

From the Department of Medicine
Karolinska University Hospital Solna
Clinical Epidemiology Unit
Karolinska Institutet, Stockholm, Sweden

**EMERGENCY CARE SEEKING BEHAVIOUR
IN RELATION TO PATIENTS' AND PROVIDERS'
PERCEPTIONS AND ATTITUDES**

Ann-Sofie Backman



**Karolinska
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The frontpage text is sentences selected from the patients interview and represent some answers on the last question; *Do you have any further comments?* All previously published papers were reproduced with permission from the publisher.

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We shall forget by day, except

*The moments when we choose to play
The imagined pine, the imagined jay.*

-Wallace Stevens, The man with the blue guitar (1937)

*To my fantastic family
and to life*

1 ABSTRACT

Background: This study was developed with the main objective of evaluating users of emergency departments (ED) triaged as non-urgent following a period of time when large cutbacks in hospital and ambulatory care were taking place in Sweden.

Aim: To analyse patients seeking medical attention for conditions triaged as non-urgent at an ED and patients who used non-scheduled services in primary care (PC) in relation to their symptoms, perceptions and the physicians' assessments of urgency, and to register their subsequent health care use within one month. The question was; are non-urgent patients at the ED similar to unscheduled PC patients?

Methods: In this cross-sectional study subjects from a defined catchment area were identified and interviewed at the time of a non-scheduled PC visit, or a non-referred, non-urgent (triage level 4) ED visit. Structured face-to-face interviews and a concomitant questionnaire to the treating physician were used to collect the data in office hours during a nine-week period. The subjects' subsequent health care contacts within a month were registered through a population based registry.

Results: Of 924 eligible patients, 736 (80%) agreed to participate, 194 at the ED and 542 at the nine PC centres. The two groups shared demographic characteristics except for gender. A majority (47%) of the patients at the PC centres had respiratory symptoms, whereas most non-urgent ED patients (52%) had digestive symptoms, musculoskeletal symptoms, or symptoms due to trauma. Both groups had used health care frequently, but ED patients had previously been more often hospitalized (35%) than PC patients (21%) ($p < 0.001$). ED patients were more anxious about and disturbed by their symptoms and had had a shorter duration of symptoms. Regular monitoring of chronic disease was associated with an increased probability of another physician visit the following month (OR 2.0; CI 95%, 1.2-3.4). The majority of patients was found to have complaints appropriate for the setting, but general practitioners considered to a higher extent than their ED colleagues that patients had chosen an appropriate level of care ($p < 0.001$). General practitioners were older and had longer clinical experience than physicians at the ED. ED patients, having chosen an appropriate care level as judged by the physician, were distinguished by different symptom presentation, shorter duration of symptoms, and more regular previous health care use. Men without previous regular health care use were more likely to present symptoms assessed as inappropriate for the ED ($p < 0.001$), and this group was also less likely to use health information or advice before seeking care ($p < 0.01$).

Conclusions: Non-urgent ED patients and PC patients had similar socio-demographic characteristics but differed regarding types of diseases, previous hospitalizations and current perception of symptoms. Patients with disorders that ED physicians considered inappropriate for the setting had low previous regular health care use but their treating physicians were less experienced than the physicians in PC. General practitioners agreed with their patients' choice of health care level to a large extent. Information concerning appropriate health care level could be targeted to individuals with low previous health care use. No evidence was found for any widespread misuse of the ED service during the time of the study.

Keywords: Emergency department, primary care, questionnaire, non-urgent, health information, triage, overcrowding, health utilization, access

2 LIST OF ABBREVIATIONS

ED	Emergency department
PC	Primary care
VAS	Visual analogue scale
IQR	Interquartile range
CI	Confidence interval
WHO	World Health Organization
OR	Odds ratio
U.K.	United Kingdom
U.S.	United States
NHS	National Health Service
A&E	Accident and emergency department
ER	Emergency room
EW	Emergency ward
NCHS	National Center for Health Statistics
ACEP	The American College of Emergency Physicians

3 LIST OF PUBLICATIONS

The thesis is based on the following original papers, which will be referred to in the following text by their roman numerals:

- I. **Backman AS**, Blomqvist P, Lagerlund M, Karlsson-Holm E, Adami J.
Characteristics of non-urgent patients. Cross-sectional study of emergency department and primary care patients.
Scand J Prim Health Care. 2008;26(3):181-7
- II. **Backman AS**, Blomqvist P, Lagerlund M, Adami J.
Physician assessment of appropriate healthcare level among nonurgent patients.
Am J Manag Care. 2010 May;16(5):361-8
- III. **Backman AS**, Blomqvist P, Svensson T, Adami J.
Health care utilization following a non-urgent visit in emergency department and primary care.
Intern Emerg Med. 2010 Aug 19. Epub ahead of print
- IV. **Backman AS**, Blomqvist P, Svensson T, Lagerlund M, Adami J.
Use of decision support among non-urgent patients.
Manuscript submitted.

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5 INTRODUCTION

The challenges in organizing the emergency care system are not new. A casualty officer at King's College hospital, London, wrote in the Lancet 1960 that "The word casualty implies an accident or a serious or fatal event, but present day casualty work is certainly not confined to accidents. Indeed it could literally be called general practice, for every aspect of medicine is encountered". He ends the article by saying, "Who should decide whether he goes to the casualty department, the patient himself or his doctor? When he is sure that he will be sent on to the casualty department, the patient naturally wants to avoid an unnecessary visit to his doctor first. But apart from this, some people seem to prefer hospitals to general practitioners."¹

Almost 40 years later it is stated in the same journal, that "inappropriate" use of casualty departments is a problem that has a deficient solution in Britain, partly because the problem has been defined by doctors and not by patients.²

During the mid 1990s, after large cutbacks in the number of hospital beds and emergency hospitals, the number of emergency care visits in Stockholm decreased. However, in the end of the 1990s the number of ED visits once again increased. Having in mind earlier international reports of non-urgent, inappropriate, frequent, and presumably expensive ED visits, there was an interest among politicians to explore reasons for this rise in ED visits.

The aim of the present thesis is to analyse factors behind the increased demand on emergency care and thereby contribute to the future planning and optimization of health care resources.

6 BACKGROUND

6.1 INTERNATIONAL ASPECTS ON EMERGENCY CARE ORGANIZATION

The trend of rising numbers of patients at the EDs in the U.K. described in the introduction,³ were also noted after the 1950s in the U.S. as well as in other western countries.⁴⁻⁶ Following a great expansion of health care resources and increased proportion of BNP used for health care in the early 1970s, the beginning of 1980s was characterized by a concern about rising costs of health care. Focus was directed on the emergency care, with special attention to frequent attenders^{7,8} non-urgent attenders,^{6,9,10} and overcrowding at the ED and its consequences.^{11,12} It was proposed that public EDs could refer large numbers of patients to PC facilities^{13,14} and even refuse care.¹⁵ Although several studies at this time claimed that there was a large proportion of emergency visits for non-urgent or inappropriate care this statement was continuously questioned.^{16,17}

In 2002, U.S. citizens made 110.2 million visits to hospital EDs. This was a 23 percent increase since 1992. During the same period of time, the number of hospital EDs had decreased about 15 percent.¹⁸⁻²⁰ In the U.K. the NHS and Community Care Act of 1990 radically changed the financial and organizational framework within which hospitals operated. A study analysing the organizational changes during these years concluded in 1997 that by creating separate purchasing organizations, the act opened the possibility for competition between hospitals, but in practice, competition was limited. Central directives aimed at reducing waiting times for admissions, as well as raising the amount of work done relative to the finances available, influenced health care significantly. It is suggested that these changes, combined with rising numbers of emergency admissions, put the physical and human resources of British hospitals under intense pressure. It is noted that admissions has risen, lengths of stay has fallen across all age groups, and ambulatory care has grown rapidly.²¹

6.2 HEALTH CARE ORGANIZATION AND UTILIZATION

6.2.1 Primary care

In the WHO World health report *Primary care* 2008 four goals for PC are stated.²² These goals include universal coverage, health equity, service delivery, public health actions. PC should in all countries be characterized by equity, accessibility, availability of resources, social participation, intersectional community action, and cultural sensitivity.²³

In practice, PC is known as the term for the health services that play a central role in the local community. It refers to the work of health care professionals who act as a first point of consultation for all patients. Such a professional would usually be a general practitioner or a family physician, depending on locality.²⁴ There are over 1,000 local medical centres, doctors' surgeries and district nursing clinics throughout Sweden. Together, these form the PC structure, which is the foundation of the

Swedish health care system. The local medical centres, PC centres, are responsible for all the health problems that do not require the technical and medical resources of a hospital.²⁵

6.2.2 Emergency department

An Emergency Department (ED), also known as Accident & Emergency (A&E), Emergency Room (ER), Emergency Ward (EW), or Casualty Department is a medical treatment facility, specializing in acute care of patients who present to a hospital without prior appointment, either by their own means or by ambulance.²⁶ Due to the unplanned nature of patient attendance, the ED must provide initial treatment for a broad spectrum of illnesses and injuries, some of which may be life-threatening and require immediate attention. EDs are designed to provide immediate availability of special resources for those in need of urgent or emergent care around the clock.²⁷

6.2.3 Health care utilization, the impact of socio-economy factors

Health care delivery in Sweden is organized by County councils. In the Stockholm County council 3.9 outpatient visits per person and year were made to a physician in primary or specialized care in the year 2002, and of these, about 5% were unscheduled visits to PC centres or EDs.²⁸ All physicians receive a monthly salary and are not compensated for the number of patients they see.

In Sweden, individuals with higher income are found to utilize the ED resources to higher extent, while individuals with low socio-economic class and low income are found to utilize the PC resources to a larger extent.²⁹ In contrast, in U.S. it has been suggested that EDs have become entry points for those without other means of access to medical care.³⁰⁻³² This finding could be related to the health care system in the U.S. where you need a private insurance to obtain regular care. In U.S. Medicare (national program that provides health care insurance to the elderly) and Medicaid (run by individual states and provide health care to certain categories of the needy) provides financial aid to the uninsured population since 1965.³³ Many U.S. studies have thereby investigated the uninsured populations emergency care seeking behavior.³⁴⁻³⁸

In Sweden, all residents are covered by the national health insurance system, primarily financed by taxes, which is considered to diminish socio-economic differences. The differences in social insurance policies worldwide make comparisons of health care systems difficult. Since the time of the study, also some preconditions for providing care in Sweden has changed.

6.3 TRIAGE

Triage is defined as the process of prioritizing patients for care.^{39, 40} A primary goal of the ED is to distinguish patients with minor illnesses from those with life-threatening diseases, in order to optimize available resources. This is to ensure that patients are treated in order of their clinical urgency and that they receive treatment in a timely and appropriate manner.

There are several triage systems, e.g. the Manchester five category triage system,⁴⁰ the Canadian emergency department triage system⁴¹ and the Emergency severity index (ESI).⁴² The ESI system includes three to five levels of care. Use of a five level scale, instead of fewer steps, is shown to improve the discriminatory ability necessary to identify acuity in a high volume ED.^{43, 44} Presently (2010), consensus concerning one internationally accepted triage scale is lacking,^{45, 46} however, the ESI is recommended by the American College of Emergency Physicians (ACEP).⁴⁷

The use of triage at EDs was introduced successively and evaluated during the 1990s.⁴⁸⁻⁵⁰ A “subjective” triage by nurses without using a formal system is shown to have very low sensitivity and specificity,^{48, 51} whereas use of a formal triage scale has an high interrater agreement.⁵² A study of triage-related work during 2005 in Swedish EDs revealed a surprisingly low utilization of triage scales. Slightly less than half (46%) of the emergency departments did not use any kind of triage scale to document patient acuity ratings.⁵³

At the South general hospital in Stockholm, a four level scale were used for triage at the time of the study. Patients with triage 1 were in need of immediate medial attention, triage 2 within 30 minutes, triage 3 within one hour and triage 4 could wait at least one hour or longer.

6.4 DEFINITIONS ON NON-URGENT PATIENTS

The definition of non-urgent patients at the ED differ greatly in the literature, which explains why the proportion of non-urgent visits also varies between reports from twenty up to sixty percent⁵⁴ and makes comparisons difficult. A non-urgent patient could be a patient identified by the triage nurse as non-urgent; “not assigned to immediate care”,¹⁴ or by external observers.^{55, 56} Criteria vary between “a patient who could be treated by a GP”,⁵⁷ to “with complaints lasting for longer than 24 hours”.⁵⁸ Definitions of non-urgent patients could also be more specific; “satisfy four criteria; non-alarming vital signs, presence of non-emergency complaint, absence of significant abnormality in screening examination and absence of high risk complaint”.⁵⁹ Some studies use specific explicit criteria to exclude urgent cases; “vital signs within specific levels, any history of cardiac disease, symptoms for two days or less, any cardiac risk factors”.⁶⁰

Efforts have been made to accommodate the attendance of non-urgent patients, but none of these have had any effect on the total number of emergency visits.^{10, 61} This might be due to that the proportion of more urgent patients at the ED seem to have increased during the recent years.

