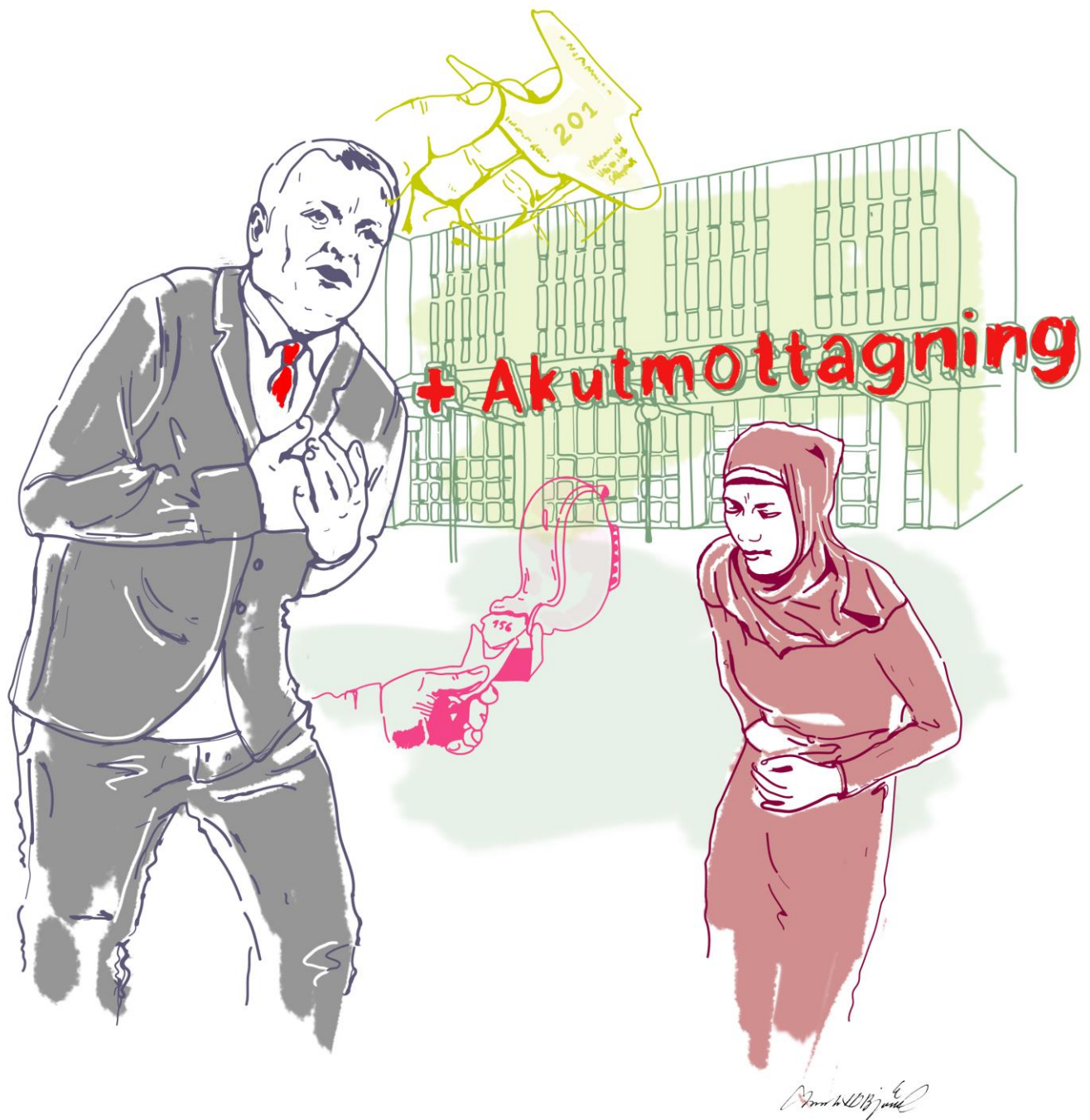


Waiting Time at the Emergency Department from a Gender Equality Perspective



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**Master Thesis in Medicine
Institute of Medicine at the Sahlgrenska Academy
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Table of Content

Table of Content	3
List of Abbreviations	4
Abstract	5
Introduction	6
Aims	10
Material and Methods	11
Ethics	13
Results	13
Discussion	17
Conclusions	25
Populärvetenskaplig sammanfattning	26
Acknowledgements	27
References	28
Tables	31
Figures	39
Appendix	53

List of Abbreviations

ABCDE	Airway, Breathing, Circulation, Disability, Exposure (a method to assess vital signs used in the triage process at the emergency department)
AÖKIR	Emergency room Östra Hospital Surgery
AÖMED	Emergency room Östra Hospital Internal Medicine
BP	Blood Pressure
ESS	Emergency Symptoms and Signs
HR	Heart Rate
IHR	Irregular Heart Rate
METTS	Medical Emergency Triage and Treatment System (based on a protocol including a triage algorithm combining vital signs, chief complaints, symptoms and signs, giving the patient a priority level)
POX	Pulse Oximetry
RETTS	Rapid Emergency Triage and Treatment System (METTS is today renamed RETTS)
RHR	Regular Heart Rate
RLS	Reaction Level Scale
RR	Respiratory Rate
SBP	Systolic Blood Pressure
SpO ₂	Oxygen saturation
TRIK	Doctor's triage surgery (patients who are triaged yellow or green (daytime during Monday through Friday) get a second opinion by a specialist in surgery)
TRIM	Doctor's triage internal medicine (patients who are triaged yellow or green (daytime during Monday through Friday) get a second opinion by a specialist in internal medicine)
TLT	Total lead time (the time from the patient's arrival at the emergency department until the patient leaves the emergency department (being sent home or getting a direct ward admission))
TTD	Time to doctor (the waiting time from the patient's arrival at the emergency department until the first meeting with a doctor)
TTT	Time to triage (the time from when the patient gets a queue ticket in the waiting room or when the ambulance arrives until the patient undergoes the triage)

Abstract

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Introduction

Increasing patient load and longer waiting times at the emergency departments are well-known phenomena. A central function is the so-called triage system for prioritization of the patients. Only a few studies address the question if there is a gender bias in triaging and waiting time.

Aim

To quantify gender effects in a large mixed population of patients seeking health care at a large emergency department and, on the basis of the magnitude of the gender difference in subpopulations draw conclusions regarding possible causes of observed gender effects.

Methods

The patient material consisted of all cases seeking medical care at the emergency ward of the Östra Hospital during 2009-2012. They were divided into subgroups on the basis of gender, chief complaint, age and socioeconomic status. A standardized formula (RETTS_{TM}) was used in the triaging process and the patients were prioritized with one of five colors. Three time registrations were recorded; time to triage (TTT), time to doctor (TTD) and total lead time (TLT).

Results

135 417 patients were included in the study with a mean age of 54,2 years. They came from all parts of Gothenburg. Men were more often triaged red/orange and women more often green/yellow. There was no gender difference in TTT. The mean TTD and TLT were significantly longer for females than for males in the entire material, with an approximate magnitude of 15 minutes. The gender signal was seen independently of the chief complaint, in both medical and surgical cases. The signal disappeared among old seriously ill patients and among patients from residence areas with high socioeconomic status.

Conclusion

We observed differences in waiting times and triage priority levels that are hard to explain on the basis of presenting symptoms. The magnitude of the gender dependent signal was affected by age and socioeconomic status.

Key words

Emergency department, waiting times, gender, age, socioeconomy

Introduction

The emergency department is the hub of a hospital. Waiting times at emergency departments all over the world are well researched. Today, there is a worldwide problem with an increasing load of patients and longer waiting times. Prolonged waiting may deteriorate the medical condition and causes patient dissatisfaction. The waiting time and length of stay are two factors commonly measured in the evaluation of the quality of emergency services (1-6).

The Region of Västra Götaland has approximately 1.5 million inhabitants. The population is continuously increasing (Table 1). Sahlgrenska University Hospital (SU) provides emergency and basic care for the city of Gothenburg and the surrounding areas. It serves as an urban, academic teaching hospital. The emergency care consists of three emergency departments with a high throughput of patients. They are located at the Sahlgrenska, Östra and Mölndal sites (7). Children under the age of 16 years are taken care of at the common emergency department for children at the Sahlgrenska University Hospital, The Queen Silvia Children's Hospital (8).

A person with a health problem can contact health care in four different ways; calling 1177 (medical information), calling 112 (SOS Alarm), visiting the emergency department or visiting primary care. The arrival manner to the emergency department varies. The majority at the Östra Hospital are ambulatory cases, followed by transportation by ambulance, police and helicopter. There is also a large amount of referred patients from primary care (Fig. 1).

A central function at an emergency department is the sorting of patients; who needs medical care at once and what patient can wait? A queuing system for this is triage (9, 10). The word originates from the French word trier and means to sort or choose (11). According to Fernandes et al. "triage is the process of quickly sorting patients to determine priority of further evaluation of care at the time of patient arrival in the emergency department, that is, to assign the right patient to the right resources in the right place at the right time" (12). The triage process was first introduced in the US in the late 1950s, when the volume of patients started to increase. It was then noticed that many

patients were visiting the emergency department without urgent conditions (11). From the US, the triaging initially was transferred to Australia and Canada. Today, it is used in most parts of the world (9).

The triage systems have developed over the decades. At the beginning, 3-level scales were used. The 5-level scales mostly replaced them during the 1990s. In modern times, countries like Australia, Canada, Great Britain and the US launched different systems; Australasian Triage Scale (ATS), Canadian Emergency Department Triage and Acuity Scale (CTAS), Manchester Triage Scale (MTS) and Emergency Severity Index (ESI) (9). These models are all based on the patient's need of medical care. They have been dominating in many other countries as well (12).

In the beginning of the 21st century, some hospitals in Sweden, primarily from the Region of Västra Götaland (RVG), embraced the British "Manchester Triage System" (MTS). This was the beginning of the development of the Swedish triage (13). Today, there are three main triage systems, several modifications and other local varieties. According to the Swedish Council on Health Technology Assessment, the most frequently used systems during 2010 were two Swedish-made systems; "Medical Emergency Triage and Treatment System" (METTS) (33%) and "Adaptivt processtriage" (ADAPT) (28%) (9). Since then, several emergency departments have changed to METTS (14).

METTS was invented at the Sahlgrenska University Hospital in Gothenburg during 2004. The METTS-A (adults) was later developed and expanded with METTS-T (trauma), METTS-pre (prehospital), metts-p (pediatric) and METTS-psy (psychiatry) (9). Today, METTS is renamed RETTS ("Rapid Emergency Triage and Treatment System"). RETTS is based on a protocol including a triage algorithm combining vital signs, chief complaints, symptoms and signs to give the patient a priority level (13).

Vital signs are physiological parameters often used to evaluate basic somatic functions at the emergency department (9). They have been evaluated in several studies for the prediction of death during the ward time (15, 16). The vital signs most commonly used in different triage systems are

respiratory rate, oxygen saturation, heart rate, systolic and diastolic blood pressure, reaction level scale and body temperature. Chief complaints, symptoms and signs are the patients' experienced symptoms. For example, it may involve chest pain, dyspnea or wound lesions (9).

The triage model RETTS ("Rapid Emergency Triage and Treatment System") has five triage categories with five colors associated with different waiting times. According to Widgren and Jourak, "Red priority is classified as life threatening and in need of immediate medical attention by physicians and nurses. Orange priority level is classified as potentially life threatening and in need of medical attention within 20 minutes. Yellow priority level is classified as not life threatening but in need of medical attention within 120 minutes, and green priority level is classified as not life threatening and not in need of immediate care. The lowest level is blue, which is given to patients without need of emergency care or any hospital facilities" (13).

Evaluations of the triage systems are continuously done all over the world. However, the question if the triaging is affected by the gender of the patient has only been discussed in a few studies (17-19). This lack of knowledge needs to be dealt with, as some gender differences in symptoms and pathophysiologic factors of disease have been revealed in health care research in the last decade (20-22). Another discussed issue is that women and men express their symptoms in different ways (23-25). However, this phenomenon is still controversial (26, 27).

In addition, previous studies have shown that there is a gender difference both in terms of the use of diagnostic procedures and in the treatment of patients. Some authors suggest that men receive emergency treatment more often than women and in addition, a more aggressive one (27-31). According to Herlitz et al., the mechanisms behind these observations are less well described (32).

