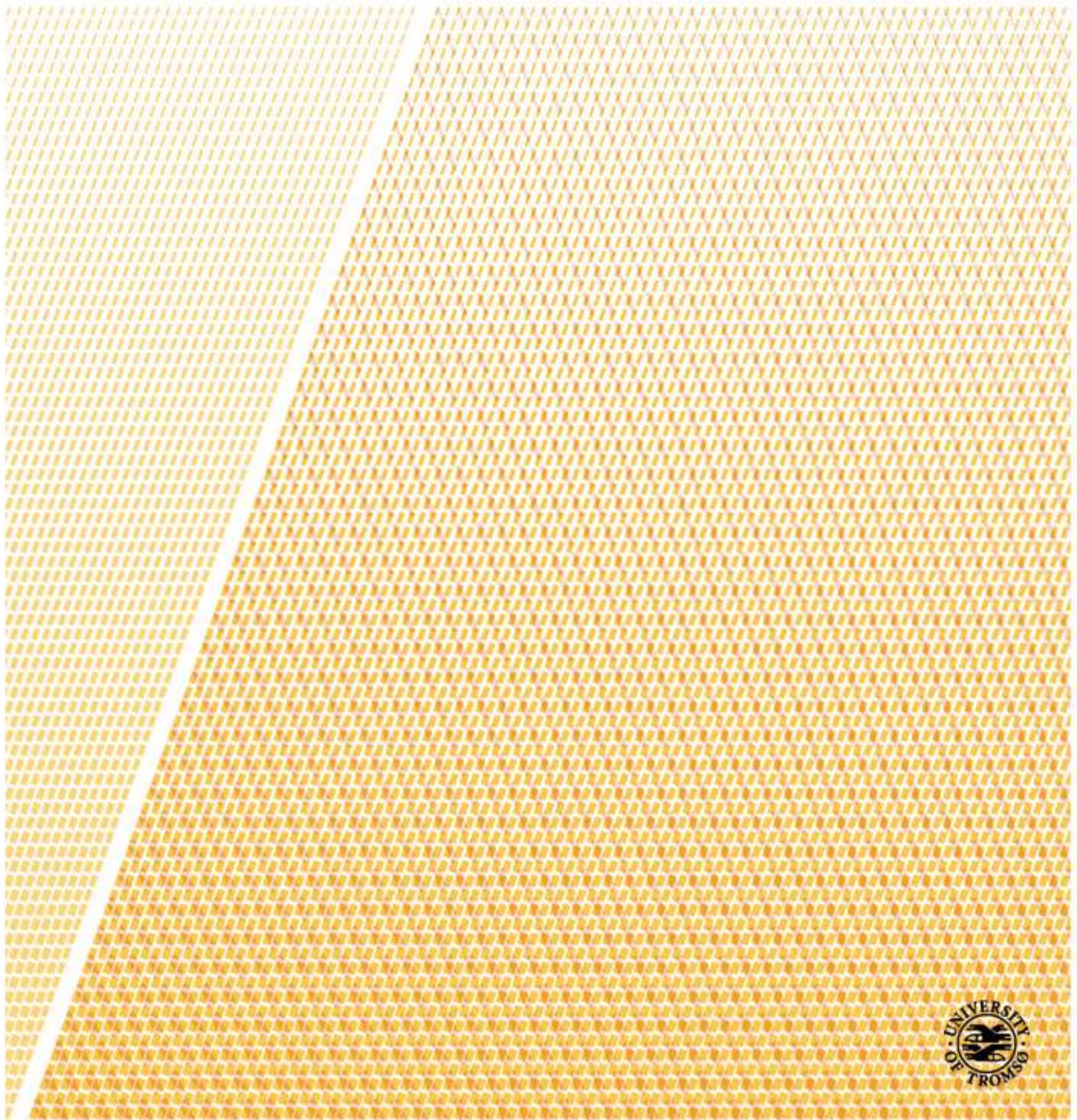


# Norwegian General Practitioners Contribution and Participation in Emergency Medicine

—  
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## Summary

The utility of general practitioner (GP) participation is a current issue in emergency medicine.

The aim of this thesis is to examine Norwegian GPs' contribution and participation in emergency medicine.

We started by conducting qualitative focus group interviews with emergency medical technicians (EMTs) at four, mainly rural, ambulance stations and GPs working at rural casualty clinics. They were then followed by a survey sent to all regular GPs in Norway (n=4701). In this web-based questionnaire, that 1002 GPs answered, we examined GP participation in emergency medicine and factors associated with participation.

The participants in our interviews and survey found that GPs play an important part in pre-hospital emergency medicine, and that GP participation improves the quality of the health care. They thought that the GPs were better at diagnosing and making clinical decisions concerning treatment and hospital admittance. Findings indicate that the GPs participate in emergency medicine on several arenas, in casualty clinics, by phone and on ambulance call-outs. The GPs have different knowledge and skills than the EMTs, and the two professions complement each other during medical emergencies, according to both EMTs and GPs. They suggested interdisciplinary team training as an important way to improve this teamwork. In the survey, self-reported participation in emergency medicine was strongly associated with working at a casualty clinic that regularly conducted interdisciplinary team training.

Participation was also associated with working at a casualty clinic without extra staff.

These findings may serve as a point of departure for future studies of the utility of GP participation. Until further data becomes available, I believe that measures to facilitate continued GP participation in pre hospital emergencies and further implementation of team training are warranted.

## Sammendrag

Nytten av allmennlegen er et aktuelt tema innen akuttmedisin. Hensikten med denne avhandlingen er å bidra med kunnskap om norske allmennlegens deltakelse og bidrag i akuttmedisin.

Vi startet med kvalitative fokusgruppe intervjuer med ambulansesarbeiderene ved fire ambulansestasjoner, hvorav tre var i distrikt og allmennleger som jobbet på legevakter i distrikt. De kvalitative studiene ble fulgt av et spørreskjema som ble sendt til alle norske fastleger (n=4701). I dette webbaserte spørreskjemaet, som 1002 allmennleger besvarte, undersøkte vi legenes deltakelse i legevakt og forhold som var assosiert med deltakelse.

Deltakerne i fokusgruppeintervjuene og spørresundersøkelse opplevde at allmennlegen spiller en viktig rolle i prehospital akuttmedisin, og at legens deltakelse øker kvaliteten på helsetjenesten. De mente at allmennlegen var bedre til å diagnostisere og å fatte kliniske beslutninger om behandling og sykehusinnleggelse. Funnene våre indikerer at allmennlegene deltar på forskjellige arenaer, på legekantoret, på legevakt, over telefon og på ambulansetrykning. Allmennlegen har annen kunnskap og andre ferdigheter enn ambulansesarbeiderene og de to profesjonene komplementerer hverandre på akuttmedisinske oppdrag, i følge deltakerne. De foreslo tverrfaglig team trening som en viktig måte å forbedre dette samarbeidet. I spørreundersøkelsen var selvrapportert deltakelse i akuttmedisin sterkt assosiert med å jobbe på en legevakt som regelmessig gjennomførte tverrfaglig team trening. Det var også assosiert med å jobbe alene på legevakt, uten sykepleier eller andre allmennleger. Disse funnene kan være et grunnlag for videre studier av allmennlegens nytte. Jeg mener at man bør tilrettelegge for allmennlegens deltakelse i akuttmedisin og implementere tverrfaglig teamtrening i påvente av ny kunnskap.

## Abbreviations

Norwegian translation in brackets.

EMCC	Emergency Medical Communication Center	(AMK, akuttmedisinsk kommunikasjonsentral)
ED	Emergency Department	(akuttmottak)
EMS	Emergency medicine services	(akuttmedisinske tjenester)
EMT	Emergency Medical Technician	(ambulansefagarbeider)
GP	General Practitioner	(allmennlege)
HEMS	Helicopter Emergency Medical Service	(luftambulansetjenesten)
Regular GP		(fastlege)
QUALYs	quality-adjusted life years	(kvalitetsjusterte leveår)

In the thesis I have used the term “casualty clinic” to describe the out-of-hours emergency primary health care system in Norway that is called “legevakt”.

## List of papers

### Paper I:

Hjortdahl, Magnus; Zakariassen, Erik; Wisborg, Torben. The role of general practitioners in the pre hospital setting, as experienced by emergency medicine technicians: a qualitative study. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 2014; Volum 22:47.

### Paper II:

Hjortdahl, Magnus; Halvorsen, Peder Andreas; Risør, Mette Bech. Rural GPs' attitudes toward participating in emergency medicine: a qualitative study. *Scandinavian Journal of Primary Health Care* 2016; Volum 34 :4.

### Paper III:

Magnus Hjortdahl, Erik Zakariassen ; Peder A. Halvorsen. Self reported involvement in emergency medicine among GPs in Norway, *Scandinavian Journal of Primary Health Care* 2018; Volum 36:2.



## 1 Introduction

### 1.1 Why examine GP participation and contribution in emergency medicine?

When I started working as a GP in 2010, on duty at the local out-of-hours casualty clinic, I was regularly asked by the Emergency Medicine Communication Center (EMCC) to participate in medical emergencies along with the local ambulance. That I, as a GP, was expected to participate in emergency medicine was different from my previous experiences. I was therefore unsure if I should participate in these emergencies, or if I would be of more use at the casualty clinic. I also wondered what my contribution should be, if I decided to take part in these out-of-office emergencies. I looked to colleagues and guidelines for advice, but I found few firm answers. My search for answers to these questions led to a research project about GP participation and contribution in emergency medicine, finally resulting in this thesis.

By the time I started examining GP contribution in emergency medicine, a national expert panel was reviewing the entire prehospital emergency medical services in Norway [1]. The expert panel claimed that GP-run casualty clinics were of poor quality, and that the GP was underutilized in pre-hospital emergency medicine. They concluded in 2015, that there is little knowledge about the benefit of pre-hospital treatment and how best to organize the services, and recommended that more research should be conducted in this field. This lack of knowledge was also evident when the Norwegian Knowledge Centre for the Health Services was unable to conclude in a systematic review of the effect of GPs in pre-hospital trauma treatment in 2017, as they could not identify any studies to include in the review [2].

The use of GPs and GP-run casualty clinics in emergency medicine have been debated in Norway. A group of healthcare personnel argued, in 2013, that GPs are pulling out of emergency medicine, by not doing their casualty clinic duty, and not taking part in ambulance

call-outs [3]. They based this on their own experience of working in the ambulance service in one of Norway's main cities, and on their medical student thesis. They suggested that paramedics should treat medical emergencies outside hospitals and casualty clinics by themselves, without the assistance of GPs. In 2015, the president of the Norwegian Medical Association claimed that GP-run casualty clinics are the weakest link of the health care services [4]. She referred to a report made by the medical association that states that casualty clinics are troubled by recruitment difficulties, lack of organization and poor quality. The medical association's solution was, according to the president, to staff the casualty clinics with more doctors, and that the authorities must be aware that the casualty clinics are struggling [4]. Hospital anesthesiologists argue in *The Journal of the Norwegian Medical Association*, in 2016, that GP-run casualty clinics are an efficient way of letting many patients be examined by a physician outside hospitals, relieving the hospital emergency departments (EDs). The success of gatekeeping and triage in GP-run casualty clinics is used as an argument for why a separate emergency medicine specialty in hospitals is not needed in Norway [5]. The Norwegian Directorate of Health claimed, at the national conference for casualty clinic leaders in 2018, that GPs are not attending to their duty in emergency medicine. The Directorate of Health is therefore piloting a new way of organizing pre-hospital care in Norway, with less GP participation [6]. It is a paradox that different stakeholders have strong opinions about the GP-run casualty clinics' place in pre-hospital EMS, and how to best organize them, while they have little knowledge to back these opinions with. Empirical and systematic knowledge on the subject is apparently absent [1,2]. In this thesis, I will try to address some of these issues and offer research-based knowledge that may be helpful when organizing the emergency medical services in Norway in the future.

## 1.2 What is emergency medicine?

Emergency medical services that are provided by the municipalities' and the hospitals' pre-hospital emergency services in Norway, are regulated in the "emergency medicine regulations" of 2015 [7]. The regulations outline the municipalities' responsibility for providing immediate health care to its inhabitants, qualification requirements for the healthcare personnel, and equipment requirements in the municipal emergency services. The regulations also describe the hospitals' responsibility for the ambulance services, and the qualification requirements for ambulance personnel. Finally, the regulations list the requirements for the emergency communication center and municipalities' immediate help phone services. According to the regulations, "emergency medicine is diagnostics, counseling, treatment and/or monitoring of acute onset or deterioration of disease or injury where prompt medical help can be decisive for the patient's life and health" [7].

Emergency medicine is regarded a medical specialty in some countries. The American College of Emergency Physicians defines emergency medicine as the medical specialty dedicated to the diagnosis and treatment of unforeseen illness or injury. "The practice of emergency medicine includes the initial evaluation, diagnosis, treatment and coordination of care among multiple providers, and disposition of any patient requiring expeditious medical, surgical, or psychiatric care" [8].

Emergency medicine is practiced by emergency medicine services (EMS), and can be divided into in-hospital service and out-of-hospital EMS. The out-of-hospital EMS, also known as pre-hospital EMS, includes emergency medical call centers (EMCC), ambulance services, and primary care personnel and facilities [9].

Another way of describing emergency medicine is to look at the panorama of diseases that make up medical emergencies. Between 2005 and 2007, all medical emergencies in the

municipality of Austevoll were recorded [10]. A medical emergency was defined as an event for which the GP, based on the first notification, prioritized to see the patient without any delay. This data describes the occurrence of disease and injury in a Norwegian municipality. The study found that disease (84% of all cases) was far more common than injuries (16%). The patients suffered from a great variety of conditions, 62 diagnoses in total, i.e. they were not limited to a few core conditions. In contrast, EMS research, organization, training and guidelines often focus on detecting and treating a few potentially deadly conditions. These conditions, often referred to as the first hour quintet, consist of cardiac arrest, chest pain, stroke, breathing difficulties and severe trauma [11].

### **1.3 Out-of-hours care in Western countries**

The organization of pre-hospital EMS differs from country to country and within countries. In most western countries, the patients visit the hospital's Emergency Departments (ED) directly, without a referral, when they have an urgent illness or injury [12,13]. Most countries also have a primary care service that is available for emergencies during out-of-office hours, instead of EDs, for non-life-threatening conditions [12].

The organization of these primary healthcare resources varies greatly between countries, and a survey of out-of-hours care in western countries identified nine different organizational models currently used across the world. These models differ in a number of aspects such as patients treated, availability, staffing and size [12,13].

As a result of a growing problem of overcrowded EDs, several countries are exploring the possibility of letting the primary healthcare system take care of more medical emergencies. Studies from the UK [14] and Sweden [15], have shown that involvement by GPs in the pre-hospital EMS can reduce the number of patients brought to EDs. In the US, Urgent Care

Centers run by GPs are also suggested as a solution to relieve the EDs [16]. GPs are also largely responsible for delivering emergency medical services in rural areas, for instance in the UK, USA, and Australia [17,18,19]. GPs working in metropolitan areas may also encounter emergency medicine as part of their ordinary office day, since their regular patients sometimes present with severe symptoms [20,21].

The great variation between and within countries indicates that the “optimal” role for GPs in emergency medicine may depend on context [12]. For example, rural GPs are found to play a greater role in EMS, but the difference in organization might also be a result of history and culture [12]. This variation in organizing, and difference in nomenclature of EMS makes it challenging to compare the use of GPs in emergency medicine between countries.

#### **1.4 Organization of pre-hospital emergency medicine in Norway**

Pre-hospital emergency medicine in Norway is, in principal, made up of general practitioners (GPs), GP-run casualty clinics, the emergency communication center (EMCC), the ambulance service, and the National Air Ambulance Services.