6.5 DEFINITIONS OF INAPPROPRIATE USE OF THE EMERGENCY DEPARTMENT

ACEP published a policy statement in 1982, revised in 2009, which states that a patient has an appropriate visit to an ED “when having any medical condition such that a prudent layperson possessing an average knowledge of medicine and health, believes that immediate unscheduled medical care is required after consideration of possible alternatives... This would include conditions such as severe pain, acute infection and mental illness.”²⁷ This is of course a wide definition. Today, no valid and reliable method exists to define inappropriate care at an ED.⁶²

Several studies of ED visits have attempted to classify visits as inappropriate or appropriate for the setting, but no international standard has been developed.⁶³ One of the most recent reviews concerning inappropriate use of emergency services evaluates 53 studies.⁵⁴ The author describes a prevalence of inappropriate ED use that varied from 10-90%, based on the criterion used. In nearly half of the studies the proportion varied from 24-40%.⁶⁴⁻⁷⁰

In 1990 Derlet et al proposed it possible and safe to refuse care to ED patients using specific triage criteria.^{15, 59} It has not been possible to confirm these findings by other researchers. The use of triage has not proven to be sensitive enough to refer patients safely out of the ED.^{16, 47, 71}

Some studies have evaluated physicians’ judgment concerning what constitutes an emergency. This has revealed a dramatic divergence regarding the designation of visits as emergencies and the appropriate treatment location.^{72, 73} It is suggested that defining an emergency may be more a matter of physician training, specialty and belief than of science.⁷⁴

6.6 FREQUENT ATTENDERS

Frequent attenders are thoroughly studied at the EDs, but should not be confused with non-urgent or inappropriate ED attenders. Frequent ED attenders are characterized by having higher levels of stress, lower levels of social support, and worse general health status, often including psychiatric disorders.⁷⁵⁻⁷⁸ They are also found to have a higher mortality^{4, 7, 79} and a higher use of other health care services^{66, 80-83} including access to a PC physician.^{76, 84} In frequent PC attenders however, patients are found to have a morbidity similar to age matched controls, but a higher consulting frequency for most medical conditions.⁸⁵

The discussion about frequent ED attenders should be distinctly separated from non-urgent ED patients since reasons for attending, as well as the patients’ characteristics are different.⁸³ However, some of the frequent attendees’ visits might be considered non-urgent.

6.7 OVERCROWDING IN THE EMERGENCY DEPARTMENT

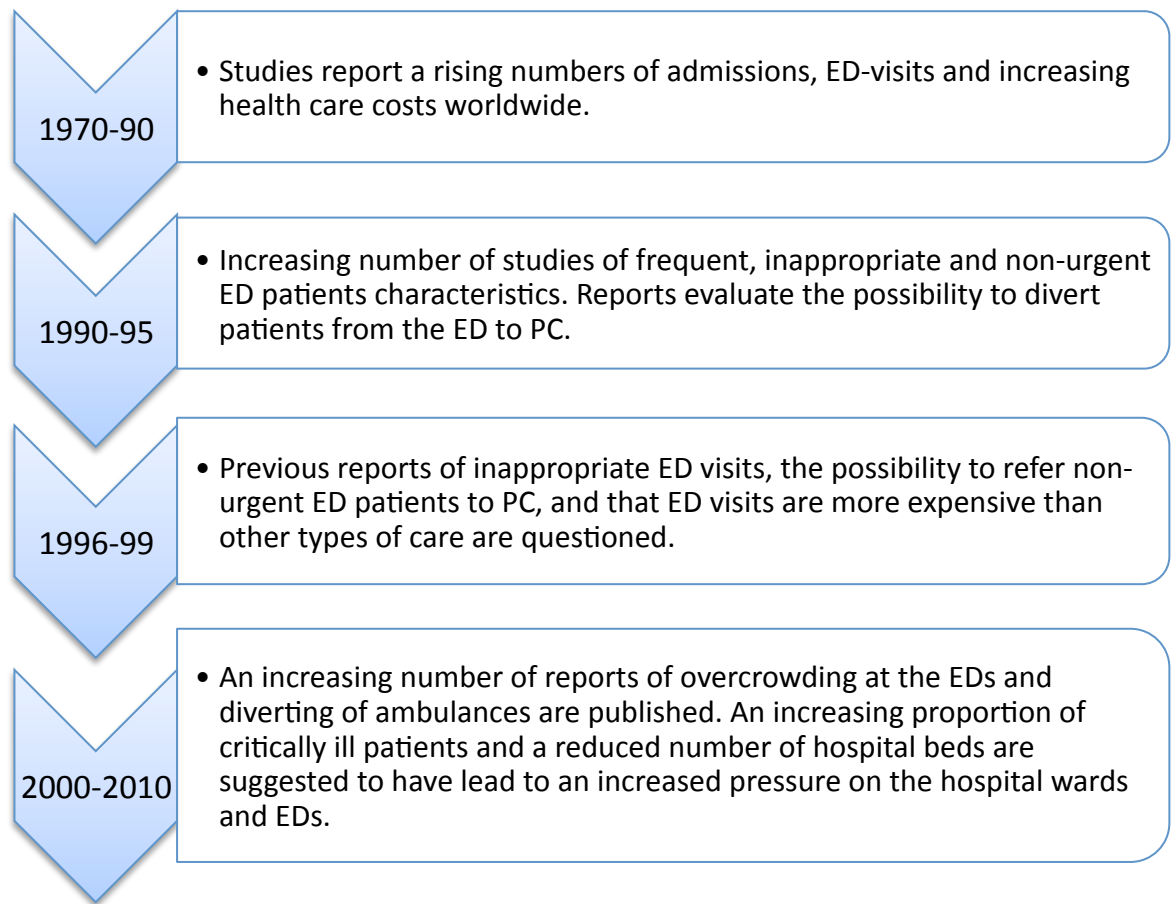
During the last decade an increasing number of reports from U.S. and the western countries appeared about overcrowding of emergency departments and diverting of ambulances.^{86, 87} The reports are raising concern about the EDs' capacity to provide medical care for all who need it.^{16, 88}

No precise definition exist, but ED overcrowding could be referred to an extreme excess of patients in the treatment areas, exceeding ED capacity^{89, 90} and frequently necessitating medical care to be provided in hallways and similar areas.⁹¹ It has been shown that overcrowding in the ED prolongs waiting time, delays treatment of severely ill patients and is an important barrier to effective health care access. In addition the quality of care is reduced.^{86, 92, 93} Poor patient outcomes has been associated with ED overcrowding and long waits. ED crowding may lead to patients leaving the ED without being examined by a doctor.⁹¹⁻⁹³

Having ended their practice of denying ED care to non-urgent patients, Derlet and Richards published an article in 2000 entitled "Overcrowding in the nation's EDs, Complex causes and disturbing effects". Here they proposed that providing care to an increasing number of critically ill patients had contributed significantly to ED overcrowding. This proposal is supported by statistics from the National Health Policy Forum showing that critical visits to the ED increased with 59% 1990-1999, and urgent visits increased with 36% during the same time.^{11, 94, 95} The number of non-urgent patients declined with 8% which illustrates the increasing pressure on the emergency services.

In summary, although the total numbers of hospitals and EDs has declined, numbers of visits to the ED has continued to increase in the western countries. Swedish regional statistics show that visits to general practitioners have increased five times 1990-2002 in the Stockholm County council. The number of patients admitted to hospital wards, as well as ED visits are, however, stationary, whereas the number of hospital beds has declined. The number of visits to specialized medicine clinics has increased slightly but is correlated to the population size.^{28, 96, 97}

Figure 1. Trends and findings in studies of emergency department use 1970-2010



6.8 THE COST OF ED VISITS

The main argument for criticizing visits to the ED for non-urgent reasons during the 1990s was that it was widely believed that the cost for ED care was threefold and even fivefold the cost of a visit to PC.⁹⁸ There was also a political statement from president Bill Clinton who referred to EDs as “ the most expensive place of all” and that “non-urgent ED patients were a target group” in 1993.⁹⁹ Diverting non-urgent visits from EDs to PC was viewed as a way to gain substantial savings.¹⁰⁰ However, these opinions are questioned by researchers suggesting that the ED has lower marginal costs to deliver 24 hour care than PC, and propose that limiting ED access may target the poor.^{32, 101, 102}

However, even if the marginal cost of a non-urgent ED visit may be lower, studies comparing the work of ED physicians and general practitioners have shown that non-urgent consultations made by emergency medical staff resulted in greater utilization of investigative, outpatient, and specialist services than those made by general practitioners.^{103, 104}

6.9 HEALTH INFORMATION SEEKING BEHAVIOUR

Health information seeking behaviour (HISB) has mainly been investigated in the following context: dealing with health-threatening situations, making medical decisions and pursuing behaviour change.¹⁰⁵ Variables influencing patients' health information-seeking behaviour may be divided into two categories: Contextual (e.g. delivery of care, information, environment factors) or personal (e.g. demographic factors, health history, attitudes, intentions and behaviours).¹⁰⁶

One factor which has been suggested to have an influence on non-urgent use of the ED is a lack of information about proper use of EDs.⁶⁷ In the western countries there are, however, several sources of health care information available. Information is provided through different channels, such as PCs, pharmacies or community services. Use of telephone consultation services for medical advice in urgent matters is continuously expanded, but has actually not been shown to reduce the demand for care at either PC or EDs.^{84, 107-109} Actually, the development of telephone services has been suggested to result in increased numbers of visits to the EDs.¹¹⁰ Health care information through the internet has expanded recently,¹¹¹⁻¹¹³ but the availability and usefulness of this source for health care seeking might be exaggerated by policy-makers.^{114, 115} Use of health information on the internet is also found to disfavour individuals with low socio-economic standard.¹¹⁶⁻¹¹⁸

6.10 PATIENT- PROVIDER COMMUNICATION

Many patients perceive their symptoms as being more urgent than does the physician,^{119, 120} and this discrepancy has been found to be stable over the past decades.^{17, 121} Who owns the definition of urgency? This has been reflected on in literature concerning health behaviour. "The fund of medical knowledge is vast and complex, the schooling so intense and gruelling, and the daily experience so unique, that an unbridgeable competence gap exists between physicians and the lay word."¹²² Because of this, there are protections afforded to patients in terms of moral conduct that physicians are held to, including a code of ethics defining the special duty of physicians to protect the interest of their patients".¹²³

A potential effect when physicians evaluate symptoms and signs of their patients as being inappropriate for the facility is that their attitudes may negatively affect behaviour toward their patients.^{119, 124} It has been suggested that the physicians' opinion can adversely affect patient outcome and future health care utilization.^{120, 125, 126}

6.11 THE PATIENT, SEEKING BEHAVIOUR AND ACCESS TO CARE

One model to structure behavioural influences on health care utilization is the Andersen behavioural model.¹²⁷ In this model determinant factors for being in the population of risk to attend health care are grouped into three different parts; predisposing (properties that exist prior to the onset of illness episodes, such as socio-demographics), enabling (resources specific to the individual such as insurance or economy, but also type of community, e.g. rural, urban area) and need (both the actual and perceived illness level).

Final access and utilization of health care services is proposed to depend on the population at risk and health policy, characteristics of health delivery system, utilization of health services, and consumer satisfaction. By use of the questionnaire (appendix) the patients' predisposing factors and need could be elucidated.

6.12 THE CHOICE BETWEEN THE PRIMARY CARE AND EMERGENCY DEPARTMENT

Is there a rationale why a patient primarily should attend a physician in PC with the majority of conditions if the cost for the society is the same or even lower for an ED visit?

Although it may appear appropriate from the patient's perspective to seek the ED to obtain immediate attention for all symptoms, this places a burden on the health system. Care at the EDs might fail to create a bond with the health service (in which patients would receive not only treatment to relieve their immediate symptoms, but also health education) or to link with on-going care in order to prevent complications and new illnesses.^{54, 103, 128, 129}

But, are non-urgent patients at the ED similar to unscheduled PC patients?

Few comprehensive analyses of non-urgent patients have been conducted after the last decades of cut-backs and organizational changes. Over the years a considerable number of studies have focused on non-urgent patients ED attendance. However, few researches have compared them to unscheduled PC patients from the same catchment area. Those studies were small,¹³⁰ based on old data,^{6, 131-133} or mainly focused on services in out-of-office hours.^{134, 135} Neither the patients' subsequent health care use, nor their seeking of health information and advice before a visit has been elucidated in a comprehensive analysis.⁶²

Since all residents are covered by the national health insurance system, other factors behind emergency care seeking behaviour than financial resources are possible to analyse in the Swedish health care system.

7 AIMS

The overall aim was to analyse patients who attend the ED for a complaint considered non-urgent by the health professionals, and unscheduled PC patients.

The specific aims were

To elucidate which demographic factors and health perceptions in patients with non-urgent medical conditions affect the choice of location.