There are even fewer studies addressing that there may be differences in the waiting time between men and women, in favor of men (31, 33). Moreover, the results from non-Swedish studies can be difficult to apply on Swedish conditions due to differences in national healthcare systems. The national healthcare systems of the world differ regarding both organization and funding. In the Scandinavian countries, medical care is financed mainly by taxes and government grants. This

means that all hospitals provide medical care for all citizens. In the US, before the introduction of “Obamacare” (i.e. public health insurance), medical care was mainly based on private health insurance. This means that some people were completely outside the system without the ability to access medical care. Germany, Switzerland and Japan have compulsory health insurance, which can be both privately and publicly organized (34).

A few studies performed at the Sahlgrenska University Hospital compare emergency room handling between men and women (35, 36). Ravn-Fischer has found that female patients with acute chest pain have a significantly longer delay time from arrival to the hospital to admission to a hospital ward as compared with males (35). Lönnbark has shown that there are small but consistent differences in the waiting times and that men more often are triaged with higher urgency scores (36). This was also found in the US by Arslanian-Engoren (18).

As previously mentioned, the total number of visits to emergency departments is continuously increasing. Older adults visit the emergency department more often than young people and have longer waiting times. However, little is known about how the emergency care received by the elderly population differs from that received by young people (37, 38). Even less is known about gender differences in the younger patient group compared to gender differences in the older patient group.

There is a strong correlation between socioeconomic status and health. People with high socioeconomic status in general have better health than those with low socioeconomic status (39, 40). It has been clearly shown that low income is associated with bad health (40). Johar et al. found that waiting times are strongly influenced by patients’ socioeconomic status, but were unable to identify the exact mechanisms (41). Another study also showed that low-income patients with chest pain at the emergency department are less likely to be treated immediately than high-income patients (42). According to Santos and co-workers, poorer language proficiency is associated with a

longer waiting time from arrival to the hospital to receiving medical care (43).

No studies can be found that explicitly analyze the gender differences regarding waiting time in different socioeconomic groups.

Aims

- To quantify gender effects in a large mixed population of patients seeking healthcare at an emergency department;
- on the basis of the magnitude of the gender difference in subpopulations, draw conclusions regarding possible causes of the gender effect.
- To prepare for the designing of a prospective intervention study on the basis of the observational data to test this hypothesis.

Research questions

1. What does the patient group visiting the emergency department at Östra Hospital, Sahlgrenska University Hospital look like demographically?
2. Are there gender differences in each of the three time registrations TTT (time to triage), TTD (time to doctor) or TLT (total lead time) at the emergency department?
3. Is there a gender difference in triaging and waiting times at the emergency department, when looking at the entire material and at subgroups based on age, socioeconomic status and chief complaint?

Hypothesis

Female patients wait longer than male patients at the emergency department at Östra Hospital.

Material and Methods

Patients

A cohort of patients (Östra Hospital (SU/Ö)) has been selected from the Sahlgrenska University Hospital (SU) from January 1, 2009 to December 31st, 2012. This emergency department has a high throughput and relative homogeneity of patients. There were 159 352 visits during the period. Patients may have been visiting the emergency department more than once.

The patients came from different parts of the Region of Västra Götaland and the majority were residents of the city of Gothenburg. Gothenburg is divided into ten districts. In this study, they were classified into three socioeconomic status levels based on the mean income of the district (low, moderate and high).

The patients were also divided into subgroups based on gender, chief complaint, age and socioeconomic status.

Methods

Triage process

A patient that arrives at the emergency department at Östra Hospital undergoes an immersed triaging by a nurse (Fig. 2). The standardized formula (RETTS_{TM}) is used (Appendix 1). Date, arrival time, specialization (surgery, internal medicine) and triage color are registered. The triage color (red, orange, yellow, green or blue) is determined by (Table 2):

- Vital signs according to the ABCDE-method (respiratory rate, oxygen saturation, heart rate, systolic and diastolic blood pressure, reaction level scale and body temperature).
- Chief complaint(s) (free text), history (free text) and symptomatology (ESS = Emergency Symptoms and Signs).

The highest valued component is decisive the final priority level (Table 2). The patient is then treated according to special routines depending on the color and chief complaint. If the patient changes in condition, the color can be reevaluated and reregistered in the standardized formula (13).

The information from the formula is transformed to the database Elvis[®].

Patients who are triaged red or orange are immediately sent to the emergency room surgical specialization (AÖKIR) or to the emergency room internal medicine specialization (AÖMED). Patients who are triaged yellow or green (daytime during Monday through Friday) get a second opinion by a specialist in surgery (triage surgery (TRIK)) or by a specialist in medicine (triage medicine (TRIM)) already in the triage (Fig. 2). This doctor decides if the patient is in need of care or observation at the emergency room or can be sent home.

Time registrations

There are three time registrations in the database Elvis at the emergency department.

- Time to triage (TTT) is the time from when the patient gets a queue ticket in the waiting room or when the ambulance arrives until the patient undergoes the triage.
- Time to doctor (TTD) is the waiting time from the patient's arrival at the emergency department until the first meeting with a doctor.
- Total lead time (TLT) or total length of stay is the time from the patient's arrival at the emergency department until the patient leaves the emergency department (being either sent home or getting a direct ward admission) (Fig. 2).

Data collecting and statistical analysis

Information in Elvis[®] is transferred to the database of the Region of Västra Götaland (RVG). The following variables were taken from the database during 2009-2012; year, gender, chief complaint, age, residence area (2012), color of triage, TTT, TTD and TLT.

All statistical analyses were performed with StatPlus:mac version 2009. Differences between groups were analyzed with a T-test. The level of significance was set to a *p* value below 0.05.

Ethics

On December 1, 2013, a new act about health research on environmental and genetic causes of disease had given Swedish universities the opportunity to create research registers. Anonymised data can be released from these registers for specific research projects (44).

All data in the study was collected from the database of the Region of Västra Götaland (RVG), in which all patients are unidentified. This study has intentionally chosen not to do the analyses on an individual basis. This means that it is impossible to identify an individual patient. Since this is a master thesis, the legislation regarding ethical vetting of scientific work was not necessary. However, the project was ethically censored and approved by the head of the department.

The study was conducted according to the WMA Declaration of Helsinki (45).

Results

Description of patient material, flow distribution, chief complaints and triage colors in the entire material

Number of patients, gender and age distribution

There were totally 135 417 patients (85%) seeing a doctor at the emergency ward at SU/Ö during 2009-2012 (Fig. 3). There was a steady increase in the number of patients per year from 2009 to 2012. The gender distribution was stable over the years, with 53% females and 47% males (Table 3).

The distribution of age is shown in Fig. 4. The majority of patients were between 30 and 70 years of age. The mean age was $54,2 \pm 22,6$ yrs. (Women: $54,4 \pm 23,4$ yrs.; Men: $54,0 \pm 21,9$ yrs.).

Patients from different parts of Gothenburg

Approximately 96% of the patients were residents of the Region of Västra Götaland and 76% were residents of the city of Gothenburg. The distribution of patients from the different parts of Gothenburg is summarized in Table 4. Angered and Eastern Gothenburg, with a large number of socioeconomically weak immigrants, dominated with 26,9%, followed by Hisingen (a majority with low average socioeconomic status but less immigrants). Approximately 2,7% of the patients came

from the most affluent areas (Askim-Frölunda-Högsbo, Western Gothenburg).

Route of contact

The route of contact is summarized in Fig. 1. A majority (106 483) were ambulatory cases and the remaining patients arrived by ambulance. 103 patients arrived by helicopter. 24 309 patients were referred, i.e., they had been in previous contact with the healthcare system. There was no gender difference in the arrival manner to the emergency department. Approximately 70% of both males and females were ambulatory cases, followed by transportation with ambulance (Fig. 5).

The triage process

A patient that arrives to the emergency department at Östra Hospital undergoes an immersed triage (Fig. 2). In Sweden the triage process is handled by nurses (both female and male nurses). For most of the patients, this is the first meeting with a clinician (ambulance and referred patients excluded). Thereafter, the patients pass different steps at the emergency department with several meetings with different professionals. At the end of the flowchart, 63% of the patients were sent home (Fig. 6).

Chief complaints

The total numbers of chief complaints at the emergency department at Östra Hospital were 105. The 20 most common chief complaints represented 88,6% of the total visits (Fig. 7). Among the 20 chief complaints, twelve involved mainly internal medicine and eight involved surgery. The largest group was acute abdomen, followed by chest pain, dyspnea, unknown disease and infection (Table 5).

Color distribution in the triage

In the triage process, the patients are prioritized with colors depending on the severity of the symptoms.

The triage color distribution in the entire material is shown in Fig. 8. Approximately 5% of the patients were judged red (emergency), 25% orange, 45% yellow, 20% green and 2% blue.

The triage color distribution as related to the 20 most common chief complaints is shown in Fig. 9. The percentage of patients judged blue and green was highest for rectal problems, wound lesion and headache. The proportion of patients with red or orange triage color was highest for intoxication, cramps and allergy.

The most common chief complaints within the triage groups are summarized in Fig. 10. The red triage group was dominated by dyspnea, the orange by chest pain and abdominal pain, and both the yellow and green groups by abdominal pain.

Description of gender differences

Time registrations at the emergency department

There are three time registrations (TTT, TTD, TLT) in ELVIS, done by nurses, for all patients arriving at the emergency department.

There was no gender difference to be found in time to triage (9 min vs. 9 min (2009), 8 min vs. 7 min (2010), 7 min vs. 7 min (2011 and 2012)).

The mean TTD in the total material for men and women was 1 h 54 min and 2 h 5 min, respectively. This means that female patients waited significantly longer than male patients. The mean difference was 11 min (Table 6).

The mean TLT in the total material for men and women was 3 h 46 min and 4 h 2 min, respectively. This means that female patients waited significantly longer than male patients. The mean difference was 16 min (Table 6).

When leaving the emergency department, the patient can be either hospitalized or sent home. Both female and male patients were more frequently sent home from the emergency department in 2012 compared to 2009. In 2009 and 2010, men and women equally received direct ward admissions from the emergency department. However, in 2012, the percentage of male patients that received a direct ward admission was slightly higher than for females (Fig. 11).

Severity of the symptoms

The patients are prioritized with colors depending on the severity of the symptoms. The most common color for both men and women in the total group was yellow. Men had a higher frequency of red/orange compared to the women (33% vs. 29%). Women had a higher frequency of green/yellow compared to the men (68% vs. 63%) (Fig. 8). This means that male patients often received a higher prioritized color than female patients.

In the orange, yellow and green triage color groups, women waited significantly longer (mean TTD) than the men. The difference was 6-8 min in these groups compared to 3 min in the red group (Table 6).

Female patients also had a longer total lead time (mean TLT) in all of the color groups (except from blue). The largest difference could be seen in the yellow group where women waited 14 min longer. The smallest difference was seen in the red group with 5 min (Table 6). This means that among the most seriously ill patients, gender mattered less for both TTD and TLT.

Age

The patients were divided into three age groups; <30 years of age, 30-70 years of age and >70 years of age. In all of the groups, men were more often triaged red/orange. It was most obvious in the group 30-70 years. Older female and male patients were more often prioritized as red/orange than younger (Fig. 12).

In all the three age groups, female patients had a significantly longer mean TTD than the male patients, if looking at the entire material regardless of triage color (Table 7).

When comparing waiting time (TTD) and severity of the symptoms (triage color) in the three age groups, the differences in waiting time between men and women were most obvious in the youngest age group (seen in the red, orange and yellow groups). In the red group there were more men with intoxications and more women with acute abdomen. In the oldest group (> 70 yrs.), there were no significant differences in the orange and red group. This means that gender mattered less for the oldest patients with more severe symptoms (Table 7).

Socioeconomic status

Men were more often triaged red/orange in all parts of Gothenburg in 2012. This observation could clearly be seen in Askim-Frölunda-Högsbo, which is an area with a high mean income. It could also be seen in Majorna-Linné, with a moderate mean income (Fig. 13).

Women living in low socioeconomic districts (Angered and Eastern Gothenburg), with a majority of immigrants, had significantly longer waiting times than men. Women in Angered had the longest mean TTD of all patients (2 h 6 min). Men living in Örgryte-Härlanda, which is one of the most affluent areas, had the shortest mean TTD (1 h 45 min). In three of four high socioeconomic residence areas, no significant differences in waiting times between genders were seen. In all of the five lowest socioeconomic residence areas, women waited significantly longer than the men (Fig. 14a). The mean waiting time for female patients decreased with higher mean incomes in contrast to male patients, where the waiting time steadily increased (Fig. 14b,c).