##### **1.4.1 Non-life-threatening medical emergencies**

If you are acutely ill or injured in Norway, you are expected to visit your regular GP for examination and treatment. All Norwegians have the right to be registered on the list of a regular GP. The regular GP system is popular in the population, and is an important part of a strong primary health care system, delivering efficient health care of good quality to all Norwegians [22]. It is mandatory for regular GPs to offer their list patients immediate appointments when needed. These appointments cover a broad range of acute illnesses and

injuries of varying severity that require examination within reasonable time. Altogether, Norwegian GPs carry out about 4 million of these immediate appointments each year [23]. In some cases, the patient will be referred by the GP to a hospital for further treatment. Although we do not have exact numbers for how many of the immediate appointments that lead to hospital appointments, we do know that Norwegian GPs handled about 90 percent of the patient contacts without involvement of secondary care [24].

If acutely ill or injured outside of office hours, patients are supposed to contact the local, GP staffed, out-of-hours medical center, preferably by phone (phone number 116 117). The intention is that a portion of the patients will manage with advice given by phone, whereas others receive a doctor's appointment at their local out-of-hours medical center. These medical centers, also named casualty clinics, are available 24/7. All areas of Norway have a designated casualty clinic, but due to centralization, the patient might have to travel some distance to his closest casualty clinic. Most patients are treated at the casualty clinic, but about 20 percent of the patients that are seen by casualty clinic GPs are admitted to hospital for treatment [1].

#### **1.4.2 Life-threatening medical emergencies**

In the event of a possible life-threatening disease or accident, the public is advised to call the EMCC (phone number 113). The EMCC will then decide, based on information from the caller, whether to dispatch an ambulance (an ambulance call-out) or not. If the EMCC operator suspects a life-threatening situation (also called a "red response") he will also alert the GP on duty at the local casualty clinic. The GP on call is obliged to always carry a handheld radio to be able to receive these alerts. The GP then has to decide if he will leave what he is currently doing, usually tending to patients at the casualty clinic, to attend the

patient on site (i.e. take part in the ambulance call-out) or not. According to regulations from 2015, the GP has to take part in the ambulance call-out whenever necessary [7]. The regulation does not explain any further what is implied by “necessary,” which is left to the GPs’ discretion. In some cases, an ambulance may not be available, and the GP then has to attend to the patient on his own. After initial assessment, the patient will either be driven to the local casualty clinic for further examination, be admitted to hospital or discharged at the scene. The initial assessment will be done by a GP, the ambulance services or both, depending on the resources present on scene. The EMCC will in selected cases dispatch an ambulance helicopter. In an observational study from 2010, they found that the ambulance helicopter was dispatched in eight percent of the red responses [25]. The incidence of emergency ambulance call-outs is estimated to be around 20-25 per 1000 inhabitants per year [1]. There are national guidelines recommending pre-hospital treatment and fast track delivery to an appropriate treatment facility for selected medical emergencies like stroke, suspected myocardial infarction, cardiac arrest and major trauma. The GP and casualty clinic involvement in these emergencies varies from case to case, and according to localization.

### **1.4.3 Casualty clinics**

The municipalities are responsible for providing emergency medical services to all people staying in the municipality through the regular GP system and casualty clinics. Norway consists of 422 municipalities of varying size (from 6 km<sup>2</sup> to 9700 km<sup>2</sup>) and population (from 200 inhabitants in the smallest to 660 000 in the largest), and the organization and structure of the casualty clinics in Norway is heterogeneous [26]. The casualty clinic might serve a single municipality or several municipalities. The clinic is usually a dedicated building, but in some municipalities the different GP offices will take turns being a casualty clinic during office hours. It can be staffed by a single GP or several GPs working at the same

time. Some clinics also have on-call GPs at home, to be called in if needed. It is mandatory for regular GPs in Norway to work at their local casualty clinic, and this work is in addition to their regular work as a GP. How often they have to work at the casualty clinic varies from municipality to municipality, and is largely influenced by how many GPs that work in the municipality. As a consequence, GPs working in sparsely populated municipalities might have to be on call every third or fourth day.

The National Centre for Emergency Primary Health Care was concerned that some of the casualty clinics were too small to be able to give adequate service over time, and recommended fewer and more robust EMS units [27]. Many municipalities, therefore, reorganized their EMS from separate small municipality clinics to fewer inter-municipality casualty clinics responsible for larger geographical areas. In 2016, 101 of the 182 casualty clinics in Norway were inter-municipal casualty clinics [26]. This reorganization has led to longer distances for the patients [23]. A study has shown that patients that have a long distance to travel will less often use the casualty clinic. This is also the case when the patient is at risk of severe illness [28]. There is now a concern that this centralization of casualty clinics will lead to less involvement of the casualty clinic GP in pre-hospital EMS [1,11].

Even though casualty clinic work has been defined as general practice, there is a long-standing tradition for doctors with other specialties to work at these clinics, at least in urban areas. According to “emergency medicine regulations” from 2015, the GP must have a minimum of experience and training in emergency medicine in order to work at a casualty clinic [7]. The new legislation is stricter in the sense that the doctors have to be GP specialists or in training to become a GP specialist, with minimum three years’ experience, in order to be an “experienced GP” and allowed to work independently at the casualty clinic. If these criteria are not met, the doctor is not an “experienced GP” and has to work under the supervision of an “experienced GP”.



The clinic may be staffed with nursing personnel. Thirty-nine percent of the clinics have dedicated cars for the GP to use, with or without a driver [26]. In some cases, the casualty clinic is co-located with the ambulance station (10 %) or the local hospital (19%) [26]. The municipality's responsibility to provide care for its inhabitants at all hours was also mandated in a previous regulation, in effect from 2005. This responsibility has been expanded in the new regulation, with the addition of the rule that the GP on duty must participate on ambulance call-outs when required. The legislation also states that all EMS personnel, for instance EMTs and casualty clinic personnel, must participate in training exercises, i.e. multidisciplinary team training, focusing on interaction and teamwork with other healthcare personnel [7].

#### **1.4.4 The ambulance service**

The hospital trusts are responsible for in-hospital EMS, ambulance services and the EMCC. The ambulance service in Norway consists of mobile medical care units: cars, motorbikes, boats, airplanes and helicopters. The ambulance services are organized as a part of the secondary health care system, i.e. they are part of the hospitals' pre-hospital unit. The helicopters are staffed with anesthesiologists, and the airplanes are staffed with specially trained nurses. The regular ambulances, that carry out the majority of the ambulance assignments, are usually staffed with emergency medical technicians (EMTs). It is a minimum requirement that the ambulance is staffed with at least one EMT, and that the other staff member is a health care professional with sufficient competence in emergency medicine. The EMTs have 2 years of upper secondary school and 2 years apprenticeship training and certification as health personnel. Some EMTs with additional, advanced pre-hospital training are called paramedics. It is optional to staff the ambulances with paramedics, according to regulations.

## 1.5 Knowledge about GPs and emergency medicine in Norway

Norwegian GPs encounter medical emergencies, to a varying degree, in most of their work. They will encounter this in their regular GP office, while on call at the casualty clinic, and when participating in ambulance call-outs. The few studies on GPs and emergencies in Norway are mostly focused on the work at casualty clinics, especially examining GP work when participating on call-outs. Studies have shown that the EMCC does not always alert the GPs about emergencies in their area. In 2010, GP participation in more than 5000 ambulance call-outs from three different EMCCs were examined, in order to find out how the EMCC administrated the red response situations (ambulance call-outs in suspected medical emergencies). In only half of these was the GP on call alerted as well, and the proportion of GPs alerted varied greatly between the EMCCs. The GP then took part in the ambulance call-out in about half of these cases, resulting in GP participation on a quarter of ambulance call-outs [25]. Another study, from 2015, aimed to assess how the casualty clinic physician decides whether to take part in an ambulance call-out. In this study, GPs that had been alerted by the EMCC in Bergen (western part of Norway) during a period of 108 days, filled out a questionnaire. They found that 65% of the GPs that were alerted took part in the call-out, but this study does not report whether there were many ambulance call-outs where the GP on call was not alerted. They also found that information about the patients' medical condition was important when the doctor decided to participate. Practical circumstances, such as other patients waiting or distance to the emergency event, were important when they decided not to participate [29].

An important argument for GP participation in emergency medicine is that the patient can be triaged on site by a physician. In 2009, Rørtveit et al. found that the GPs downgraded the severity of the patients' condition after examination in 43 percent of the cases, whereas they upgraded it in 11 percent of the cases. They also found that the emergency procedures done

by the GPs were basic practical procedures like venous cannulation, airway measures, including administration of O<sub>2</sub>, ECG recording and monitoring of cardiac rhythm, and parenteral administration of drugs. This study suggests that the ambulance personnel and GPs have complementary roles during medical emergencies, and that GPs should participate in medical emergencies since they have the ability to obtain an overall view of the patient's condition, that the ambulance personnel does not have. An important limitation to this study is that it is based on data from a rural island of the coast of Norway, so care must be taken when generalizing the results [10].

In 2015, a government-appointed expert panel published an official Norwegian report (white paper) describing the pre-hospital emergency medicine system in Norway [1]. The report establishes that the pre-hospital theatre is expanding, and that more examination and treatment is now done outside hospitals. The GP-run casualty clinics were considered a weak part of the pre-hospital emergency system. The report suggested that the GP as a resource should generally be focused on the most severely ill patients, and that the GP should participate more often on ambulance call-outs and house calls. The expert panel stated that even if EMTs have become more skilled, they cannot serve as a substitute for GPs, especially when it comes to assessment of elderly and multi-morbid patients. They also hypothesized that more involvement by GPs in emergency medicine might lead to fewer hospital admissions. The report recognized that GPs and EMTs can form a good team to deal with pre-hospital emergencies, but that there is a need to develop their collaboration further. The report stated that there is too little knowledge about pre-hospital medicine in Norway in general, and on GP participation in emergency medicine in particular. The expert panel concluded that more publicly funded research is needed for quality to improve.

In February of 2018, the National Centre for Emergency Primary Health Care and the Norwegian Centre of Rural Medicine separately published reports describing the competence at the casualty clinics [30,31] in order to evaluate the effect of the EMS regulation that was introduced in 2015. As outlined above, only physicians that are GP specialists or in training to become a GP with a specified experience are “experienced GPs” and allowed to work without supervision. The centers were tasked with finding out how many of the casualty clinics actually managed to fulfill these requirements. These up-to-date reports show that casualty clinic work in Norway is usually carried out by local GPs, that the GP’s experience varies and that several municipalities are struggling to implement supervision and team training, even though both are required by regulations [30,31].

## **1.6 Summary of knowledge and need for further research**

We know how often GPs participate on call-outs, and we have some knowledge about rural doctors’ contribution when they participate [10,25,29]. We also have some information about the doctors that work at the casualty clinics and what kind of medical emergencies they may encounter [10,30,31]. However, there is still a lack of knowledge about GP contribution and participation in pre-hospital emergency medicine [1,2]. In order to examine the utility of GPs in emergency medicine, we need to have a hypothesis about how and where the GPs contribute. Explorative studies, producing knowledge based on the perspective of the stakeholders, are a first step in this process, laying the ground for future observational or experimental studies.

## **2 Objectives**

Overall aim and objective, to:

- examine GP participation and contribution in pre-hospital emergency medicine.

Sub research questions, to:

- explore EMTs' experiences with GPs in pre-hospital emergency medicine (Study I)
- explore GPs' experience of working in pre-hospital emergency medicine (Study II)
- examine GP participation in pre-hospital emergency medicine (Study III)
- examine factors associated with GP participation in emergency medicine (Study III)

## **3 Materials and Methods**

### **3.1 How the project evolved**

The project started by examining EMTs' experiences with GPs in emergency medicine. This was chosen because there was limited knowledge about GPs' participation in emergency medicine, EMTs often work together with GPs in this field, and because the EMTs' perspective on this had not been previously examined. A qualitative method was chosen since the objective was to study the EMTs' experience and perspectives, exploring an area with limited previous knowledge. Focus group interviewing is suitable because it is a pragmatic and still systematic way of gaining insights from different people, and suitable when wanting to explore common experiences, attitudes or views in an environment where people interact. The EMTs could then develop a group discussion mobilizing associations resulting in new reflections [32].

As the project evolved, it became evident that the issue of GP participation in emergency medicine was not sufficiently covered by Study I. Feedback from participants in Study I, colleagues and the scientific community made it evident that there was a need and interest for further knowledge, justifying turning it into a Ph.D. project. The benefit of further exploration of GP contribution and participation in emergencies was reinforced as the project coincided with the national expert panel working on the pre-hospital emergency medicine white paper, and the development of a new regulation of pre-hospital EMS.

The second study in the Ph.D. project examined the GPs own experiences with emergency medicine, to succeed the study of EMTs' experiences. This was also a qualitative study, based on focus group interviews. Rural GPs were included in this part of the project as a way to increase the probability of talking to GPs with experience from medical emergencies, as participation in ambulance call-outs was thought to be mostly a rural phenomenon.

The final study in the Ph.D. project, Study III, was chosen in order to examine GP involvement from another angle. The objective was to examine the total GP population in Norway and their experiences with participation in emergency medicine, and by doing so, complementing the knowledge from Study I and II. The GP perspective was still the objective, as the limited research in this field is largely based on data from EMCCs [25,29]. A survey was developed to map Norwegian GPs' participation in emergency medicine. Using a survey made it possible to study whether some of the results from examining EMTs and rural GPs in paper I and II were applicable to the general GP population. It was also an opportunity to test for associations between self-reported participation and characteristics of the GPs, and casualty clinics.

The project resulted in three papers; two qualitative studies based on interviews with EMTs and GPs, respectively, and a quantitative study based on a national survey of GPs. These papers have made up the basis for analysis and discussion in this thesis.

### **3.2 Study I**

#### **Participants:**

In Study I, in-depth knowledge from EMTs working in rural areas with different levels of experience of working with GPs in pre-hospital emergency medicine, was of great interest. This was solved by using a homogeneous sampling strategy. This is a strategy where the purpose is to describe some particular subgroup in depth, which is well suited when sampling for focus groups [33]. In the paper from Study I, we have not described this strategy in detail but add it here for further information. I contacted the head of the four different ambulance stations by email. Three of the stations were located more than two hours' drive from the nearest hospital. One station that was closer to a hospital was also included, in order to see if they had different experiences there. All four stations accepted the invitation, resulting in four focus group discussions. The interviews were carried out in the fall of 2012, during working hours at the ambulance station. This strategy was chosen because it would be the most convenient for the EMTs, thereby improving attendance, resulting in a higher possibility of reaching EMTs with different levels of experience. Between five and seven participants was the aim when recruiting, as recommended in literature [32]; but all personnel at the station were invited to take part. The focus groups ended up having between five and nine participants, and their work experience varied from less than one year to more than 10 years. Some of the participants were actually on duty while participating, while others were not. On-

duty personnel was included to ensure enough participants. Although this resulted in some minor interruptions and disturbances, the interviews went according to plan.

#### Data collection:

The research group had developed an interview guide based on clinical experience, discussion with EMTs and GP colleagues, and relevant literature [34]. The interview guide was adjusted after each interview based on the new information, in accordance with the tradition of qualitative research [35]. I, Magnus Hjortdahl, did the interviewing, while co-supervisor Erik Zakariassen observed, took notes and had the opportunity to pose follow-up questions. In the first interview, Professor Torben Wisborg also observed, in order to give feedback on interviewing technique. Torben Wisborg is a professor of emergency medicine with previous experience with focus group interviews. The interviews were tape recorded, transcribed by a secretary, and finally Magnus Hjortdahl proofread them. Data collection ended after four interviews, as preliminary analysis indicated that there were sufficient data to answer our research question, and similar patterns started to emerge.

