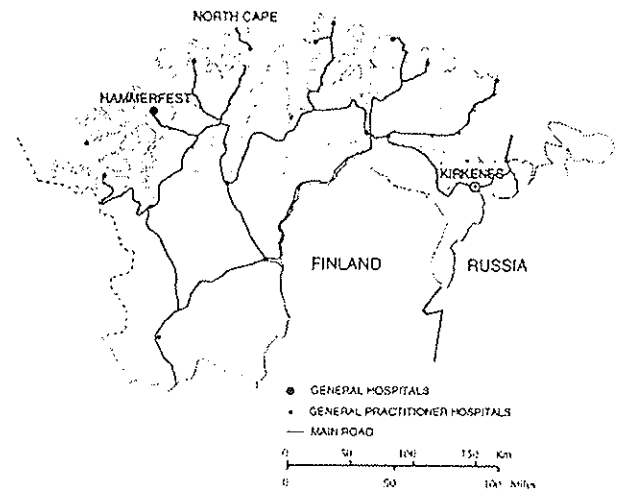


Fig. 1 Finnmark.

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fessionals in each unit during the planning phase. Due to a high turnover of doctors in some municipalities, the form was designed so that the nurses could fill in the main part of it, and in each unit a nurse was appointed in charge of the data recording. At admission the nurses recorded basic information about the patient, her/his residence and the reason for the stay. The diagnoses were recorded by the doctors in free text and coded according to The International Classification of Primary Care (4). Towards the end of the stay the nurses recorded the patient's next place of residence, while the doctors assessed the alternative to care in a

GPH for each patient by answering the question: "If the possibility to admit to the GPH did not exist, what would have been the most probable place of care for this patient?". That information made it possible to classify each patient into separate "flow groups". 15 of the 16 GPH units returned data. When stays allocated for nursing home and obstetric beds are excluded, the material for analysis included 395 stays (in 77 beds), completed by the end of the observation period.

Results

Elderly people constituted the majority of patients, but all ages were represented (Table I). 55% of the patients were female, the majority of whom were confined to age groups above 70, while the two sexes were equally represented in ages below 70.

Considering both terminated and unterminated stays within the registration period, the beds were occupied for 3235 days, which corresponded to a 75% occupancy rate. The mean duration of all terminated stays was 9.0 days. 93% of the stays lasted less than one month and these had a mean duration of 4.9 days. The duration of stays differed with age (Table II) and with patient flow groups (Table III). On average the duration was 6.8 days for the largest patient flow group, the 60% admitted from and discharged to home. The duration was 3.6 days for the 19% admitted from home and discharged to hospitals. Pre-hospital stays were significantly shorter than the remaining ones ($p < 0.0001$) and included a majority of

Table I. Patients discharged from general practitioner hospitals in Finnmark during 8 weeks, 1992. Age and sex distribution.

Age group years	Stays		Female n	Male n
	n	%		
0-15	19	(4.8)	11	8
16-49	98	(24.8)	48	50
50-69	98	(24.8)	50	48
70-79	99	(25.1)	56	43
80+	81	(20.5)	52	29
Total	395	(100.0)	217 (55%)	178 (45%)

Table II. Discharges from general practitioner hospitals in Finnmark during 8 weeks, 1992. Age according to length of stay.

Number of stays (N=395)		Length of stay day groups	Age years mean	(SD)
n	%			
218	(55.2)	0-2	51.6	(23.5)
81	(20.5)	3-7	69.7	(19.3)
70	(17.7)	8-30	74.3	(12.9)
17	(4.3)	31-59	78.9	(6.4)
9	(2.3)	60+	73.0	(13.3)
Total (mean):		9.0 days	61.0	(23.0)

men as opposed to other flow groups in which women tended to dominate. The male majority referred to hospitals consisted mainly of middle-aged men (on average 58.1 years) who most frequently had digestive, cardiovascular, and mus-

Table III. Age and duration of stays for patients in general practitioner hospitals in Finnmark by care level prior to and after the stay ("patient flow groups")

Patient flow group	GPH stays		Age years		Duration days	
	n	(%)	mean	(SD)	mean	(SD)
A: from home via GPH to home	236	(59.7)	58.0	(23.4)	6.8	(22.1)
B: from home via GPH to hospital	76	(19.2)	58.8	(23.1)	3.6	(7.5)
C: from hosp./nurs.home via GPH to home/ nurs.home/hosp.	41	(10.4)	75.2	(13.8)	19.3	(25.8)
D: other*	42	(10.6)	68.4	(21.0)	21.5	(29.9)
Total	395	(100.0)				

* Group D includes 16 deaths and stays not classified otherwise due to lack of information

Table IV. Number of stays for patients in general practitioner hospitals in Finnmark during 8 weeks, 1992, by main diagnoses according to ICPC*

Diagnoses	Number of stays	
	(N=395)	
ICPC group	n	%
General	25	(6.3)
Gastrointestinal	48	(12.2)
Cardiovascular	77	(19.5)
Musculoskeletal	62	(15.7)
Neurological	34	(8.6)
Mental	25	(6.3)
Respiratory	45	(11.4)
Urinary/kidney	15	(3.8)
Female genital	16	(4.1)
Social	10	(2.5)
Others**	23	(5.8)
Not recorded	15	(3.8)

* International Classification of Primary Care (4)

** Others include eye, ear, skin, male genital and metabolic disorders

culoskeletal disorders. Post-hospital stays, representing 9% of the material, lasted 22.3 days and were significantly longer than the rest ($p < 0.001$). Post-hospital stays involved older patients with cardiovascular or musculoskeletal diseases as the two most common diagnoses.

The varied spectrum of medical problems encountered may be somewhat hidden in the ICPC main group presentation (Table IV). The most frequent diagnoses, as recorded in free text, were: cerebral and cardiac vascular disease, trauma/

fractures, cancer, abdominal pain, asthma, and pneumonia. Psychological or social problems were recorded as the main diagnosis for 8.8% of the stays. Some 75% of all admissions were ascribed to emergency situations.

According to the doctors' overall assessments during the stay, the best alternative to GPH stays, if GPHs did not exist, were general hospitals for 240 patients (Table V), of whom 61 were actually transferred. The remaining 179 patients represent "saved" hospital admissions and constitute 45% of the total GPH material.

Discussion

The main result of this study is that the typical GPH patient is admitted for an acute medical incident and discharged to home after a few days. Only every fifth stay resulted in transfer to a general hospital. The broad spectrum of medical problems encountered are mainly diagnosed as somatic ones.

Since the existing number of GPH beds is relatively small and spread over several small units, a main methodological challenge was to motivate health personnel in the local units to comply with the protocol. Contact with key professionals in the planning phase made it clear that to secure participation in a prospective study it would have to be limited to as short a period as possible. One considered eight weeks as a maximum during which motivation could be kept up. On this background we are satisfied that 15 of the 16 units participated and believe that the results are representative of the GPH situation in Finnmark.

Table V. Doctors' assessments of appropriate place or level of care as a potential alternative to the general practitioner hospital, by patient flow group.

Patient flow group	GPH stays		Assessments of appropriate place/level of care if GPH did not exist		
	n	%	hospital	nursing home or home	not assessed
A: from home <i>via</i> GPH to home	236	(59.7)	133	88	15
B: from home <i>via</i> GPH to hospital	76	(19.2)	61	7	8
C: from hospital/nursing home <i>via</i> GPH to home/hosp./nursing home	41	(10.4)	20	17	4
D: other	42	(10.6)	26	13	3
Total	395	(100.0)	240	125	30

Although the majority of patients were elderly, all age groups were represented. The mean age of 61 years for GPH patients is higher than for patients in medical and surgical departments in Finnmark, which was 55 years during the study period. In a study concerning emergency patients admitted to an internal medicine department in a city hospital the mean age was 67.3 years (5), while nursing home patients are considerably older, i.e. on average 75-80 years (6). The preponderance of men of 60 being admitted from GPHs to general hospitals corresponds both to the distribution of men in the Finnmark hospitals and to the overall age distribution in Norwegian general hospitals, where males between 50 and 70 years are most frequently hospitalized (7). In all, the age and sex distribution of GPH patients seems to bear a stronger resemblance to patients in general hospital departments than in nursing homes. This resemblance is also obvious through the finding of a high turnover of patients and relatively few prolonged stays. The same general trend has been reported earlier in Norway (3) and in several studies from British general practitioner hospitals during the 1970s and 1980s (8-10). Longer stays in corresponding Finnish institutions have been explained by official regulations stating that 30% of the beds shall be used for acute general medical cases and 70% for chronic geriatric patients (1, 11).

A total bed occupancy rate of 75% is high and probably close to a maximum if GPHs shall function according to their purpose. The need to keep one bed free in case of emergencies was emphasized in all places and was commonly practiced. Occupancy rates above 100% were recorded in three units. This may be explained by the fact that 1/4 of the stays lasted less than 24 hours. Consequently, one bed could be used by two patients on the same day, each patient staying a few hours only.

According to the diagnoses collected, the GPHs in Finnmark seem to be rather somatically oriented. Of all transfers to and from higher level hospitals, 3% involved psychiatric hospitals. The low rate of social and mental disorders may partially be due to a tradition of admitting mainly somatic patients, but can also be due to a well developed network of local psychiatric institutions in Finnmark. Still, some positive psychological and social functions of GPHs should be

acknowledged. Terminally ill patients and patients with chronic disorders, often admitted from higher level hospitals, are offered long-term care close to their homes. Such a location is also beneficial for medical reasons. Maintaining contact with the patient's family and network may be crucial in comprehensive terminal care, for recovery, as well as for a well planned discharge. A low rate of patients transferred from nursing homes (together 5%) may seem surprisingly low. This implies that the beds are not usually occupied by long-term geriatric patients. The reason for this became apparent during visiting rounds to the units: most medical incidents in debilitated patients are observed and treated without moving the patient. This functions smoothly at the local level since nursing home beds and medical beds are on the same premises and are served by the same personnel. Even though difficult to control, this model may be favourable from the county authorities' point of view since relevant hospital services can be given both in GPH beds and in the next door nursing beds (paid for locally). A particular benefit is that transportation of the oldest and weakest patients can be reduced to a minimum.

When admitting patients to hospital services, doctors are necessarily forced to do some kind of overall assessment, considering both the clinical and the social situation in each case. An assessment towards the end of the stay, as done in this study, may be met by two principal objections. First, it is obviously easier to decide who is a hospital case and who is not when the situation is clarified at the end of the stay than on admission when it is characterized by urgency and uncertainty. We could not record the assessments by the admitting doctors directly, but the fact that they did admit indirectly reflects the need for a higher level of care at that moment than later during the course. Second, the GPs doing the assessments are not neutral and may favour the use of their "own" beds. During discussions when the study was planned the doctors themselves pointed to the professional challenge and the ideal to be economical on behalf of society at large as the two main motives for their use of GPH beds. It is unlikely that these motives changed during the recording period. Personal economic incentives can hardly be said to explain the doctors' utilization of GPH beds, since no extra payment is

given for work with such patients. Actually, the alternative of admitting patients to the far away general hospital can be less time consuming and more profitable for the doctors in the Norwegian fee system. When doctors in 15 different units assessed the majority of stays at discharge as the best choice for the patients, this may confirm a sound decision-making practice by the admitting doctors, most often someone else. The validity of the doctors' assessments is strengthened by the fact that the results correspond closely to a similar evaluation performed by 45 other doctors six years earlier (3).

Since GPHs are given the opportunity to decide the appropriate level of care through a two-step process, we think that our findings support the view that GPHs serve as pre-hospital "buffers" by "protecting" patients (especially those with acute, early symptoms) from unnecessary hospital admissions. In addition, a post-hospital function was evident since the beds allow for long-term follow up stays for patients transferred from general hospitals. The second function might be as important as the first in modern hospital care, where demands for effectiveness and high turnover are steadily increasing. A study from Wales concluded that the general practitioner hospital, as an example of an observation unit, eases the burden of the general hospital at a reasonable cost (12). Due to rising costs of hospital care, and the suggestion that co-operation between pre- and post-hospital care could be more efficient, the idea of reintroducing GPH-like institutions in other geographical areas is discussed in a 1994 governmental white paper on health care (13).