Chief complaints and medical/surgical specializations

Women had a significantly longer mean waiting time in both the surgical (6 of 8 chief complaints) and internal medicine (7 of 12 chief complaints) specializations. There was no significance between the specializations (Table 8).

Men were more frequently triaged red/orange than women in both the surgical (7 of 8 chief complaints) and internal medicine (6 of 12 chief complaints) specializations. There was no significance between the specializations. In three internal medicine chief complaints, women were triaged more red/orange (intoxication, headache, cramps) (Table 8).

Discussion

This study shows that there is a consistent, very robust signal revealing a gender dependent difference in this very large material, at the emergency department at Östra Hospital, Sahlgrenska University Hospital. The key observations are that male patients mostly had shorter waiting times than female patients, and male patients more often were given a higher prioritized color in the triage process. This is seen in the entire material and in almost all subgroups including classification on

the basis of chief complaints, age and socioeconomic status.

Strengths and Limitations

Material

The Sahlgrenska University Hospital (SU), with three emergency departments, provides emergency and basic care for the city of Gothenburg and the surrounding areas. In this study, one of the emergency departments with a great throughput of patients was chosen. This is located in a well-equipped regional hospital and is divided into two disciplines, internal medicine and surgery. A few other specialties (e.g. ophthalmology and psychiatry) are not included in this investigation. However, this is a small amount of patients and should not affect the results.

Strengths in the study were the large number of patients and a minimal number of missing data. This enabled the division of the material into subgroups according to chief complaint, age and socioeconomic status. However, there is always a risk that in such a large material group significance can be reached by chance and without clinical relevance.

The patients visited the emergency department during four recent years. The pattern was similar over years and did not differ much in the number of patients or in the distribution of men and women. This suggests that the included years were representative for the emergency department. Other strengths were that the patients represented all ages, except for children under 16 years of age, and the patients came from parts of Gothenburg with different socioeconomic status. All these factors make the study generalizable.

Method

Strengths of the method were the well-developed triage process and the standardized formula RETTS (Rapid Emergency Triage and Treatment System) used in every patient visit. It is a well-known, reliable and validated triage method. RETTS is also used at the majority of other Swedish emergency departments (14). However, RETTS is a Swedish-made system and not established abroad. This means that it is difficult to compare the results from this study with international

studies. Another limitation with the RETTS system could be that the same formula is used for both female and male patients. The consequence of this is not investigated but one might argue that different formulas should be used, because of the sometimes well-known symptomatology differences between the genders. This difference is most clearly shown in acute coronary disease (20, 22).

The patient's way through the emergency system

The next part of the discussion is structured to follow the patient's way through the emergency system.

Most patients at Östra Hospital were ambulatory cases followed by transportation with an ambulance. There was no gender difference to be found in the arrival manner. This is in agreement with Widgren and co-workers (13). There were more female than male patients, which probably reflects the proportion of inhabitants in the Region of Västra Götaland. However, this is in contrast to previous studies at the Sahlgrenska University Hospital by Widgren and Ravn-Fischer (13, 35).

TTT

No gender differences were found in the mean time to triage (TTT). It is in agreement with Lönnbark (36). This suggests that the queue ticket system in the emergency waiting room was not affected by gender. No data was available regarding if there were gender dependent waiting time differences within the ambulance transport system.

Chief complaints

When looking at the 20 most common chief complaints at the emergency department, which represented 88,6% of all visits, the proportion of men and women was almost equal within the groups (Fig. 7a, b). This means that female and male patients mainly visited the emergency department for the same reasons. As expected, asymmetries between men and women (male > female) occurred for urology problems, wound lesions and trauma thorax. These were chief

complaints with low visiting numbers and should not influence the result.

Triage process

This study showed gender dependent differences in the triage pattern. Men were registered more seriously ill than the women, which meant more orange and red (Fig. 8). Women were more often triaged yellow and green. This is in agreement with earlier studies at the Sahlgrenska University Hospital (13, 36). A possible explanation could be that the male patients are more seriously ill than the females. It could also be explained by varied symptoms according to gender, which several authors have shown (20-22, 46). Another discussed cause is that women and men express their symptoms in different ways (24, 25). On the contrary, there are also studies showing that there is no difference in symptomatology or in verbal expression of the symptoms (26, 27). Further, there is always a risk that the triage process could be influenced by the patient's age, ethnicity and socioeconomic status. This is subject for future research.

TTD

After the triaging process, the patient waits for a doctor's appointment. In this study, it was shown that the gender dependent waiting time differences did appear when looking at mean time to doctor (TTD). This is also previously shown in Sweden by Lönnbark (36). Other studies have shown the same results in foreign countries (31, 33). However, results from studies abroad can be difficult to apply on Swedish conditions, because of the difference of national healthcare systems.

In agreement with Lönnbark, the difference also occurred when men and women were registered equally in the triage process (36). This means that even if women and men are prioritized with the same triage color, women still had a longer mean waiting time (TTD). The reason for this is unknown. A possible theory could be that the chief complaints within a triage color group vary, which may affect the waiting times. For example, acute abdomen was dominated by female patients, which is a chief complaint with longer waiting times within all of the triage color groups, compared to other chief complaints. This phenomenon could have contributed to the prolonged

waiting times for women. Another explanation could be that men more often complain loudly, when they have to wait for the doctor. According to Arslanian-Engoren et al. “women are much easier to deal with than men” (17).

Red triage color

The magnitude of the waiting time differences between men and women varied according to the triage color group. For the most seriously ill patients (red), the gender signal seemed to disappear when it came to TTD. However, it did appear in TLT for this group. It suggests that men in the red color group were processed faster and received direct ward admissions faster than the women (Table 6).

Orange, yellow and green triage colors

The gender signal was consistent for both TTD and TLT in the orange, yellow and green triage color groups. The question is if the time differences matter. In the orange group, the prolonged waiting time for women may deteriorate the medical condition. In the yellow and green groups, which were the largest in number, the waiting time differences may not be of medical importance. However, from a legally and gender equality perspective, the differences in waiting time are unacceptable. According to the Swedish Health and Medical Services Act, all patients should be treated equally.

In summary, the triaging is suggested to influence the magnitude of the gender signal at the emergency department at Östra Hospital.

TLT

The tendency that women waited longer than men for a doctor’s appointment (TTD) did not disappear if the total lead time (TLT) was studied. Quite the contrary, the mean time differences increased. However, TTD is a more reliable measurement, as TLT is affected by many other factors, e.g., waiting for an x-ray, blood samples, hospitalization or transportation from the hospital.

The role of gender, age and socioeconomic status

The third part of the discussion considers the role of gender, age and socioeconomic status.

Age

The mean age in this study was 54,2 years. It varied in other studies with both higher and lower average age (2, 28, 30, 35). One factor that could affect the mean age at an emergency department, as the situation at the Sahlgrenska University Hospital, is if there is a separate emergency department for children. This will increase the mean age. Widgren et al. found that the men were significantly older than the women at the emergency departments at the Sahlgrenska University Hospital (13). This is in contrast to this study, in which the mean age was equivalent between the genders.

There are no previous studies to be found that discuss the relationship between waiting time, age and gender. In this study, the gender difference in waiting time was most clear in the youngest age group (Table 7). One explanation to this phenomenon in the red group could be that the chief complaints within this group had different waiting times. For example, intoxications with a shorter waiting time were dominated by men, while acute abdomen with longer waiting time were dominated by women. The signal decreased with age among the most seriously ill patients (red and orange). This suggests that among older patients, the medical condition dominates before gender. A possible explanation could be that both elderly men and women have more time and often accept to wait without complaining. It is in agreement with a previous study that showed that older patients (70-80 yrs. old) are “more stoic a lot of times”, “better able to describe their complaints” and “more believable” (17). It may also be that older male and female patients have more similar symptoms than younger.

Moreover, in the younger age groups, male patients are “more nervous”, “more dramatic” and more likely to “think that they are having a heart attack” according to Arslanian-Engoren et al. (17). This

could affect the triaging and waiting time in favor of men.

Socioeconomic status

In this study, it was possible to include patients from different socioeconomic status groups. This had not been possible in some countries with other healthcare systems. As previously mentioned, all patients in Sweden, regardless of income, have the opportunity to seek acute care at any national emergency department (34).

The ten residence areas of Gothenburg were grouped into three socioeconomic levels based on the mean income in the district (low, moderate and high). This division is of course questionable on an individual basis, but acceptable at the group level. The study showed that women from the area in Gothenburg with the lowest mean income (Angered), had the longest mean waiting time for a doctor's appointment (TTD) (Fig. 14). As seen in Fig. 13, the prolonged waiting time in this group cannot be explained by the distribution of triage colors. The frequency of red and orange among these females was equivalent to that of other districts. A possible reason for the prolonged waiting time for women in this area could be that many of them originate from parts of the world where women usually have a subordinate position and are not used to arguing for themselves. Waiting for an interpreter when needed, could also have affected the results. Santos et al. showed that poorer language proficiency was associated with longer delay time from hospital arrival to catheterization laboratory or ward (43).

An interesting observation was seen in the three remaining high mean income groups (Fig. 14), where the men had longer mean waiting times than low and moderate income men. As seen in Fig. 13, male patients from these areas have a lesser frequency of the red and orange triage colors, which suggests they are less seriously ill. This case mix may be an explanation for the prolonged waiting times.

The significant gender differences in the mean waiting time disappeared in these three high-income groups. They consisted of a lower numbers of patients compared to the other groups and therefore, these results should be analyzed with some caution. Increasing the material was not possible since

the current division of the residence areas was recently changed (Fig. 14).

Flowchart

It was not possible to find out if the gender dependent waiting time differences could be explained by correct medical priorities or by a gender discrimination. However, most likely there is no deliberate gender discrimination going on at the emergency department at Östra Hospital. This study did not either allow us to draw conclusions regarding exactly where in the flowchart the possible discrimination appeared and increased. The emergency ward is handled by female and male nurses and doctors. This study did not investigate sex, age, ethnicity, education and work experience of the staff and how this could have affected the waiting times. It is an interesting aspect and needs further investigation. No studies on the subject can be found.

Ethical aspects

The study has shown that female and male patients were differently prioritized at the emergency department and that female patients had longer waiting times than male patients. This is in conflict with the principles of medical ethics. The principle of human dignity is one of the most important principles when it comes to priorities in healthcare. It is based on human rights. All people should be equally treated without discrimination (47).

Future research and recommendations

This study is supported by the Sahlgrenska University Hospital and Kunskapscentrum för Jämlik vård (KJV). These organizations are interested in cooperation to hereafter analyze the results.

To obtain more equal medical care for men and women, whether they be old or young, high-income or low-income patients, a qualitative interview study for nurses and doctors in the triage system is recommended. Such a study should give information regarding thoughts and priorities among the staff.

This in turn could give rise to a prospective intervention study, where all personnel involved should

be presented with the results from this study and educated in equal medical care. The effect of these interventions can then be evaluated approximately after 12 months.

Furthermore, these results and education about equal medical care should be highlighted at the undergraduate studies for medical and nursing students. It is of great importance to create an early awareness of the gender inequalities at the emergency department.

Conclusions

There are gender dependent, mean waiting time differences (TTD, TLT) at the emergency department at Östra Hospital, Sahlgrenska University Hospital. Female patients generally waited longer than male patients. Male patients more often were given a higher prioritized color in the triage process. Even if males and females received the same priority color, female patients waited longer for a doctor's appointment. The gender difference in mean waiting time disappeared among the old seriously ill patients and among patients from residence areas with high socioeconomic status.

Populärvetenskaplig sammanfattning

Ökande väntetider på akutmottagningar världen över är idag ett välkänt problem. Ämnet är belyst i många studier. Mer sällan diskuteras dock om väntetiderna skiljer sig mellan män och kvinnor, mellan unga och gamla samt mellan patienter med låg och hög socioekonomisk status. Syftet med denna studie var därför att utreda om det förelåg några skillnader i väntetiderna på akutmottagningen på Östra sjukhuset, Sahlgrenska Universitetssjukhuset. Uppgifter registrerades från akutmottagningen under fyra på varandra följande år (2009-2012).