#### Analyses:

The transcribed interviews and notes taken during and after the interviews were analyzed using systematic text condensation, as described by Malterud [35]. This method of analysis was chosen because it is a straight forward, systematic, and a step-by-step way to create categories of knowledge from data. The method aims to elicit meaning-based units, i.e. what interviewees express as significant and meaningful. It was also chosen because the research group had previous training and expertise in using the method. First, the transcripts were read through to get an overall impression. Then meaning units, text that contained information about EMT experiences with GPs in emergency medicine, were identified and sorted. For example, this could be an EMT describing why he thinks it is reassuring when the GP



participates on a call-out, or when the EMT tells us a story about when he had to give medications that he was not allowed to give, since a GP was not present on a call-out. The units were then coded, given a name, and the codes were grouped. The content of each group of codes was then condensed, giving us generalized descriptions about the EMTs' experiences. Finally, the contents of each group were summarized into generalized descriptions of different aspects concerning GPs in emergency medicine, as experienced by EMTs. Each step of the analysis was discussed in the research group. During this process, the group repeatedly went back to the transcribed interviews and field notes to make sure that the interpretations were consistent with the views of the informants.

### **3.3 Study II**

Participants:

In Paper II, the goal was to gain insight into GPs' experiences with emergency medicine - a perspective that has not been explored previously. Focus groups were again chosen as a method as it is suitable when common experiences and attitudes in an environment where people interact is explored, and since group dynamics can lead to extra information [32].

Homogeneous sampling strategy was used to recruit GPs with experience from emergency medicine. In the paper from Study II we have not described this strategy in detail, but add it here for further information. The research group had a hypothesis, that rural GPs are more often involved in medical emergencies than GPs in urban areas. GPs from rural areas in different parts of Norway were therefore invited to participate in the focus group interviews, as a strategy to increase the likelihood that the GPs interviewed actually had experience with medical emergencies. As in the previous study, the aim was to recruit between five and seven participants in each group as this is recommended in the literature. Four focus group

interviews were conducted during the winter of 2015. Recruiting GPs with different levels of experience was done in order to get diversity in the groups, resulting in richer data [32]. The first group consisted of young GPs that met regularly as a part of their specialist training. The other three groups were made up of doctors working at three different casualty clinics in Norway. Contact was established through the GP in charge of the casualty clinics.

#### Data collection:

An interview guide was developed based on clinical experience, information from Paper I, discussions with colleagues, and relevant literature [1]. The interview guide was revised after each interview, in light of the new information obtained during the interviews. Magnus Hjortdahl conducted the interview, while supervisor Peder Halvorsen observed, took notes and had the possibility to pose follow-up questions at the end. Professor Mette Bech Risør observed the first interview, giving feedback on how the interview was conducted. Mette Bech Risør is a professor of medical anthropology, with extensive experience from qualitative research. The interviews were tape recorded and transcribed verbatim by Magnus Hjortdahl. The research group discussed the contents of each interview after it was completed. Gradually the same themes appeared in the GPs' experiences, and we sensed that there was sufficient data to answer the research question. As a result, we concluded the data collection after four interviews.

#### Analyses:

The transcribed interviews, supported by field notes taken during the interviews, were analyzed using thematic analysis [37]. This approach was chosen as it produces both themes and links between themes, often resulting in a coherent story. Connections in the way the GPs thought about participation could be pursued, not merely single-standing categories. The

approach is also flexible as it can be tailored to e.g. a theoretical or inductive approach during analysis, and the data can be analyzed at different levels [37].

The analysis follows a number of steps. Step one was to get familiarized with the data. This process started during interviews, continued by transcribing the data, and finally by reading through the data several times. Codes that identify interesting features in the data were then inductively identified. The coding was also theory driven to some extent, as the research group already was familiar with this field. After the data was coded and collated, themes were developed according to dominant patterns. The codes were then sorted into the different themes and the themes were reviewed. In this process some themes were merged, and others were no longer themes. In this process the research group read through all the collated extracts for each theme to see if they formed a coherent pattern. The entire data set was then re-read to see if the themes agreed with the data and to recode additional data that was missed earlier in the process. The themes were then defined and named, writing a detailed analysis for each theme. Finally, the paper was written, using the themes, subthemes, analysis and data extracts. Peder A. Halvorsen, Mette Bech Risør and Magnus Hjortdahl, all took part in all the stages of analysis.

### **3.4 Study III**

Survey:

The aim of Study III was to examine GP participation in emergency medicine, and to examine the characteristics of the GPs and casualty clinics associated with the GPs' involvement in emergency medicine. To reach this aim we developed a survey, based on the information in Paper I and II, literature and on the research group and colleagues' experiences. We then discussed the questionnaire with Dorte Gyrd-Hansen, professor of health economics,

Department of Public Health at the University of Southern Denmark. The survey was piloted on a group of GPs in the town of Alta.

#### Participants:

All the GPs that were registered as regular GPs by Norwegian Health Economics Administration (HELFO database) (n=4701) were invited to participate in an online survey. The GPs were invited by mail in August 2016. They also got two reminders by mail. To further boost recruitment, the Norwegian Center of Rural Medicine provided news coverage of the study, which was posted twice on a Facebook group for Norwegian GPs with more than 3000 members, and on their homepage. Response rates increased considerably in the days following the Facebook posts.

#### Data collection:

In an online questionnaire (Appendix 1), GPs were asked to report their perceived role in emergency medicine, frequency of on-call duty and participation in call-outs, as well as sociodemographic data and characteristics of the casualty clinics. The GPs were invited by mail, and were given a link which could be used to log on to the web-based questionnaire. We used Questback to provide the web-based questionnaire. Questback is a Norwegian company that has designed a web service where you make a survey online, invite people to participate by going to a webpage, and then get the results as an SPSS file afterwards.

#### Outcome measures:

”Participation” was measured in terms of three items regarding perceived role in emergency medicine (measured on a Likert scale anchored at 1 (small degree) and 6 (large degree)), frequency of on-call duty (response options: weekly (1), monthly (2), twice a year (3), once a

year (4), and not at all (5)) and frequency of participation in ambulance call-outs (response options: “not relevant” (1), “never” (2), “25%” (3), “50%” (4), “75%” (5), and “always” (6))

Independent variables:

GP characteristics included; age, gender, specialist status and number of patients listed.

Attributes of the casualty clinic included; distance to nearest hospital (more or less than an hour), type of casualty clinic (large city casualty clinic, intermunicipality clinic or in a casualty clinic serving only one municipality), staffing at the casualty clinic (whether there was more than one GP working at the same time, whether there was an extra GP at home on standby, and whether there was nursing staff present at the clinic), whether the GP had a dedicated emergency vehicle when working at the casualty clinic, whether the clinic was co-localized with the ambulance service, and whether the casualty clinic held training exercises with other emergency personnel.

Analyses:

Descriptive data of the GPs was presented in terms of means and percentages. Multivariable logistic regression was used to explore possible associations between the independent variables and our primary outcome measures. The outcome variables were dichotomized for these analyses. For frequency of on-call duty, “weekly” and “monthly” were counted as “regularly” whereas “twice a year”, “once a year” and “not at all” were counted as “not regularly”. Taking part in ambulance call-outs was dichotomized into “usually taking part in call-outs” and “usually not taking part in call-outs”. Taking part in “75 percent” or “always taking part” was counted as “usually taking part in call-outs”, whereas “not relevant”, “never”, “25 percent” and “50 percent” were counted as usually not taking part in call-outs. Finally, perceived role in emergency medicine was dichotomized into “playing a large role” and “not playing a large role.” Answering 1, 2, 3 and 4 on the Likert scale was counted as

“not playing a large role”. Answering 5 or 6 on the same scale was counted as “playing a large role”. Analyses was carried out using IBM SPSS Statistics 23. P values <0.05 were considered statically significant. Magnus Hjortdahl and Peder Halvorsen analyzed the data independently.

### **3.5 Ethics and Approvals**

Study I was presented to NSD - Norwegian Centre for Research Data, they decided that the study was not to be subject to notification (Appendix 2: letter dated 02.08.12). Study I was also presented to REC North (Regional committee for medical and health research ethics, North). They decided that the study did not require approval from REC (Appendix 3: letter dated 29.06.12). As Study II was designed similar to Study I, we concluded that Study II did not need approval from NSD or REC. Study III was subjected to notification at NSD (Appendix 4: letter dated 22.06.16). Study III was not presented to REC, as these types of projects are not required to be assessed by REC.

## **4 Results**

### **4.1 Study I**

In Study I, we examined EMTs’ experiences with GPs in emergency medicine. Our analysis produced four major analytical categories : an important supplement, suboptimal care, dysfunctional GPs and perfecting cooperation.

An important supplement

The EMTs told us that they had evolved as a profession over the last years and could now manage a variety of medical emergencies. Despite this, they had experienced the need for GP participation. Important GP contributions were clinical judgment and decision making regarding diagnoses, treatment and whether to admit the patient. GP presence was felt to be of special importance when the patients were children or had psychiatric conditions. The EMTs found that their practical skills complemented the GPs' knowledge and leadership. Bringing the GP to the patient was also thought to improve the quality of healthcare given, since treatment could be given right away and patients could be driven directly to hospitals when needed, without a time-consuming detour to the casualty clinic.

#### Suboptimal care

There were several examples of how the absence of GPs on call-outs had led to delay in diagnosis and treatment. Tending to critically injured patients on their own was described as stressful, resulting in discomfort for the EMTs. In other examples, waiting on the GP before driving to the patient was seen as annoying because they would get to the patient later than necessary.

#### Dysfunctional GPs

Sometimes the EMTs perceived the GPs as being a burden on ambulance call-outs due to limited knowledge or interest in emergency medicine. The EMTs also described problems with GPs that did not know the geography, or had difficulties communicating with the patients and the EMTs.

#### Perfecting cooperation

The EMTs thought that the GPs who worked in casualty clinics and participated in ambulance call-outs should have knowledge and experience with pre-hospital EMS. The EMTs wanted

GPs on one side to be humble and open to the EMT's input, and on the other side, be able to sit down and explain complicated theory to the EMTs when needed. They believed that GPs and EMTs should take part in regular interdisciplinary training, since they had found that this led to better cooperation. They were dissatisfied that not all GPs took part in this training, and that these training schemes often had terminated over time.

## **4.2 Study II**

In Study II we explore GPs' experience of working in pre-hospital emergency medicine. Our analysis produced the following themes: a) Emergency medicine is now dominated by other professions, b) GPs are still an important part of local emergency medicine and c) The decision whether to leave the casualty clinic is difficult.

Emergency medicine is now dominated by other professions

The GPs had experienced that EMS organization had changed, and that the GP now played a less important part. Salient reasons were better trained and equipped EMTs, the increased availability of HEMS and new guidelines. Furthermore, some municipalities had chosen to organize the casualty clinics in a way where the EMTs were left to handle all emergencies by themselves. These changes resulted in less experience and in turn less confidence in emergency medicine for the GPs. That EMTs tend to medical emergencies on their own was thought to be safe by the GPs, but they also thought that treatment improved when EMTs and GPs tended to patients together. Interdisciplinary training, together with EMTs, was suggested as a solution to the problem of diminishing experience.

GPs are still an important part of local emergency medicine



The GPs described taking part in emergencies as an innate and interesting part of being a rural GP. They also had the sense that the local community expected and appreciated that they participated in emergencies. The GPs thought that the quality of emergency medicine improved when they participated as they were better at diagnosing, medication could be given earlier, patients could be admitted directly to the hospital if needed, or else allowed to stay home when admission was not needed. The GPs emphasized that they participated in emergencies in several ways apart from attending ambulance call-outs, e.g. by advising EMTs and others by phone, and seeing patients at the casualty clinic.

The decision whether to leave the casualty clinic is difficult

The GPs told us that they thought it was difficult to decide when to participate on ambulance call-outs. They also had different opinions about when to participate. Some reasoned that the patient in the call-out might be the sickest, and therefore warranted GP participation. Others argued that EMTs handle most cases well by themselves, and that casualty clinics need the GP in order to be functional. The GP told us that they wanted more information from the EMCC before deciding whether to participate, but in the end they had difficulties specifying what kind of information they would want. However, they usually participated when the EMCC information had dramatic content. The GPs often disagreed with the EMCC triage, and argued that the local GP should decide whether to participate on ambulance call-outs.

### **4.3 Study III**

Characteristics of respondents

1002 GPs returned our questionnaire, resulting in a response rate of 21%. Our respondents were fairly representative of Norwegian GPs in general, but differed slightly in some ways:

The mean age was somewhat lower (45 vs 48 years), the proportion of females was slightly higher (44 vs 41 percent), the mean GP patient list was slightly shorter (1044 vs 1128), the proportion of GP specialists was slightly higher (57 vs 53%). 26% of our respondents worked more than an hour by car from their local hospital, which means that rural GPs probably were somewhat overrepresented.

#### GP participation in emergency medicine

Forty-six percent of our respondents perceived that they had a large role in emergency medicine (5 or 6 on a scale from 1=very low to 6=very high). Sixty-three percent of the GPs reported that they were on call regularly (weekly or monthly) whereas 28 percent usually participated in ambulance call-outs when alerted by the EMCC (75 and 100 percent of the time).

#### Associations between GP's participation in emergency medicine and casualty clinic characteristics

Working at a casualty clinic that held multidisciplinary team training was strongly associated with all of our outcome measures. The perception of playing a large role in emergency medicine was also associated with working a long distance from the hospital, and working with no nursing staff. Being on call regularly was also associated with working at a casualty clinic staffed with only one full or part-time physician, and with working at a casualty clinic with no nursing staff. Taking part in ambulance call-outs when alerted by the EMCC was also associated with working in a municipal casualty clinic, working without a GP on standby, and working with no nursing staff.

## **5 Discussion**

### **5.1 Summary of main results**

According to our informants, pre-hospital emergency medicine in Norway has evolved, and now consists of several professions in addition to the GPs. In spite of this, EMTs and GPs find that GPs play an important role in emergency medicine, and that patient treatment improves with GP participation. GPs and EMTs are believed to have different and complementary skills, and participating in call-outs is also seen as an important learning arena for GPs. Our findings indicate that GPs participate on several different arenas, in the GP office, casualty clinic duty and on ambulance call-outs. The EMTs and GPs recommend participation in multidisciplinary team training, and this type of training is strongly associated with GP participation in emergency medicine.

### **5.2 Discussion of results**

In the following section, I will discuss my results in light of current events, relevant theory and empirical studies. Instead of doing a point-by-point discussion of my results, as done in the articles, I have chosen to expand the discussions in the articles by focusing on the two aims of the thesis, contribution and participation. In part one of the discussion, I argue that expected utility theory can be used when deciding how to utilize resources in healthcare, in this case GPs in emergency medicine. In order to use this theory, one needs knowledge about contribution. I then discuss how my results are relevant when exploring contribution, and share my opinion on how further research into GP contribution could be performed. In the second part of the discussion, I focus on team work. I have chosen this perspective because team training was found to be strongly associated with participation in the survey, and teamwork was a recurring theme in the focus group discussions. I argue that GPs are part of

teams in the different specters of emergency care, and that training in teamwork is shown to improve healthcare. Finally, I speculate how the size and localization of casualty clinics may affect GP participation.

### **5.2.1 GP contribution in light of expected utility theory**

Current issues concerning GP contribution in emergency medicine

GP contribution to emergency medicine is currently an issue in Norway and in other western countries. The Norwegian government recently announced that they will pilot a new way of organizing local emergency medicine in rural areas [2]. In the new system, GPs will be replaced by other health care professionals, such as nurses or EMTs already present in the community, as the first point of contact. The argument for introducing this new level of healthcare is, according to the Norwegian Directorate of Health, that it is difficult to recruit GPs in general, and GPs with formal qualifications to do unsupervised duty at casualty clinics in particular, that GPs do not participate enough in emergency medicine, and that casualty clinics are centralizing. This new organization may result in an emergency medicine service without GPs in rural areas. A similar example of task shifting has been introduced in the UK, where a new law in 2018 allows specially trained paramedics to prescribe medications such as painkillers to patients with lower back pain, and antibiotics for urinary tract infection [38]. This is done in an effort to unburden hospital emergency departments, but will probably also be used as a substitute for GP appointments. The Norwegian pilot is in contrast to how western countries, including Norway, have previously introduced GPs into emergency medicine, in order to relieve other parts of the emergency medical services [14,15]. Based on these current issues it is relevant to discuss GP contribution, as this knowledge is vital in order to make the right decisions on the use of GPs in emergency medicine.