One may question whether our results, obtained during eight weeks in late autumn and early winter, are representative for the rest of the year, and whether they apply to medical care outside Finnmark. Our pilot survey in the first half of 1992 showed the same general trend as reported here: many short and few prolonged stays. In their 1986 study, which was completed during 8 weeks in the spring time, Mamen & Nylenna found figures for stays, patient turnover, diagnoses, and assessment of alternatives to GPHs closely corresponding to our data (3). In 1986, GPHs were more widespread, and various parts of rural Norway were included. It is reasonable to believe that our results, comparing well with experiences six years earlier, could also be relevant for rural districts

outside Finnmark in the 1990s. Except for a few days every year when extreme weather conditions prevent patient transport, Finnmark is not particularly different from other rural areas in Norway or neighbouring countries as regards access to modern health care facilities.

That our and previous GPH studies cover rural areas does not necessarily imply that this type of institution is inadequate for urban areas. A primary care bed unit for short-term observation in Oslo seemed to prevent hospital admission for 45% of "urban" patients (14), which is in accordance with our "rural" findings. A recent study from a Norwegian city hospital, without GPH in its area, suggested that observation units should be established in order to release the pressure on beds in internal medicine departments (5). Although intermediate institutions to buffer patient flow between primary care and hospitals can be needed anywhere, experiences from Finnmark may be difficult to transpose to urban populations living close to hospitals. While the GPH is seen as a safety link in health care for patients in Finnmark, it may be felt more like a (hospital) barrier to a city population. Also, GPs in cities, used to having easy access to hospital facilities, may be reluctant to take on GPH work that their colleagues in Finnmark find challenging. Presumably, observation beds attached to hospitals and not to nursing homes would be more appropriate in cities.

An unanswered question is whether the "transit" stay in a GPH for patients transferred from home to hospital leads to delay in diagnosis and treatment. This and other questions concerning quality of care, as well as economic aspects of GPHs, will be considered in forthcoming papers.

Conclusion

Our answers to the questions addressed in this paper are: General practitioner hospitals in Finnmark are mainly used for short-term care and observation of medical problems. Prolonged stays are relatively infrequent, mainly used for terminal patients and intermediate post-hospital stays, not for long-term care of geriatric patients. Almost 20% of the patients were admitted to general hospitals, while 45% of the GPH stays seem to replace hospital admissions.

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PAPER II

Is the general practitioner hospital a potential “patient trap”?

A panel study of emergency cases transferred to higher level hospitals

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Objectives - 1) To find out whether a stay in local general practitioner hospitals (GP hospitals) prior to an emergency admission to higher level hospitals aggravated or prolonged the course of the disease, or contributed to permanent health loss for some patients. 2) To detect cases where a transitory stay in a GP hospital might have been favourable.

Design - A retrospective expert panel study based on records from GP hospitals and general hospitals. The included patients had participated in a previous prospective study of consecutive admissions to GP hospitals during eight weeks.

Setting - Fifteen out of 16 GP hospitals in Finnmark county, Norway.

Subjects - Seventy-three patients transferred to higher level hospitals from a total of 395 admitted to GP hospitals.

Main outcome measures - Three outcome categories were considered for each patient: "possible permanent health loss", "possible significantly prolonged or aggravated disease course", and "possible favourable effect on the disease course".

Results - There was agreement about the possibility of negative effects in two patients (2.7%), while a possible favourable influence was ascribed to six cases (8.2%).

Conclusion - Negative health effects due to transitory stays in GP hospitals are uncommon and moderate, and balanced by benefits, particularly with regard to early access to life saving treatment for critically ill patients.

Key words: general practitioner hospital, quality of care, medical injury, delay of care.

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The purpose of general practitioner hospitals (GP hospitals) is to deliver care at an intermediate level between primary care and general hospitals. In a study from Finnmark county in northern Norway we have previously reported that the GP hospitals seem to function according to their purpose, by avoiding unnecessary admissions to general hospitals, and by giving access to long-term follow up stays after hospital admissions (1). About 20% of the patients in the GP hospitals were transferred to general hospitals after stays lasting from hours to a few days. Since these patients were admitted in the end to general hospitals as emergency cases, one may ask if the stays in the GP hospitals were in any way harmful. Could the GP hospital act as a “patient trap”, obstructing access to optimal care?

The aim of this paper was to examine whether the transient stays in the GP hospitals could result in aggravated or prolonged course of the disease, or at worst permanent health loss. We also wanted to detect and describe cases where early access to GP hospital treatment might have been favourable.

MATERIAL AND METHODS

The study was carried out in Finnmark, the northernmost and most sparsely populated county of Norway. The travel time by ambulance from 16 rural communities with GP hospitals to two general county hospitals ranged from 1 to 4 hours. During a period of eight weeks (14 October to 10 December 1992) consecutive admissions (n=395) to 15 of the 16 GP hospitals were recorded. Case histories concerning all the patients transferred as emergencies to higher level somatic hospitals after temporary stays in GP hospitals (n=73) were scrutinized by a panel of three experienced specialists covering the fields of general practice (HM),

internal medicine (BOE), and surgery (ØI). The assessments were based on anonymous copies of the referral letter from the GP hospital, the hospital medical record, and the discharge letter for individual patients. To enable the judgement of possible long-term effects, a report from the latest general hospital stay was enclosed, if such a stay had taken place by the time of the assessment, some 2.5 years after the actual transfer. In the first round the assessments were made independently on a written form, including the three following questions:

1. "Did the stay in the GP hospital possibly cause permanent health loss?"
2. "Did the stay in the GP hospital possibly cause a significant prolongation or aggravation of the course of the disease?"
3. "Did the stay in the GP hospital possibly have a favourable effect on the course of the disease?"

In a second round only cases of disagreement in the first round were included. The primary decisions were discussed by the panel before ultimate conclusions were drawn. It was explicitly agreed that positive effects should apply strictly to medical outcomes. This mentioned that social benefits, e.g. care close to home, were ruled out on the positive side. Main characteristics of cases finally assessed with either negative or positive effects of the GP hospital were to be presented in the paper to facilitate outside criticism and validation. Student's t-test was applied for statistical testing of age differences, while agreement between experts was estimated by kappa statistics.

RESULTS

Age, sex, and diagnosis

The age of the 73 patients ranged from 1 to 90 years (mean of 58.7 years), with no significant difference between women (59.1 years) and men (58.5 years), $p=0.91$. The majority were men (62%). The principal diagnoses according to ICD-9 main group classification were distributed as follows: cardiovascular diseases ($n=19$), respiratory diseases ($n=9$), digestive diseases ($n=7$), trauma/intoxication ($n=11$), general symptoms ($n=15$), others ($n=12$). In most instances the principal diagnosis in the GP hospital and the general hospital was identical, but for 15 patients it was changed (Table I).

Panel assessments

The number of cases with disagreement was reduced from the first to the second round (Table II). It was agreed that “no” negative health effects could be ascribed to the GP hospital stay in 71 (97%) and 70 (96%) cases, assessed for question 1 and question 2 respectively. The panel finally agreed on a negative effect in two cases, while two other cases resulted in a persistent disagreement on negative effects. Overall agreement within the panel for the negative categories tested with kappa was 0.75 (CI 0.62-0.87) and 0.59 (CI 0.47-0.71), for question 1 and question 2 respectively. For question 3 complete consent was reached ($\text{kappa}=1$), which mentioned that “no” positive effects could be traced in 67 (92%) cases, while a possible positive effect was ascribed to six patients. Negative effects were ascribed to elderly patients (60-85 years) with chronic disorders accompanying their acute illnesses, while positive effects were found in both younger and older patients (29-82 years) with more clear-cut acute conditions. The most distinctive case histories are described in Table III.

DISCUSSION

Method

Modifications of the expert panel method is a common alternative to randomized studies in assessments of quality and outcome of health care procedures (2,3). In the present study a randomized controlled design was not acceptable from a practical point of view and might also have been refused on ethical grounds. Consequently one had to rely on expert judgements. The validity and reliability of expert judgement can be questioned (4). Anyone involved may be influenced by his attitude towards the topic of the study. A specific criticism of previous GP hospital studies has been that data recorded by enthusiastic local doctors may be biased in favour of their own activity (5). To counteract this kind of bias, several precautions were taken. The assessments were based on records from both the primary and the secondary (hospital) level of care. These documents contained detailed descriptions of the patients' clinical condition, and of the treatments given as well as the cooperation between different care levels. Neutrality of the panel members was emphasized, and none had any previous experience or particular interests in any of the units under study. Three factors may have biased the judgements in a more critical direction. First, the objective to record possible and not only obvious negative effects of the GP hospital. Second, the explicit exclusion of "non-medical" factors such as shortened time in hospital from the positive effects of the GP hospital, while, on the negative side, a prolonged hospital course was not excluded. Third, the retrospective design may in itself induce a critical attitude, due to reliance on wisdom after the event, without awareness of difficulties experienced in the situation. Individual

positive ratings were reduced more than negative ones from the first to the second round (Table II), which may indicate a rather conservative (pessimistic) end result.

Negative effects

Inevitably, all medical interventions imply a certain risk. Were the negative effects found for the GP hospital acceptable? At least they were not particularly alarming. The possible negative effect agreed on in two cases (2.7%) was not perceived by all experts in the first round, and the final conclusion was drawn in doubt in one case. Among patients with a change of diagnosis from the GP hospital to the general hospital 14 of 15 were not assessed as delayed in the GP hospital, including four patients with an ultimate cancer diagnosis (Table I). The only patient with changed diagnosis assessed as possibly delayed (by one expert) was an old woman with cardiac dyspnoea staying in the GP hospital for two weeks, later treated with a pacemaker (patient no 7 in Table I). In a large American study including 44 hospitals, adverse events due to erroneous or inadequate hospital management occurred for 3.7% of the patients (3). That study, like ours, was based on retrospective assessments of record documents, but included more obvious negative effects. Among the patients experiencing adverse events 13.6% died. The frequency of unintended life-threatening or disabling events in the treatment of elderly patients in a university hospital was 9% (4). In other words, the negative effects due to a transitory stay in the GP hospital appear to be few, moderate, and acceptable compared with more advanced wards.

Positive effects

Our study indicated that a local GP hospital staffed and equipped to start intensive treatment was positive for six patients (8.2%). The full range of emergency procedures possible in a GP hospital cannot be performed by a GP on his own, neither in the surgery nor at the patient's home. In a study comparing air and ground ambulance, 2.4% of the patients represented 96% of total health benefit of air transport (3). This suggests that a certain delay of hospital arrival is rarely critical, especially if adequate emergency management can be started locally. In two cases, in which the time factor *was* critical, advanced and possibly life saving treatment was started immediately (Table III). This demonstrates a particular advantage of GP emergency beds in rural areas.

Reduced time in hospital, due to initial non-emergency treatment in the GP hospital, was not evaluated as a medical benefit in this study. However, from a social point of view this would usually be a desirable effect, apart from the chance of avoiding hospital admission at all. The possibility of economic gains would also add to the positive effects of a GP hospital (7,8).

General aspects

One may question whether the 80% of the patients who were managed in the GP hospital without further hospital referral would have benefited from general hospital care. This possibility is not very likely, because a majority of the patients could be sent home or to other appointed care after few days, according to judgements by their local doctors (1). For 179 non-referred patients who were assessed as candidates for general hospital by the GPs, if the GP hospital option had not existed, we investigated whether there had been any admissions to the general hospital during the two months following

the stay in the GP hospital. Only four were admitted, and hospital documents checked in these cases did not indicate that any of these admissions had been preceded by GP hospital ignorance. All considered, it seems unlikely that the GP hospital kept patients away from significant therapeutic opportunities.

The potential of the GP hospital to reduce hospital admissions and to release pressure on general hospitals has been indicated in other studies (7,9-11). An adverse effect of easy access to advanced wards in urban areas may be over-admission of non severe and chronic cases. The increase in emergency admissions to hospitals has been regarded as a general problem disrupting the national health service in the UK (12). According to a recent study, 10% of admissions to general hospital might be suitable for alternative forms of care, particularly GP hospital and urgent outpatient appointment (13). A Norwegian study proposed pre-hospital observation units as one measure to relieve pressure on inner city medical departments (14). Our study indicates that intermediate wards such as a GP hospital may counteract hospital overload through appropriate and safe selection of emergency patients.