När patienter sökte akutmottagningen fick de först en bedömning av en sjuksköterska, som fastställde hur allvarligt sjuka de var. Denna process kallas för triagering. Patienterna triagerades enligt en färgskala beroende på allvarlighetsgrad (röd, orange, gul, grön, blå). Därefter fick patienterna vänta på en första läkarkontakt. Väntetiden för detta registrerades. Även den totala tiden för vistelsen på akutmottagningen registrerades.

De viktigaste fynden i denna studie var att kvinnliga patienter generellt sett fick vänta längre på att få träffa en läkare än manliga patienter på akutmottagningen. Männerna blev oftare högre prioriterade i den etablerade triageringsprocessen. Även om en manlig och en kvinnlig patient blev triagerade med samma färg, fick kvinnan vänta längre. Resultaten visade att könsskillnader i väntetider också påverkades av patienternas ålder samt socioekonomisk status. Skillnaderna försvann bland allvarligt sjuka äldre patienter samt bland patienter från områden med hög socioekonomisk status. Ytterligare forskning inom området krävs för att få ökad klarhet till orsakerna.

Studiens resultat är viktiga ur ett samhällsperspektiv, då det är ytterst betydelsefullt att alla människor behandlas lika oavsett kön, ålder och socioekonomisk status. En jämlik vård ska vara en självklarhet i Sverige idag. För att Sahlgrenska Universitetssjukhusets vision om sjukvård, forskning, utveckling och utbildning med högsta kvalitet ska kunna uppfyllas, måste fokus i större grad riktas mot att beakta genusperspektivet. För att lyckas med detta förändringsarbete är det viktigt att vidareutbilda sjuksköterskor och läkare på akutmottagningen i jämlik vård. Insatser redan i grundutbildningen för dessa yrkeskategorier är att föredra, då det är önskvärt att tidigt etablera en medvetenhet om fynden i denna studie och hur man kan arbeta för att uppnå en större jämlikhet.

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Tables

Table 1. Number of inhabitants and the percentage distribution of men and women in the Region of Västra Götaland 2009-2012 (48).

	Female	Male	Total
2009	50.1%	49.9%	1 568 390
2010	50.1%	49.9%	1 579 137
2011	50.1%	49.9%	1 589 619
2012	50.1%	49.9%	1 598 700

Table 2. Vital signs and Emergency Symptoms and Signs (ESS) in the standardized formula RETTS_{TM} associated with different colors.

		Blue	Red	Orange	Yellow	Green
A		Don't need emergency care	Airway compromised Stridor	Not used	Not used	Not used
B	SpO ₂ (POX%) RR/min		SpO ₂ < 90% with O ₂ RR > 30 or < 8	SpO ₂ < 90% without O ₂ RR > 25	SpO ₂ 90-95% without O ₂	SpO ₂ > 95% without O ₂ RR 8-25 (normal)
C	HR BP		RHR > 130 or IHR > 150 SBP < 90 mmHg	HR > 120 or < 40	HR > 110 or < 50	HR 50-110
D	RLS		Unconscious Ongoing seizures	Somnolent/RLS 2-3	Acute disoriented	Alert
E	Body temp			Temp > 41°, < 35°	Temp > 38.5°	Temp 35° - 38.5°
ESS			Red	Orange	Yellow	Green

- A = Airway
- B = Breathing
- C = Circulation
- D = Disability (neurological examination)
- E = Exposure
- ESS = Emergency Symptoms and Signs
- SpO₂ = Oxygen saturation
- POX = Pulse Oximetry
- RR = Respiratory Rate
- HR = Heart Rate
- BP = Blood Pressure
- RLS = Reaction Level Scale
- RHR = Regular Heart Rate
- IHR = Irregular Heart Rate
- SBP = Systolic Blood Pressure
- Not used = Means that the patients in these groups should not have any problems with A (airway)

Table 3. Number of patients with a doctor's appointment at the emergency department at Östra Hospital 2009-2012 and percentage distribution (database Region of Västra Götaland).

	Female		Male		Total
2009	16 320	53.0%	14 515	47.0%	30 835
2010	17 110	53.0%	15 088	47.0%	32 198
2011	18 757	53.0%	16 591	47.0%	35 348
2012	19 544	53.0%	17 492	47.0%	37 036
Total	71 731	53.0%	63 686	47.0%	135 417

Table 4. Proportions of patients, visiting the emergency department at Östra Hospital 2012, from different parts of the city of Gothenburg.

Parts of the city of Gothenburg	n	%	Mean income (25-64 yrs)*
			Low
Angered	4 790	12.9	200 178
Eastern Gothenburg	5 179	14.0	205 418
			Moderate
Lundby	2 597	7.0	291 648
Northern Hisingen	3 599	9.7	293 376
Majorna-Linné	725	2.0	301 161
Western Hisingen	2555	6.9	301 295
			High
Centre	945	2.6	316 249
Örgryte-Härlanda	5 068	13.7	320 430
Askim-Frölunda-Högsbo	551	1.5	330 368
Western Gothenburg	431	1.2	373 543

*<http://www4.goteborg.se/prod/G-info/statistik.nsf> (140924)

Table 5. Number of patients with the 20 most common chief complaints visiting the emergency department at Östra Hospital 2009-2012. (S=surgery, M=medicine)

Chief complaints	Speciality	Female		Male		Total n (female vs. male)
		n	%	n	%	
Acute abdomen	S	19 175	29.7%	13 157	23.7%	32 332 (59.3% vs. 40.7%)
Chest pain	M	7 753	12.0%	8 161	14.7%	15 914 (48.7% vs. 51.3%)
Dyspnea	M	6 474	10.0%	5 094	9.2%	11 568 (56.0% vs. 44.0%)
Unknown disease	M	3 417	5.3%	2 975	5.4%	6 392 (53.5% vs. 46.5%)
Infection	M	2 834	4.4%	2 732	4.9%	5 566 (50.9% vs. 49.1%)
Trauma head	S	2 646	4.1%	2 681	4.8%	5 327 (49.7% vs. 50.3%)
Extremity pain	S	3 075	4.8%	2 248	4.0%	5 323 (57.8% vs. 42.2%)
Vertigo	M	2 851	4.4%	1 818	3.3%	4 669 (61.1% vs. 38.9%)
Neurologic deficit	M	2 335	3.6%	1 977	3.6%	4 312 (54.2% vs. 45.8%)
Intoxication	M	2 278	3.5%	1 957	3.5%	4 235 (53.8% vs. 46.2%)
Irregular heartrate	S	2 179	3.4%	1 970	3.5%	4 149 (52.5% vs. 47.5%)
Headache	M	1 945	3.0%	1 035	1.9%	2 980 (65.3% vs. 34.7%)
Wound lesion	S	1 038	1.6%	1 811	3.3%	2 849 (36.4% vs. 63.6%)
GI bleeding	S	1 168	1.8%	1 407	2.5%	2 575 (45.4% vs. 54.6%)
Urology problems	S	655	1.0%	1 831	3.3%	2 486 (26.3% vs. 73.7%)
Rectal problems	S	934	1.4%	1 165	2.1%	2 099 (44.5% vs. 55.5%)
Allergy	M	1 248	1.9%	739	1.3%	1 987 (62.8% vs. 37.2%)
Syncope	M	1 132	1.8%	855	1.5%	1 987 (57.0% vs. 43.0%)
Cramps	M	717	1.1%	1 084	2.0%	1 801 (39.8% vs. 60.2%)
Trauma thorax	S	605	0.9%	821	1.5%	1 426 (42.4% vs. 57.6%)
		64 459	100.0%	55 518	100.0%	

Table 6. The mean TTD (time to a doctor’s appointment) and TLT (total lead time) for females and males in the different triage color groups at the emergency department, Östra Hospital 2009-2012.

Color	TTD								
	Female		Male		p Value	Female		Male	
	mean	sd	mean	sd		median	range	median	range
Red	00.21	00.44	00.18	00.45	ns	00.04	00.00-09.05	00.03	00.00-10.50
Orange	01.20	01.24	01.14	01.22	***	00.54	00.00-14.38	00.49	00.00-15.42
Yellow	02.32	02.17	02.24	02.12	***	01.47	00.00-18.03	01.41	00.00-18.12
Green	02.31	02.20	02.24	02.14	***	01.45	00.00-19.21	01.39	00.00-16.18
Blue	01.24	01.35	01.30	01.35	ns	00.56	00.00-19.55	00.59	00.00-11.18
Total	02.05	02.08	01.54	02.02	***	01.21	00.00-19.55	01.12	00.00-18.12

Color	TLT								
	Female		Male		p Value	Female		Male	
	mean	sd	mean	sd		median	range	median	range
Red	02.52	01.48	02.47	01.53	*	02.01	00.03-16.09	02.24	00.01-18.39
Orange	03.54	02.13	03.45	02.17	***	03.28	00.01-21.47	03.17	00.01-61.44
Yellow	04.44	02.56	04.30	02.52	***	04.10	00.01-00.59	03.55	00.01-26.55
Green	04.08	03.02	03.56	02.56	***	03.30	00.01-03.26	03.17	00.01-26.03
Blue	01.52	01.59	01.52	01.57	ns	01.15	00.01-22.17	01.15	00.01-12.35
Total	04.02	02.52	03.46	02.48	***	03.28	00.01-27.26	03.12	00.01-61.44

Table 7. Mean waiting times (TTD) between men and women in the three age groups and in each triage color group at the emergency department, Östra Hospital 2009-2012. TTD is the time from the patient's arrival at the emergency department until the first meeting with a doctor.

Color	< 30 yrs										
	Female			Male			p Value	Female		Male	
	n	mean	sd	n	mean	sd		median	range	median	range
Red	491	00.24	00.54	499	00.14	00.38	***	00.03	00.00-09.05	00.02	00.00-06.48
Orange	3 109	01.18	01.23	2 715	01.09	01.21	***	00.50	00.00-10.46	00.42	00.00-11.45
Yellow	7 210	02.29	02.09	5 100	02.20	02.05	***	01.48	00.00-17.18	01.41	00.00-15.38
Green	3 379	02.27	02.09	2 370	02.21	02.06	ns	01.46	00.00-14.18	01.40	00.00-14.22
Blue	312	01.27	01.17	470	01.29	01.34	ns	01.00	00.01-06.26	00.55	00.00-11.18
Total	14 501	02.06	02.02	11 154	01.53	01.58	***	01.25	00.00-17.18	01.13	00.00-15.38

Color	30-70 yrs										
	Female			Male			p Value	Female		Male	
	n	mean	sd	n	mean	sd		median	range	median	range
Red	1 322	00.20	00.41	1 741	00.20	00.48	ns	00.05	00.00-08.09	00.04	00.00-10.50
Orange	7 870	01.21	01.27	9 907	01.14	01.22	***	00.54	00.00-14.04	00.48	00.00-15.42
Yellow	16 943	02.32	02.17	16 623	02.26	02.14	***	01.47	00.00-18.03	01.42	00.00-18.12
Green	6 798	02.30	02.19	6 270	02.24	02.16	*	01.44	00-00-17.36	01.38	00.00-16.18
Blue	572	01.24	01.49	788	01.31	01.36	ns	00.53	00.00-19.55	00.59	00.00-10.40
Total	33 505	02.07	02.10	35 329	01.57	02.04	***	01.23	00.00-19.55	01.14	00.00-18.12

Color	> 70 yrs										
	Female			Male			p Value	Female		Male	
	n	mean	sd	n	mean	sd		median	range	median	range
Red	1 951	00.20	00.43	1 495	00.19	00.43	ns	00.03	00.00-07.41	00.03	00.00-09.08
Orange	6 253	01.19	01.21	4 697	01.17	01.23	ns	00.55	00.00-14.38	00.53	00.00-15.07
Yellow	10 497	02.33	02.21	7 191	02.21	02.13	***	01.46	00.00-17.38	01.38	00.00-16.21
Green	3 828	02.37	02.31	2 580	02.25	02.16	***	01.45	00.00-19.21	01.41	00.00-14.02
Blue	215	01.16	01.19	145	01.29	01.33	ns	00.57	00.00-07.24	01.04	00.00-08.46
Total	22 744	02.00	02.10	16 108	01.50	02.01	***	01.15	00.00-19.21	01.09	00.00-16.21

Table 8. Difference in mean waiting time (TTD) between men and women in the 20 most common chief complaints 2009-2012.