## The use of GPs in emergency medicine in light of expected utility theory

The decision of whether inhabitants should be served by local emergency medicine service staffed with GPs or not, or whether GPs should allocate time to work in casualty clinics or take part in ambulance call-outs, can be analyzed using expected utility theory. This is a theory of how we should make decisions under uncertainty. The theory assumes that individuals and society aim to maximize good outcomes (wellbeing, welfare), i.e. utility in economic terms [39]. In order to calculate the expected utility, we need to know the available options (for example using a GP or not using a GP), the outcomes that may follow from each option, the probabilities of these outcomes, and finally the value (utility) of each outcome.

The value of health outcomes is often measured in terms of quality-adjusted life year (QALYs) [40]. QALYs are based on the assumption that number of years alive and quality of life are core values in society, and they are fundamental in health economics. Once we know the probability and the value of the outcomes, we can calculate the expected utility of each option and choose a course of action accordingly. Expected utility theory is a normative decision theory, as it prescribes how we should act. This is in contrast to descriptive theories, which aim to explain what we actually do.

Arguably, GP time is limited and the health authorities have to decide to what extent they want GPs to participate in medical emergencies. The following analysis, albeit crude, may serve as an example of how expected utility theory could inform this decision: When the emergency medical communication center (EMCC) suspects a potentially life-threatening situation, they have two different courses of action. They can include the local GP in the call-out, alternative 1, or they do not include the GP, alternative 2. In both alternatives, the patient can either live without sequela, live with sequela, or die. If we know the probabilities and QALYs associated with the different outcomes, both with and without a GP present, and summarize all ambulance call-outs over a given time, we may calculate the QALYs gained

by GP participation. Next, we calculate the extra cost of GP participation, and consequently the cost per QUALY gained. This can then be compared to QUALYs gained using GP time for other purposes; GP time spent on call-outs has opportunity costs, ie. the alternative activities foregone when GPs spend their time on call-outs. A similar analysis could be used to examine whether the GP, as a health care resource in the local community, would on average do more good spending time in her regular daily practice, rather than in emergency clinics. In principle, the theory could even guide the individual GP's decision whether to participate in call-outs when alerted. Due to time constraints it would be impracticable for the GP in each particular case, but such analyses might inform the development of guidelines.

The findings presented in this thesis are of course insufficient to inform an expected utility theory based analysis. However, we encountered in the interviews that the GPs argued in terms of opportunity costs when considering whether they should stay at the casualty clinic or participate on call-outs. They argued that they contributed more by seeing patients at the casualty clinic than on call-outs since the casualty clinic could not function without a GP. Other GPs, however, argued that they contributed more by taking part in call-outs, as it was more likely that these patients were ill and in need of a doctor.

Furthermore, my thesis (and previous studies) may suggest a good starting point for systematic, large-scale assessment of the utility of using GPs in emergency medicine, as this was a recurring theme in both the EMT and GP focus group discussions. The participants told us that health care improved with GP participation, as he/she could contribute with a more specific diagnosis, and better decision making concerning potential hospital admittance and treatment. However, we also encountered GPs at different casualty clinics that argued that many of the patients could be safely seen by EMTs alone on call-outs. On the other hand, the EMTs told us that they wanted the presence of a GP when responding to children and psychiatric patients, and also when the patients did not respond to their standard treatment

regime. My interpretation of the information from the GPs and EMTs is that they believe that EMTs are capable of handling most life-threatening cases without GPs, by complying with their guidelines. But, they also believed that treatment improves with GP participation, which might be explained by the fact that most medical emergencies are not life threatening, and in these cases, the GP's skills complement EMT guidelines. However, this is explorative data, so we cannot draw inferences on GP utility based on my studies. Yet, my results could be useful when designing further studies. If, for instance, Norway considers allowing paramedics to prescribe drugs like antibiotics and painkillers, it could be relevant to let expected utility inform the decision. However, in order to do this we need data that proves that GP participation leads to better (or worse) treatment, for instance appropriate hospital admittance, adherence to guidelines, on-scene times or patient satisfaction, and ultimately, gains in quality and length of life.

There are, however, limitations to using expected utility theory as in these examples. First, it can be seen as an oversimplification of a complex reality. It is seldom that one course of action is the only reason for an outcome, and the causes can be causally connected in complex ways. If it is too theoretical and removed from context, one could argue that it is of little practical use. Another dilemma is that in order to use the theory you have to use outcomes that can be measured, and there might be several positive (or negative) effects of GP participation that are difficult or impossible to measure in terms of QALYs.

For instance, some might argue that it is difficult to measure whether GP participation in emergency medicine in rural area gives the inhabitants a sense of security. The fact that local health care resources give a sense of security valued by the community, is a recurring theme when health care services are centralized. This sense, that local resources provide safe care, is often at odds with recommendations from the government and experts, who say that

centralization results in better and safer services. This suggests that the feeling of safety in the community is poorly accounted for by the expert definition of utility.

Another perspective that has gotten little attention in this field, is the perspective of the patient. The GPs we interviewed suggested that the patients appreciated that they participated in emergency medicine. One could speculate, like the GPs in Study II did, that bringing the GP home to the patient might be gentler for the patient. However, we do not really know what the patients think. Does it matter to the patient whether a GP participates in emergency care? To what extent does it actually matter to a father whether a nurse, an EMT or a GP, examines his child? It is a paradox that we do not have the answer to these questions while the patients' values and preferences are in focus, nationally and internationally.

Empirical studies relevant for GP participation in emergency medicine.

It is often difficult to assess the severity of the patient's condition in pre-hospital emergency medicine. This is often the case if you examine or get information concerning the patient early on during the course of the disease or injury, since many cases are similar at the onset. To determine whether the patient will become critically ill or not, is indeed a judgment made under uncertainty. An example of this, is the study from an island in western Norway where emergency calls were reassessed by the local GP. The GP downgraded 43 percent and upgraded 11 percent of the patients after examination [41]. This study suggests that it is difficult to triage patients, especially by phone. A study on pre-hospital management of stroke in Norway from 2017, found that healthcare personnel answering the phone at doctors' offices had difficulties identifying stroke, when the symptoms were not clear cut. The stroke study is another example of challenges assessing patients in pre-hospital emergency medicine [42]. Finally, a recent study of pre-hospital trauma care in Norway showed that only 50 percent of



severely injured patients were offered advanced pre-hospital care by HEMS, and problems with precision in dispatch was thought to be one of the main reasons for this. This indicates that in trauma, as well as in medical emergencies, it is difficult to determine the severity of the patients early on [43]. When we interviewed the GPs, we heard that they thought it was difficult to decide when to participate on call-outs based on limited information from the EMCC. The GPs also struggled to identify what information that would simplify this decision. I speculate that this can be another example of how difficult it is to assess patients based on limited information. The difficulty of assessing patients in emergency medicine can be used as an argument to include local GPs in emergency medicine as they are, according to our informants, better at diagnosing patients.

In most emergency alerts, the patient turns out to be in a non-life-threatening situation with no need for advanced medical procedures. For example, in a large epidemiologic study of red responses, 90 percent of the problems were medical, and 70 percent of the patients were in a non-life-threatening situation [44]. A similar picture was found in a study of patients treated by anesthesiologist-manned helicopters and rapid-response car service in the western part of Norway, where only 7% of the patients were in need of advanced medical procedures [45]. GPs are trained in treating general, unselected and non-life-threatening conditions, while EMTs are largely trained to focus on a few life-threatening conditions. It is also relevant that GPs see far more patients every day than EMTs, and therefore have greater experience with patient examination. The fact that most emergency situations are not life threatening, may explain why the EMTs and GPs we interviewed argued that GP involvement improves patient care by complementing EMT skills.

Even though most medical emergencies are not life threatening, others may argue that life-threatening medical problems should be the basis for organizing emergency medicine. As the treatment of life-threatening conditions often follows pre-planned treatment algorithms, one

could argue that there is less need for doctors in emergency medicine. This argument rests on the assumption that the patients will be treated by highly trained EMTs. Yet, the GPs we interviewed found that they played an important role in life-threatening situations as well. This experience may be influenced by the fact that we interviewed rural doctors. For example, the GPs argued that they played an important part in local emergency medicine since they occasionally were the only emergency resource available in the community. They also experienced having patients with life-threatening conditions turn up, directly at the casualty clinic. This was seen, by the GPs, as another example of why rural doctors cannot be excluded from emergency medicine. The GPs also told us that as there are limited pre-hospital resources in rural areas, they might also contribute with an extra pair of hands, in for example cardiac arrests. As medical emergencies are rare, and few people live in rural areas, the EMTs as well as GPs, will have limited experience treating these patients. As an example, ambulance personnel in the northern counties of Norway will on average participate in one ambulance call-out every sixth day of working [46]. Therefore, I argue that all local resources, including GPs and EMTs, should be utilized in life-threatening situations, to compensate for the limited experience of the individual professional. According to the GPs we interviewed, GPs in rural areas play an important part in life-threatening situations as well, contributing with experience and extra hands.

Another GP contribution in emergency medicine, is the role of the gate keeper. In this system, the patient has to see a GP first. The GP will treat most patients by himself, and refer only the patients that need to see a specialist. An example of this in our study, was that EMTs and GPs described how patient treatment improved with GP participation on call-outs, since hospital admittance was avoided in selected cases. The system of gate keeping is thought to be a more efficient use of resources, letting the specialist focus of the more complex cases [47].

According to expected utility theory, this could be an example of maximizing the utility by

being cost effective. In Norway, the casualty clinic GPs will treat and discharge most of their patients, leaving the hospital EMS to take care of the potentially life-threatening situations [1]. This has been one of the main arguments for GP-run casualty clinics in Norway, and is now also being tested in several other countries. It is possible that a new system, with emergency medicine delivered by non-physicians, might lead to more patients being admitted to hospitals, crowding of the EDs, costing more money, and resulting in poorer health care. On the other hand, the gatekeeping system is controversial as it is claimed to delay diagnosis and be a hindrance to shared decision making [47]. It is therefore possible that too few patients are admitted to hospitals, and that removing the gate keeper function would actually improve the healthcare. However, it is shown that countries that have strong primary healthcare services also have the best health among inhabitants, and a strong equity of healthcare [48].

It is also relevant to examine emergency medicines' place in general practice. Although the GPs we interviewed, and 46 percent of the GPs that participated in the survey, experience playing a large role in emergency medicine, this contribution comes at a price. It is currently a growing concern that GP are exhausted by too many responsibilities. Consequently, experienced GPs quit the profession, while young doctors are reluctant to become GPs. This is a cause for concern, since a failing primary healthcare system can topple the healthcare system as a whole [48]. Taking part in medical emergencies and working at casualty clinics on top of working as regular GPs, are some of the strains that GPs face [49]. A survey of Norwegian GPs from 2012 found that most Norwegian GPs find emergency medicine meaningful, but they want to spend less time on it [50]. It is, therefore, relevant to examine GP contribution in emergency medicine further, and then discuss if this contribution is so important that it justifies the extra workload.

A challenge when examining utilization of GPs in light of empirical studies, is the lack of evidence in this area. This lack of evidence, as reported by the Norwegian expert panel and

the Norwegian Knowledge Centre for the Health Services, is not only a national problem [1,2]. Several systematic reviews of organization and utilization of physicians in emergency medicine could not conclude because of lack of studies. In 2017, a Cochrane review aimed to assess the quality of care and patient satisfaction in walk-in clinics [51]. This was because of a growing concern of the clinical efficacy of these, often nurse run, clinics compared to primary care practices or emergency rooms. This review, which is relevant when considering the new non-physician based emergency medicine providers in rural Norway, could not identify any articles that fit the study criteria. A similar Cochrane review from 2018, examined the safety and efficiency of using primary care providers (GPs and nurse practitioners) in emergency rooms [52]. This study was conducted because several hospitals are introducing primary care providers in emergency rooms to mitigate problems with overcrowding. The study could not conclude either, because of lack of studies. Finally, there has been a long-lasting international discussion about the use and utility of emergency physicians, including the use of HEMS versus EMTs and ground-based services in pre-hospital emergency medicine. These discussions, which can be viewed as an equivalent of the national discussion about utility of GPs in emergency medicine, have not reached a clear conclusion [53,54]. The authors point out several challenges when designing these types of studies. Since few patients actually are in a life-threatening situation, it will be difficult to design studies with sufficient power to detect differences in terms of mortality or quality of life. As there are several different units that take part in the treatment, it is difficult to pinpoint how a single part of the chain affects the outcome. Furthermore, the difference in organizing EMS systems makes it difficult to compare, and ethical considerations can make it difficult to do randomized controlled trials [54]. Although these reviews do not explore the utility of GPs in pre-hospital emergency directly, they illustrate how the heterogeneity and complexity of EMS systems make it difficult to obtain the data we need to make good decisions [55].

## **5.2.2 GP participation, with emphasis on team work and interdisciplinary training**

The official policy in Norway, is that GPs are an important part of pre-hospital emergency medicine, that casualty clinics should be run by GPs, and that GPs should participate in ambulance call-outs when on casualty clinic duty. Given this perspective, and in light of the results in Study I and II suggesting that GP participation improves patients' treatment, according to EMTs and GPs, it is relevant to explore which factors that may be associated with GP participation. We explored these factors in the survey in Study III. As we found a strong association between interdisciplinary team training and GP participation, I have chosen to discuss the GP's role as a team player and the rationale for interdisciplinary team training. Finally, I will briefly present the possible association between GP participation, and casualty clinic size and location.

### **Current trends related to teamwork and interdisciplinary team training**

Pre-hospital and in-hospital emergency medicine has evolved over the last decades. Diseases where only symptoms used to be treated, like cardiac infarction or stroke, are now cured by giving advanced treatment, both pre-hospital and in-hospital. There has also been a change in who delivers the advanced pre-hospital care. A number of different professionals with different expertise work together as a team in order to give the patient optimal treatment. This may include EMCC, GPs, casualty clinic nurses, EMTs, helicopter personnel and other healthcare and emergency personnel [1]. The GPs that participated in our interviews described this evolution. They told us how their role in emergency medicine had changed over the last decades, from being the single provider of emergency care to now having to cooperate with a number of different professions. The EMTs also described a change, from only transportation of patients to now being an important resource in emergency medicine. Increasingly, team work is becoming the norm in hospitals as well as primary healthcare. In

Norway, new kinds of teams are being introduced in primary healthcare, outside of emergency medicine, such as “primary health teams” and “follow-up teams”. Since pre-hospital EMS has evolved into an interdisciplinary field, it is now required by law that the professionals working together in pre-hospital emergencies also have to train together. The training will usually involve casualty clinic personnel and EMTs, but other professionals can also participate when relevant. About half of Norwegian casualty clinics reported that they carried out interdisciplinary team training in 2016 [31].

### Teamwork in healthcare

A team can be defined as two or more people working together to reach a common goal. They have task-specific competencies, specialized work roles and shared resources. The members in a team have to communicate with each other in order to coordinate and adapt to change. Medical teams, especially in dynamic domains such as emergency medicine, often work under changing conditions, may be assembled ad hoc, have changing team membership, and often only work together for a short time. These teams often consist of several specialist crews, and have to integrate different professional cultures. These kinds of teams are often called action teams [56,57]. The EMTs and GPs we interviewed described how they, as different professions with different and complementing knowledge and skills, worked together when they treated patients that were in potentially life-threatening situations, and by doing so, working as an action team. They believed that the quality of healthcare improved when the patients were seen by both professions. They also commented that it was important to know each other in order to work well together.