Conclusion

The panel agreed that stays in a GP hospital contributed to a possible permanent health loss in one patient and to a possible (moderate) prolongation of the disease course in another one. These negative effects were marginal and well balanced by benefits from early intervention, including life saving procedures for critically ill patients. We conclude that the GP hospital is *not* a patient trap.

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Table I. Changes of principal diagnosis from GP hospital to general hospital for 15 patients.

Patient			Time in GP hospital	Diagnosis at discharge	
no	sex	age	days	from GP hospital	from general hospital
1	M	73	6	Lung abscess	Lung cancer
2	F	39	1	Appendicitis	Salpingitis
3	M	45	<1	Angina pectoris	Pericarditis
4	M	55	<1	Angina pectoris	Pericarditis
5	F	71	1	Cerebral apoplexy	Subdural haematoma
6	M	60	1	Deep vein thrombosis	Fracture sequela
7	F	85	14	Dyspnoea	Cardiac arrhythmia
8	M	43	<1	Spinal fracture	Spinal trauma
9	M	51	3	Jaundice	Cancer (unknown origin)
10	F	85	2	Obs/abdomen	Diverticulitis
11	F	70	<1	Obs/abdomen	Pancreatitis
12	M	30	<1	Obs/abdomen	Gastroenteritis
13	F	88	3	Obs/heart	Bronchitis
14	M	81	2	Pneumonia	Lung cancer
15	M	78	3	Pneumonia	Stomach cancer

Table II. Assessments of possible negative and positive effects of stays in GP hospitals for 73 patients transferred to general hospitals as emergencies, according to the expert panel.

Possible effects of GP hospital stay	Panel round 1			Panel round 2		
	Agreement		Disagreement	Agreement		Disagreement
	<i>Yes, possibly</i>	<i>No</i>		<i>Yes, possibly</i>	<i>No</i>	
<i>Negative effects:</i>						
1. Permanent health loss	0	69	4	1	71	1
2. Significantly prolonging or aggravating the course of the disease	0	65	8	1	70	2
<i>Positive effects:</i>						
3. Favourable effect on the course of the disease	2	58	13	6	67	0

Table III. Examples of patients with possible negative and positive health effects due to stays in GP hospitals. Panel opinions and arguments.

Patient	Panel
<p>Woman 74 (diabetic) D: Myocardial infarction 8-12 hours in the GP hospital <i>Pain in back and arm. Vomiting. ECG and enzyme analysis in GP hospital indicated MI. During the next year the patient developed A-V block and left ventricular failure.</i></p>	<p>Negative effects?</p> <p><i>PANEL AGREEMENT:</i> Quest. 1 Permanent health loss?</p> <p>Yes: During the GP hospital stay acetyl salicylic acid (ASA) was not given. The delay of ASA may have increased the size of the MI and contributed to the later heart complications.</p>
<p>Man 60 D: Apoplexia 24 hours in the GP hospital <i>Partially recovered from apoplexia two years ago. Admitted to GP hospital due to sudden dizziness combined with gradually evolving stroke. In the general hospital progressively worse and little by little loss of consciousness. Died after 28 days.</i></p>	<p><i>PANEL DISAGREEMENT:</i> Quest. 1 + 2 Permanent health loss + significantly prolonged/aggravated course?</p> <p>Yes on 1 + 2 (BOE): Stroke-in-progress could have been reduced if treated early with heparin. No on 1 + 2 (HM/OI): Stroke patients not always accepted for immediate admission in hospitals in 1992. Heparin not routinely used, and not given to this patient in the general hospital.</p>
<p>Woman 64 (tbc sequel) D: Resp. failure/arrest 2 hours in GP hospital <i>Intubation, ventilation, oxygen, dopamine i.v. in the GP hospital to secure adequate transport to general hospital. Stabilized at discharge after 13 days.</i></p>	<p>Positive effects?</p> <p><i>PANEL AGREEMENT:</i></p> <p>Yes: Immediate advanced intervention, possibly life saving.</p>
<p>Woman 70 D: Septicaemia/bleeding 2 hours in GP hospital <i>Acute fever, diarrhoea, vomiting, anaemia. In GP hospital blood culture + i.v. infusion of fluid/ electrolytes and antibiotics. Salmonella in blood culture. Discharged in good health from hospital after 18 days.</i></p>	<p>Yes: Potentially life threatening condition in which immediate blood culture and start of i.v. treatment may have contributed positively to the course.</p>
<p>Man 29 (industry worker) D: Eye injury 8-10 hours in GP hospital <i>Caustic liquid in both eyes. Eye rinsing started instantly and continued over night in the GP hospital in telephone co-operation with the distant eye department. Eye examination next day showed no deeper injury.</i></p>	<p>Yes: Early adequate treatment may have prevented eye damage and visual complications.</p>

PAPER III

**General practitioner motives for referrals to general hospitals:
Does access to general practitioner beds make any difference?**

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Abstract

Objectives: To explore the relative impact of medical and other situational motives on general practitioner (GP) decisions to refer patients to specialist care in a general hospital, and to assess whether having access to a general practitioner hospital (GP hospital) influences the decisions.

Design: Prospective study of consecutive doctor-patient contacts during one week. The effects of main motives, medical, social/nursing, general hospital advice, distance to general hospital and access to GP hospital on referral decisions were explored by logistic regression. The motives for different referral decisions were also explored through frequency analyses.

Setting: General practices in the county of Finnmark in North Norway, which included 40 GPs from rural practices with access to a GP hospital and eight GPs working closer to a general hospital without access to GP hospital.

Subjects: 2,496 doctor-patients contacts, resulting in 411 patients being considered for any kind of referral, of which 205 were referred to the general hospital.

Main results: Medical needs were recorded as the only referral motive of major importance in about half of the cases considered for referral, while additional motives were recorded in the other half. The rationale for admissions to general hospitals and GP hospitals (inpatient care) was compatible in terms of the relative importance of the medical arguments. The GP hospital option was mainly chosen due to the long distance to the general hospital, nursing needs and preferences of the patient and the family, and resulted in a lower proportion of patients being referred to general hospitals from GPs with access to a GP hospital.

Conclusion: Medical motives dominate the decision to refer patients to general hospitals, but access to a GP hospital, in cases where nursing needs and long distances to the general hospital are supplementary considerations, reduces the proportion of patients being referred to general hospitals.

Key words: referral decision, general practitioner, general practitioner hospital, general hospital

Introduction

A main objective of modern health care is to provide high-quality and equally distributed cost-effective hospital services. A growing concern has been an uncontrolled increase in emergency admissions to hospitals, which may have a disrupting impact on the health services as a whole.¹

General practitioners (GPs) play a key role as hospital gate-keepers, since the bulk of referrals and admissions pass through them. Presumably, when referring a patient to specialist care in a general hospital, the GP will firstly base her/his decision upon medical considerations. But the decision is often not based upon clinical factors alone.² Other motives may arise from preferences of the patient, family and social setting of the situation. Likewise, distance to the general hospital, whether an appropriate care alternative is available and the more or less explicit advice and guidelines given by the hospital are other extraneous factors that are likely to influence referral decisions.

In Norway, the implementation of general practitioner hospitals (GP hospitals) has been considered to be an appropriate measure of reducing the high pressure on hospitals,³ and of improving co-operation between the primary and secondary level of care.⁴ Previous studies from the UK⁵⁻⁷ and Norway^{8,9} have suggested that a substantial portion of patients in the GP hospitals would have been referred to general hospitals if the local GP beds were not available.

In the present study among GPs in Finnmark County in North Norway, the aim was to explore the relative weight of medical and other situational motives for doctors' decisions to refer/admit to general hospitals. Since GP hospitals exist as an option of care in many remote communities in Finnmark, a specific aim was to assess whether and to what extent having access to a GP hospital modifies the GP decisions to refer to general hospitals.

Material and method

Of a total of 65 GPs invited, 48 accepted to record all their patient contacts during one week in November 1992. Forty GPs worked in rural practices with access to a GP hospital, while eight worked without access to a GP hospital and closer to the

general hospital. At the end of each consecutive contact, a brief registration form, which had been tested in a pilot study, was completed. A total of 2.496 patient contacts were recorded of which any kind of referral was considered in 411, while referral to a general hospital was completed in 205 cases. The registration form contained information about the age and sex of the patient, the time and type of contact (consultation, home-visit, telephone) and the urgency of the condition. The GPs were asked to rate the importance of various listed motives for any referral on a scale graded from 1 to 4 (no, little, medium or major importance). In the multivariate analysis, this information was grouped into the following four groups of motives:

- 1) *Medical needs* [need for observation, investigation, treatment as single variables (1,4) were added to an index and regrouped (1-4)]
- 2) *Hospital advice* (1-4)
- 3) *Social and nursing needs* [psycho-social factors, nursing needs, preferences of the patient or family as single variables (1,4) were added to an index and regrouped (1-4)]
- 4) *Long distance to the general hospital* (1-4)

Those cases where referral had been considered but ratings were missing for some of the listed motives were coded to be of "no" importance. Epi-Info¹⁰ was used for data entry and frequency analyses, while SPSS/Windows¹¹ was applied for the logistic regression analyses. Separate logistic regression analyses were performed with 1) all referrals to general hospital care, 2) outpatient referrals, and 3) inpatient referrals (admissions) as dependent variables using the 206 patients considered but not referred to the general hospital as reference population. In the first model, patient age, sex and access to GP hospital were included as independent variables, whereas in the second model, age, sex, hour of patient contact and type and importance of motives were introduced as independent variables.

Results

Among 411 patients considered for any kind of referral, 205 were referred to general hospitals, 146 to outpatient and 59 to inpatient care, respectively. Of the remaining 206 patients, 29 were admitted to a GP hospital, 85 were sent to X-ray, laboratory examination and various other local care options, while 92 were not given any further

follow up. The GPs assessed medical needs as the only important motive for the decision whether or not to refer in 52% of cases considered, while one or more additional motives were included as important among the rest.

With respect to age and sex, the patient contacts were no different when comparing GPs with and without access to a GP hospital (Table 1). GPs with access to GP hospitals had a higher frequency of on-call contacts ($p < 0.01$) and of combined critical/serious contacts ($p < 0.01$) than the others. Although not statistically significant, the proportion of contacts generating referrals to general hospitals was, as a total, lower from practices with GP hospitals than those without that possibility, 7.8 versus 9.8% ($p = 0.14$). The same trend was found both for outpatient (5.7 versus 6.6%) and inpatient referrals (2.1 versus 3.3%). When the 29 admissions to GP hospitals beds were included, the proportion of inpatient referrals was only just slightly higher from GPs with access to these beds, 3.6 versus 3.3% ($p = 0.73$).

Access to a GP hospital was associated with a significant 40% reduction in total referrals to general hospitals adjusted for age and sex of the patients (Table 2, Model I), and the reduction was greater for inpatient than for outpatient referrals.

Adjusted for age, sex and hour of contact, medical needs and long distance to the general hospital appeared as the strongest motives for and against any referral to general hospitals (Table 2, Model II). The analysis indicated, however, less impact of medical needs on outpatient compared to inpatient referrals. A significant half of the inpatient referrals were based upon advice from the general hospital.

Figure 1 displays the frequency of referred cases in which single motives were reported to be of medium or major importance for the referral decision, restricted to GPs with access to a GP hospital. Medical needs appeared to have medium/major importance for inpatient referrals to both the general hospital and the GP hospital in about 80% of referred cases. In 25% and 28% of the cases admitted to a general hospital or a GP hospital, respectively, the preferences of the patient and the family were of medium/major importance for the decision. For the decision to use GP beds, long distance to the general hospital and nursing needs were assessed to have importance, in respectively, 39% and 28% of the cases, while these two factors had little influence upon the decision to admit to a general hospital. The decision to refer to general hospital outpatient services was recorded to be medically motivated

in 48% of the cases, while 33% of the decisions were regarded as more influenced by patient preferences.

Discussion

Main findings

Hospital referral decisions among GPs were assessed with particular emphasis upon how GP hospitals as an option of care might influence decisions. Medical needs appeared as the only motive of major importance for the referral decision in about 50% of the cases, while additional motives were assessed as important as medical needs in the other half. Motives for inpatient referrals (admissions) to general hospitals and to GP hospitals were similar in terms of the relative importance of medical needs, but that the GP hospital option was chosen mainly due to additional motives such as long distance, nursing needs and preferences of the patient and family. The data, emerging from GP referral situations, provides additional support to previous findings based upon GP hospital and general hospital data sources: that access to GP hospitals may be a substitute for^{9,12} and reduce use of general hospitals.^{6,13,14} Furthermore, that the GP hospital option seems mainly to reduce general hospital inpatient referrals and, finally, that outpatient referrals are less dictated by medical needs, and more by other motives such as patient preferences.