TTD is the time from the patient's arrival at the emergency department until the first meeting with a doctor. (S=surgery, M=medicine)

Chief complaint	Speciality	Female		Male		p Value
		mean	sd	mean	sd	
Acute abdomen	S	02.11	01.57	02.03	01.54	***
Chest pain	M	02.05	02.15	01.56	02.09	***
Dyspnea	M	01.43	02.06	01.42	02.08	ns
Unknown disease	M	02.19	02.23	02.11	02.16	*
Infection	M	02.15	02.12	02.07	02.06	*
Trauma head	S	01.44	01.42	01.34	01.34	***
Extremity pain	S	02.30	02.24	02.24	02.19	ns
Vertigo	M	02.27	02.27	02.16	02.19	*
Neurologic deficit	M	01.58	02.17	01.59	02.15	ns
Intoxication	M	01.18	01.43	01.14	01.51	ns
Arrythmia	M	01.54	02.14	01.45	01.59	*
Headache	M	02.24	02.19	02.18	02.15	ns
Wound lesion	S	01.34	01.31	01.26	01.26	*
GI bleeding	S	01.57	01.52	01.45	01.44	***
Urology problems	S	02.27	02.10	01.58	01.51	***
Rectal problems	S	02.32	02.07	02.20	01.59	*
Allergy	M	01.36	01.54	01.24	01.47	*
Syncope	M	02.21	02.28	01.59	02.11	**
Cramps	M	01.27	01.58	01.36	02.05	ns
Trauma thorax	S	01.56	01.56	01.43	01.49	ns

Figures

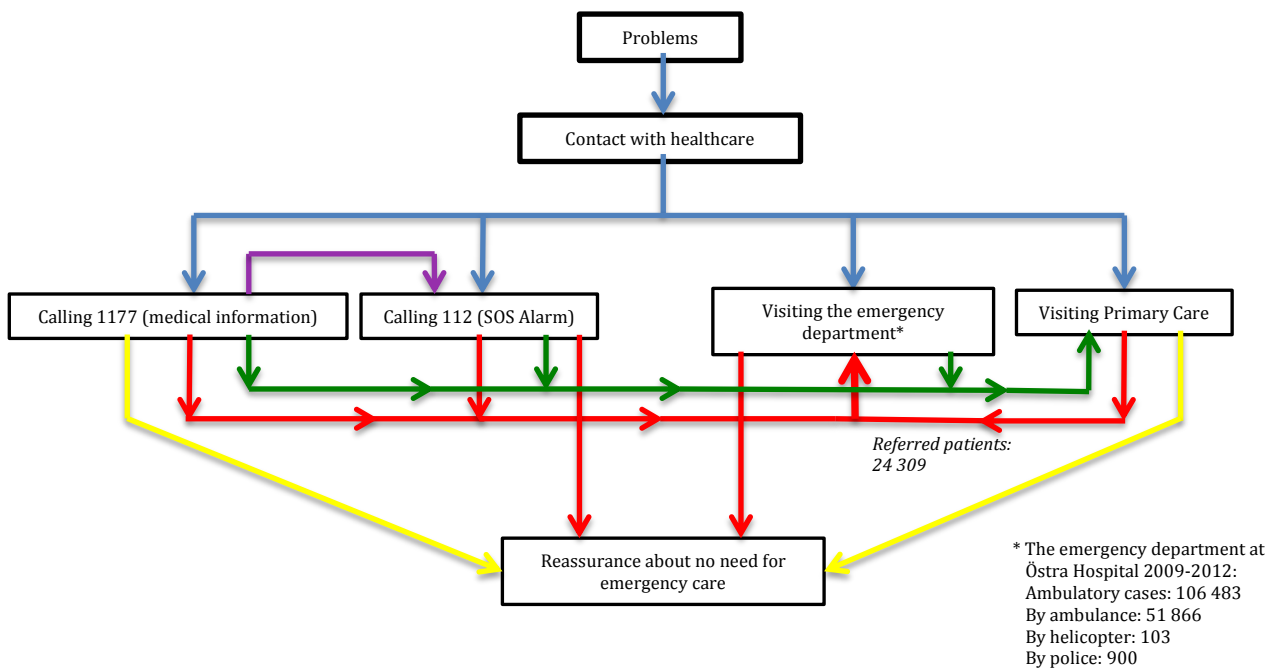


Fig 1. Flowchart showing different ways to contact healthcare for patients with health problems.

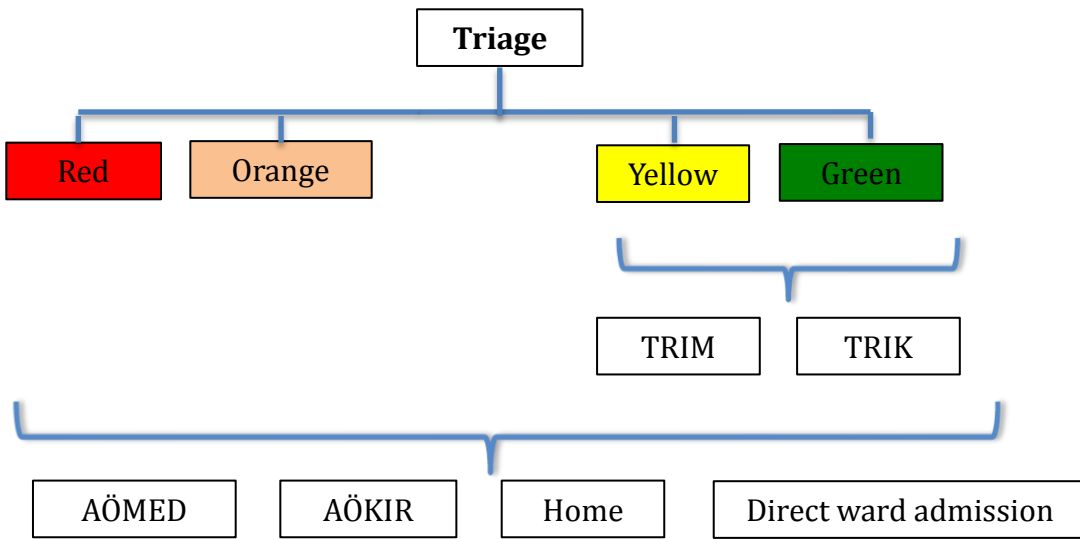


Fig 2. The triage system at Östra Hospital.
 AÖMED = emergency room Östra Hospital, medicine; AÖKIR = emergency room Östra Hospital, surgery; TRIM = triage medicine; TRIK = triage surgery.

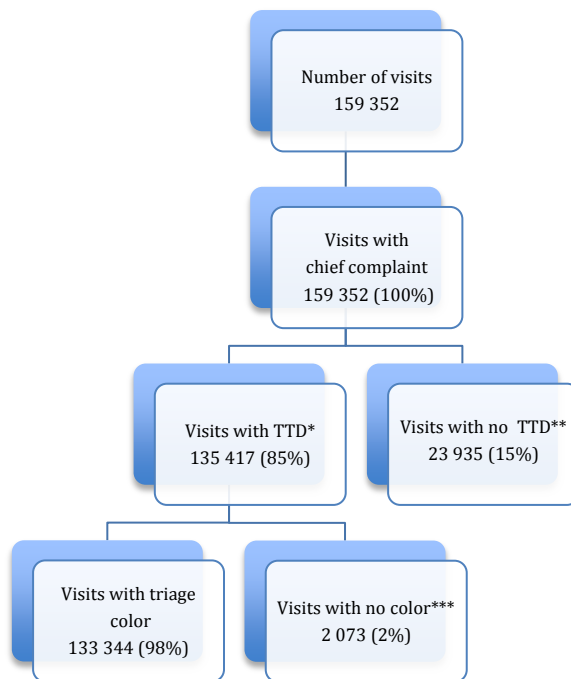


Fig 3. Number of visits at the emergency department at SU/Östra Hospital during 2009-2012.

* TTD: The time from the patient's arrival at the emergency department until the first meeting with a doctor.

** No TTD: Patients that did not have a doctor's appointment because of leaving the emergency department, being sent to primary care or for other reasons.

*** No color: Patients that not were given a color in the triage process for different reasons.

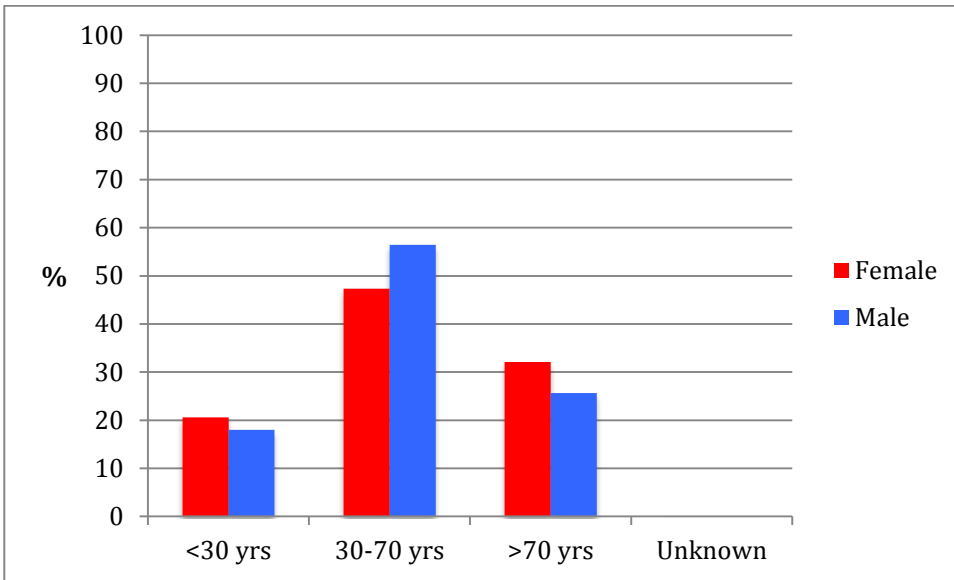


Fig 4. The distribution of age of the patients visiting the emergency department, Östra Hospital 2009-2012.

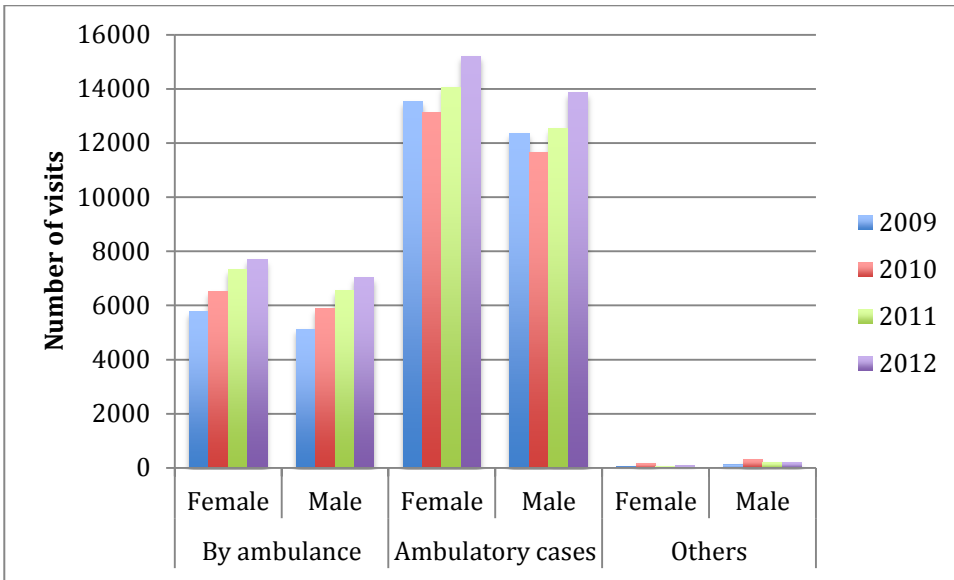


Fig 5. Gender distribution of the arrival manner to the emergency department at Östra Hospital, 2009-2012.