To analyse the physicians' perceptions of appropriate health care level in non-urgent patients in an ED compared with unscheduled PC patients.

To analyse factors influencing the physicians' evaluations.

To describe and analyse factors influencing subsequent health care contacts within 30 days after a non-urgent ED visit or an unscheduled visit in PC.

To describe the seeking for health care information and advice among non-urgent ED patients and unscheduled PC patients before attending care.

8 MATERIAL AND METHODS

8.1 SETTING

The study was performed in the catchment area of Stockholm South General hospital. The hospital is a public general hospital with 505 beds and a catchment population of about 500,000. The ED of this hospital has a mean of 90,000 visits per year by patients 15 years and older. During the study period, physicians within internal medicine, cardiology, surgery, emergency medicine, and orthopedics were on call at the ED around the clock.

Primary care is provided at PC centers, each serving the population of a defined geographic catchment area. In the capital of Sweden, the county of Stockholm, there were about 200 PC centers and five hospitals with EDs open 24 hours, serving 1.9 million inhabitants, at the time of the study.

Forty PC centers were located within the Stockholm South General hospitals' catchment area and were open during office hours. All PC centers are responsible for performing a medical examination of any patient in the catchment area the day he or she presents with an urgent complaint. A patient with an urgent symptom occurring during regular office hours is expected to contact the PC center but may also attend a hospital ED without a referral.²⁵

The forty PC centres were randomly approached one by one. The first nine centres that agreed to participate were included, each with a catchment area of more than 9,000 inhabitants (Ektorp, Gustavsberg, Trollbäcken, Bagarmossen, Älta, Stureby, Rosenlund, Ringen, Söderhalsan). Four centres refused due to reorganization or lack of space and equipment for interview. The study population covered the catchment area of the nine centres in Paper I and II. In paper III and IV one of the nine centres (Älta) was excluded due to difficulties in obtaining follow-up data.

The patient copayments at the time of the study were US \$20 in PC and US \$38 at the ED. An ED visit was free of charge if the patient was referred from PC. There was also a high-cost ceiling unrelated to patient income. A patient who had paid a total of US \$160 in patient fees was entitled to a "free care card" (i.e., free medical care for the rest of the 12-month period, calculated from the date of the first consultation).

8.2 SUBJECTS

The inclusion criteria were set to identify the population with the lowest level of medical risk. Inclusion criteria for patients were the same at the PC and ED sites. Only inhabitants in the catchment areas of the nine PC centers were eligible for inclusion in the study. Eligible patients had to have contacted one of the nine PC centers within the preceding 24 hours or had to have gone directly to the ED without written referral from a general practitioner in the catchment area. Other criteria for inclusion were age between 20 and 80 years, ability to understand Swedish, physical and mental capability of being interviewed, and absence of dementia or influence of alcohol or drugs. Patients had to be able to wait for physician evaluation for at least one hour without medical risk (i.e., triage level 4) and had to have arrived at the health care facility by their own means of transport. Triage was performed before study inclusion by the regular staff at the different sites. Informed verbal consent was obtained from each participant.

8.2.1 Patients' interview (Paper I, II, III, IV)

The interviews were conducted during a nine-week period from March to May 2002, Monday to Friday inclusive, between 8 a.m. and 4 p.m, at the ED of Stockholm South general hospital in Sweden and at the PC centres. There were 19 interviewers who had been recruited and trained by the research team, and each interview was carried out just before the examination by the physician. The interview took 30 minutes and was performed in a separated space. The structured interview comprised 80 items concerning patient demographics, duration of symptoms, perception of symptoms as indicated by being anxious or troubled, and health care experiences. The perceptions were measured on the VAS-scale.¹³⁶

8.2.2 Physicians' questionnaire (Paper II, III, IV)

After examining the patient, the physician was requested to complete a self-administered questionnaire assessing the suitability of the level of care chosen by the patient and the medical risk of any delay before examination. The specific items asked were;

1. How long could the patient have waited without exposing himself or herself to unnecessary medical risk?
2. What do you consider is the most appropriate healthcare level for the patient's condition in general?
3. What would be the most appropriate healthcare level under current circumstances for this patient?

The physician was also asked for information about sex, age, professional experience, and affiliation. Physicians included consultants and residents.

8.2.3 Follow up with register data (Paper III and IV)

All health care contacts in Stockholm county, including both in- and outpatient care, are registered with a code that contains information on facility and type of health care provider (in Swedish: kombikod). The database covers the whole Stockholm County.

During a period of 30 days following the interview, all health care contacts at other clinics and hospitals in the county were recorded using the County council's database code, together with the patients' personal identification numbers. The patients with complete interviews, accepting use of their personal identity number, whose condition had been evaluated with a questionnaire of the treating physician, and whose visits were registered with a valid database code for all subsequent care were included.

8.3 STATISTICAL ANALYSES

The reasons for the visit (question 1, Appendix) were categorized by the author of the thesis (ASB) into groups that corresponded to one of seven chapters of the tenth revision of the International Statistical Classification of Diseases and related health problems, ICD-10.¹³⁷ If the reason for the visit did not correspond to one of these selected chapters it was classified as miscellaneous. Perceptions were measured by using a 10-grade visual analogue scale (VAS).¹³⁶ Ethnicity was categorized on the basis of information on the patients' and their parents' origin. Employment status was classified into the following groups: (a) employed more than 75% of full time, (b) employed 25-75%, (c) employed less than 25% or unemployed, (d) retired, (e) receiving a disability pension. Further categorizations of the data are described in respectively paper.

The data were entered into Epidata 4.0. In paper I and II, recoding and univariate analyses were performed in SPSS 12.0.1 for Windows and Statistica release 7. Confidence intervals (CIs) were calculated by the binomial exact method in Excel for Windows. Ordinal data were analysed by the Mann-Whitney U-test. In paper III and IV, descriptive, univariate and multivariate analyses were performed in Statistica release 8 and SAS version 9.1.3.

8.4 ETICAL APPROVAL

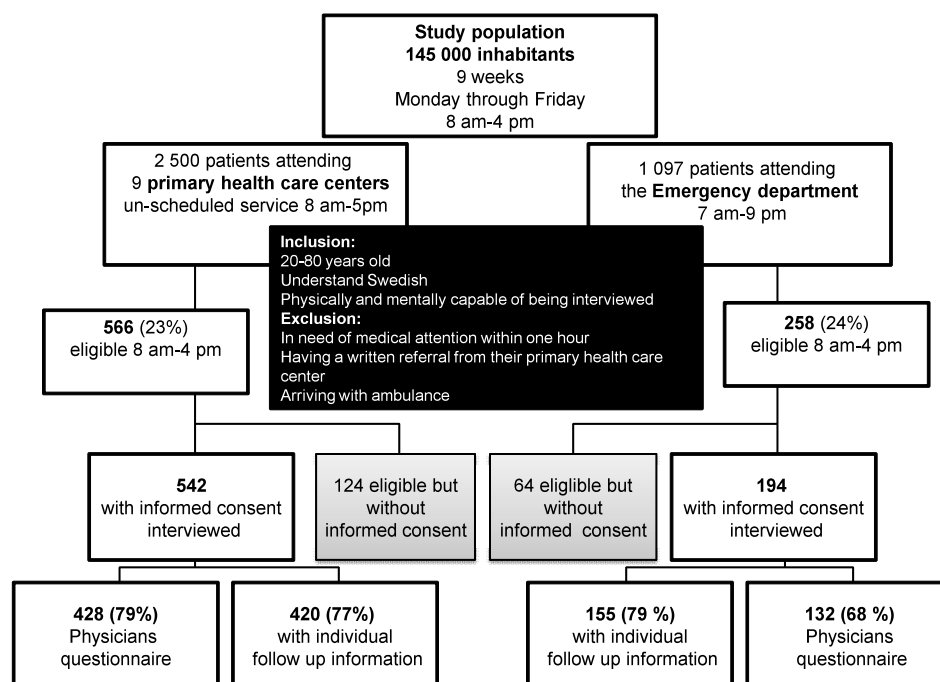
The study was approved by the Regional Ethics Committee at the Karolinska Institutet (Dnr 442/01).

9 RESULTS

9.1 STUDY PATIENTS

During the study period a total of 924 patients were eligible for the study (Figure 2). Of these, 736 (80%) agreed to participate: 542 patients at the PC centres and 194 patients at the ED. The interview was interrupted by the physician in 1.8% of the study participants at the PC centres and in 3.6% at the ED, or the patient did not want to answer all 80 questions. The loss was recorded as missing data.

Figure 2. Study design and flow of patients



9.2 NON-PARTICIPANTS – ELIGIBLE BUT WITHOUT INFORMED CONSENT

There were 188 patients (19% of those approached) who declined to participate, and of these 64 patients (34%) were visiting the emergency department. The majority of those, 22 patients (34%) at the emergency department and 48 patients (39%) in PC, were between 31-39 years. Women were over-represented among the non-responders: 122 patients (65%) at the PC compared to 36 patients (57%) at the ED. The main reason for declining to participate at both facilities was that the patient felt too ill. A common reason in PC was also lack of time.

9.3 CHARACTERISTICS OF PATIENTS (PAPER I)

9.3.1 Socio-demographics

The proportion of women was higher in PC (64%, 95% CI 60-68) than at the ED (51%, 95% CI 44-59). The mean age of both the PC and the ED group (both sexes combined) was 48 years. The groups were similar regarding age distribution, highest level of completed education, country of birth, the proportion of being married or cohabiting, having children or not, and proportions of employed, unemployed, and disabled.

At the ED 43% of the patients were being monitored regularly for chronic diseases, compared with 35% of the primary care patients (difference 8%, 95% CI 0.1-16.4). The types of chronic diseases did not differ. A higher proportion of patients attending the ED had been admitted to a hospital within the last two years (35%, 95% CI 28-42), compared with PC patients (21%, 95% CI 17-24). In both groups a majority of the patients (85%) had visited a physician at least once during the preceding two years. The same proportions (43% at the ED and 42% at PC) reported that they used regular medication. Furthermore, there was no significant difference in the proportion of free care card holders between ED patients (33%, 95% CI 26-40) and PC patients (25%, 95% CI 21-29).

9.3.2 Symptoms

In PC, 47% (95% CI 43-51) of the patients had symptoms from the respiratory system, mainly infections and allergies. Some, 13% (95%, CI 10-16), had musculo-skeletal symptoms and 9% (95%, CI 7-12) had symptoms from the genital or urinary tract.

Figure 3. Distribution of symptoms. Unscheduled primary care patients.

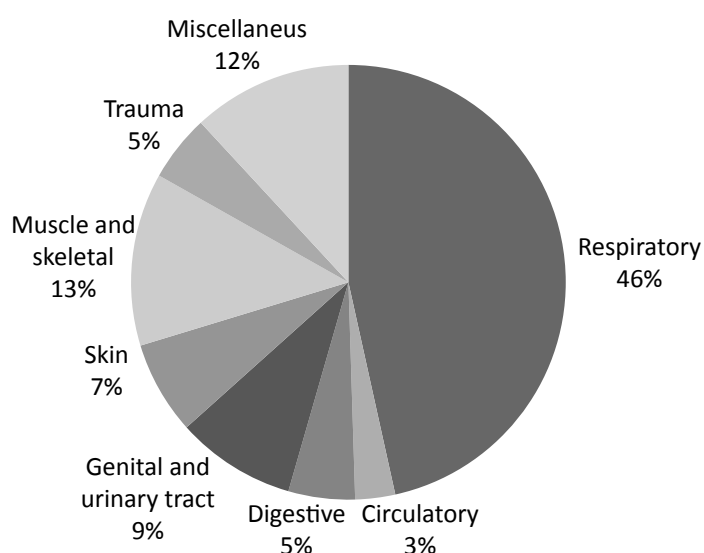
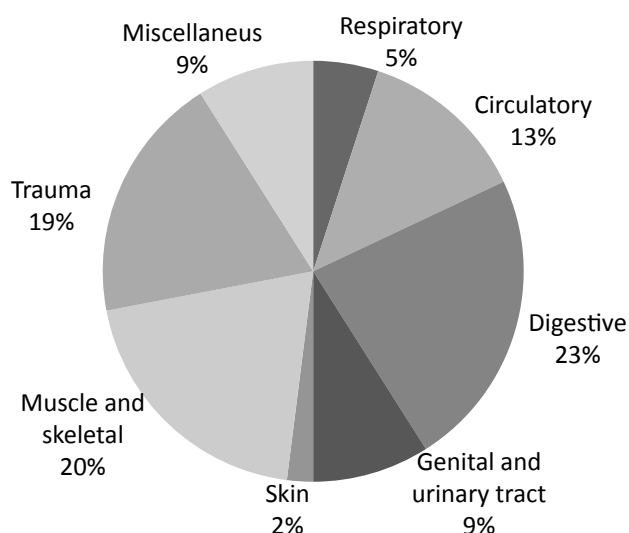


Figure 4. Distribution of symptoms. Non-urgent emergency department patients.