Material and method

For our purpose, to record the doctors' immediate appraisal of their motives in referral situations, no validated instruments were available. The registration form intended to focus the doctor's consciousness on a range of referral considerations judged as relevant. The pilot study indicated that a practically useful expression of motives influencing doctors had been developed. A total of 205 general hospital referrals, though arising from as many as 2,500 doctor-patient contacts, were a bit too scanty for more complex analyses. Consequently, solitary interrelated motives had to be added and pooled before being included in the multivariate analysis, and this might have obliterated specific influences.

A particular problem in this study could be that some GPs had positive attitudes towards GP hospitals, which implied opportunistic responses in favour of

the local GP beds. If so, one would have expected more referrals to GP hospitals than the 29 cases referred, which was actually less than one admission per doctor during the week. Moreover, bias seems unlikely due to the fact that inclusion of GP hospital admissions approximates the total proportion of admissions to hospitals from doctors with and without access to a GP hospital. The time doctors had been practising in Finnmark (six months vs. longer time), which was included in a preliminary step of the multivariate analysis, did not influence the results. Accordingly, it seems reasonable to suggest that the recorded motivating factors, rather than biased attitudes or previous experience, confine the principal considerations related to the GPs' decisions to refer to general hospital care.

Medical versus other motives

Since doctors are trained to primarily respond to medical needs, a tendency to overlook other factors could be expected. Our findings do not support this. When the doctors decide to use a bed (in a general hospital or a GP hospital), the preference of the patient or family has been of medium or major importance in as many as one-fourth of the cases. A paradoxical finding in the multivariate analysis was that the social/nursing factor (including preferences of patient and family) was not a significant determinant for general hospital referrals, while long distance to the general hospital was significantly reducing referrals to these hospitals. The reason for this may be twofold: obliteration of specific effects through pooling of motives, and lack of contrast to the reference population with respect to the motive. The social/nursing needs may be a characteristic for a broad range of patients considered, and may have been recorded as motive both for referring and not referring, while long distance is only a motive when the patient is admitted to the GP hospital or offered other local care. The significance of the long-distance factor was considerably reduced, though not quite disappearing, when the reference population was "adjusted" through exclusion of cases admitted to the GP hospital (data not given).

As regards medical motives, these are evidently far more important among referred cases than in the reference population. In contrast to both general hospital and GP hospital admissions, which were medically motivated in 80% of the cases, it

may seem surprising that medical needs were weighed to be of medium/major importance in only 48% of outpatient referrals. For the latter, the preference of the patient was regarded to be important for as many as 33%. This is in accordance with other studies showing that risk to the patient is rarely a major consideration behind the GPs' referral decisions to an outpatient clinic,¹⁵ and that "high referrers" tend to refer the patient in spite of reasons against it.¹⁶

The role of the GP hospital

The fact that only 8 of the 48 GPs were without access to GP beds and were closer to the hospital, are apparent weaknesses in this study, leaving an assessment of the role of the GP hospital with some uncertainty. Although the GPs without access to GP beds admitted more patients to general hospitals, the total admissions to hospital beds were just slightly higher for those with access to GP beds (Table 1). An inference of this could be that GP beds in rural areas are only replacing general hospital beds, and little or no net gain is obtained. The balance could even be a negative one since care at a lower level might keep patients away from appropriate specialist care. However, concurrent data shows that only one-fifth of the patients admitted to GP beds need further admission to a general hospital,¹² that the outcome of care after initial GP hospital care is satisfactory,¹⁷ and that care in GP hospitals could be cost-saving.¹⁸ Moreover, data from the general hospitals of Finnmark shows that the use of general hospital beds is considerably lower for populations with access to GP hospitals,¹⁴ and that this is particularly true for disorders commonly treated in the GP beds. Using this background plus the fact that 29 GP hospital admissions would constitute 33% of all admissions in the material if added to the general hospital admissions, a real influence of the GP hospital on the use of the general hospital is strongly suggested.

Although medical needs, patient and family preferences were equally often weighed as important for inpatient referrals to general hospitals and GP hospitals, nursing needs and long distance seemed to be specific additional motives for the decision to admit to a GP hospital. Two key questions proposed by Wilkin & Smith¹⁹ in explaining variation in general practitioner referrals to hospitals seem to be relevant for our context: 1) "Are the risks to the patient serious if I do not refer

now ?” and 2) “Have I the means (time, resources, facilities) to find out more?”. Admission to the GP hospital would be the rational response to these questions to investigate, treat and observe common acute exacerbations in patients with well-known chronic conditions. The GP hospital may be judged as a safe option to avoid long transports and substitute admissions to a general hospital,^{9,12} unavoidable without this option.³ This is also indicated by our findings, since GPs with access to a GP hospital admit and refer relatively fewer elderly patients (usually suffering from degenerative and chronic diseases) than their colleagues. Supporting the same point of view is the lower proportion of admissions from practices with access to GP hospitals during off-hours time, despite a higher frequency of contacts. A likely suggestion is that admissions to the GP hospital in a rural practice would more easily go directly to the general hospital in more centrally located practices - especially if the patients are elderly and consult at night and no alternative care option exists.

Conclusion

With respect to the specific aim of this study, the conclusion is that access to general practitioner beds is associated with a lower proportion of patients referred to general hospitals.

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Table 1. Patient characteristics (%) according to outcome of contact and according to general practitioner access to GP hospital in Finnmark county, Norway

Patient characteristics:	All patients		Considered for referral		Referred to general hospital			
					Outpatient referrals		Inpatient referrals	
	<u>Access to GP hospital:</u> Yes (2006) No (490)		<u>Access to GP hospital:</u> Yes (331) No (80)		<u>Access to GP hospital:</u> Yes (114) No (32)		<u>Access to GP hospital:</u> Yes (43) No (16)	
<i>Females %</i>	58.5	58.6	52.6	57.5	55.3	71.9	51.2	56.3
<i>Age distribution %</i>								
≤ 15	12.1	12.0	7.3	7.5	10.5	3.1	7.0	12.5
15-49	54.9	56.3	52.9	60.0	54.4	65.6	55.8	50.0
50-66	17.9	16.7	23.0	11.3	22.8	12.5	20.9	12.5
≥ 67	14.4	14.1	16.3	21.3	11.4	18.8	16.3	25.0
<i>Time of contact %</i>								
Day (surgery)	83.0	87.1	84.3	83.8	92.1	100	76.7	50.0
Night (on call)	16.7	11.6	15.7	15.0	7.9	0.0	23.3	43.8
<i>Degree of urgency %</i>								
Critical hours/days	1.6	1.2	6.3	6.3	3.5	3.1	20.9	25.0
Serious	19.4	12.9	33.5	30.0	35.1	25.0	44.2	25.0
Not serious	67.7	71.4	39.6	42.5	37.7	53.1	20.9	25.0
Uncertain	8.2	6.3	18.4	17.5	21.1	18.8	11.6	12.5
% of all contacts			16.5	16.3	5.7	6.6	2.1*	3.3

* Total inpatient referrals to general hospital + GP beds = 3.6%; (29 patients to GP beds not included in 2.1%)

Table 2. Influence of patient age, sex, and having access to a GP hospital (Model I) or of patient age, sex, hour of contact and motivating factors (Model II) on GP decisions to refer to general hospitals among patients considered for referral (N=411), analysed by logistic regression.

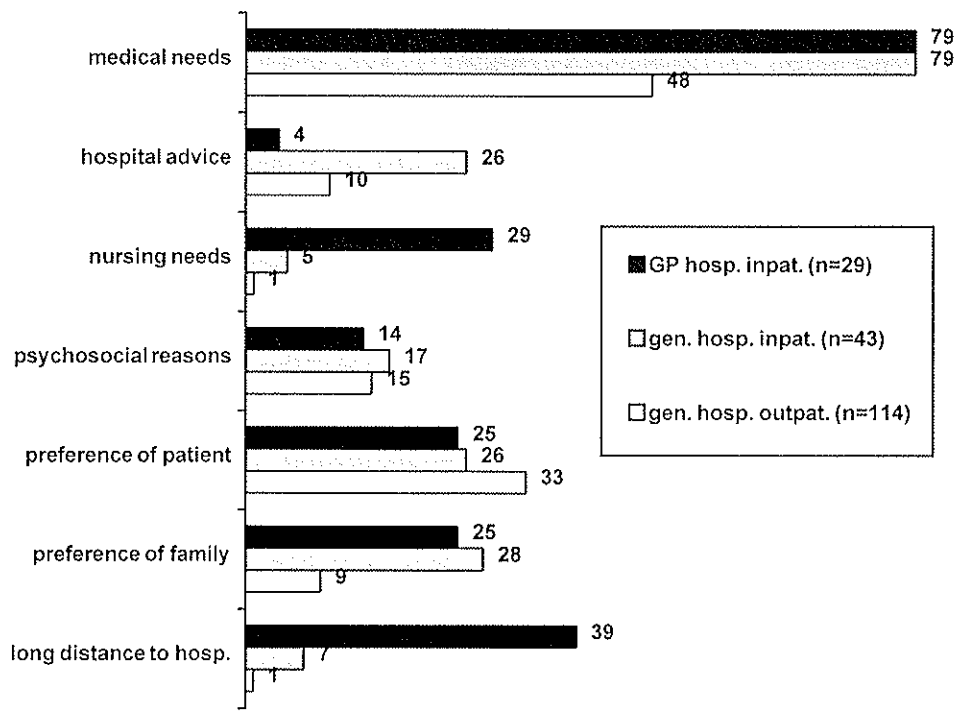
Determinants	Decisions to refer to general hospital					
	All referrals to gen. hospital (n=205)		Outpatient referrals (n=146)		Inpatient referrals (n=59)	
<i>Reference population: patients considered, not referred to general hospital (n= 206):</i>	OR	95% CI	OR	95% CI	OR	95% CI
Model I						
<i>Patient age, years:</i>						
0-14	2.17	0.90 - 5.23	2.60	0.99 - 6.83	1.49	0.43 - 5.21
15-49	1.46	0.85 - 2.51	1.64	0.88 - 3.05	1.11	0.51 - 2.43
50-66	1.39	0.73 - 2.64	1.59	0.77 - 3.28	1.03	0.40 - 2.66
≥ 67 (ref.)	1		1		1	
<i>Patient sex:</i>						
Male (ref.)	1		1		1	
Female	1.35	0.91 - 2.01	1.49	0.96 - 2.31	1.14	0.63 - 2.05
<i>Access to GP hospital</i>						
No (ref.)	1		1		1	
Yes	0.60	0.36 - 0.99	0.65	0.37 - 1.13	0.50	0.25 - 1.01

Model: Chi square (p-value):	9.7 (0.08)		9.7 (0.09)		4.4 (0.49)	
Model II						
<i>Patient age, years:</i>						
0-14	3.29	1.25 - 8.69	3.30	1.14 - 9.51	3.29	0.75 - 14.45
15-49	1.82	0.99 - 3.35	1.76	0.89 - 3.45	2.50	0.97 - 6.45
50-66	1.79	0.88 - 3.64	1.76	0.80 - 3.85	2.33	0.76 - 7.13
≥ 67 (ref.)	1		1		1	
<i>Patient sex:</i>						
male (ref.)	1		1		1	
female	1.38	0.90 - 2.12	1.50	0.94 - 2.40	1.23	0.62 - 2.44
<i>Hour of contact:</i>						
day (ref.)	1		1		1	
night (on call)	0.62	0.34 - 1.14	0.30	0.13 - 0.68	1.93	0.87 - 4.27
<i>Doctor's appraisal of importance (1=no, 4=great)</i>						
medical needs (1,4)	2.15	1.70 - 2.72	1.76	1.37 - 2.26	3.45	2.33 - 5.13
hospital advice (1,4)	1.22	0.91 - 1.63	1.18	0.85 - 1.64	1.48	1.02 - 2.14
social/nurs. factors (1,4)	1.04	0.86 - 1.27	1.17	0.95 - 1.45	0.84	0.62 - 1.14
long distance to gen.hosp. (1,4)	0.41	0.25 - 0.66	0.41	0.22 - 0.76	0.42	0.21 - 0.81

Model: Chi square (p-value)	71.2 (0.0000)		53.3 (0.0000)		65.8 (0.0000)	

Fig. 1 Percentage of referral-cases in which different motives were reported to be of medium or major importance for the decision among 40 general practitioners with access to a GP hospital

Motives:



PAPER IV

DO GENERAL PRACTITIONER HOSPITALS REDUCE THE UTILISATION
OF GENERAL HOSPITAL BEDS? EVIDENCE FROM FINNMARK
COUNTY IN NORTH NORWAY

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Abstract

Study objective: To assess whether populations with access to general practitioner hospitals (GP hospitals) utilise general hospitals less than populations without such access.