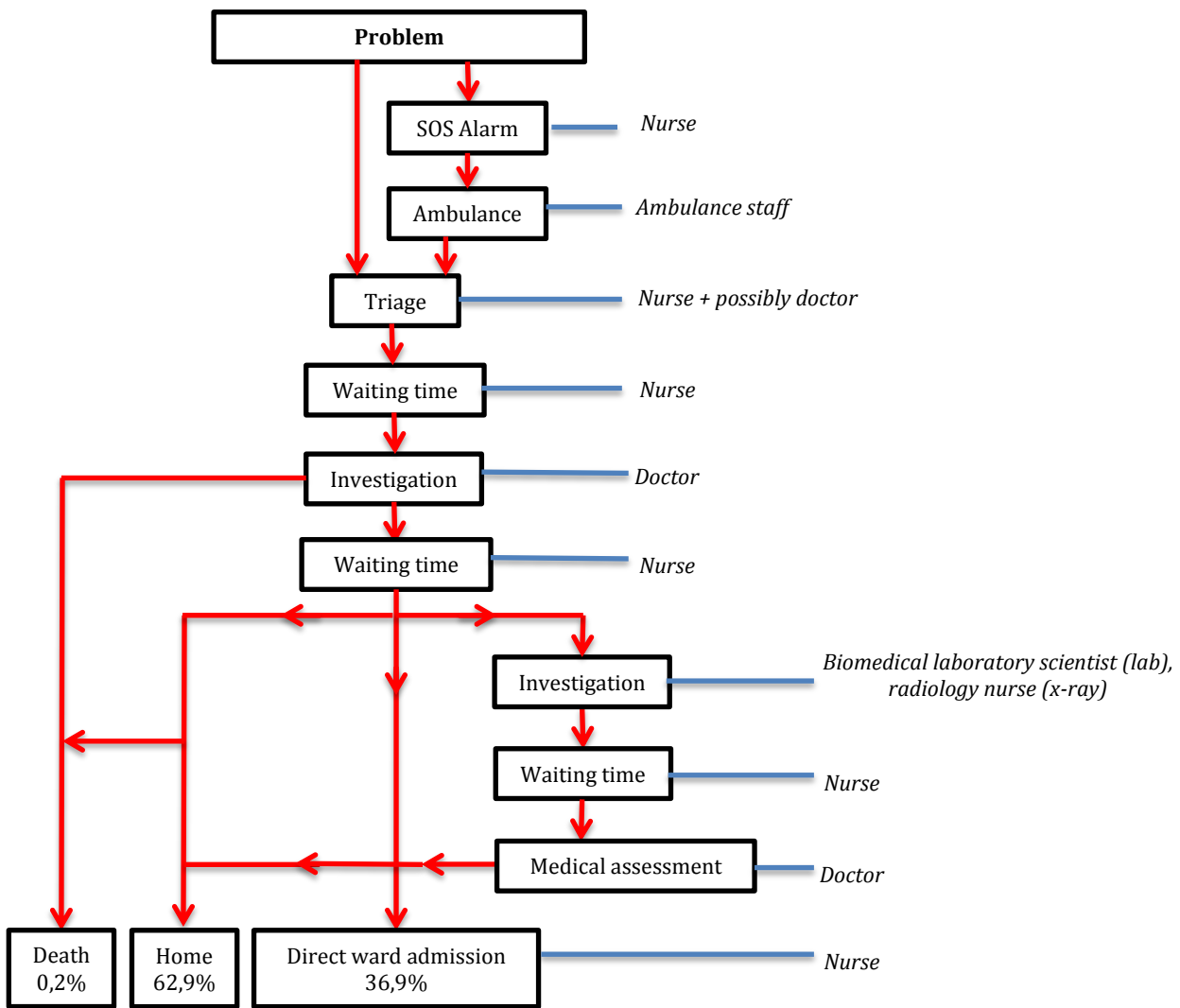


Fig 6. Flowchart from the time the patient is seeking emergency care until the time the patient leaves the emergency department.

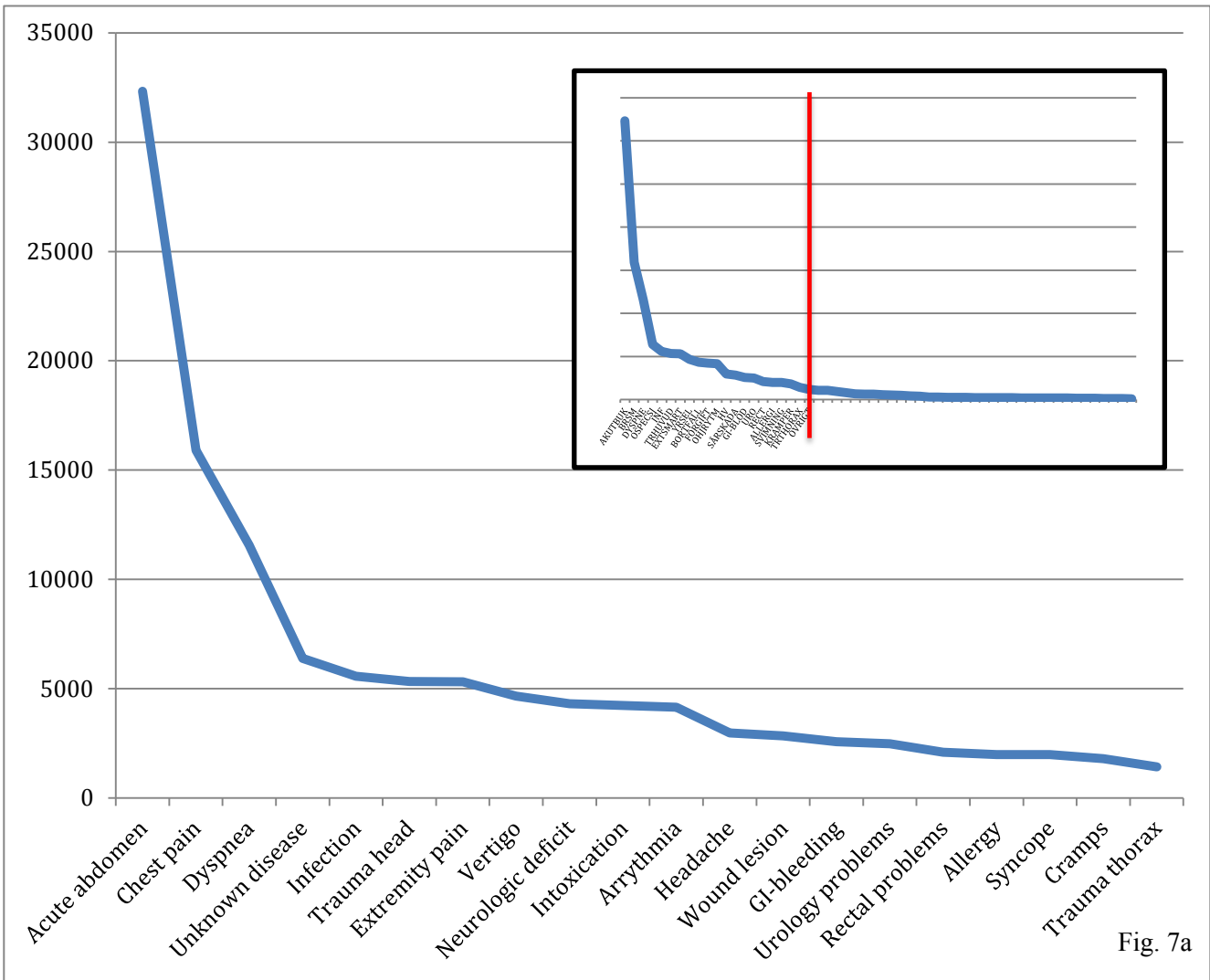


Fig. 7a

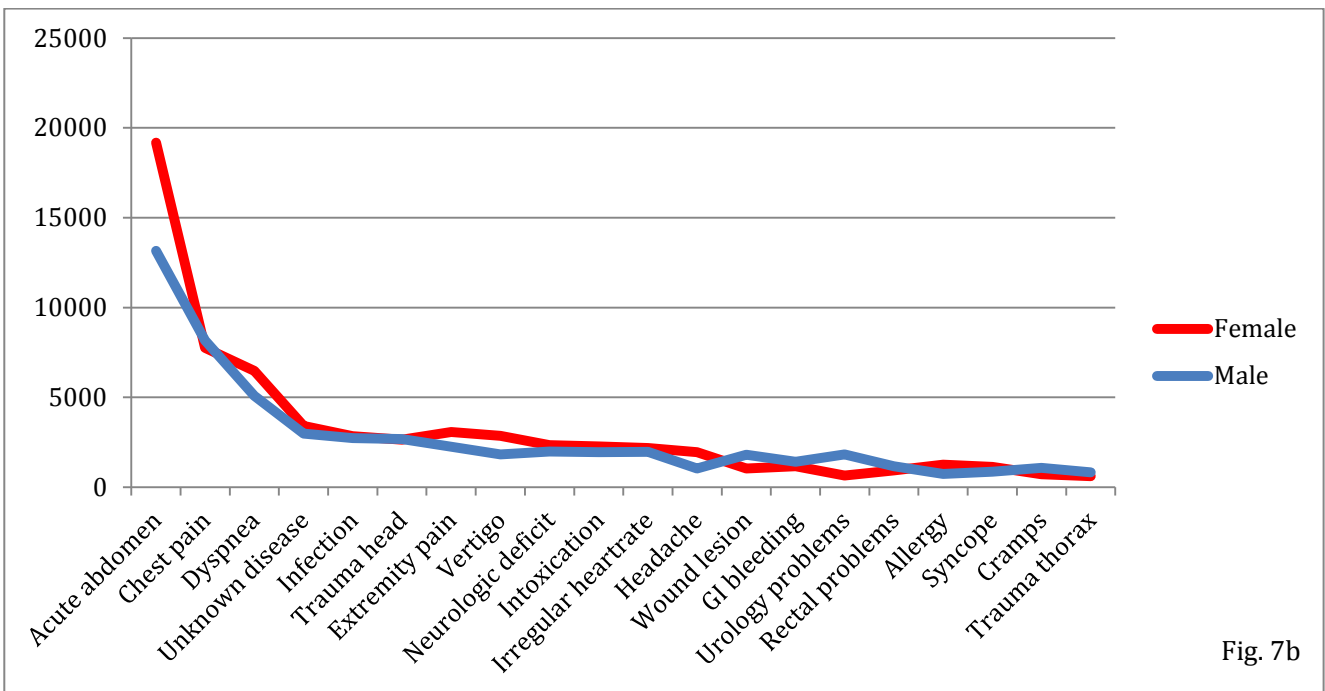


Fig. 7b

Fig 7a. Number of patients in each of the 20 most common chief complaints. The smaller figure shows all of the 105 chief complaints with a doctor's appointment at Östra Hospital 2009-2012 (n = 135 417 visits). On the left side of the red line are the 20 most common chief complaints (88,6%). Fig 7b. Number of female and male patients in each of the 20 most common chief complaints.