One can argue that most emergency medicine cases are not life threatening, and that the GP then works by himself and not as part of a team. Even though the GP often sees the patient by himself, in these non-life-threatening emergency situations, there are usually a number of

other people involved. The patient or relatives might have talked to nurses or other staff before seeing the GP. The GP may need assistance from other healthcare personnel while examining and treating the patient. Sometimes, the GP has consulted a specialist at the hospital. Other times, homecare or nursing home personnel get involved in the treatment and follow up. EMTs are sometimes included in these non- life-threatening situations as well, as they assist with transportation. One could also argue that relatives, and the patients themselves, are members of the team [58]. All these people, with different competencies, work together in order to achieve a common goal – i.e. the best possible treatment. This team also has several of the characteristics of an action team, as it is made up ad hoc, and might only work together for a short time.

Empirical studies about teamwork and team training.

There is growing evidence of the positive relationship between teamwork and quality of healthcare. A review of research on teamwork in highly dynamic domains of healthcare found a relationship between teamwork and patient safety [57]. Teamwork was found to play an important role in the causation and prevention of adverse events, and staff's perceptions of teamwork and attitudes toward safety-relevant team behavior were related to the quality and safety of patient care [57]. The relationship between teamwork and quality of healthcare was also present in our interviews, as the EMTs and GPs found that they contributed with different and complementary skills and knowledge, resulting in better treatment when both professions participated.

Recent research has demonstrated the relationship between team training and improved patient outcomes. A study from Scotland, found that regular in-situ training of pediatric medical emergency teams leads to improved response to deteriorating patients by healthcare providers, improved outcomes in intensive care, and financial savings [59]. In another study,

implementation of team training was associated with fewer serious complications and lower mortality in critically ill patients [60]. Similar results are emerging in Norway. A study of interdisciplinary team training of pre-hospital emergency teams in northern Norway, consisting of casualty clinic nurses, GPs and EMT personnel, found that this way of training is a good arena for learning, resulting in social and structural improvements [61]. A survey of team training participants in the same area, reported a significantly improved confidence in their own role and the correct order of necessary procedures [62]. Furthermore, taking part in simulation-based training was found to be an important success factor when analyzing the pre-hospital and intra-hospital response to the grave terror incident in Norway, July 22nd, 2011 [63,64]. The usefulness of interdisciplinary team training also emerged as a theme when we interviewed the EMTs and GPs. Taking part in interdisciplinary team training was put forward as a way to improve cooperation and teamwork. Some of the GPs explained how training was an important arena for getting acquainted with the EMTs. There were GPs that felt that medical emergencies were rare, and that their limited experience made it uncomfortable to participate in emergency situations. Taking part in team training was seen as a solution to this problem, reducing the anxiety of participating in ambulance call-outs. When interviewing EMTs, team training was suggested by several EMTs as an important way of improving patient treatment, since it would let the different professions learn and respect each other's knowledge and capabilities. Many of the ambulance stations and casualty clinics had participated in this type of training, but several of them had phased it out over time. This fits with our findings that only 28% of the GPs in our survey reported that their local casualty clinic arranges this type of training annually.

Interdisciplinary training was also the strongest predictor of participation in emergency medicine among the GP respondents in the survey. This is an important new finding, as it indicates that team training might influence the quality of healthcare by affecting the



resources that respond to medical emergencies. However, given the study design, I cannot prove that team training leads to increased GP participation. But given the strong association and known positive effects of team training, it appears reasonable to investigate this link further.

The EMTs and GPs we interviewed told us about the evolution of pre-hospital healthcare and how they now often worked as a team in the life-treating situations. Arguably, GPs take part in several different teams when they participate in emergency medicine, not just in the life-threatening situations. Team work is increasingly the norm in healthcare in general, and as team training is not only mandatory by regulations, but also associated with better patient care and involvement, more pre-hospital EMS personnel should participate.

#### Increased participation at smaller casualty clinics

GP participation in emergency medicine, defined by us as frequent casualty clinic duty, participating on ambulance call-outs, and perceiving to play a large role in emergency medicine, was also associated with working at a casualty clinic without other healthcare personnel. A possible explanation for this association is that it is the absence of other healthcare personnel that leads to increased GP participation; when you are the only healthcare personnel present, you may feel that you are a vital part of local emergency medicine.

Another explanation might be that casualty clinics without allied health care professionals are smaller, and that this, rather than the absence of other professionals per se, explains the association with participation in emergency medicine. However since we did not ask about number of inhabitants served by the clinic, or the population of the municipality, it is not

possible adjust for this. In areas with small populations, there will be fewer GPs to share the casualty clinic duty, resulting in more frequent casualty duty for the individual GP. Casualty clinics in areas with small populations also often have limited personnel present at the clinic. This could explain an association between working alone and frequent casualty clinic duty. Interestingly, in the multivariable regression models, working at a distance from the nearest hospital was associated with perceiving to play a large role in emergency medicine, but not with doing casualty clinic duty or participating on call-outs.

The GPs we interviewed told us that they had experienced that the local community appreciated that they participated on ambulance call-outs. They also reported that it was natural that they participated in emergency medicine when working as a GP, as they cared for their patients in non-emergencies, and would continue to care for them after the emergencies. Taking part in emergencies was also described as a natural part of being a rural doctor, by some of the GPs. These examples might explain the association between working in casualty clinics without other healthcare personnel, and participating in emergency medicine. It is not possible, using our results, to prove that GPs working at smaller local casualty clinics participate more in emergency medicine. However, this is an interesting finding that would be relevant to explore further. Especially as there has been, and probably will continue to be, a trend toward centralizing into fewer and bigger casualty clinics serving larger areas and greater populations.

### **5.3 Methodological considerations**

In this project, we have chosen two different methodological designs that include the use of two different methods to produce knowledge, from different research traditions, with their own characteristics and procedures. Although the methods arise from quite different research

paradigms, scientists argue that the same standards can be applied to both, but that the content of the standards then need to be tailored to the individual method [36]. However, applying the same criteria to different methods is debated, and other scientists argue that to judge qualitative and quantitative studies using the same criteria is problematic [36,65]. In this section, I have chosen to discuss the use of the two methods using the same criteria: reflexivity, internal validity and external validity, while I acknowledge that this is one of several different ways of evaluating these methods. I made this decision as I believe that there are some basic principles that apply to all science, independent of method used. I will start by discussing the choice of methods and how they interact. I will then discuss how my background, positions and perspectives might have influenced the project, the issue of reflexivity. Finally, I will discuss the internal validity of the findings and how the findings can be used in other settings, external validity.

### **5.3.1 Choice of method**

The overall aim of this project was to examine GPs' participation and contribution in emergency medicine. We decided to start examining this topic using qualitative methods. This gave us the opportunity to develop explorative and nuanced knowledge. We then wanted to examine the general GP population, by using a survey partly based on the knowledge gained from the explorative studies.

Since the aim of the first studies was to examine EMTs' and GPs' experiences with GPs in emergency medicine, we chose to use focus group interviews. This method was chosen because qualitative methods are appropriate when exploring a field with limited previous knowledge [36]. As we wanted to take part in the EMTs' and GPs' experiences and their mutual interpretation of these experiences, we chose interviews, and not observations, to

collect data. It would, however, be interesting to supplement our findings with observational studies. They can tell us more about what GPs actually do in emergency medicine. This could have given the project a new dimension, and interesting perspectives to discuss in the focus groups. Although we did not have observational data, we had some previous knowledge about GP participation in emergency medicine, as several of the members of the research group have extensive experience from working in pre-hospital EMS, in different professions. This experience was, along with scientific literature, the basis of the interview guides. However, an observational study will not give us information about how the GPs think, evaluate and interpret when they act. One-to-one interviews could have been a relevant alternative to the focus groups. This might have given the participants the possibility to talk about issues that they would be uncomfortable raising in the group. The opposite is also possible. That they felt secure since they were together with their colleagues, and therefore talked about issues they would not be comfortable relating to us on their own. An example of this could be that in both the EMT groups and GP groups, the participants shared experiences and thoughts that differ from the professional norm.

In the last study, we sought to examine GP participation in emergency medicine in the total GP population of Norway. We did this by survey. We chose survey as it is a pragmatic way to reach many individuals in a population, in order to get their perspective. We argue that this perspective is important to supplement the research already done on GP activity from EMCC data. By using a survey we also had the opportunity to ask the GPs directly about their opinion, like how they assess their role in emergency medicine. We could not have done this using active data from EMCC. A survey gave us the opportunity to ask for details about the GPs and their workplace, and compare this to information on work load, which would have been difficult using existing data. This method also gave us the opportunity to test for factors associated with GP participation. The challenge with using self-reported survey data, is that

we do not know whether what the GPs report actually is correct. This leads to several possible biases. This does not imply that it is impossible to use data from surveys, but it is important to bear this in mind when interpreting the results.

Although this project does not have a definite mixed method design, the choice of methods and the relationship between them is not incidental [66]. It was a deliberate decision to start the project with qualitative studies, and then to follow with a quantitative study. The knowledge from Study 1 and 2 acted as a basis for developing the questionnaire. This was important, as there was no validated questionnaire in this field that we could use. We were also able to use knowledge from the first two qualitative studies when interpreting the findings from the survey. To let studies, carried out using different methods, collaborate in this way is recommended when there is limited knowledge in a field [36]. Thus, I claim that the different studies in the project, with their different methods, complement and enhance each other.

### **5.3.2 Reflexivity**

The concept of reflexivity, which is a premise for quality research, is based on the assumption that the researcher will always influence the different steps of a research project in some way or another. What we investigate, the angle we investigate from, the methods we use, and how we frame and communicate our findings, are all affected by the researcher's background and position according to Malterud [36]. Objectivity is therefore not a goal, but the goal is to identify and reflect on one's own position throughout all research phases, as well as to use a reflective stance to constantly question, evaluate and contextualize any research premise and finding. Although reflexivity is often highlighted in qualitative research, scientists also argue that this concept is valid when doing quantitative research as well. I will address reflexivity

by presenting my background, motives and perspectives and how they might have influenced every step of the research project, in the following section.

My experience with EMS started in 2004, when I worked as a locum EMT in Oslo, the capital of Norway, during medical school. At the end of medical school, I also worked as a locum physician at the Oslo Accident and Emergency Outpatient Clinic, which is a large casualty clinic. Through these experiences, I got the impression that EMTs were well trained, had a lot of experience, and could cope with most emergency situations on their own. I seldom met GPs participating in medical emergencies outside of the casualty clinic in Oslo. Most of the education about emergency medicine at medical school was carried out by EMTs and anesthesiologists, and many of the prominent experts in the field of pre-hospital emergency medicine in Norway are anesthesiologists working with the helicopter-based air ambulance service, not representatives of GP run casualty clinics. This might have strengthened my impression that GPs play a small part in emergency medicine outside hospitals, and I think that I brought with me some of this preconception into this Ph.D. project. I have also worked as a GP in rural parts of Norway during this project. The first four years were in a town with 20.000 inhabitants, two hours' drive from a hospital. As a result of these conditions, the town had a well-functioning, high quality, GP-manned casualty clinic and ambulance station. In this town, we had regular ambulance call-outs, and the casualty clinic personnel worked and trained regularly with the EMT personnel. The last two years I have been working at a small casualty clinic, serving 2000 inhabitants located two hours' drive from the nearest hospital. In this little village I worked mostly alone, but there was also one ambulance that I worked with from time to time.

I have experienced that GPs and EMTs can be highly trained and involved in pre-hospital emergency medicine, but I have also experienced that in rural areas you often work by yourself, and GPs and EMTs have limited experience, since they seldom treat severely injured

patients. These different experiences have probably influenced my Ph.D. project in different ways during its progress. My preconception at the start of the project may have led me to underestimate the use and benefit of GPs in emergency medicine. I felt that pre-hospital EMS was a field best served by the ambulance EMTs and ambulance helicopters. My experience from working in the town with 20.000 inhabitants, during the first years of my Ph.D., might have made me overly optimistic about the pre-hospital emergency treatment in rural areas. There I worked at a casualty clinic where emergency medicine was a priority in regards to staffing, equipment and training, resulting in a local pre-hospital EMS that probably is more advanced than most rural communities. This optimism was then adjusted after working in the small village with limited resources and few patients, during the last years of my Ph.D. I then experienced that local pre-hospital EMS also is carried out with few resources and limited training. Nevertheless, I still felt that the local ambulance team and I, as the on-call GP, were important providers of EMS in the local community, and that a few local and dedicated resources can have a large impact. Having had hands-on experience with the field that I am studying, before and during the project have pros and cons. One possible pitfall is to believe that all other casualty clinics are the same as the ones that I have been working at, and that my personal experiences are general GP experiences. I have tried to counter this by being aware of this pitfall, trying not to interpret the data to fit my beliefs, and always discussing the findings and my interpretations with the research group. However, it is also a strength that I have in-depth working experience from three distinctly different casualty clinics. This made me realize how different pre-hospital care throughout Norway actually is.

The fact that the research team has experienced members from different EMS professions, as well as different research backgrounds, has been an important tool to improve flexibility and validity throughout the project. My background as a GP and researcher in the field of prehospital EMS, might also have influenced the participants during the focus group

interviews. One could speculate that the EMTs would speak more highly of the GPs' role in EMS in order to please me. The same might be the case of the GPs. We were aware of this possible influence and during the interviews we explicitly stated that there were no right or wrong answers to our questions. I was also conscious of how my own beliefs and experiences influenced me while I carried out the interviews. We believe that since participants in the EMS groups and GP groups put forward views that are contrary to my preconceptions and the official norm, we succeeded in limiting this influence during the interviews.

It has also been a strength to the project that I have a background in the field. It has helped me to communicate with the EMTs and GPs, as we share a common background and language.

As mentioned above, some scientist argue that reflexivity is just as relevant in quantitative papers [36]. For example, I believe that the preconceptions discussed in connection with the qualitative studies are also relevant when I planned, performed and analyzed the survey study. When we developed the survey I was aware that my personal experiences as a GP, that led me to believe that GPs might be an important resource in the local community, would affect the formulation and design of the questionnaire. To counter this effect, we made sure that the questions reflected the knowledge from Study I and II, we discussed the questions in our research group and with an external expert, and we piloted the survey on a group of GPs. We have also shown and discussed the results with colleges in Norway and abroad, during and after analysis, in order to get feedback and to challenge our interpretation. The possible importance of participation in interdisciplinary team training is one of the main results in the survey. I have had a part-time job as an instructor in this type of team training since medical school, and have begun to believe this is an efficient way to improve the local EMS. It is conceivable that this has influenced my work when evaluating the impact of this result.



### 5.3.3 Internal validity

Internal validity is the question of whether the results of the study are trustworthy or if they are artifacts of the way the study was designed or conducted. The correct choice and quality of study design, data collection and analysis are key points when evaluating internal validity [67].

#### Paper I + II

Internal validity is often referred to as credibility in qualitative research, and the question is whether the study and its design is able to answer the research questions posed [36].

According to Mays and Pope there are several strategies that can improve validity in qualitative studies [65]. The strategies are triangulation, responder validation, detailing of data collection and analysis, reflexivity, attention to negative cases and fair dealing. I will now discuss how I have, or could have, used these strategies to improve the validity of this project.

Triangulation is a strategy where different methods for collecting data (for example interviews and observations) or sources with different perspectives are used. Even though triangulation is listed here as a strategy for validation, it should not be seen as a way to test some data by seeing if it is present in other data. Triangulation is recommended as a way to get a richer interpretation, and to explore if the inferences made in different analyses may converge. I did not use triangulation as a deliberate strategy during the different studies, but one can argue that interviewing GPs in Study 2 about the same themes as we used interviewing EMTs in Study 1, could be seen as a way of triangulation. It would have been interesting to triangulate our data with observational data in a later stage.

Responder validation is a strategy to let the responders and researchers check that they have the same account. This is seen as a strong validation strategy, but has limitations as the responder might not agree with the researcher's analysis, since this analysis is often based on

several responders, theories and own experience. Responder validation can be a useful strategy to avoid misinterpretation and to clarify issues. We did not use responder validation in our studies, and as a result we might have overlooked misinterpretations. One can argue that as we did several consecutive focus group interviews in the same population, we had the possibility to clarify issues in similar groups, although this is not responder validation per se.