Design: Observational study comparing the total rates of admissions and of occupied bed days in general hospitals between populations with and without access to GP hospitals. Comparisons were also made separately for diagnoses commonly encountered in GP hospitals.

Setting: Two general hospitals serving the population of Finnmark county in North Norway.

Patients: 35,435 admissions based on five years' routine recordings from the two hospitals.

Main results: The total rate of admission to general hospitals was lower in peripheral municipalities with a GP hospital than in central municipalities without this kind of institution, 26% and 28% lower for men and women respectively. The corresponding differences were 38% and 52%, when analysed for occupied bed days. The differences were most pronounced for patients with respiratory diseases, cardiac failure and cancer who are primarily or intermediately treated or cared for in GP hospitals, and for patients with stroke and fractures, who are regularly transferred from general hospitals to GP hospitals for longer term follow up care.

Conclusion: GP hospitals appear to reduce the utilisation of general hospitals with respect to admissions as well as occupied bed days.

Key words: general practitioner hospital, general hospital, hospital utilisation

Introduction

In Norway, general practitioner hospitals (GP hospitals) are small medical institutions on a level between primary care and general hospitals. They contain from two to around 20 beds and are usually located together with the GPs' surgery and the local nursing home in a joint facility. It is still questioned whether these institutions, as intended, relieve the pressure on general hospitals. In a previous study from Finnmark in North Norway it was estimated that 45% of the patients in the GP hospitals would have been admitted to general hospitals if the GP hospitals had not been available,[1]. It was also observed that patients transferred *from* general hospitals to GP hospitals for follow up care had the longest stays in the GP hospitals. Based on these findings it seems reasonable to anticipate that hospital admission rates are lower and that length of stays is shorter for populations with access to GP hospitals than for those without. An eight weeks survey indicated that this was the case particularly for conditions commonly cared for in GP hospitals,[2]. To explore this issue further, we have studied general hospital utilisation for a longer period in the same geographic area. The county of Finnmark is well suited for such a study because it still has 16 GP hospitals in active use and because 90% of GP hospital patients referred to higher level hospitals are admitted to the two county general hospitals,[2].

The aim of the study was to assess whether populations with access to a GP hospital utilise general hospital beds at a lower rate than populations without such access, particularly with respect to conditions commonly managed in GP hospitals.

Material and method

Routine hospital data for the five year period 1/1 1990 through 31/12 1994 were collected. The material includes admissions to both county general hospitals and comprises 35,435 stays over 224,969 days, corresponding to an average length of 6.3 days per stay. Admissions due to administrative/non disease reasons and pa-

tients with obstetric or missing diagnoses or with residence outside the county hospital area were excluded. Based on previous studies of medical conditions frequently managed in GP hospitals,[1-2], we classified certain ICD-9 diagnoses as “GP hospital diagnoses” (see Table 2). Calculation of rates was based on the population size of Finnmark in the middle of the five year period. This included a total of 75,975 persons among whom 55,409 lived distant from the hospital (1- 4 hours travel time away) in sixteen municipalities with a GP hospital , while 20,566 lived in three municipalities closer to the general hospital and without access to a GP hospital. The age distribution and average age were almost identical in the population with (mean = 34.6 years) and without (mean = 35.6 years) access to GP beds. Epi- Info, database and statistics system, were used in the statistical analysis,[3]. Age differences were tested by students t-test. Age standardisation was done by the direct method,[4], with the total population of Finnmark as the reference population. To test differences in admission rates between corresponding subpopulations from different municipalities chi square (goodness of fit for proportions) was applied.

Results

Standardised for age, the total hospital admission rate was 26% lower for men (420 vs. 566 admissions per 1000 inhabitants over 5 years) and 28% lower for women (415 vs. 578) in municipalities with a GP hospital than in those without (Table 1). The difference was statistically significant for all age/sex groups and highly significant for those above 15 years ($p < 0,0001$). The age adjusted rates of occupied bed days were 2407 and 2440 for men and women respectively in municipalities with a GP hospital and 3912 and 4698 in those without. This represents a 38% and 52% lower rate of occupied bed days for men and women, respectively. The differences were most marked for those aged 50 and older (73% and 71% lower among those aged 80 and over). The rates of admission were significantly lower ($p < 0,05\%$) for nine of the ten selected “GP hospital diagnoses” in

municipalities with a GP hospital than in those without. General abdominal symptoms were an exception ($p=0,15$). When all “GP hospital diagnoses” and all other diagnoses were analysed as entire groups the rates were also lower in municipalities with a GP hospital ($p<0,001$). The differences in length of stay were striking for most “GP hospital diagnoses” (Table 2). This was particularly true for patients with cancer, heart failure, stroke, pneumonia and fractures, while there was no difference with respect to angina pectoris, general symptoms and traumas. Highly significant age differences between patients from communities with and without GP hospitals were demonstrated for several «GP hospital diagnoses», with stroke (69.6 vs. 73.9 years) and asthmatic disorders (50.9 vs. 57.0 years) as the two most prominent examples, while no significant age difference was found for patients with cancer, general abdominal symptoms and traumas. The rates of occupied bed days in populations with GP hospitals were less than 50% of the rates in populations without GP hospitals for five of the ten «GP hospital diagnoses» (Fig.1). The greatest differences were revealed for stroke and asthmatic disorders with 78% and 69% lower rates in populations with a GP hospital. The highest rates of occupied bed days were found for the only municipality which had neither GP hospital nor a general hospital in its locality.

Discussion

Main finding

This study strongly indicates that general practitioners hospitals result in lower utilisation of general hospital services. This has previously been suggested in several studies,[5-10]. According to estimates from a hospital medical department of Finnmark,[5], patients from municipalities with a GP hospital occupied 0,38 bed days per inhabitant per year compared to 1,19 bed days from the general hospital municipality. In Oxfordshire the rate of use of medical and geriatric beds in general hospitals by practice populations with access to general practitioner beds was about half that of populations without such access,[6]. Our results add to previous

findings by demonstrating that the GP hospital effect is mainly linked to diagnoses commonly managed in GP beds, and that it is due both to reduced admission rates and to reduced occupied bed days.

Material

The study was based on routine data collected for the management of the two general hospitals. The data covered as many as five years with small variation in total utilisation from year to year. We believe that the data necessary for adequate patient management like date of birth, admission and discharge as well as patient addresses would be largely correct. Recording of diagnoses may be more inaccurate, but we have no indication of any bias affecting the present study. Missing diagnoses, representing altogether 1395 stays during the five year period, were excluded from the material. Among those excluded due to missing diagnoses patients from municipalities without GP hospitals were over-represented and used 80% of the excluded care days. This would suggest that we have underestimated the difference between municipalities with and without GP hospitals.

Geographical factor

In Finnmark the travel time to the hospital varies from a few minutes to up to four hours. Unfortunately, the municipalities with a GP hospital are also those most distant from the general hospitals. This means that the distance to general hospitals is a confounder, which was demonstrated in a preliminary multivariate analysis. Due to high correlation between travel time and the locality of a GP hospital the regression model turned out to be unstable and was omitted. In several studies hospital admission rates have been found to be higher from central communities with a hospital compared to peripheral communities,[11-13]. However, none of these studies has demonstrated any linear association between distance, in terms of travel time, and use of hospital beds. Roughly, it seems that two categories of distances from hospitals, "close" or "remote", are associated with high or low use,

respectively. One study suggested that the difference in admission rates between hospital communities and more distant communities was not due to geographical distance, but a social one,[11]. An analysis of all admissions to Norwegian hospitals in 1991 demonstrated that patients up to the age of 65 living in a municipality with a hospital stayed in hospitals just as long as corresponding patients from municipalities without a hospital,[13]. For older patients there were significant differences between central and peripheral municipalities. Finnmark seems to be special in the sense that striking differences between central and peripheral municipalities are found for all age groups. In addition the most pronounced differences were observed for diagnoses frequently encountered in GP hospitals. The eight week study of admissions to general practitioner hospitals,[2], indicates the relative influence of these beds: The rate of admissions to general hospitals was 35% lower from distant populations if admissions to GP beds were excluded from the estimate, but still 22% lower if these admissions were included. In terms of utilisation of hospital bed days, the difference was even greater. This does not rule out the effect of geographical distance, but strongly suggest an independent, specific effect of GP hospitals in Finnmark.

Use of hospitals and resources

Due to the abundant supply of GP hospitals one might have expected that general hospital utilisation in Finnmark would be lower than in the rest of the country, but this is not the case,[14]. The high hospital bed capacity of Finnmark (excluding GP beds) is the probable explanation of this phenomenon. This is in accordance with studies indicating that hospital utilisation varies with bed capacity,[15-16]. Our material revealed differences within Finnmark consistent with this assumption. The general hospital area which has the highest admission rates also had the highest bed capacity in the general hospital. One rural municipality located equally distant from the two general hospitals made use of beds in both hospitals as well as its own GP beds. The admission rate for "GP hospital diagnoses" from

this remote community was the highest among the rural municipalities, which may indicate an effect of high bed availability reducing the influence of the geographical dimension.

In addition to high admission rates, the relative abundance of hospital beds in Finnmark may result in more prolonged stays for nursing problems. The preponderance of long term stays among elderly people living in municipalities with a general hospital demonstrates the unequal geographical distribution of this facilities. According to the previous study,[1], stroke and fractures, two major “GP hospital diagnoses” in the present study, were the most common conditions among patients with «post hospital» long term care in GP beds. This gives reason to believe that the unequal distribution of long term care for certain conditions (Table 2) is in part associated with easier access to follow up care in GP hospitals.

Reduced admissions and shorter stays in general hospitals for several diagnostic groups may indicate that GP hospitals contribute to both economical and appropriate use of resources. According to county budget data the average costs of care per day in a GP hospital is roughly 70% lower than the costs of general hospital care. The care of cancer, one of the most common diagnoses encountered in the GP beds[1], may illustrate the role of the local beds. At visits we could observe that cancer patients were both given intermediate (cytostatic) treatment and terminal care in the GP hospitals.

Do GP hospitals induce a particular practice style?

Available beds, better equipment, and probably an attraction of professionals with enthusiasm for GP hospital work may facilitate a particular style of practice different from primary care elsewhere. Co-operation of general practitioners in pre- and post-hospital specialist care for conditions like cancer, fracture, stroke and asthma are typical elements of GP hospital work in Finnmark. This would be difficult to accomplish without access to beds. Modification of practice due to access to GP beds may explain the lower general hospital utilisation from peripheral

municipalities for these conditions. This is in accordance with other studies ascribing variation in hospital use to factors such as different medical practice,[17-18] and doctors' enthusiasm for certain kinds of treatment,[19].

Conclusion

The findings of this study strongly suggest that GP hospitals in Finnmark reduce rates of admission and of occupied bed days in general hospitals. This is most evident for conditions commonly treated in GP hospitals, particularly cancer, stroke, fractures, traumas and respiratory disorders.