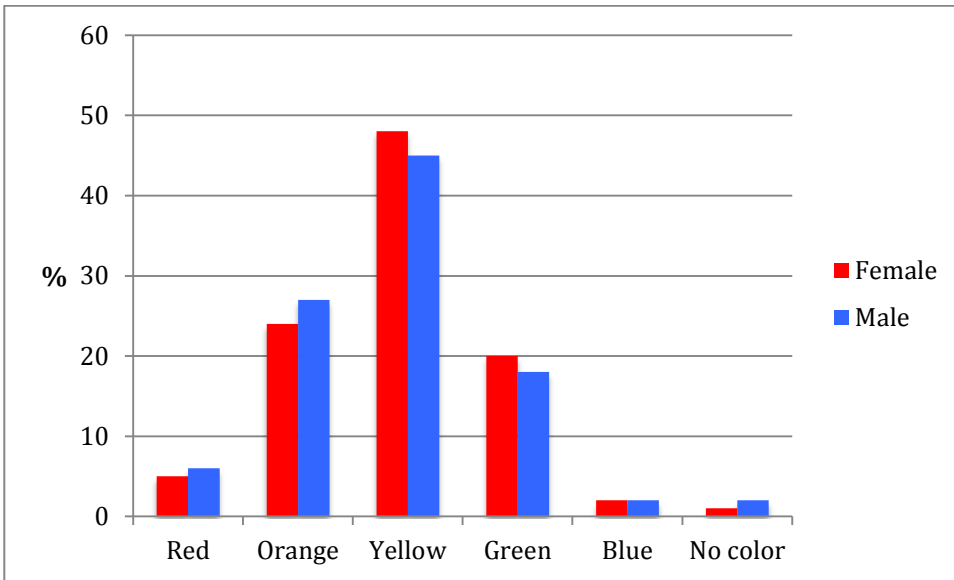


Fig 8. Distribution of prioritized colors at Östra Hospital 2009-2012.
(n = 135 417)

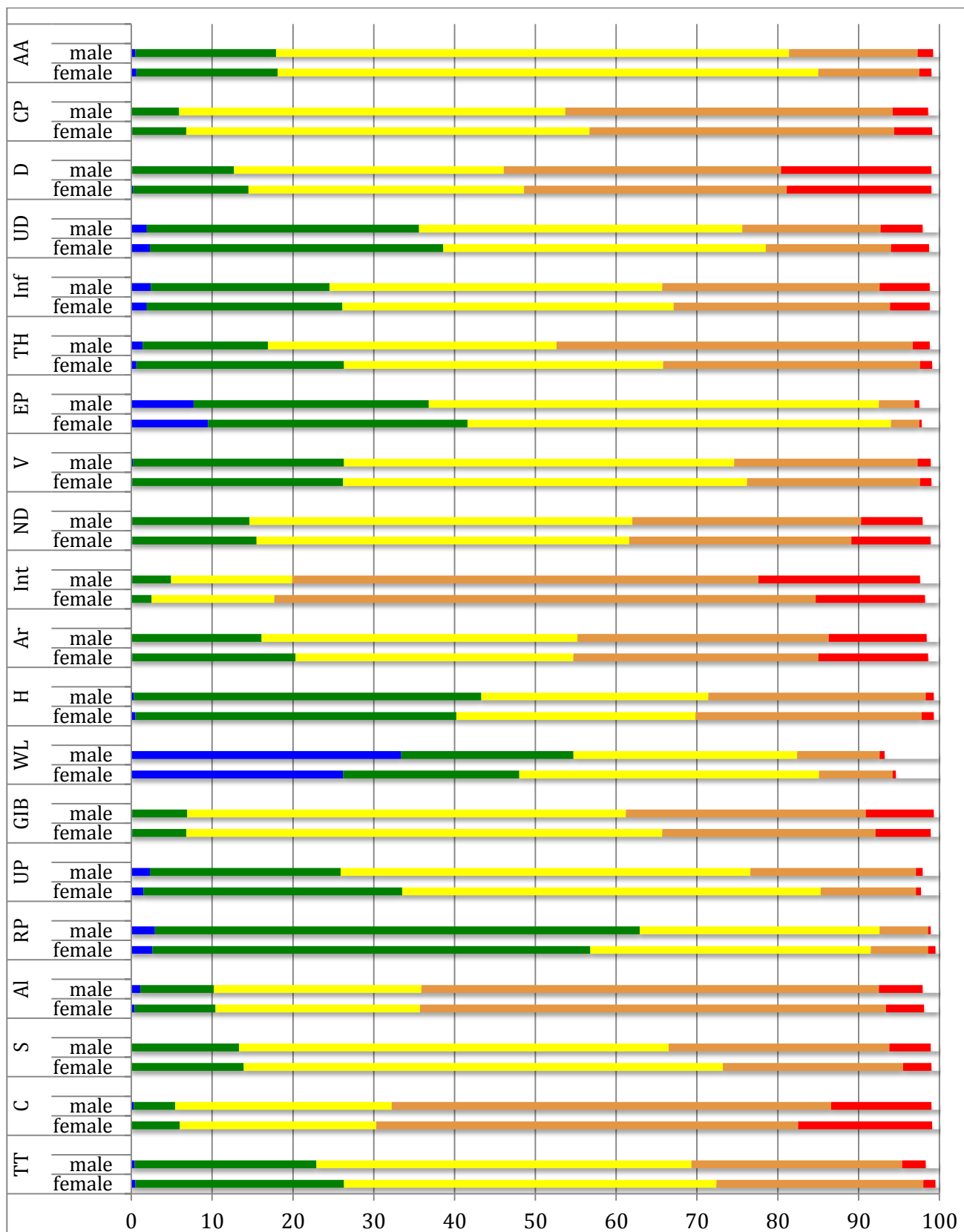


Fig 9. The triage color distribution among the 20 most common chief complaints at the emergency department, Östra Hospital 2009-2012.

AA: acute abdomen	TH: trauma head	Ar: arrhythmia	RP: rectal problem
CP: chest pain	EP: extremity pain	H: headache	AI: allergy
D: dyspnea	V: vertigo	WL: wound lesion	S: syncope
UD: unknown disease	ND: neurologic deficit	GIB: GI-bleeding	C: cramps
Inf: infection	Int: Intoxication	UP: urology problems	TT: trauma thorax

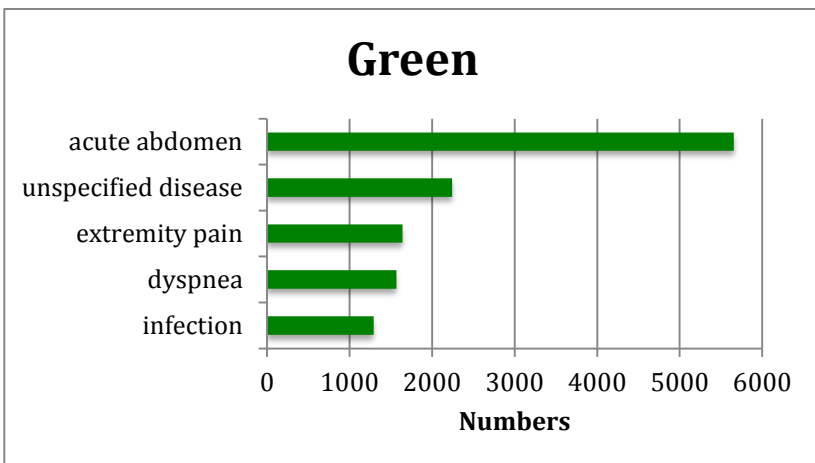
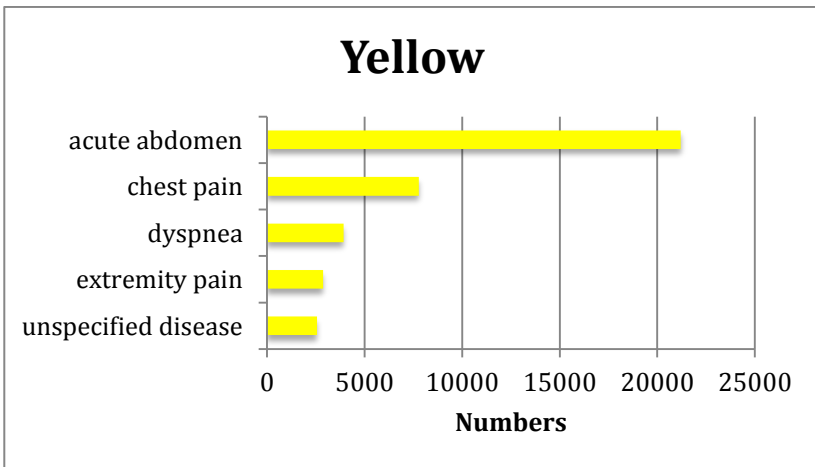
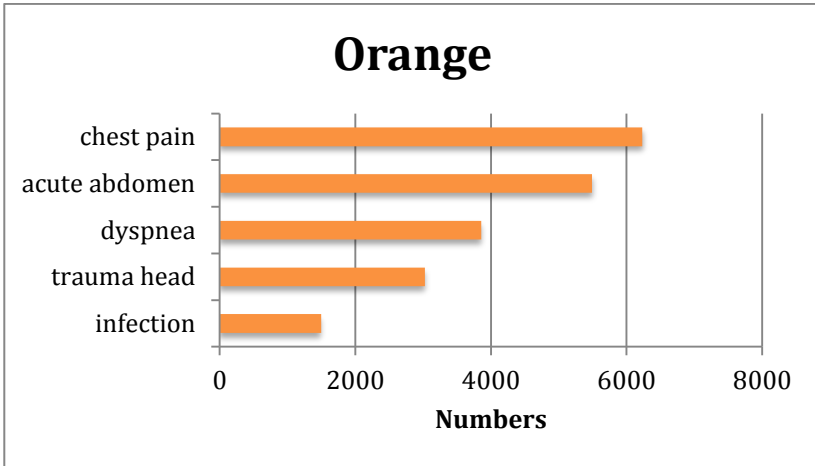
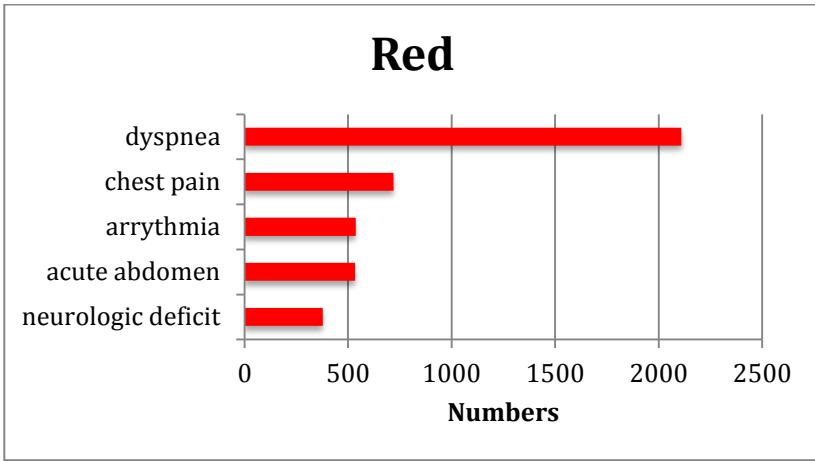


Fig 10. The most common chief complaints within different triage colors.

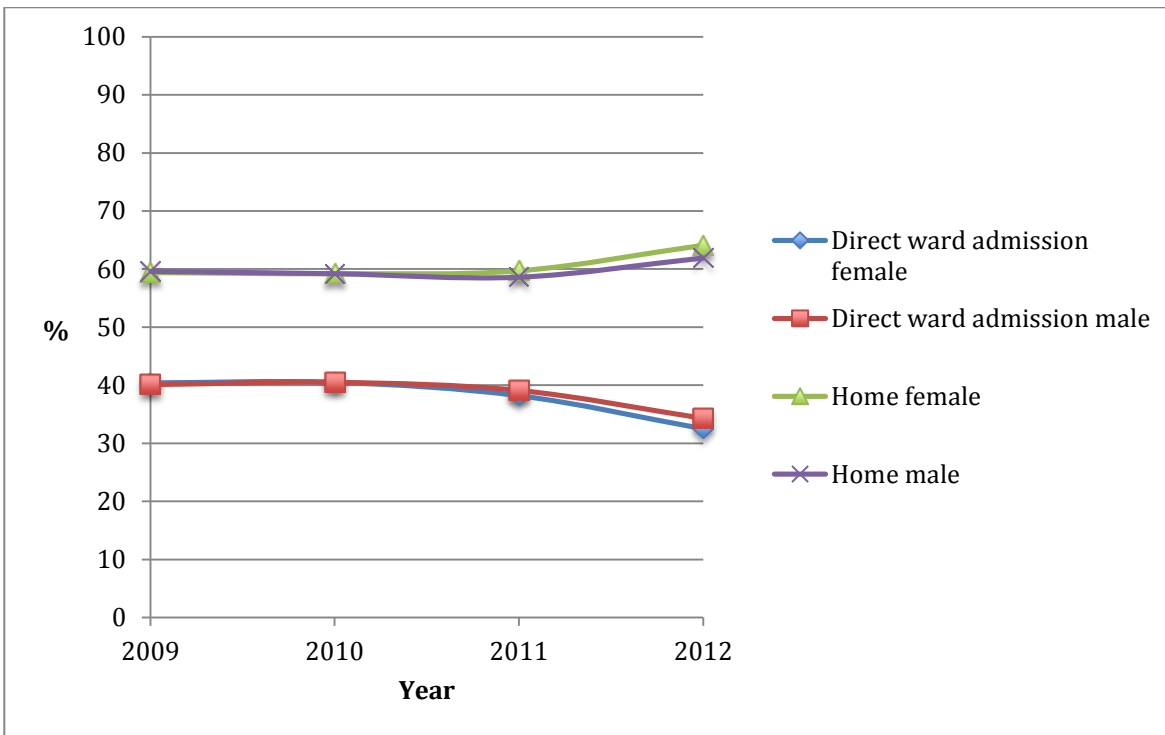


Fig. 11. Distribution of female and male patients with direct ward admission and patients that were sent home from the emergency department, Östra Hospital 2009-2012.