At the ED the most common symptoms were from the digestive system (23%, 95% CI 17-29) or the musculo-skeletal system (20%, 95% CI 14-26) or were due to trauma (19%, 95% CI 13-25).

The patients at the ED had had symptoms for a much shorter time than the primary care patients. Among the patients at the ED, 43% (95% CI 36-48) had experienced symptoms for one day or less, compared with 18% (95% CI 15-21) of the PC patients. No differences in age distribution were found in the subgroup of patients with symptom duration of less than one day.

9.3.3 Patients' perceptions

The patients at the ED were more anxious about their symptoms than the primary care patients (VAS: median 6, mode 10, interquartile range [IQR] 3 to 8 vs. median 5, mode 1, IQR 1 to 7, $p < 0.001$). The median age of the most anxious patients was similar at the two facilities. The patients at the ED felt more disturbed by their symptoms than the PC patients (VAS: median 8, mode 10, IQR 6 to 10 vs. median 8, mode 8, IQR 5 to 9, $p < 0.02$). There was no significant age difference between the patients who were most disturbed and those who were least disturbed, at either facility. However, there was a tendency for the most disturbed ED patients to be younger.

9.4 PHYSICIANS' ASSESSMENTS (PAPER II)

9.4.1 Characteristics of physicians

At PC centers, the proportions of male (45%) and female physicians (54%) were similar, whereas there was a predominance of male physicians (71%) at the ED. General practitioners were older than ED physicians (median age, 50 vs. 36 years) and were more experienced, with 75% being consultants compared with 27% at the ED.

9.4.2 Physicians' assessments

At PC centers, 25% of unscheduled patients were considered to need an evaluation within 24 hours compared with 46% of non-urgent ED patients ($p < 0.001$). Concerning appropriateness of the healthcare level, 97% of PC patients were considered suitable for the health care level by their physicians, compared with 47% of ED patients ($p < 0.001$). Because of this result, we did not explore the PC patients further but performed a detailed analysis of 132 ED patients.

We identified 60 ED patients who were considered to need medical treatment within 24 hours (high risk) and 70 ED patients who could have waited longer than 24 hours (low risk). Two patients had missing data. Moreover, we identified 62 ED patients who were considered to have chosen the appropriate level of care and 69 ED patients who were considered more suitable for PC. To further analyse 130 ED patients with complete data, we categorized them into two groups. First, appropriate ED users were those assessed as either attending the right level or having high risk (78 patients [60%]). Second, inappropriate ED users were those assessed as both attending the wrong level and having low risk (52 patients [40%]).

9.4.3 Patients' characteristics in relation to physicians' assessments

There were no significant differences between patient groups regarding sex, country of birth, education level, marital status with children, or perception of symptoms as indicated by being anxious or troubled. Among patients considered inappropriate for the ED, the most common symptoms and signs at presentation were musculoskeletal (33%), and two-thirds reported symptoms for longer than 24 hours compared with one-half of the patients considered appropriate for the ED ($p = 0.02$). Patients considered appropriate for the ED were often 40 years or older, had more frequently a

free care card and had more regularly previous health care use. In the multivariate analysis, after controlling for age, sex and education level, we found that patients taking regular medication were more often considered appropriate for the ED (Odds ratio (OR) 3.2 ; 95% CI 1.1-9.8). Significant interaction between sex and regular previous health care use was found in the multivariate model, indicating that men with less regular previous health care use were particularly likely to have symptoms assessed as inappropriate for the ED ($p<0.001$).

9.5 SUBSEQUENT HEALTH CARE UTILIZATION (PAPER III)

9.5.1 Characteristics of patients

All parts of the study, including the patient's interview, the physicians' questionnaire, and the 30-days follow up, were completed in 428 patients: 323 (82% of eligible) at the PC centers and 105 (71% of eligible) at the ED.

No differences were found between the PC and ED groups with respect to gender, age, having a partner, level of education and proportions of employed, unemployed, retired or disabled patients. It was more common among PC patients to have children (76 vs. 66%, $p<0.05$). ED patients had been hospitalized more frequently within the past 2 years compared to PC patients (30 vs. 20%, $p<0.05$). Similar proportions of patients had regular monitoring of chronic disease, had used regular medication or had a free care card in both settings. A higher proportion of patients at the ED were very anxious concerning their symptoms (53 vs. 33%, $p<0.01$), and more troubled (82 vs. 72%, $p<0.05$). ED patients had a shorter symptom duration before presenting at the ED, 42% had had symptoms less than 24 h, compared to 21% of the PC patients ($p<0.001$).

9.5.2 Subsequent care

At the ED, 14 (13%) of the patients were admitted after the interview. During the following month, another four patients (4%) were admitted. Of those admitted, four patients were admitted one more time during the following 30 days and three patients were admitted three times. In the PC group, one patient (0.3%) was referred and admitted to a hospital on the day of the interview and three (1%) during the following month ($p<0.01$). In 46% of the patients at the PC and 42% at the ED, the visit in connection with the interview was the only health care contact that month. Among the PC patients 28% had one later contact compared to 26% of the ED patients. Among PC patients, 25% had two or more contacts in the following month compared to 32% of ED patients ($p<0.05$). At the PC, 43% of the patients and at the ED, 50% had at least one later visit to a physician in the following month ($p<0.07$). ED patients were more likely to visit a specialist clinic (33%) than PC patients (2%). The proportions of further contacts made to an in- or outpatient ED were 16% by the ED patients group and 9% by the PC patient group ($p<0.05$).

9.5.3 Follow-up in relation to patients' characteristics and physicians' assessments

We found in the multivariate analysis that patients with a free care card (OR 1.8; CI 95%, 1.1–3.0) and regular monitoring for chronic disease (OR 2.0; CI 95% 1.2–3.4) were associated with an increased risk of one or more physician visits the following

month. Patients with previous health care experience and having children had an increased probability of reattendance (OR 2.7; CI 95% 1.3–5.5). No other of the patients' characteristics predicted further health care contacts.

9.6 HEALTH INFORMATION SEEKING BEHAVIOUR (PAPER IV)

9.6.1 Characteristics of patients

The patients' characteristics were identical with those described in paper III.

9.6.2 Use of advice or health information (decision support) before the index visit

The multivariate analysis showed that in PC, more females (91%) often decided to attend care without any decision support than males (81%) (OR; 2.5 95% CI 1.3-5.0). Among the ED patients, the situation was reversed (OR 0.4; 95% CI 0.2-0.9). Previous healthcare experience among PC patients was associated with less use of decision support (OR 2.6; 95% CI 1.3-5.6) while this experience had no impact on the ED patients' decisions. The patients' age, employment status, education level, physicians' perception of urgency, subsequent physician contacts, health care information use in the past, symptom duration, and patients' perception of symptoms did not affect the use of decision support before attendance in PC or the ED.

We stratified the patients by facility and previous health care experience. This showed that men with no previous healthcare experience attending the ED had the lowest utilization of decision support ($p < 0.01$)

9.6.3 Previous use of health information for an urgent matter

We stratified the patients by having used health care information previously in another urgent matter, or not. In the multivariate analysis, the likelihood of having used healthcare information was higher among women (OR 1.9; 95%, CI 1.1-3.3), and among those being employed $> 75\%$ (OR 3.1; 95%, CI 1.5-6.2). It was also more common among patients with previous healthcare experience (OR 2.5; 95%, CI 1.3-5.0), in the group who had one or more visit after the index visit (OR 2.8; 95%, CI 1.5-5.1), and among those with the index visit in PC (OR 2.7; 95%, CI 1.4-5.4). Patients older than the median age of 48 years had used health care information more seldom, compared to younger patients (OR 0.4; 95%, CI 0.2-0.7).

10 DISCUSSION

10.1 FINDINGS

The major finding of this investigation was that the non-urgent patients at the ED and unscheduled PC patients were different concerning the perception of their symptoms and that the majority of the patients were assessed as appropriate for the health care level which they had attended.

The patients groups shared socio-demographic characteristics except gender. Almost two thirds of the patients at the PC were women, whereas there were no gender differences at the ED. ED patients were in general more anxious about and disturbed by their symptoms, and the panorama of complaints was completely different compared to PC patients (Paper I).

Patients who attended the ED had used health care information more actively, such as the County council telephone service or personal advice, compared to patients attending the PC (Paper IV). The physicians at the PC considered to a higher extent than their ED colleagues that the patients attended an appropriate level of care. General practitioners were older and had longer experience (Paper II).

More than half of the patients in both settings had at least one further contact with health care the following month. Previous health care utilization was associated with an increased probability of one or additional physician visit the following month, regardless of the setting for the index visit or other patients' characteristics. Physicians' perception of urgency did not influence the probability of further contacts (Paper III).

The major strength of this investigation was the use and combination of three different information sources: the patients' interview, the physicians' assessments and the registry with complete coverage of health care utilization after the index visit. The most important components of the study design was the inclusion of both ED and PC patients, and that all patients lived within the geographical area of the PC centres included in the study. This design made it possible both to describe and compare the patients' characteristics and illustrate the patients' and physicians' perceptions at these two health care levels.

To facilitate the discussion about study findings and implications the discussion is expanded with a section on methodological considerations since the design of a study both limits and permits the possibility to draw conclusions.

10.2 METHODOLOGICAL CONSIDERATIONS

10.2.1 Study design

There are two basic categories of epidemiological study design; descriptive and analytical designs.^{138, 139} The choice of study design is important since it influences the internal validity (“how likely are the results to reflect the true association in the population under study?”), external validity (“how likely are results to apply to other populations?”) and efficiency (“how do we get the most out of the invested time and money?”).

10.2.1.1 Descriptive studies

Descriptive studies are records of events. These include studies that observe series of cases (case reports or case series) or a cross-section of a population (cross-sectional study) in order to find particular characteristics.¹⁴⁰

In cross-sectional studies, the aspects of interest in a group of patients, including potential causes and effects, are all observed at the same time. This study design is useful in exploratory studies aiming to screen or classify different characteristics and outcomes. Papers I, II and IV were based on a cross-sectional design. Paper I described the different patterns in symptoms at the two different sites. In paper II the risk of being considered appropriate for the ED or not (outcome), depending on the patients and physicians’ characteristics (independent risk factor) was calculated. In paper IV various ways of seeking advice and health care information before attending care at the different sites, were explored.

10.2.1.2 Analytical studies

There are three principal types of analytical study designs. These are categorized into observational; cohort studies, case-control studies, and interventional; clinical randomized trials.¹³⁹

In a cohort study a group of patients who are selected based on the presence or absence of a factor, are followed over time for an outcome. This study design is optimal for measuring associations between exposure and outcome, and if prospectively performed, less sensitive for recall biases.

Paper III is a prospective cohort study in which all interviewed patients were followed for 30 days and the outcome of interest was the number of health care contacts during this time.

In a case-control study the subjects are initially selected because they either have (cases) or have not (controls) the outcome of interest. A randomized clinical trial is a study where the investigator intervenes by manipulating a risk factor. These designs were not applied in the present thesis and will therefore not be further discussed.

10.2.2 Internal validity

When designing a study, attempts are made to reduce both random and systematic errors (bias) in order to optimize the internal validity. In contrast to random errors, systematic errors are not affected by the size of the study population.

10.2.2.1 *Systematic errors*

Bias is defined as the introduction of errors into a study that can distort the results in a non-random way. Biases can be classified as selection bias, observation or information bias and confounding.

10.2.2.1.1 Selection bias

A selection bias refers to any error that arises in the process of identifying the study population. It occurs when the association between exposure and outcome is different between individuals in two or more comparison groups.

In this study the two main risks of selection bias are the following: The first is the selection of PC centres. The centres were randomly approached one by one and included consecutively. However, it can not be excluded that the PC centres that accepted inclusion had a better organization, facilities and maybe also a population that differed from non-participating centres. This may have affected the internal validity if only PC patients had been studied. By also studying patients who turned directly to the ED from the same catchment area the risk of a selection bias due to the inclusion process of PC centres is unlikely.

The second time selection bias may have occurred was when the patients were approached for the interview. In PC it was not possible to approach and interview all patients having an unscheduled appointment, although they might have been eligible, since they were too many. However, the interviewers were instructed to approach the patients consequently at arrival. At the ED this was not a problem. Eventually, due to only including patients from triage level four, together with the restrictive study inclusion criteria, very few patients were possible to include from the specific geographical area. We have therefore reason to believe that we did not miss to approach anyone, and thereby the risk of a selection bias was low.

10.2.2.1.2 Information or observation bias

Information bias results from systematic differences in the way data on exposure regarding outcome are obtained from the study groups. In an interview study this might occur if different interviewers do not conduct the interview in a structured way. The risk of this was minimized by use of a structured questionnaire. The interviewers also had to pass a training course before the study started.

A major type of observation bias is misclassification. Misclassification bias occurs when the status of patients or the outcome is incorrectly classified. Misclassification could for instance have occurred in connection with the nurses' triage if patients who were more severely ill were triaged as non-urgent.