We have sought to be as thorough and detailed when describing the process of data collection and analysis as feasible, when writing papers for medical journals. We hope that this gives the reader the possibility to judge whether the interpretation is supported by data, and by doing so, improving the validity of the papers. We acknowledge that these descriptions could be even more detailed than presented, but argue that we have produced is a compromise between demand for information, limited space in medical journals, and seeking to maintain anonymity.

I argue that the analytical approaches were relevant in order to explore the data material and produce knowledge on the research questions. The analytical approaches made it possible to develop categories and themes that were experience-near or made up a coherent line of statements/story across cases from focus groups. The analysis produced knowledge that was helpful when designing the survey in Study III, and when interpreting the data from the survey.

Throughout the project I have tried to be aware of how my background and my preconceptions have affected the different parts of the project. I have discussed this, the issue of reflexivity in more detail in the section above.

We tried to be aware of, and actively look for, data that contradicted the emerging explanations, during the interviews and when analyzing the data, as a strategy to gather a rich data. An example of this was when the younger EMTs and younger GPs expressed opinions

about the use of GPs in emergency medicine that differed from their older peers. Finally, we tried to ensure that all members of the groups had the opportunity to share their experiences and take part in the discussion.

We have also attempted to improve the internal validity by the way we have organized the research team. I have lead all interviews, but I have always had an observer taking part. The observer, Erik Zakariassen in Study 1, and Peder Halvorsen in Study 2, have had the opportunity to observe and pick up issues that I might have overlooked. We also included a senior researcher with experience in qualitative methods as a third member in the first interviews of each study, Torben Wisborg and Mette Bech Risør, to observe and comment on how we conducted the interviews. By doing so, we were given the possibility to reflect on and improve the data collection. Finally, we involved the whole research team in the analysis and writing of the papers in order to get more perspectives and experiences, and to balance my preconceptions.

### Paper III

The aim of this study was to examine GP participation in emergency medicine. To answer this question, we used self-reported data collected using a survey. In order to assess the validity of this study, it is important to discuss the choice of method, outcome variables and whether we can trust the data.

One could question whether self-reported data is the best method for answering this research question. Would it be better to answer this question using data based on observation? I acknowledge that it is important to observe and count number of times a GP takes part in a call-out. However, it is also important to examine this by self-reporting. Firstly, we used self-reported data as we were interested in examining GPs' perceived role in emergency medicine. As this is a question related to the GP's own view, it is not accessible through observational

studies. Secondly, we wanted to examine details about the individual GP, his workplace and how often he took part in casualty clinic work and ambulance call-outs. As this data would be difficult and resource-consuming to collect, using a survey is consequently a more feasible solution. This information can also be used to test for associations between GP and workplace factors, and GP participation in emergency medicine. This new knowledge, based on data from individual self-reported GP characteristics and participation, will add depth and nuance to previous knowledge-based observed group data on GP participation.

Another issue is the choice of outcome measures. In order to answer the question about GP participation in emergency medicine, we chose the following outcome measures: Perceived role in emergency medicine, frequency of being on call, and proportion of ambulances with GP participation. Splitting participation into these three different outcomes, was a result of context as well as results from the first two studies. The context was the discourse that GPs are pulling out of emergency medicine, which was based on the number of ambulance call-outs that the GPs participate in. This argument is founded on the assumption that participation in emergency medicine equals participation on ambulance call-outs. Study I and II gave us new perspectives that challenged this assumption. The GPs found that they played an important role in emergency medicine, while they did not see the need to participate on all ambulance call-outs. The GPs explained that they participated in several different arenas like their regular office, casualty clinic, by phone, as well as taking part in ambulance call-outs. This led us to examine different types of participation in the survey. We asked about casualty clinic work as well as ambulance call-outs, in order to see if different arenas matter. We also included the question about role in emergency medicine, since we acknowledged that there might be a dimension of participation that we did not capture by asking about participation in different arenas. One could argue that asking a GP about how he perceives his role in emergency medicine is subjective and difficult to define. Can we infer knowledge about GP

participation based on this subjective question? One could argue that GP participation can only be measured using data from registers counting number of times GPs participate.

Although the subjective question about perceived role cannot give us exact information about GP participation, it does give valuable information about how one of the main actors in pre-hospital emergency care in Norway, perceives their contribution. We hoped that by surveying these different types of participation we would provide new perspectives, thereby nuancing the discourse of GPs' participation in emergency medicine.

There is also the question of whether the outcome measures overlap. In the analysis, we considered a model with the GP's perception of his/her own role as the main outcome measure, adjusting for working at casualty clinics (being on call) and participation in call-outs. However, during the analysis, we realized that the three variables might be causally related in complex ways that we were not able to account for in a simple cross-sectional design. For example, they might be intermediate steps in a casual chain, so we decided that it would be best not to put them in the same model.

Although self-reported data is commonly used in research, it is often debated whether we can trust the data. When assessing the validity of self-reported data, several biases should be accounted for. The participants might misunderstand the questions, they might deliberately answer wrongfully, or they may have difficulties remembering the right answer [68].

When conducting a survey it is important that the respondents understand what you are asking. I do not believe that this was a big problem in our study. As the participants were Norwegian GPs and it was piloted on Norwegian GPs, I anticipate that the majority of the GPs understood the questions. Since the survey was voluntary, and concerns an issue that is relevant to GPs, I also believe that most participants treated the survey seriously, giving few nonsense answers. Social desirability bias is a phenomenon where the responders are not

answering truthfully, in order to appear socially desirable [68]. This is often reported when the participants are asked about sensitive topics like drugs or criminal behavior, especially if anonymity is not guaranteed, or the answers are traceable back to the respondents. I believe that it is less likely that social desirability has an impact on our data. Firstly, the topic we examined, GP participation in emergency medicine, is not very sensitive. Secondly, there are no obvious right or wrong answers. And thirdly, we facilitated honest answers by designing the questions and data collection to ensure anonymity. Lastly, it is an issue whether the respondents remember the answers to our questions, called recall bias [68]. This is an important validity issue in retrospective studies where scientists try to map different exposures. I do not consider recall bias to influence our data as much, as we asked the GPs about more general questions related to present issues, like if they presently worked at a casualty clinic monthly, once half a year, or once a year, and not detailed questions.

Another possible bias in surveys is acquiescence bias, or “yea-saying”. In this type of bias the respondent tend to answer yes to all questions, or sometimes no. One of the reasons for this bias might be that there are too many questions, so the participant reaches a survey fatigue. We tried to minimize acquiescence bias avoiding leading questions, by limiting the number of questions, and avoiding simple yes/no answers.

#### **5.3.4 External validity**

The issue of external validity is important in quantitative as well as qualitative research. However, what is meant by external validity differs between the two methods. In qualitative research, we use the expression “transferability” and in quantitative we use the expression “generalizability” [36]. Transferability is the question of range and limitations for the application of the study findings, beyond the context in which the study was done.

Transferability is supported by an adequate sampling strategy and the effort to make strong, general arguments [36]. Generalizability in quantitative methods is the act of drawing broad inferences from particular observations, usually from a sample to the population that the sample presumably represents.

## Paper I + II

### Transferability

Transferability is closely related to the adequacy of sampling, and the selection of information-rich participants [36]. In other words, transferability is dependent on a relevant sampling strategy - who are the participants, how and why were they selected to participate. Second, transferability relies on the effort to analyze and contextualize findings to an extent that the reader of these is able to understand how findings may have general value, and be applicable to other contexts. Related to transferability and evaluating qualitative research, it may also be appropriate to consider usefulness, i.e. how the knowledge can be applied in an everyday setting [69].

For Study I, we sampled a mix of on-duty and off-duty personnel, in total four focus group interviews with five to nine participants in each, both genders, and working experience from under one year to more than ten years. As participation was voluntarily, we expected that the participants were interested in emergency medicine, and had experiences and opinions that they wanted to share. Using data from experienced participants is considered a strength in qualitative studies, but the researchers have to be cautious so that those who represent differing views are given the possibility to present their experience. We believe that we achieved this, since we encountered both positive and negative experiences, and views on the use of GPs in emergency medicine. The views and experiences were similar among those working close to and far from the nearest hospital. This was, however, not analyzed and

discussed thoroughly in the paper, and as a consequence we cannot draw inferences from this. Because the interviews in Paper I were done in rural areas in different parts of Norway, with personnel of both genders and a variety of experience, and because the analysis aimed to move it beyond the actual study, we think that our findings in Paper I are useful when discussing the GPs' participation in emergency medicine in rural Norway, from an EMT perspective. They may also have transferable value for other researchers and readers in terms of the findings on how working and training together can improve teamwork.

In Norway, nurses and GPs often work together at casualty clinics, not unlike the situation when GPs and EMTs work together on ambulance call-outs. It is probable that our findings of how the different professions have different knowledge and skills that complement each other, and that interdisciplinary teamwork may improve patient care, is transferable to the teamwork of casualty clinic nurses and GPs. It is possible that some of our findings are relevant for EMT personnel in rural areas in other countries as well.

In Study II, we collected data from a group of GPs in training, and from GPs working at three different casualty clinics in rural Norway, in the winter of 2014. The GPs in training had between one and five years of experience working as a GP, and they worked in different towns in the county. The towns are all small (less than 20.000 inhabitants), and two of the towns have a small hospital. The three casualty stations had GPs with experience ranging from one to 30 years, and were of both genders. By including the GPs that participated in the training group, we were given the opportunity to get experience from different parts of a large rural county. We do not believe that their limited experience was a serious limitation to the transferability, as we found similar experiences at the casualty clinics where more experienced GPs participated, and since casualty clinic duty is often performed by the younger and less experienced GPs. As in the EMT study, participation in the GP study was voluntary, favoring participation of GPs that have an interest in the topic. We came across



GPs arguing for and against GP participation, indicating that we managed to recruit participants with different opinions on this question. We believe that the results from Study II are useful in order to understand the use of GPs in emergency medicine in Norway, and like Study I, Study II may have transferable value for other researchers or general readers in terms of the findings on teamwork and decision-making. It is also possible that they will be relevant in other countries, to the extent that they have organized their EMS in a similar way.

An interesting question is whether the results from the qualitative papers can be applied in non-rural areas. As more of the hospital emergency medicine is centralized to a limited number of larger hospitals, it is possible that GPs and EMTs working close to local hospitals increasingly will experience challenges related to transportation time and logistics, as well as deciding the appropriate treatment level. The GPs in our study described a shift in emergency medicine, from working by themselves to now being a part of a team. This result is probably transferable to GPs in general as healthcare and primary care are increasingly using teams when treating patients. That interdisciplinary team training may improve patient care in situations that are unfamiliar, as reported by GPs, may also be transferable to other situations where doctors tend to ill patients as part of a team, for instance at hospitals. I also postulate that the trend in organizing hospital EMS by centralizing acute hospital care, will lead to more urban GPs facing challenges similar to those of the rural GPs we interviewed.

### Paper III

#### Generalizability

Before drawing conclusions about generalizability, several limitations must be borne in mind. When comparing the study sample to all GPs in Norway, our respondents were somewhat younger (45 vs. 48), and the proportion of females and specialists in general practice slightly higher. The national mean patient list size was 1128, which is a little higher than in our

sample (1128 versus 1044). Since these variables are registered and controlled for in the analysis, we believe that these differences do not jeopardize the external validity of our data.

Another issue is the question of rurality. In our questionnaire, we asked if the GP has to drive over or under an hour to the nearest hospital. The one hour distance to a hospital was chosen as a pragmatic proxy for working in a rural area, since one of our hypotheses was that GPs working at a distance from hospitals were more involved in emergency medicine (being on call, participating in ambulance call-outs, feeling that they play a part in emergency medicine). The variable was also chosen since we believed it to be fairly wide-ranging, reducing the GPs' perceived risk of being identified through a combination of variables (age, sex, list size and distance to hospital). We believed this to be important, as the fear of being identified could lead to fewer participants or participants being reluctant to answer truthfully.

Unfortunately, we do not know the proportion working more than one hour away from hospitals in the total Norwegian GP population. However, according to the classification of centrality used by Statistics Norway, the proportion of rural GPs in Norway (19%) are those working in fairly remote (class 1) and remote municipalities (class 0) [70]. These municipalities have 15.000 inhabitants or less. Even though this is not directly comparable to our rural definition, we believe that this is as close as we can get. Since the proportion of rural doctors in our survey was 26%, we assume that rural doctors might be slightly overrepresented among our respondents.

In hindsight, it would have been interesting if we had asked the GPs about the population size served by "their" casualty clinic, as well as distance to the hospital. This could have enabled us to build better statistical models, and making better comparisons between our sample and the national average. But then, as previously discussed, the amount of information asked for had to be balanced with the intention to preserve anonymity.

However, even if our sample was fairly similar to the total GP population with respect to age, gender, specialty attainment, list size and proportion of rural GPs, there might be other, unmeasured differences that could lead to systematic errors. Errors arising from systematic differences in the characteristics of those who do and do not agree to participate in a study is called participation bias. We invited all regular GPs by mail, followed by two reminders. The Norwegian Center of Rural Medicine also made a news story, urging GPs to participate. This was posted in a Facebook group for Norwegian GPs, that has over 3500 members, and on The Norwegian Center of Rural Medicine's homepage and Facebook page. This could have resulted in a higher proportion of social media users and GPs that are interested in rural medicine in the responder group, than in the general GP population. Users of social media are younger and more often females [71]. This could be a variant of participation bias, and a possible explanation of why our responders are younger, more often women, and perhaps more rural. It is also possible that the GPs that answered are special, that they have a special interest in emergency medicine, and that the results are not as general as we would like to think when we only look at the demographic variables that we have. However, we do not know the level of interest in emergency medicine among Norwegian GPs, and we did not ask about it in the survey. We can therefore only speculate whether the responding GPs have a more positive attitude towards participating in emergency medicine, than the total GP population, causing us to overestimate the GPs' role perception and participation in emergency medicine. Another potential participation bias might be that busy GPs did not have time to answer our survey. We have however, adjusted for list size, and it is difficult to speculate if and in which way a large work load might influence attitudes towards emergency medicine. Even though caution should be applied when generalizing from our results, the data from more than 1000 unselected Norwegian GPs has an important intrinsic value, thus, we

consider our findings representative of Norwegian GPs. The results may also be of interest in other countries where GPs play a similar role in the pre-hospital emergency system.

#### **5.4 Ethical considerations**

Ethical considerations in the qualitative studies

The participants received written and oral information about the project, that it was voluntary to participate, and the possibility to withdraw before the interviews began. This was done in accordance with the general research ethics principles of participation, based on informed consent. The interviews were recorded. The audio files were deleted after transcription. The transcribed data did not contain names, but the participants were given a code describing their gender and years of experience in their profession. The participants were advised not to share information that they learned from other participants during the interviews. This was done in order to limit sensitive information being spread.

The participants exposed themselves in the interviews, as they shared experiences of not following protocol or guidelines. This was important information, adding richness to the data. At the same time, I was mindful that sharing this information would not harm the participants, e.g. limiting the possibility of recognition. We, therefore, limited the data describing the ambulance stations and casualty clinics that we visited, and kept the information about participants to a minimum, while still containing relevant information.

The balance between keeping the voice of the individual respondent while the data is analyzed together with data from other respondents, is a challenge in qualitative research [72]. The participants might experience that they have been misinterpreted if they do not recognize their voice in the results of the research. I find this balance challenging, and therefore had a

special focus on it during the project. During the interviews I was careful to ask clarifying questions like “Have I understood you right that you think...”. We also turned back to the transcripts, regularly, trying to ensure that we had understood the participant correctly. We also discussed this during analysis in order to avoid confusing our own presumptions with the participants. A possible technique to avoid misunderstandings that we did not try, is to verify the information in the interviews afterwards by letting participants read the transcript [72]. This would reduce the possibility of misunderstandings, but we would still have the possibility of participants not recognizing their voice in the final product.