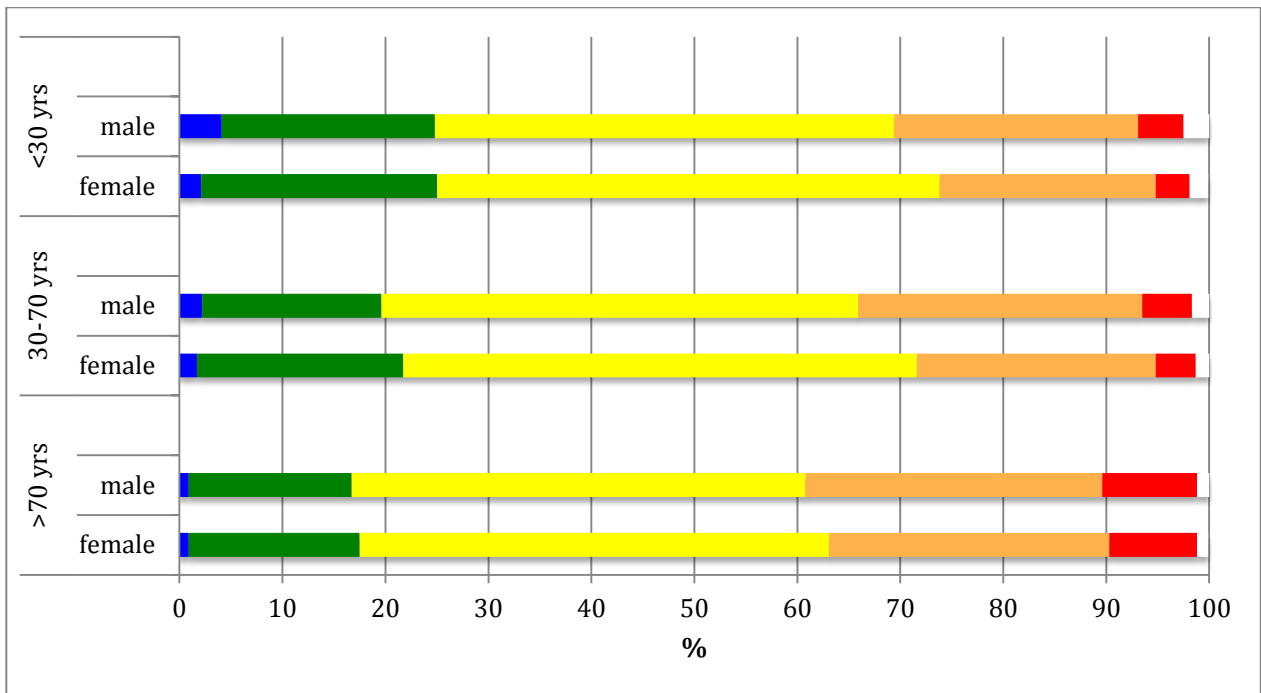


Fig. 12. The triage color distribution among the three age groups of patients at the emergency department, Östra Hospital 2009-2012.

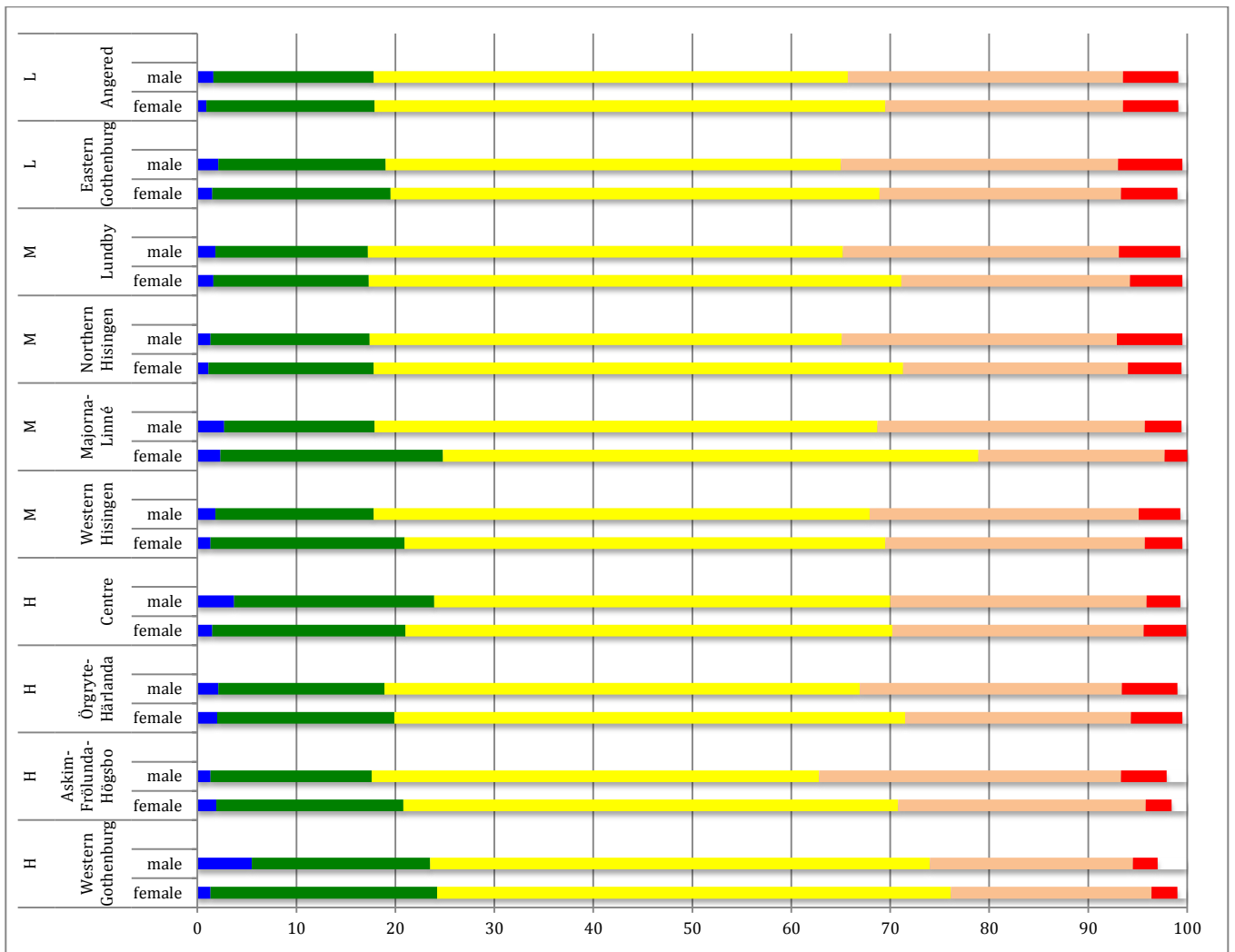


Fig. 13. Triage color distribution among patients from different parts of Gothenburg at the emergency department, Östra Hospital, 2012.

L = low income
M = moderate income
H = high income

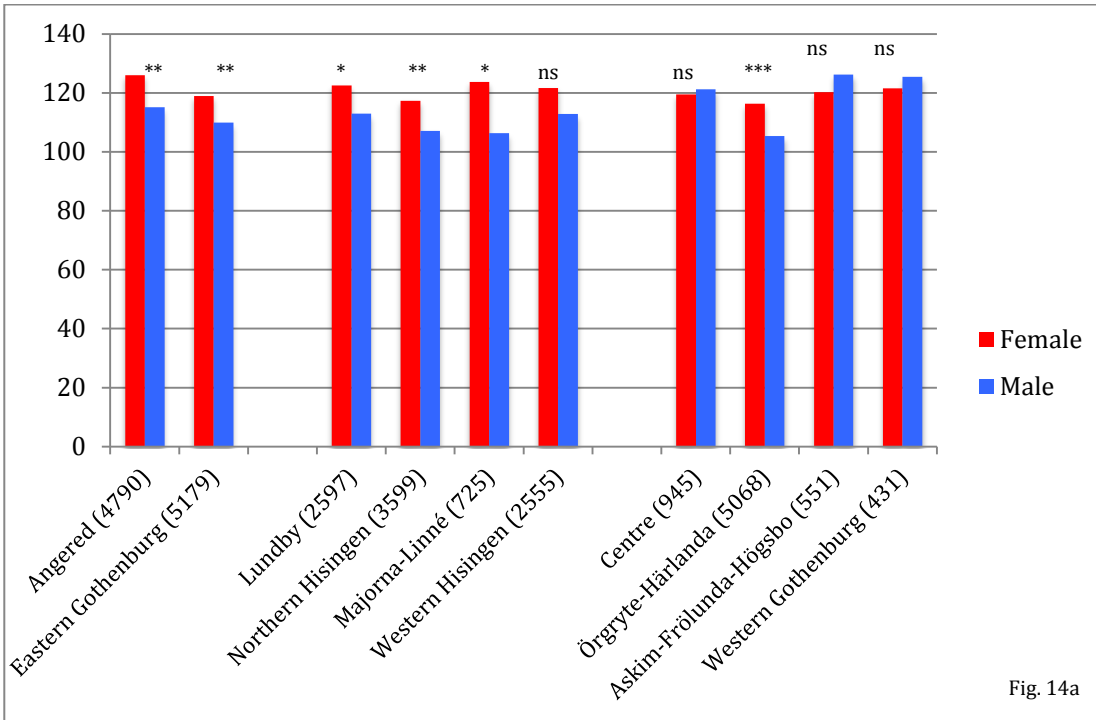


Fig. 14a

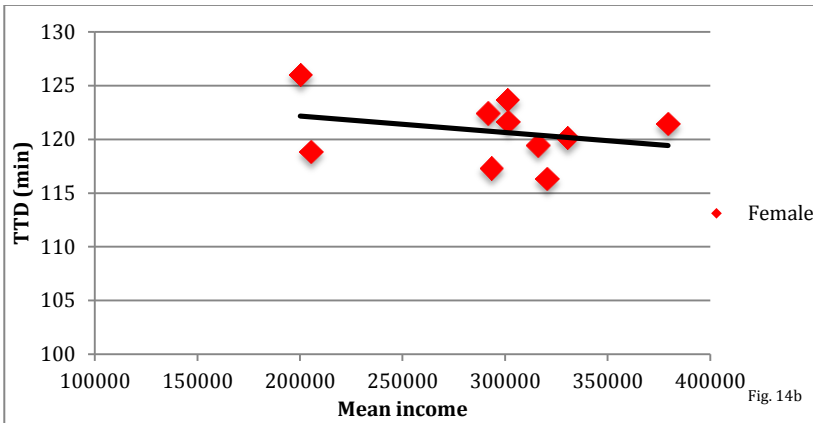


Fig. 14b

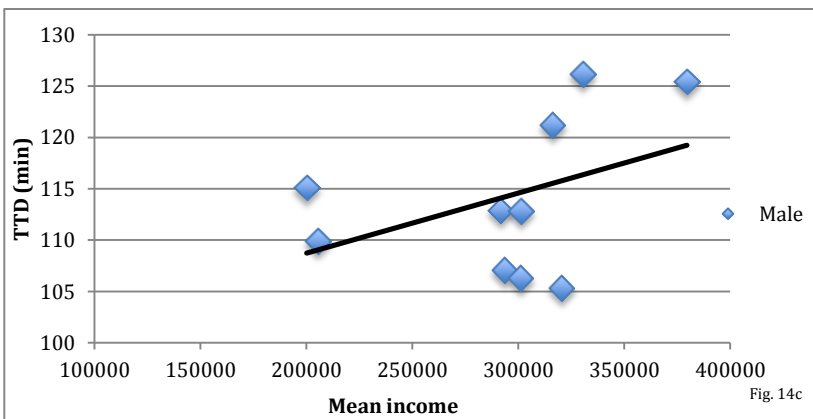


Fig. 14c

Fig. 14a. Mean TTD for patients from different parts of Gothenburg at the emergency department, Östra Hospital 2012. The city parts are sorted from low to high mean income (from left to right). Number of patients in brackets.

* p Value < 0,05; ** p Value < 0,01; *** p Value < 0,001; ns = no significance

Fig. 14b. Mean TTD for females from different parts of Gothenburg at the emergency department, Östra Hospital 2012.

Fig. 14c. Mean TTD for males from different parts of Gothenburg at the emergency department, Östra Hospital 2012.