In the structured interview, many questions were multiple choice or open-ended. Dichotomizing these answers was performed to enable the statistical analysis. By dichotomizing the variables there is a risk of underestimating some findings. However, since this process was performed using the same method on ED and PC patients, it would be non-differential and would thereby not affect the internal validity.

10.2.2.1.3 Confounding

Confounding is a major threat to the validity of inferences on the association between exposure and outcome. A confounder is a factor that is closely associated (positively or negatively) with the exposure, and a risk factor for the outcome, but not an intermediate. A cross-sectional study could be sensitive for confounders. A possible confounder in these investigations could be the patients' age or having a free care card. These are factors that are associated with chronic disease. When aware of this problem, it is a factor that can be accommodated in the analysis.

There are various ways in the study design and data analysis to account for confounding. Among such strategies are; stratification, standardisation, restriction, matching and logistic regression. Multiple logistic regression was used in papers II, III and IV. In paper IV stratification was performed by previous health care use.

10.2.2.2 *Random error, precision and chance*

Statistical analysis is used to estimate an association after correcting for confounding described above, and to assess variability in the data i.e. the distribution of a variable. The goal of the analysis is to obtain an accurate result with as little error as possible. High precision of estimates makes chance a less likely explanation of findings.

A confidence interval (CI) is a range of values around the estimated effect indicating the amount of random error in the estimate. A wide CI indicates low precision in contrast to a narrow CI indicating high precision of the results. A major factor determining the width of a CI is the size of the sample used in the estimation procedure.

In this study random errors can not be excluded, but due to the large number of patients studied they are less likely to occur. In paper III and IV a limitation was the attrition caused by only including patients recorded in all three datasets.

10.2.3 External validity

Given that the distribution of completed education, the proportion of unemployed, and the proportion of immigrants were consistent with the general distribution in Stockholm County, the generalizability of the results to the county of Stockholm and other urban areas could be high.^{28, 97}

However, when determining the external validity our inclusion and exclusion criteria have to be considered.

To be included the patient had to understand and speak Swedish and we can not generalize our findings to non-Swedish speaking inhabitants. We excluded patients older than 80 years, and patients influenced by drugs. These factors might influence the

seeking behaviour to the ED and PC in different ways.¹⁴¹ Socioeconomic stress, psychiatric co-morbidity and lack of social support have been associated with frequent health care attendance as well as non-urgent visits.^{75, 142} To study these population groups, e.g. patients with on-going drug abuse¹⁴³, homeless people,¹⁴⁴ geriatric patients,^{145, 146} as well as individuals not familiar with the Swedish health system,²⁹ a specific approach is probably needed, and this study was not designed to evaluate these groups.¹⁴⁷

With these limitations in mind, the large study population and the study design reinforces the external validity and ensures applicability of the results to other population groups.

10.3 IMPLICATIONS OF STUDY FINDINGS

When does an individual attend the ED instead of the PC?

The answer might be; when the individual feels more ill, disturbed or worried by the symptom. A sudden onset of symptoms was a predictor for approaching the ED. Also, the ED patients had more often been hospitalized previously. This could indicate a more vulnerable population, but could also imply that the ED patients were more familiar with the hospital service, when in demand of care. The absence of socio-demographic differences is in contrast to some previous research.^{94, 142} Studies with the same design, however, support the finding that ED attenders were similar to PC patients in terms of socio-demographic indicators, but had symptoms which were not typical of the PC workload.^{78, 132, 148}

The gender difference, i.e. the larger proportion of women attending the PC, and the finding that women were more conscious in taking advice or search for health care information before an ED visit is consistent with some previous findings,¹⁴⁹⁻¹⁵¹ while other studies present contradictory results.^{55, 67}

It has been shown that patients who visit an ED also frequently use other health care services.⁸¹ However, we found that this also was the case in PC patients. This frequent use was further indicated by the finding of similar high proportions of free-care card holders in both groups compared with the general population.⁹⁶ Also, patients with chronic disease were associated with an increased probability of having one or more physician visits the following month, regardless of the setting for the interview. Patients considered appropriate for the ED were older and had more regular previous health care use. This finding is consistent with previous research.^{78, 152}

The patients with complaints that ED physicians considered inappropriate for the setting had in general less regular previous health care experience, but were also treated by less experienced physicians compared to patients in PC. The interpretation of this finding must be cautious, having in mind previous reports concerning lack of agreement between physicians' perceptions of what constitutes an emergency.^{72, 73, 153} It is unknown if patients considered inappropriate by ED physicians would have been

considered appropriate in PC by general practitioners. Such a design was unfeasible because of ethical and logistic concerns.

Actually, the patients with symptoms considered inappropriate for the ED had used health care information or advice before the visit to the same extent as patients with symptoms considered appropriate for the setting. Our findings are supported by other studies showing that for a large proportion of self referred patients, the ED was not the first contact with health services for the present health problem.^{148, 154}

Surprisingly few had used the county council telephone service and few had ever used the internet to search for information in case of an urgent health matter. One might argue that the internet utilization has increased since the time of the study, but also more recent international data support this finding and point out that it might be premature to embrace the internet as an effective asset for health information concerning health care use.^{114, 155} The internet seem to suit the health-active consumer best.¹⁵⁶

Three patterns could be distinguished when comparing health information seeking behaviour. The first group had previous health experience and used little or no health information, a second group which consisted of concerned patients who sought information actively, and a third group, which consisted mainly of men without health care experience, who did not use any advice or information before attendance.

To find ways to target information concerning health care use to the latter group deserves attention.

10.3.1 Which proportion of inappropriateness is appropriate?

To attend the ED in case of a life-treating disorder is widely accepted, but how should the organization respond to the public's needs and expectation in the case of medical disorders considered minor and suitable for a different health care level. This is a difficult question to respond to when developing an emergency care organization that puts safety for the public first, at a reasonable costs. An important question which arose during the study was if non-urgent patients at the ED constitute an organisational problem or not?

This study was not designed to evaluate the proportion of patients who had symptoms inappropriate for the ED. We have background and triage information only for patients meeting the inclusion criteria (i.e. those with lowest medical risk). It would have been advantageous to obtain this information for all patients to assess whether inappropriate use of the ED after a decade of constraints in hospital ED services constitutes an organizational problem. It is, anyhow, interesting to try to put the results into a perspective.

The patients perceived by the physicians to have inappropriate symptoms for the setting were few, 65 (5.9 %) persons out of all 1,097 ED patients (all triage levels) attending from the catchment area during the time of the study. They represented only half (65/132) of those fitting our restrictive inclusion criteria, which aimed at focusing on those patients which eventually could have been treated in PC.

This share might even be a too low proportion. Recent data from the Centers for Disease Control and Prevention/National Center for Health Statistics (NCHS) estimate that 34% of ED patient visits required treatment within 15 minutes, and point out that “only 10% were classified as non-urgent”.¹⁸

To evaluate the relevance of the proportion in the perspective of a patients’ safety, we have to consider the sensitivity and specificity of this finding. We have in the background section mentioned the moderate agreement between different health professionals’ evaluation of appropriate ED-visits.^{72, 157, 158} Also, the triage system is shown to have moderate sensitivity¹⁵⁹ when classifying urgent and non-urgent cases.^{46, 158, 160-162} This means that some patients triaged as non-urgent actually have a more urgent condition. It is also generally considered unsafe medical practice to divert non-urgent patients from the ED, since a substantial proportion may need to be admitted for care.^{126, 163, 164}

The health care systems may probably have to accept a certain proportion of patients attending with low-risk symptoms, in order not to risk some patients health by denying them immediate medical attention.¹⁶⁵ ACEP strongly opposes deferral of care for patients presenting to the ED.⁴⁷ The ED is primarily a facility for evaluating urgencies from non-urgencies. A certain proportion of non-urgent patients at the ED is not a failure of the system but could, and maybe even should, be considered a natural part of the daily work.

It is difficult to determine if a condition is urgent or not for the layman, but also sometimes for the health professional. Active observation of the patients’ symptoms is often helpful, therefore the waiting time could be considered as a part of the evaluation of the patients’ condition at the ED. Long waiting times (3-6 hours) for patients within triage level 4-5 may therefore not always be considered as negative.

On the other hand, long waiting times lead to organizational problems at the ED since the patients waiting for attention might exploit considerable resources both in space and time from the nurses. Providing EDs with fast-tracks or co-operating general practitioners are examples of effective management strategies.^{166, 167}

Even though a low proportion of patients with symptoms inappropriate for the setting were found within this study, the EDs need to continuously evaluate the proportions of every triage level to identify and report the need for changes of routines.

10.3.2 Suggestions for future management and research

1. It is important to develop organizational ways to manage patient needs that are suitable for the setting to a reasonable cost. Developing closer collaborations between PC and ED physicians might benefit inexperienced physicians and their patients.
2. Public health information sources concerning health care use should continuously be evaluated for effectiveness.
3. Methods to inform and reach patients with no or little health care experiences about health care use need to be developed. Education concerning the health care system, medical issues and health care use might need to be improved and implemented in schools.
4. The distribution of patients within each triage level could continuously be evaluated at the ED to register changes in seeking behaviour. This could also be used to measure and evaluate the workload.

11 CONCLUSIONS

Individuals with a condition considered non-urgent by a health-professional attending the ED and unscheduled PC patients were examined.

- The non-urgent patients at the ED shared all demographics characteristics except gender with the unscheduled patients in PC.
- Symptoms, previous hospitalization, onset of symptoms and current perception of symptoms were the main factors discriminating between the groups.
- General practitioners agreed with the choice of healthcare level among their patients to a large extent.
- ED patients with disorders rated as inappropriate for the setting by the physician had little regular previous health care use, but were also managed by less experienced physicians compared to patients in PC.
- Previous health care experience was associated with an increased probability of one or more visits to a physician the following month, regardless of the setting, or other patient characteristics.
- Physicians' perception of urgency did not influence the probability of further contacts the following month.
- Non-urgent patients at the ED used more health care information or advice, than the unscheduled PC patients before attending care.
- Less than half of the ED patients used advice from a professional health source and there was a gender difference in health information-seeking behaviour. Men used less information before an ED visit compared to women.

11.1 FINAL REMARKS

The possibility to attend an ED 24 hours per day without the need of a referral letter is a great favour and safety for the public health. With this follows a responsibility of the individual not to misuse this favour.

From our investigation, we could not find evidence for any widespread misuse of the ED service during the time of the study. There was a small proportion of all ED patients who were rated as having a condition inappropriate for the ED, and a large proportion of those patients had utilized professional health information or advice before the visit.

The study findings do not prove or imply that non-urgent ED patients' complaints were equal to the PC patients. In contrast, most non-urgent patients' complaints seem to fulfil most criteria for an appropriate visit to the ED in accordance to ACEP policy statement, previously described in the background section; "medical condition such that a prudent layperson possessing an average knowledge of medicine and health, believes that immediate unscheduled medical care is required after consideration of possible alternatives."²⁷

The patients' perception of the severity of the disease will continue to be the major reason for the choice of health care level and in most cases the individuals' intuition and choice is correct. ED overcrowding is a symptom of a larger set of issues that cannot be addressed by the emergency department, or even hospitals, alone.^{91, 164}

Finally, a thought-provoking quote from the editor of the Journal of Emergency Medicine, Stephen R. Hayden. He writes in an editorial in 2009; "shifting patients presenting to the ED who are believed to be non-urgent will not solve crowding in the ED! Once and for all, if we are going to make any headway toward solving the real problems that lead to ED crowding, we must stop being distracted by this issue of non-urgent patients in the ED and put it to rest."¹¹⁰

12 APPENDIX

Interview questionnaire:

(The full interview consisted of 80 questions. Here only those questions finally analysed and used for the papers are shown)

1. What is your reason for attending today?

Respiratory

Respiratory disorder, Asthma, Coughing, Pneumonia, Pharyngitis, Sinusitis, Cold, Sore throat

Circulatory

Heart palpitation, Pain in chest, Dyspnea, Fear of thrombosis

Digestive

Diarrhea, Constipation, Vomiting, Pain in stomach, Blood in stools

Genital and Urinary tract

Blood in urine, Urinary infection, Genital disorder, STD

Skin

Rash, Wound (non-traumatic)

Muscle and skeletal

Back pain, Pain in knees, Numbness, Muscle pain

Trauma, Injury

Accident, Fall, Sprain, Bleeding injury, Whiplash

Miscellaneous

Tired, Insomnia, Earache, Dizziness, Animal and insect bites, Fever, Headache, Prescription

Other: free text.....

2. How long have you had symptoms so troublesome that you have been thinking of seeking health care?

A few weeks

A few days

One day

Suddenly today

I will now ask you some questions about your complaints.

On a scale from 1-10:

3. How disturbed are you by your symptoms?

Not at all (1) __2__3__4__5__6__7__8__9__10 Very disturbed(10)

10 cm

We used a plastic strip with a line on one side. The patient pointed at the line and the interviewer noted the corresponding square, divided into 10 pieces on the other side of the strip.