#### Ethical considerations in the quantitative study

The survey data was collected and stored according to regulations from NSD - Norwegian Centre for Research Data. The participants received a written invitation that contained information about the project, and that it was voluntary to participate. The invitation was drafted according to NSD recommendations. As opposed to qualitative studies, there is not a high risk of participants being recognized in quantitative studies, since these present aggregated data. There is, in the same way as in qualitative data, the possibility to offend on a group level, so that members of a group feel that they are inaccurately presented, and will therefore not participate in any future research. Again, I think this risk is low, since our survey did not include particularly sensitive topics.

An ethical issue that is relevant to this study is whether the project justifies the strain that we put on the participating GPs. GPs are often invited to participate in surveys, since they are believed to be able to relay important knowledge. If researchers flood the GPs with surveys, the GPs will eventually grow tired of answering them, and will no longer participate in similar studies. An important question is therefore whether the information can be obtained through other sources. As I have argued in the discussion of methods, self-reported data is an

important supplement to data from observations. I therefore argue that this survey is necessary, even though it adds to the strain on GPs. We were conscious not to burden the GPs unnecessarily. They were contacted by e-mail, we only sent two reminders, and were careful not to make the questionnaire too comprehensive. The fact that over 1000 GPs took the time to complete the survey in their busy life is a sign that they considered this survey worthwhile and important.

## **6 Implications for clinical practice**

When organizing pre-hospital EMS service in the future health authorities may do well considering the findings that, according to the participants, the EMTs and GPs have different knowledge and skills, and that the two professions complement each other in emergency medicine. These findings suggest that pre-hospital health care services should be organized in such a way that the patients are served by both professions in cooperation. Furthermore, there was nothing in our data to suggest that large, centralized casualty clinics facilitate GP participation in prehospital emergencies; if anything, it might be quite opposite. This should be taken into account when considering the organization of casualty clinics in the future. Finally, the findings presented in this thesis give support for continued implementation of team training, since this was strongly associated with GP participation.

## **7 Future Research**

In order to investigate GP contribution in emergency medicine further, I believe that large scale studies comparing pre hospital services with or without GP participation are needed. Based on my findings, it may be wise to focus on GP contribution in terms of early diagnosis and clinical decision-making and how these contributions are related to patient outcomes.

When doing so, it would be desirable to include patient and community perspectives. I also recommend that future investigations on GP participation in emergency medicine reflect our finding that the GPs participates in different arenas, not just on ambulance call-outs. Finally, it would be interesting to examine the association between team training and participation further. Is there a causal relationship between the two, and in what direction?

## **8 Conclusion**

My studies suggest that the GP still plays an important part in emergency medicine on different pre-hospital arenas. According to my informants, salient GP contributions were diagnostic skills and clinical decision-making. Interdisciplinary team training was strongly associated with self reported participation in emergency medicine. These findings may serve as a point of departure for future studies of the utility of GP participation in terms of patient outcomes. Until further data becomes available, I believe that measures to facilitate continued GP participation in pre hospital emergencies and further implementation of team training are warranted.

## References

1. The Ministry of Health and Care Services. Først og fremst — Et helhetlig system for håndtering av akutte sykdommer og skader utenfor sykehus [First and foremost – a complete system for managing the care of acute illness and injuries outside hospitals]. Official Norwegian Report NOU 2015: 17; 2015.
2. Straumann GH, Austvoll-Dahlgren A, Holte HH, Wisborg T. Effekt av legevaktlegens tilstedeværelse på skadested ved akutte, tidskrisiske situasjoner: en systematisk oversikt. [Effect of general practitioner's presence at accident site: a systematic review.] Rapport –2017. The Norwegian Institute of Public Health, 2017.
3. Kindt PG, Momyr M, Sundland E, et al. Prehospital akuttmedisin uten legevaktlege? [Prehospital emergency medicine without after-hours care physician?]. Tidsskr nor Laegeforen. 2013;133:1176–1177.
4. Johannessen C J. Legevakten – helsetjenstens svakeste ledd? [out-of-hours emergency primary health care – the weakest link]. Tidsskr nor Laegeforen. 2015;135:1612-3
5. Buskop C, Berve P O, Sabel M A. Debatten om akuttmedisin i Norge [The debate concerning emergency medicine in Norway]. Tidsskr Nor Laegeforen 2016;136:296-7.
6. Lauritzen T. Nytt fra sentrale myndigheter [News from the central authorities] Presentet at Lederkonferansen 2018; 2018 mar 8. Gardermoen airport
7. The Ministry of Health and Care Services. Regulation on pre-hospital emergency medicine services; 2015. [Internet]; [cited 2017 Aug 17]. Available from: <https://lovdata.no/dokument/SF/forskrift/2015-03-20-231?q=akuttmedisinforskriften>.
8. Definition of Emergency Medicine [internet] Irving (Tx)The American College of Emergency Physicians;[cited 2018 may 18]. Available from: <https://www.acep.org/globalassets/new-pdfs/policy-statements/definition.of.emergency.medicine.pdf>
9. Emergency Medical Services Systems in the European Union Report of an assessment project coordinated by the World Health Organization. Copenhagen: World Health Organization 2008.
10. Rortveit S, Hunskar S. Akuttmedisinsk handsaming i ein utkantkommune. [Management of emergency medical events in a rural community]. Tidsskr nor Laegeforen. 2009;129:735–737.
11. Nilsen J E, Wik L, Kramer-Johansen J, Styrkson K, Tjelmeland IBM, Seland N, Flingtorp LD, Olsen JÅ. Fremtidens prehospitaltjenester [The pre hospital services of the future]. Oslo: Norwegian National Advisory Unit on Prehospital Emergency Medicine 2014



12. Bondevik GT. Norsk legevakt i et internasjonalt perspektiv [Norwegian Emergency Primary Health Care in an international perspective] In: Hansen EH, Hunskår S, editors. Legevaktarbeid En innføringsbok for leger og sykepleiere [An introduction to Emergency Primary Health Care]. Oslo: Gyldendal Norsk Forlag AS;2016. p31-36
  
13. Huibers L, Giesen P, Wensing M, Grol R. Out-of-hours care in western countries: assessment of different organizational models. *BMC Health Services Research* 2009;9:105
  
14. Villareal M, Leach J, Ngianga-Bakwin K, Dale J. Can a partnership between general Practitioners and ambulance services reduce conveyance to emergency care? *Emerg med J*. 2017;34:459-465.
  
15. Larsson G, Holmén A, Ziegert K. Early prehospital assessment of non-urgent patients and outcomes at the appropriate level of care: A prospective exploratory study. *Int Emerg Nurs* 2017;32:45-49.
  
16. Weinick RM, Burns RM, Mehrotra A. Many Emergency Department Visits Could Be Managed At Urgent Care Centers And Retail Clinics. *Health Affairs*. 2010;29:1630-1636.
  
17. Porter K M. Training doctors in prehospital care: the West Midlands (UK) approach. *Emerg Med J* 2004;21:509-510.
  
18. Lew E, Fagan LJ, Mattek N, Mahler J, Lowe RA. Emergency department coverage by primary care physicians in a rural practice-based research network: incentives, confidence, and training. *J Rural Health*. 2009;25:189-93.
  
19. Humphreys J S, Jones JA, Jones MP, Mildenhall D, Mara PR, Chater B, Adena M A. The influence of geographical location on the complexity of rural general practice activities. *Medical Journal of Australia*. 2003;179:416-421.
  
20. Mole J, McGuire D, Riely R, Trewhella N. Are Perth metropolitan GPs prepared for common emergencies? *Aust Fam Physician* 2006;35:553-554.
  
21. Liddy C, Dreise H, Gaboury I. Frequency of in-office emergencies in primary care. *Can Fam Physician* 2009;55:1004-1005.
  
22. Eide TB, Straand J, Melbye H Rørtveit G, Hetlevik I, Rosvold EO. Patient experiences and the association with organizational factors in general practice: results from the Norwegian part of the international, multi-centre, cross-sectional QUALICOPC study. *BMC Health Serv Res*. 2016;16:428.

23. Hunskaar S, Blinkenberg J, Bondevik G, Ellensen E, Furu S, Johansen I Rebnord, I. Nasjonale krav til legevakt og fremtidens øyeblikkelig hjelp-tilbud i kommunene. Oppdrag fra Akuttutvalget. [National standards for casualty clinics and future emergency care in municipalities]Bergen: Nasjonalt kompetansesenter for legevaktmedisin, Uni Research Helse; 2014 Rapport nr. 7-2014.
24. Riktig diagnose til rett tid – fastlegen som helsetjenestens portner [the right diagnoses at the right time – the regular GP as the gate keeper of health care services]. Oslo: The Norwegian Medical Association;2017.
25. Zakariassen E, Hunskaar S. Involvement in emergency situations by primary care doctors on-call in Norway – a prospective population-based observational study. BMC Emerg Med. 2010;10:5.
26. Morken T, Myhr K, Raknes G, Hunskaar S. Legevaktorganisering i Norge. Rapport fra Nasjonalt legevaktregister 2016 [The organization of emergency primary health care in Norway. Research report 2016] National Centre for Emergency Primary Health Care 2016
27. Hunskaar S. Nasjonalt kompetansesenter for legevaktmedisin. ... er hjelpa nærmast! Forslag til Nasjonal handlingsplan for legevakt. [.. is the help close by! Proposition for a new plan of action for emergency care] Bergen: Nasjonalt kompetansesenter for legevaktmedisin, Unifob helse; 2009. Rapport nr. 1-2009.
28. Raknes G, Hansen EH, Hunskaar S. Distance and utilisation of out-of-hours services in a Norwegian urban/rural district: an ecological study. BMC Health Services Research. 2013;13:222
29. Brennvall HM, Hauken H, Hunskaar S, et al. Legevaktlegers avgjørelse om utrykning i akutt situasjoner [Out-of-hours doctors' decisions on call-outs in emergency situations.]. Tidsskr nor Laegeforen. 2015;135:654–657.
30. Midtbø V, Leirvåg J, Hunskaar S, Morken T. Kompetanse i legevakt og legevaktsentral- implementering av akuttmedisinforskriften [competence at the casualty clinics after implementation of emergency care regulations]. Bergen: Nasjonalt kompetansesenter for legevaktmedisin, Uni Research Helse; 2017. Rapport nr. 5-2017.
31. Abelsen B, Brandstorp H. Oppfyller kommunene kompetansekrav i akuttmedisinforskriften? Krav til leger i vakt og trening i samhandling[competence in the municipalities after implementation of emergency care regulations]. Tromsø: Norwegian Centre of Rural Medicine; 2017.
32. Malterud K. Fokusgrupper som forskningsmetode for medisin og helsefag [Focus groups as a research method in medicine and health education subjects]. Oslo: Universitetsforlaget AS;2012.

33. Patton, M. Qualitative evaluation and research methods. Beverly Hills (CA): Sage;1990. Purposeful sampling p. 169-186
34. Forland O, Zakariassen E, Hunskar S. Samhandling mellom ambulansesarbeider og legevaktlege [Cooperation between ambulance personnel and regular general practitioners.]. Tidsskr nor Laegeforen. 2009;129:1109–1111.
35. Malterud K. Systematic text condensation: A strategy for qualitative analysis. Scan J Public Health. 2012;40:795-805.
36. Malterud K. Qualitative research: standards, challenges, and guidelines. Lancet. 2001;358:483-488.
37. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol. 2006;3:77–101.
38. Campbell D. Top paramedics in UK gain right to prescribe medicines. The Guardian [internet]. 2018 Mar 31 [cited 2018 May 18];NHS:[about 2 screens]. Available from: <https://www.theguardian.com/society/2018/mar/31/nhs-englands-top-paramedics-gain-right-to-prescribe-medicines#top>
39. Baron, J. Thinking and Deciding. New York (NY): Cambridge University Press; 2007
40. The National Institute for Health and Care Excellence (NICE) glossary [internet].London [cited 2018 May 18] Available from: <https://www.nice.org.uk/glossary?letter=q>
41. Rortveit S, Meland E, Hunskaar S. Changes of triage by GPs during the course of prehospital emergency situations in a Norwegian rural community. Scand J Trauma Resusc Emerg Med. 2013;21:89.
42. Faiz K, Sundseth A, Thommessen B, Rønningen O M. Prehospitalt forløp ved akutt hjerneslag [Prehospital path in acute stroke]. Tidsskr Nor Legeforen 2017;137:798-802.
43. Wisborg T, Ellensen E, Svege I, Dehli T. Are severely injured trauma victims in Norway offered advanced pre-hospital care? National, retrospective, observational cohort. ? Acta Anaesthesiol Scand. 2017;61:7
44. Zakariassen E, Burman RA, Hunskaar S. The epidemiology of medical emergency contacts outside hospitals in Norway-a prospective population based study. Scand J Trauma Resusc Emerg Med. 2010; 18: 9-10.
45. Lossius HM, Søreide E, Hotvedt R, Hapnes SA, Eielsen OV, Førde OH, Steen PA. Prehospital advanced life support provided by specially trained physicians: is there a benefit in terms of life years gained? Acta Anaesthesiol Scand. 2002;46:771-8.

46. Myrbostad A, Lauvsnes A, Johansen K I. Utvikling av ambulansetjenesten i Helse Nord [Development of ambulance services in Health trust North]. Trondheim. SINTEF; 2005
47. Greenfield G, Foley K, Majeed A. Rethinking primary care's gatekeeper role. *BMJ* 2016;354.
48. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q.* 2005;83:457-502.
49. Kjosavik SR. Ongoing recruitment crisis In Norwegian general practice. *Scand J Prim Health Care* 2018; 36: 107-108
50. Halvorsen PA, Edwards A, Aaraas IJ, Aasland OG, Kristensen IS. What professional activities do general practitioners find most meaningful? Cross sectional survey of Norwegian general practitioners. *BMC Family Practice* 2013;14:41
51. Chen CE, Chen CT, Hu J, Mehrotra A. Walk-in clinics versus physician offices and emergency rooms for urgent care and chronic disease management. *Cochrane Database of Systematic Reviews.* 2017;2.
52. Gonçalves-Bradley D, Khangura JK, Flodgren G, Perera R, Rowe BH, Shepperd S. Primary care professionals providing non-urgent care in hospital emergency departments. *Cochrane Database of Systematic Reviews.* 2018; 2
53. Galvagno Jr SM, Sikorski R, Hirshon JM, Floccare D, Stephens C, Beecher D, Thomas S. Helicopter emergency medical services for adults with major trauma. *Cochrane Database of Systematic Reviews.* 2015; 12
54. Timmermann A, Russo SG, Hollmann MW: Paramedic versus emergency physician emergency medical service: role of the anaesthesiologist and the European versus the Anglo-American concept. *Curr Opin Anesthesiol.* 2008; 21:222-227.
55. MacFarlane C. The advances and evidence base for prehospital care. *BMJ Emerg Med J.* 2003;20:114-115
56. Brannick M T, Salas E, Prince C. Team performance assessment and measurement. New York (NY) Psychology Press; 1997. Chapter 1, An overview of team performance measurement. p. 3-16.
57. Manser T. Teamwork and patient safety in dynamic domains of healthcare: a review of the literature. *Acta Anaesthesiol Scand.* 2000;53:143-151