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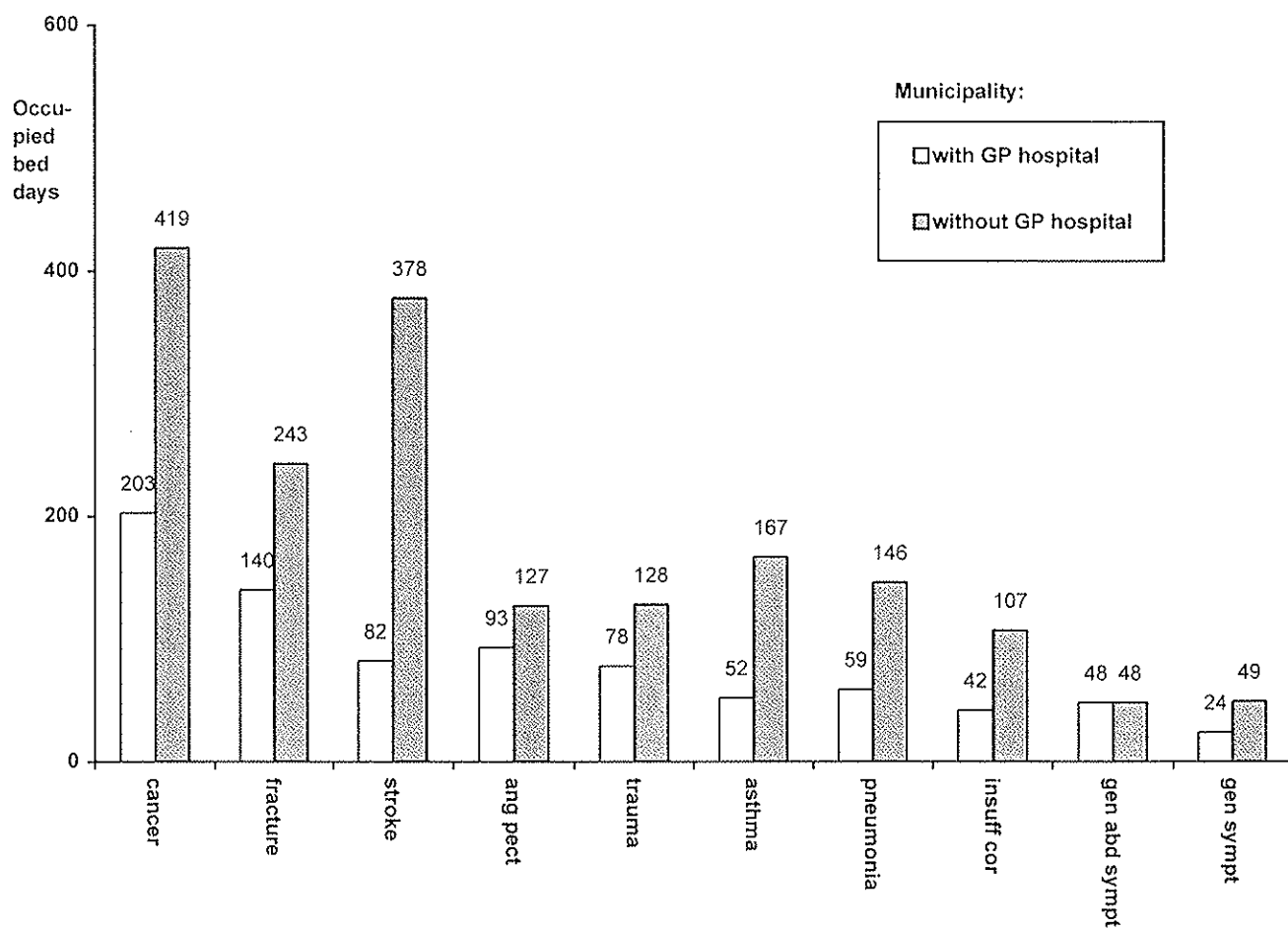
Table 1 Admissions and occupied bed days per 1000 inhabitants in general hospitals in Finnmark from municipalities with and without GP hospitals, 1990-1994, according to sex and age.

Age groups	Admissions /1000 inhabitants				Occupied bed days /1000 inhabitants			
	Municipality with GP hospital		Municipality without GP hospital		Municipality with GP hospital		Municipality without GP hospital	
	Males	Females	Males	Females	Males	Females	Males	Females
0-14	304.8	227.5	406.4	253.4	995.2	767.6	1294.3	775.2
5-29	186.6	229.6	255.0	313.1	654.0	777.9	911.4	1203.1
30-49	269.8	366.3	341.1	456.6	1293.6	1598.2	1556.3	1974.7
50-69	719.5	617.5	981.6	741.6	4922.4	3960.2	7092.5	5844.9
70-79	1596.6	1148.5	1900.5	1687.3	11998.5	9228.5	19354.4	22252.3
≥ 80	1676.9	1302.2	3201.1	2414.8	13183.4	10262.5	48126.4	35266.5
Total:								
Crude rate	417.7	426.9	574.5	597.1	2386.3	2399.3	4020.0	4974.8
Age adjusted rate	420.0	415.3	566.1	577.7	2406.7	2439.5	3912.1	4698.4

Table 2 Number, rate and length of stays in general hospitals of Finnmark for patients from municipalities with and without GP hospitals, 1990-1994, according to diagnoses.

Diagnoses	Municipality with GP hospital general hospital stays				Municipality without GP hospital general hospital stays			
	n	stays per 1000 inhabitants	<u>days per stay</u> mean SD		n	stays per 1000 inhabitants	<u>days per stay</u> mean SD	
"GP hospital diagnoses" (ICD-9 numbers):								
Cancer (140-208)	1669	30.1	6.6	7.3	900	43.8	10.1	26.3
Angina pectoris (413)	787	14.2	6.7	4.7	457	22.2	6.0	5.8
Insuff. cordis (428)	214	3.9	10.8	14.7	149	7.2	15.8	62.3
Apoplexia cerebri (435-436)	347	6.3	13.0	14.2	285	13.9	29.3	57.7
Pneumonia (480-488)	480	8.7	6.7	6.5	314	15.3	10.1	23.0
Asthma/chron. obstr. pulmonary disease (490-497)	473	8.5	6.0	5.7	427	20.8	8.4	20.7
General symptoms (780)	315	5.7	4.2	3.5	271	13.2	3.9	5.5
General abdominal symptoms (787-789)	829	15.0	3.2	3.3	338	16.4	2.9	2.6
Fractures, excl. cranial (805-829)	1297	23.4	5.9	7.4	532	25.9	9.8	14.6
Traumas, incl. minor traumas, distortions, commotio cerebri, intoxications (830-849, 850, 905-919, 939-949, 960-979, 996-999)	1066	19.2	4.1	5.6	671	32.6	4.1	8.1
All "GP hospital diagnoses"	7477	134.9	6.0	7.4	4344	211.2	9.0	25.6
Other diagnoses	15913	287.2	5.5	6.1	7701	374.2	6.9	24.7

Fig. 1 Occupied bed days in general hospitals in Finnmark per 1000 persons (1990-1994) for populations from municipalities with and without GP hospitals according to "GP hospital diagnoses" (conditions commonly treated in GP hospitals), adjusted for age



PAPER V

Are general practitioner hospitals cost-saving? Evidence from a rural area of Norway

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Aaraas I, Søråsdekkkan H and Kristiansen IS. Are general practitioner hospitals cost-saving? Evidence from a rural area of Norway. *Family Practice* 1997; 14: 397–402.

Objective. We aimed to determine whether general practitioner GP hospitals, compared with alternative modes of health care, are cost-saving.

Methods. Based on a study of admissions ($n = 415$) to fifteen GP hospitals in the Finnmark county of Norway during 8 weeks in 1992, a full 1-year patient throughput in GP hospitals was estimated. The alternative modes of care (general hospital, nursing home or home care) were based on assessments by the GPs handling the individual patients. The funds transferred to finance GP hospitals were taken as the cost of GP hospitals, while the cost of alternative care was based on municipality and hospital accounts, and standard charges for patient transport.

Results. The estimated total annual operating cost of GP hospitals was 32.2 million NOK (10 NOK = £1) while the cost of alternative care was in total 35.9 million NOK. Sensitivity analyses, under a range of assumptions, indicate that GP care in hospitals incurs the lowest costs to society.

Conclusion. GP hospitals are likely to provide health care at lower costs than alternative modes of care.

Keywords. Costs of care, general hospital, general practitioner hospital, primary care.

Introduction

General practitioner (GP) hospitals, intending to bridge the gap between home and hospital care, are small medical institutions with a few beds for the observation and treatment of patients who do not necessarily need hospital care. Even though patient outcome and the costs of care are not known, for several years many GP hospitals were closed down and the services provided elsewhere, mainly in general hospitals. More recently, however, motivated by a striving to minimize hospital costs and to improve co-operation between levels of care, a renewed interest in GP hospitals has been expressed by the government.¹ The GP hospital model has been pointed out as a possible low-cost alternative securing the quality of acute care in rural areas.²

In Norway, the GP hospitals are located in conjunction with nursing homes. Since the latter are financed by municipal authorities, whereas GP hospitals (and higher-level hospitals) are the responsibility of the county, county authorities have been concerned about

their involvement with GP hospitals. First, it has been claimed that a considerable proportion of the patients admitted to GP hospitals have relatively minor health problems that could have been treated at the patient's home or in a nursing home. Secondly, for those who really need GP care in hospital, it could be less costly to transfer the patients to general hospitals. To address these issues we have undertaken a study in the county of Finnmark. Being the northernmost county of Norway, long travel distances (up to about 320 km to the nearest hospital) and a tough climate have until now 'forced' politicians to keep the GP hospital units in 16 out of the 19 municipalities. The other three municipalities either had a general hospital or were located near to one. Primary health care and social services, including nursing homes and home care, are well developed all over Finnmark, without much variation between municipalities.³

The aim of this study was to estimate the costs of GP care in hospitals compared with the costs of alternative care (i.e. admission to hospital care at home or in a nursing home). Another study shows that negative effects due to transitory stays in GP hospitals prior to emergency hospital admissions are minor and well balanced by benefits from early intervention,

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particularly life-saving procedures for the critically ill.⁴ Apparently, GPs are able to select for patients the appropriate level of care such that no one has sub-optimal care. On the basis of this, we assume that the difference in health outcome from GP hospital care and alternative care is negligible. Consequently, we have undertaken a so-called cost-minimization study,⁵ where the aim is to identify the least costly way of achieving a certain health benefit.

Method

During an 8-week period (14 October–10 December 1992), consecutive admissions to GP hospitals ($n = 415$) including stays in the attached maternity units ($n = 20$) were recorded in 15 out of a total of 16 GP hospitals in the county of Finnmark. Seventy-six of the patients were transferred to general hospitals after one or more days in a GP hospital. As a conservative estimate, we assumed that without a GP hospital available their stays in a general hospital would have been 1 day longer. The remaining 339 GP hospital stays (3308 days of GP care in hospitals) were classified according to the alternative mode of care as assessed by the GPs.⁶ Where such assessment was missing ($n = 22$) we assumed that the distribution of alternative care was the same as for the rest of the patients. With respect to the 20 GP deliveries in hospitals, admission to hospital was assumed to be the alternative mode of care, since home deliveries are rare in Norway. We estimated a full-year patient throughput in the GP hospitals by assuming that there would be 44 weeks similar to the 8 study-weeks, while 8 weeks would have 75% activity. This 25% reduction in volume in the latter period is based on the fact that a minimum of 75% of GP hospital admissions are emergencies,⁶ and consequently not affected by holidays.

The grants (in total 30.23 million NOK in total (10 NOK = £1)) transferred from the county health authorities to municipality governments for funding of the 15 GP hospitals were taken as the cost of GP hospital care (i.e. we assumed no cross-subsidization between GP hospitals and nursing homes).

The cost of care in general hospitals was estimated on the basis of routine hospital statistics. The total costs of running the two general hospitals in Finnmark in 1992 were 220.9 million NOK, equivalent to 1.23 million per bed or 3896 NOK per day of care. We assumed that the extra (marginal) cost associated with providing hospital care for GP hospital patients was 60% of the average cost per day (2338 NOK), which was moderately above the national average cost of keeping an elderly patient (ready for discharge to a nursing home) an extra day in a general hospital.⁷ It would be unreasonable to assume that extra GP hospital patients could be treated more cheaply.

Based on 1992 Norwegian health statistics, the cost of care in nursing homes was set to 950 NOK per day.⁸ The cost of home care was estimated to be 25% of the cost of care in a nursing home (240 NOK per day), roughly equivalent to the cost of a GP home visit or to the cost of 1 hour's home service by a qualified nurse.