4. How anxious have you been?

Not at all (1)___2___3___4___5___6___7___8___9___10 Very anxious(10)
10 cm

5. Have you tried to treat yourself before coming here?

Yes /

No

6. If yes, how?

(Several options possible, options not read)

Rest/stay home from work

Prescribed medication

Over-the counter medicine (also e.g., Bafucin, cold balsam, vitamins)

Physical activities

Supportive bandage

Compress, wound bandage

Alternative medicine, e.g., naturopathic medicine, homeopathic preparation, acupuncture, masseuse

Food

Other:_____

7. Did you come here on your own initiative?

Yes

No

8. If no:

Did someone advise you to come here?

Yes

No

Who?

Where from?

9. Did you get a referral from a doctor?

Yes

No

(If yes to question 9)

From whom?

From where?

10. Do you think you could have received help for your symptoms elsewhere?

Yes

No

(If yes to question 10) **From where?**

Primary care centre
Emergency department
Other: _____

10. Do you have a card that gives you free healthcare?

Yes

No

11. Have you been admitted to a hospital within the last two years?

Yes, how many times? ____

No

12. Do you have any symptoms that require a regular check-up by a doctor?

Yes. If yes, for what? _____

No

13. Do you take medicine or have injections regularly?

Yes

No

14. Do you receive help from the home help service? (cleaning,, meals on wheels, help with personal hygiene etc.)

Yes

No

**15. Do you receive medical care at home by e.g. the district nurse ?
(dressing wounds, medication, and injections)**

Yes

No

Telephone contacts/ telephone availability

16. Have you tried to contact the primary care centre by phone in another urgent matter?

Yes

No

17. Have you previously contacted the emergency department by phone in another urgent matter?

Yes

No

18. Have you tried to contact the County councils telephone service for medical inquiries by phone in another urgent matter?

Yes

No

19. Have you used the internet to seek medical advice in connection with another urgent matter?

Yes

No

Background variables

20. We would like to end the interview with some general questions about your background

Sex (question not asked)

Male

Female

21. How old are you? ____ years

22. In what country were you born?

Sweden

Other: _____

23. How long have you lived in Sweden?

_____ years

Whole life

24. In what country were your parents born?

Mother: _____

Father: _____

25. What is your highest completed education? (state one alternative)

Elementary school

Compulsory school or comprehensive school

Vocational school or non academic vocational training

Lower secondary school/girls' school

Upper secondary school

College, university or equivalent

Other: _____

26. What is your occupation now, and how much do you work? (make sure that the proportions amount to at least 100%, e.g., 50% part time and 50% studies, and that the proportion seems reasonable)

Occupation: _____

	Proportion in percentage
Salaried fulltime work	
Salaried part time work	
Self employed	
Student	
Unpaid housework e.g., housewife/househusband	
Unemployed	
Sickness benefit	

Sickness pension/long term sickness	
Early retirement pension	
Retirement	
Other:	
Sum:	

Social network

27. Are you living with a partner?

Yes

No

28. Do you have children?

Yes

No

(If yes) How many? ____

29. How many children are living permanently at home? _____

Social security number

30. We should like to follow up your case and, by going through your medical record, to see what the outcome was within one month. In order to do that, we need your social security number. Would you be willing to give it to me?

13 POPULÄRVETENSKAPLIG SAMMANFATTNING

Syfte

Denna studie utvecklades med syfte att undersöka om de lägst prioriterade patienterna på en akutmottagning hade besvär som bäst skulle lämpa sig för omhändertagande i primärvården, d v s vid vårdcentral. Målet var att beskriva och jämföra individer i ett geografiskt upptagningsområde som sökt sig antingen till en vårdcentral i ett akut medicinskt ärende alternativt valt att söka akutmottagningen och där inkluderats i den lägst prioriterade gruppen.

Bakgrund

Vid livshotande medicinska tillstånd är det fortfarande en självklarhet för en invånare i Sverige att direkt kunna vända sig till en sjukhusansluten akutmottagning. Detta är ett system som bygger på att individen själv kan avgöra sjukdomen eller skadans allvarlighetsgrad och vilka sjukvårdsresurser som är lämpliga i det aktuella fallet. Detta system medför en ökad medicinsk säkerhet för individen då han eller hon med säkerhet snabbt kan få en bedömning och vid behov utredning och behandling. Ett överutnyttjande av denna resurs kan dock medföra längre väntetider för icke akuta tillstånd, men även sämre omhändertagande för patienter med livshotande tillstånd.

Primärvårdens uppgift är att omhänderta det grundläggande medicinska behovet hos befolkningen. Uppdraget sträcker sig även utöver det rent medicinska och innefattar såväl förebyggande hälsovård som utbildning om hälsa och sjukdom. Primärvårdens möjligheter till ett första omhändertagande i en akut situation skiljer sig åt mellan olika geografiska områden, där även antalet patienter per läkare, samt avståndet till ett akutsjukhus har betydelse.

Efter flera decennier med kraftig utbyggnad av sjukhusansluten vård uppmärksammades stigande sjukvårdskostnader och långa vårdtider under slutet av 1980-talet. Ett flertal studier under 1980 och 1990-talet beskriver en ökad andel icke akuta patientfall vid akutmottagningar i Sverige samt i västvärlden. Ädelreformen under 1990-talet innebar att patienter som var medicinskt färdigbehandlade överfördes för fortsatt omhändertagande i kommunal regi och vårdtiderna kunde därmed kortas radikalt. I samma skede tog vårdcentralerna/primärvården över allt fler uppgifter och kontroller som tidigare handlagts av sjukhusens specialistmottagningar. Ändrade rutiner innebar att patienterna i lägre utsträckning behövde få inneliggande vård. Ett flertal akutsjukhus rationaliserades bort under mitten av 1990-talet och under en period minskade antalet besök på kvarvarande akutmottagningar. Under den senare delen av 1990-talet ökade antalet besök till sjukhusens akutmottagningar åter. En hypotes var att tekniska och medicinska framsteg hade lett till att möjligheterna till utredning och behandling av medicinska tillstånd hade förbättrats och därmed att såväl krav som efterfrågan hos befolkningen hade ökat.

Material och Metod

Faktorer som patientens symtom, upplevelse av sina besvär och bakgrundsvariabler som bland annat kön, utbildning, tidigare sjukvårdserfarenhet och social situation kartlades i en trettio minuter lång intervju. Den behandlande läkaren ombads efter genomförd undersökning att bedöma vilken vårdnivå som hade varit lämplig för patienten samt ange hur länge läkaren ansåg att patienten kunde väntat på medicinsk bedömning. Patientens totala vårdkonsumtion månaden efter besöket kartlades därefter.

Resultat

Delarbete I beskriver och jämför egenskaper hos de patienter som identifierats vid en akutmottagning respektive vårdcentraler. Patienterna vid akutmottagningen skiljde sig åt från vårdcentralspatienterna beträffande typ av symtom men ej i sociodemografiskt hänseende, förutom kön. Två tredjedelar av patienterna vid vårdcentralerna var kvinnor. Akutpatienterna var mer oroliga och besvärade av sina symtom och de hade i högre utsträckning varit inlagda på sjukhus de senaste två åren.

I **delarbete II** analyserades den behandlande läkarens bedömning av brådskegrad samt val av vårdnivå. Även läkarnas ålder, kön, specialitet och erfarenhetsnivå kartlades. Läkarna vid vårdcentralerna hade i regel längre klinisk erfarenhet och ansåg oftare än kollegorna på akutmottagningen att patienten kommit till rätt vårdnivå. De patienter som bedömdes ha symptom mindre lämpliga för akutmottagningen var huvudsakligen män utan tidigare sjukvårdserfarenhet. De patienter som i hög utsträckning bedömdes ha för akutsjukvård lämpliga symtom hade haft besvär under kortare tid. De hade även tidigare sjukvårdserfarenhet, exempelvis regelbunden medicinering, regelbundna kontroller hos läkare, innehav av frikort samt hade varit inlagda på sjukhus vid fler tillfällen de föregående två åren.

I **delarbete III** följdes vårdcentrals- och akutvårdspatienterna under 30 dagar efter besöket i samband med intervjun och det totala vårdutnyttjandet registrerades. Tidigare sjukvårdsutnyttjande ökade sannolikheten för ytterligare läkarbesök och annan vårdkontakt den kommande månaden, oavsett vårdnivå. Läkarens bedömning av lämplig vårdnivå hos patienten påverkade inte heller sannolikheten för ytterligare sjukvårdskontakter. Av vårdcentralspatienterna uppsökte 9 % en akutmottagning den kommande månaden jämfört med 16 % av patienterna i akutvårdsguppen.

Delarbete IV beskriver vilket beslutstöd i form av kontakt med sjukvårdsupplysning, information från internet respektive andra råd patienterna använde sig av i allmänhet samt inför det aktuella besöket. Patienter som sökte på akutmottagningen utnyttjade i större utsträckning beslutstöd än primärvårdspatienterna oavsett läkarnas bedömning av lämplig vårdnivå. Särskilt män utan tidigare sjukvårdserfarenhet valde att söka akutmottagningen utan beslutstöd. Inför det aktuella besöket hade endast 8 % av akutpatienterna och 3 % av vårdcentralspatienterna ringt sjukvårdsupplysningen. Dock hade 45 % av akutpatienterna och 38 % av vårdcentralspatienterna använt sjukvårdsupplysningen vid ett annat tillfälle. Endast 10 % av alla patienter angav att de hade använt sig av internet för att söka hjälp i en akut situation.

Sammanfattning

Majoriteten av patienterna uppfattades ha valt rätt vårdnivå. Typ av besvär och upplevelse av symtom styrde i hög utsträckning val av vårdnivå. Innan man vände sig till akutmottagningen utnyttjades i hög grad någon form av beslutsstöd. Utifrån dessa studier kunde vi ej belägga ett överutnyttjande av akutmottagningens resurser. En mindre grupp som i stor utsträckning utgjordes av män utan tidigare sjukvårdserfarenhet befanns ha sökt till akutmottagningen med besvär som uppfattades som olämpliga för vårdnivån. Information och utbildning gällande val av lämplig vårdnivå vid akuta tillstånd bör styras mot grupper med ringa sjukvårdserfarenhet.

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15 REFERENCES

1. **Fry L:** Casualties and casualties. *Lancet* 1960, 1:163-166.
2. **Editorial.** Calling all gatekeepers: this is an emergency. *Lancet* 1994, 343; 8893:305-306.
3. **Milner PC, Nicholl JP, Williams BT:** Variation in demand for accident and emergency departments in England from 1974 to 1985. *J Epidemiol Community Health* 1988, 42; 3:274-278.
4. **Hansagi H, Norell SE, Magnusson G:** Hospital care utilization in a 17,000 population sample: 5-year follow-up. *Soc Sci Med* 1985, 20; 5:487-492.
5. **Shortliffe EC, Hamilton TS, Noroian EH:** The emergency room and the changing pattern of medical care. *N Engl J Med* 1958, 258; 1:20-25.
6. **Magnusson G:** The hospital emergency department as the primary source of medical care. *Scand J Soc Med* 1980, 8; 3:149-156.
7. **Hansagi H, Allebeck P, Edhag O et al:** Frequency of emergency department attendances as a predictor of mortality: nine-year follow-up of a population-based cohort. *J Public Health Med* 1990, 12; 1:39-44.
8. **Genell Andren K, Rosenqvist U:** Heavy users of an emergency department--a two year follow-up study. *Soc Sci Med* 1987, 25; 7:825-831.
9. **Powers MJ, Reichelt PA, Jalowiec A:** Use of the emergency department by patients with nonurgent conditions. *J Emerg Nurs* 1983, 9; 3:145-149.
10. **Hider P, O'Hagan J, Bidwell S et al:** The rise in acute medical admissions. *Aust N Z J Med* 2000, 30; 2:252-260.
11. **Derlet RW:** Overcrowding in emergency departments: increased demand and decreased capacity. *Ann Emerg Med* 2002, 39; 4:430-432.
12. **Derlet RW, Richards JR:** Overcrowding in the nation's emergency departments: complex causes and disturbing effects. *Ann Emerg Med* 2000, 35; 1:63-68.
13. **Hansagi H:** Referral of non-urgent cases from an emergency department: patient compliance, satisfaction and attitudes. *Scand J Soc Med* 1990, 18; 4:249-255.
14. **Grumbach K, Keane D, Bindman A:** Primary care and public emergency department overcrowding. *Am J Public Health* 1993, 83; 3:372-378.
15. **Derlet RW, Nishio DA:** Refusing care to patients who present to an emergency department. *Ann Emerg Med* 1990, 19; 3:262-267.