58. Martin GP, Finn R. Patients as team members: opportunities, challenges and paradoxes of including patients in multi-professional healthcare teams. *Sociology of Health and Illness*. 2011;33:7
59. Theilen U, Fraser L, Jones P, Leonard P, Simpson D. Regular in-situ simulation training of paediatric Medical Emergency Team leads to sustained improvements in hospital response to deteriorating patients, improved outcomes in intensive care and financial savings. *Resuscitation*. 2017;11:61-67
60. Haerkens MH, Knox M, Lemson J et al. Crew Resource Management in the Intensive Care Unit: a prospective 3-year cohort study. *Acta Anaesthesiol Scand* 2015;59:1319-29.
61. Brandstorp H, Halvorsen PA, Sterud B, Haugland B, Kirkengen AL. Primary care emergency team training in situ means learning in real context. *Scand J Prim Health Care* 2016;34:295-303.
62. Utsi R, Brandstorp H, Johansen K, Wisborg T. Tverrfaglig akuttmedisinsk teamtrening i kommunehelsetjenesten [Training in multiprofessional emergency medicine in primary health care]. *Tidsskr Nor Laegeforen* 2008;128:1057-9.
63. Brandrud AS, Bretthauer M, Brattebø G, Pedersen MJ, Håpnes K, Møller K, Borge T, Nyen B, Strauman L, Schreiner A, Haldorsen GS, Bergli M, Nelson E, Morgan TS, Hjortdahl P. Local emergency medical response after a terrorist attack in Norway: a qualitative study. *BMJ Qual Saf*. 2017;26:806-816.
64. Pedersen MJ, Gjerland A, Rund BR, Ekeberg Ø, Skogstad L. Emergency Preparedness and Role Clarity among Rescue Workers during the Terror Attacks in Norway July 22, 2011. *PLoS One*. 2016;11.
65. Mays N, Pope C. Assessing quality in qualitative research. *BMJ* 2000; 320 :50.
66. Hanson W E, Creswell J W, Clark V L P, Petska K S, Creswell J D. Mixed methods research designs in counseling psychology. *Journal of Counseling Psychology* 2005; 52: 224-235.
67. Kukull W A, Ganguli M. Generalizability, The trees, the forest, and the low-hanging fruit *Neurology*. 2012; 78: 1886–1891.
68. Althubaiti A. Information bias in health research: definition, pitfalls, and adjustment methods. *J Multidiscip Healthc*. 2016;9:211-217.
69. Stige B, Malterud K, Midtgarden T. Toward an Agenda for Evaluation of Qualitative Research. *Qualitative Health Research* 2009;19:1504-1516

70. StatBank Norway [Internet]. Statistics Norway [cited 2017 Aug 17] Available from: <https://www.ssb.no/en/statistikbanken>
71. Use of social media in Norway Q4 2016 [internet]Ipsos [cited 2018 May 20] Available from: <https://www.ipsos.com/nb-no/ipsos-tracker-om-sosiale-medier-q416>
72. Veiledning for forskningsetiske og vitenskapelige vurderinger av kvalitative forskningsprosjekter innen medisin og helsefag [A guide to ethical evaluation of healthcare research].Oslo: De nasjonale forskningsetiske komiteer;2010

## **Appendices**

Appendix I: Questionnaire (Norwegian and English version)

Appendix II: NSD - Norwegian Centre for Research Data: letter dated 02.08.12

Appendix III: Regional committee for medical and health research ethics: letter dated 29.06.12.

Appendix IV: NSD - Norwegian Centre for Research Data: letter dated 22.06.16

**Questionnaire to Norwegian GPs about casualty clinic duty, emergency medicine and callouts.**

The following questions was used in the analysis in Study III. Magnus Hjortdahl has translated the questions into English when preparing the thesis, as the original questionnaire is in Norwegian. The original questions in Norwegian are also included.

**A. Background information about you:**

1. Gender:

1.	Female	
2.	Male	

2. Your age:  years

3. Are you a specialist GP?

1.	Yes	
2.	No	

4. How many patients are there on your list?

Fill in:  number of patients

5. During the last year, how often have you worked at the casualty clinic?

1.	Weekly (one or more a week)	
2.	Monthly ( between one and three a month)	
3.	Semiannual (between one and five during six months)	
4.	Annual (one each year)	
5.	Not relevant (Have not worked there the last year)	

6. To what degree do you experience that you, as a GP, play a role in emergency medicine?

1 (small degree)

5 (large degree)



**B Questions about your casualty clinic**

7. What type of casualty clinic do you work at?

1.	Municipal, not a large city	
2.	Municipal, large city (se below)	
3.	Inter-municipal	

large city casualty clinic: Oslo, Bergen, Stavanger, Trondheim

8. Are there several physicians working at the same time at your casualty clinic?

1.	Yes	
2.	On an off	
3	Never	

9. Is there a physician on stand by if you have to tend to a call out?

1.	Yes	
2.	No	

10. Are you collocated with the ambulance service?

1.	Yes	
2.	No	

11. Do you have a dedicated response vehicle for the physician?

1.	Yes, with a driver	
2.	Yes, without a driver	
3.	No	

12. Are you located more than a 60 minutes car drive from the nearest hospital?

1.	Yes	
2.	No	

13. What proportion of ambulance call outs do you usually participate in?:

Never                      25%                      50%                      75%                      Always                      Not relevant

14. Are there nurses/other healthcare personnel present at your casualty clinic 24/7?

1.	Yes	
2.	No	

15. How often do you carry out emergency medical training exercises with other professions (EMTs, community care nurses, personnel from air ambulance services, others) in your casualty clinic?

1.	We never do	
2.	Less than once a year	
3.	We train once a year	
4.	We train several times a year	
5.	Not relevant (have not worked at casualty clinic the last year)	

### Spørreskjema til norske fastleger om legevakt, akuttmedisin og deltagelse på utrykning.

#### A. Bakgrunnsopplysninger om deg:

1. Kjønn:

1.	Kvinne	
2.	Mann	

2. Din alder:  år

3. Er du spesialist i allmennmedisin?

1.	Ja	
2.	Nei	

4. Hvor mange pasienter er det på listen din?

Skriv:  antall pasienter

5. Hvor ofte har du hatt legevakt det siste året?

1.	Ukentlig (1 eller flere i uken)	
2.	Månedlig (1 til 3 i måneden)	
3.	Halvårlig (en til fem i halvåret)	
4.	Årlig (en vakt i året)	
5.	Ikke relevant (ikke hatt vakt siste året)	

6. I hvilken grad opplever du at du som allmennlege har en rolle innen akuttmedisin:

1 (liten grad)

5(stor grad)

**B Spørsmål om din legevakt:**

7. Hva slags legevakt jobber du på?

1.	Kommunal, ikke storby	
2.	Kommunal, storby (se under)	
3.	Interkommunal	

storby legevakt: Oslo, Bergen, Stavanger, Trondheim

8. Er dere flere leger på jobb samtidig når du har legevakt?

1.	Ja,	
2.	Av og til	
3.	Aldri	

9. Er det en lege i beredskapsvakt hvis du må rykke ut?

1.	Ja,	
2.	Nei	

10. Er dere samlokalisert med ambulansetjenesten?

1.	Ja,	
2.	Nei	

11. Har dere eget utrykningskjøretøy til legen?

1.	Ja, med sjåfør	
2.	Ja, uten sjåfør	
3.	Nei	

12. Er dere lokalisert mer enn 60 minutters bilkjøring fra nærmeste sykehus?

1.	Ja,	
2.	Nei	

13. Hvor stor andel av uttrykninger ved «lege-ambulansealarm» deltar du vanligvis på:

Aldri                      ca 25%                      ca 50%                      ca 75%                      Alltid                      Ikke relevant

14. Er det sykepleiere/annet hjelpepersonell tilstede på din legevakt hele døgnet?

1.	Ja,	
2.	Nei	

15. Hvor ofte har dere trening i akuttmedisin med andre aktører (ambulansetjenesten, hjemmesykepleien, luftambulansen, andre) ved din legevakt:

1.	Vi har aldri trening	
2.	Det er mer enn et år mellom hver gang	
3.	Vi trener en gang i året	
4.	Vi trener flere ganger i året	
5.	Ikke relevant (ikke hatt vakt siste året)	



Magnus Hjortdahl  
Nasjonalt kompetansesenter for legevaktmedisin  
Uni Helse  
Kalfarveien 31  
5018 BERGEN

Vår dato: 02.08.2012

Vår ref:31049 / 3 / KH

Deres dato:

Deres ref:

## TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 11.07.2012. Meldingen gjelder prosjektet:

31049                      *Lege-ambulansealarm – hva betyr legen for ambulansarbeiderne? En kvalitativ undersøkelse*  
Behandlingsansvarlig      *Universitetet i Bergen, ved institusjonens øverste leder*  
Daglig ansvarlig              *Magnus Hjortdahl*

Etter gjennomgang av opplysninger gitt i meldeskjemaet og øvrig dokumentasjon, finner vi at prosjektet ikke medfører meldeplikt eller konsesjonsplikt etter personopplysningslovens §§ 31 og 33.

Dersom prosjektopplegget endres i forhold til de opplysninger som ligger til grunn for vår vurdering, skal prosjektet meldes på nytt. Endringsmeldinger gis via et eget skjema, [http://www.nsd.uib.no/personvern/forsk\\_stud/skjema.html](http://www.nsd.uib.no/personvern/forsk_stud/skjema.html).

Vedlagt følger vår begrunnelse for hvorfor prosjektet ikke er meldepliktig.

Vennlig hilsen

Vigdis Namtvedt Kvalheim  
*K + KSjek*

*Kjersti Håvardstun*  
Kjersti Håvardstun

Kontaktperson: Kjersti Håvardstun tlf: 55 58 29 53  
Vedlegg: Prosjektvurdering



Personvernombudet kan ikke se at det foretas behandling av personopplysninger med elektroniske hjelpemidler eller at det opprettes manuelt personregister som inneholder sensitive personopplysninger. Prosjektet vil dermed ikke omfattes av meldeplikten.

Det legges til grunn at opptak ikke behandles på datamaskin samt at data anonymiseres ved transkribering ved at verken direkte eller indirekte personidentifiserbare opplysninger fremgår. Det vil ikke finnes en koblingsnøkkel som knytter transkripsjoner til informant.

Det er videre lagt til grunn at det ikke innhentes personidentifiserbare opplysninger om verken leger eller pasienter.

Lydopptak slettes innen prosjektslutt.

---

<b>Region:</b>	<b>Saksbehandler:</b>	<b>Telefon:</b>	<b>Vår dato:</b>	<b>Vår referanse:</b>
REK nord	Veronica Sørensen	77620758	29.06.2012	2012/1260/REK nord
			<b>Deres dato:</b>	<b>Deres referanse:</b>

Vår referanse må oppgis ved alle henvendelser

Magnus Hjortdahl

Hesteskoen 8

9510 Alta

### **2012-1260 Lege-ambulanselarm – hva betyr legen for ambulansearbeiderne? En kvalitativ undersøkelse**

Vi viser til skjema for framleggingsplikt av 20.06.2012.

#### **Framleggingsplikt**

De prosjektene som skal framlegges for REK er prosjekt som dreier seg om "medisinsk og helsefaglig forskning på mennesker, humant biologisk materiale eller helseopplysninger", jf. helseforskningsloven (h) § 2. "Medisinsk og helsefaglig forskning" er i h § 4 a) definert som "virksomhet som utføres med vitenskapelig metodikk for å skaffe til veie ny kunnskap om helse og sykdom". Det er altså formålet med studien som avgjør om et prosjekt skal anses som framleggelsespliktig for REK eller ikke.

Formålet er ikke å fremskaffe ny kunnskap om sykdom eller helse som sådan, men å utforske ambulansearbeideres erfaringer med å ha lege med på akuttoppdrag. Prosjektet er ikke framleggingspliktig. Det forutsettes at intervjuobjektene skal overholde sin lovpålagte taushetsplikt og at det således heller ikke er nødvendig med disp. fra taushetsplikten.

På bakgrunn av det overnevnte anser REK at prosjektet ikke er framleggingspliktig.

#### **Vedtak**

*Etter søknaden fremstår prosjektet ikke som et medisinsk og helsefaglig forskningsprosjekt som faller innenfor helseforskningsloven. Prosjektet er ikke framleggingspliktig, jf. helseforskningslovens § 10, jf. forskningsetikkloven § 4, 2. ledd.*

Vi ber om at alle henvendelser sendes inn via vår saksportal: <http://helseforskning.etikkom.no> eller på e-post til: [post@helseforskning.etikkom.no](mailto:post@helseforskning.etikkom.no)

Vennligst oppgi vårt referansenummer i korrespondansen.

Med vennlig hilsen

May Britt Rossvoll  
sekretariatsleder

Veronica Sørensen  
rådgiver





Magnus Hjortdahl  
Institutt for samfunnsmedisin UiT Norges arktiske universitet

9037 TROMSØ

Vår dato: 22.06.2016

Vår ref: 48819 / 3 / STM

Deres dato:

Deres ref:

## TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 01.06.2016. Meldingen gjelder prosjektet:

48819                      *Akutt utrykning på legevakt: Hva er allmennlegens bidrag, og hvordan tas beslutningen om å rykke ut?*  
                                 *Delprosjektet: Allmennlegen, legevakt og akuttmedisin*  
*Behandlingsansvarlig      UiT Norges arktiske universitet, ved institusjonens øverste leder*  
*Daglig ansvarlig            Magnus Hjortdahl*

Personvernombudet har vurdert prosjektet og finner at behandlingen av personopplysninger er meldepliktig i henhold til personopplysningsloven § 31. Behandlingen tilfredsstiller kravene i personopplysningsloven.

Personvernombudets vurdering forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, ombudets kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, <http://www.nsd.uib.no/personvern/meldeplikt/skjema.html>. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, <http://pvo.nsd.no/prosjekt>.

Personvernombudet vil ved prosjektets avslutning, 30.06.2018, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Kjersti Haugstvedt

Siri Tenden Myklebust

Kontaktperson: Siri Tenden Myklebust tlf: 55 58 22 68

*Dokumentet er elektronisk produsert og godkjent ved NSDs rutiner for elektronisk godkjenning.*

Vedlegg: Prosjektvurdering



Det fremgår at prosjektet er en nasjonal samarbeidsstudie. UiT Norges arktiske universitet er behandlingsansvarlig institusjon. Personvernombudet forutsetter at ansvaret for behandlingen av personopplysninger er avklart mellom institusjonene. Vi anbefaler at det inngås en avtale som omfatter ansvarsfordeling, ansvarsstruktur, hvem som initierer prosjektet, bruk av data og eventuelt eierskap.

Informasjonsskrivet er greit utformet, men det må presiseres at selve undersøkelsen ikke er anonym. Videre må utvalget informeres om prosjektslutt og tidspunkt for anonymisering av datamaterialet. Vi ber derfor om at følgende endres:

-Setningen: "Deltagelse er frivillig og du vil være anonym." endres til "Deltakelse i prosjektet er frivillig. Du vil ikke kunne gjenkjennes i publikasjoner. Ved prosjektslutt 30.06.2018 slettes kontaktinformasjon og koblinger mellom IP-/epostadresser og besvarelser."

Vi legger til grunn at du går gjennom informasjonsskrivet og sørger for at alle overnevnte punkter er med, slik at samtykket du får fra den enkelte er gyldig.

Personvernombudet legger til grunn at forsker etterfølger UiT Norges arktiske universitet sine interne rutiner for datasikkerhet.

Questback er databehandler for prosjektet. UiT Norges arktiske universitet skal inngå skriftlig avtale med Questback om hvordan personopplysninger skal behandles, jf. personopplysningsloven § 15. For råd om hva databehandleravtalen bør inneholde, se Datatilsynets veileder: <http://www.datatilsynet.no/Sikkerhet-internkontroll/Databehandleravtale/>.

Forventet prosjektslutt er 30.06.2018. Ifølge prosjektmeldingen skal innsamlede opplysninger da anonymiseres. Anonymisering innebærer å bearbeide datamaterialet slik at ingen enkeltpersoner kan gjenkjennes. Det gjøres ved å:

- slette direkte personopplysninger (som navn/koblingsnøkkel)
- slette/omskrive indirekte personopplysninger (identifiserende sammenstilling av bakgrunnsopplysninger som f.eks. bosted/arbeidssted, alder og kjønn)

Vi gjør oppmerksom på at også databehandler (Questback) må slette personopplysninger tilknyttet prosjektet i sine systemer. Dette inkluderer eventuelle logger og koblinger mellom IP-/epostadresser og besvarelser.