Calculation of transport costs was based on the actual use of transport means in Finnmark. In 1992, the average cost per ground ambulance was 2910 NOK, while it was 5590 NOK for air transport and 14 590 NOK for boat ambulance. On the basis of knowledge of excess capacity and the circumstances involved for various transport means, we anticipated that the extra (marginal) cost per transfer would be about 25% for ground ambulance to a GP hospital, while it would be 50%, 70% and 20% for transport to a general hospital by ground, air, and boat ambulance, respectively. The costs of taxi and private transport were based on customary charges.

Results

Cardiovascular diseases, fracture trauma/symptoms, respiratory diseases and cancer constituted the five largest diagnostic categories, representing in total 57% of all main diagnoses (Table 1). Fifty-seven per cent of the patients were women. There was no significant difference in age between the sexes. The mean age of patients handled solely in GP hospitals was 59.6 years (SD 23.7), while it was 58.8 years (SD 23.1) for those transferred to hospital.

Among the 339 patients managed solely in the GP hospitals, admission to hospital would be the alternative mode of care for 63%, while the rest would be cared

TABLE 1 *Main diagnosis of patients in GP hospitals in Finnmark during 8 weeks, according to the level of care*

Diagnosis (ICD-9 group)	Level of care		
	GP hospital alone	Transfer to hospitals	Total no. of patients
02 Cancer	24	6	30
05 Mental disorders	22	3	25
06 Nervous system	26	1	27
07 Cardiovascular disease	53	19	72
08 Respiratory disease	34	6	40
09 Digestive disorders	17	7	24
10 Urinary/kidney disease	15	3	18
11 Pregnancy	22	2	24
13 Musculoskeletal disorders	25	2	27
16 Various symptoms	31	13	44
17 Fractures/trauma	40	12	52
Other groups	30	2	32
Total	339	76	415

TABLE 2 Days of care during 1 year by level of alternative care, based on 8 weeks of recordings in GP hospitals of Finnmark

Alternative level of care ^a	Admissions in 8 weeks	Average length of stay (days) ^b	Days of care during 1 year ^c
Hospital care (acutely transferred)	76	1.0	475
Hospital care (not really transferred)	213	7.9	10 517
Nursing home care	30	27.1	5 081
Home care	96	8.4	5 040
Total	415		21 113

^a Based on assessments in a previous study.⁶

^b Result of recordings in 8 weeks.⁶

^c Estimated on the basis that there are 44 weeks during 1 year similar to the 8-week registration period and 8 weeks with reduced (75%) activity.

TABLE 3 The total annual cost of care in GP hospitals and of alternative modes of care

Cost components	GP hospital care (million NOK)	Alternative care (million NOK)
GP hospital	30.230	-
Transport ^a	2.013	4.188
Hospital care	-	25.695
Nursing home care	-	4.827
Home care	-	1.210
Total	32.243	35.920

^a Estimates of transport costs to alternative care based on actual distribution of various modes of ambulance transport in 1992 (ground 69%, air 23% and boat 8%).

for at home (28%) or in a nursing home (9%) (Table 2). This would represent 10 517, 5081 and 5040 days of care in hospital, nursing home and at home respectively. Additionally, alternative care would have represented 475 days in general hospital for the 76 patients who were admitted to a GP hospital and then transferred to a general hospital.

The estimated total cost of care in GP hospitals was 32.243 million NOK, including transport (Table 3) while it was 35.920 million NOK for the alternative modes of care (25.695 million NOK for admissions in hospital, 4.827 million NOK for nursing home care, 1.210 million NOK for home care and 4.188 million NOK for transport).

Sensitivity analysis

To study whether this conclusion was sensitive to changes in the assumptions upon which it is based, we

performed sensitivity analyses (Table 4). If, because of cross-subsidization, the cost of running the GP hospitals were 10% higher or lower than we assumed in the base case, the total cost of the GP hospital alternative would be 35.266 or 29.220 million NOK, respectively (Table 4). If the marginal cost of a hospital bed were 50 or 100% of the average cost, the total cost of alternative care would be 31.637 or 53.050 million NOK, respectively. If the cost per extra day in hospital were 2021 NOK, the two options would have the same total costs.

Changing the assumption that about 51% of GP hospital patients (213 out of 415) would have hospital as the alternative mode of care down to 40% or up to 60% would make the total estimated cost of alternative care 31.875 or 39.017 million NOK, respectively. Changing other assumptions, including those on transport costs, would have little effect and would not change the conclusion.

Discussion

Main finding

The main finding of this study is that GP hospitals are likely to provide health care at lower costs than other options. This supports previous suggestions of a cost-saving effect of GP hospitals based on the indirect evidence that provision of GP beds reduce the use of general hospital beds.⁹⁻¹²

Methodological considerations

To our knowledge, no one has previously attempted to compare GP costs of hospitals with alternative costs more thoroughly, using real-world data. It is inevitable that the study is left with the data limitations of the real world, and the results should be interpreted with caution.

TABLE 4 *Sensitivity analysis: the cost of alternative care under different assumptions*

	Total costs (million NOK)					
	Assumption		GP hospital		Alternative	
	Low	High	Low	High	Low	High
Total cost of GP hospitals (million NOK) ^a	27.207	33.253	29.220	35.266	35.920	35.920
Cost per day in hospital ^b	1948 NOK	3896 NOK	32.243	32.243	31.637	53.050
Proportion of patients having hospital care as alternative level ^c	40%	60%	32.243	32.243	31.875	39.017

^a Equivalent to $\pm 10\%$ of the basic estimate.

^b Assuming the marginal cost per day to be 50 or 100% of the average cost per day.

^c 51% in the basic estimate.

The volume and case-mix of GP hospital work in the autumn was confirmed by a pilot survey earlier in the year, as well as by a previous study conducted during 8 weeks in the spring,¹³ with results closely corresponding to ours. Therefore, our estimate of a full-year throughput based on 8 weeks' normal workload in the autumn seems justified.

Short of randomized trials, neither the present nor previous analyses of costs of GP hospitals can be supported by robust models. Clearly, a randomized trial would be the gold-standard methodology. Such a randomized trial, however, would not be possible in practice. It would be most unlikely to obtain ethical approval, many patients would almost certainly refuse to participate and it would be difficult to administer. In practice, policy makers have to choose between analyses based on a less-than-precise methodology, or no research-based evidence at all.

Cost assumptions

The per diem costings had to be based on different types of data, in the case of GP hospitals, on the funds allocated, and for general hospitals on the actual expenditure. There is no reason to believe that such figures will create any bias in the estimation. Additionally, since GP hospitals and nursing homes are managed as one unit, separate accountings of costs for these two activities are not common. In one GP hospital, however, which does have separate accounts, expenditures corresponded closely with funds allocated. It therefore seems reasonable to assume that the grants to fund GP hospitals reflect the costs.

The assumption that the marginal cost of a day in general hospital is 60% of the average cost (i.e. 2338 NOK per day) is crucial for the conclusion of the study. We believe this figure to be a conservative estimate for two reasons. The first reason (as already stated) is related to the costs of keeping an elderly patient an extra day in hospital when nursing homes are not available.

According to the Norwegian DRG price list, the in-hospital cost per day is 2015 NOK for elderly patients ready for discharge but waiting for a place in a nursing home.⁷ Such patients would normally be less severely ill and need fewer resources than the 'standard' GP hospital patient. The second reason is that transferring the GP hospital patients to general hospitals would increase the occupied bed days in the general hospitals by about 20%. The occupancy rates would increase from about 80 to 100%,¹⁴ which would incur additional costs in terms of staff and facilities as well as drugs, disposable materials, etc. We consider it most unlikely that caring for the extra GP hospital patients in a general hospital would cost less than 2021 NOK per day, which was the threshold for making GP care in hospitals the least costly option.

While we had good information on the average cost per transfer of the various means of transport, we had limited information on the marginal costs. However, the sensitivity analyses indicate that even if the transport costs were substantially increased or decreased, this would not change the conclusion.

The estimation of the costs of home care and nursing-home care was based on average costs. For the latter there is excess demand, and patients cannot be transferred from GP hospital care to lower-level care without the allocation of extra resources to these levels (or denying other patients care). Using the average cost may in fact underestimate the real costs of increasing capacity at these levels of care. We therefore conclude that under a wide range of assumptions, GP hospitals are cost-saving.

Disease severity and alternative levels of care

Even though the GP hospitals have less-advanced equipment and less-specialized personnel than the general hospitals, this does not necessarily mean that the GP hospital patients are 'cheap and easy'. Table 1 shows

that the majority of patients in GP hospitals not transferred to hospital include all diagnostic categories, from cancer to fractures. The patients with the longest stays in GP hospitals are those transferred from general hospitals for further treatment.⁶ They are often complicated cases, due to cardiovascular diseases, trauma and surgery. GPs, often in agreement with hospital doctors, cope with heavy tasks such as treatment of acute respiratory and cardiovascular failure, management of cytostatic and analgesic regimens, infusions, stabilization of injured patients and even dialysis. If all the 'hospital candidates' among the GP hospital patients had been transferred to hospital, the hospital admission rates would be about 20% lower from populations with GP hospitals than from those without, when standardized for age.¹⁵ This indicates that 51% is a reasonable estimate for the proportion of GP hospital patients that would need admission to general hospitals if a GP hospital were not available. This is also in accordance with an estimate from an earlier study.¹³

Equal outcome of care?

The assumption that the outcome of care is equal for GP hospital and alternative modes of care is crucial. In this context, 'equal outcomes' imply that GPs are able, without delay, to select correctly patients who need urgent hospital care, and provide adequate observation and treatment of those admitted to a GP hospital. The study of emergency cases transferred to general hospitals suggests that this is usually true.⁴ Also, other reports indicate that GPs in Finnmark may use GP hospitals according to this ideal, and that GP hospitals promote (early) discharges from general hospitals for long-term patients.^{6,12} One may even argue that patients are better off when they can have care close to their families. If the health benefits were higher by increased and prolonged hospital admissions, the question would be whether the extra benefits are worth the extra costs. This question calls for a cost-benefit/cost-effectiveness study, which is beyond the scope of this paper.

Equity considerations

In health care systems of today, equity in access is a central goal.¹⁶ People with equal medical needs should have equal access to care. This, however, is difficult to achieve in rural areas. People living long distances from the health care provider tend to under-utilize care.¹⁷ Moving the provision of care closer to where people live, for example through GP hospitals, is therefore a means to increase equity in access.

When GPs can observe patients in GP hospitals staffed by well-qualified nurses, this is likely to reduce GPs' uncertainty, especially when confronted with (early) acute symptoms, which often subside spontaneously. Such situations might otherwise represent hospital admission 'for safety'. The higher hospital

admission rates from populations living outside GP hospital areas,^{12,15} might indicate that admissions 'for safety' are more widespread in communities without GP hospitals.

Generalizability

Whether our conclusion can be generalized to other areas and countries would depend on the travel distances, on the types of patients and on the relative costs of GP hospitals, nursing homes, home care, hospitals and transport. Despite the long distances to hospitals in Finnmark, the cost of transport plays a minor role in this study. The cost-saving of GP hospitals seems to lie much more in averted hospital costs than in lower costs of transport. This means that GP hospitals might be cost-saving even in areas where the distances to general hospitals are small. In fact, a recent Norwegian study recommended the use of GP hospitals in inner cities to relieve the burden on hospital departments.¹⁸ An English study showed that a GP hospital took a considerable load off the neighbouring general hospital at a cost per day of care that was 20% lower at the GP hospital than at the local general hospital.¹⁰

Are the costs of alternative care to GP hospital underestimated?

If the estimated 60% marginal cost for alternative care of GP hospital patients in general hospitals is conservative, the cost-saving effect of GP hospitals will tend to be higher than is indicated by our basic estimate. Apart from arguments already presented, other factors may contribute to there being relatively higher costs of alternative general hospital care than those shown. GP hospital patients admitted from distant places as emergency cases will tend to incur relatively high costs during short stays compared with long-term patients, since more of these belong to general hospital municipalities.¹⁵ The integration of GP hospitals and nursing homes promotes an economical use of beds, since GP hospital patients can be allocated to the nursing home if GP hospital beds are occupied. Possible GP hospital patients admitted directly to nursing-home beds were excluded from the study material and consequently from the estimation of alternative cost. If included, they would represent about 2 million NOK per year. Generally, the evidence that the cost of a GP hospital bed is only about 10% above the cost of a nursing-home bed, while it is about 70% lower than the cost of a general hospital bed in Finnmark, counts in favour of GP hospitals as true low-cost institutions compared with general hospitals.