16. **Lowe RA, Bindman AB, Ulrich SK *et al*:** Refusing care to emergency department of patients: evaluation of published triage guidelines. *Ann Emerg Med* 1994, 23; 2:286-293.
17. **Gifford MJ, Franaszek JB, Gibson G:** Emergency physicians' and patients' assessments: urgency of need for medical care. *Ann Emerg Med* 1980, 9; 10:502-507.
18. **Emergency Department Summary.** Advance Data Number 340. 35 pp. [<http://www.cdc.gov/nchs/pressroom/04facts/emergencydept.htm>]
19. **McCaig LF, Burt CW:** National Hospital Ambulatory Medical Care Survey: 2001 emergency department summary. *Adv Data* 2003, 335:1-29.
20. **Schafermeyer RW, Asplin BR:** Hospital and emergency department crowding in the United States. *Emerg Med (Fremantle)* 2003, 15; 1:22-27.
21. **Harrison AJ:** Hospitals in England: impact of the 1990 National Health Service reforms. *Med Care* 1997, 35; 10 Suppl:OS50-61.
22. **The world health report 2008 :** Primary health care, now more than ever. WHO report 2008. ISSN: 1020-3311
23. **McElmurry BJ, Keeney GB:** Primary health care. *Annu Rev Nurs Res* 1999, 17:241-268.
24. **Donaldsson M S, Cohr K N, Vanselow A:** Primary care, Americas health in a new era. In.; 1996: 27-51.
25. **Swedish association of local authorities and regions** Primary care in Sweden 2007 [<http://english.skl.se/web>]
26. **Wikipedia:** Emergency department [http://en.wikipedia.org/wiki/Emergency_department]
27. **American Collegue of Emergency Physicians.**ACEP policy compendium [<http://www.acep.org>]
28. **Swedish association of local authorities and regions;** Health care and regional development. 2002.
29. **Walander A ÅS, Burström B:** Sociala skillnader i vårdutnyttjande. Yrkesverksamma åldrar. In., vol. Vård på lika villkor Rapport 1/2004: Samhällsmedicin, Enheten för Socialmedicin och Hälsoekonomi; 2004: 50.
30. **Dickhudt JS, Gjerdingen DK, Asp DS:** Emergency room use and abuse. How it varies with payment mechanism. *Minn Med* 1987, 70; 10:571-574.
31. **Gordon JA:** The hospital emergency department as a social welfare institution. *Ann Emerg Med* 1999, 33; 3:321-325.

32. **Tyrance PH, Jr., Himmelstein DU, Woolhandler S:** US emergency department costs: no emergency. *Am J Public Health* 1996, 86; 11:1527-1531.
33. **Folland S, Goodman AC, Stano M:** The Economics of Health and Health care: Macmillan Publishing Company; 1993. p 459-460.
34. **Weber EJ, Showstack JA, Hunt KA et al:** Are the uninsured responsible for the increase in emergency department visits in the United States? *Ann Emerg Med* 2008, 52; 2:108-115.
35. **Newton MF, Keirns CC, Cunningham R et al:** Uninsured adults presenting to US emergency departments: assumptions vs data. *JAMA* 2008, 300; 16:1914-1924.
36. **Zuckerman S, Shen YC:** Characteristics of occasional and frequent emergency department users: do insurance coverage and access to care matter? *Med Care* 2004, 42; 2:176-182.
37. **Hurley RE, Freund DA, Taylor DE:** Emergency room use and primary care case management: evidence from four Medicaid demonstration programs. *Am J Public Health* 1989, 79; 7:843-846.
38. **Hurley RE, Freund DA, Taylor DE:** Gatekeeping the emergency department: impact of a Medicaid primary care case management program. *Health Care Manage Rev* 1989, 14; 2:63-71.
39. **Estrada EG:** Triage systems. *Nurs Clin North Am* 1981, 16; 1:13-24.
40. **Mackway-Jones:** In Emergency triage. Manchester Triage Group; 1997.
41. **Beveridge R:** CAEP issues. The Canadian Triage and Acuity Scale: a new and critical element in health care reform. Canadian Association of Emergency Physicians. *J Emerg Med* 1998, 16; 3:507-511.
42. **Shelton R:** The Emergency Severity Index 5-level triage system. *Dimens Crit Care Nurs* 2009, 28; 1:9-12.
43. **Travers DA, Waller AE, Bowling JM et al:** Five-level triage system more effective than three-level in tertiary emergency department. *J Emerg Nurs* 2002, 28; 5:395-400.
44. **O'Neill KA, Molczan K:** Pediatric triage: a 2-tier, 5-level system in the United States. *Pediatr Emerg Care* 2003, 19; 4:285-290.
45. **FitzGerald G, Jelinek GA, Scott D et al:** Emergency department triage revisited. *Emerg Med J*, 27; 2:86-92.
46. **Hardern RD:** Critical appraisal of papers describing triage systems. *Acad Emerg Med* 1999, 6; 11:1166-1171.

47. **American Collegue of Emergency Physicians.**Medical screening of emergency department patients.Web page.
[<http://www.acep.org/practres.aspx?id=29572&terms=appropriate>]
48. **Adams SL, Fontanarosa PB:** Triage of ambulatory patients. *JAMA* 1996, 276; 6:493-494.
49. **Kaplan LJ, Santora TA, Blank-Reid CA et al:** Improved emergency department efficiency with a three-tier trauma triage system. *Injury* 1997, 28; 7:449-453.
50. **Richardson JR, Braitberg G, Yeoh MJ:** Multidisciplinary assessment at triage: a new way forward. *Emerg Med Australas* 2004, 16; 1:41-46.
51. **Camilloni L, Rossi PG, Farchi S et al:** Triage and Injury Severity Scores as predictors of mortality and hospital admission for injuries: a validation study. *Accid Anal Prev*, 42; 6:1958-1965.
52. **Beveridge R, Ducharme J, Janes L et al:** Reliability of the Canadian emergency department triage and acuity scale: interrater agreement. *Ann Emerg Med* 1999, 34; 2:155-159.
53. **Goransson KE, Ehrenberg A, Ehnfors M:** Triage in emergency departments: national survey. *J Clin Nurs* 2005, 14; 9:1067-1074.
54. **Carret ML, Fassa AC, Domingues MR:** Inappropriate use of emergency services: a systematic review of prevalence and associated factors. *Cad Saude Publica* 2009, 25; 1:7-28.
55. **Bianco A, Pileggi C, Angelillo IF:** Non-urgent visits to a hospital emergency department in Italy. *Public Health* 2003, 117; 4:250-255.
56. **Lee A, Lau FL, Hazlett CB et al:** Factors associated with non-urgent utilization of Accident and Emergency services: a case-control study in Hong Kong. *Soc Sci Med* 2000, 51; 7:1075-1085.
57. **Gentile S, Vignally P, Durand AC et al:** Nonurgent patients in the emergency department? A French formula to prevent misuse. *BMC Health Serv Res*, 10:66.
58. **Rieffe C, Oosterveld P, Wijkkel D et al:** Reasons why patients bypass their GP to visit a hospital emergency department. *Accid Emerg Nurs* 1999, 7; 4:217-225.
59. **Derlet RW, Kinser D, Ray L et al:** Prospective identification and triage of nonemergency patients out of an emergency department: a 5-year study. *Ann Emerg Med* 1995, 25; 2:215-223.
60. **Petersen LA, Burstin HR, O'Neil AC et al:** Nonurgent emergency department visits: the effect of having a regular doctor. *Med Care* 1998, 36; 8:1249-1255.
61. **Liu T, Sayre MR, Carleton SC:** Emergency medical care: types, trends, and factors related to nonurgent visits. *Acad Emerg Med* 1999, 6; 11:1147-1152.

62. **New Zealand Health Technology Assessment (NZHTA):** Emergency department Attendance. A critical appraisal of the key literature. In.; 1998.
63. **Lowe RA, Abbuhl SB:** Appropriate standards for "appropriateness" research. *Ann Emerg Med* 2001, 37; 6:629-632.
64. **Billings J, Parikh N, Mijanovich T:** Emergency department use in New York City: a substitute for primary care? *Issue Brief (Commonw Fund)* 2000433:1-5.
65. **Lowe RA, Bindman AB:** Judging who needs emergency department care: a prerequisite for policy-making. *Am J Emerg Med* 1997, 15; 2:133-136.
66. **Afilalo J, Marinovich A, Afilalo M et al:** Nonurgent emergency department patient characteristics and barriers to primary care. *Acad Emerg Med* 2004, 11; 12:1302-1310.
67. **Carret ML, Fassa AG, Kawachi I:** Demand for emergency health service: factors associated with inappropriate use. *BMC Health Serv Res* 2007, 7:131.
68. **Sempere-Selva T, Peiro S, Sendra-Pina P et al:** Inappropriate use of an accident and emergency department: magnitude, associated factors, and reasons--an approach with explicit criteria. *Ann Emerg Med* 2001, 37; 6:568-579.
69. **Beland F, Lemay A, Boucher M:** Patterns of visits to hospital-based emergency rooms. *Soc Sci Med* 1998, 47; 2:165-179.
70. **Dale J, Green J, Reid F et al:** Primary care in the accident and emergency department: I. Prospective identification of patients. *BMJ* 1995, 311; 7002:423-426.
71. **Birnbaum A, Gallagher J, Utkewicz M et al:** Failure to validate a predictive model for refusal of care to emergency-department patients. *Acad Emerg Med* 1994, 1; 3:213-217.
72. **Foldes SS, Fischer LR, Kaminsky K:** What is an emergency? The judgments of two physicians. *Ann Emerg Med* 1994, 23; 4:833-840.
73. **O'Brien GM, Shapiro MJ, Fagan MJ et al:** Do internists and emergency physicians agree on the appropriateness of emergency department visits? *J Gen Intern Med* 1997, 12; 3:188-191.
74. **Frostholm L, Fink P, Oernboel E et al:** The uncertain consultation and patient satisfaction: the impact of patients' illness perceptions and a randomized controlled trial on the training of physicians' communication skills. *Psychosom Med* 2005, 67; 6:897-905.
75. **Hansagi H, Edhag O, Allebeck P:** High consumers of health care in emergency units: how to improve their quality of care. *Qual Assur Health Care* 1991, 3; 1:51-62.

76. **Sandoval E, Smith S, Walter J *et al*:** A comparison of frequent and infrequent visitors to an urban emergency department. *J Emerg Med*, 38; 2:115-121.
77. **Byrne M, Murphy AW, Plunkett PK *et al*:** Frequent attenders to an emergency department: a study of primary health care use, medical profile, and psychosocial characteristics. *Ann Emerg Med* 2003, 41; 3:309-318.
78. **Hunt KA, Weber EJ, Showstack JA *et al*:** Characteristics of frequent users of emergency departments. *Ann Emerg Med* 2006, 48; 1:1-8.
79. **Gunnarsdottir OS, Rafnsson V:** Mortality of the users of a hospital emergency department. *Emerg Med J* 2006, 23; 4:269-273.
80. **Sun BC, Burstin HR, Brennan TA:** Predictors and outcomes of frequent emergency department users. *Acad Emerg Med* 2003, 10; 4:320-328.
81. **Hansagi H, Olsson M, Sjoberg S *et al*:** Frequent use of the hospital emergency department is indicative of high use of other health care services. *Ann Emerg Med* 2001, 37; 6:561-567.
82. **Blank FS, Li H, Henneman PL *et al*:** A descriptive study of heavy emergency department users at an academic emergency department reveals heavy ED users have better access to care than average users. *J Emerg Nurs* 2005, 31; 2:139-144.
83. **LaCalle E, Rabin E:** Frequent users of emergency departments: the myths, the data, and the policy implications. *Ann Emerg Med*, 56; 1:42-48.
84. **Bunn F, Byrne G, Kendall S:** The effects of telephone consultation and triage on healthcare use and patient satisfaction: a systematic review. *Br J Gen Pract* 2005, 55; 521:956-961.
85. **Bergh H, Marklund B:** Characteristics of frequent attenders in different age and sex groups in primary health care. *Scand J Prim Health Care* 2003, 21; 3:171-177.
86. **Bond K, Ospina MB, Blitz S *et al*:** Frequency, determinants and impact of overcrowding in emergency departments in Canada: a national survey. *Healthc Q* 2007, 10; 4:32-40.
87. **Olshaker JS, Rathlev NK:** Emergency Department overcrowding and ambulance diversion: the impact and potential solutions of extended boarding of admitted patients in the Emergency Department. *J Emerg Med* 2006, 30; 3:351-356.
88. **Richards JR, Navarro ML, Derlet RW:** Survey of directors of emergency departments in California on overcrowding. *West J Med* 2000, 172; 6:385-388.
89. **Gordon JA, Billings J, Asplin BR *et al*:** Safety net research in emergency medicine: proceedings of the Academic Emergency Medicine Consensus Conference on "The Unraveling Safety Net". *Acad Emerg Med* 2001, 8; 11:1024-1029.

90. **Fatovich DM, Hirsch RL:** Entry overload, emergency department overcrowding, and ambulance bypass. *Emerg Med J* 2003, 20; **5**:406-409.
91. **Trzeciak S, Rivers EP:** Emergency department overcrowding in the United States: an emerging threat to patient safety and public health. *Emerg Med J* 2003, 20; **5**:402-405.
92. **Bindman AB, Grumbach K, Keane D et al:** Consequences of queuing for care at a public hospital emergency department. *JAMA* 1991, 266; **8**:1091-1096.
93. **Bernstein SL, Aronsky D, Duseja R et al:** The effect of emergency department crowding on clinically oriented outcomes. *Acad Emerg Med* 2009, **16**; 1:1-10.
94. **Lambe S, Washington DL, Fink A et al:** Trends in the use and capacity of California's emergency departments, 1990-1999. *Ann Emerg Med* 2002, **39**; 4:389-396.
95. **Kellermann AL:** Crisis in the emergency department. *N Engl J Med* 2006, **355**; 13:1300-1303.
96. **Swedish Association of Local Authorities and Regions.** Statistical yearbook from the country councils in Sweden.; 2005: 15-17.
97. **Swedish Association of Local Authorities and Regions.** Statistical yearbook from the country councils in Sweden; 2003.
98. **McCaig LF:** National Hospital Ambulatory Medical Care Survey: 1992 emergency department summary. *Adv Data* 1994;245:1-12.
99. **Clinton W:** Televised address to the joint session of congress and the nation.; September 23, 1993.
100. **Baker LC, Baker LS:** Excess cost of emergency department visits for nonurgent care. *Health Aff (Millwood)* 1994, **13**; **5**:162-171.
101. **Williams RM:** The costs of visits to emergency departments. *N Engl J Med* 1996, **334**; **10**:642-646.
102. **Ruger JP, Richter CJ, Spitznagel EL et al:** Analysis of costs, length of stay, and utilization of emergency department services by frequent users: implications for health policy. *Acad Emerg Med* 2004, **11**; **12**:1311-1317.
103. **Dale J, Green J, Reid F et al:** Primary care in the accident and emergency department: II. Comparison of general practitioners and hospital doctors. *BMJ* 1995, **311**; **7002**:427-430.
104. **Murphy AW, Bury G, Plunkett PK et al:** Randomised controlled trial of general practitioner versus usual medical care in an urban accident and emergency department: process, outcome, and comparative cost. *BMJ* 1996, **312**; **7039**:1135-1142.

105. **Lambert SD, Loisel CG:** Health information seeking behavior. *Qual Health Res* 2007, 17; 8:1006-1019.
106. **Longo DR:** Understanding health information, communication, and information seeking of patients and consumers: a comprehensive and integrated model. *Health Expect* 2005, 8; 3:189-194.
107. **Sprivulis P, Carey M, Rouse I:** Compliance with advice and appropriateness of emergency presentation following contact with the HealthDirect telephone triage service. *Emerg Med Australas* 2004, 16; 1:35-40.
108. **Maeda K, Okamoto S, Mishina H et al:** A decision analysis of the effectiveness of the pediatric telephone triage program in Japan. *Biosci Trends* 2009, 3; 5:184-190.
109. **O'Connell JM, Towles W, Yin M et al:** Patient decision making: use of and adherence to telephone-based nurse triage recommendations. *Med Decis Making* 2002, 22; 4:309-317.
110. **Hayden SR, Jouriles NJ, Rosen P:** Requiem for "Non-urgent" Patients in the Emergency Department. *J Emerg Med* 2009.
111. **Wangberg S, Andreassen H, Kummervold P et al:** Use of the internet for health purposes: trends in Norway 2000-2010. *Scand J Caring Sci* 2009.
112. **Kummervold PE, Chronaki CE, Lausen B et al:** eHealth trends in Europe 2005-2007: a population-based survey. *J Med Internet Res* 2008, 10; 4:e42.
113. **Dutta-Bergman MJ:** Health attitudes, health cognitions, and health behaviors among Internet health information seekers: population-based survey. *J Med Internet Res* 2004, 6; 2:e15.
114. **Weaver JB, 3rd, Mays D, Lindner G et al:** Profiling characteristics of internet medical information users. *J Am Med Inform Assoc* 2009, 16; 5:714-722.
115. **Rains SA:** Perceptions of traditional information sources and use of the world wide web to seek health information: findings from the health information national trends survey. *J Health Commun* 2007, 12; 7:667-680.
116. **Dickerson S, Reinhart AM, Feeley TH et al:** Patient Internet use for health information at three urban primary care clinics. *J Am Med Inform Assoc* 2004, 11; 6:499-504.
117. **Birru MS, Monaco VM, Charles L et al:** Internet usage by low-literacy adults seeking health information: an observational analysis. *J Med Internet Res* 2004, 6; 3:e25.
118. **Wangberg SC, Andreassen HK, Prokosch HU et al:** Relations between Internet use, socio-economic status (SES), social support and subjective health. *Health Promot Int* 2008, 23; 1:70-77.

119. **Sanders J:** A review of health professional attitudes and patient perceptions on 'inappropriate' accident and emergency attendances. The implications for current minor injury service provision in England and Wales. *J Adv Nurs* 2000, 31; 5:1097-1105.
120. **Barry DW, Melhado TV, Chacko KM et al:** Patient and physician perceptions of timely access to care. *J Gen Intern Med* 2006, 21; 2:130-133.
121. **Hunt RC, DeHart KL, Allison EJ, Jr. et al:** Patient and physician perception of need for emergency medical care: a prospective and retrospective analysis. *Am J Emerg Med* 1996, 14; 7:635-639.
122. **Glanz K LF, Rimer KB:** Health behavior and health education. Theory, Research, and Practice: Jossey-Bass Inc; 1996.
123. **Parsons T:** Illness and the role of the physician: a sociological perspective. *Am J Orthopsychiatry* 1951, 21; 3:452-460.
124. **Caldicott CV, Dunn KA, Frankel RM:** Can patients tell when they are unwanted? "Turfing" in residency training. *Patient Educ Couns* 2005, 56; 1:104-111.
125. **Thomas EJ, Burstin HR, O'Neil AC et al:** Patient noncompliance with medical advice after the emergency department visit. *Ann Emerg Med* 1996, 27; 1:49-55.
126. **Vertesi L:** Does the Canadian Emergency Department Triage and Acuity Scale identify non-urgent patients who can be triaged away from the emergency department? *CJEM* 2004, 6; 5:337-342.
127. **Aday LA, Andersen R:** A framework for the study of access to medical care. *Health Serv Res* 1974, 9; 3:208-220.
128. **Gill JM:** Use of hospital emergency departments for nonurgent care: a persistent problem with no easy solutions. *Am J Manag Care* 1999, 5; 12:1565-1568.
129. **Plauth AE, Pearson SD:** Discontinuity of care: urgent care utilization within a health maintenance organization. *Am J Manag Care* 1998, 4; 11:1531-1537.
130. **Rajpar SF, Smith MA, Cooke MW:** Study of choice between accident and emergency departments and general practice centres for out of hours primary care problems. *J Accid Emerg Med* 2000, 17; 1:18-21.
131. **Cunningham PJ, Clancy CM, Cohen JW et al:** The use of hospital emergency departments for nonurgent health problems: a national perspective. *Med Care Res Rev* 1995, 52; 4:453-474.
132. **Green J, Dale J:** Primary care in accident and emergency and general practice: a comparison. *Soc Sci Med* 1992, 35; 8:987-995.

133. **Krakau I:** Trends in use of health care services in Swedish primary care district. A ten year perspective. *Scand J Prim Health Care* 1992, 10; 1:66-71.
134. **Christensen MB, Christensen B, Mortensen JT et al:** Intervention among frequent attenders of the out-of-hours service: a stratified cluster randomized controlled trial. *Scand J Prim Health Care* 2004, 22; 3:180-186.
135. **Shipman C, Longhurst S, Hollenbach F et al:** Using out-of-hours services: general practice or A&E? *Fam Pract* 1997, 14; 6:503-509.
136. **Aitken RC:** Measurement of feelings using visual analogue scales. *Proc R Soc Med* 1969, 62; 10:989-993.
137. **International Statistical Classification of Diseases and Related Health Problems** 10th Revision edition; 2003.
138. **Rothman KJ, Greenland S:** Modern Epidemiology, second edition. In.: Lippincott-Raven Publishers; 1998.
139. **Hennekens C. H. Buring JE:** Epidemiology in medicine. 1987:101-108.
140. **Mayer D:** Essential evidence-based medicine 2004.
141. **Gruneir A, Silver MJ, Rochon PA:** Emergency Department Use by Older Adults: A Literature Review on Trends, Appropriateness, and Consequences of Unmet Health Care Needs. *Med Care Res Rev.*
142. **Padgett DK, Brodsky B:** Psychosocial factors influencing non-urgent use of the emergency room: a review of the literature and recommendations for research and improved service delivery. *Soc Sci Med* 1992, 35; 9:1189-1197.
143. **Brubacher JR, Mabie A, Ngo M et al:** Substance-related problems in patients visiting an urban Canadian emergency department. *CJEM* 2008, 10; 3:198-204.
144. **Kushel MB, Perry S, Bangsberg D et al:** Emergency department use among the homeless and marginally housed: results from a community-based study. *Am J Public Health* 2002, 92; 5:778-784.
145. **Gruneir A, Bell CM, Bronskill SE et al:** Frequency and pattern of emergency department visits by long-term care residents--a population-based study. *J Am Geriatr Soc*, 58; 3:510-517.
146. **Burns E:** Older people in accident and emergency departments. *Age Ageing* 2001, 30 Suppl 3:3-6.
147. **Martin A, Martin C, Martin PB et al:** 'Inappropriate' attendance at an accident and emergency department by adults registered in local general practices: how is it related to their use of primary care? *J Health Serv Res Policy* 2002, 7; 3:160-165.
148. **Tranquada KE, Denninghoff KR, King ME et al:** Emergency department workload increase: Dependence on primary care? *J Emerg Med* 2009.

149. **Brown JB, Carroll J, Boon H *et al*:** Women's decision-making about their health care: views over the life cycle. *Patient Educ Couns* 2002, 48; 3:225-231.
150. **Murphy AW, Leonard C, Plunkett PK *et al*:** Characteristics of attenders and their attendances at an urban accident and emergency department over a one year period. *J Accid Emerg Med* 1999, 16; 6:425-427.
151. **Wyke S, Hunt K, Ford G:** Gender differences in consulting a general practitioner for common symptoms of minor illness. *Soc Sci Med* 1998, 46; 7:901-906.
152. **David M, Schwartz I, Anand Pant H *et al*:** Emergency outpatient services in the city of Berlin: Factors for appropriate use and predictors for hospital admission. *Eur J Emerg Med* 2006, 13; 6:352-357.
153. **Richardson S, Ardagh M, Hider P:** New Zealand health professionals do not agree about what defines appropriate attendance at an emergency department. *N Z Med J* 2006, 119; 1232:U1933.
154. **Coleman P, Irons R, Nicholl J:** Will alternative immediate care services reduce demands for non-urgent treatment at accident and emergency? *Emerg Med J* 2001, 18; 6:482-487.
155. **Baker L, Wagner TH, Singer S *et al*:** Use of the Internet and e-mail for health care information: results from a national survey. *JAMA* 2003, 289; 18:2400-2406.
156. **Dutta-Bergman MJ:** Primary sources of health information: comparisons in the domain of health attitudes, health cognitions, and health behaviors. *Health Commun* 2004, 16; 3:273-288.
157. **O'Brien GM, Shapiro MJ, Woolard RW *et al*:** "Inappropriate" emergency department use: a comparison of three methodologies for identification. *Acad Emerg Med* 1996, 3; 3:252-257.
158. **Gill JM, Reese CL, Diamond JJ:** Disagreement among health care professionals about the urgent care needs of emergency department patients. *Ann Emerg Med* 1996, 28; 5:474-479.
159. **Petrie A, Sabin C:** Medical statistics at a glance, Second edn; 2006.
160. **Cooke MW, Jinks S:** Does the Manchester triage system detect the critically ill? *J Accid Emerg Med* 1999, 16; 3:179-181.
161. **Roukema J, Steyerberg EW, van Meurs A *et al*:** Validity of the Manchester Triage System in paediatric emergency care. *Emerg Med J* 2006, 23; 12:906-910.
162. **van Veen M, Steyerberg EW, Ruige M *et al*:** Manchester triage system in paediatric emergency care: prospective observational study. *BMJ* 2008, 337:a1501.

163. **Schull MJ, Slaughter PM, Redelmeier DA:** Urban emergency department overcrowding: defining the problem and eliminating misconceptions. *CJEM* 2002, 4; 2:76-83.
164. **Editorial.** Myth: Emergency room overcrowding is caused by non-urgent cases. *J Health Serv Res Policy*, 15; 3:188-189.
165. **Petrini C:** Triage in public health emergencies: ethical issues. *Intern Emerg Med*, 5; 2:137-144.
166. **Sharma A, Inder B:** Impact of co-located general practitioner (GP) clinics and patient choice on duration of wait in the emergency department. *Emerg Med J*.
167. **Schull MJ, Kiss A, Szalai JP:** The effect of low-complexity patients on emergency department waiting times. *Ann Emerg Med* 2007, 49; 3:257-264, 264 e251.