Conclusion

We conclude that the GP hospital can result in better access to health care for people in rural areas and at a lower cost than other options.

Acknowledgements

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APPENDIX I

SYKESTUEPROSJEKTET

«FASE 2 SKJEMA A»



UNIVERSITETET I TROMSØ
INSTITUTT FOR SAMFUNNSMEDISIN

Registreringsperiode høsten 1992:

Fra onsdag 14. oktober kl 0800 til onsdag
9. desember kl. 0800

1400

Hvilke pasienter skal registreres?

Et skjema skal fylles ut for hver pasient som innlegges ved eller utskrives fra sykestua/sykehjemmet i registreringsperioden.

Hvem fyller ut skjema?

Sykepleier og lege i samarbeid med sekretær/assistent.

Lokal koordinator har ansvar for gjennomføring og innsamling av skjemaer.

Når og hvordan skal skjemaet fylles ut?

– Når en pasient innlegges i registreringsperioden fylles skjemaets del 1 og del 2 ut. Utfyllingen

gjøres innleggelsesdagen eller påfølgende dag eller på mandag, hvis innleggelsen har skjedd i helgen.

- Når en pasient som er innlagt i registreringsperioden, blir utskrevet, fylles del 3 ut, på samme skjema som del 1 og 2 tidligere er utfylt. Dette gjøres utskrivningsdagen eller dagen før.
- Når en pasient, som var innlagt før registreringsperioden startet, blir utskrevet, fylles skjemaets del 1 og del 3 ut.
- Når innleggelsen er kortvarig, f.eks bare noen timer i løpet av en natt eller en helg, fylles alle skjemaets deler ut den påfølgende (hver)dag.

DEL 1 - BASISINFORMASJON

Fylles ut for alle pasienter av assistent/sykepleier

1. Navn

Fornavn _____

Etternavn _____

2. Fødselsdato

--	--	--	--	--	--	--	--

3. Kjønn

M K

4. Innleggelsesdato

--	--	--	--	--	--	--	--

5. Innlagt av hvem?

- Primærlege,
legens navn: _____
- Sykehuslege
- Hjemmesykepleier
- Andre, hvem: _____

6. Innlagt hvorfra?

- Hjemmet
- Aldershjem/bolig
- Sykehjem
- Sykehus,
Navn: _____ Avd: _____
- Annet, beskriv: _____

DEL 2 - VURDERING VED INNLEGGELSE

Punktene 7-14 utfylles av sykepleier.

Punkt 15-16 utfylles av lege

7. Innleggelsessituasjon

- Akutt/ø.hj.
- Kort varsel/halv ø.hj
- Planlagt/venteliste

8. Hvorfor ble pasienten innlagt?

Flere faktorer og forhold kan ha hatt sin betydning. Forsøk å ta stilling til hver enkelt faktor, som er nevnt nedenfor. Anmerk din oppfatning, ved å sette ring rundt det tall du synes passer best, for hver enkelt faktor.

Faktorer/forhold	Betydning for innleggelsen			
	Stor	Middels	Liten	Ingen
Observasjon	4	3	2	1
Undersøkelse	4	3	2	1
Behandling	4	3	2	1
Pleiebehov	4	3	2	1
Psykiske forhold	4	3	2	1
Sosiale forhold	4	3	2	1
Pasientens ønske	4	3	2	1
Familiens ønske	4	3	2	1
Sykehusets råd	4	3	2	1
Lang avstand/dårlige kommunikasjoner til sykehus	4	3	2	1

9. Spesifiser/beskriv nærmere (med egne ord) hovedgrunnen til at pasienten ble innlagt:

10. Er innleggelsen i sykestua/sykehjemmet i samsvar med pasientens primære ønske for plassering?

Kryss av på ett alternativ:

- Ja
- Nei
- Usikker

Hvis nei eller usikker, hvor antar du pasienten helst ville vært?

Kryss av på ett alternativ:

- Hjemme
 - På sykehus
 - Annet, beskriv
-

11. Antatt målsetting for oppholdet

- Medisinsk obs/beh
 - Rehabilitering
 - Kortere pleie/avlastn
 - Langtidspleie
 - Terminal beh/pleie
 - Annet, beskriv
-

12. Antatt lengde på oppholdet

- Under 1 uke
- 1-4 uker
- 1-3 mndr
- Over 3 mndr

13. Pasientens «institusjonsstatus» ved innleggelse

- «Sykestuepasient»
 - «Sykehjemspasient»
 - «I mellomstilling»
 - «Annen status», beskriv
-

14. Pasientens mentale status

- Fungerer normalt
- Noe mentalt redusert
- Mye mentalt redusert

15. Diagnoser (utfylles av lege)

Hoveddiagnose (med ord):

Evt. ICPC- kode _____

Bidiagnose 1:

Evt. ICPC-kode _____

Bidiagnose 2:

Evt. ICPC-kode _____

16. Vurdering av pasientens tilstand (utfylles av lege)

Gi som tilsynslege/behandlende lege en nærmere vurdering av pasientens tilstand ved å krysse av nedenfor.

Tilstandens natur

Kryss av på ett alternativ:

- Vesentlig somatisk
 - Vesentlig psykososial
 - Sammensatt bilde
 - Annet, beskriv
-

Tilstandens potensielle alvorlighetsgrad.

Kryss av på ett alternativ:

- Kritisk, innen minutter/timer
 - Kritisk, innen døgn/dager
 - Alvorlig på noe lengre sikt
 - Lite alvorlig
 - Ikke alvorlig
 - Usikker alvorlighetsgrad
 - Terminal fase
 - Annet, beskriv
-

DEL 3 - VURDERING VED UTSKRIVNING

Punkt 17 - 21 utfylles av sykepleier

Punkt 22 - 25 utfylles av lege

17. Utskrivningsdato

--	--	--	--	--	--	--	--	--	--

18. Utskrivning til

- Hjemmet
- Aldershjem/bolig
- Sykehjem
- Sykehus,

Navn _____ Avd. _____

- Annet, beskriv

19. Pasientens «institusjonsstatus» ved utskrivning

- «Sykestuepasient»
- «Sykehjemspasient»
- «I mellomstilling»
- «Annen status», beskriv

20. Pasientens tilstand ved utskrivning, sammenlignet med innleggelsen. Kryss av på ett alternativ:

- Bedre
- Uforandret
- Svekket/dårligere
- Kritisk syk
- Terminal fase
- Død
- Annet, beskriv:

21. Hvor tror du pasienten helst vil være etter utskrivning? Kryss av på ett alternativ:

- ønsker å bli i sykestua/sykehjemmet fortsatt
- ønsker å komme hjem
- ønsker å komme på sykehus
- annet, beskriv

22. Vurdering av oppholdets nytte (utfylles av lege)

Gi som tilsynslege/behandlende lege din vurdering av hvilken nytte pasienten har hatt av oppholdet ved å krysse foran den/de beskrivelser nedenfor som passer best i dette tilfellet:

- Pasienten ble bedre etter å ha hatt behov for kvalifisert medisinsk pleie og/eller legetilsyn under oppholdet
- Pasienten fikk behandling/rehabilitering i forbindelse med oppholdet, som hadde positiv effekt på helsetilstanden

- Pasienten fikk avkreftet eller stillt en viktig diagnose under oppholdet
- Pasienten har fått tilsyn og pleie
- Familien har fått avlastning
- Annet, beskriv

23. Vurdering av det tilbud pasienten har fått (utfylles av lege)

Er det sannsynlig at pasienten ved dette institusjonsopphold har gått glipp av muligheter, som kunne tenkes oppnådd et annet sted, og som kunne tenkes å ha vært til nytte?

Gått glipp av diagnostiske muligheter

- Lite/ikke sannsynlig
- Noe sannsynlig

Evt. kommentar: _____

Gått glipp av behandlingsmessige muligheter

- Lite/ikke sannsynlig
- Noe sannsynlig

Evt. kommentar: _____

Gått glipp av muligheter for sosial kontakt

- Lite/ikke sannsynlig
- Noe sannsynlig

Evt. kommentar: _____

24. Helhetsvurdering 1 (utfylles av lege)

Når du tar alt i betraktning, fra pasientens situasjon til ressursene i samfunnet, hvordan vurderer du da det tilbud som er gitt ved sykestua/ sykehjemmet?

- Som det beste tilbud
- Ikke som det beste tilbud

Hvis ikke det er det beste tilbud, hva ville etter din mening vært det beste. Kryss evt. av på ett alternativ:

- Hjelp i hjemmet/hjemmesykepleie
- Innleggelse i lokalsykehus
- Innleggelse i region- eller spesialsykehus
- Annet, beskriv

25. Helhetsvurdering 2 (utfylles av lege)

Hvis muligheten til å legge pasienten inn på sykestua ikke fantes, hva ville ha vært den mest sannsynlige plassering av denne pasienten?

- Hjemme
- Annen lokal institusjon
- Sykehus
- Annet, beskriv

APPENDIX II

REGISTRERING AV PRIMÆRLEGEKONTAKTER SYKESTUEPROSJEKTET «FASE 2 SKJEMA C»

16. – 23. november 1992



UNIVERSITETET I TROMSØ
INSTITUTT FOR SAMFUNNSMEDISIN

04461

1. Konsultasjonsdato

november 1992

2. Pasientdata

Fødselsdato

Fornavn (forbokstav) _____

Etternavn (forbokstav) _____

Kjønn M K

3. Kontaktype (sett ett kryss):

a) Kontortid

- konsultasjon
 telefon konsultasjon
 sykebesøk
 annet, spesifiser _____

b) Legevakt/kveldstid

- konsultasjon
 telefon konsultasjon
 sykebesøk
 annet, spesifiser _____

4. a) Kontaktårsak:

Med tekst _____

Eller ICPC-kode _____

b) Hoveddiagnose:

Med tekst _____

Eller ICPC-kode _____

5. Vurdering av pasientens tilstand

a) Tilstandens natur (sett ett kryss):

- vesentlig somatisk
 vesentlig psykososial
 sammensatt bilde
 annet, spesifiser _____

b) Tilstandens potensielle alvorlighetsgrad (sett ett kryss):

- kritisk, innen minutter/timer
 kritisk, innen døgn/dager
 alvorlig på noe lengre sikt
 lite alvorlig
 ikke alvorlig
 usikker alvorlighetsgrad
 terminal fase
 annet, spesifiser _____

6. Har innleggelse i sykestue/sykehjem eller sykehus eller henvisning til poliklinikk/spesialist vært på tale, blitt tenkt på eller vurdert ved denne pasientkontakten?

Ja Nei

Hvis ja, fyll ut pkt. 7, 8 og 9

Hvis nei, avslutt utfyllingen her

7. Ad innleggelse/henvisning - Hvilken beslutning er tatt?

a) Ingen tiltak

- innleggelse/henvisning er påtenkt/vurdert, men ikke gjennomført
 (hvis alternativ a avkrysses, hopp over b)

b) Tiltak

(ett eller flere punkter kan avkrysses)

- innlegges/henvises sykestue som øhj/halv øhj
 innlegges/henvises sykehusmottakelse som øhj/halv øhj
 søkes innlagt sykestue
 søkes innlagt sykehus
 søkes innlagt sykehjem
 sendes/henvises sykehuspoliklinikk som øhj/halv øhj
 søkes til sykehuspoliklinikk
 annet, spesifiser _____

8. Bakgrunnen for beslutningen

Flere faktorer og forhold kan ha hatt sin betydning. Forsøk å ta stilling til hver enkelt faktor, som er nevnt nedenfor. Anmerk din oppfatning, ved å sette ring rundt det tall du synes passer best, for hver enkelt faktor.

Faktorer/forhold	Betydning for beslutningen			
	Stor	Middels	Liten	Ingen
Behov for observasjon	4	3	2	1
Behov for undersøkelse	4	3	2	1
Behov for behandling	4	3	2	1
Pleiebehov	4	3	2	1
Psyriske forhold	4	3	2	1
Sosiale forhold	4	3	2	1
Pasientens ønske	4	3	2	1
Familiens ønske	4	3	2	1
Sykehusets råd	4	3	2	1
Lang avstand/dårlige kommunikasjoner til sykehus	4	3	2	1

9. Spesifiser nærmere (evt med egne ord) hovedgrunnen for beslutningen: